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FINAL REPORT
INCLUDES APPENDIXES A AND B

Corinne
MARKS

REMEDIAL DESIGN DETAILS - ADDENDUM

SUBUNIT 2A, MEADE STREET OPERABLE UNIT

RICHMOND FIELD STATION, RICHMOND, CALIFORNIA

(TASKS 2D AND 3D, RWQCB ORDER NO. 01-102)

Prepared for
University of California Berkeley
Capital Projects
1936 University Ave, 2nd Floor
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August 16, 2002

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51-09967067.01

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August 16, 2002

Mr. Cecilio Felix
Associate Engineering Geologist
California Regional Water Quality Control Board
San Francisco Bay Region
1515 Clay Street, Suite 1400
Oakland, California 94612

Subject: Addendum to the Remedial Design Details for Subunit 2A, Meade Street Operable Unit, University of California, Richmond Field Station, Richmond, California

Dear Mr. Felix:

URS Corporation (URS), on the behalf of the University of California Berkeley (UC Berkeley), has prepared this addendum to Zeneca, Inc.'s report titled "Remedial Design Details, Meade Street Operable Unit" (RDDR), prepared by Levine Fricke (LFR) and submitted to the California Regional Water Quality Control Board (RWQCB) on January 31, 2002. The RDDR discusses activities to remediate Subunits 1 and 2A of the Meade Street Operable Unit designated in Order Nos. 01-101 and 01-102, respectively. The RDDR and this addendum are submitted to comply with Order 01-102, Task 2d for the upland portion of Subunit 2A and Task 3d for the marsh portion.

Zeneca and UC Berkeley own Subunits 1 and 2A, respectively. Zeneca is responsible for the remediation of Subunit 1 and Zeneca and UC Berkeley are jointly responsible for the remediation of Subunit 2A. Subunit 2A consists of the southern portion of the upland property and the eastern portion of Western Stege Marsh located south of the Richmond Field Station's (RFS) upland area. The location of the RFS is shown on Figure 1 and the locations and boundaries of Subunits 2A and 2B are shown on Figure 2.

Since the submittal of the RDDR, some of the details of the remedial measures discussed in the RDDR have evolved based on the results of additional investigations in Subunit 2A as required under Task 2a of the Order. This addendum to the RDDR provides supplemental information regarding proposed remedial actions as requested by, and discussed with, RWQCB staff to complete requirements of Tasks 2c and 2d. The RDDR addendum contains the following information:

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Section 1.0	Results of additional investigations within Subunit 2A;
Section 2.0	Remedial Action Objectives proposed for Subunit 2A;
Section 3.0	Excavation, treatment, and disposal plan for cinders and sediment for Subunit 2A; and
Section 4.0	Installation of a slurry wall along a portion of the boundary between Subunit 1 and Subunit 2.

As discussed below in Section 3.0, URS is currently conducting a treatability study for soil containing elevated concentrations of mercury. The results of the study, that will be used to determine the disposal destination of the material, will be reported to the RWQCB in an attachment to this addendum to be submitted separately at the conclusion of the study.

Also, details of the slurry wall, discussed in general in Section 4.0, will be submitted to the RWQCB in a separate attachment to this addendum following final design. Construction details are under review and may change from the current design.

1.0 Results of Additional Investigations for Subunit 2A

UC Berkeley submitted a report titled "Results of Additional Soil and Groundwater Investigations and Groundwater Monitoring Plan, Upland Portion of Subunit 2A, Richmond Field Station" to the RWQCB on November 21, 2001. That report discussed the results of additional soil analytical data collected in Subunit 2A since the initial RFS site investigation reported to the RWQCB in December 2000. Although the additional investigation provided a better understanding of the distribution of the chemicals of concern (COCs) in Subunit 2A, the vertical extent of COCs in the upland portion and the western extent of the COCs in the marsh were not defined. UC Berkeley, in coordination with Zeneca, performed additional investigations to delineate COCs in Subunit 2A and identify COCs in excess of the proposed remedial action objectives (RAOs).

Between April and July 2002, URS, on behalf of UC Berkeley, installed 35 Geoprobe borings and analyzed 130 soil, cinder, and sediment samples for priority pollutant metals and pH. Sampling locations are shown on Figure 3 and the analytical results for metals, volatile organic compounds (VOCs), and semi-volatile organic compounds (SVOCs) are presented in Tables 1 through 3, respectively. These data were compiled with previous analytical data from Subunit 2A as shown in Tables 4 and 5, the upland data and the marsh data, respectively. Stratigraphic data from all borings and test pits within the upland portion of Subunit 2A were compiled as shown in Table 6. Appendix A includes the geologic boring logs for the recently installed Geoprobe boring locations, Appendix B summarizes the quality assurance/quality control (QA/QC) analysis of the laboratory analytical results, and Appendix C contains the laboratory analytical data reports for the recently collected soil, cinder, and sediment samples.

Based on the results of the investigations conducted in the upland portion of Subunit 2A, three soil layers have been identified:

- Overburden consisting of fill originally placed on the property by UC Berkeley in the 1950's;
- Pyrite cinders; and
- Sediment deposited on a former shoreline tidal flat prior to the placement of cinders and fill.

The overburden that was imported for engineering fill appears to be relatively clean with the exception of a small area in the vicinity of the rectangular pond and the inner portion of the berm of the Round Pond. Elevated concentrations of metals were detected in the pyrite cinder layer and the upper portion of the underlying sediment (former tidal mud flat deposits). The metals, including arsenic, cadmium, copper, lead, mercury, selenium, and zinc, are generally contained in the cinder layer and the upper 1 ½ feet of sediment. In the center of the upland portion of Subunit 2A shown on Figure 6, elevated concentrations of mercury occur in sediment at depths up to –5 feet.

Two soil layers were identified in the marsh, a layer of pyrite cinders or soft, high-water-content clay overlying stiff native clay. The marsh stratigraphy varies from east to west. In the eastern portion of the subunit, the walking path consists of cinders and fill overlying former tidal flat sediment. The thickness of the cinder layer decreases and the thickness of the soft clay layer increases westward towards Subunit 2B. Although the upper layer consisting of cinders and soft sediment varies, the underlying sediment layer consisting of stiff clay at approximately elevation –2 feet appears continuous. The cinder/soft clay layer contains elevated concentrations of metals including arsenic, cadmium, copper, lead, mercury, selenium, and zinc. The metals do not appear to have migrated into the underlying stiff native clay.

2.0 Proposed Remedial Action Objectives for Subunit 2A

As presented in a human health and ecological risk assessment submitted to the RWQCB (Task 1 of Order No. 01-102) in November 2001, UC Berkeley developed site-specific target levels (SSTLs) for the protection of human health (H-SSTLs) and ecological receptors (E-SSTLs) for the RFS site (including Western Stege Marsh). In the upland area, human receptors include commercial/industrial workers and construction workers. The ecological receptors include ground squirrels and red-tailed hawks. In the marsh, H-SSTLs were developed for recreators including children on paths and roads, adults in the tidal marsh, and anglers fishing in the marsh. The ecological receptors that were considered include the Salt Marsh Harvest Mouse and the

California Clapper Rail. The applicable H-SSTLs and E-SSTLs for the upland and marsh areas are provided in Tables 4 and 5, respectively.

In addition to evaluating the risk to site receptors, concentrations of COCs were compared to risk-based screening levels (RBSLs) developed by the RWQCB for soil at industrial sites < 3 meters (9.9 feet) and > 3 meters below ground surface ("Application of Risk-Based Screening Levels and Decision Making to Sites with Impacted Soil and Groundwater"). The RBSLs were used as a screening level because the H-SSTLs and E-SSTLs have not yet been approved by the RWQCB. The RBSLs for the appropriate depth of the material were then compared to the applicable SSTLs and the lowest value was selected as the proposed RAO for each of the metals. The proposed RAOs, based on the protection of human health, the environment, or the RBSL, are shown in the following table:

Metal	**Remedial Action Objective (mg/kg)**	
	Soil < 9.9 ft bgs	Soil > 9.9 ft bgs
Arsenic (background)	8	8
Cadmium	12	61
Copper	225	5000
Lead	400	1000
Mercury	10	160
Nickel	150	1000
Selenium	10	2700
Zinc	600	5000

Areas exceeding the proposed RAOs were identified as areas of concern (AOCs) within Subunit 2A and are identified for remediation as described below in the following section.

The RAOs to be used for Subunit 2B will be modified based on H-SSTLs and E-SSTLs approved by the RWQCB.

3.0 Excavation Plan

The goal of the upland and marsh remediation activities in Subunit 2A is to remove pyrite cinders and sediment containing COCs that exceed the proposed RAOs. To identify this material, the analytical data for Subunit 2A was screened against the proposed RAOs developed for the site as shown in Table 4. Soils and cinders containing metals in excess of the proposed RAOs were identified for excavation. An excavation plan was then developed based on the stratigraphy of the materials (Table 6) and applicable treatment methodology based on the COCs contained within the material to be excavated. In general, the excavation plan consists of the following elements:

- Overburden will be excavated, stockpiled, and reused as backfill following the excavation of underlying materials (See Figure 4);
- Portions of the cinders and sediment, containing less than 50 mg/kg mercury, will be excavated, transported to the Zeneca site, treated as described in the RDDR, and placed along with cinders from Subunit 1 (See Figure 5);
- Portions of the cinders and sediment containing between 50 mg/kg and 260 mg/kg mercury will be excavated, the soil/cinders will be treated to stabilize the mercury on the RFS site, treated as described in this RDDR addendum, and transported to the Zeneca site to be placed with treated cinders; and
- Portions of cinders and sediment containing greater than 260 mg/kg mercury will be excavated, solidified to reduce water content and leachability of metals on the RFS site, and transported to a Class I landfill for disposal (see Figure 6).

Each of these elements is discussed in more detail below.

Upland Portion of Subunit 2A

Overburden

The overburden (fill) cut is designed to remove the clean fill from the upper layer from the upland portion of Subunit 2A for reuse as clean backfill. The fill excavation plan is shown on Figure 4. As shown on this figure, the upland area was subdivided into subareas based on the elevation of the fill material and depth to cinders. The goal for this excavation cut is to remove as much of the clean fill material as possible without excavating the underlying cinder and sediment that contains metals exceeding the proposed RAOs. Metals concentrations in the overburden samples are shown in Tables 1 and 4. Overburden containing metals in excess of the proposed RAOs in the vicinity of the rectangular pond will be segregated and treated with the underlying cinder material. It is important to note that the excavation bottom elevations shown on Figure 4 for each of the subareas are meant to be used as an excavation guide only. Due to the undulating surface of the underlying cinder materials, visual observations in the field during excavation will be used in conjunction with these elevations to maximize the fill to be reused while minimizing the cinders that may be mixed in with the clean fill during excavation activities.

Following excavation, the overburden will be temporarily stored in a stockpile and returned to the excavation after removal of the cinder and sediment layers discussed below.

Cinders and Sediment

The elevation of the bottom of the excavation, within the sediment beneath the cinder layer, was selected based on the comparison of the analytical results with the proposed RAOs as discussed above. The excavation area was subdivided into cells based on the analytical results, the stratigraphy of the material, and treatment method. The cinders and sediment containing elevated concentrations of metals, but with a mercury concentration less than 50 mg/kg, will be transported to the Zeneca site for metals treatment and placement as described in the RDDR. The upland and marsh areas and depths of the excavations of the material to be transported to the Zeneca site for treatment are shown on Figure 5. This threshold was established based on treatability studies, conducted by LFR and discussed in Appendix D of the RDDR, that showed that concentrations of 50 mg/kg mercury should not leach significant concentrations of mercury after treatment with limestone, as is being performed at the site.

Due to the nature of the process being utilized by Zeneca to stabilize soil/cinders, UC Berkeley will perform additional treatment to stabilize the elevated concentrations of mercury (between 50 mg/kg and 260 mg/kg). The purpose of the pretreatment for mercury is to minimize leachability and to solidify (chemically dry) the material for handling and hauling purposes. Following pretreatment on the RFS site, this material will be transported to the Zeneca site for placement. Before transport to Zeneca, treatment quality assurance testing will be completed on the treated cinder and soil. Material will only be transported to Zeneca after approval by Zeneca and the treatment has shown a reduction in mercury leaching to levels that are to be protective of the underlying groundwater and nearby surface water.

Once this material has been excavated, the remaining cinders and sediment with mercury greater than 260 mg/kg will be excavated. UC Berkeley will solidify (dry) the material on the RFS site and haul it to a Class I landfill for disposal. As with the previous excavation cuts, the area was subdivided into subareas based on the depth of the excavation within that area. The areas and depths of the material to be treated on the RFS site by UC Berkeley and hauled either to the Zeneca site or to a Class I landfill are shown on Figure 6.

Excavation profiles of the three layers to be excavated, i.e., the overburden fill, the material to be treated by Zeneca, and the material to be treated by UC Berkeley, are shown on Figures 7 and 8. Profiles A, B, and C are located in the upland portion of Subunit 2A as shown on Figure 9. These profiles provide a visualization of the excavation plan.

The process to stabilize cinders and sediment containing concentrations of mercury greater than 50 mg/kg will be accomplished by mixing a stabilization reagent into the material on impervious pads. The pads will be bermed, to contain water from the saturated soil and sediment, and constructed on the RFS site using either asphalt or a geomembrane. The location of the pads will

be in the stippled areas shown on Figure 10 west and north of the upland portion of Subunit 2A. The particular reagent will be selected by a benchscale study that is currently ongoing. Following treatment, the material will be loaded into trucks and transported to either the Zeneca site or to a Class I landfill as appropriate.

Marsh Portion of Subunit 2A

For the marsh portion of Subunit 2A, cinders and soft sediment containing COCs in excess of the proposed RAOs will be removed down to the clean, native, underlying substrate at approximately –1.5 feet elevation. As with the fill cut, the bottom excavation elevations are meant to be used as a guide in conjunction with visual observations for cinders in the field during the excavation activities. A profile of the marsh excavation is shown on Profile D on Figure 8. The vegetation layer will be removed and disposed in an appropriate offsite landfill. As in the upland area, material containing greater than 50 mg/kg mercury will be treated by UC Berkeley at the RFS site and transported to the Zeneca site for placement. As described in the RDDR, the Zeneca site will be capped to limit exposure to the treated material.

Excavation Confirmation Samples

The extensive sampling program to define the vertical extent of elevated metals was designed to demonstrate that the excavation had achieved the desired proposed RAOs without post confirmation sampling. The reason for performing up-front confirmation sampling is due to the difficulties in obtaining representative bottom samples under the groundwater table after the desired depth has been achieved. Besides showing screening level exceedances, Table 4 also shows whether the sample location (horizontally and vertically) will be excavated or left in place. The sediment samples that will be left in place were compiled in Table 8 to show residual metal concentrations after remediation. This table shows that the source of metals contamination will be removed. Elevated metals will remain at five sampled locations. Considering the depth of these samples (5 feet to 18 feet) and that the concentrations are only slightly above the proposed RAOs, we believe that the residual contamination will not pose a risk or an ongoing source of contamination to the groundwater and the adjacent marsh. To ensure that residual metal concentrations in the groundwater in the eastern portion of Subunit 2A will not impact the marsh, the biologically-active permeable barrier (BAPB) will be extended downgradient of this area. A long-term effectiveness monitoring program will be implemented to demonstrate the effectiveness of the removal action.

Backfill Materials

Once the excavation activities have been completed, the site will be backfilled with clean soil. The post-remediation grading plan is shown on Figure 11. All materials to be used as backfill

will be sampled to ensure that the material meets the geotechnical and chemical requirements prior to placement. Analytical results from the sampling of Stege Marsh fill material brought onsite will be compared to the criteria selected from the Wetland Surface Material Screening Guidelines included in the *RWQCB Draft Staff Report – Beneficial Reuse of Dredged Materials: Sediment Screening and Testing Guidelines (May 2000)*, background metals concentrations documented in the *Lawrence Berkeley National Laboratory (LBNL) Protocol for Determining Background Concentrations of Metals in Soil at Lawrence Berkeley National Laboratory (August 1995)*, and the Human Health SSTLs developed for the Risk Assessment. The lower of the LBNL and H-SSTL concentrations were selected for those metals for which no criteria is established in the RWQCB report. The criteria for organic compounds are based on laboratory detection limits for PCBs, pesticides, PAHs, VOCs, or TPH. Low detection limits for the USEPA Method 8270 will be specified. If low concentrations of organic compounds are detected in a potential borrow source, the source may be considered for acceptance or rejection on a case-by-case basis.

Analytical results for samples of backfill material brought onsite for the upland portion of the site will be compared to the criteria based on the LBNL background metals concentrations. The criteria for organic compounds are based on laboratory detection limits for PCBs, pesticides, PAHs, VOCs, or TPH. Low detection limits for the USEPA Method 8270 will be specified. If low concentrations of organic compounds are detected in a potential source, the borrow source will be considered for acceptance or rejection on a case-by-case basis.

4.0 Slurry Wall

As a contingency measure to assure that residual chemicals detected in the groundwater at Subunit 1 and Subunit 2A are not transported between the Sites, a low permeability slurry wall will be installed along South 46th Street. The slurry wall will act as a barrier to shallow groundwater flow in the Upper Horizon. The slurry wall depth will include the entirety of the Upper Horizon as defined in the Conceptual Remedial and Risk Management Plan for the upland portion of the Zeneca, Inc. Richmond Facility (LFR 2000). The slurry wall will be keyed into the silty clay material between the upper and lower horizon observed in the geologic logs for sample locations H-36 and H-58, shown in Appendix A. This bottom depth will be approximately consistent with the proposed bottom depth of the BAPB. Final design details will be submitted to the RWQCB following completion of the design by Zeneca and concurrence by UC Berkeley.

Based on the additional characterization, cleanup to the proposed RAOs, and remedial actions outlined above, we believe that the COCs will be reduced to levels that will protect human and ecological health, and water quality. Please call me at (510) 874-3192 if you have questions or need additional information.

Sincerely,

URS CORPORATION

Diane K. Mims
Senior Project Manager

Cc: Mike Hryciw, UC Berkeley Capital Projects
Anna Moore, UC Berkeley Environment, Health, and Safety
Pat Schlesinger, UC Office of the General Counsel
Jane Anderson, Zeneca Inc.
Bill Carson, LFR
John Edgcomb, Esq.
File

Attachments

Tables
Table 1: Metals in Soil, Cinders, and Sediment (Recent Data), Subunit 2A
Table 2: VOCs in Soil and Sediment, Upland Portion of Subunit 2A
Table 3: SVOCs in Soil and Sediment, Upland Portion of Subunit 2A
Table 4: Metals in Soils, Cinders, and Sediment, Upland Portion of Subunit 2A
Table 5: Metals in Sediment, Marsh Portion of Subunit 2A
Table 6: Stratigraphic Information, Subunit 2A
Table 7: Metals in Overburden, Upland Portion of Subunit 2A
Table 8: Metals in Sediment below Excavation, Upland Portion of Subunit 2A

Figures
Figure 1: Site Location Map
Figure 2: Subunits 2A and 2B Locations and Boundaries
Figure 3: Sampling Locations
Figure 4: Excavation Plan for Surface Fill

TABLES

TABLE 1
METALS IN SOIL, CINDERS, AND SEDIMENT (RECENT DATA)
UPLAND PORTION OF SUBUNIT 2A
RICHMOND FIELD STATION

EPA Method 6010 (7471 for Mercury), units = mg/kg

Sample Location	Depth [feet]	Elevation [feet] of Ground Surface	Elevation of Sample [feet]	Material Type	Antimony	Arsenic	Beryllium	Cadmium	Chromium	Copper	Lead	Mercury	Nickel	Selenium	Silver	Thallium	Zinc
2AU-1-1	1.0	5.79	4.8	Fill	<3	4.8	0.61	1.4	39	120	10	0.73 J	62	0.61	<0.25	0.41	140
2AU-1-4	4.0	5.79	1.8	Cinders	12	210	0.19	22	30	2,300	150	41	62	5.7	5.9	<0.31	2,600
2AU-1-4.5	4.5	5.79	1.3	Sediment	5.7	130	0.21	9.6	20	1,900	220	210	53	6.6	3.7	1.3	2,100
2AU-1-5.5	5.5	5.79	0.3	Sediment	<3.3 UJ	1.5	0.54	1	48	15	4	3.1	50	<0.27	<0.27	<0.27	39
2AU-1-7	7.0	5.79	-1.2	Sediment	<3.7 UJ	12.0	0.55	1.2	42	18	5.4	0.12 J	51	<0.31	<0.31	<0.31	44
2AU-1-8	8.0	5.79	-2.2	Sediment	<3.7 UJ	7.9	0.56	1.5	44	20	5.9	0.33 J	62	<0.31	<0.31	<0.31	38
2AU-3-4	4.0	6.42	2.4	Cinders	7.9	66	<0.11	8.5	0.87	590	20	6.2	41	2.9	13	<0.29	1,100
2AU-3-5	5.0	6.42	1.4	Sediment	<2.9 UJ	73	0.33	4.3	32	1,100	170	120	43	1.4	1.4	0.38	1,100
2AU-3-7	7.0	6.42	-0.6	Sediment	<3.7 UJ	1.6	0.73	1.3	78	19	6.6	0.43 J	71	<0.31	<0.31	<0.31	42
2AU-3-8	8.0	6.42	-1.6	Sediment	<3.5 UJ	1.2	0.48	0.86	46	14	4.3	0.12 J	48	<0.29	<0.29	<0.29	30
2AU-4-1	1.0	8.78	7.8	Fill	< 3.4 UJ	3.3	0.66	0.97	41	18	4.7	0.13	45	< 0.28	< 0.28	< 0.28	32
2AU-4-7	7.0	8.78	1.8	Cinders	na	na	na	na	na	na	na	120	na	na	na	na	na
2AU-4-8	8.0	8.78	0.8	Sediment	<3.2	2.4	0.24	0.64	31	13	10	700	31	<0.26	<0.26	<0.26	30
2AU-4-10	10.0	8.78	-1.2	Sediment	< 3.1 UJ	2.4	0.4	0.73	47	15	5.9	28	43	< 0.26	< 0.26	< 0.26	35
2AU-4-11	11.0	8.78	-2.2	Sediment	< 3.0 UJ	7.9	0.65	0.97	61	31	5.3	79	69	< 0.25	< 0.25	0.56	77
2AU-4-13	13.0	8.78	-4.2	Sediment	na	na	na	na	na	na	na	390	na	na	na	na	na
2AU-5-5.5	5.5	5.72	0.2	Sediment	<3.5	8.3	0.38	1.2	58	26	10	11	63	<0.29	<0.29	<0.29	79
2AU-5-6	6.0	5.72	-0.3	Sediment	< 3.1 UJ	4.5	0.29	0.71	39	16	3.3	10	38	< 0.26	< 0.26	< 0.26	32
2AU-5-7	7.0	5.72	-1.3	Sediment	< 3.0 UJ	5.8	0.37	1.1	41	90	7.5	12	44	< 0.25	< 0.25	0.47	88
2AU-6-1	1.0	5.55	4.6	Fill	< 3.4 UJ	4.2	0.59	1.1	26	47	11	0.42	42	< 0.29	< 0.29	1	53
2AU-6-2.5	2.5	5.55	3.1	Fill	< 3.4 UJ	260	0.58	2.4	29	150	42	85	49	1.2	< 0.28	< 0.28	220
2AU-6-4.5	4.5	5.55	1.1	Sediment	5.5	230	0.42	11	55	1,200	160	150	72	2.5	3.5	0.96	2,700
2AU-6-5	5.0	5.55	0.6	Sediment	<4.8	26	0.32	1.9	51	26	9.1	1.3	56	1.4	<0.4	<0.4	97
2AU-6-6	6.0	5.55	-0.5	Sediment	< 2.9 UJ	17	0.40	1.1	40	23	9.0	2.3	52	< 0.24	< 0.24	< 0.24	44
2AU-6-7	7.0	5.55	-1.5	Sediment	< 2.9 UJ	1.1	0.30	0.73	37	17	4.8	2.2	44	< 0.24	< 0.24	< 0.24	39
2AU-7-7	7.0	8.92	1.9	Cinders	na	na	na	na	na	na	na	17	na	na	na	na	na
2AU-7-8	8.0	8.92	0.9	Sediment	<49	250	0.35	12	41	2,200	260	170	59	4.7	2.8	<0.41	2,800
2AU-7-9	9.0	8.92	-0.1	Sediment	<4.1 UJ	2.7	0.62	1.3	61	17	6.1	1.5	68	<0.34	<0.34	<0.34	45
2AU-7-10	10.0	8.92	-1.1	Sediment	<3.8 UJ	26	0.52	1.7	41	20	3.6	0.67 J	63	<0.32	<0.32	<0.32	44
2AU-7-11	11.0	8.92	-2.1	Sediment	<3.3 UJ	2.6	0.47	1.2	37	14	3.4	0.48 J	48	<0.28	<0.28	<0.28	33
2AU-8-4	4.0	5.76	1.8	Sediment	6.8	770	0.41	17	62	2,600	230	1,100	75	11	5.6	0.51	3,700
2AU-8-7	7.0	5.76	-1.2	Sediment	< 2.8 UJ	1.4	0.39	0.74	58	15	3.7	8.3	50	< 0.24	< 0.24	0.37	37
2AU-9-8.5	8.5	7.93	-0.6	Fill	< 3.1	1.6	0.34	0.99	110	16	3.3	2.4	51	< 0.26	< 0.26	0.59	32
2AU-9-13	13.0	7.93	-5.1	Sediment	<3.1	5.6	0.47	1.3	53	20	3.5	0.77	73.0	<0.26	<0.26	0.84	39
2AU-10-1	1.0	5.51	4.5	Fill	< 3.5 UJ	5.7	0.59	1.4	20	26	9.4	0.043	50	< 0.29	< 0.29	< 0.29	60
2AU-10-3	3.0	5.51	2.5	Fill	< 3.2 UJ	5.3	0.56	1.4	22	24	9.3	0.096	50	0.4	< 0.27	< 0.27	54
2AU-10-4.5	4.5	5.51	1.0	Cinders	na	na	na	na	na	na	na	35	na	na	na	na	na
2AU-10-5	5.0	5.51	0.5	Sediment	<3.4	3.3	0.29	1.7	38	15	4.3	0.63	52	0.62	<0.29	<0.29	43
2AU-10-6	6.0	5.51	-0.5	Sediment	<3.5	2.5	0.5	1.1	53	23	13	0.16	61	<0.29	<0.29	<0.29	53
2AU-10-7	7.0	5.51	-1.5	Sediment	< 3.3 UJ	1.9	0.38	0.82	49	21	5.5	0.23	48	< 0.28	< 0.28	< 0.28	43
2AU-10-8	8.0	5.51	-2.5	Sediment	< 3.7 UJ	4.2	0.31	0.91	47	14	2.8	0.71	40	< 0.31	< 0.31	< 0.31	33
2AU-11-1	1.0	8.69	7.7	Fill	<3.2	4.0	0.51	1.0	39	21	7.7	0.096 J	46	<0.26	<0.26	0.28	40
2AU-11-5	5.0	8.69	3.7	Cinders	na	na	na	na	na	na	na	2.7	na	na	na	na	na
2AU-11-7	7.0	8.69	1.7	Cinders	na	na	na	na	na	na	na	1.2	na	na	na	na	na
2AU-11-8	8.0	8.69	0.7	Sediment	<3.3 UJ	43	0.73	2.4	45	75	30	88	77	<0.28	<0.28	<0.28	140
2AU-11-10	10.0	8.69	-1.3	Sediment	<2.8 UJ	12.0	0.24	1.5	44	39	6.4	7.9 J	36	0.3	0.5	<0.23	130
2AU-11-11	11.0	8.69	-2.3	Sediment	<3.1 UJ	5.4	0.38	0.95	51	15	2.5	3.3 J	51	0.3	<0.26	0.5	68
2AU-12-7	7.0	8.97	2.0	Cinders	na	na	na	na	na	na	na	49	na	na	na	na	na
2AU-12-10	10.0	8.97	-1.0	Sediment	< 3.8 UJ	3.8	0.88	1.9	51	660	5.5	0.93	73	0.72	< 0.32	< 0.32	820
2AU-12-11	11.0	8.97	-2.0	Sediment	< 3.3 UJ	3.2	0.67	1.0	44	23	3.8	3.3	54	0.31	< 0.28	0.50	200
2AU-13-2	2.0	5.50	3.5	Fill	< 2.9 UJ	5.1	0.59	1.4	30	19	7.8	0.084	39	0.34	< 0.25	< 0.25	42
2AU-13-3.5	3.5	5.50	2.0	Fill	4.8 J	170	0.12	7.3	11	600	140	60	40	4.9	1.7	< 0.28	1,500
2AU-13-4	4.0	5.50	1.5	Cinders	na	na	na	na	na	na	na	73					
2AU-13-5	5.0	5.50	0.5	Sediment	<3.3	6.7	0.56	1.1	40	19	4.9	0.064	50	<0.27	<0.27	<0.27	36
2AU-13-7	7.0	5.50	-1.5	Sediment	< 3.3 UJ	2.4	0.36	1	32	20	3.4	0.070	42	< 0.27	< 0.27	0.58	44
2AU-13-8	8.0	5.50	-2.5	Sediment	< 3.1 UJ	6.7	0.45	1.2	36	17	6.1	0.049	56	0.70	< 0.26	2.5	38
2AU-14-5.5	5.5	8.71	3.2	Cinders	na	na	na	na	na	na	na	1.6	na	na	na	na	na
2AU-14-7.5	7.5	8.71	1.2	Sediment	13 J	320	0.21	27	15	1,200	220	56	43	10	5.5	2	6,100
2AU-14-8.5	8.5	8.71	0.2	Sediment	<4.3	13	0.53	1.8	55	20	6.1	0.17	81	1.3	<0.36	1.1	56
2AU-14-9	9.0	8.71	-0.3	Sediment	<2.8 UJ	7.8	0.45	1.1	42	19	4.7	0.088 J	56	0.27	<0.23	<0.23	39
2AU-14-10.5	10.5	8.71	-1.8	Sediment	<3.0 UJ	5.0	0.41	1.0	41	18	4.6	0.20 J	49	<0.25	<0.25	<0.25	39
2AU-15-5	5.0	8.38	3.4	Cinders	na	na	na	na	na	na	na	2.2	na	na	na	na	na
2AU-15-7	7.0	8.38	1.4	Sediment	6.2	150	<0.11	21	16	3,700	150	310	24	9.8	3.6	<0.26	21,000
2AU-15-8	8.0	8.38	0.4	Sediment	<3.8	66	0.32	6	31	1,900	180	50	48	2	2	1	1,500
2AU-15-9	9.0	8.38	-0.6	Sediment	< 3.6 UJ	5.7	0.52	1.2	45	17	5.6	0.18	53	< 0.30	< 0.30	< 0.30	54
2AU-15-10	10.0	8.38	-1.6	Sediment	< 3.3 UJ	6.1	0.70	1.5	61	32	3.9	6.5	56	0.32	< 0.28	< 0.28	160
2AU-16-1	1.0	9.00	8.0	Fill	< 3.0 UJ	4.8	0.67	1.2	39	43	19	0.75	42	0.73	< 0.25	1.2	69
2AU-16-7	7.0	9.00	2.0	Cinders	<65	100	<2.2	3,000	6.6	11,000	270	6.3	260	6.8	4.9	9.7	47,000
2AU-16-8.5	8.5	9.00	0.5	Sediment	<3.2	4.7	0.55	1.8	41	31	3.8	0.29	47	<0.27	<0.27	<0.27	960
2AU-16-10.5	10.5	9.00	-1.5	Sediment	< 3.1 UJ	5.5	0.42	9.6	34	100	4.5	0.21	40	0.61	< 0.26	< 0.26	370
2AU-16-11.5	11.5	9.00	-2.5	Sediment	< 3.3 UJ	4.7	0.58	1.7	35	17	2.8	0.85	57	< 0.28	< 0.28	0.29	200
2AU-17-13	13.0	13.28	0.3	Sediment	<74	84	<2.5	7.5	43	7,800	750	1	150	11	0.7	<6.2	22,000

TABLE 1
METALS IN SOIL, CINDERS, AND SEDIMENT (RECENT DATA)
UPLAND PORTION OF SUBUNIT 2A
RICHMOND FIELD STATION

Sample Location	Depth [feet]	Elevation [feet] of Ground Surface	Elevation of Sample [feet]	Material Type	Antimony	Arsenic	Beryllium	Cadmium	Chromium	Copper	Lead	Mercury	Nickel	Selenium	Silver	Thallium	Zinc
2AU-17-14	14.0	13.28	-0.7	Sediment	<3.6	5.6	0.58	1.3	47	21	5	0.13	67	<0.3	<0.3	0.76	120
2AU-17-15	15.0	13.28	-1.7	Sediment	< 3.2 UJ	6.0	0.54	1.3	38	22	4.5	0.083	63	0.40	< 0.27	0.70	60
2AU-17-16	16.0	13.28	-2.7	Sediment	< 3.4 UJ	5.8	0.56	1.3	40	20	3.9	0.070	61	< 0.28	< 0.28	0.71	46
2AU-18-9	9.0	13.10	4.1	Fill	7.6 J	94	< 2.3	10	0.87	450	160	2.3	83	< 5.8	7.6	< 5.8	990
2AU-18-13	13.0	13.10	0.1	Sediment	< 3.8 UJ	46	0.27	3.3	29	800	120	19	45	3.3	1.3	< 0.32	4,000
2AU-18-14	14.0	13.10	-0.9	Sediment	< 3.9 UJ	26	0.48	1.9	54	150	100	52	79	1.3	< 0.32	< 0.32	5,000
2AU-18-15	15.0	13.10	-1.9	Sediment	< 3.4 UJ	6.1	0.56	1.4	51	22	4.6	0.055	66	< 0.29	< 0.29	< 0.29	58
2AU-19-14	14.0	13.64	-0.4	Sediment	<3.7	6.6	0.31	1.9	46	27	6.3	100	62	0.83	<0.31	<0.31	570
2AU-19-15	15.0	13.64	-1.4	Sediment	< 3.5 UJ	7.0	0.53	1.7	44	23	5.5	0.098	64	< 0.29	< 0.29	< 0.29	980
2AU-19-16	16.0	13.64	-2.4	Sediment	< 3.5 UJ	6.5	0.67	1.7	45	38	5.4	0.081	73	0.37	< 0.29	< 0.29	1,100
2AU-19-17	17.0	13.64	-3.4	Sediment	<3.5	5.8	0.71	1.5	59	27	4.2	0.15	67	<0.29	<0.29	<0.29	1,500
2AU-19-18	18.0	13.64	-4.4	Sediment	<3.7	7.5	0.55	1.7	48	20	4.9	170	70	1.5	<0.31	0.53	1,200
2AU-20-13	13.0	13.31	0.3	Sediment	<4.2	37	0.22	1.3	40	440	140	100	43	2.3	0.51	<0.35	1,800
2AU-20-14	14.0	13.31	-0.7	Sediment	< 3.9 UJ	9.9	0.33	1.2	40	14	4.9	1.9	50	0.49	< 0.33	< 0.33	940
2AU-20-15	15.0	13.31	-1.7	Sediment	< 3.5 UJ	4.0	0.48	1.3	46	22	4.9	0.084	64	0.45	< 0.29	< 0.29	400
2AU-21-10	10.0	8.36	-1.6	Sediment	< 3.5 UJ	1.5	0.27	0.76	52	13	2.8	1.9	38	0.30	< 0.29	0.43	32
2AU-21-11	11.0	8.36	-2.6	Sediment	< 3.3	5.1	0.28	0.89	40	12	2.5	0.98	43	0.52	< 0.28	1.1	30
2AU-22-7.5	7.5	9.19	1.7	Cinders	na	na	na	na	na	na	na	150	na	na	na	na	na
2AU-22-10	10.0	9.19	-0.8	Sediment	<3.4 UJ	9.7	0.71	1.8	57	290	8.3	0.047	66	<0.28	<0.28	<0.28	340
2AU-22-12	12.0	9.19	-2.8	Sediment	<3.8 UJ	1.8	0.61	1.2	57	150	6.9	0.26 J	82	<0.31	<0.31	<0.31	200
2AU-22-13	13.0	9.19	-3.8	Sediment	<3.8 UJ	4.9	0.47	1.1	41	19	3.5	0.71 J	55	<0.32	<0.32	<0.32	37
2AU-23-4.8	4.8	8.24	3.4	Cinders	3.4 J	110	<0.11	6.3	1.7	1,800	220	25	34	7.8	5.6	0.95	1,500
2AU-23-7	7	7	0.0	Sediment	3.4 J	110	<0.099	3.8	1.6	660	120	2.2	34	5.6	2.2	1.0	1,400
2AU-23-13	13	8.24	-4.8	Sediment	<2.8 UJ	5.5	0.39	1.1	38	20	3.8	0.15	66	1.6	<0.24	1.3	75
2AU-23-14	14	8.24	-5.8	Sediment	<3.8 UJ	5.4	0.45	1.2	39	21	5.0	0.14	66	0.73	<0.31	1.5	75
2AU-24-4.5	4.5	8.30	3.8	Cinders	<3.5 UJ	38	<0.12	3.4	1.3	580	93	35	19	2.9	1.7	1.2	600
2AU-24-7.5	7.5	8.30	0.8	Sediment	<3.7 UJ	11	0.38	1.7	46	79	6.4	1.3	59	2.4	<0.31	0.43	390
2AU-24-11	11	8.30	-2.7	Sediment	<3.6 UJ	7.5	0.36	1.1	49	22	6.9	0.13	54	1.6	<0.3	0.37	54
2AU-25-4	4	5.87	1.9	Cinders	4.6 J	110	<0.11	35	2.0	5,300	100	88	42	4.2	6.3	1.1	4,900
2AU-25-7	7	5.87	-1.1	Sediment	<2.9 UJ	1.8	0.27	0.96	32	18	4.2	130	50	0.95	<0.24	0.28	52
2AU-25-8	8	5.87	-2.1	Sediment	<2.9	1.9	0.24	0.78	28	13	3.1	0.23	49	0.36	<0.24	0.58	47
2AU-25-9	9	5.87	-3.1	Sediment	<3.1	3.5	0.22	0.79	31	10	2.7	0.068	43	0.47	<0.26	0.39	32
2AU-25-13	13	5.87	-7.1	Sediment	<2.6 UJ	5.8	0.40	1.4	35	24	4.2	0.23	65	0.71	<0.22	0.71	200
2AU-25-14	14	5.87	-8.1	Sediment	<3.2 UJ	8.0	0.54	1.8	49	28	5.7	0.15	85	1.1	<0.27	1.3	190
2AU-26-13.5	13.5	13.77	0.3	Sediment	<3.0 UJ	31	0.16	14	27	110	110	12	22	2.2	<0.25	0.32	1,700
2AU-26-14.5	14.5	13.77	-0.7	Sediment	<3.3 UJ	4.9	0.44	1.3	42	18	4.8	0.32	56	0.6	<0.28	0.8	720
2AU-26-16	16	13.77	-2.2	Sediment	<4.0 UJ	4.9	0.56	1.4	38	21	4.9	0.29	69	0.50	<0.34	1.3	610
2AU-27-13.3	13.3	13.30	0.0	Sediment	<4.1 UJ	14	0.22	1.1	35	110	93	71	31	1.4	<0.34	<0.34	1,800
2AU-27-14.3	14.3	13.30	-1.0	Sediment	<3.8 UJ	12	0.30	1.1	32	14	12	0.11	47	0.99	<0.32	<0.32	1,600
2AU-27-15.3	15.3	13.30	-2.0	Sediment	<3.4 UJ	5.6	0.52	1.3	40	21	5.3	0.42	65	<0.28	<0.28	<0.28	280
2AU-28-4	4	3.84	-0.2	Sediment	<3.5 UJ	7.3	0.41	1.3	39	19	4.7	58	67	1.1	<0.29	1.0	1,000
2AU-28-5	5	3.84	-1.2	Sediment	<3.4 UJ	5.4	0.47	1.3	46	21	5.1	0.26	68	0.88	<0.29	<0.29	600
2AU-28-6	6	3.84	-2.2	Sediment	<3.8 UJ	7.6	0.54	1.5	37	25	5.3	0.10	72	2.0	<0.31	<0.31	350
2AU-29-4	4	3.80	-0.2	Sediment	<3.9 UJ	9.8	0.45	1.4	42	57	10.0	120	60	0.63	<0.32	<0.32	910
2AU-29-5	5	3.80	-1.2	Sediment	<3.2 UJ	6.4	0.50	1.3	36	19	4.8	0.11	63	1.2	<0.27	0.29	630
2AU-29-6	6	3.80	-2.2	Sediment	<3.8 UJ	5.3	0.51	1.3	38	21	4.8	0.098	71	0.61	<0.32	1.2	360
2AU-30-16.5	16.5	8.66	-7.8	Sediment	<3.1	2.2	0.28	1.5	35	9.6	1.5	6.7	57	<0.26	<0.26	<0.26	49
2AU-30-19.5	19.5	8.66	-10.8	Sediment	<3.4	4.8	0.33	1.2	34	15	23	0.27	41	0.46	<0.29	1.2	43
2AU-30-20.5	20.5	8.66	-11.8	Sediment	<3.5	4.5	0.38	1.3	38	17	26	4	43	<0.29	<0.29	1	43
2AU-31-11	11	8.96	-2.0	Sediment	<3.5	9.6	0.37	2	39	56	2.6	3.2	51	0.87	<0.29	<0.29	150
2AU-31-16.5	16.5	8.96	-7.5	Sediment	<3.8	3.8	0.45	1.5	40	32	14	7.2	67	0.72	<0.32	0.84	59
2AU-31-17.5	17.5	8.96	-8.5	Sediment	<3.3	3.8	0.42	1.4	40	22	15	1.3	68	0.62	<0.28	1	48
2AU-32A-a	4	5.61	1.6	composite	<3.3	110	0.31	3.9	35	450	75	260	50	2.5	1.1	<0.28	690
2AU-32A-b	5	5.61	0.6	composite													
2AU-32B-c	4	5.61	1.6	composite													
2AU-32B-d	5.5	5.61	0.1	composite													
2AU-33A-a	4	5.40	1.4	composite	4.5	610	0.35	7.1	42	850	190	130	76	15	1.8	<0.37	3800
2AU-33A-b	5.5	5.40	-0.1	composite													
2AU-33B-c	3	5.40	2.4	composite													
2AU-33B-d	4	5.40	1.4	composite													
2AU-ASPHALT 1				asphalt	<2.7	1.4	0.18	0.64	21	14	4.7	0.023 J	37	<0.22	<0.22	0.41	70
2AU-ASPHALT 2				asphalt	<2.7	1.7	0.24	0.66	19	12	4.2	0.091 J	27	<0.23	<0.23	<0.23	39
2AU-CONCRETE 1				asphalt	<2.8	2.5	0.34	1.8	27	41	6.6	0.10 J	49	0.94	0.37	0.48	95
2AU-CONCRETE 2				asphalt	3.3	3.6	0.40	1.9	40	120	16.0	0.31 J	56	1.8	1.8	<0.24	19

Note: UJ The analyte was not detected above the sample quantitation limit. However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample.

J The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.

TABLE 2
VOCs IN SOIL AND SEDIMENT
UPLAND PORTION OF SUBUNIT 2A
RICHMOND FIELD STATION

EPA Method 8260B. Units = ug/Kg

Field ID # / Date	2AU-18-9 04/18/2002	2AU-18-13 04/22/2002	2AU-13-2 04/22/2002	2AU-13-3.5 04/22/2002	2AU-10-1 04/22/2002	2AU-10-3 04/22/2002	2AU-6-1 04/22/2002	2AU-6-2.5 04/22/2002	2AU-ASPHALT 1 04/24/2002	2AU-ASPHALT 2 04/24/2002	2AU-CONCRETE 1 04/24/2002	2AU-CONCRETE 2 04/24/2002	SCREENING VALUE*
Parameter													
Freon 12	< 13.0	< 14.0	< 10.0	< 11.0	< 11.0	< 11.0	< 11.0	< 13.0	< 10.0	< 10.0	< 11.0	< 9.6	na
Chloromethane	< 13.0	< 14.0	< 10.0	< 11.0	< 11.0	< 11.0	< 11.0	< 13.0	< 10.0	< 10.0	< 11.0	< 9.6	na
Vinyl Chloride	< 13.0	< 14.0	< 10.0	< 11.0	< 11.0	< 11.0	< 11.0	< 13.0	< 10.0	< 10.0	< 11.0	< 9.6	4.9
Bromomethane	< 13.0	< 14.0	< 10.0	< 11.0	< 11.0	< 11.0	< 11.0	< 13.0	< 10.0	< 10.0	< 11.0	< 9.6	na
Chloroethane	< 13.0	< 14.0	< 10.0	< 11.0	< 11.0	< 11.0	< 11.0	< 13.0	< 10.0	< 10.0	< 11.0	< 9.6	na
Trichlorofluoromethane	< 6.4	< 7.1	< 5.1	< 5.7	< 5.4	< 5.3	< 5.6	< 6.4	< 5.0	< 5.1	< 5.6	< 4.8	na
Acetone	< 26.0	42	< 21.0	33	< 22.0	< 21.0	< 23.0	29	< 20.0	< 20.0	37	50	1500
Freon 113	< 6.4	< 7.1	< 5.1	< 5.7	< 5.4	< 5.3	< 5.6	< 6.4	< 5.0	< 5.1	< 5.6	< 4.8	na
1,1-Dichloroethene	< 6.4	< 7.1	< 5.1	< 5.7	< 5.4	< 5.3	< 5.6	< 6.4	< 5.0	< 5.1	< 5.6	< 4.8	9.6
Methylene Chloride	< 26.0	< 28.0	< 21.0	< 23.0	< 22.0	< 21.0	< 23.0	< 26.0	48	58	98	34	na
Carbon Disulfide	< 6.4	< 7.1	< 5.1	< 5.7	< 5.4	< 5.3	< 5.6	< 6.4	< 5.0	< 5.1	< 5.6	7	na
MTBE	< 6.4	< 7.1	< 5.1	< 5.7	< 5.4	< 5.3	< 5.6	< 6.4	< 5.0	< 5.1	< 5.6	< 4.8	na
trans-1,2-Dichloroethene	< 6.4	< 7.1	< 5.1	< 5.7	< 5.4	< 5.3	< 5.6	< 6.4	< 5.0	< 5.1	< 56.0	< 4.8	590
Vinyl Acetate	< 6.4	< 71.0	< 51.0	< 57.0	< 54.0	< 53.0	< 56.0	< 64.0	< 50.0	< 51.0	< 5.6	< 48.0	na
1,1-Dichloroethane	< 6.4	< 7.1	< 5.1	< 5.7	< 5.4	< 5.3	< 5.6	< 6.4	< 5.0	< 5.1	< 11.0	< 4.8	na
2-Butanone	< 13.0	< 14.0	< 10.0	< 11.0	< 11.0	< 11.0	< 11.0	< 13.0	< 10.0	< 10.0	< 5.6	13	na
cis-1,2-Dichloroethene	49	< 7.1	< 5.1	< 5.7	< 5.4	< 5.3	< 5.6	< 6.4	< 5.0	< 5.1	< 5.6	< 4.8	590
2,2-Dichloropropane	< 6.4	< 7.1	< 5.1	< 5.7	< 5.4	< 5.3	< 5.6	< 6.4	< 5.0	< 5.1	< 5.6	< 4.8	na
Chloroform	< 6.4	< 7.1	< 5.1	< 5.7	< 5.4	< 5.3	< 5.6	< 6.4	< 5.0	< 5.1	< 5.6	< 4.8	28
Bromochloromethane	< 6.4	< 7.1	< 5.1	< 5.7	< 5.4	< 5.3	< 5.6	< 6.4	< 5.0	< 5.1	< 5.6	< 4.8	na
1,1,1-Trichloroethane	< 6.4	< 7.1	< 5.1	< 5.7	< 5.4	< 5.3	< 5.6	< 6.4	< 5.0	< 5.1	< 5.6	< 4.8	na
1,1-Dichloropropene	< 6.4	< 7.1	< 5.1	< 5.7	< 5.4	< 5.3	< 5.6	< 6.4	< 5.0	< 5.1	< 5.6	< 4.8	na
Carbon Tetrachloride	< 6.4	< 7.1	< 5.1	< 5.7	< 5.4	< 5.3	< 5.6	< 6.4	< 5.0	< 5.1	< 5.6	< 4.8	9.8
1,2-Dichloroethane	< 6.4	< 7.1	< 5.1	< 5.7	< 5.4	< 5.3	< 5.6	< 6.4	< 5.0	< 5.1	< 5.6	< 4.8	420
Benzene	< 6.4	< 7.1	< 5.1	< 5.7	< 5.4	< 5.3	< 5.6	< 6.4	< 5.0	< 5.1	< 5.6	< 4.8	46
Trichloroethene	8	< 7.1	< 5.1	< 5.7	< 5.4	< 5.3	< 5.6	< 6.4	< 5.0	< 5.1	< 5.6	< 4.8	360
1,2-Dichloropropane	< 6.4	< 7.1	< 5.1	< 5.7	< 5.4	< 5.3	< 5.6	< 6.4	< 5.0	< 5.1	< 5.6	< 4.8	na
Bromodichloromethane	< 6.4	< 7.1	< 5.1	< 5.7	< 5.4	< 5.3	< 5.6	< 6.4	< 5.0	< 5.1	< 5.6	< 4.8	na
Dibromomethane	< 6.4	< 7.1	< 5.1	< 5.7	< 5.4	< 5.3	< 5.6	< 6.4	< 5.0	< 5.1	< 5.6	< 4.8	na
4-Methyl-2-Pentanone	< 13.0	< 14.0	< 10.0	< 11.0	< 11.0	< 5.3	< 11.0	< 13.0	< 10.0	< 10.0	< 11.0	< 9.6	na
cis-1,3-Dichloropropene	< 6.4	< 7.1	< 5.1	< 5.7	< 5.4	< 11.0	< 5.6	< 6.4	< 5.0	< 5.1	< 5.6	< 4.8	na
Toluene	< 6.4	< 7.1	< 5.1	< 5.7	< 5.0	< 5.3	< 5.6	< 6.4	< 5.0	< 5.1	< 5.6	< 4.8	130
trans-1,3-Dichloropropene	< 6.4	< 7.1	< 5.1	< 5.7	< 5.4	< 5.3	< 5.6	< 6.4	< 5.0	< 5.1	< 5.6	< 4.8	na
1,1,2-Trichloroethane	< 6.4	< 14.0	< 5.1	< 5.7	< 5.4	< 5.3	< 5.6	< 6.4	< 5.0	< 5.1	< 5.6	< 4.8	920
2-Hexanone	< 13.0	< 7.1	< 10.0	< 11.0	< 5.4	< 11.0	< 11.0	< 13.0	< 10.0	< 10.0	< 11.0	< 9.6	na
1,3-Dichloropropane	< 6.4	< 7.1	< 5.1	< 5.7	< 11.0	< 5.3	< 5.6	< 6.4	< 5.0	< 5.1	< 5.6	< 4.8	na
Tetrachloroethene	59	33	< 5.1	< 5.7	< 5.4	< 5.3	< 5.6	< 6.4	< 5.0	< 5.1	< 5.6	< 4.8	120
Dibromochloromethane	< 6.4	< 7.1	< 5.1	< 5.7	< 5.4	< 5.3	< 5.6	< 6.4	< 5.0	< 5.1	< 5.6	< 4.8	na
1,2-Dibromoethane	< 6.4	< 7.1	< 5.1	< 5.7	< 5.4	< 5.3	< 5.6	< 6.4	< 5.0	< 5.1	< 5.6	< 4.8	na
Chlorobenzene	< 6.4	< 7.1	< 5.1	< 5.7	< 5.4	< 5.3	< 5.6	< 6.4	< 5.0	< 5.1	< 5.6	< 4.8	50
1,1,1,2-Tetrachloroethane	< 6.4	< 7.1	< 5.1	< 5.7	< 5.4	< 5.3	< 5.6	< 6.4	< 5.0	< 5.1	< 5.6	< 4.8	na
Ethylbenzene	< 6.4	< 7.1	< 5.1	< 5.7	< 5.4	< 5.3	< 5.6	< 6.4	< 5.0	< 5.1	< 5.6	< 4.8	na
m,p-Xylenes	< 6.4	< 7.1	< 5.1	< 5.7	< 5.4	< 5.3	< 5.6	< 6.4	< 5.0	< 5.1	< 5.6	< 4.8	13
o-Xylene	< 6.4	< 7.1	< 5.1	< 5.7	< 5.4	< 5.3	< 5.6	< 6.4	< 5.0	< 5.1	< 5.6	< 4.8	na
Styrene	< 6.4	< 7.1	< 5.1	< 5.7	< 5.4	< 5.3	< 5.6	< 6.4	< 5.0	< 5.1	< 5.6	< 4.8	na
Bromoform	< 6.4	< 7.1	< 5.1	< 5.7	< 5.4	< 5.3	< 5.6	< 6.4	< 5.0	< 5.1	< 5.6	< 4.8	na
Isopropylbenzene	< 6.4	< 7.1	< 5.1	< 5.7	< 5.4	< 5.3	< 5.6	< 6.4	< 5.0	< 5.1	< 5.6	< 4.8	na
1,1,2,2-Tetrachloroethane	< 6.4	< 7.1	< 5.1	< 5.7	< 5.4	< 5.3	< 5.6	< 6.4	< 5.0	< 5.1	< 5.6	< 4.8	na
1,2,3-Trichloropropane	< 6.4	< 7.1	< 5.1	< 5.7	< 5.4	< 5.3	< 5.6	< 6.4	< 5.0	< 5.1	< 5.6	< 4.8	na

TABLE 2
VOCs IN SOIL AND SEDIMENT
UPLAND PORTION OF SUBUNIT 2A
RICHMOND FIELD STATION

EPA Method 8260B. Units = ug/Kg

Field ID # / Date	2AU-18-9 04/18/2002	2AU-18-13 04/22/2002	2AU-13-2 04/22/2002	2AU-13-3.5 04/22/2002	2AU-10-1 04/22/2002	2AU-10-3 04/22/2002	2AU-6-1 04/22/2002	2AU-6-2.5 04/22/2002	2AU-ASPHALT 1 04/24/2002	2AU-ASPHALT 2 04/24/2002	2AU-CONCRETE 1 04/24/2002	2AU-CONCRETE 2 04/24/2002	SCREENING VALUE*
Parameter													
Propylbenzene	< 6.4	< 7.1	< 5.1	< 5.7	< 5.4	< 5.3	< 5.6	< 6.4	< 5.0	< 5.1	< 5.6	< 4.8	na
Bromobenzene	< 6.4	< 7.1	< 5.1	< 5.7	< 5.4	< 5.3	< 5.6	< 6.4	< 5.0	< 5.1	< 5.6	< 4.8	na
1,3,5-Trimethylbenzene	< 6.4	< 7.1	< 5.1	< 5.7	< 5.4	< 5.3	< 5.6	< 6.4	< 5.0	< 5.1	< 5.6	< 4.8	na
2-Chlorotoluene	< 6.4	< 7.1	< 5.1	< 5.7	< 5.4	< 5.3	< 5.6	< 6.4	< 5.0	< 5.1	< 5.6	< 4.8	na
4-Chlorotoluene	< 6.4	< 7.1	< 5.1	< 5.7	< 5.4	< 5.3	< 5.6	< 6.4	< 5.0	< 5.1	< 5.6	< 4.8	na
tert-Butylbenzene	< 6.4	< 7.1	< 5.1	< 5.7	< 5.4	< 5.3	< 5.6	< 6.4	< 5.0	< 5.1	< 5.6	< 4.8	na
1,2,4-Trimethylbenzene	< 6.4	< 7.1	< 5.1	< 5.7	< 5.4	< 5.3	< 5.6	< 6.4	< 5.0	< 5.1	< 5.6	< 4.8	na
sec-Butylbenzene	< 6.4	< 7.1	< 5.1	< 5.7	< 5.4	< 5.3	< 5.6	< 6.4	< 5.0	< 5.1	< 5.6	< 4.8	na
para-Isopropyl Toluene	< 6.4	< 7.1	< 5.1	< 5.7	< 5.4	< 5.3	< 5.6	< 6.4	< 5.0	< 5.1	< 5.6	< 4.8	na
1,3-Dichlorobenzene	< 6.4	< 7.1	< 5.1	< 5.7	< 5.4	< 5.3	< 5.6	< 6.4	< 5.0	< 5.1	< 5.6	< 4.8	na
1,4-Dichlorobenzene	< 6.4	< 7.1	< 5.1	< 5.7	< 5.4	< 5.3	< 5.6	< 6.4	< 5.0	< 5.1	< 5.6	< 4.8	na
n-Butylbenzene	< 6.4	< 7.1	< 5.1	< 5.7	< 5.4	< 5.3	< 5.6	< 6.4	< 5.0	< 5.1	< 5.6	< 4.8	na
1,2-Dichlorobenzene	< 6.4	< 7.1	< 5.1	< 5.7	< 5.4	< 5.3	< 5.6	< 6.4	< 5.0	< 5.1	< 5.6	< 4.8	na
1,2-Dibromo-3-Chloropropane	< 6.4	< 7.1	< 5.1	< 5.7	< 5.4	< 5.3	< 5.6	< 6.4	< 5.0	< 5.1	< 5.6	< 4.8	na
1,2,4-Trichlorobenzene	< 6.4	< 7.1	< 5.1	< 5.7	< 5.4	< 5.3	< 5.6	< 6.4	< 5.0	< 5.1	< 5.6	< 4.8	na
Hexachlorobutadiene	< 6.4	< 7.1	< 5.1	< 5.7	< 5.4	< 5.3	< 5.6	< 6.4	< 5.0	< 5.1	< 5.6	< 4.8	na
Naphthalene	< 6.4	< 7.1	< 5.1	< 5.7	< 5.4	< 5.3	< 5.6	< 6.4	< 5.0	< 5.1	< 5.6	< 4.8	na
1,2,3-Trichlorobenzene	< 6.4	< 7.1	< 5.1	< 5.7	< 5.4	< 5.3	< 5.6	< 6.4	< 5.0	< 5.1	< 5.6	< 4.8	na

* SF-RWQCB RBSLs (2000) Lowest value was selected from RBSLs protective of groundwater that is not a current or potential drinking water resource.
na = not available

TABLE 3
SVOCs IN SOIL AND SEDIMENT
UPLAND PORTION OF SUBUNIT 2A
RICHMOND FIELD STATION

EPA Method 8260B, Units = ug/Kg

Field ID #	2AU-ASPHALT 1	2AU-ASPHALT 2	2AU-CONCRETE 1	2AU-CONCRETE 2
Date	04/23/2002	04/25/2002	04/25/2002	04/24/2002
Parameter				
N-Nitrosodimethylamine	< 83000.0	< 84000.0	< 1700.0	< 1700.0
Phenol	< 83000.0	< 84000.0	< 1700.0 R	< 1700.0
bis (2-Chloroethyl) ether	< 83000.0	< 84000.0	< 1700.0	< 1700.0
2-Chlorophenol	< 83000.0	< 84000.0	< 1700.0 R	< 1700.0
1,3-Dichlorobenzene	< 83000.0	< 84000.0	< 1700.0	< 1700.0
1,4-Dichlorobenzene	< 83000.0	< 84000.0	< 1700.0	< 1700.0
Benzyl alcohol	< 83000.0	< 84000.0	< 1700.0	< 1700.0
1,2-Dichlorobenzene	< 83000.0	< 84000.0	< 1700.0	< 1700.0
2-Methylphenol	< 83000.0	< 84000.0	< 1700.0 R	< 1700.0
bis (2-Chloroisoproply) ether	< 83000.0	< 84000.0	< 1700.0	< 1700.0
4-Methylphenol	< 83000.0	< 84000.0	< 1700.0 R	< 1700.0
N-Nitroso-di-n-propylamine	< 83000.0	< 84000.0	< 1700.0	< 1700.0
Hexachlorethane	< 83000.0	< 84000.0	< 1700.0	< 1700.0
Nitrobenzene	< 83000.0	< 84000.0	< 1700.0	< 1700.0
Isophorone	< 83000.0	< 84000.0	< 1700.0	< 1700.0
2-Nirotphenol	< 420000.0	< 420000.0	< 8300.0 R	< 8300.0
2,4-Dimethylphenol	< 83000.0	< 84000.0	< 1700.0 R	< 1700.0
Benzoic acid	< 420000.0	< 420000.0	< 8300.0 R	< 8300.0
bis (2-Chloroethoxy) methane	< 83000.0	< 84000.0	< 1700.0 R	< 1700.0
2,4-Dichlorophenol	< 83000.0	< 84000.0	< 1700.0 R	< 1700.0
1, 2, 4-Trichlorobenzene	< 83000.0	< 84000.0	< 1700.0	< 1700.0
Naphthalene	< 83000.0	< 84000.0	< 1700.0	< 1700.0
4-Chloroaniline	< 83000.0	< 84000.0	< 1700.0	< 1700.0
Hexachlorobutadiene	< 83000.0	< 84000.0	< 1700.0	< 1700.0
4-Chloro-3-methylphenol	< 83000.0	< 84000.0	< 1700.0 R	< 1700.0
2-Methylnaphthalene	< 83000.0	< 84000.0	< 1700.0	< 1700.0
Hexachlorocyclopentadine	< 420000.0	< 240000.0	< 8300.0	< 8300.0
2, 4, 6-Trichlorophenol	< 83000.0	< 84000.0	< 1700.0 R	< 1700.0
2, 4, 5-Trichlorophenol	< 83000.0	< 84000.0	< 1700.0 R	< 1700.0
2-Chloronaphthanene	< 83000.0	< 84000.0	< 1700.0	< 1700.0
2-Nitroaniline	< 420000.0	< 420000.0	< 8300.0	< 8300.0
Dimethylphthalate	< 83000.0	< 84000.0	< 1700.0	< 1700.0
Acenaphthylene	< 83000.0	< 84000.0	< 1700.0	< 1700.0
2, 6-Dinitrotoluene	< 83000.0	< 84000.0	< 1700.0	< 1700.0
3-Nitroaniline	< 420000.0	< 420000.0	< 8300.0	< 8300.0
Acenaphthene	< 83000.0	< 84000.0	< 1700.0	< 1700.0
3, 4-Dinitrophenol	< 420000.0	< 420000.0	< 8300.0 R	< 8300.0
4-Nitrophenol	< 420000.0	< 420000.0	< 8300.0 R	< 8300.0
Dibenzofuran	< 83000.0	< 84000.0	< 1700.0	< 1700.0
2, 4-Dinitrotoluene	< 83000.0	< 84000.0	< 1700.0	< 1700.0
Diethylphthalate	< 83000.0	< 84000.0	< 1700.0	< 1700.0
Fluorene	< 83000.0	< 84000.0	< 1700.0	< 1700.0
4-chlorophenyl-phenylether	< 83000.0	< 84000.0	< 1700.0	< 1700.0
4-Nitroaniline	< 420000.0	< 420000.0	< 8300.0	< 8300.0

TABLE 3
SVOCs IN SOIL AND SEDIMENT
UPLAND PORTION OF SUBUNIT 2A
RICHMOND FIELD STATION

EPA Method 8260B, Units = ug/Kg

Field ID #	2AU-ASPHALT 1	2AU-ASPHALT 2	2AU-CONCRETE 1	2AU-CONCRETE 2
Date	04/23/2002	04/25/2002	04/25/2002	04/24/2002
Parameter				
4, 6-Dinitro-2-methylphenol	< 420000.0	< 420000.0	< 8300.0 R	< 8300.0
N-Nitrosodiphenylamine	< 83000.0	< 84000.0	< 1700.0	< 1700.0
Azobenzene	< 83000.0	< 84000.0	< 1700.0	< 1700.0
4-Bromophenyl-phenylether	< 83000.0	< 84000.0	< 1700.0	< 1700.0
Hexachlorobenzene	< 83000.0	< 84000.0	< 1700.0	< 1700.0
Pentachlorophenol	< 420000.0	< 420000.0	< 8300.0 R	< 8300.0
Phenanthrene	< 83000.0	< 84000.0	< 1700.0	< 1700.0
Anthracene	< 83000.0	< 84000.0	< 1700.0	< 1700.0
Di-n-butlphthalate	< 83000.0	< 84000.0	< 1700.0	< 1700.0
Fluoranthene	< 83000.0	< 84000.0	< 1700.0	< 1700.0
Pyrene	< 83000.0	< 84000.0	< 1700.0	< 1700.0
Butylbenzylphthalate	< 83000.0	< 84000.0	< 1700.0	< 1700.0
3, 3'-Dichlorobenzidine	< 420000.0	< 420000.0	< 8300.0	< 8300.0
Benzo (a) anthracene	< 83000.0	< 84000.0	< 1700.0	< 1700.0
Chrysene	< 83000.0	< 84000.0	< 1700.0	< 1700.0
bis (2-Ethylhexyl) phthalate	< 83000.0	< 84000.0	< 1700.0	< 1700.0
Di-n-octylphthalate	< 83000.0	< 84000.0	< 1700.0	< 1700.0
Benzo (b) fluoranthene	< 83000.0	< 84000.0	< 1700.0	< 1700.0
Benzo (k) fluoranthene	< 83000.0	< 84000.0	< 1700.0	< 1700.0
Benzo (a) pyrene	< 83000.0	< 84000.0	< 1700.0	< 1700.0
Indeno (1, 2, 3-cd) pyrene	< 83000.0	< 84000.0	< 1700.0	< 1700.0
Dibenz (a, h) anthracene	< 83000.0	< 84000.0	< 1700.0	< 1700.0
Benzo (q, h, i) perylene	< 83000.0	< 84000.0	< 1700.0	< 1700.0

R — The sample results are rejected due to serious deficiencies in the ability to analyze the sample and meet quality control criteria. The presence or absence of the analyte cannot

TABLE 4
METALS IN SOIL, CINDERS, AND SEDIMENT
UPLAND PORTION OF SUBUNIT 2A
RICHMOND FIELD STATION

EPA Method 6010 (7471 for Mercury), units = mg/kg

Sample Location	Depth [feet]	Elevation [feet] of Ground Surface	Elevation of Sample [feet]	Source	Antimony	Arsenic	Beryllium	Cadmium	Chromium	Copper	Lead	Mercury	Nickel	Selenium	Silver	Thallium	Zinc	pH
ECOLOGICAL AND HUMAN HEALTH SCREENING VALUES																		
E-SSTL (hawk)								230	157	412	437	42	621				760	
E-SSTL (squirrel)								524	27,167	429,123	326,825	5,017	7,691				111,817	
H-SSTL (Comm. Ind. Worker)						27.3		147				264						
RBSLs* (<9.9 feet bgs)					40	8*	8	12	750	225	1000	10	150	10	40	29	600	
RBSLs* (>9.9 feet bgs)						8*	95	61	5000	5000	1000	160	1000	2700	2700	37	5000	
2AU-1-1	1.0	5.79	4.8	Fill	<3	4.8	0.61	1.4	39	120	10	0.73 J	62	0.61	<0.25	0.41	140	
2AU-1-4	4.0	5.79	1.8	Cinders	12	210	0.19	22	30	2,300	150	41	62	5.7	5.9	<0.31	2,600	7.3
2AU-1-4.5	4.5	5.79	1.3	Sediment	5.7	130	0.21	9.6	20	1,900	220	210	53	6.6	3.7	1.3	2,100	8.2
2AU-1-5.5	5.5	5.79	0.3	Sediment	<3.3 UJ	1.5	0.54	1.0	48	15	4	3.1	50	<0.27	<0.27	<0.27	39	7.9
2AU-1-7	7.0	5.79	-1.2	Sediment	<3.7 UJ	12.0	0.55	1.2	42	18	5.4	0.12 J	51	<0.31	<0.31	<0.31	44	7.8
2AU-1-8	8.0	5.79	-2.2	Sediment	<3.7 UJ	7.9	0.56	1.5	44	20	5.9	0.33 J	62	<0.31	<0.31	<0.31	38	7.8
2AU-3-4	4.0	6.42	2.4	Cinders	7.9	66	<0.11	8.5	0.87	590	20	6.2	41	2.9	13	<0.29	1,100	7.1
2AU-3-5	5.0	6.42	1.4	Sediment	<2.9 UJ	73	0.33	4.3	32	1,100	170	120	43	1.4	1.4	0.38	1,100	8.4
2AU-3-7	7.0	6.42	-0.6	Sediment	<3.7 UJ	1.6	0.73	1.3	78	19	6.6	0.43 J	71	<0.31	<0.31	<0.31	42	8.1
2AU-3-8	8.0	6.42	-1.6	Sediment	<3.5 UJ	1.2	0.48	0.86	46	14	4.3	0.12 J	48	<0.29	<0.29	<0.29	30	7.9
2AU-4-1	1.0	8.78	7.8	Fill	< 3.4 UJ	3.3	0.66	0.97	41	18	4.7	0.13	45	< 0.28	< 0.28	< 0.28	32	
2AU-4-7	7.0	8.78	1.8	Cinders	na	na	na	na	na	na	na	120	na	na	na	na	na	7.1
2AU-4-8	8.0	8.78	0.8	Sediment	<3.2	2.4	0.24	0.64	31	13	10	700	31	<0.26	<0.26	<0.26	30	
2AU-4-10	10.0	8.78	-1.2	Sediment	< 3.1 UJ	2.4	0.4	0.73	47	15	5.9	28	43	< 0.26	< 0.26	< 0.26	35	8.8
2AU-4-11	11.0	8.78	-2.2	Sediment	< 3.0 UJ	7.9	0.65	0.97	61	31	5.3	79	69	< 0.25	< 0.25	0.56	77	8.3
2AU-4-13	13.0	8.78	-4.2	Sediment	na	na	na	na	na	na	na	390	na	na	na	na	na	
2AU-5-5.5	5.5	5.72	0.2	Sediment	<3.5	8.3	0.38	1.2	58	26	10	11	63	<0.29	<0.29	<0.29	79	
2AU-5-6	6.0	5.72	-0.3	Sediment	< 3.1 UJ	4.5	0.29	0.71	39	16	3.3	10	38	< 0.26	< 0.26	< 0.26	32	8.1
2AU-5-7	7.0	5.72	-1.3	Sediment	< 3.0 UJ	5.8	0.37	1.1	41	90	7.5	12	44	< 0.25	< 0.25	0.47	88	8.3
2AU-6-1	1.0	5.55	4.6	Fill	< 3.4 UJ	4.2	0.59	1.1	26	47	11	0.42	42	< 0.29	< 0.29	1	53	6.8
2AU-6-2.5	2.5	5.55	3.1	Fill	< 3.4 UJ	260	0.58	2.4	29	150	42	85	49	1.2	< 0.28	< 0.28	220	7.4
2AU-6-4.5	4.5	5.55	1.1	Sediment	5.5	230	0.42	11	55	1,200	160	150	72	2.5	3.5	0.96	2,700	
2AU-6-5	5.0	5.55	0.6	Sediment	<4.8	26	0.32	1.9	51	26	9.1	1.3	56	1.4	<0.4	<0.4	97	8.1
2AU-6-6	6.0	5.55	-0.5	Sediment	< 2.9 UJ	17	0.40	1.1	40	23	9.0	2.3	52	< 0.24	< 0.24	< 0.24	44	8.0
2AU-6-7	7.0	5.55	-1.5	Sediment	< 2.9 UJ	1.1	0.30	0.73	37	17	4.8	2.2	44	< 0.24	< 0.24	< 0.24	39	8.0
2AU-7-7	7.0	8.92	1.9	Cinders	na	na	na	na	na	na	na	17	na	na	na	na	na	7.0
2AU-7-8	8.0	8.92	0.9	Sediment	<49	250	0.35	12	41	2,200	260	170	59	4.7	2.8	<0.41	2,800	7.8
2AU-7-9	9.0	8.92	-0.1	Sediment	<4.1 UJ	2.7	0.62	1.3	61	17	6.1	1.5	68	<0.34	<0.34	<0.34	45	7.7
2AU-7-10	10.0	8.92	-1.1	Sediment	<3.8 UJ	26	0.52	1.7	41	20	3.6	0.67 J	63	<0.32	<0.32	<0.32	44	7.7
2AU-7-11	11.0	8.92	-2.1	Sediment	<3.3 UJ	2.6	0.47	1.2	37	14	3.4	0.48 J	48	<0.28	<0.28	<0.28	33	7.8
2AU-8-4	4.0	5.76	1.8	Sediment	6.8	770	0.41	17	62	2,600	230	1,100	75	11	5.6	0.51	3,700	
2AU-8-7	7.0	5.76	-1.2	Sediment	< 2.8 UJ	1.4	0.39	0.74	58	15	3.7	8.3	50	< 0.24	< 0.24	0.37	37	7.5
2AU-9-8.5	8.5	7.93	-0.6	Fill	< 3.1	1.6	0.34	0.99	110	16	3.3	2.4	51	< 0.26	< 0.26	0.59	32	8.0
2AU-9-13	13.0	7.93	-5.1	Sediment	<3.1	5.6	0.47	1.3	53	20	3.5	0.77	73.0	<0.26	<0.26	0.84	39	
2AU-10-1	1.0	5.51	4.5	Fill	< 3.5 UJ	5.7	0.59	1.4	20	26	9.4	0.043	50	< 0.29	< 0.29	< 0.29	60	6.9
2AU-10-3	3.0	5.51	2.5	Fill	< 3.2 UJ	5.3	0.56	1.4	22	24	9.3	0.096	50	0.4	< 0.27	< 0.27	54	7.1
2AU-10-4.5	4.5	5.51	1.0	Cinders	na	na	na	na	na	na	na	35	na	na	na	na	na	7.8
2AU-10-5	5.0	5.51	0.5	Sediment	<3.4	3.3	0.29	1.7	38	15	4.3	0.63	52	0.62	<0.29	<0.29	43	8.7
2AU-10-6	6.0	5.51	-0.5	Sediment	<3.5	2.5	0.5	1.1	53	23	13	0.16	61	<0.29	<0.29	<0.29	53	
2AU-10-7	7.0	5.51	-1.5	Sediment	< 3.3 UJ	1.9	0.38	0.82	49	21	5.5	0.23	48	< 0.28	< 0.28	< 0.28	43	8.5
2AU-10-8	8.0	5.51	-2.5	Sediment	< 3.7 UJ	4.2	0.31	0.91	47	14	2.8	0.71	40	< 0.31	< 0.31	< 0.31	33	7.8
2AU-11-1	1.0	8.69	7.7	Fill	<3.2	4.0	0.51	1.0	39	21	7.7	0.096 J	46	<0.26	<0.26	0.28	40	
2AU-11-5	5.0	8.69	3.7	Cinders	na	na	na	na	na	na	na	2.7	na	na	na	na	na	7.0
2AU-11-7	7.0	8.69	1.7	Cinders	na	na	na	na	na	na	na	1.2	na	na	na	na	na	6.9
2AU-11-8	8.0	8.69	0.7	Sediment	<3.3 UJ	43	0.73	2.4	45	75	30	88	77	<0.28	<0.28	<0.28	140	7.7
2AU-11-10	10.0	8.69	-1.3	Sediment	<2.8 UJ	12.0	0.24	1.5	44	39	6.4	7.9 J	36	0.3	0.5	<0.23	130	7.7
2AU-11-11	11.0	8.69	-2.3	Sediment	<3.1 UJ	5.4	0.38	0.95	51	15	2.5	3.3 J	51	0.3	<0.26	0.5	68	7.4
2AU-12-7	7.0	8.97	2.0	Cinders	na	na	na	na	na	na	na	49	na	na	na	na	na	6.8
2AU-12-10	10.0	8.97	-1.0	Sediment	< 3.8 UJ	3.8	0.88	1.9	51	660	5.5	0.93	73	0.72	< 0.32	< 0.32	820	6.0
2AU-12-11	11.0	8.97	-2.0	Sediment	< 3.3 UJ	3.2	0.67	1.0	44	23	3.8	3.3	54	0.31	< 0.28	0.50	200	5.7
2AU-13-2	2.0	5.50	3.5	Fill	< 2.9 UJ	5.1	0.59	1.4	30	19	7.8	0.084	39	0.34	< 0.25	< 0.25	42	6.6
2AU-13-3.5	3.5	5.50	2.0	Fill	4.8 J	170	0.12	7.3	11	600	140	60	40	4.9	1.7	< 0.28	1,500	6.8
2AU-13-4	4.0	5.50	1.5	Cinders	na	na	na	na	na	na	na	73						6.3
2AU-13-5	5.0	5.50	0.5	Sediment	<3.3	6.7	0.56	1.1	40	19	4.9	0.064	50	<0.27	<0.27	<0.27	36	
2AU-13-7	7.0	5.50	-1.5	Sediment	< 3.3 UJ	2.4	0.36	1.0	32	20	3.4	0.070	42	< 0.27	< 0.27	0.58	44	6.6

TABLE 4
METALS IN SOIL, CINDERS, AND SEDIMENT
UPLAND PORTION OF SUBUNIT 2A
RICHMOND FIELD STATION

Sample Location	Depth [feet]	Elevation [feet] of Ground Surface	Elevation of Sample [feet]	Source	Antimony	Arsenic	Beryllium	Cadmium	Chromium	Copper	Lead	Mercury	Nickel	Selenium	Silver	Thallium	Zinc	pH
ECOLOGICAL AND HUMAN HEALTH SCREENING VALUES																		
E-SSTL (hawk)								230	157	412	437	42	621				760	
E-SSTL (squirrel)								524	27,167	429,123	326,825	5,017	7,691				111,817	
H-SSTL (Comm. Ind. Worker)						27.3		147				264						
RBSLs* (<9.9 feet bgs)					40	8*	8	12	750	225	1000	10	150	10	40	29	600	
RBSLs* (>9.9 feet bgs)						8*	95	61	5000	5000	1000	160	1000	2700	2700	37	5000	
2AU-13-8	8.0	5.50	-2.5	Sediment	< 3.1 UJ	6.7	0.45	1.2	36	17	6.1	0.049	56	0.70	< 0.26	2.5	38	7.2
2AU-14-5.5	5.5	8.71	3.2	Cinders	na	na	na	na	na	na	na	1.6	na	na	na	na	na	6.6
2AU-14-7.5	7.5	8.71	1.2	Sediment	13 J	320	0.21	27	15	1,200	220	56	43	10	5.5	2	6,100	6.9
2AU-14-8.5	8.5	8.71	0.2	Sediment	<4.3	13	0.53	1.8	55	20	6.1	0.17	81	1.3	<0.36	1.1	56	6.4
2AU-14-9	9.0	8.71	-0.3	Sediment	<2.8 UJ	7.8	0.45	1.1	42	19	4.7	0.088 J	56	0.27	<0.23	<0.23	39	7.4
2AU-14-10.5	10.5	8.71	-1.8	Sediment	<3.0 UJ	5.0	0.41	1.0	41	18	4.6	0.20 J	49	<0.25	<0.25	<0.25	39	7.4
2AU-15-5	5.0	8.38	3.4	Cinders	na	na	na	na	na	na	na	2.2	na	na	na	na	na	4.5
2AU-15-7	7.0	8.38	1.4	Sediment	6.2	150	<0.11	21	16	3,700	150	310	24	9.8	3.6	<0.26	21,000	5.9
2AU-15-8	8.0	8.38	0.4	Sediment	<3.8	66	0.32	6	31	1,900	180	50	48	2	2	1	1,500	
2AU-15-9	9.0	8.38	-0.6	Sediment	< 3.6 UJ	5.7	0.52	1.2	45	17	5.6	0.18	53	< 0.30	< 0.30	< 0.30	54	6.0
2AU-15-10	10.0	8.38	-1.6	Sediment	< 3.3 UJ	6.1	0.70	1.5	61	32	3.9	6.5	56	0.32	< 0.28	< 0.28	160	6.7
2AU-16-1	1.0	9.00	8.0	Fill	< 3.0 UJ	4.8	0.67	1.2	39	43	19	0.75	42	0.73	< 0.25	1.2	69	7.6
2AU-16-7	7.0	9.00	2.0	Cinders	<65	100	<2.2	3,000	6.6	11,000	270	6.3	260	6.8	4.9	9.7	47,000	6.4
2AU-16-8.5	8.5	9.00	0.5	Sediment	<3.2	4.7	0.55	1.8	41	31	3.8	0.29	47	<0.27	<0.27	<0.27	960	
2AU-16-10.5	10.5	9.00	-1.5	Sediment	< 3.1 UJ	5.5	0.42	9.6	34	100	4.5	0.21	40	0.61	< 0.26	< 0.26	370	6.3
2AU-16-11.5	11.5	9.00	-2.5	Sediment	< 3.3 UJ	4.7	0.58	1.7	35	17	2.8	0.85	57	< 0.28	< 0.28	0.29	200	7.0
2AU-17-13	13.0	13.28	0.3	Sediment	<74	84	<2.5	7.5	43	7,800	750	1	150	11	0.7	<6.2	22,000	5.6
2AU-17-14	14.0	13.28	-0.7	Sediment	<3.6	5.6	0.58	1.3	47	21	5	0.13	67	<0.3	<0.3	0.76	120	
2AU-17-15	15.0	13.28	-1.7	Sediment	< 3.2 UJ	6.0	0.54	1.3	38	22	4.5	0.083	63	0.40	< 0.27	0.70	60	4.9
2AU-17-16	16.0	13.28	-2.7	Sediment	< 3.4 UJ	5.8	0.56	1.3	40	20	3.9	0.070	61	< 0.28	< 0.28	0.71	46	5.0
2AU-18-9	9.0	13.10	4.1	Fill	7.6 J	94	< 2.3	10	0.87	450	160	2.3	83	< 5.8	7.6	< 5.8	990	3.7
2AU-18-13	13.0	13.10	0.1	Sediment	< 3.8 UJ	46	0.27	3.3	29	800	120	19	45	3.3	1.3	< 0.32	4,000	5.7
2AU-18-14	14.0	13.10	-0.9	Sediment	< 3.9 UJ	26	0.48	1.9	54	150	100	52	79	1.3	< 0.32	< 0.32	5,000	6.4
2AU-18-15	15.0	13.10	-1.9	Sediment	< 3.4 UJ	6.1	0.56	1.4	51	22	4.6	0.055	66	< 0.29	< 0.29	< 0.29	58	4.9
2AU-19-14	14.0	13.64	-0.4	Sediment	<3.7	6.6	0.31	1.9	46	27	6.3	100	62	0.83	<0.31	<0.31	570	4.3
2AU-19-15	15.0	13.64	-1.4	Sediment	< 3.5 UJ	7.0	0.53	1.7	44	23	5.5	0.098	64	< 0.29	< 0.29	< 0.29	980	4.3
2AU-19-16	16.0	13.64	-2.4	Sediment	< 3.5 UJ	6.5	0.67	1.7	45	38	5.4	0.081	73	0.37	< 0.29	< 0.29	1,100	4.4
2AU-19-17	17.0	13.64	-3.4	Sediment	<3.5	5.8	0.71	1.5	59	27	4.2	0.15	67	<0.29	<0.29	<0.29	1,500	
2AU-19-18	18.0	13.64	-4.4	Sediment	<3.7	7.5	0.55	1.7	48	20	4.9	170	70	1.5	<0.31	0.53	1,200	4.1
2AU-20-13	13.0	13.31	0.3	Sediment	<4.2	37	0.22	1.3	40	440	140	100	43	2.3	0.51	<0.35	1,800	5.0
2AU-20-14	14.0	13.31	-0.7	Sediment	< 3.9 UJ	9.9	0.33	1.2	40	14	4.9	1.9	50	0.49	< 0.33	< 0.33	940	5.3
2AU-20-15	15.0	13.31	-1.7	Sediment	< 3.5 UJ	4.0	0.48	1.3	46	22	4.9	0.084	64	0.45	< 0.29	< 0.29	400	4.7
2AU-21-10	10.0	8.36	-1.6	Sediment	< 3.5 UJ	1.5	0.27	0.76	52	13	2.8	1.9	38	0.30	< 0.29	0.43	32	7.3
2AU-21-11	11.0	8.36	-2.6	Sediment	< 3.3	5.1	0.28	0.89	40	12	2.5	0.98	43	0.52	< 0.28	1.1	30	7.7
2AU-22-7.5	7.5	9.19	1.7	Cinders	na	na	na	na	na	na	na	150	na	na	na	na	na	7.1
2AU-22-10	10.0	9.19	-0.8	Sediment	<3.4 UJ	9.7	0.71	1.8	57	290	8.3	0.047	66	<0.28	<0.28	<0.28	340	5.4
2AU-22-12	12.0	9.19	-2.8	Sediment	<3.8 UJ	1.8	0.61	1.2	57	150	6.9	0.26 J	82	<0.31	<0.31	<0.31	200	5.2
2AU-22-13	13.0	9.19	-3.8	Sediment	<3.8 UJ	4.9	0.47	1.1	41	19	3.5	0.71 J	55	<0.32	<0.32	<0.32	37	7.0
2AU-23-4.8	4.8	8.24	3.4	Cinders	3.4 J	110	<0.11	6.3	1.7	1,800	220	25	34	7.8	5.6	0.95	1,500	5.5
2AU-23-7	7	7	0.0	Sediment	3.4 J	110	<0.099	3.8	1.6	660	120	2.2	34	5.6	2.2	1.0	1,400	7.1
2AU-23-13	13	8.24	-4.8	Sediment	<2.8 UJ	5.5	0.39	1.1	38	20	3.8	0.15	66	1.6	<0.24	1.3	75	7.4
2AU-23-14	14	8.24	-5.8	Sediment	<3.8 UJ	5.4	0.45	1.2	39	21	5.0	0.14	66	0.73	<0.31	1.5	75	6.9
2AU-24-4.5	4.5	8.30	3.8	Cinders	<3.5 UJ	38	<0.12	3.4	1.3	580	93	35	19	2.9	1.7	1.2	600	4.9
2AU-24-7.5	7.5	8.30	0.8	Sediment	<3.7 UJ	11	0.38	1.7	46	79	6.4	1.3	59	2.4	<0.31	0.43	390	5.6
2AU-24-11	11	8.30	-2.7	Sediment	<3.6 UJ	7.5	0.36	1.1	49	22	6.9	0.13	54	1.6	<0.3	0.37	54	7.0
2AU-25-4	4	5.87	1.9	Cinders	4.6 J	110	<0.11	35	2.0	5,300	100	88	42	4.2	6.3	1.1	4,900	6.2
2AU-25-7	7	5.87	-1.1	Sediment	<2.9 UJ	1.8	0.27	0.96	32	18	4.2	130	50	0.95	<0.24	0.28	52	6.9
2AU-25-8	8	5.87	-2.1	Sediment	<2.10	1.9	0.24	0.78	28	13	3.1	0.23	49	0.36	<0.24	0.58	47	
2AU-25-9	9	5.87	-3.1	Sediment	<3.1	3.5	0.22	0.79	31	10	2.7	0.068	43	0.47	<0.26	0.39	32	
2AU-25-13	13	5.87	-7.1	Sediment	<2.6 UJ	5.8	0.40	1.4	35	24	4.2	0.23	65	0.71	<0.22	0.71	200	7.0
2AU-25-14	14	5.87	-8.1	Sediment	<3.2 UJ	8.0	0.54	1.8	49	28	5.7	0.15	85	1.1	<0.27	1.3	190	6.9
2AU-26-13.5	13.5	13.77	0.3	Sediment	<3.0 UJ	31	0.16	14	27	110	110	12	22	2.2	<0.25	0.32	1,700	4.4
2AU-26-14.5	14.5	13.77	-0.7	Sediment	<3.3 UJ	4.9	0.44	1.3	42	18	4.8	0.32	56	0.6	<0.28	0.8	720	4.5
2AU-26-16	16	13.77	-2.2	Sediment	<4.0 UJ	4.9	0.56	1.4	38	21	4.9	0.29	69	0.50	<0.34	1.3	610	4.7

TABLE 4
METALS IN SOIL, CINDERS, AND SEDIMENT
UPLAND PORTION OF SUBUNIT 2A
RICHMOND FIELD STATION

Sample Location	Depth (feet)	Elevation (feet) of Ground Surface	Elevation of Sample (feet)	Source	Antimony	Arsenic	Beryllium	Cadmium	Chromium	Copper	Lead	Mercury	Nickel	Selenium	Silver	Thallium	Zinc	pH
ECOLOGICAL AND HUMAN HEALTH SCREENING VALUES																		
E-SSTL (hawk)								230	157	412	437	42	621				760	
E-SSTL (squirrel)								524	27,167	429,123	326,825	5,017	7,691				111,817	
H-SSTL (Comm. Ind. Worker)						27.3		147				264						
RBSLs* (<9.9 feet bgs)					40	8*	8	12	750	225	1000	10	150	10	40	29	600	
RBSLs* (>9.9 feet bgs)						8*	95	61	5000	5000	1000	160	1000	2700	2700	37	5000	
2AU-27-13.3	13.3	13.30	0.0	Sediment	<4.1 UJ	14	0.22	1.1	35	110	93	71	31	1.4	<0.34	<0.34	1,800	5.6
2AU-27-14.3	14.3	13.30	-1.0	Sediment	<3.8 UJ	12	0.30	1.1	32	14	12	0.11	47	0.99	<0.32	<0.32	1,600	5.5
2AU-27-15.3	15.3	13.30	-2.0	Sediment	<3.4 UJ	5.6	0.52	1.3	40	21	5.3	0.42	65	<0.28	<0.28	<0.28	280	5.1
2AU-28-4	4	3.84	-0.2	Sediment	<3.5 UJ	7.3	0.41	1.3	39	19	4.7	58	67	1.1	<0.29	1.0	1,000	5.3
2AU-28-5	5	3.84	-1.2	Sediment	<3.4 UJ	5.4	0.47	1.3	46	21	5.1	0.26	68	0.88	<0.29	<0.29	600	5.0
2AU-28-6	6	3.84	-2.2	Sediment	<3.8 UJ	7.6	0.54	1.5	37	25	5.3	0.10	72	2.0	<0.31	<0.31	350	4.9
2AU-29-4	4	3.80	-0.2	Sediment	<3.9 UJ	9.8	0.45	1.4	42	57	10.0	120	60	0.63	<0.32	<0.32	910	5.0
2AU-29-5	5	3.80	-1.2	Sediment	<3.2 UJ	6.4	0.50	1.3	36	19	4.8	0.11	63	1.2	<0.27	0.29	630	4.4
2AU-29-6	6	3.80	-2.2	Sediment	<3.8 UJ	5.3	0.51	1.3	38	21	4.8	0.098	71	0.61	<0.32	1.2	360	4.6
2AU-30-16.5	16.5	8.66	-7.8	Sediment	<3.1	2.2	0.28	1.5	35	9.6	1.5	6.7	57	<0.26	<0.26	<0.26	49	
2AU-30-19.5	19.5	8.66	-10.8	Sediment	<3.4	4.8	0.33	1.2	34	15	23	0.27	41	0.46	<0.29	1.2	43	
2AU-30-20.5	20.5	8.66	-11.8	Sediment	<3.5	4.5	0.38	1.3	38	17	26	4	43	<0.29	<0.29	1	43	
2AU-31-11	11	8.96	-2.0	Sediment	<3.5	9.6	0.37	2	39	56	2.6	3.2	51	0.87	<0.29	<0.29	150	
2AU-31-16.5	16.5	8.96	-7.5	Sediment	<3.8	3.8	0.45	1.5	40	32	14	7.2	67	0.72	<0.32	0.84	59	
2AU-31-17.5	17.5	8.96	-8.5	Sediment	<3.3	3.8	0.42	1.4	40	22	15	1.3	68	0.62	<0.28	1	48	
2AU-32A-a	4	5.61	1.6	composite	<3.3	110	0.31	3.9	35	450	75	260	50	2.5	1.1	<0.28	690	
2AU-32A-b	5	5.61	0.6	composite														
2AU-32B-c	4	5.61	1.6	composite														
2AU-32B-d	5.5	5.61	0.1	composite														
2AU-33A-a	4	5.40	1.4	composite	4.5	610	0.35	7.1	42	850	190	130	76	15	1.8	<0.37	3800	
2AU-33A-b	5.5	5.40	-0.1	composite														
2AU-33B-c	3	5.40	2.4	composite														
2AU-33B-d	4	5.40	1.4	composite														
A4-10	4.5	8.34	3.8	Cinder	<3.8	67	<0.13	13	1	620	32	11	36	2.3	3.7	<0.32	2,800	4.3
A4-10	10	8.34	-1.7	Sediment	<3.5	5.2	0.45	2.1	54	22	4.5	0.069	70	0.43	<0.29	<0.29	180	5.0
A4-12	7.5	8.91	1.4	Cinder	<3.3	130	<0.11	280	8.4	10,000	81	62	59	7.5	24	<0.27	16,000	5.8
A4-12	10	8.91	-1.1	Sediment	<3.4	5.4	0.31	2.2	54	21	7.4	1.2	40	0.5	<0.28	<0.28	170	6.0
A4-13	7	9.30	2.3	Cinder	<3.4	150	0.17	2200	12	10,000	210	27	65	8.1	3.4	20	23,000	5.7
A4-13	9.5	9.30	-0.2	Sediment	<3.2	6.2	0.42	2.5	39	22	5.8	0.82	63	0.51	<0.27	<0.27	72	4.8
A4-14	4.5	5.80	1.3	Cinder	<3.4	49	<0.11	29	2	2,300	62	0.63	29	1.8	9.2	<0.28	2,900	5.3
A4-14	7	5.80	-1.2	Sediment	<3.5	1.6	0.29	1.8	20	57	3.1	0.063	30	<0.29	<0.29	<0.29	690	5.0
A4-15	4	6.70	2.7	Cinder	<3.9	57	<0.13	13	1.8	2,700	82	0.82	56	7.2	12	<0.33	2,300	2.4
A4-15	6	6.70	0.7	Sediment	<3.5	11	0.14	2	24	3,800	180	0.33	20	0.81	0.35	<0.29	170	5.7
A4-16	5.5	8.83	3.3	Cinder	<3.8	100	<0.13	24	2.6	860	71	1,000	36	2.4	5	<0.32	6,400	5.9
A4-16	11.5	8.83	-2.7	Sediment	<3.4	1.9	0.23	1.3	30	19	6.8	5.4	43	<0.28	<0.28	<0.28	81	7.8
A4-17	7	8.62	1.6	Cinder	<3.6	74	<0.12	36	3.4	8,900	120	1.4	62	5.9	4.1	2	6,200	6.2
A4-17	10	8.62	-1.4	Sediment	<3.5	4.6	0.24	2	33	36	8.5	0.85	43	0.34	<0.29	<0.29	180	6.1
A4-2	4	6.78	2.8	Cinder	<4.8 UJ	150	0.21	8.3	32	1,900	180	85	47	2.2	2.3	<0.4	2,000	8.6
A4-6	5.5	8.36	2.9	Cinder	<3.5	64	0.12	5	11	680	160	57	34	1.2	1.9	<0.29	590	7.4
A4-6	7	8.36	1.4	Sediment	<3.5	3.5	0.39	1.6	28	21	5.9	0.22	46	0.61	<0.29	<0.29	36	8.6
A4-7	5.5	8.29	2.8	Cinder	<4.1	57	<0.14	4.1	0.88	430	91	62	18	1.3	1.6	<0.34	220	7.1
A4-7	9.5	8.29	-1.2	Sediment	<3.5	3.1	0.17	1.2	22	35	9.8	0.44	29	<0.29	<0.29	<0.29	40	5.2
A4-9	4.5	7.78	3.3	Cinder	<3.2	140	<0.11	10	1.9	470	94	5	27	2.7	3.3	<0.27	2,400	6.8
A4-9	8	7.78	-0.2	Sediment	<3.7	10	0.36	3.2	53	88	8.5	0.21	75	0.86	<0.31	<0.31	120	6.4
A4-9	11.5	7.78	-3.7	Sediment	<3.1	4.8	0.34	2.1	34	27	4.8	0.074	60	0.51	<0.26	<0.26	57	7.4
MF-104-B-0	0	6.36	6.4	Fill	<3.6	6.8	0.37	1.9	24 J	39	19	12	42 J	0.41	<0.3	<0.3	130	
MF-104-B-3	3	6.36	3.4	Fill	<4.3	95	<0.14	7.7	3.4 J	430	19	5,100	30 J	3	5.7	1.3	1,400	
MF-104-B-9	9	6.36	-2.6	Sediment	<3.4	1.8	<0.11	1.3	28	65	13	2,200	24 J	0.39	<0.29	<0.29	48	
MF114-0	0	8.89	8.9	Fill	na	na	na	na	na	na	na	0.87	na	na	na	na	na	

TABLE 4
METALS IN SOIL, CINDERS, AND SEDIMENT
UPLAND PORTION OF SUBUNIT 2A
RICHMOND FIELD STATION

Sample Location	Depth [feet]	Elevation [feet] of Ground Surface	Elevation of Sample [feet]	Source	Antimony	Arsenic	Beryllium	Cadmium	Chromium	Copper	Lead	Mercury	Nickel	Selenium	Silver	Thallium	Zinc	pH
ECOLOGICAL AND HUMAN HEALTH SCREENING VALUES																		
E-SSTL (hawk)								230	157	412	437	42	621				760	
E-SSTL (squirrel)								524	27,167	429,123	326,825	5,017	7,691				111,817	
H-SSTL (Comm, Ind, Worker)						27.3		147				264						
RBSLs* (<9.9 feet bgs)					40	8*	8	12	750	225	1000	10	150	10	40	29	600	
RBSLs* (>9.9 feet bgs)						8*	95	61	5000	5000	1000	160	1000	2700	2700	37	5000	
MF114-2	2	8.89	6.9	Fill	na	na	na	na	na	na	na	0.11	na	na	na	na	na	
MF114-9.5	9.5	8.89	-0.6	Sediment	na	na	na	na	na	na	na	0.23	na	na	na	na	na	
MF-114-11.3	11.3	8.89	-2.4	Sediment	<3.6	3.9	0.91	2.4	58	39	9.9	0.3	56	0.56	<0.3	<0.3	64	
MF114-13	13	8.89	-4.1	Sediment	na	na	na	na	na	na	na	170	na	na	na	na	na	
MF115-0	0	8.52	8.5	Fill	na	na	na	na	na	na	na	0.14	na	na	na	na	na	
MF115-12	12	8.52	-3.5	Sediment	na	na	na	na	na	na	na	5.3	na	na	na	na	na	
MF115-6	6	8.52	2.5	Cinder	na	na	na	na	na	na	na	3,900	na	na	na	na	na	
MF115-9.2	9.2	8.52	-0.7	Sediment	na	na	na	na	na	na	na	3.4	na	na	na	na	na	
MF116-0	0	8.71	8.7	Fill	na	na	na	na	na	na	na	0.23	na	na	na	na	na	
MF116-9.5	9.5	8.71	-0.8	Sediment	na	na	na	na	na	na	na	510	na	na	na	na	na	
MF116-12	12	8.71	-3.3	Sediment	na	na	na	na	na	na	na	930	na	na	na	na	na	
MF117-0	0	8.84	8.8	Fill	na	na	na	na	na	na	na	0.67	na	na	na	na	na	
MF117-10	10	8.84	-1.2	Sediment	na	na	na	na	na	na	na	0.31	na	na	na	na	na	
MF117-13.5	13.5	8.84	-4.7	Sediment	na	na	na	na	na	na	na	0.21	na	na	na	na	na	
MF118-0	0	8.85	8.9	Fill	na	na	na	na	na	na	na	0.28	na	na	na	na	na	
MF118-6.5	6.5	8.85	2.4	Sediment	na	na	na	na	na	na	na	64	na	na	na	na	na	
MF118-9	9	8.85	-0.2	Sediment	na	na	na	na	na	na	na	0.75	na	na	na	na	na	
MF119-0	0	8.82	8.8	Fill	na	na	na	na	na	na	na	0.13	na	na	na	na	na	
MF119-9	9	8.82	-0.2	Sediment	na	na	na	na	na	na	na	0.36	na	na	na	na	na	
MF119-13	13	8.82	-4.2	Sediment	na	na	na	na	na	na	na	<0.23	na	na	na	na	na	
PB12	0	9.0	9.0	Fill	<3.4	220	<0.11	8.1	17	170	190	8.8	42	32	2.1	<0.29	130	2.1
PB12	4	9.0	5.0	Cinders	<2.7	89	<0.091	6.4	2.2	270	73	1.3	29	2.2	4.5	<0.23	160	2.4
PB12	11	9.0	-2.0	Sediment	<3.6	6.8	0.49	2.9	39	27	7	0.17	74	0.38	<0.3	<0.3	230	4.6
PH1-6.5-sed	6.5	8.80	2.3	Sediment	3.9	320	0.14	11	23	1,700	320	22	37	2.6 J	3.5	2	3,000	
PH1-cinder		8.80		Cinder	3.6	53	<0.12	9.5	0.91	640	55	8.7	37	1.4 J	8	0.76	2,000	2.4
PH2-6.5-sed	6.5	8.34	1.8	Sediment	<4.2	75	0.24	4.2	34	850	150	140	45	0.76 J	1.1	<0.35	830	
PH3-6.5-sed	6.5	8.14	1.6	Sediment	6	560	<0.14	25	27	2,000	210	390	35	38 J	7	1.9	3,800	
PH4-7-sed	7	8.27	1.3	Sediment	9.9	1,600	0.46	27	110	4,100	570	500	120	28 J	6.4	<0.51	6,500	
PH4-cinder		8.27		Cinder	5.8	210	<0.12	13	1.5	780	40	10	33	0.79 J	11	<0.3	2,800	2.5
PH5-7-sed	7	8.28	1.3	Sediment	<3.9	210	<0.13	13	12	1,600	110	94	32	1.7 J	3.4	1.2	2,600	
PH7-6-sed	6	8.44	2.4	Sediment	16	1,000	0.18	34	56	2,200	410	140	81	50 J	11	<0.38	6,700	
PH7-cinder		8.44		Cinder	6.3	210	<0.12	10	1.2	290	92	2.7	38	1 J	8.6	<0.31	1,300	7.0
SL-101	0	9.27	9.3	Fill	<3.2	1.2	0.33	0.91	6.4	6.5	5	0.43	16 J	<0.26	<0.26	<0.26	22	
SL-101	3	9.27	6.3	Fill	<3.6	3	0.52	1.2	31	15	6.8	0.15	46	<0.3	<0.3	0.73	24	
SL-101	6	9.27	3.3	Cinder	<4.2	160	0.25	14	17	3,500	130	77	85	3.7	3.6	3.6	13,000	
SL-101	10	9.27	-0.7	Sediment	<3.5	7.3	0.19	1.9	48	110	6.6	0.43	31	<0.29	<0.29	<0.29	440	
B-1	0	8.7	8.7	unknown	ND	15	na	ND	18	120	27	4.6	23	na	ND	na	160	
B-1	4.5	8.7	4.2	unknown	8	62	na	ND	ND	490	91	6.4	ND	na	ND	na	580	
B-1	8.5	8.7	0.2	unknown	ND	160	na	ND	ND	2,600	98	8	11	na	ND	na	1,600	
B-2	0	8.8	8.8	unknown	ND	35	na	ND	15	190	43	0.35	20	na	ND	na	210	
B-2	4.5	8.8	4.3	unknown	5.1	6.5	na	ND	36	19	ND	0.16	39	na	ND	na	41	
B-2	8	8.8	0.8	unknown	ND	54	na	6	ND	870	61	7.3	ND	na	ND	na	730	
B-3	0	8.5	8.5	unknown	ND	7.9	na	ND	12	65	21	0.64	25	na	ND	na	84	
B-3	4	8.5	4.5	unknown	ND	14	na	ND	47	65	12	0.18	64	na	ND	na	250	
B-3	8.5	8.5	0.0	unknown	ND	110	na	340	7.7	20,000	43	1.3	21	na	12	na	7,900	
B-4	0	8	8.0	unknown	ND	17	na	ND	16	71	15	0.7	25	na	ND	na	110	
B-4	4	8	4.0	unknown	ND	17	na	ND	26	34	8.3	4.7	33	na	ND	na	220	
B-4	8	8	0.0	unknown	9.7	110	na	ND	ND	770	50	8	ND	na	5.3	na	1,000	
B-5	0	8	8.0	unknown	ND	ND	na	ND	11	12	13	0.22	19	na	6.5	na	37	
B-5	4	8	4.0	unknown	7.7	140	na	53	15	9,300	160	10	8.3	na	8.8	na	2,300	

TABLE 4
METALS IN SOIL, CINDERS, AND SEDIMENT
UPLAND PORTION OF SUBUNIT 2A
RICHMOND FIELD STATION

Sample Location	Depth [feet]	Elevation [feet] of Ground Surface	Elevation of Sample [feet]	Source	Antimony	Arsenic	Beryllium	Cadmium	Chromium	Copper	Lead	Mercury	Nickel	Selenium	Silver	Thallium	Zinc	pH
ECOLOGICAL AND HUMAN HEALTH SCREENING VALUES																		
E-SSTL (hawk)								230	157	412	437	42	621				760	
E-SSTL (squirrel)								524	27,167	429,123	326,825	5,017	7,691				111,817	
H-SSTL (Comm, Ind, Worker)						27.3		147				264						
RBSLs* (<9.9 feet bgs)					40	8*	8	12	750	225	1000	10	150	10	40	29	600	
RBSLs* (>9.9 feet bgs)						8*	95	61	5000	5000	1000	160	1000	2700	2700	37	5000	
B-5	8	8	0.0	unknown	ND	120	na	20	5.7	17,000	80	32	23	na	ND	na	1,800	
B-6	0	8	8.0	unknown	ND	ND	na	ND	7	9.8	6.9	0.59	15	na	ND	na	26	
B-6	4	8	4.0	unknown	ND	14	na	ND	43	24	12	0.65	42	na	ND	na	87	
B-6	8.5	8	-0.5	unknown	7.4	160	na	22	6.4	1,100	140	32	ND	na	ND	na	7,100	
B-7	0	8	8.0	unknown	ND	8.6	na	ND	18	970	18	4.1	22	na	ND	na	130	
B-7	4.5	8	3.5	unknown	ND	8.8	na	ND	33	16	ND	3.2	27	na	ND	na	22	
B-7	8	8	0.0	unknown	ND	260	na	27	ND	1,300	72	9.5	5.9	na	7.8	na	4,600	
B-8	0	7.8	7.8	unknown	ND	16	na	ND	22	36	16	6.7	34	na	ND	na	96	
B-8	4.5	7.8	3.3	unknown	ND	160	na	ND	17	330	71	2	25	na	9.9	na	770	
B-8	8.5	7.8	-0.7	unknown	ND	210	na	ND	ND	380	84	12	ND	na	ND	na	1,400	

* RBSLs = Surface soil (less than or equal to 3 meters (9.9 feet) below ground surface) Risk Based Screening Levels where Groundwater is not a potential source of drinking water. From "Application of Risk-Based Screening Levels and Decision Making to Sites With Impacted Soil and Groundwatere", prepared by RWQCB, August 2000. For Arsenic, background concentration of 19 mg/kg is used (LBNL, 19__).

= exceedance of screening level
= material to be reused (overburden) or below bottom of excavation (sediment remaining in place)
= material to be excavated and treated prior to disposal

UJ The analyte was not detected above the sample quantitation limit. However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample.

J The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.

TABLE 5
METALS IN SEDIMENT
MARSH PORTION OF SUBUNIT 2A
RICHMOND FIELD STATION

EPA Method 6010 (7471 for Mercury), units = mg/kg

Sample Location	depth	Arsenic	Cadmium	Copper	Lead	Mercury	Nickel	Selenium	Zinc	pH
TIDAL SALT MARSH HABITAT										
E-SSTL (Clapper Rail)		685	57	598	576	3.8	2,773	16	5,244	
E-SSTL (Harvest Mouse)		355	15	14,399	19,026	143	1,685	145	7,904	
H-SSTL (Receator)		35.4	155	10,000	400	4,380	10,000	10,000	10,000	
SMAB-1	0	28	2.4	97	39	0.45 J	71	1.7	480	6.6
SMAB-2	0	410	9.1	750	280	23 J	93	56	1,700	6.5
SMAB-3	0	1,100	14	2,000	2,600	5.4 J	100	24	3,500	6.4
SMAB-4	0	1,100	18	1,400	660	18 J	120	59	2,600	6.5
SMAB-5	0	600	19	1,900	440	28 J	140	43	3,700	6.7
SMAB-6	0	88	2.4	19	6	0.92 J	25	<1.3	120	6.8
SMAB-7	0	1,100	13	1,400	910	30 J	120	81	2,400	6.7
SMAB-8	0	1,800	24	3,500	560	170 J	110	93	4,800	7.3
SMAB-9	0	1,700	15	1,600	460	62 J	99	130	2,000	6.9
SMAB-10	0	2,900	24	1,300	480	160 J	110	260	3,000	6.6
SMAB-11	0	640	11	780	180	1.8 J	130	<1.3	2,800	5.7
SMAB-12	0	1,700	17	910	180	270 J	97	140	2,000	6.7
SMAB-13	0	930	28	890	360	16	130	32	8,900	5.1
SMAB-14	0	420	520	900	270	3.6	39	10	9,200	5.1
SMAB-15	0	640	28	1,400	220	110	120	13	9,200	6.5
SMAB-16	1.5	410	19	1,400	140	82	34	11	4,500	5.2
SMAB-16	2.5	140	15	560	75	24	38	7.5	3,200	6.8
SMAB-17	0	1,600	38	2,200	470	150	87	130	7,500	6.8
SMAB-18	0	410	40	1,000	190	61	62	43	8,000	7.2
SMAB-19	0	550	9.8	140	170	1.2	89	4.8	980	7.7
SMAB-20 fill	0	26	2.2	71	46	0.73	40	1.5	250	7.8
SMAB-21 fill	0	13	1	20	25	0.46	25	0.75	84	6.9
SMAB-13 veg	0.5	850	55	1,200	230	4.6	300	17	13,000	4.0
SMAB-17 veg	0.5	2,000	15	110	110	0.71	150	12	1,200	6.4
SMAB-8 veg	0.5	980	12	870	190	3.3	150	5.8	3,000	6.0
SM-108	0	610	21	54	8.9	0.86	120	6.7	190	
SM-108	2	700	41	450	220	11	77	17	8,800	
SM-108	4.5	1,200	36	940	310	53	85	53	7,200	
SM-108	5.5	7.2	1.6	18	4.7	0.44	50	<0.29	50	
SM-109	0	200	12	230	84	9.5	51	9.9	1,300	
SM-123	0	26	3.9	460	76	4.3	53 J	4.2	1,300	
SM-123	3	130	12	480	190	36	18 J	6.7	2,700	
SM-123	8	2.6	1.7	23	5.3	0.95	65 J	<0.3	50	
SM-124	3.5	260	18	12,000	700	35	140	18	770	
SM-131	0	576	3	258	577	12	12	135	688	
B8MA	1	875	7.7	415	235	35.9	na	<1.6	517	
B9MA	1	125	8.7	519	91.3	7.09	na	<11.1	1,270	
E-1	0	496	na	315	310	10.9	na	60.7	957	
E-2	0	749	na	239	563	5.8	na	124	863	
RFS-1	0	217	16	1,330	236	5.7	na	19	3,930	
RFS-1	0-2	425	2.5	425	149	24.2	na	19.7	793	
RFS-1	3	895	4.6	587	345	22	na	57	1,000	
RFS-1	5	172	1.1	145	76.7	9	na	9	304	
RFS-2	1	973	11.1	1,130	801	142	na	444	2,000	

TABLE 5
METALS IN SEDIMENT
MARSH PORTION OF SUBUNIT 2A
RICHMOND FIELD STATION

Sample Location	depth	Arsenic	Cadmium	Copper	Lead	Mercury	Nickel	Selenium	Zinc	pH
TIDAL SALT MARSH HABITAT										
E-SSTL (Clapper Rail)		685	57	598	576	3.8	2,773	16	5,244	
E-SSTL (Harvest Mouse)		355	15	14,399	19,026	143	1,685	145	7,904	
H-SSTL (Recreator)		35.4	155	10,000	400	4,380	10,000	10,000	10,000	
RFS-2	3	746	8.2	620	211	53	na	78	1,710	
RFS-2	5	57	1.2	109	34.1	5.2	na	7	271	
RFS-3	0	1,020	2.4	193	37.2	1.3	na	6	517	
RFS-3	1	746	3.0	745	289	27.5	na	854	945	
RFS-3	2.5	1,330	44	1,640	1,240	166	na	610	5,000	
SD1ESD	1	<348	31	813	172	8	na	<17.9	305	
UPLAND HABITAT (access road)										
E-SSTL (hawk)			230	412	437	42	621		760	
E-SSTL (squirrel)			524	429,123	326,825	5,017	7,691		111,817	
H-SSTL (Recreator)		19.1	46.8	81,300	400	513	43,800	11,000	10,000	
H-SSTL (Comm. Ind. Worker)		27.3	147			264				
RBSLs* (<9.9 feet bgs)		19	12	225	1000	10	150	10	600	
RBSLs* (>9.9 feet bgs)		19	61	5000	1000	160	1000	2700	5000	
21401		1,140	na	373	180	5.5	na	35.7	2,500	
AR2	11	1,600	16	720	300	61	70	93	2,700	7.6
AR2	11.5	980	35	1,200	520	63	65	200	5,400	7
B10MA	1	2,210	12.3	495	357	20.2	na	11	694	
RFS-4	0-2	688	19.4	4,250	238	7.5	na	249	3,750	
RFS-4	2.0-4	319	50	8,090	167	26.6	na	8	5,290	
RFS-4	4.0-5	14	0.14	30	7.61	1.5	na	ND	60	
SD4MA	1	161	9.7	262	293	15.7	na	<4.5	697	
SD6MA	1	555	33	823	814	10.6	na	8.7	2,840	
SM-110	0	90	4.2	150	190	3	44 J	8.5	310	
SM-110	9	350	6.5	420	45	1.4	32 J	3.2	260	
SM-110	14	8.3	2.3	71	6.8	0.44	62 J	0.46	1,100	

= exceeds minimum screening level

= material to be excavated and disposed

UJ — The analyte was not detected above the sample quantitation limit. However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample.

J — The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.

TABLE 6
STRATIGRAPHIC INFORMATION
SUBUNIT 2A
RICHMOND FIELD STATION

Location	Ground Surface Elevation (1929 NGVD)	Elevation - bottom of fill	Elevation - bottom of cinders	Fill thickness (ft)	Cinder thickness (ft)	Top of cinders (ft bgs)	Bottom of cinders or top of sediment (ft bgs)
UPLAND EXCAVATION AREA							
2AU-10	5.51	1.0	0.2	4.5	0.8	4.5	5.3
2AU-11	8.69	4.2	0.7	4.5	3.5	4.5	8
2AU-12	9.00	3.0	1.2	6	1.8	6	7.8
2AU-13	5.50	1.7	0.8	3.8	0.9	3.8	4.7
2AU-14	8.71	5.9	1.5	2.8	4.4	2.8	7.2
2AU-15	8.38	4.2	1.2	4.2	3.0	4.2	7.2
2AU-16	9.00	4.2	0.5	4.8	3.7	4.8	8.5
2AU-17	13.28	4.3	0.1	9	4.2	9	13.2
2AU-18	13.10	4.4	1.3	8.7	3.1	8.7	11.8
2AU-19	13.64	5.8	0.6	7.8	5.2	7.8	13
2AU-20	13.31	5.0	1.1	8.3	3.9	8.3	12.2
2AU-21	8.36	0.4		8	0.0		8
2AU-22	9.19	1.7	-0.3	7.5	2.0	7.5	9.5
2AU-3	6.30	3.5	1.3	2.8	2.2	2.8	5
2AU-4	8.78	3.0	2.2	5.8	0.8	5.8	6.6
2AU-5	5.70	1.2		4.5	0.0		4.5
2AU-6	5.55	1.6		4	0.0		4
2AU-7	8.80	2.8	0.8	6	2.0	6	8
2AU-8	5.76	1.8		4	0.0		4
A4-10	8.34	7.3	0.8	1	6.5	1	7.5
A4-12	8.91	1.4	0.4	7.5	1.0	7.5	8.5
A4-13	9.27	4.8	0.8	4.5	4.0	4.5	8.5
A4-15	6.69	6.2	1.7	0.5	4.5	0.5	5
A4-16	8.83	4.3	-2.2	4.5	6.5	4.5	11
A4-17	8.62	4.6	0.6	4	4.0	4	8
A4-3	6.70	1.7	0.7	5	1.0	5	6
A4-4	8.66	3.7	-1.3	5	5.0	5.0	10.0
A4-5	7.78	3.3	1.8	4.5	2.5	3.5	6.0
A4-7	8.29	3.8	0.3	4.5	3.5	4.5	8
A4-9	7.78	3.8	0.8	4	3.0	4	7
MF-104	6.36	1.9	0.9	4.5	1.0	4.5	5.5
MF114	8.89	4.9	-0.1	4	5.0	4	9
MF115	8.52	3.0	0.0	5.5	3.0	5.5	8.5
MF116	8.71	3.2	-0.3	5.5	3.5	5.5	9
MF117	8.84	3.3	-0.7	5.5	4.0	5.5	9.5
MF118	8.85	3.4	-0.2	5.5	1.0	5.5	9
MF119	8.82	3.3	0.3	5.5	3.0	5.5	8.5
PB12	9.78	3.8	-0.7	6	2.0	6	10.5
PB-12	9.0	5.5	-1.5	4.0	6.4	4	10.5
PH1	8.80	3.3	2.3	5.5	1.0	5.5	6.5
PH10	8.44	1.4		7	0.0		7
PH11	8.86	1.9		7	0.0		7
PH12	8.71	2.7	0.7	6	2.0	6	8

TABLE 6
STRATIGRAPHIC INFORMATION
SUBUNIT 2A
RICHMOND FIELD STATION

Location	Ground Surface Elevation (1929 NGVD)	Elevation - bottom of fill	Elevation - bottom of cinders	Fill thickness (ft)	Cinder thickness (ft)	Top of cinders (ft bgs)	Bottom of cinders or top of sediment (ft bgs)
PH13	7.99	3.0	0.0	5	3.0	5	8
PH14	8.27	4.3	0.8	4	3.5	4	7.5
PH15	8.46	4.5	2.5	4	3.0	4	6
PH16	8.50	3.5	1.5	5	2.0	5	7
PH17	8.53	5.0	3.0	3.5	2.0	3.5	5.5
PH19	7.06	3.6	1.6	3.5	2.0	3.5	5.5
PH2	8.34	3.3	1.8	5	1.5	5	6.5
PH20	6.26	2.3	0.3	4	2.0	4	6
PH25	8.82	4.3	2.3	4.5	2.0	4.5	6.5
PH26A	9.40	8.4	2.4	1	6.0	1.0	7.0
PH27	8.75	5.8	2.3	3	1.5	5.0	6.5
PH28	8.90	6.9	2.6	2.0	4.0	2.3	6.3
PH3	8.14	2.6	1.6	5.5	1.0	5.5	6.5
PH4	8.27	2.5	1.3	5.8	1.2	5.8	7
PH5	8.28	3.5	2.3	4.8	2.2	4.8	6
PH6	8.50	3.5	2.5	5	1.0	5	6
PH7	8.44	4.9	2.4	3.5	2.5	3.5	6
PH8	8.56	2.1		6.5	0.0		6.5
PH9	8.52	0.5		8	0.0		8
SL-101	9.3	4.3	1.8	5.5	0.5	4.5	7.5
TP1	6.10	2.8	-0.9	3.3	3.7	3.3	7.0
TP2	5.98	0.0		6	0.0	6.0	6.0
TP4	6.91	3.4	1.4	3.5	0.0		5.5
TP6	10.18	5.2	1.2	5	4.0	5.0	9.0
WEST OF UPLAND EXCAVATION AREA							
2AU-1	5.8	1.8	1.3	4.0	0.5	4	4.5
A4-1	6.0	2.0	1.0	4.0	1.0	4	5.0
A4-14	5.9	3.9	0.9	2.0	3.0	2	5.0
A4-2	6.8	2.8	0.3	4.0	2.5	4	6.5
A4-6	8.4	4.4	2.4	4.0	2.0	4	6.0
PH-21	5.6	1.1		4.5	1.5	4.5	6.0
PH-22	7.8	2.3		5.5	0.0		5.5
PH-23	8.93	0.9		8.0	0.0		8.0
PH-24	8.30	2.8		5.5	1.0	5.5	6.5
PH-29	5.46	3.5		2.0	2.5	2	4.5
PH-30	5.79	3.3		2.5	2.0	2.5	4.5
PH-31	7.23	2.2		5.0	1.5	5	6.5
PH-32	8.01	2.5		5.5	1.0	5.5	6.5
PH-33	7.43	1.9		5.5	0.5	5.5	6
SD-101	8.6	7.1	-1.4	1.5	4.2	5.8	10.0
SD-102	11.0	8.0	6.0	3.0	4.5	0.5	5.0

TABLE 6
STRATIGRAPHIC INFORMATION
SUBUNIT 2A
RICHMOND FIELD STATION

Location	Ground Surface Elevation (1929 NGVD)	Elevation - bottom of fill	Elevation - bottom of cinders	Fill thickness (ft)	Cinder thickness (ft)	Top of cinders (ft bgs)	Bottom of cinders or top of sediment (ft bgs)
MARSH EXCAVATION AREA							
Access Road							
AR-1	5.74	0.0	-0.3	0.0	6	0.0	6
AR-2	8.02	0.0	-2.0	0.0	10	0.0	10
AR-3	6.90	1.9		5.0	0		5
SM110	10.88	0.0	-2.6	0.0	13.5	0.0	13.5
Marsh							
SM108	4.21	NA	0.7	0.0	4	0.0	3.5
SM109	3.36	NA	2.4	0.0	1	0.0	1
SM123	4.34	NA	2.8	0.0	0.5	0.5	1.5
SM124	3.69	NA	NA				3.5
SMAB-1	2.05	NA	NA				3
SMAB-2	2.28	NA	NA				3
SMAB-3	2.50	NA	NA				1.7
SMAB-11	2.53	NA	NA				2
SMAB-12	2.56	NA	NA				3.6
SMAB-10	2.57	NA	NA				2.3
SMAB-9	2.62	NA	NA				2.5
SMAB-4	2.43	NA	NA				2.5
SMAB-5	2.12	NA	NA				2.5
SMAB-7	2.21	NA	NA				2.3
SMAB-8	2.06	NA	NA				2.6

TABLE 7
METALS IN OVERBURDEN
UPLAND SUBUNIT 2A
RICHMOND FIELD STATION

EPA Method 6010 (7471 for Mercury), units = mg/kg

Sample Location	Depth (feet)	Elevation (feet) of Ground Surface	Elevation of Sample (feet)	Source	Antimony	Arsenic	Beryllium	Cadmium	Chromium	Copper	Lead	Mercury	Nickel	Selenium	Silver	Thallium	Zinc
ECOLOGICAL AND HUMAN HEALTH SCREENING VALUES																	
E-SSTL (hawk)								230	157	412	437	42	621				760
E-SSTL (squirrel)								524	27,167	429,123	326,825	5,017	7,691				111,817
H-SSTL (Comm. Ind. Worker)						27.3		147				264					
RBSLs* (<9.9 feet bgs)					40	8	8	12	750	225	1000	10		10	40	29	600
RBSLs* (>9.9 feet bgs)						8	95	61	5000	5000	1000	160		2700	2700	37	5000
2AU-1-1	1.0	5.79	4.8	Fill	<3	4.8	0.61	1.4	39	120	10	0.73 J	62	0.61	<0.25	0.41	140
2AU-4-1	1.0	8.78	7.8	Fill	< 3.4 UJ	3.3	0.66	0.97	41	18	4.7	0.13	45	< 0.28	< 0.28	< 0.28	32
2AU-6-1	1.0	5.55	4.6	Fill	< 3.4 UJ	4.2	0.59	1.1	26	47	11	0.42	42	< 0.29	< 0.29	1	53
2AU-10-1	1.0	5.51	4.5	Fill	< 3.5 UJ	5.7	0.59	1.4	20	26	9.4	0.043	50	< 0.29	< 0.29	< 0.29	60
2AU-11-1	1.0	8.69	7.7	Fill	<3.2	4.0	0.51	1	39	21	7.7	0.096 J	46	<0.26	<0.26	0.28	40
2AU-13-2	2.0	5.50	3.5	Fill	< 2.9 UJ	5.1	0.59	1.4	30	19	7.8	0.084	39	0.34	< 0.25	< 0.25	42
2AU-16-1	1.0	9.00	8.0	Fill	< 3.0 UJ	4.8	0.67	1.2	39	43	19	0.75	42	0.73	< 0.25	1.2	69
MF-104-B-0	0	6.36	6.4	Fill	<3.6	6.8	0.37	1.9	24 J	39	19	12	42 J	0.41	<0.3	<0.3	130
MF114-0	0	8.89	8.9	Fill	na	na	na	na	na	na	na	0.87	na	na	na	na	na
MF115-0	0	8.52	8.5	Fill	na	na	na	na	na	na	na	0.14	na	na	na	na	na
MF116-0	0	8.71	8.7	Fill	na	na	na	na	na	na	na	0.23	na	na	na	na	na
MF117-0	0	8.84	8.8	Fill	na	na	na	na	na	na	na	0.67	na	na	na	na	na
MF118-0	0	8.85	8.9	Fill	na	na	na	na	na	na	na	0.28	na	na	na	na	na
MF119-0	0	8.82	8.8	Fill	na	na	na	na	na	na	na	0.13	na	na	na	na	na
SL-101	0	9.27	9.3	Fill	<3.2	1.2	0.33	0.91	6.4	6.5	5	0.43	16 J	<0.26	<0.26	<0.26	22

* RBSLs = Surface soil (less than or equal to 3 meters (9.9 feet) below ground surface) Risk Based Screening Levels where Groundwater is not a potential source of drinking water.

= sample exceeding minimum screening level as pertains to depth below ground surface

= material reused (overburden) or not excavated (below excavation)

UJ The analyte was not detected above the sample quantitation limit. However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample.

J The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.

TABLE 8
METALS IN SEDIMENT BELOW EXCAVATION
UPLAND SUBUNIT 2A
RICHMOND FIELD STATION

EPA Method 6010 (7471 for Mercury), units = mg/kg

Sample Location	Depth [feet]	Elevation [feet] of Ground Surface	Elevation of Sample [feet]	Source	Antimony	Arsenic	Beryllium	Cadmium	Chromium	Copper	Lead	Mercury	Nickel	Selenium	Silver	Thallium	Zinc	pH
ECOLOGICAL AND HUMAN HEALTH SCREENING VALUES																		
E-SSTL (hawk)								230	157	412	437	42	621				760	
E-SSTL (squirrel)								524	27,167	429,123	326,825	5,017	7,691				111,817	
H-SSTL (Comm, Ind, Worker)						27.3		147				264						
RBSLs* (<9.9 feet bgs)					40	8*	8	12	750	225	1000	10		10	40	29	600	
RBSLs* (>9.9 feet bgs)						8*	95	61	5000	5000	1000	160		2700	2700	37	5000	
2AU-1-8	8.0	5.79	-2.2	Sediment	<3.7 UJ	7.9	0.56	1.5	44	20	5.9	0.33 J	62	<0.31	<0.31	<0.31	38	7.8
2AU-3-7	7.0	6.42	-0.6	Sediment	<3.7 UJ	1.6	0.73	1.3	78	19	6.6	0.43 J	71	<0.31	<0.31	<0.31	42	8.1
2AU-3-8	8.0	6.42	-1.6	Sediment	<3.5 UJ	1.2	0.48	0.86	46	14	4.3	0.12 J	48	<0.29	<0.29	<0.29	30	7.9
2AU-7-9	9.0	8.92	-0.1	Sediment	<4.1 UJ	2.7	0.62	1.3	61	17	6.1	1.5	68	<0.34	<0.34	<0.34	45	7.7
2AU-7-10	10.0	8.92	-1.1	Sediment	<3.8 UJ	26	0.52	1.7	41	20	3.6	0.67 J	63	<0.32	<0.32	<0.32	44	7.7
2AU-7-11	11.0	8.92	-2.1	Sediment	<3.3 UJ	2.6	0.47	1.2	37	14	3.4	0.48 J	48	<0.28	<0.28	<0.28	33	7.8
2AU-11-11	11.0	8.69	-2.3	Sediment	<3.1 UJ	5.4	0.38	0.95	51	15	2.5	3.3 J	51	0.3	<0.26	0.5	68	7.4
2AU-12-11	11.0	8.97	-2.0	Sediment	< 3.3 UJ	3.2	0.67	1.0	44	23	3.8	3.3	54	0.31	< 0.28	0.50	200	5.7
2AU-13-7	7.0	5.50	-1.5	Sediment	< 3.3 UJ	2.4	0.36	1	32	20	3.4	0.070	42	< 0.27	< 0.27	0.58	44	6.6
2AU-13-8	8.0	5.50	-2.5	Sediment	< 3.1 UJ	6.7	0.45	1.2	36	17	6.1	0.049	56	0.70	< 0.26	2.5	38	7.2
2AU-14-9	9.0	8.71	-0.3	Sediment	<2.8 UJ	7.8	0.45	1.1	42	19	4.7	0.088 J	56	0.27	<0.23	<0.23	39	7.4
2AU-14-10.5	10.5	8.71	-1.8	Sediment	<3.0 UJ	5.0	0.41	1.0	41	18	4.6	0.20 J	49	<0.25	<0.25	<0.25	39	7.4
2AU-15-10	10.0	8.38	-1.6	Sediment	< 3.3 UJ	6.1	0.70	1.5	61	32	3.9	6.5	56	0.32	< 0.28	< 0.28	160	6.7
2AU-16-10.5	10.5	9.00	-1.5	Sediment	< 3.1 UJ	5.5	0.42	9.6	34	100	4.5	0.21	40	0.61	< 0.26	< 0.26	370	6.3
2AU-16-11.5	11.5	9.00	-2.5	Sediment	< 3.3 UJ	4.7	0.58	1.7	35	17	2.8	0.85	57	< 0.28	< 0.28	0.29	200	7.0
2AU-17-15	15.0	13.28	-1.7	Sediment	< 3.2 UJ	6.0	0.54	1.3	38	22	4.5	0.083	63	0.40	< 0.27	0.70	60	4.9
2AU-17-16	16.0	13.28	-2.7	Sediment	< 3.4 UJ	5.8	0.56	1.3	40	20	3.9	0.070	61	< 0.28	< 0.28	0.71	46	5.0
2AU-18-15	15.0	13.10	-1.9	Sediment	< 3.4 UJ	6.1	0.56	1.4	51	22	4.6	0.055	66	< 0.29	< 0.29	< 0.29	58	4.9
2AU-19-15	15.0	13.64	-1.4	Sediment	< 3.5 UJ	7.0	0.53	1.7	44	23	5.5	0.098	64	< 0.29	< 0.29	< 0.29	980	4.3
2AU-19-16	16.0	13.64	-2.4	Sediment	< 3.5 UJ	6.5	0.67	1.7	45	38	5.4	0.081	73	0.37	< 0.29	< 0.29	1,100	4.4
2AU-19-17	17.0	13.64	-3.4	Sediment	<3.5	5.8	0.71	1.5	59	27	4.2	0.15	67	<0.29	<0.29	<0.29	1,500	
2AU-19-18	18.0	13.64	-4.4	Sediment	<3.7	7.5	0.55	1.7	48	20	4.9	170	70	1.5	<0.31	0.53	1,200	4.1
2AU-20-15	15.0	13.31	-1.7	Sediment	< 3.5 UJ	4.0	0.48	1.3	46	22	4.9	0.084	64	0.45	< 0.29	< 0.29	400	4.7
2AU-22-10	10.0	9.19	-0.8	Sediment	<3.4 UJ	9.7	0.71	1.8	57	290	8.3	0.047	66	<0.28	<0.28	<0.28	340	5.4
2AU-22-12	12.0	9.19	-2.8	Sediment	<3.8 UJ	1.8	0.61	1.2	57	150	6.9	0.26 J	82	<0.31	<0.31	<0.31	200	5.2
2AU-22-13	13.0	9.19	-3.8	Sediment	<3.8 UJ	4.9	0.47	1.1	41	19	3.5	0.71 J	55	<0.32	<0.32	<0.32	37	7.0
2AU-23-13	13	8.24	-4.8	Sediment	<2.8 UJ	5.5	0.39	1.1	38	20	3.8	0.15	66	1.6	<0.24	1.3	75	7.4
2AU-23-14	14	8.24	-5.8	Sediment	<3.8 UJ	5.4	0.45	1.2	39	21	5.0	0.14	66	0.73	<0.31	1.5	75	6.9
2AU-24-11	11	8.30	-2.7	Sediment	<3.6 UJ	7.5	0.36	1.1	49	22	6.9	0.13	54	1.6	<0.3	0.37	54	7.0
2AU-25-7	7	5.87	-1.1	Sediment	<2.9 UJ	1.8	0.27	0.96	32	18	4.2	130	50	0.95	<0.24	0.28	52	6.9
2AU-25-13	13	5.87	-7.1	Sediment	<2.6 UJ	5.8	0.40	1.4	35	24	4.2	0.23	65	0.71	<0.22	0.71	200	7.0
2AU-25-14	14	5.87	-8.1	Sediment	<3.2 UJ	8.0	0.54	1.8	49	28	5.7	0.15	85	1.1	<0.27	1.30	190	6.9
2AU-26-16	16	13.77	-2.2	Sediment	<4.0 UJ	4.9	0.56	1.4	38	21	4.9	0.29	69	0.50	<0.34	1.3	610	4.7
2AU-27-15.3	15.3	13.30	-2.0	Sediment	<3.4 UJ	5.6	0.52	1.30	40	21	5.3	0.42	65	<0.28	<0.28	<0.28	280	5.1
2AU-28-5	5	3.84	-1.2	Sediment	<3.4 UJ	5.4	0.47	1.3	46	21	5.1	0.26	68	0.88	<0.29	<0.29	600	5.0
2AU-28-6	6	3.84	-2.2	Sediment	<3.8 UJ	7.6	0.54	1.5	37	25	5.3	0.10	72	2.0	<0.31	<0.31	350	4.9
2AU-29-5	5	3.80	-1.2	Sediment	<3.2 UJ	6.4	0.50	1.3	36	19	4.8	0.11	63	1.2	<0.27	0.29	630	4.4
2AU-29-6	6	3.80	-2.2	Sediment	<3.8 UJ	5.3	0.51	1.3	38	21	4.8	0.098	71	0.61	<0.32	1.2	360	4.6
2AU-30-19.5	19.5	8.66	-10.8	Sediment	<3.4	4.8	0.33	1.2	34	15	23	0.27	41	0.46	<0.29	1.2	43	
2AU-30-20.5	20.5	8.66	-11.8	Sediment	<3.5	4.5	0.38	1.3	38	17	26	4	43	<0.29	<0.29	1	43	
2AU-31-16.5	16.5	8.96	-7.5	Sediment	<3.8	3.8	0.45	1.5	40	32	14	7.2	67	0.72	<0.32	0.84	59	
2AU-31-17.5	17.5	8.96	-8.5	Sediment	<3.3	3.8	0.42	1.4	40	22	15	1.3	68	0.62	<0.28	1	48	
A4-10	10	8.34	-1.7	Sediment	<3.5	5.2	0.45	2.1	54	22	4.5	0.069	70	0.43	<0.29	<0.29	180	5.0
A4-12	10	8.91	-1.1	Sediment	<3.4	5.4	0.31	2.2	54	21	7.4	1.2	40	0.5	<0.28	<0.28	170	6.0
A4-14	7	5.80	-1.2	Sediment	<3.5	1.6	0.29	1.8	20	57	3.1	0.063	30	<0.29	<0.29	<0.29	690	5.0
A4-17	10	8.62	-1.4	Sediment	<3.5	4.6	0.24	2	33	36	8.5	0.85	43	0.34	<0.29	<0.29	180	6.1
A4-9	11.5	7.78	-3.7	Sediment	<3.1	4.8	0.34	2.1	34	27	4.8	0.074	60	0.51	<0.26	<0.26	57	7.4
MF117-13.5	13.5	8.84	-4.7	Sediment	na	na	na	na	na	na	na	0.21	na	na	na	na	na	
MF119-9	9	8.82	-0.2	Sediment	na	na	na	na	na	na	na	0.36	na	na	na	na	na	
MF119-13	13	8.82	-4.2	Sediment	na	na	na	na	na	na	na	<0.23	na	na	na	na	na	
PB12	11	9.0	-2.0	Sediment	<3.6	6.8	0.49	2.9	39	27	7	0.17	74	0.38	<0.3	<0.3	230	4.6

* RBSLs = Surface soil (less than or equal to 3 meters (9.9 feet) below ground surface) Risk Based Screening Levels where Groundwater is not a potential source of drinking water. From "Application of Risk-Based Screening Levels and Decision Making to Sites With Impacted Soil and Groundwatere", prepared by RWQCB, August 2000. For Arsenic, background concentration of 19 mg/kg is used (LBNL, 19__).

= sample exceeding minimum screening level as pertains to depth below ground surface

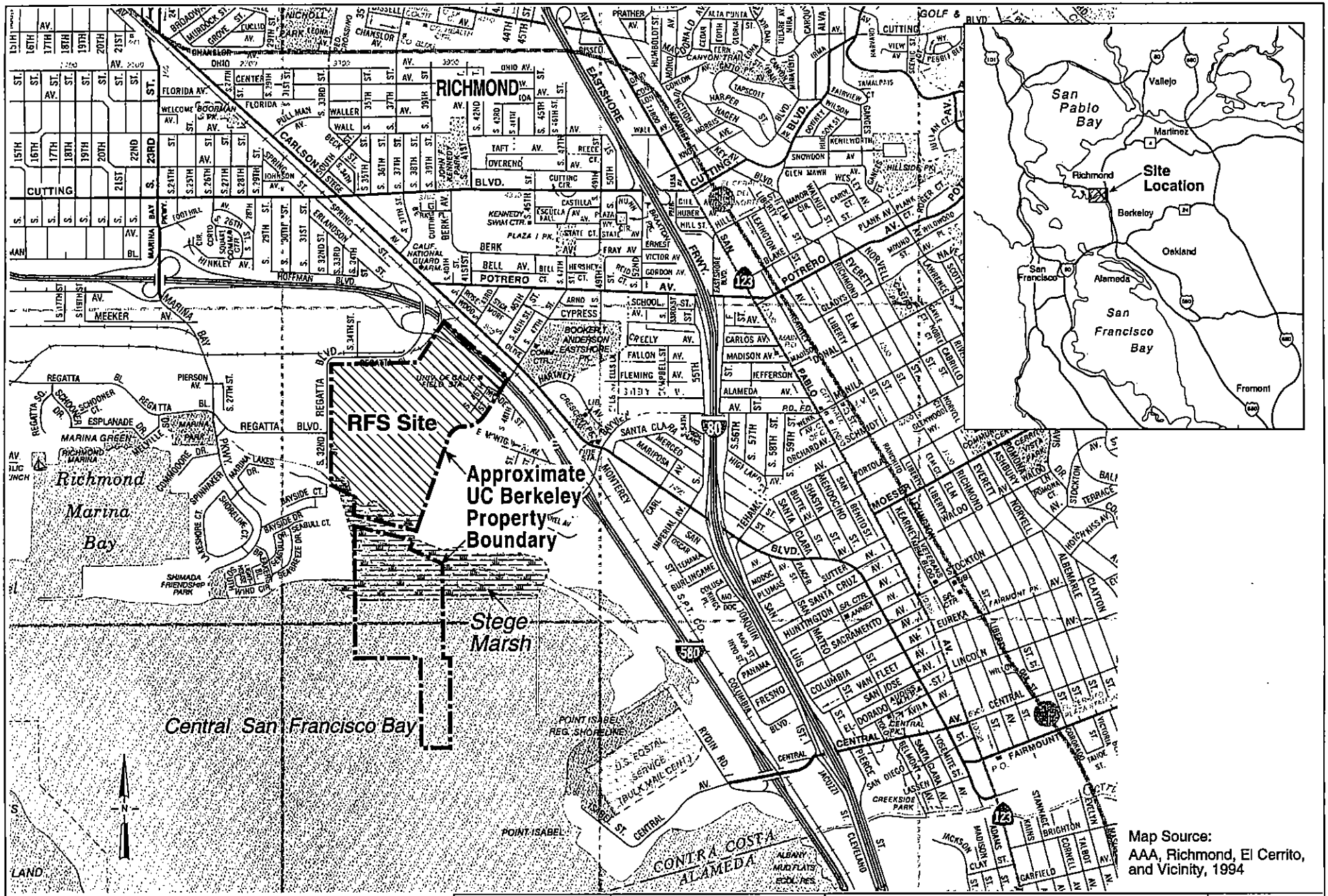
= material reused (overburden) or not excavated (below excavation)

= material reused or not excavated that exceeds the screening level

UJ The analyte was not detected above the sample quantitation limit. However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample.

J The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.

FIGURES



Map Source:
AAA, Richmond, El Cerrito, and Vicinity, 1994

URS

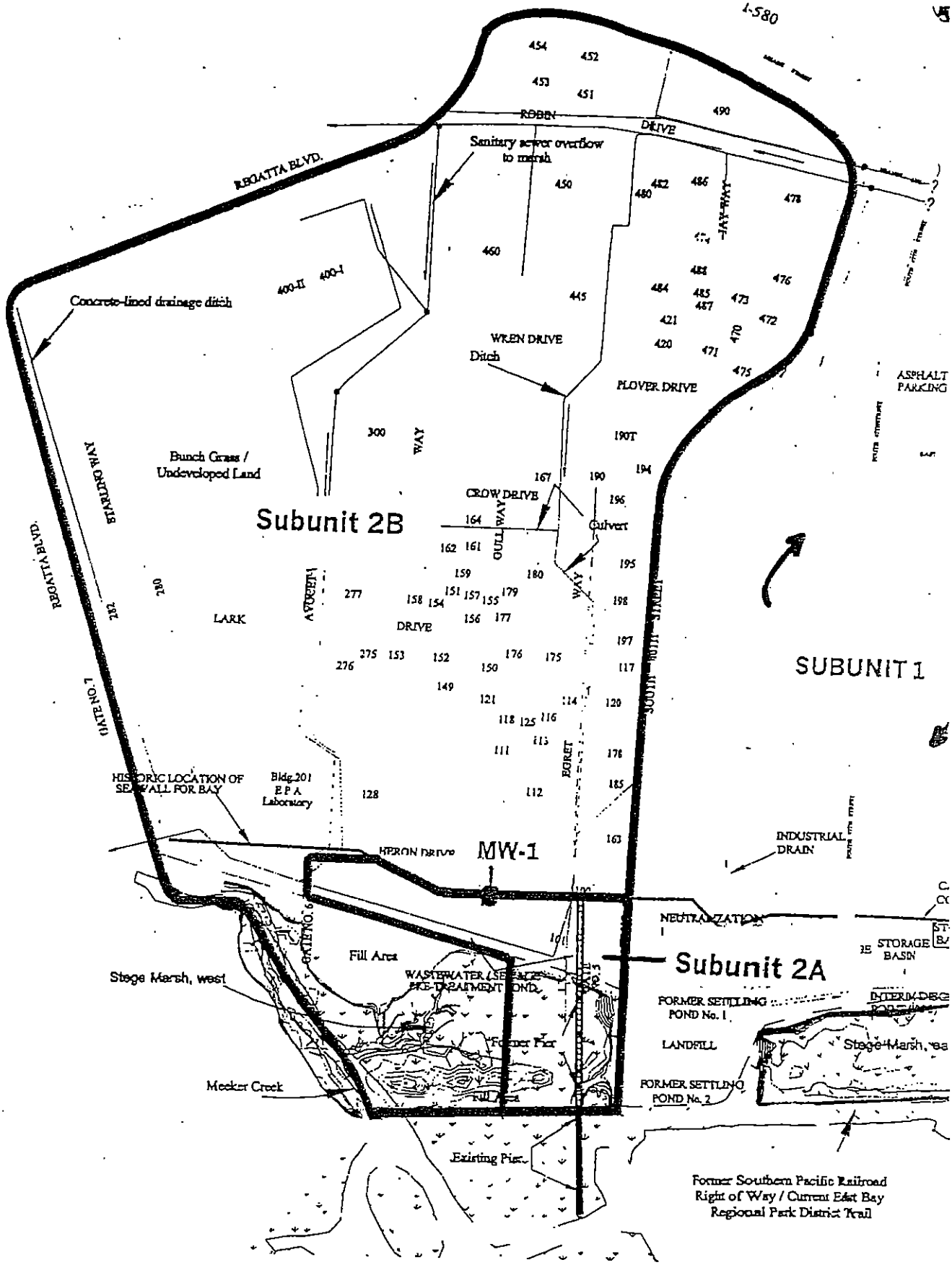
Project No. 51-09967067.00

University of California
Richmond Field Station

UNIVERSITY OF CALIFORNIA, BERKELEY
RICHMOND FIELD STATION
SITE LOCATION MAP

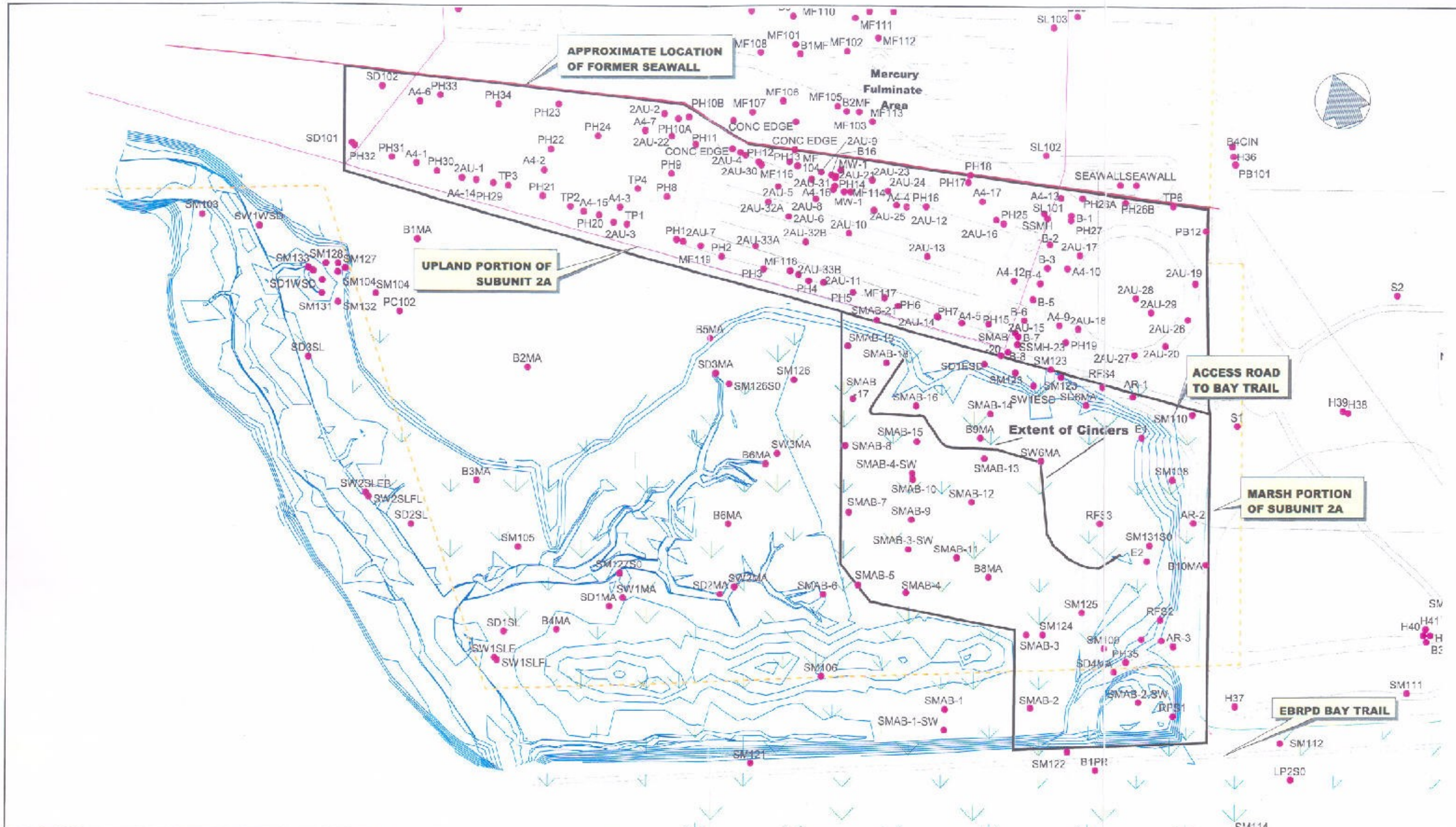
Figure 1

51-09967067.00-00009/081402/gos



Subunits 2A and 2B
Locations and Boundaries

Figure 2



LEGEND

- Surveyed Sampling Location (borings or test pits)
- Marsh Contour Lines
- Stege Marsh
- Property Boundary
- Approximate Location of Former Sea Wall

NOTES :

Project No.
51-09967067.01

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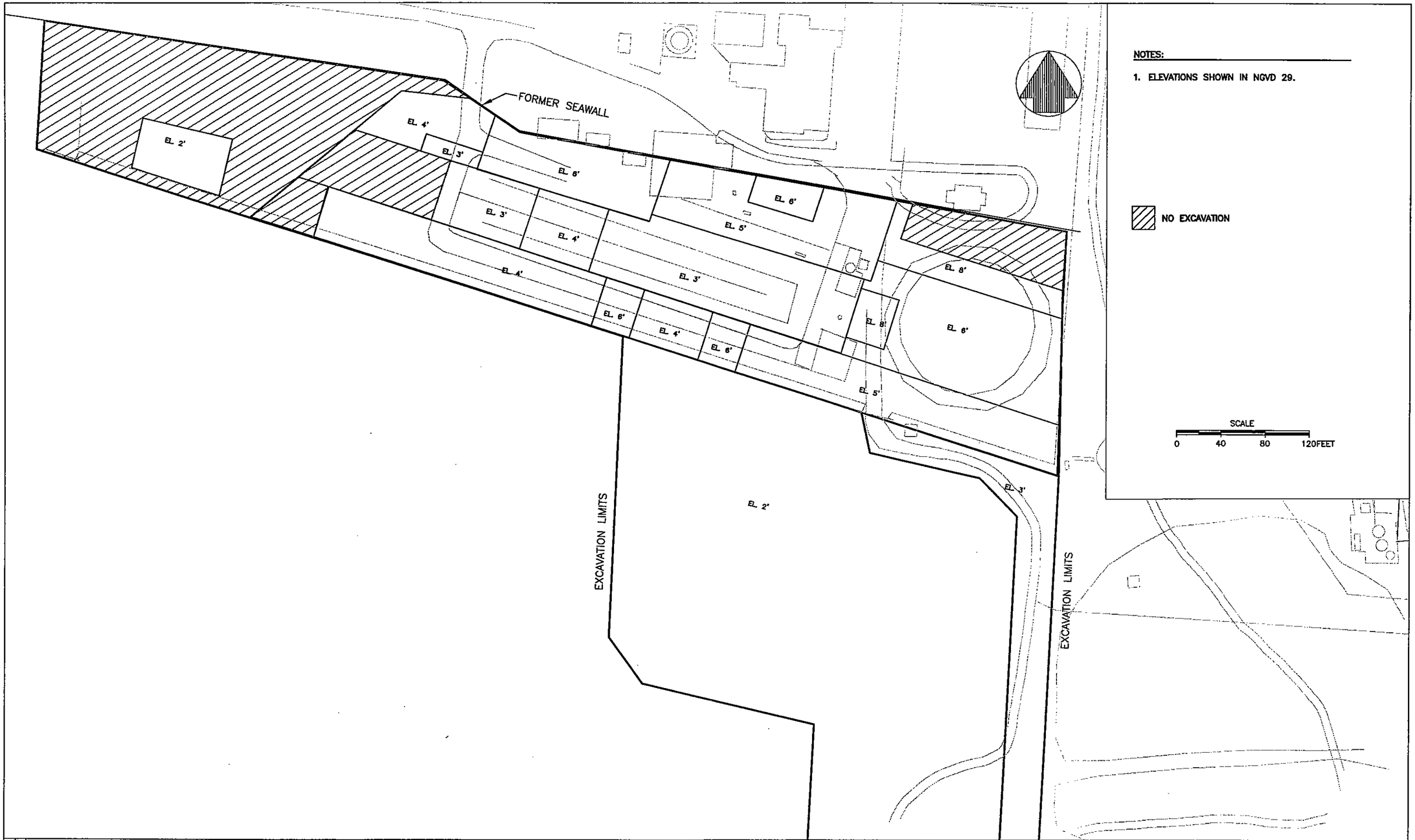
Sampling Locations

August 2002	Scale 1" = 100'	Figure 3



NOTES:

1. ELEVATIONS SHOWN IN NGVD 29.

NO EXCAVATION

SCALE
0 40 80 120FEET

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EXCAVATION PLAN FOR SURFACE FILL

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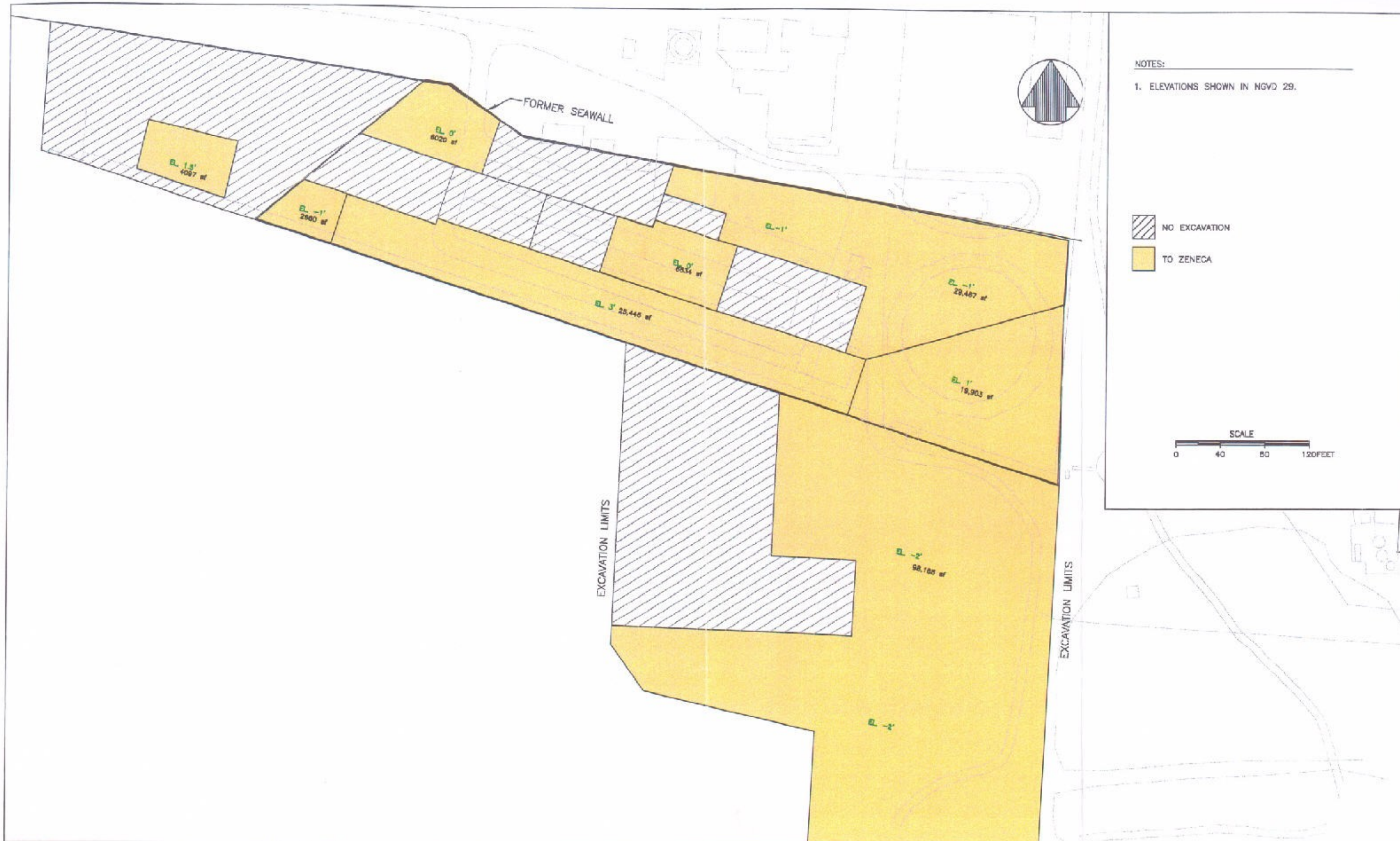
PROJECT	51-09967067.00
FIGURE	4



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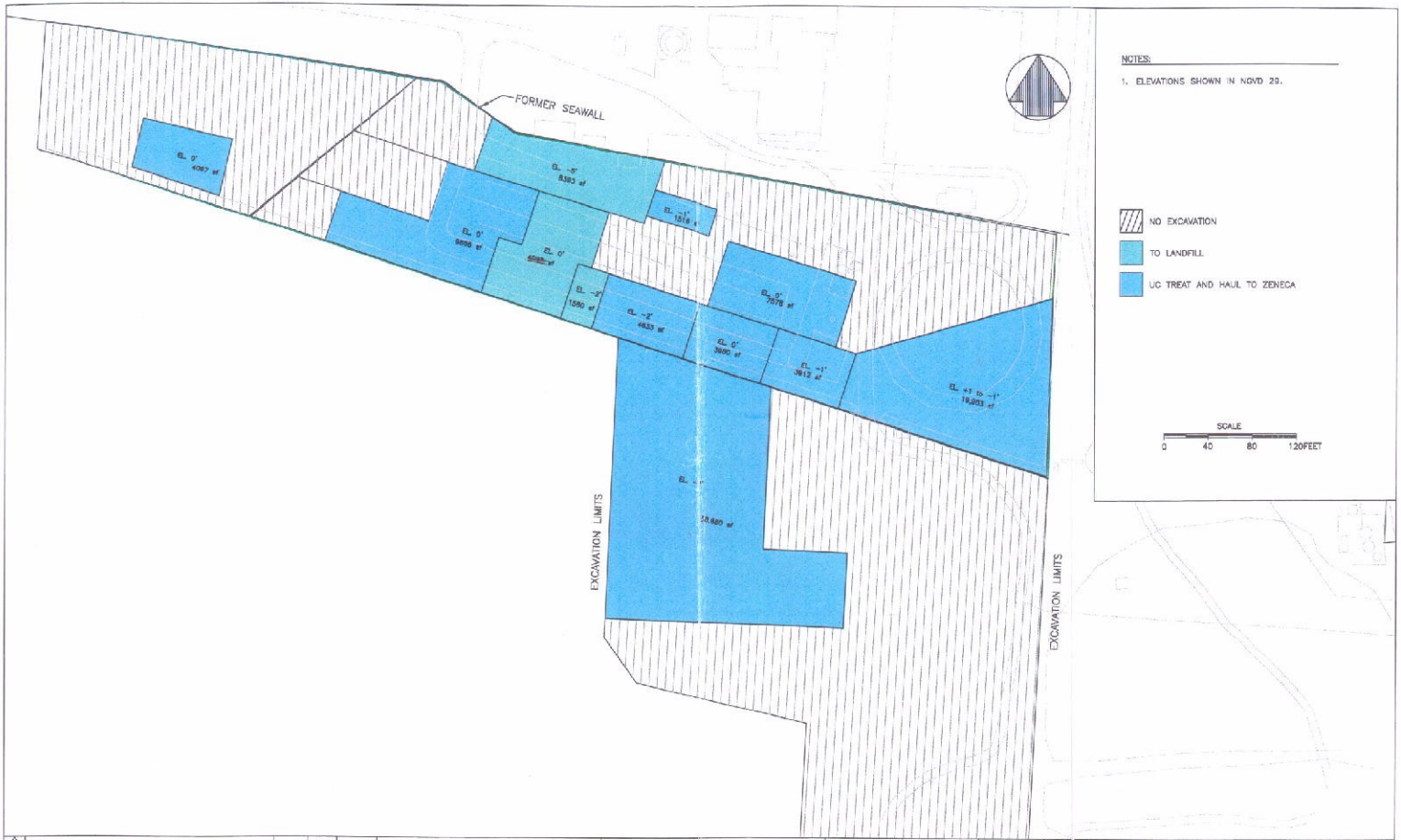
EXCAVATION PLAN FOR AREAS TO BE EXCAVATED AND TREATED BY ZENECA

REVISION 1
PROJECT 51-09967057.00
FIGURE 5



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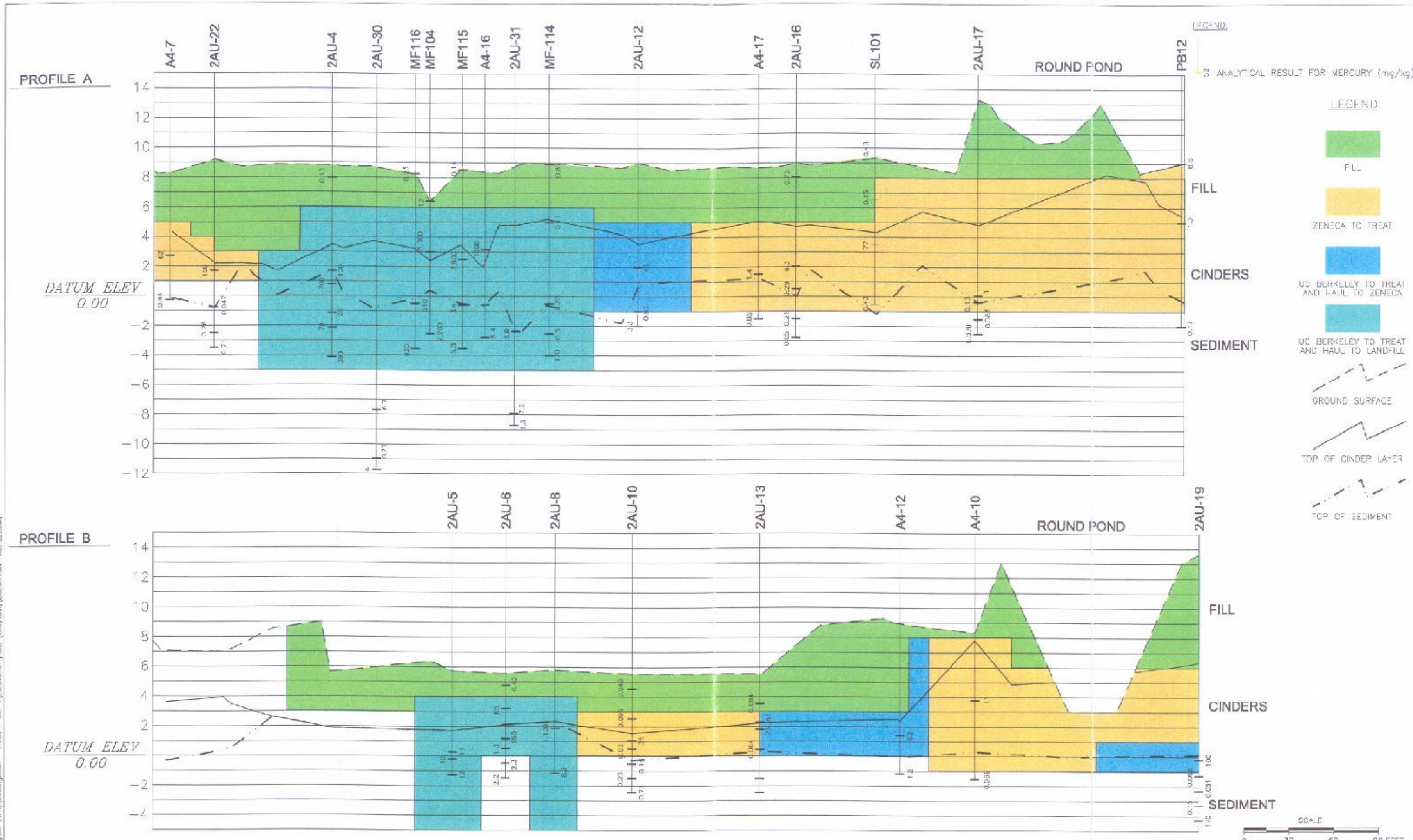
EXCAVATION PLAN FOR
AREAS TO BE EXCAVATED AND TREATED
BY UC BERKELEY

REVISION 1
PROJECT 51-09867.00
FIGURE 6

Aug 05, 2002 - 8:42am
X:\Jobs\Landfill\Berkeley\UC (RFS)\Investigation - Areas 1 and 4\Excavation plans (2002)\dwg\New Finals\UC FIGURE 6RFS.dwg



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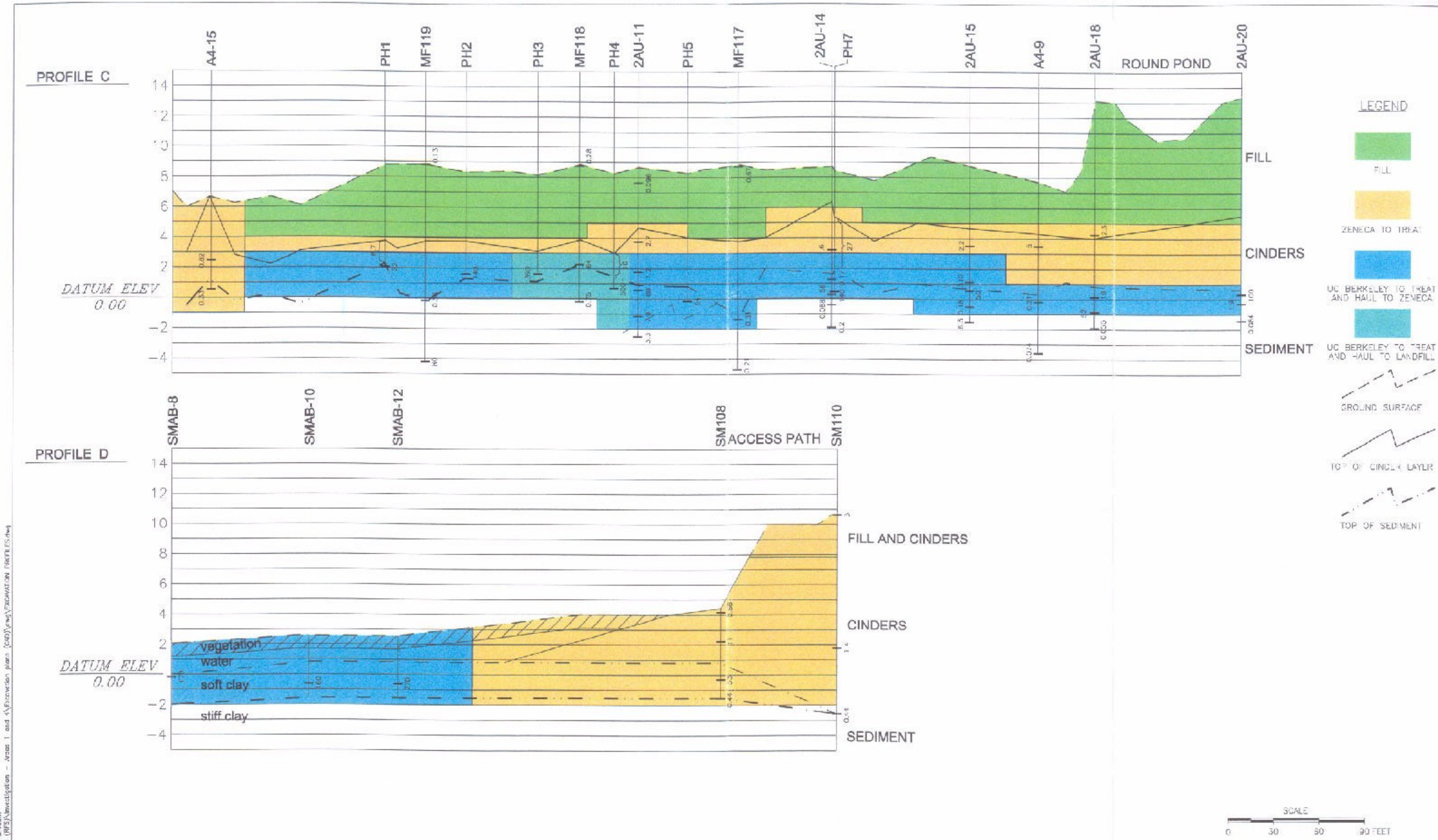
EXCAVATION PROFILES
A AND B

REVISION
PROJECT 51-05987007.00
FIGURE 7



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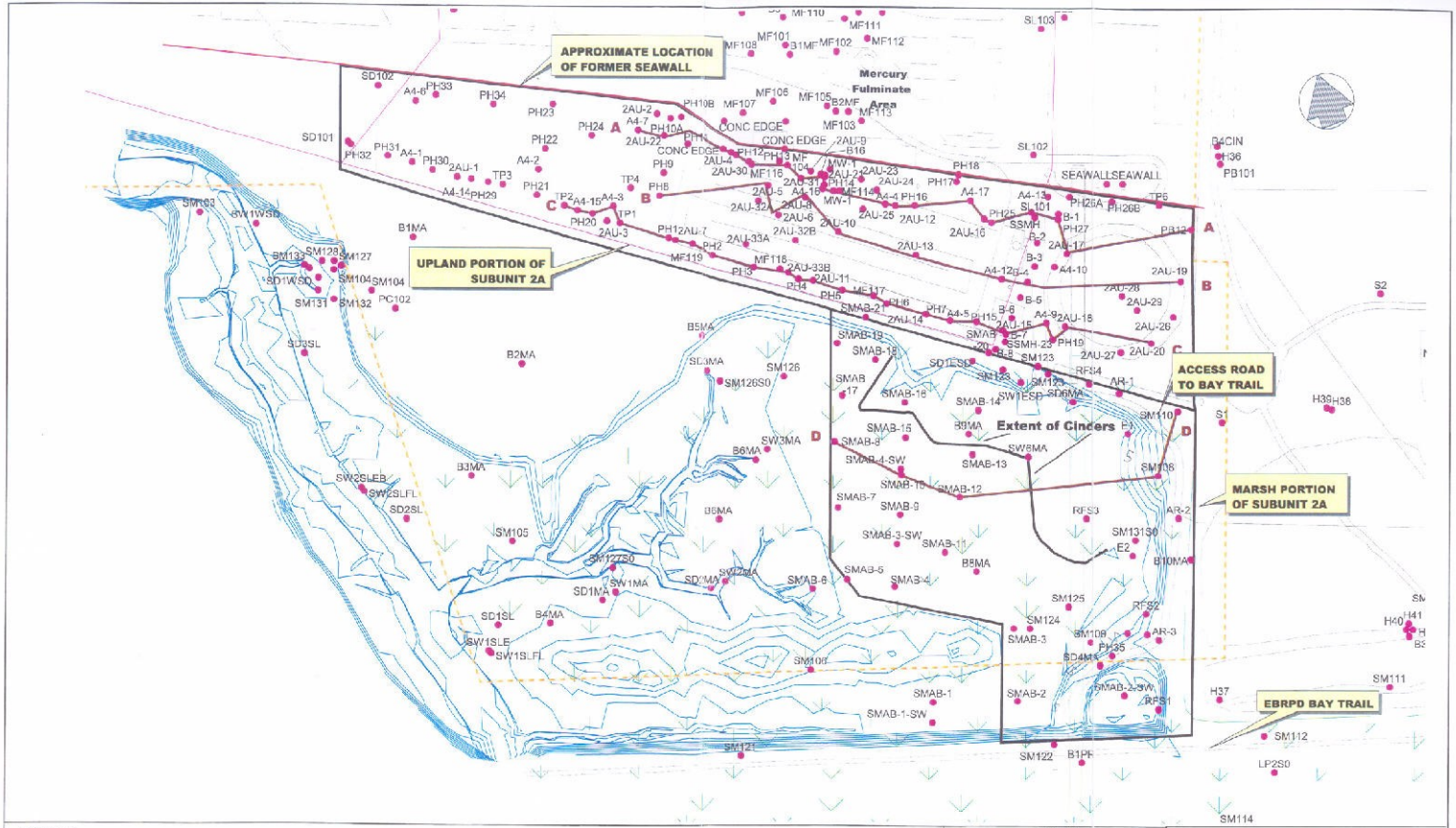
EXCAVATION PROFILES
C AND D

PROJECT: 51-39967067.00
FIGURE: 8


APPROXIMATE LOCATION OF FORMER SEAWALL
UPLAND PORTION OF SUBUNIT 2A
MARSH PORTION OF SUBUNIT 2A
ACCESS ROAD TO BAY TRAIL
EBRPD BAY TRAIL
Extent of Cinders
Mercury Fulminate Area
SEAWALL
CONC EDGE
A
B
C
D
LEGEND
Surveyed Sampling Location (borings or test pits)
Marsh Contour Lines
Stege Marsh
Property Boundary
Cross Sections
Approximate Location of Former Sea Wall
NOTES:
Project No.
51-09667087.01
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Richmond Field Station
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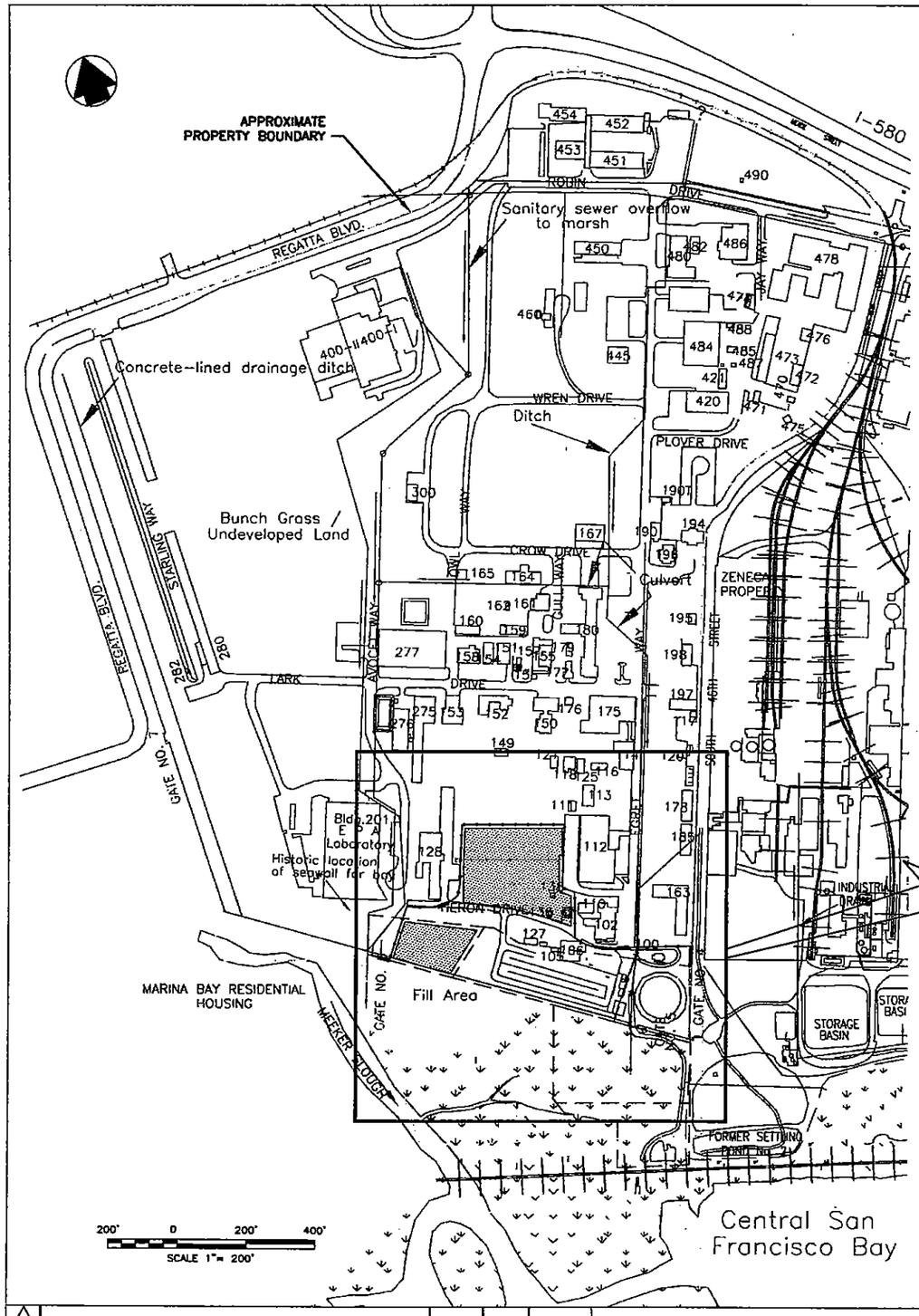
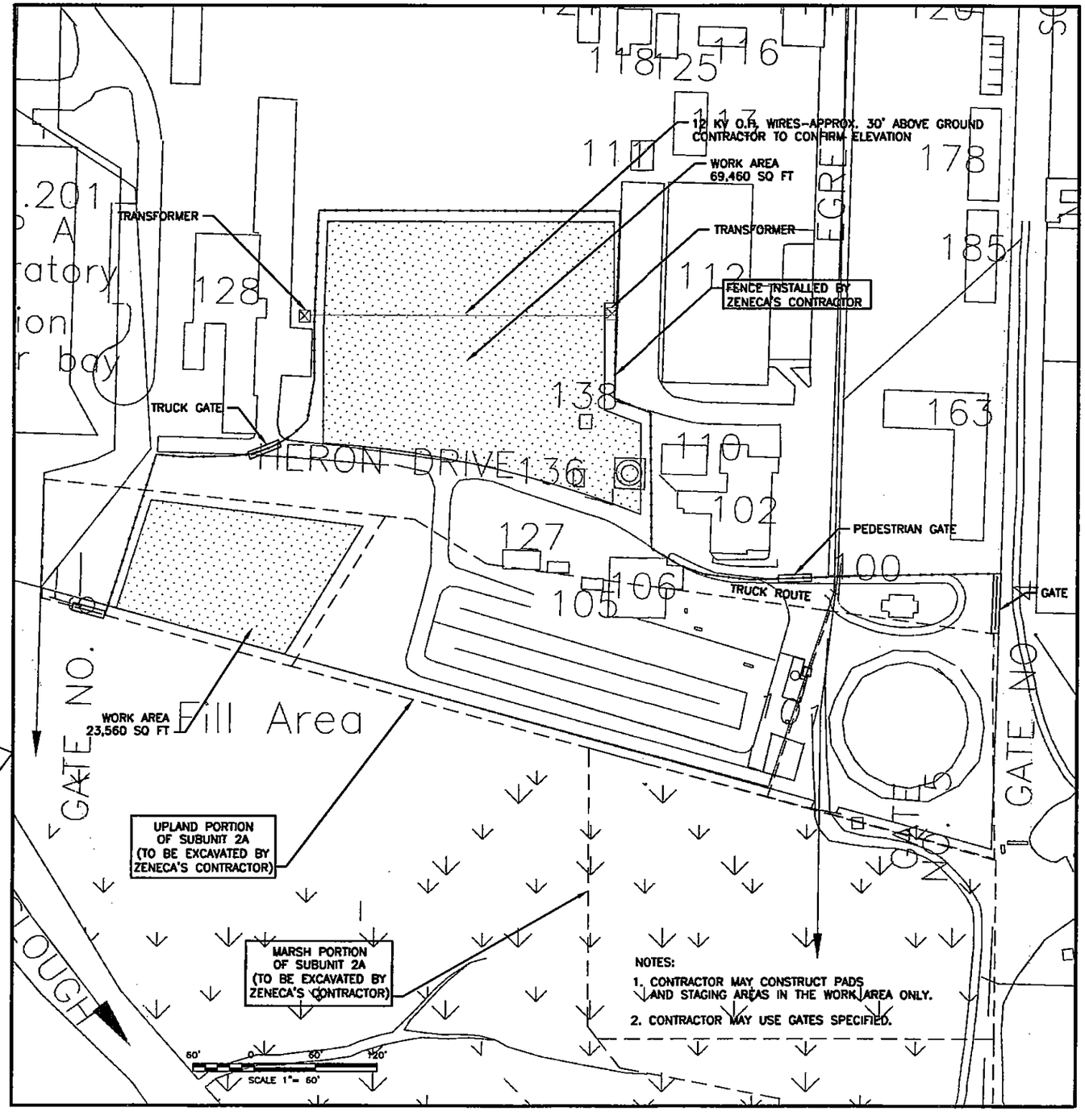
Excavation Profile Locations
August 2002
Scale 1" = 100'
Figure 9





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RFS SUBUNIT 2A MERCURY STABILIZATION AND SOLIDIFICATION PROJECT
PROJECT NO. 19335A, RICHMOND FIELD STATION
RICHMOND, CALIFORNIA

SITE LAYOUT

REVISION 0
PROJECT 51-09967067.01
FIGURE 10

Plotted: Aug 06, 2002 - 9:47am
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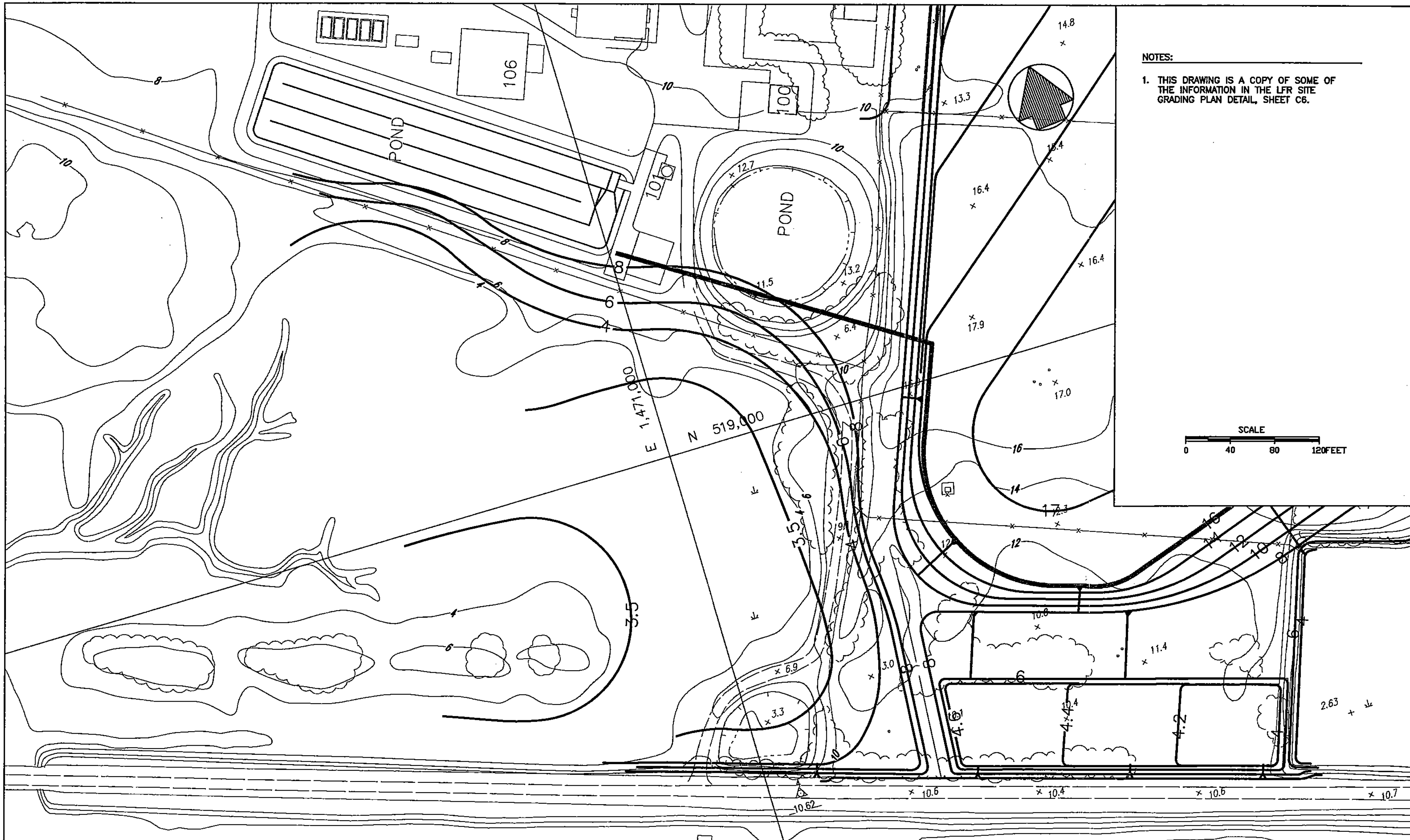

NOTES:

1. THIS DRAWING IS A COPY OF SOME OF THE INFORMATION IN THE LFR SITE GRADING PLAN DETAIL, SHEET C6.

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Richmond Field Station

SITE GRADING PLAN
(FROM LFR 6/02 SHEET C6)

REVISION △

PROJECT 51-09967067.00

FIGURE 11

X:\x_env_waste\Berkeley,UC (RFS)\Graphics, maps\Excavation Plan - 2A\FIG 11 GRADING PLAN FROM LFR.DWG

APPENDIX A

Project: UC Berkeley Richmond Field Station
Project Location: Richmond, California
Project Number: 51-09967067.00

Key to Log of Boring

Sheet 1 of 1

Elevation, feet	Depth, feet	SAMPLES: Interval	SAMPLES: Lab ID Number	SAMPLES: Headspace PID, ppm	Graphic Log	MATERIAL DESCRIPTION	FIELD NOTES
1	2	3	4	5	6	7	8

COLUMN DESCRIPTIONS

1. **Elevation:** Elevation in feet referenced to mean sea level (MSL) or site datum.
2. **Downhole Depth:** Distance in feet below the ground surface.
3. **Sample Interval:** Graphic depiction of field sampling depths and intervals from which laboratory samples were collected; sampler symbols are explained below.
4. **Lab ID Number:** Identification number of samples collected for possible chemical analysis.
5. **Headspace PID:** Photo-ionization device field sample headspace reading, in parts per million (ppm).
6. **Graphic Log:** Graphic depiction of subsurface material encountered; typical symbols are explained below.
7. **Material Description:** Description of material encountered; may include color, moisture, grain size, and density/consistency.
8. **Field Notes:** Comments and observations regarding drilling or sampling made by driller or URS field personnel.

TYPICAL MATERIAL GRAPHIC SYMBOLS

- SAND
- SAND with SILT
- SILTY SAND
- CLAY, low to medium plasticity
- CLAY, high plasticity
- CLAYEY SAND
- SILT
- SILTY CLAY
- CLAYEY SILT
- GRAVEL
- SILTY GRAVEL
- Cinders

TYPICAL SAMPLER GRAPHIC SYMBOLS

- Recovery in geoprobe continuous core sampler
- No recovery zone in geoprobe sampler
- Sample retained for possible chemical testing

OTHER GRAPHIC SYMBOLS

- First water encountered at during drilling
- Water level measured at completion of drilling
- Water level measured after 24 hrs
- --- Inferred contact due to no recovery or gradational change in lithology

GENERAL NOTES

1. Soil classifications are based on the Unified Soil Classification System. Descriptions and stratum lines are interpretive; actual lithologic changes may be gradual. Field descriptions may have been modified to reflect results of lab tests.
2. Descriptions on these logs apply only at the specific boring locations and at the time the borings were advanced. They are not warranted to be representative of subsurface conditions at other locations or times.

Report: ENV_3PS_SOLON_KEY; File: BERKRICH.GPJ; 5/3/2002 key2av

URS

Project: UC Berkeley Richmond Field Station Project Location: Richmond, California Project Number: 51-09967067.00	**Log of Boring 2AU-1** Sheet 1 of 1

Date(s) Drilled	4/18/02	Logged By	B. Copeland	Checked By	J. Durkin
Drilling Method	Direct Push	Drill Bit Size/Type	2-inch-OD drive point	Total Depth of Borehole	13.0 feet
Drill Rig Type	Geoprobe	Drilling Contractor	Precision Drilling	Surface Elevation	5.79 feet MSL
Groundwater Level(s)	First: None Completion: 2.75 ft bgs	Sampling Method(s)	4-foot dual tube Geoprobe sampler with acetate liner		
Location	Refer to site plan	Borehole Completion	Backfilled with grout to ground surface		

Elevation, feet	Depth, feet	SAMPLES: Interval	SAMPLES: Lab ID Number	SAMPLES: Headspace PID, ppm	Graphic Log	MATERIAL DESCRIPTION	FIELD NOTES
	0					SILTY CLAY [FILL], dark brown, dry, hard	
5			2AU-1-1'			▼	
			2AU-1-4'			Cinders	Cinders approx. 0.5 ft thick.
	5		2AU-1-4.5'			SILT [SEDIMENT], dark gray, wet	
0			2AU-1-5.5'			CLAY, olive gray, wet, stiff [Bay Mud]	
			2AU-1-7'			▼ Becomes reddish brown and gray	
			2AU-1-8'			▼ Becomes medium stiff	
			2AU-1-9'				
	10		2AU-1-10'			SILTY SAND, brown, wet, medium sand	
-5						CLAY, brown, wet, stiff	
						BOTTOM OF BORING AT 13 FEET	
	15						
-10							
	20						
-15							
	25						

Report: ENV_3PS/W_SOLON; File: BERKRICH.GPJ; 5/3/2002 2AU-01

URS

Project: UC Berkeley Richmond Field Station Project Location: Richmond, California Project Number: 51-09967067.00	**Log of Boring 2AU-2** Sheet 1 of 1

Date(s) Drilled	4/18/02	Logged By	B. Copeland	Checked By	J. Durkin
Drilling Method	Direct Push	Drill Bit Size/Type	2-inch-OD drive point	Total Depth of Borehole	13.0 feet
Drill Rig Type	Geoprobe	Drilling Contractor	Precision Drilling	Surface Elevation	8.70 feet MSL
Groundwater Level(s)	First: None Completion: 12.4 ft bgs	Sampling Method(s)	4-foot dual tube Geoprobe sampler with acetate liner		
Location	Refer to site plan	Borehole Completion	Backfilled with grout to ground surface		

Elevation, feet	Depth, feet	SAMPLES: Interval	SAMPLES: Lab ID Number	SAMPLES: Headspace PID, ppm	Graphic Log	MATERIAL DESCRIPTION	FIELD NOTES
	0					SILTY CLAY [FILL], dark brown, dry, hard, trace gravel to 1 inch dia.	
						CLAY, dark brown, moist, medium stiff	No cinders. Believe north of former seawall, moving 21 ft south.
-5	5					Becomes tan	
						Little fine sand	
-0						Becomes mottled gray and tan	
	10					No sand	
						▼	Groundwater level not equilibrated.
-5						BOTTOM OF BORING AT 13 FEET	
	15						
-10							
	20						
-15							
	25						

Report: ENV_3PS/W_SOLON; File: BERKRICH.GPJ; 5/2/2002 2AU-02

URS

Project: UC Berkeley Richmond Field Station Project Location: Richmond, California Project Number: 51-09967067.00	**Log of Boring 2AU-3** Sheet 1 of 1

Date(s) Drilled	4/18/02	Logged By	B. Copeland	Checked By	J. Durkin
Drilling Method	Direct Push	Drill Bit Size/Type	2-inch-OD drive point	Total Depth of Borehole	10.0 feet
Drill Rig Type	Geoprobe	Drilling Contractor	Precision Drilling	Surface Elevation	6.42 feet MSL
Groundwater Levels(s)	First: None Completion: 3.55 ft bgs	Sampling Method(s)	4-foot dual tube Geoprobe sampler with acetate liner		
Location	Refer to site plan	Borehole Completion	Backfilled with grout to ground surface		

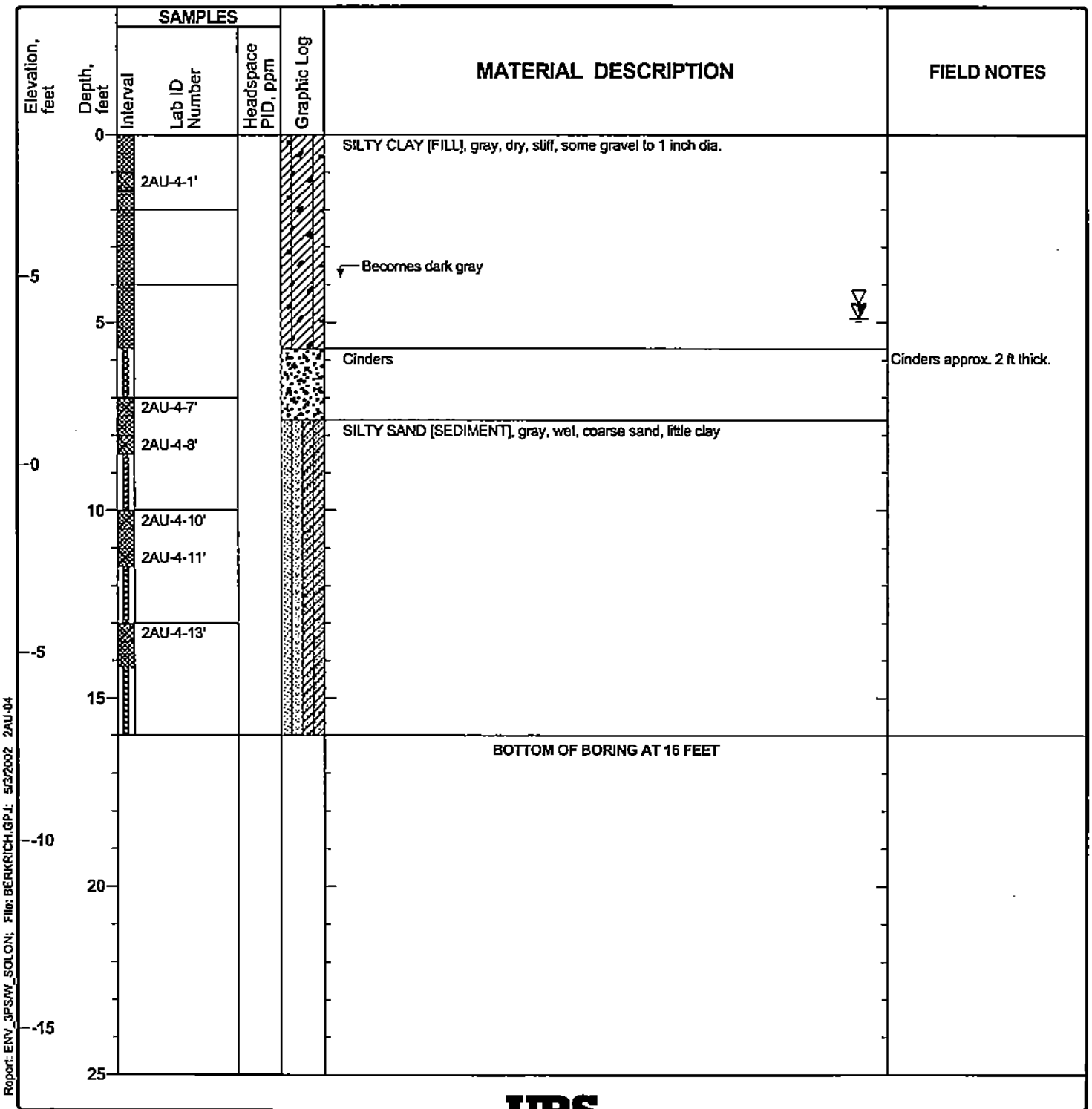
Elevation, feet	Depth, feet	SAMPLES: Interval	SAMPLES: Lab ID Number	Headspace PID, ppm	Graphic Log	MATERIAL DESCRIPTION	FIELD NOTES
	0					SILTY CLAY [FILL], dark brown, dry, some gravel	
5						Becomes orange-brown, with sandstone and concrete fragments	
						Cinders	Cinders approx. 2.5 ft thick.
			2AU-3-4'				
	5		2AU-3-5'			SILT [SEDIMENT], black, wet, soft	
0							
			2AU-3-7'			CLAY, olive gray, wet, stiff	
			2AU-3-8'			Becomes medium stiff	
			2AU-3-9'			CLAYEY SAND, gray and orange-brown, wet, medium sand	
	10					BOTTOM OF BORING AT 10 FEET	
-5							
	15						
-10							
	20						
-15							
	25						

Report: ENV_3PS/W_SOLON; File: BERKRICH.GPJ; 5/3/2002 2AU-03

URS

Project: UC Berkeley Richmond Field Station Project Location: Richmond, California Project Number: 51-09967067.00	**Log of Boring 2AU-4** Sheet 1 of 1

Date(s) Drilled	4/17/02	Logged By	B. Copeland	Checked By	J. Durkin
Drilling Method	Direct Push	Drill Bit Size/Type	2-inch-OD drive point	Total Depth of Borehole	16.0 feet
Drill Rig Type	Geoprobe	Drilling Contractor	Precision Drilling	Surface Elevation	8.78 feet MSL
Groundwater Level(s)	First: 4.5 ft 24 hrs: 4.9 ft bgs	Sampling Method(s)	4-foot dual tube Geoprobe sampler with acetate liner		
Location	Refer to site plan	Borehole Completion	Backfilled with grout to ground surface		

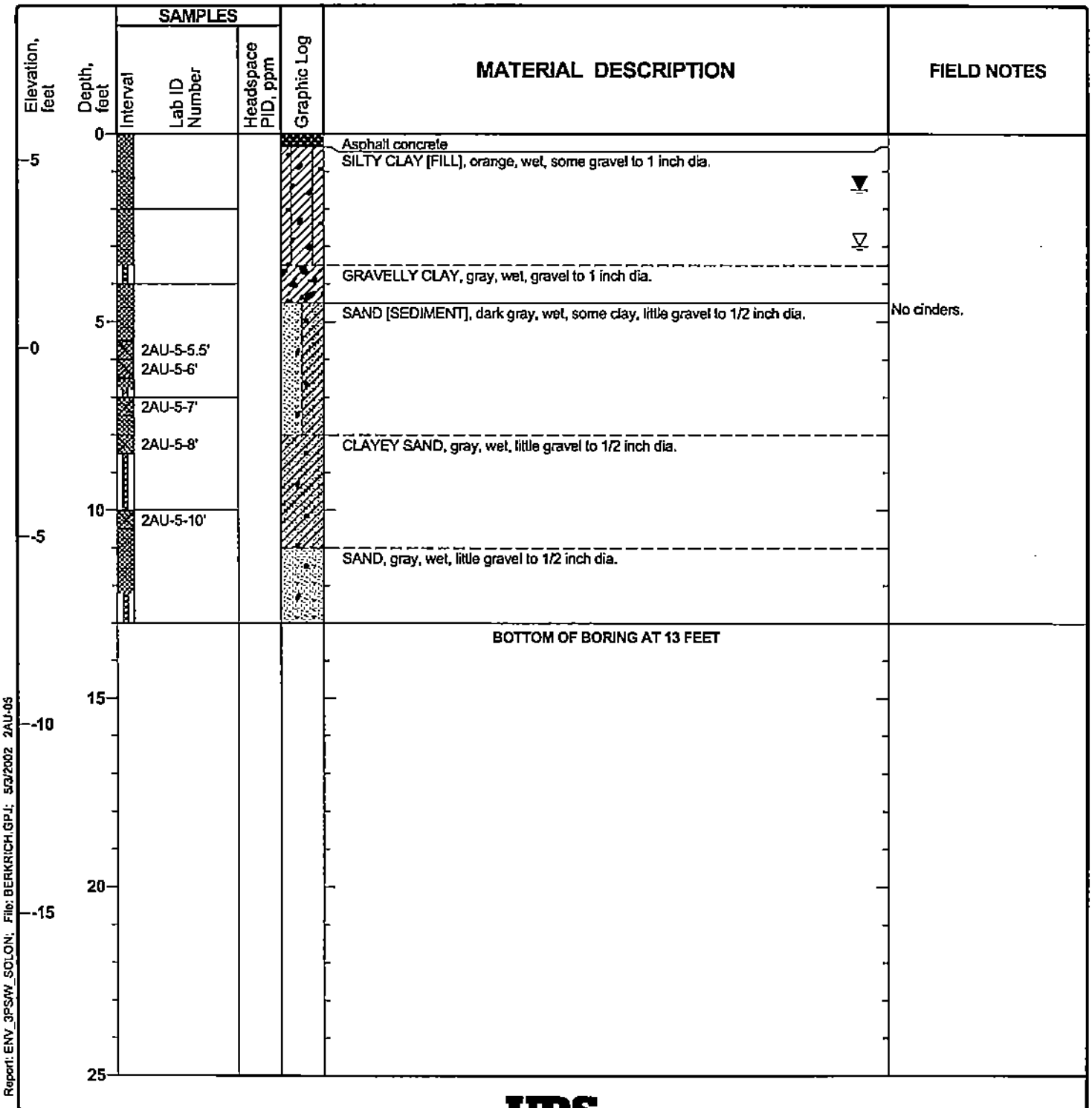


Report: ENV_3PSMV_SOLON; File: BERKRICH.GPJ; 5/3/2002 2AU-04

URS

Project: UC Berkeley Richmond Field Station Project Location: Richmond, California Project Number: 51-09967067.00	**Log of Boring 2AU-5** Sheet 1 of 1

Date(s) Drilled	4/17/02	Logged By	B. Copeland	Checked By	J. Durkin
Drilling Method	Direct Push	Drill Bit Size/Type	2-inch-OD drive point	Total Depth of Borehole	13.0 feet
Drill Rig Type	Geoprobe	Drilling Contractor	Precision Drilling	Surface Elevation	5.70 feet MSL
Groundwater Level(s)	First: 3 ft Completion: 1.5 ft bgs	Sampling Method(s)	4-foot dual tube Geoprobe sampler with acetate liner		
Location	Refer to site plan	Borehole Completion	Backfilled with grout to ground surface		



Report: ENV_3PS/W_SOLON; File: BERKRICH.GPJ; 5/3/2002 2AU-05

URS

Project: UC Berkeley Richmond Field Station Project Location: Richmond, California Project Number: 51-09967067.00	**Log of Boring 2AU-6** Sheet 1 of 1

Date(s) Drilled	4/17/02	Logged By	B. Copeland	Checked By	J. Durkin
Drilling Method	Direct Push	Drill Bit Size/Type	2-inch-OD drive point	Total Depth of Borehole	13.0 feet
Drill Rig Type	Geoprobe	Drilling Contractor	Precision Drilling	Surface Elevation	5.55 feet MSL
Groundwater Levels(s)	First: None Completion: 1.4 ft bgs	Sampling Method(s)	4-foot dual tube Geoprobe sampler with acetate liner		
Location	Refer to site plan	Borehole Completion	Backfilled with grout to ground surface		

Elevation, feet	Depth, feet	SAMPLES: Interval	SAMPLES: Lab ID Number	SAMPLES: Headspace PID, ppm	Graphic Log	MATERIAL DESCRIPTION	FIELD NOTES
	0					Asphalt concrete	
-5			2AU-6-1'			SILTY CLAY [FILL], dark gray, moist, some orange sandstone fragments	
			2AU-6-2.5'			GRAVELLY CLAY, gray, wet, gravel to 1/2 inch dia.	
						SILT [SEDIMENT], maroon, wet, some roots	No cinders.
	5		2AU-6-4.5'				
			2AU-6-5'			Becomes dark gray	
0			2AU-6-6'			CLAYEY SILT, mottled orange and gray, wet, soft	
			2AU-6-7'				
			2AU-6-8'			GRAVELLY SAND, gray, wet, coarse sand, gravel to 1/2 inch dia., some silt	
	10		2AU-6-10'				
-5							
						BOTTOM OF BORING AT 13 FEET	
	15						
-10							
	20						
-15							
	25						

Report: ENV_3PS/W_SOLON; File: BERKRICH.GPJ; 5/3/2002 2AU-06

URS

Project: UC Berkeley Richmond Field Station Project Location: Richmond, California Project Number: 51-09967067.00	**Log of Boring 2AU-7** Sheet 1 of 1

Date(s) Drilled	4/18/02	Logged By	B. Copeland	Checked By	J. Durkin
Drilling Method	Direct Push	Drill Bit Size/Type	2-inch-OD drive point	Total Depth of Borehole	16.0 feet
Drill Rig Type	Geoprobe	Drilling Contractor	Precision Drilling	Surface Elevation	Not available
Groundwater Level(s)	First: None Completion: 5.2 ft bgs	Sampling Method(s)	4-foot dual tube Geoprobe sampler with acetate liner		
Location	Refer to site plan	Borehole Completion	Backfilled with grout to ground surface		

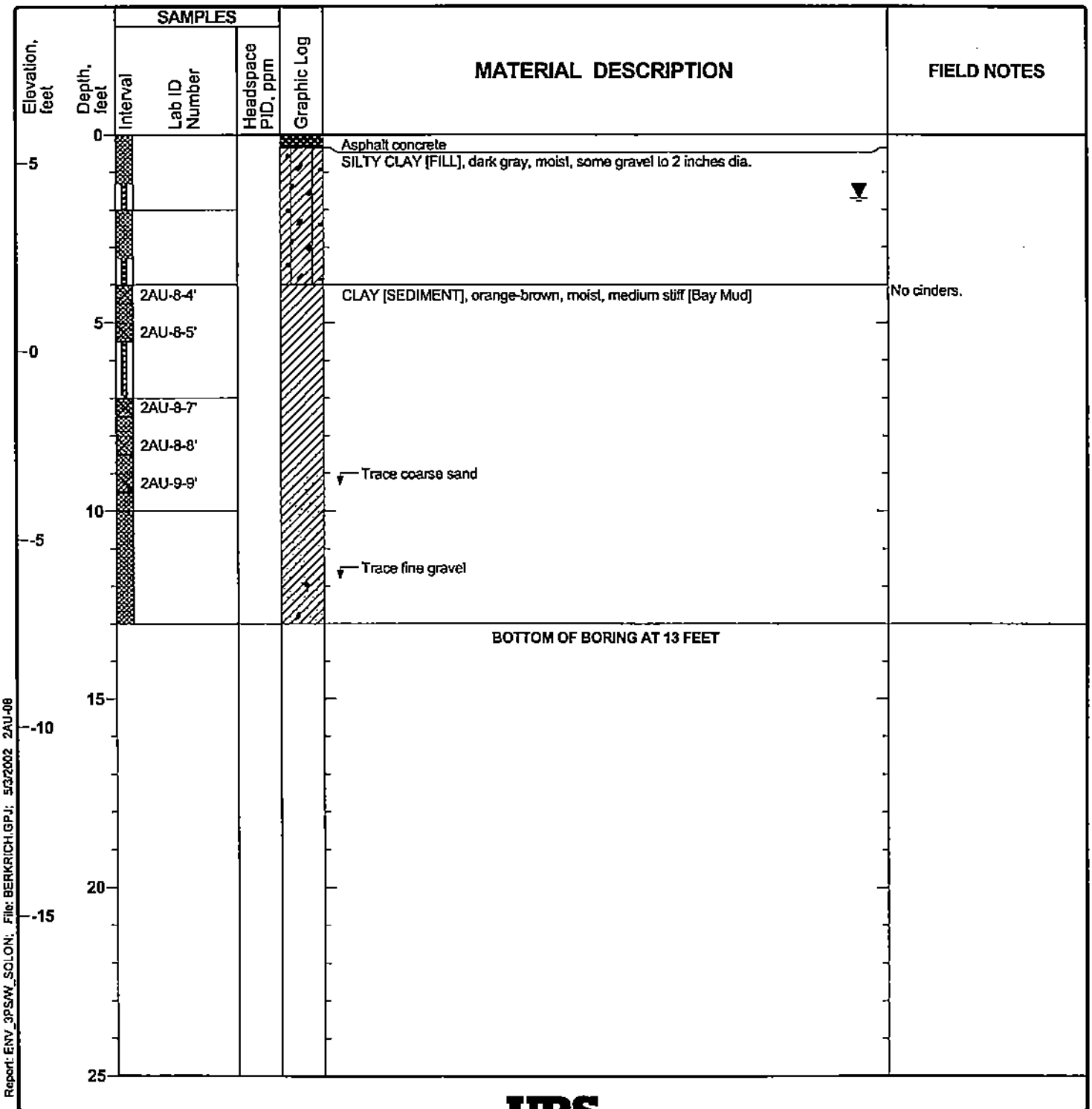
Elevation, feet	Depth, feet	SAMPLES: Interval	SAMPLES: Lab ID Number	SAMPLES: Headspace PID, ppm	Graphic Log	MATERIAL DESCRIPTION	FIELD NOTES
	0					SILTY CLAY [FILL], dark brown, dry, hard, some gravel to 2 inches dia., sandstone fragments	
	5					Cinders	Cinders approx. 2 ft thick.
			2AU-7-7'				
			2AU-7-8'			SILT [SEDIMENT], black, wet, soft, some roots	
			2AU-7-9'				
	10		2AU-7-10'			CLAY, olive gray and orange-brown, wet, stiff	
			2AU-7-11'			CLAYEY SILT, gray and orange-brown, wet	
			2AU-7-12'			SILTY CLAY, gray, wet, some coarse sand	
			2AU-7-13'			SILTY SAND, gray, wet, coarse sand	
	15					SILT, brownish gray, wet, some clay	
						BOTTOM OF BORING AT 16 FEET	
	20						
	25						

Report: ENV_3PS/W_SOLON; File: BERKRICH.GPJ; 5/3/2002 2AU-07

URS

Project: UC Berkeley Richmond Field Station Project Location: Richmond, California Project Number: 51-09967067.00	**Log of Boring 2AU-8** Sheet 1 of 1

Date(s) Drilled	4/17/02	Logged By	B. Copeland	Checked By	J. Durkin
Drilling Method	Direct Push	Drill Bit Size/Type	2-inch-OD drive point	Total Depth of Borehole	13.0 feet
Drill Rig Type	Geoprobe	Drilling Contractor	Precision Drilling	Surface Elevation	5.76 feet MSL
Groundwater Levels(s)	First: None Completion: 1.7 ft bgs	Sampling Method(s)	4-foot dual tube Geoprobe sampler with acetate liner		
Location	Refer to site plan	Borehole Completion	Backfilled with grout to ground surface		



Report: ENV_3PS/W_SQ.LON; File: BERKRICH.GPJ; 5/3/2002 2AU-08

URS

Project: UC Berkeley Richmond Field Station Project Location: Richmond, California Project Number: 51-09967067.00	**Log of Boring 2AU-9** Sheet 1 of 1

Date(s) Drilled	4/17/02	Logged By	B. Copeland	Checked By	J. Durkin
Drilling Method	Direct Push	Drill Bit Size/Type	2-inch-OD drive point	Total Depth of Borehole	16.0 feet
Drill Rig Type	Geoprobe	Drilling Contractor	Precision Drilling	Surface Elevation	7.93 feet MSL
Groundwater Levels(s)	First: 4 ft Completion: 3.8 ft bgs	Sampling Method(s)	4-foot dual tube Geoprobe sampler with acetate liner		
Location	Refer to site plan	Borehole Completion	Backfilled with grout to ground surface		

Elevation, feet	Depth, feet	SAMPLES: Interval	SAMPLES: Lab ID Number	SAMPLES: Headspace PID, ppm	Graphic Log	MATERIAL DESCRIPTION	FIELD NOTES
	0					SILTY CLAY [FILL], brown, damp, some roots, concrete and brick fragments	
5							
	5					SAND [SEDIMENT?], brown, wet, coarse	No cinders.
						SILTY CLAY, gray, wet, soft, some fine gravel	Unable to determine top of sediment.
						SILTY SAND, gray, wet	
0							
			2AU-9-8.5'			SILTY CLAY [SEDIMENT], gray, wet, medium stiff, some fine gravel	
	10						
						CLAY, brown, wet [Bay Mud]	
-5							
			2AU-9-13'				
	15						
						BOTTOM OF BORING AT 16 FEET	
-10							
	20						
-15							
	25						

URS

Report: ENV_3PS/W_SOLON; File: BERKRICH.GPJ; 5/3/2002 2AU-09

Project: UC Berkeley Richmond Field Station Project Location: Richmond, California Project Number: 51-09967067.00	**Log of Boring 2AU-10** Sheet 1 of 1

Date(s) Drilled	4/17/02	Logged By	B. Copeland	Checked By	J. Durkin
Drilling Method	Direct Push	Drill Bit Size/Type	2-inch-OD drive point	Total Depth of Borehole	16.0 feet
Drill Rig Type	Geoprobe	Drilling Contractor	Precision Drilling	Surface Elevation	5.51 feet MSL
Groundwater Levels(s)	First: 4 ft Completion: 1.4 ft bgs	Sampling Method(s)	4-foot dual tube Geoprobe sampler with acetate liner		
Location	Refer to site plan	Borehole Completion	Backfilled with grout to ground surface		

Elevation, feet	Depth, feet	SAMPLES: Interval	SAMPLES: Lab ID Number	SAMPLES: Headspace PID, ppm	Graphic Log	MATERIAL DESCRIPTION	FIELD NOTES
	0					Asphalt concrete	
5			2AU-10-1'			CLAY [FILL], orange, moist, some gravel to 1/4 inch dia.	
			2AU-10-3'				
	5		2AU-10-4.5'			Cinders	Cinders approx. 1 ft thick.
0			2AU-10-5'			SANDY SILT [SEDIMENT], gray, wet, soft	
			2AU-10-6'				
			2AU-10-7'				
			2AU-10-8'			SILTY SAND, orange, wet, trace gravel	
	10						
-5							
						SILTY CLAY, orange, wet, medium stiff	
	15					Some gravel to 1 inch dia.	
-10							
						BOTTOM OF BORING AT 16 FEET	
	20						
-15							
	25						

Report: ENV_3PS/W_SOLON; File: BERKRICH.GPJ; 5/3/2002 2AU-10

URS

Project: UC Berkeley Richmond Field Station Project Location: Richmond, California Project Number: 51-09967067.00	Log of Boring 2AU-11 Sheet 1 of 1

Date(s) Drilled	4/18/02	Logged By	B. Copeland	Checked By	J. Durkin
Drilling Method	Direct Push	Drill Bit Size/Type	2-inch-OD drive point	Total Depth of Borehole	16.0 feet
Drill Rig Type	Geoprobe	Drilling Contractor	Precision Drilling	Surface Elevation	8.69 feet MSL
Groundwater Level(s)	First: None Completion: 4.8 ft bgs	Sampling Method(s)	4-foot dual tube Geoprobe sampler with acetate liner		
Location	Refer to site plan	Borehole Completion	Backfilled with grout to ground surface		

Elevation, feet	Depth, feet	SAMPLES: Interval	SAMPLES: Lab ID Number	SAMPLES: Headspace PID, ppm	Graphic Log	MATERIAL DESCRIPTION	FIELD NOTES
	0		2AU-11-1'			SILTY CLAY [FILL], dark brown, moist, stiff, some sandstone fragments	
-5	5		2AU-11-5'			Cinders	Cinders approx. 3.5 ft thick.
			2AU-11-7'				
-0			2AU-11-8'			SILTY SAND [SEDIMENT], dark gray, wet, some gravel to 1 inch dia.	
	10		2AU-11-10'			Cinders	
			2AU-11-11'			CLAYEY SAND, gray, wet, medium sand, little gravel to 3/4 inch dia.	
-5			2AU-11-13'			Sand grades coarse	
			2AU-11-14'				
	15					CLAY, brown, wet, very stiff	
						BOTTOM OF BORING AT 16 FEET	
-10	20						
-15							
	25						

Report: ENV_3PSWW_SOLON; File: BERKRICH.GPJ; 5/3/2002 2AU-11

URS

Project: UC Berkeley Richmond Field Station Project Location: Richmond, California Project Number: 51-09967067.00	**Log of Boring 2AU-12** Sheet 1 of 1

Date(s) Drilled	4/16/02	Logged By	B. Copeland	Checked By	J. Durkin
Drilling Method	Direct Push	Drill Bit Size/Type	2-inch-OD drive point	Total Depth of Borehole	13.0 feet
Drill Rig Type	Geoprobe	Drilling Contractor	Precision Drilling	Surface Elevation	9.00 feet MSL
Groundwater Levels(s)	First: 5 ft 24 hrs: 4.75 ft bgs	Sampling Method(s)	4-foot dual tube Geoprobe sampler with acetate liner		
Location	Refer to site plan	Borehole Completion	Backfilled with grout to ground surface		

Elevation, feet	Depth, feet	SAMPLES: Interval	SAMPLES: Lab ID Number	SAMPLES: Headspace PID, ppm	Graphic Log	MATERIAL DESCRIPTION	FIELD NOTES
	0					SILTY CLAY [FILL], orange-brown, moist, hard, some gravel	
5							
	5					Becomes dark gray	
						Cinders	Cinders approx. 2 ft thick.
			2AU-12-7'			SILTY CLAY [SEDIMENT], gray and orange-brown, wet, trace coarse sand	
0							
	10		2AU-12-10'				
			2AU-12-11'				
			2AU-12-12'			CLAYEY SILT, olive gray, wet	
						BOTTOM OF BORING AT 13 FEET	
-5							
	15						
-10							
	20						
-15							
	25						

Report: ENV_3PS/W_SOLON; File: BERKRICH.GPJ; 5/3/2002 2AU-12

URS

Project: UC Berkeley Richmond Field Station Project Location: Richmond, California Project Number: 51-09967067.00	**Log of Boring 2AU-13** Sheet 1 of 1

Date(s) Drilled	4/17/02	Logged By	B. Copeland	Checked By	J. Durkin
Drilling Method	Direct Push	Drill Bit Size/Type	2-inch-OD drive point	Total Depth of Borehole	13.0 feet
Drill Rig Type	Geoprobe	Drilling Contractor	Precision Drilling	Surface Elevation	5.50 feet MSL
Groundwater Level(s)	First: None Completion: 1.5 ft bgs	Sampling Method(s)	4-foot dual tube Geoprobe sampler with acetate liner		
Location	Refer to site plan	Borehole Completion	Backfilled with grout to ground surface		

Elevation, feet	Depth, feet	SAMPLES: Interval	SAMPLES: Lab ID Number	SAMPLES: Headspace PID, ppm	Graphic Log	MATERIAL DESCRIPTION	FIELD NOTES
5	0					Asphalt concrete	
						SILTY CLAY [FILL], orange-brown, wet, some gravel to 1 inch dia. ▼	
			2AU-13-2'				
			2AU-13-3.5'				
			2AU-13-4'			Cinders	Cinders approx. 1 ft thick.
0	5		2AU-13-5'			CLAYEY SAND [SEDIMENT], olive gray and reddish brown, wet, little gravel to 1/2 inch dia.	
						SILTY CLAY, orange, wet, some gravel to 1 inch dia.	
			2AU-13-7'				
			2AU-13-8'				
			2AU-13-9'			CLAYEY SAND, light grayish brown, wet, coarse sand, some well-rounded gravel to 1/2 inch dia.	
-5	10		2AU-13-10'				
						CLAY, olive gray, wet, stiff	
						BOTTOM OF BORING AT 13 FEET	
-10	15						
-15	20						
	25						

Report: ENV_3PS/W_SOLON; File: BERKRICH.GPJ; 5/2/2002 2AU-13

URS

Project: UC Berkeley Richmond Field Station Project Location: Richmond, California Project Number: 51-09967067.00	**Log of Boring 2AU-14** Sheet 1 of 1

Date(s) Drilled	4/16/02	Logged By	B. Copeland	Checked By	J. Durkin
Drilling Method	Direct Push	Drill Bit Size/Type	2-inch-OD drive point	Total Depth of Borehole	16.0 feet
Drill Rig Type	Geoprobe	Drilling Contractor	Precision Drilling	Surface Elevation	8.71 feet MSL
Groundwater Levels(s)	First: None Completion: 5.05 ft bgs	Sampling Method(s)	4-foot dual tube Geoprobe sampler with acetate liner		
Location	Refer to site plan	Borehole Completion	Backfilled with grout to ground surface		

Elevation, feet	Depth, feet	SAMPLES: Interval	SAMPLES: Lab ID Number	SAMPLES: Headspace PID, ppm	Graphic Log	MATERIAL DESCRIPTION	FIELD NOTES
	0					SILTY CLAY [FILL], brown, dry, hard, some gravel to 1/2 inch dia.	
5						Cinders	Cinders approx. 4 ft thick.
	5		2AU-14-5.5'				
			2AU-14-7.5'			SILT [SEDIMENT], black, wet	
0			2AU-14-8.5'				
			2AU-14-9'				
	10					CLAY, olive gray, wet, medium stiff	
			2AU-14-10.5'				
			2AU-14-11.5'			SAND, brown, wet, coarse	
			2AU-14-12.5'				
-5						GRAVELLY SAND, brown, wet, coarse sand, gravel to 1/2 inch dia.	
	15						
						BOTTOM OF BORING AT 16 FEET	
-10							
	20						
-15							
	25						

Report: ENV_3PS/W_SOLON; File: BERKRICH.GPJ; 5/3/2002 2AU-14

URS

Project: UC Berkeley Richmond Field Station Project Location: Richmond, California Project Number: 51-09967067.00	**Log of Boring 2AU-15** Sheet 1 of 1

Date(s) Drilled	4/16/12	Logged By	B. Copeland	Checked By	J. Durkin
Drilling Method	Direct Push	Drill Bit Size/Type	2-inch-OD drive point	Total Depth of Borehole	16.0 feet
Drill Rig Type	Geoprobe	Drilling Contractor	Precision Drilling	Surface Elevation	8.38 feet MSL
Groundwater Levels(s)	First: 4.2 ft 24 hrs: 5.0 ft bgs	Sampling Method(s)	4-foot dual tube Geoprobe sampler with acetate liner		
Location	Refer to site plan	Borehole Completion	Backfilled with grout to ground surface		

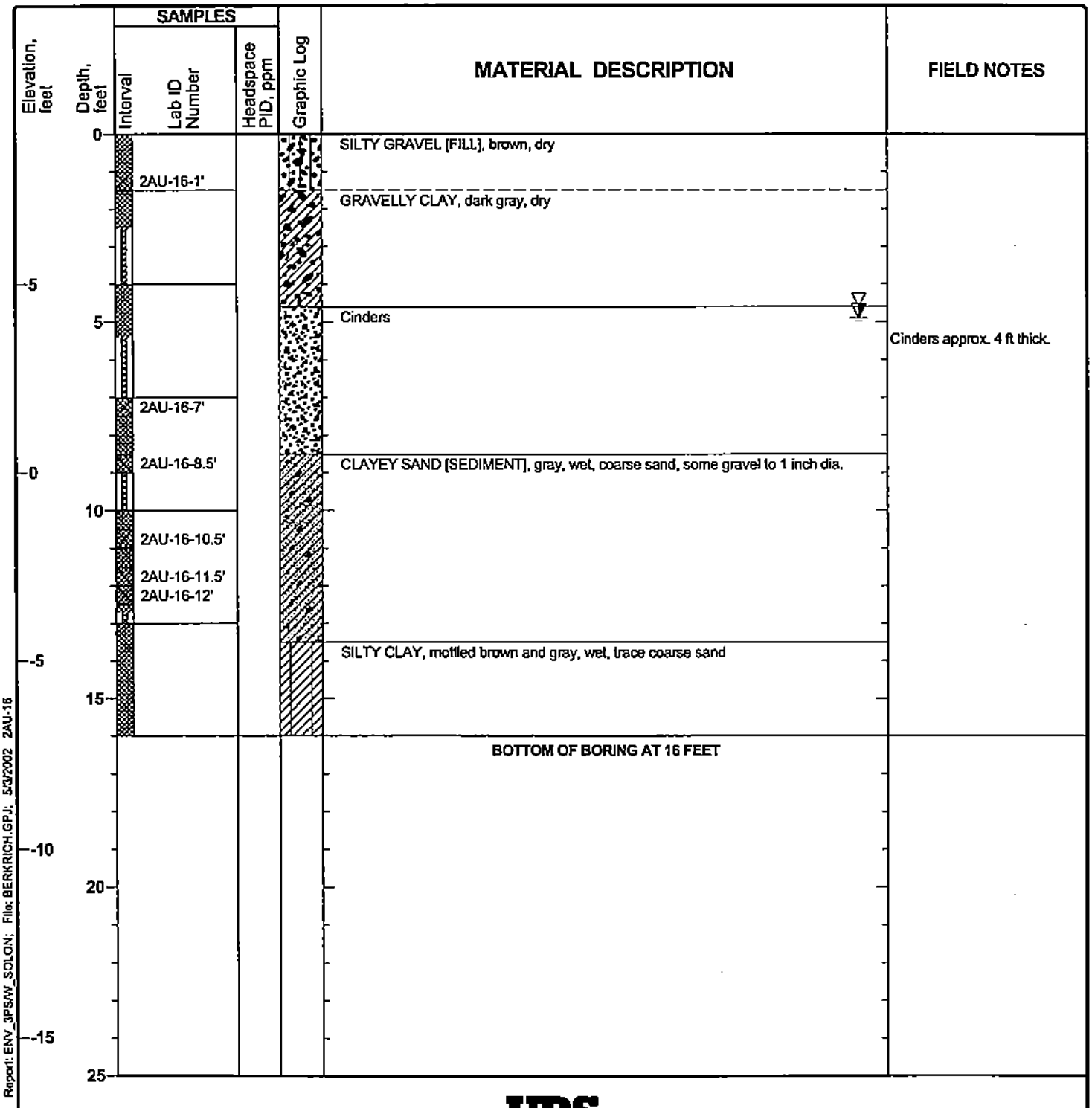
Elevation, feet	Depth, feet	SAMPLES: Interval	SAMPLES: Lab ID Number	SAMPLES: Headspace PID, ppm	Graphic Log	MATERIAL DESCRIPTION	FIELD NOTES
	0					CLAYEY SAND [FILL], brown, dry, some gravelly layers (gravel to 1 inch dia.)	
						SILTY CLAY, light brown, dry, trace coarse sand	
5							
	5		2AU-15-5'			Cinders	Cinders approx. 3 ft thick.
			2AU-15-7'			SILT [SEDIMENT], dark gray and maroon, wet	
0			2AU-15-8'				
			2AU-15-9'				
	10		2AU-15-10'			SILTY CLAY, grayish brown, wet, medium stiff, some coarse sand	
			2AU-15-11'			CLAYEY SAND, brown, wet, coarse sand	
			2AU-15-12'			CLAYEY SILT, olive brown, wet, trace coarse sand	
-5							
	15						
						BOTTOM OF BORING AT 16 FEET	
-10							
	20						
-15							
	25						

Report: ENV_3PS/W_SOLON; File: BERKRICH.GPJ; 5/3/2002 2AU-15

URS

Project: UC Berkeley Richmond Field Station Project Location: Richmond, California Project Number: 51-09967067.00	**Log of Boring 2AU-16** Sheet 1 of 1

Date(s) Drilled	4/16/02	Logged By	B. Copeland	Checked By	J. Durkin
Drilling Method	Direct Push	Drill Bit Size/Type	2-inch-OD drive point	Total Depth of Borehole	16.0 feet
Drill Rig Type	Geoprobe	Drilling Contractor	Precision Drilling	Surface Elevation	9.00 feet MSL
Groundwater Levels(s)	First: 4.6 ft 24 hrs: 4.9 ft bgs	Sampling Method(s)	4-foot dual tube Geoprobe sampler with acetate liner		
Location	Refer to site plan	Borehole Completion	Backfilled with grout to ground surface		



Report: ENV_3PSAM_SOLON; File: BERKRICH.GPJ; 5/3/2002 2AU-16

URS

Project: UC Berkeley Richmond Field Station Project Location: Richmond, California Project Number: 51-09967067.00	**Log of Boring 2AU-17** Sheet 1 of 1

Date(s) Drilled	4/16/02	Logged By	B. Copeland	Checked By	J. Durkin
Drilling Method	Direct Push	Drill Bit Size/Type	2-inch-OD drive point	Total Depth of Borehole	19.0 feet
Drill Rig Type	Geoprobe	Drilling Contractor	Precision Drilling	Surface Elevation	13.28 feet MSL
Groundwater Level(s)	First: 8.4 ft bgs Completion: Not measured	Sampling Method(s)	4-foot dual tube Geoprobe sampler with acetate liner		
Location	Refer to site plan	Borehole Completion	Backfilled with grout to ground surface		

Elevation, feet	Depth, feet	SAMPLES: Interval	SAMPLES: Lab ID Number	SAMPLES: Headspace PID, ppm	Graphic Log	MATERIAL DESCRIPTION	FIELD NOTES
	0					SILTY CLAY [FILL], mottled dark gray and orange, dry, hard, little gravel to 1 inch dia., roots	
10							
	5					Gravel	
5						▽	
	10					Cinders	Cinders approx. 4 ft thick.
0			2AU-17-13'			SILT [SEDIMENT], dark gray, wet	
			2AU-17-14'				
	15		2AU-17-15'			SILTY CLAY, brown, wet, trace gravel to 1/4 inch dia.	
			2AU-17-16'				
			2AU-17-17'				
-5			2AU-17-18'			Becomes sandy	
						BOTTOM OF BORING AT 19 FEET	
	20						
-10							
	25						

Report: ENV_3PS/W_SOLON; File: BERKRICH.GPJ; 5/3/2002 2AU-17

URS

Project: UC Berkeley Richmond Field Station Project Location: Richmond, California Project Number: 51-09967067.00	**Log of Boring 2AU-18** Sheet 1 of 1

Date(s) Drilled	4/16/02	Logged By	B. Copeland	Checked By	J. Durkin
Drilling Method	Direct Push	Drill Bit Size/Type	2-inch-OD drive point	Total Depth of Borehole	19.0 feet
Drill Rig Type	Geoprobe	Drilling Contractor	Precision Drilling	Surface Elevation	13.10 feet MSL
Groundwater Level(s)	First: 8.3 ft bgs Completion: Not measured	Sampling Method(s)	4-foot dual tube Geoprobe sampler with acetate liner		
Location	Refer to site plan	Borehole Completion	Backfilled with grout to ground surface		

Elevation, feet	Depth, feet	SAMPLES: Interval	SAMPLES: Lab ID Number	SAMPLES: Headspace PID, ppm	Graphic Log	MATERIAL DESCRIPTION	FIELD NOTES
	0					GRAVEL [FILL]	
						Cinders	
						SILTY CLAY, dark gray to black and orange, dry, stiff, trace gravel	
10							
	5					Gravel	
5						▽	
			2AU-18-9'			Cinders	Cinders approx. 3 ft thick.
	10						
0						SILT [SEDIMENT], gray, wet, soft	
			2AU-18-13'			SILTY CLAY, light grayish orange, wet, medium stiff	
			2AU-18-14'				
	15		2AU-18-15'				
			2AU-18-16'				
			2AU-18-17'			Trace gravel to 1/4 inch dia.	
-5							
	20					BOTTOM OF BORING AT 19 FEET	
-10							
	25						

Report: ENV_3PS/W_SOLON; File: BERKRICH.GPJ; 5/3/2002 2AU-18

URS

Project: UC Berkeley Richmond Field Station Project Location: Richmond, California Project Number: 51-09967067.00	**Log of Boring 2AU-19** Sheet 1 of 1

Date(s) Drilled	4/17/02	Logged By	B. Copeland	Checked By	J. Durkin
Drilling Method	Direct Push	Drill Bit Size/Type	2-inch-OD drive point	Total Depth of Borehole	19.0 feet
Drill Rig Type	Geoprobe	Drilling Contractor	Precision Drilling	Surface Elevation	13.64 feet MSL
Groundwater Level(s)	First: 7.8 ft bgs Completion: Not measured	Sampling Method(s)	4-foot dual tube Geoprobe sampler with acetate liner		
Location	Refer to site plan	Borehole Completion	Backfilled with grout to ground surface		

Elevation, feet	Depth, feet	SAMPLES: Interval	SAMPLES: Lab ID Number	SAMPLES: Headspace PID, ppm	Graphic Log	MATERIAL DESCRIPTION	FIELD NOTES
	0					SILTY CLAY [FILL], light brown, dry, hard, some gravel to 2 inches dia.	
						Cinders	
						Cinders	
						CLAY, dark gray, dry, hard	
10							
	5						
						▽	
5						Cinders	
	10						Cinders approx. 5 ft thick.
0						SILT [SEDIMENT], gray and maroon, wet, soft, scattered cinders	
			2AU-19-14'			Becomes gray	Some cinders in sample collected at 14 ft.
	15		2AU-19-15'			SILTY CLAY, orange-brown, wet, soft	
			2AU-19-16'				
			2AU-19-17'				
-5			2AU-19-18'				
	20					BOTTOM OF BORING AT 19 FEET	
-10							
	25						

Report: ENV_3PS/W_SOLON; File: BERKRICH.GPJ; 5/3/2002 2AU-19

URS

Project: UC Berkeley Richmond Field Station Project Location: Richmond, California Project Number: 51-09967067.00	**Log of Boring 2AU-20** Sheet 1 of 1

Date(s) Drilled	4/16/02	Logged By	B. Copeland	Checked By	J. Durkin
Drilling Method	Direct Push	Drill Bit Size/Type	2-inch-OD drive point	Total Depth of Borehole	19.0 feet
Drill Rig Type	Geoprobe	Drilling Contractor	Precision Drilling	Surface Elevation	13.31 feet MSL
Groundwater Level(s)	First: 8.2 ft bgs Completion: Not measured	Sampling Method(s)	4-foot dual tube Geoprobe sampler with acetate liner		
Location	Refer to site plan	Borehole Completion	Backfilled with grout to ground surface		

Elevation, feet	Depth, feet	SAMPLES: Interval	SAMPLES: Lab ID Number	SAMPLES: Headspace PID, ppm	Graphic Log	MATERIAL DESCRIPTION	FIELD NOTES
	0					SILTY CLAY [FILL], tan, dry	
						Cinders	
						SILTY CLAY [FILL], black to dark gray, dry, stiff, trace gravel to 1/2 inch dia.	
						Becomes gray	
						Cinders	
						Gravelly layers	
10							
	5					CLAYEY GRAVEL, dark gray, damp, gravel to 2 inches dia. in clayey sand matrix	
						▽	
5						Cinders	
						SAND [SEDIMENT], maroon, wet, medium with trace coarse grains	
	10					Cinders	Cinders approx. 2 ft thick. Scattered layers above.
						SILT [SEDIMENT], maroon, wet, soft	
0			2AU-20-13'			CLAY, orange to light gray, wet, medium stiff, some silt	
			2AU-20-14'				
	15		2AU-20-15'				
			2AU-20-16'				
			2AU-20-17'				
-5							
	20					BOTTOM OF BORING AT 19 FEET	
-10							
	25						

Report: ENV_3PSW_SOLON; File: BERKRICH.GPJ; 5/3/2002 2AU-20

URS

Project: UC Berkeley Richmond Field Station Project Location: Richmond, California Project Number: 51-09967067.00	Log of Boring 2AU-21 Sheet 1 of 1

Date(s) Drilled	4/17/02	Logged By	B. Copeland	Checked By	J. Durkin
Drilling Method	Direct Push	Drill Bit Size/Type	2-inch-OD drive point	Total Depth of Borehole	16.0 feet
Drill Rig Type	Geoprobe	Drilling Contractor	Precision Drilling	Surface Elevation	8.36 feet MSL
Groundwater Levels(s)	First: 7.5 ft 24 hrs: 3.9 ft bgs	Sampling Method(s)	4-foot dual tube Geoprobe sampler with acetate liner		
Location	Refer to site plan	Borehole Completion	Backfilled with grout to ground surface		

Elevation, feet	Depth, feet	SAMPLES: Interval	SAMPLES: Lab ID Number	SAMPLES: Headspace PID, ppm	Graphic Log	MATERIAL DESCRIPTION	FIELD NOTES
	0					SILTY CLAY [FILL], brown, dry, gravel to 1 inch dia., brick	
5							
	5					← Trace cinders, wet, intermixed with clay and coarse gravel	
0						SILTY SAND [SEDIMENT], gray, wet, coarse sand, some gravel to 1/4 inch dia.	No cinders.
	10		2AU-21-10'				
			2AU-21-11'				
-5			2AU-21-13'			CLAY, brown, wet, stiff	
	15		2AU-21-14'				
						BOTTOM OF BORING AT 16 FEET	
-10							
	20						
-15							
	25						

Report: ENV_3PS/W_SOLON; File: BERKRICH.GPJ; 5/3/2002 2AU-21

URS

Project: UC Berkeley Richmond Field Station Project Location: Richmond, California Project Number: 51-09967067.00	**Log of Boring 2AU-22** Sheet 1 of 1

Date(s) Drilled	4/18/02	Logged By	B. Copeland	Checked By	J. Durkin
Drilling Method	Direct Push	Drill Bit Size/Type	2-inch-OD drive point	Total Depth of Borehole	16.0 feet
Drill Rig Type	Geoprobe	Drilling Contractor	Precision Drilling	Surface Elevation	9.19 feet MSL
Groundwater Levels(s)	First: None Completion: 6.9 ft bgs	Sampling Method(s)	4-foot dual tube Geoprobe sampler with acetate liner		
Location	Refer to site plan	Borehole Completion	Backfilled with grout to ground surface		

Elevation, feet	Depth, feet	SAMPLES: Interval	SAMPLES: Lab ID Number	SAMPLES: Headspace PID, ppm	Graphic Log	MATERIAL DESCRIPTION	FIELD NOTES
	0					SILTY CLAY [FILL], dark brown, dry, hard, some sandstone fragments	
						← Glass fragment	
-5	5					GRAVEL, red, wet, possibly brick fragments	Refusal due to concrete at about 5 ft in first hole; move 2 ft.
			2AU-22-7.5'			Cinders	Cinders approx. 2 ft thick.
0	10		2AU-22-10'			SILTY CLAY [SEDIMENT], mottled orange-brown and gray, wet, medium stiff, some medium sand	
			2AU-22-11'				
			2AU-22-12'				
			2AU-22-13'			← Trace sand	
-5	15		2AU-22-14'				
			2AU-22-15'				
						BOTTOM OF BORING AT 16 FEET	Groundwater still rising at end of day.
-10	20						
-15	25						

Report: ENV_3PS/W_SOLON; File: BERKRICH.GPJ; 5/3/2002 2AU-22

URS

Project: UC Berkeley Richmond Field Station Project Location: Richmond, California Project Number: 51-09967067.00	**Log of Boring 2AU-23** Sheet 1 of 1

Date(s) Drilled	7/9/02	Logged By	B. Copeland	Checked By	
Drilling Method	Direct Push	Drill Bit Size/Type	2-inch-OD drive point	Total Depth of Borehole	16.0 feet
Drill Rig Type	Geoprobe	Drilling Contractor	Precision Drilling	Surface Elevation	Not available
Groundwater Level(s)	First: None Completion: 4.5 ft bgs	Sampling Method(s)	4-foot dual tube Geoprobe sampler with acetate liner		
Location	Inside Building 106; see site plan	Borehole Completion	Backfilled with grout to ground surface		

Elevation, feet	Depth, feet	SAMPLES: Interval	SAMPLES: Lab ID Number	Headspace PID, ppm	Graphic Log	MATERIAL DESCRIPTION	FIELD NOTES
	0					Concrete	
						GRAVEL [FILL], brown, wet, gravel to 1/2 inches dia., little clay and sand	
	5		2AU-23-4.8'			Cinders	Cinders approx. 3 ft thick.
			2AU-23-7'			CLAY [SEDIMENT], reddish brown, moist	
						GRAVELLY SAND, gray, wet, gravel to 1/2 inch dia., little clay	
	10		2AU-23-10'				
			2AU-23-11'				
			2AU-23-13'			CLAY, brown, moist, stiff [Bay Mud]	
	15		2AU-23-14'				
						BOTTOM OF BORING AT 16 FEET	
	20						
	25						

Report: ENV_3PS/W_SOLON; File: BERKRICH.GPJ; 7/24/2002 2AU-23

URS

Project: UC Berkeley Richmond Field Station Project Location: Richmond, California Project Number: 51-09967067.00	**Log of Boring 2AU-24** Sheet 1 of 1

Date(s) Drilled	7/9/02	Logged By	B. Copeland	Checked By	
Drilling Method	Direct Push	Drill Bit Size/Type	2-inch-OD drive point	Total Depth of Borehole	16.0 feet
Drill Rig Type	Geoprobe	Drilling Contractor	Precision Drilling	Surface Elevation	Not available
Groundwater Level(s)	First: None Completion: 5.1 ft bgs	Sampling Method(s)	4-foot dual tube Geoprobe sampler with acetate liner		
Location	Inside Building 106; see site plan	Borehole Completion	Backfilled with grout to ground surface		

Elevation, feet	Depth, feet	SAMPLES: Interval	SAMPLES: Lab ID Number	Headspace PID, ppm	Graphic Log	MATERIAL DESCRIPTION	FIELD NOTES
	0					Concrete	
						SILTY CLAY [FILL], dark brown, damp, some gravel to 1/4 inch dia., brick fragments	Sampler probably blocked off by brick fragments.
						Becomes yellowish brown; contains brick fragments	
	5		2AU-24-4.5'			Cinders	Cinders approx. 3 ft thick.
			2AU-24-7'				
			2AU-24-7.5'			CLAY [SEDIMENT], reddish brown and gray, moist, medium stiff	
			2AU-24-8.5'			CLAYEY SAND, gray and reddish brown, wet, coarse-grained sand, some gravel to 1 inch dia.	
	10		2AU-24-10'				
			2AU-24-11'				
	15					CLAY, brown, moist, soft	
						BOTTOM OF BORING AT 16 FEET	
	20						
	25						

Report: ENV_3PS/W_SOLON; File: BERKRICH.GPJ; 7/24/2002 2AU-24

URS

Project: UC Berkeley Richmond Field Station Project Location: Richmond, California Project Number: 51-09967067.00	**Log of Boring 2AU-25** Sheet 1 of 1

Date(s) Drilled	7/9/02	Logged By	B. Copeland	Checked By	
Drilling Method	Direct Push	Drill Bit Size/Type	2-Inch-OD drive point	Total Depth of Borehole	16.0 feet
Drill Rig Type	Geoprobe	Drilling Contractor	Precision Drilling	Surface Elevation	Not available
Groundwater Levels(s)	First: None Completion: 2.5 ft bgs	Sampling Method(s)	4-foot dual tube Geoprobe sampler with acetate liner		
Location	South of Building 106; see site plan	Borehole Completion	Backfilled with grout to ground surface		

Elevation, feet	Depth, feet	SAMPLES: Interval	SAMPLES: Lab ID Number	Headspace PID, ppm	Graphic Log	MATERIAL DESCRIPTION	FIELD NOTES
	0					GRAVELLY CLAY (FILL), orange-brown, dry	
						Cinders	
							Unable to determine thickness of cinders due to poor sample recovery.
	5		2AU-25-4'			SANDY CLAY (SEDIMENT), gray, moist	
			2AU-25-7'				
			2AU-25-8'			SILTY CLAY, brown, moist, trace fine gravel	
			2AU-25-9'			SAND, reddish brown, wet, fine-grained, trace clay	
	10		2AU-25-10'			GRAVELLY SAND, brown, wet, coarse-grained	
						SAND, brown, wet, medium-grained	
			2AU-25-13'			CLAY, grayish brown, moist, soft to medium stiff	
			2AU-25-14'				
	15					BOTTOM OF BORING AT 16 FEET	
	20						
	25						

Report: ENV_3PS/W_SOLON; File: BERKRICH.GPJ; 7/24/2002 2AU-25

URS

Project: UC Berkeley Richmond Field Station Project Location: Richmond, California Project Number: 51-09967067.00	**Log of Boring 2AU-26** Sheet 1 of 1

Date(s) Drilled	7/9/02	Logged By	B. Copeland	Checked By	
Drilling Method	Direct Push	Drill Bit Size/Type	2-inch-OD drive point	Total Depth of Borehole	19.0 feet
Drill Rig Type	Geoprobe	Drilling Contractor	Precision Drilling	Surface Elevation	Not available
Groundwater Levels(s)	First: 10 ft Completion: 10.2 ft bgs	Sampling Method(s)	4-foot dual tube Geoprobe sampler with acetate liner		
Location	Berm of round pond; see site plan	Borehole Completion	Backfilled with grout to ground surface		

Elevation, feet	Depth, feet	SAMPLES: Interval	SAMPLES: Lab ID Number	Headspace PID, ppm	Graphic Log	MATERIAL DESCRIPTION	FIELD NOTES
	0					Cinders	Unable to determine thickness of surficial cinders due to poor sample recovery.
						GRAVELLY CLAY [FILL], dark brown to light gray, dry, sandstone fragments to 1 inch dia.	
	5					Becomes slightly reddish brown	
						Cinders	
	10						Cinders at least 3 ft thick, possibly up to 5 ft thick.
			2AU-26-13.5'			SILT [SEDIMENT], dark gray, wet, little clay	
			2AU-26-14.5'			CLAY, light brown, moist, stiff, medium plasticity [Bay Mud]	
	15		2AU-26-16'				
			2AU-26-17'				
			2AU-26-18'				
	20					BOTTOM OF BORING AT 19 FEET	
	25						

Report: ENV_3PS/W_SOLON; File: BERKRICH.GPJ; 7/24/2002 2AU-26

URS

Project: UC Berkeley Richmond Field Station
Project Location: Richmond, California
Project Number: 51-09967067.00

Log of Boring 2AU-27

Sheet 1 of 1

Date(s) Drilled	7/9/02	Logged By	B. Copeland	Checked By	
Drilling Method	Direct Push	Drill Bit Size/Type	2-inch-OD drive point	Total Depth of Borehole	19.0 feet
Drill Rig Type	Geoprobe	Drilling Contractor	Precision Drilling	Surface Elevation	Not available
Groundwater Levels(s)	First: 10.1 ft Completion: 9.7 ft bgs	Sampling Method(s)	4-foot dual tube Geoprobe sampler with acetate liner		
Location	Berm of round pond; see site plan	Borehole Completion	Backfilled with grout to ground surface		

Elevation, feet	Depth, feet	SAMPLES: Interval	SAMPLES: Lab ID Number	Headspace PID, ppm	Graphic Log	MATERIAL DESCRIPTION	FIELD NOTES
	0					GRAVELLY SILT [FILL], light brown, dry, gravel to 1/4 inch dia.	
						Cinders	Unable to determine thickness of near-surface cinders due to poor sample recovery.
	5					CLAYEY SILT [FILL], dark brown, damp, medium stiff, little gravel to 1/2 inch dia.	
						GRAVELLY SILT [FILL], light brown, dry, gravel to 1 inch dia.	Sampler blocked by 2-inch rock.
	10					Cinders ▼	Cinders at least 4 ft thick, possibly up to 5 ft thick.
			2AU-27-13.3'			SILT [SEDIMENT], dark gray, wet	
			2AU-27-14.3'			SILTY CLAY, dark gray, moist	
	15		2AU-27-15.3'				
			2AU-27-16.3'			CLAY, reddish brown and gray, moist, soft [Bay Mud]	
			2AU-27-17.3'			▼ Becomes medium stiff	
	20					BOTTOM OF BORING AT 19 FEET	
	25						

Report: ENV_3PS/W_SOLON; File: BERKRICH.GPJ; 7/24/2002 2AU-27

URS

Project: UC Berkeley Richmond Field Station Project Location: Richmond, California Project Number: 51-09967067.00	**Log of Boring 2AU-28** Sheet 1 of 1

Date(s) Drilled	7/9/02	Logged By	B. Copeland	Checked By	
Drilling Method	Direct Push	Drill Bit Size/Type	2-inch-OD drive point	Total Depth of Borehole	10.0 feet
Drill Rig Type	Geoprobe	Drilling Contractor	Precision Drilling	Surface Elevation	Not available
Groundwater Levels(s)	First: None Completion: 0.5 ft bgs	Sampling Method(s)	4-foot dual tube Geoprobe sampler with acetate liner		
Location	Bottom of round pond; see site plan	Borehole Completion	Backfilled with grout to ground surface		

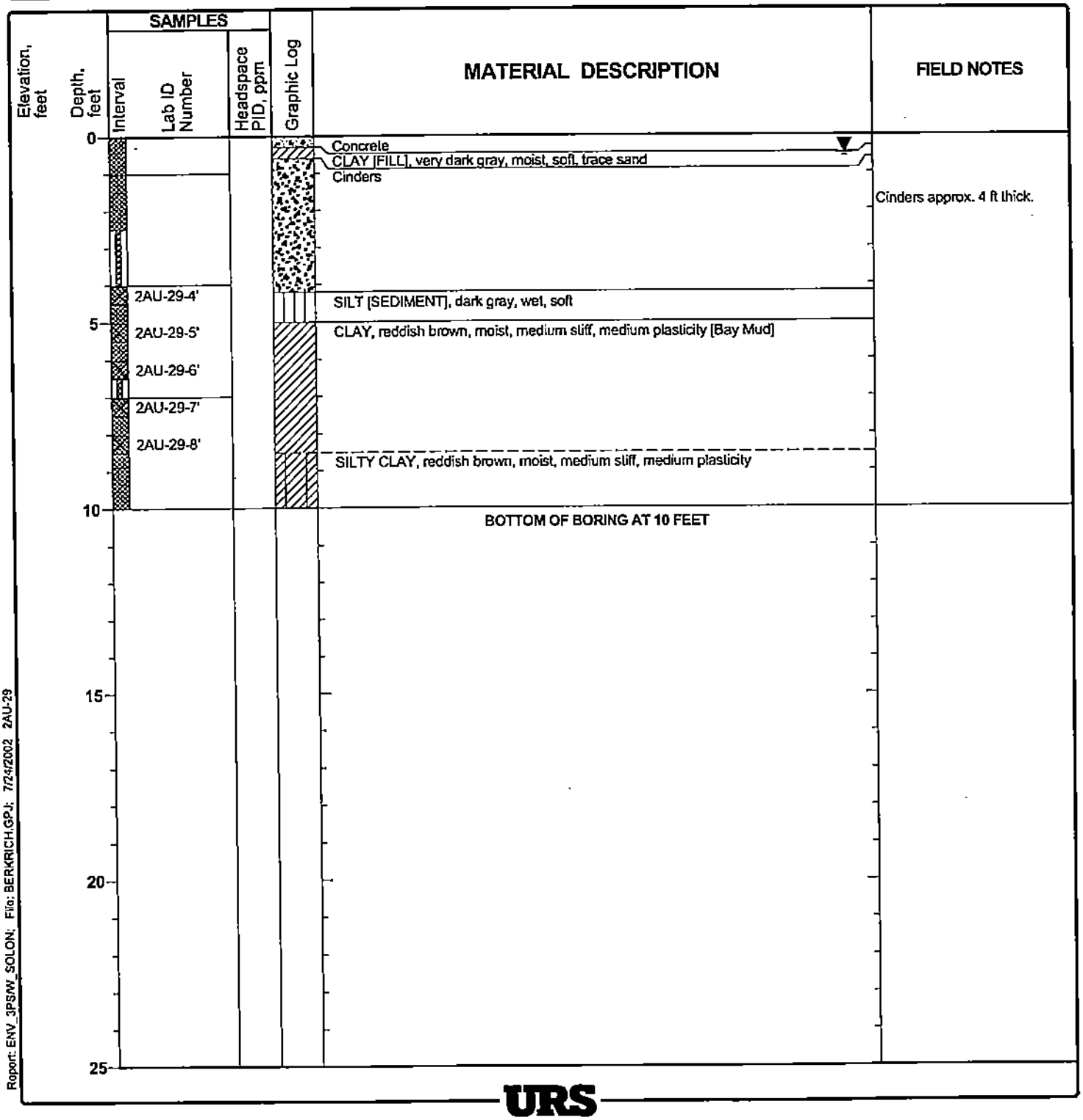
Elevation, feet	Depth, feet	SAMPLES: Interval	SAMPLES: Lab ID Number	SAMPLES: Headspace PID, ppm	Graphic Log	MATERIAL DESCRIPTION	FIELD NOTES
	0					Concrete	
						CLAY [FILL], black and green, wet, soft, some rounded gravel	
						Cinders	Unable to determine thickness of cinders due to poor sample recovery.
						SILT [SEDIMENT], dark gray, wet, soft	
	5		2AU-28-4'				
			2AU-28-5'			CLAY, reddish brown, moist, medium stiff [Bay Mud]	
			2AU-28-6'				
			2AU-28-7'				
			2AU-28-8'				
	10					BOTTOM OF BORING AT 10 FEET	
	15						
	20						
	25						

Report: ENV_3PS/W_SOLON; File: BERKRICH.GPJ; 7/24/2002 2AU-28

URS

Project: UC Berkeley Richmond Field Station **Project Location:** Richmond, California **Project Number:** 51-09967067.00	**Log of Boring 2AU-29** Sheet 1 of 1

Date(s) Drilled	7/9/02	Logged By	B. Copeland	Checked By	
Drilling Method	Direct Push	Drill Bit Size/Type	2-inch-OD drive point	Total Depth of Borehole	10.0 feet
Drill Rig Type	Geoprobe	Drilling Contractor	Precision Drilling	Surface Elevation	Not available
Groundwater Level(s)	First: 0.5 ft Completion: 0.5 ft bgs	Sampling Method(s)	4-foot dual tube Geoprobe sampler with acetate liner		
Location	Bottom of round pond; see site plan	Borehole Completion	Backfilled with grout to ground surface		



Report: ENV_3PS/W_SOLON; File: BERKRICH.GPJ; 7/24/2002 2AU-29

URS

Project: UC Berkeley Richmond Field Station
Project Location: Richmond, California
Project Number: 51-09967067.01

Log of Boring 2AU-30

Sheet 1 of 1

Date(s) Drilled	7/22/02	Logged By	B. Copeland	Checked By	
Drilling Method	Direct Push	Drill Bit Size/Type	2-inch-OD drive point	Total Depth of Borehole	22.0 feet
Drill Rig Type	Geoprobe	Drilling Contractor	Precision Drilling	Surface Elevation	8.66 feet MSL
Groundwater Level(s)	First: 7.2 ft bgs Completion: Not measured	Sampling Method(s)	4-foot dual tube Geoprobe sampler with acetate liner		
Location	Mercury Fulminate Area	Borehole Completion	Backfilled with grout to ground surface		

Elevation, feet	Depth, feet	SAMPLES Interval	Lab ID Number	Mercury, mg/kg	Graphic Log	MATERIAL DESCRIPTION	FIELD NOTES
	0					SILTY GRAVEL [FILL], light brown, dry, gravel to 1/2 inch dia.	
						CLAY [FILL], greenish gray, moist, some fine gravel, trace cinders	
	5					Some cinders	
						SILT [SEDIMENT], gray, wet, some clay, trace gravel to 1 inch dia.	
	10					With little fine-grained sand	Trace cinders in top of sampler tube.
						Becomes gravelly, well-rounded gravel to 1/4 inch dia., some fine-grained sand	
						GRAVELLY SAND, gray, wet, coarse-grained sand, fine gravel	
						GRAVELLY CLAY, gray, wet, gravel to 1/4 inch dia.	
	15					GRAVELLY SAND, dark gray, wet, fine- to medium-grained sand, well-rounded gravel to 1/2 inch dia.	
			2AU-30-16.5'	6.7			
			2AU-30-19.5'	0.27			
	20		2AU-30-20.5'	4.0		CLAY, brown, moist, soft, high plasticity (Bay Mud)	
						Becomes very stiff	
						BOTTOM OF BORING AT 22 FEET	
	25						

Report: ENV_3PSW_SOLON; File: BERKRICH.GPJ; 8/7/2002 2AU-30

URS

Project: UC Berkeley Richmond Field Station
Project Location: Richmond, California
Project Number: 51-09967067.01

Log of Boring 2AU-31

Sheet 1 of 1

Date(s) Drilled	7/22/02	Logged By	B. Copeland	Checked By	
Drilling Method	Direct Push	Drill Bit Size/Type	2-inch-OD drive point	Total Depth of Borehole	19.0 feet
Drill Rig Type	Geoprobe	Drilling Contractor	Precision Drilling	Surface Elevation	8.96 feet MSL
Groundwater Levels(s)	First: 4.8 ft Completion: 5.7 ft bgs	Sampling Method(s)	4-foot dual tube Geoprobe sampler with acetate liner		
Location	Mercury Fulminate Area	Borehole Completion	Backfilled with grout to ground surface		

Elevation, feet	Depth, feet	SAMPLES: Interval	SAMPLES: Lab ID Number	SAMPLES: Mercury, mg/kg	Graphic Log	MATERIAL DESCRIPTION	FIELD NOTES
	0					GRAVELLY CLAY [FILL], reddish brown, dry	
						Contains sandstone fragments	
	5					Cinders	Cinders approx. 3 ft thick.
						GRAVELLY SAND [SEDIMENT], orange-brown and gray, wet, fine- to medium-grained sand, well-rounded gravel to 1-4 inch dia.	
	10		2AU-31-11'	3.2		SAND, brown, wet, fine- to medium-grained, some gravel	Cinders observed in top of sampler at 13 ft probably slough; driller had to pull outer casing.
	15		2AU-31-16.5'	7.2		CLAY, brown, wet, stiff (Bay Mud)	
			2AU-31-17.5'	1.3			
	20					BOTTOM OF BORING AT 19 FEET	
	25						

Report: ENV_3PS/W_SOLON; File: BERKRICH.GPJ; 8/7/2002 2AU-31

URS

Project: UC Berkeley Richmond Field Station Project Location: Richmond, California Project Number: 51-09967067.01	**Log of Boring 2AU-32A** Sheet 1 of 1

Date(s) Drilled	7/22/02	Logged By	B. Copeland	Checked By	
Drilling Method	Direct Push	Drill Bit Size/Type	2-inch-OD drive point	Total Depth of Borehole	7.0 feet
Drill Rig Type	Geoprobe	Drilling Contractor	Precision Drilling	Surface Elevation	5.61 feet MSL
Groundwater Levels(s)	First: None Completion: 2.6 ft bgs	Sampling Method(s)	4-foot dual tube Geoprobe sampler with acetate liner		
Location	Rectangular Pond	Borehole Completion	Backfilled with grout to ground surface		

Elevation, feet	Depth, feet	SAMPLES: Interval	SAMPLES: Lab ID Number	SAMPLES: Mercury, mg/kg	Graphic Log	MATERIAL DESCRIPTION	FIELD NOTES
	0					Asphalt concrete GRAVELLY CLAY [FILL], tan, dry	
						Cinders, black to very dark maroon, very soft, degraded	Unable to determine thickness of cinders due to poor recovery; 2 ft to possibly 4 ft thick.
			2AU-32-a				
	5		2AU-32-b				
						SAND [SEDIMENT], gray, wet	
						BOTTOM OF BORING AT 7 FEET	
	10						
	15						
	20						
	25						

Report: ENV_3PS/W_SOLON; File: BERKRICH.GPJ; 8/7/2002 2AU-32A

URS

Project: UC Berkeley Richmond Field Station Project Location: Richmond, California Project Number: 51-09967067.01	**Log of Boring 2AU-32B** Sheet 1 of 1

Date(s) Drilled	7/22/02	Logged By	B. Copeland	Checked By	
Drilling Method	Direct Push	Drill Bit Size/Type	2-inch-OD drive point	Total Depth of Borehole	7.0 feet
Drill Rig Type	Geoprobe	Drilling Contractor	Precision Drilling	Surface Elevation	5.45 feet MSL
Groundwater Level(s)	First: None Completion: Not measured	Sampling Method(s)	4-foot dual tube Geoprobe sampler with acetate liner		
Location	Rectangular Pond	Borehole Completion	Backfilled with grout to ground surface		

Elevation, feet	Depth, feet	SAMPLES: Interval	SAMPLES: Lab ID Number	SAMPLES: Mercury, mg/kg	Graphic Log	MATERIAL DESCRIPTION	FIELD NOTES
	0					Asphalt concrete GRAVELLY CLAY to CLAYEY GRAVEL [FILL], dark brown and gray, dry	
						Cinders	Unable to determine thickness of cinders due to poor recovery; 1-1/2 ft to possibly 4 ft thick.
	5		2AU-32-c				
			2AU-32-d			GRAVELLY SAND [SEDIMENT], light brown, wet, little silt	
						BOTTOM OF BORING AT 7 FEET	
	10						
	15						
	20						
	25						

URS

Report: ENV_3PSW_SOLON; File: BERKRICH.GPJ; 8/7/2002 2AU-32B

Project: UC Berkeley Richmond Field Station Project Location: Richmond, California Project Number: 51-09967067.01	**Log of Boring 2AU-33A** Sheet 1 of 1

Date(s) Drilled	7/22/02	Logged By	B. Copeland	Checked By	
Drilling Method	Direct Push	Drill Bit Size/Type	2-inch-OD drive point	Total Depth of Borehole	7.0 feet
Drill Rig Type	Geoprobe	Drilling Contractor	Precision Drilling	Surface Elevation	5.40 feet MSL
Groundwater Level(s)	First: 4.0 ft bgs Completion: Not measured	Sampling Method(s)	4-foot dual tube Geoprobe sampler with acetate liner		
Location	Rectangular Pond	Borehole Completion	Backfilled with grout to ground surface		

Elevation, feet	Depth, feet	SAMPLES: Interval	SAMPLES: Lab ID Number	SAMPLES: Mercury, mg/kg	Graphic Log	MATERIAL DESCRIPTION	FIELD NOTES
	0					Asphalt concrete	
						CLAYEY GRAVEL to GRAVELLY CLAY [FILL], tan, dry	
						Cinders	Unable to determine thickness of cinders due to poor recovery; 1-1/2 ft to possibly 3-1/2 ft thick.
			2AU-33-a				
	5		2AU-33-b			GRAVELLY CLAY [SEDIMENT], gray, wet, some sand	
						BOTTOM OF BORING AT 7 FEET	
	10						
	15						
	20						
	25						

Report: ENV_3PS/W_SOLON; File: BERKRICH.GPJ; 8/7/2002 2AU-33A

URS

Project: UC Berkeley Richmond Field Station Project Location: Richmond, California Project Number: 51-09967067.01	**Log of Boring 2AU-33B** Sheet 1 of 1

Date(s) Drilled	7/22/02	Logged By	B. Copeland	Checked By	
Drilling Method	Direct Push	Drill Bit Size/Type	2-Inch-OD drive point	Total Depth of Borehole	13.0 feet
Drill Rig Type	Geoprobe	Drilling Contractor	Precision Drilling	Surface Elevation	8.71 feet MSL
Groundwater Levels(s)	First: 4.6 ft Completion: 6.4 ft bgs	Sampling Method(s)	4-foot dual tube Geoprobe sampler with acetate liner		
Location	Rectangular Pond	Borehole Completion	Backfilled with grout to ground surface		

Elevation, feet	Depth, feet	SAMPLES: Interval	SAMPLES: Lab ID Number	SAMPLES: Mercury, mg/kg	Graphic Log	MATERIAL DESCRIPTION	FIELD NOTES
	0					GRAVELLY CLAY to CLAYEY GRAVEL [FILL], tan, dry, very stiff clay	
	5					Cinders	Cinders approx. 3-1/2 ft thick.
			2AU-33-c				
			2AU-33-d			SILT [SEDIMENT], gray and reddish brown, wet	
	10					GRAVELLY SAND, gray and brown, wet, subangular gravel to 1/2 inch dia.	
						BOTTOM OF BORING AT 13 FEET	
	15						
	20						
	25						

Report: ENV_3PS/W_SOLON; File: BERKRICH.GPJ; 8/7/2002 2AU-33B

URS

Project: UC Berkeley Richmond Field Station Project Location: Richmond, California Project Number: 51-09967067.01	**Log of Boring 2AU-34** Sheet 1 of 1

Date(s) Drilled	7/22/02	Logged By	B. Copeland	Checked By	
Drilling Method	Direct Push	Drill Bit Size/Type	2-inch-OD drive point	Total Depth of Borehole	10.0 feet
Drill Rig Type	Geoprobe	Drilling Contractor	Precision Drilling	Surface Elevation	5.56 feet MSL
Groundwater Level(s)	First: None Completion: Not measured	Sampling Method(s)	4-foot dual tube Geoprobe sampler with acetate liner		
Location	Rectangular Pond	Borehole Completion	Backfilled with grout to ground surface		

Elevation, feet	Depth, feet	SAMPLES: Interval	SAMPLES: Lab ID Number	SAMPLES: Mercury, mg/kg	Graphic Log	MATERIAL DESCRIPTION	FIELD NOTES
	0					GRAVELLY CLAY to CLAYEY GRAVEL [FILL], tan, dry	
						Cinders	Unable to determine thickness of cinders due to poor recovery; 1-1/2 ft to possibly 4 ft thick.
	5		2AU-34-5'			SILTY CLAY [SEDIMENT], brownish gray, wet	
			2AU-34-6'			SAND, brown, wet	
			2AU-34-7'			CLAYEY SAND, brown, wet	
	10					BOTTOM OF BORING AT 10 FEET	
	15						
	20						
	25						

Report: ENV_JPS/W_SOLON; File: BERKRICH.GPJ; 8/7/2002 2AU-34

URS

Woodward-Clyde Consultants

PROJECT NAME Zeneca Ag Products NO. 92C0461A

BORING LOCATION H-58 pilot boring		ELEVATION AND DATUM	
DRILLING AGENCY Kvilhaug Well Drilling Co.	DRILLER Chris Pruner	DATE STARTED 3/9/93 → DATE FINISHED 3/9/93	
DRILLING EQUIPMENT Mobile B-53 Truckmount		COMPLETION DEPTH	SAMPLER Continuous Moss+Spriggs+Kenwood 2.5"
DRILLING METHOD 7-inch hollow stem auger	DRILL BIT 4 Tooth Carbide	NO. OF SAMPLES / DIST.	UNDIST.
SIZE AND TYPE OF CASING NA		WATER LEVEL: FIRST ATD ~6.5 ft. B.G.S.	COMPL. / 24 HRS.
TYPE OF PERFORATION NA	FROM TO	LOGGED BY: S. Bluestone	CHECKED BY:
SIZE AND TYPE OF PACK NA	FROM TO		
TYPE OF SEAL NO. 1 Portland I-II Neat Cement w/~5% Granular Bentonite	FROM GS TO 60.0		
NO. 2	FROM TO		

DEPTH (feet)	DESCRIPTION	GRAPHIC LOG: Lithology	GRAPHIC LOG: Piezometer Installation	H nu ppm	Piezometer Data	SAMPLES: Sample Number	SAMPLES: Recov. (feet)	REMARKS (Drill Rate, Fluid Loss, Odor, etc.)
	Unpaved ground surface; freshly cleared of vegetation							
	Loose, damp to moist, dark red to dusky red (10 R 3/6 to 3/4), silty to very fine sandy clay (SM-SC) Cinder Fill	Cinder Fill						0815 - Began Clearing Site Access
2	Soft, moist, dark yellowish brown (10 YR 4/4), silty sand to very fine sandy clay (SM-SC) with trace coarse sandy fine gravel fragments Fill	SM to SC (Fill)			2			0940 - Began Drilling (Hand Augered Upper 4' to 5')
4	Medium dense, moist, olive yellow to light yellowish brown (2.5 Y 6/6 to 6/3), silty fine to clayey sand	SM to SC			4			
6	Very soft, wet, mottled tan-yellow and black sandy clay. Minor caliche	CL			6 ATD	Moss Run No. 1	3.0/3.0	0945 BR1
	Very poorly sorted gravelly sand. Gravel clasts are siliceous and reach a maximum diameter of approximately 1/2 inch	SW						
8	Pale tan-yellow sandy clay with iron oxide mottling	CL			8			0955 ER1
	Massive light gray sandy clay with weak iron oxide mottling. Sandier below a depth of 11 feet							1002 BR2
10		CL			10	Moss Run No. 2	3.0/4.0	
12					12			1010 HRS ER2
	Yellowish-brown, very sandy clay with very fine sand	CL						1015 HRS BR3
14	Yellowish-brown, very fine silty clayey sand with two inch thick sandy clay at 14 1/2 feet	SM to SC			14	Moss Run No. 3	3.0/5.0	
16	Becomes olive brown (2.5 Y 4.4): stiff, wet, very fine sandy clay (SC) with trace subangular to subrounded medium to coarse sand, locally; and trace carbonaceous debris	SC to CL			16			
18					18			1020 ER3
								1024 BR4
20					20	Moss Run No. 4	2.7/5.0	
22	Stiff, wet, olive to olive gray (5 Y 5/3 to 5/2) clay (CL), moderately to highly plastic, locally, moderately developed clayey pedigenic structure; occasional trace carbonaceous debris (black "flecks"); locally trace to little fine, subangular sand	CL			22			1035 ER4
24					24	Moss Run No. 5	2.0/2.0	1042 BR5
								1048 ER5
26					26	Moss Run No. 6	2.5/2.5	1052 BR6
								1104 ER6
28	Local light gray (5 Y 7/1) concretionary mineral nodules and stringers (caliche?) trace to little amounts in olive to olive gray clay matrix; color becomes slightly mottled to olive; increase in carbonate nodules (?) to ~32 feet	CL			28	Moss Run No. 7	25/2.5	1112 BR7

Woodward-Clyde Consultants

PROJECT NAME Zeneca Ag Products NO. 92C0461A

DEPTH (feet)	DESCRIPTION	GRAPHIC LOG: Lithology	GRAPHIC LOG: Piezometer Installation	Water Content	Piezometer Data	SAMPLES: Type No.	SAMPLES: Recov. (feet)	SAMPLES: Penetra. Resist. (Blows 6 in.)	REMARKS (Drill Rate, Fluid Loss, Odor, etc.)
30									(Cont'd from prev. pg) 1118 ER7 1128 BR8
32	Yellow-brown, interbedded medium grained, well sorted gravelly sand and fine-grained poorly sorted sand. A two inch thick bed of sandy clay is present at a depth of approximately 32 feet.	SW & SM				Moss Run #8	2.7/3.0		
	Two inches of carbaneceous debris over four inches of light grey clay which has thin root holes	PT & CL							1135 ER8 1155 BR9
34	Stiff, wet, dark gray to very dark gray (5Y 4/1 to 3/1), clay (CL), highly plastic, very clayey pedicenic structure, trace red mineral grains, v. fine sand size Slight increase in plasticity	CL				Moss Run #9	3.0/5.0		
36									
38	Dense to very stiff, wet, dark gray to olive gray (5Y 4/1 to 4/2), sandy clay (SC), fine, subrounded, well sorted, moderate plastic	SC				Moss Run #10	2.5/2.5		1210 HRS ER9-> Core slid out of barrel in hole. Set "catcher" to retrieve. resumed 1240
40	Very stiff to hard (?), wet, olive gray to dark olive gray (5Y 4/2 to 3/2), silty clay to clay (CL) w/ trace subrounded fine to med. sand; lightly mottled, locally; moderate to highly plastic	CL							1250 BR10 1303 ER10
42	Very stiff to hard, wet, olive gray to dark olive gray (5Y 4/2 to 4/1), lightly mottled, w/ trace carbonate stringers; sandy clay (SC) w/ fine to med subrounded sand grains	SC				Moss Run #11	1.0/2.5		Poor recovery (too stiff?) 1320 ER11 1325 BR12
44						Moss Run #12	0.0/2.5		No recovery; clay is too hard for moss system? Slow, hard, drilling
46	Increase in clay content – 44' tp 47'; very stiff to hard; grades into sandy clay (SC) Trace subrounded to well rounded fine gravel to coarse sand present, locally.	CL				Moss Run #13	0.0/2.5		1345 ER12 1405 BR13 1412 ER13
48	Grades into med dense to dense, saturated, silty very fine to med grained sand to clayey very fine to med sand (SM to SC); olive to dark olive gray (5Y 4/2 to 3/2)	SC				DS 1	100%	5 8 9	1438 Began drive sampling (likely majority of rec. sample is slough)
50									- Drilled through slough in auger annals
52	Becomes lightly mottled; increasingly clayey	SM to SC				DS 2	100%	11 18 24	1520 HRS
54	Dense, saturated, silty very fine sandy clay								- Augers filling w/ silty & clayey material when extracting drive sampler (flowing silty sands)
56		SC to CL				DS 3	100%	10 16 23	1550 HRS
58									
60						DS 4	100%	14 24 28	1612 HRS 1630 HRS Began set-up for grouting
	BOH = 60.0 ft.								
62									1830 - completed grouting moved to decon area
64									1930 - cleaned up & secured site 2000 - departed site

FIELD LOG OF BORING NO. H-58 pilot boring SHEET 2 OF 2

H-36

LOG OF BORING No. B-4

DATE DRILLED: 9/15/87 EQUIPMENT: B402-22

DESCRIPTION: ELEVATION: 11.1' MSL

DRILLING CONTRACTOR Exploration Geoservices

DRILLER Tim Whitney

BY MLB DATE 1/6/88 CHK'D BY TWC

SAMPLE NO. / SAMPLE TYPE	BLOWS PER 6 INCHES	SPT-N	INCHES DRIVEN / INCHES RECOVERED	NUMBER OF RINGS	DEPTH IN FEET	WELL OR PIEZOMETER CONSTRUCTION	GRAPHIC LOG	TESTS
1s	10-11-14		18/18		2.5			
2s	12-27-34		18/18					
3s	10-22-30		18/18		5			
4s	6-9-15		18/18					
5s	6-8-12		18/18		7.5			
6s	5-5-7		18/12					
7s	3-7-14		18/18		10			
8s	8-9-15		18/18					
9s	11-19-30		18/18		12.5			
10s	8-11-16		18/15		15			
11s	7-13-16		18/14					
12s	6-8-43		18/12		17.5			
13s	12-30-24		18/12					

Cinders, SILT (ML) - loose, moist, dark reddish brown (10R 3/4), no plasticity.

SILTY CLAY (CL) - stiff, moist, moderate olive brown (5Y4/4), medium plasticity, salt crystals (gypsum).

SILTY SAND (SM) - medium dense, moist, moderate olive brown (5Y 4/4), no plasticity, very fine to fine, well-sorted.

SILTY SANDY CLAY (CL) - very stiff, moist, moderate olive brown (5Y 4/4), medium plasticity, sand fine to very fine.

Grades into SILTY CLAY (CL) - medium stiff to stiff, wet, moderate olive brown (5Y 4/4), medium plasticity, salt crystals, gray mottling.

▼ Same with bluish gray streaks (unstiff to stiff)

Becoming moister, (medium stiff).

Grades to CLAYEY SILTY SAND (SC) - very loose to medium dense, wet, moderate olive brown (5Y 4/4), low plasticity, very fine to fine sand, well-sorted.

Same.

▽

SILTY SAND (SM) - loose to medium dense, wet, light olive brown (5Y 5/6), no plasticity, very fine to fine, well-sorted, grades to silty clay at 16.0'.

SILTY CLAY (CL) - medium stiff to stiff, wet, light olive brown (5Y 5/6), medium to low plasticity.

CLAYEY SILTY SAND (SC) - loose to medium dense, wet, low plasticity, very fine to fine, well-sorted, moderate yellowish brown (10YR 5/4).
Grades to SANDY SILTY CLAY (CL) at 20.5'.
Stiff to very stiff, wet, moderat yellowish brown (10YR 5/4), medium plasticity very fine.

THIS SUMMARY APPLIES ONLY AT THE LOCATION OF THIS BORING AND AT THE TIME OF DRILLING. SUBSURFACE CONDITIONS MAY DIFFER AT OTHER LOCATIONS AND MAY CHANGE AT THIS LOCATION WITH THE PASSAGE OF TIME. THE DATA PRESENTED IS A SIMPLIFICATION OF ACTUAL CONDITIONS ENCOUNTERED.

PROJECT NO.

87-1182.18

DRAWING NO.

THE MARK GROUP
ENGINEERS & GEOLOGISTS, INC.

Hydrogeologic Investigation
Stauffer Chemical Company
Richmond, California

LOG OF BORING No. B-4

DATE DRILLED: 9/15/87 9/16/87 EQUIPMENT: B402-22

DESCRIPTION: ELEVATION: 11.1' MSL

DRILLING CONTRACTOR Exploration Geoservices

DRILLER Tim Whitney

BY MLB DATE 1/6/88 CHK'D BY TWC

SAMPLE NO. / SAMPLE TYPE	BLOWS PER 6 INCHES	SPT-N	INCHES DRIVEN / INCHES RECOVERED	NUMBER OF RINGS	DEPTH IN FEET	WELL OR PIEZOMETER CONSTRUCTION	GRAPHIC LOG	DESCRIPTION	TESTS
								to fine with fine gravel and coarse sand (5%).	
14s	12-17-30		18/12					Same.	
15s	16-25-35		18/14		22.5			SILTY CLAY (CL) - stiff to hard, wet, moderate yellowish brown, medium plasticity, very coarse sands, and small pebbles (5%), chert, subrounded to angular.	
16s	15-30-45		18/8					Same with salt seams.	
17s	8-15-20		18/12		25			Same. Medium stiff to stiff.	
18s	10-11-15		18/18		27.5			CLAYEY SILT (ML) - soft to medium stiff, wet, moderate yellowish brown (10YR 5/4), low plasticity.	
19s	6-10-13		18/18					Same.	
20s	10-17-28		18/16		30			Same with angular sandstone fragments (pebble size) (1 - 2%).	
21s	13-24-27		18/18					CLAYEY SANDY SILT (ML) - medium stiff, wet, moderate olive brown (5Y 4/4), low plasticity, very fine sand, well-sorted, rust stained, coarse sand - subrounded (1%).	
22s	10-20-28		18/18		32.5			SILTY CLAY (CL) - medium stiff to stiff, moist, grayish green (5G 5/2), brown mottling, medium plasticity.	
23s	8-13-23		18/15		35			seam 34.8 - 35.2' SILTY GRAVELLY SAND (SW) - medium dense, wet, greenish gray (5G 5/2), medium to very coarse, subrounded quartz grains, very poorly sorted clay (1%); gravel 20%.	
24s	10-17-24		18/14					SILTY SANDY CLAY (CL) - medium stiff to stiff, wet, greenish gray, (5G 5/2), sand very fine, medium plasticity, sand 5%.	
25.5	10-14-16		18/18		37.5			Same.	
26s	12-17-30		18/15					Same.	

THIS SUMMARY APPLIES ONLY AT THE LOCATION OF THIS BORING AND AT THE TIME OF DRILLING. SUBSURFACE CONDITIONS MAY DIFFER AT OTHER LOCATIONS AND MAY CHANGE AT THIS LOCATION WITH THE PASSAGE OF TIME. THE DATA PRESENTED IS A SIMPLIFICATION OF ACTUAL CONDITIONS ENCOUNTERED.

THE MARK GROUP
ENGINEERS & GEOLOGISTS, INC.

Hydrogeologic Investigation
Stauffer Chemical Company
Richmond, California

PROJECT NO
87-1182.18
DRAWING NO

LOG OF BORING No. B-4

DATE DRILLED: 9/16/87 EQUIPMENT: B402-22

DESCRIPTION: ELEVATION: 11.1' MSL

DRILLING CONTRACTOR Exploration Geoservices

DRILLER Tim Whitney

BY HLB DATE 1/6/88 CHK'D BY TWC

SAMPLE NO. / SAMPLE TYPE	BLOWS PER 6 INCHES	SPT, N	INCHES DRIVEN / INCHES RECOVERED	NUMBER OF RINGS	DEPTH IN FEET	WELL OR PIEZOMETER CONSTRUCTION	GRAPHIC LOG		TESTS
27s	10-14-24		18/12					Same. Stiff to very stiff.	
28s	30-55-55		18/15		42.5			SILTY SANDY CLAY (CL) - very stiff, moist, dark greenish gray (5G 4/1), medium plasticity, sand very fine (less than 5%).	
29s	30-40-85		18/15					Same. Very stiff to hard.	
30s	15-40-60		18/10		45				
31s	30-55-65		18/18		47.5			Same. Olive gray (5Y 4/1).	
32s	25-75-100		18/15					CLAYEY SANDY SILT (ML) - very stiff, moist, grayish olive (10Y 4/2), low plasticity, sand very fine to fine (20%).	
33s	20-60-75		18/11		50			SILTY SANDY CLAY (CL) - very stiff, wet, grayish olive (10Y 4/2), medium plasticity, sand very fine to fine (5%).	
34s	50-80-100 (10Y 4/2)		18/15					CLAYEY SAND (SC) - stiff, wet, grayish olive (10Y 4/2), low plasticity, very fine to fine.	
35s	13-40-55		18/17		52.5			SANDY CLAY (CL) - very stiff, wet, grayish olive (10Y 4/2), medium plasticity, sand very fine to fine (40%), trace coarse sand.	
36s	30-40-54		18/16					Same.	
37s	40-70-100		18/15		55			Same.	
38s	70-80-90		18/15		57.5			SILTY CLAY (CL) - very stiff, wet, olive gray (5Y, 4/1), medium plastic,	
								Same with light gray mottling.	
39s	20-30-45		18/15					SILTY CLAY (CL) - stiff, wet, grayish olive (10Y 4/2), medium plasticity, trace inclusions of organic matter.	
								Boring concluded at 59.5'.	

THIS SUMMARY APPLIES ONLY AT THE LOCATION OF THIS BORING AND AT THE TIME OF DRILLING. SUBSURFACE CONDITIONS MAY DIFFER AT OTHER LOCATIONS AND MAY CHANGE AT THIS LOCATION WITH THE PASSAGE OF TIME. THE DATA PRESENTED IS A SIMPLIFICATION OF ACTUAL CONDITIONS ENCOUNTERED.

PROJECT NO

87-1182.16

DRAWING NO.

THE MARK GROUP
ENGINEERS & GEOLOGISTS, INC.

Hydrogeologic Investigation
Stauffer Chemical Company
Richmond, California

APPENDIX B

APPENDIX B

The quality assurance/quality control (QA/QC) review process is used to evaluate the quality and usability of the analytical data. A summary of the parameters that were reviewed as part of the QA/QC evaluation process is provided below followed by a brief explanation of the data qualifiers that were assigned to results during the QA/QC process.

B.1 Summary of QA/QC Review Parameters

Method Holding Times

The analytical methods used for the investigation have prescribed holding times. The method holding time is defined as the maximum amount of time after collection that a sample may be held prior to extraction and/or analysis. Sample integrity becomes questionable for samples extracted and/or analyzed outside of the prescribed holding times due to degradation and/or volatilization of the sample. The analytical results of such samples extracted and/or analyzed outside the prescribed method holding time are suspect. The QA/QC review identifies results with exceeded method holding times.

Holding times were not exceeded in any case.

Method Blanks

Method blanks are prepared in the laboratory using deionized water. Method blanks are extracted and/or analyzed following the same procedures as an environmental sample. Analysis of the method blank indicates potential sources of contamination from laboratory procedures (e.g. contaminated reagents, improperly cleaned laboratory equipment) or persistent contamination due to the presence of certain compounds in the ambient laboratory environment. The QA/QC review identifies method blanks with detections of target analytes and evaluates the effect of the detections on associated sample results.

In all cases analyte concentrations were not detected in method blanks indicating that the laboratory environment was not contaminated.

Matrix Spikes and Laboratory Control Samples

Matrix spikes (MS), matrix spike duplicates (MSD), laboratory control samples (LCS) and laboratory control sample duplicates (LCSD) are analyzed by the laboratory to evaluate the accuracy and precision of the sample extraction and analysis procedures and to evaluate potential matrix interference. Matrix interference, the effect of the sample matrix on the analysis, may partially or completely mask the response of analytical instrumentation to the target analyte(s). Matrix interference may have a varying impact

on the accuracy and precision of the extraction and/or analysis procedures, and may bias the sample results high or low.

The MS or MSD is prepared by adding a known quantity of the target compound(s) to a sample. The sample is then extracted and/or analyzed as a typical environmental sample and the results are reported as percent recovery. The spike percent recovery is defined as:

$$\text{Recovery (\%)} = \frac{\text{spike analysis result - original sample concentration}}{\text{concentration of spike addition}} \text{ x100\%}$$

MS and MSD recoveries are reviewed for compliance with laboratory-established control limits to evaluate the accuracy of the extraction and/or analysis procedures.

LCS and LCSD are prepared exactly like MS and MSD using a clean control matrix rather than an environmental sample. LCS and LCSD are used to evaluate laboratory accuracy independent of matrix effects.

The QA/QC review identifies spike recoveries outside laboratory control limits and evaluates the effect of these recoveries on the associated sample results.

LCS and LCSD recoveries were all within control limits indicating acceptable analytical accuracy. In several cases MS and MSD recoveries were outside control limits. In most of these instances the samples spiked were not from this project and therefore do not suggest anything about the matrix heterogeneity of the project samples. In several additional instances the original concentration of the sample spiked was more than four times the spike concentration. In these cases the percent recovery is meaningless and is not used to qualify associated sample results. In cases where a project sample was used, the spike recoveries are both meaningful and outside control limits the associated sample results are qualified as estimated and flagged with a ""**J**" if detected or a "**UJ**" if undetected.

Laboratory Duplicate Analyses

Duplicate analyses are performed by the laboratory to evaluate the precision of analytical procedures. The laboratory may perform MSD and/or LCSD analyses.

Precision is evaluated by calculating a relative percent difference (RPD) using the following equation:

$$\text{RPD (\%)} = \left| \frac{(\text{Spike Concentration} - \text{Spike Duplicate Concentration})}{\frac{1}{2}(\text{Spike Concentration} + \text{Spike Duplicate Concentration})} \right| \text{ x 100\%}$$

The RPD is compared to laboratory-established control limits to evaluate analytical precision. The QA/QC review identifies RPDs outside laboratory control limits and evaluates the effect of these recoveries on the associated sample results.

In a few cases the RPD was outside control limits. In many of these, the sample analyzed was not from this project and therefore would not suggest anything about matrix

heterogeneity of the project samples. In one case both the original and duplicate concentrations were less than five times the reporting limit, in another case both concentrations were below the reporting limit. In both cases qualification was judged to be unnecessary. Finally, one SVOC MS/MSD RPD was outside control limits, however, sample results are not qualified based on MS/MSD results alone, therefore no qualification was judged necessary. In all other cases RPDs were within control limits.

Surrogate Recoveries

Surrogates are organic compounds that are similar to the target analytes in terms of their chemical structures and response to the analytical instrumentation, but are not usually detected in environmental samples. Surrogates are added to each environmental and laboratory QC sample to monitor the effect of the matrix on the accuracy of the extraction and/or analysis of organic analytes. Results for surrogate analyses are reported in terms of percent recovery (defined above). Reported recoveries are compared to laboratory-established control limits to evaluate sample-specific accuracy. The QA/QC review identifies surrogate recoveries outside laboratory control limits and evaluates the effect of these recoveries on the sample results.

In one case a VOC surrogate recovery was high, however the associated sample result was non-detect, therefore no qualification was required. In two cases, one or more SVOC surrogate recoveries were below lower control limits. Samples were qualified as suggested in EPA guidelines. The acid fraction for one sample was rejected for non-detects and flagged with an "**R**". In all other cases surrogate recoveries were within control limits.

B.2 Explanation of Analytical Data Qualifiers

The analytical data were reviewed and qualified following USEPA guidelines for organic and inorganic data review. The qualifiers assigned to results during the QA/QC process are defined below.

UJ The analyte was not detected above the sample quantitation limit. However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample.

J The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.

R The sample results are rejected due to serious deficiencies in the ability to analyze the sample and meet quality control criteria. The presence or absence of the analyte cannot be verified.

B.3 QA/QC Evaluation Summary

In summary, the QA/QC review found the data to be of acceptable quality, for intended use, with the exception of results that were assigned an "**R**" qualifier. "**R**" qualifiers

indicate that the reported result has been rejected due to serious deficiencies in the ability to analyze the sample and meet quality control criteria, and is therefore unusable.

All other project data used in the evaluation are of acceptable quality, including results that are qualified as estimated with a "J" or "UJ".