

**Phase III Field Sampling Plan**  
**University of California, Richmond Field Station Site**  
**May 21, 2012**

**Response to Comments**  
**Department of Toxic Substances Control, June 22, 2012**

August 3, 2012

Page 1 of 5

UC Berkeley Ref. No.	Page/ Sect No.	DTSC Comment	UC Berkeley Response
1	N/A	Mercury Fulminate Area: Presentations of samples associated with the mercury fulminate area are limited to analysis for elementals and methyl mercury. The historic data presented for this area in the Sampling Plan is also limited to mercury. Chemical data in addition to the mercury data needs to be provided in order for DTCS to determine whether analysis for additional chemicals is needed to characterize this area.	All chemical data for historic samples collected in the MFA have been added to Appendix A. Text was also amended to include a brief summary of previous sampling results exceeding commercial screening criteria in the MFA.
2	N/A	Transformer Area: The figures and text discussing step-out samples about Building 150 indicate that PCB concentrations were elevated at boring B15006; however, review of the data from the phase II report indicates that the elevated PCBs levels were found at boring B15005 (Arochlor 1254; 0.49 mg/kg). The tables, text, and figures need to be revised as well as the proposed step-out sampling locations.	The text, tables, and figures have been revised to propose step-out sampling at boring B15005.
3	N/A	Building 128: Clarify whether Building 128 is the original building that was used by the California Cap Company or whether the footprint of the building has been altered. If there have been alterations to the building footprint this should be identified and the location of samples may need to be amended to reflect any changes.	The historic California Cap Company buildings are shown on Figure 9. The original footprint of Building 128 has not changed; however, additional building space was added on in subsequent years. The proposed sampling provides comprehensive coverage of the original Building 128 boundaries.
4	Page 8, Section 2.2.6	Transformer House: Include a figure identifying the locations of the samples that exceeded the commercial/industrial CHHSL for benzo(a)pyrene equivalents and provide the screening value.	Figure 11 has been updated to show that the locations at the former California Cap Company transformer house exceeded the commercial/industrial CHHSL for benzo(a)pyrene.
5	Page 12, Section	DQOs for Building 201 Mounds: The depth of sampling within the soil mounds is identified as 0 to 2.5 feet below ground surface, based on the estimated heights of the mounds in comparison to the surrounding coastal terrace prairie. Actual sample depths should be evaluated based on field observations and the samples should also be collected in the fill just above the native soil interface.	The estimated elevation of the mounds was based on field observations during site walks; therefore, it is assumed that the max sampling depth will be approximately 2.5 feet below ground surface. Actual sampling depths will be evaluated in the field during sampling activities and considerations will include soil type, depth, and indications of the former native or natural surface soils.
6	Pages 13 to 15	DQOs for Groundwater at Piezometer CTP: The sampling plan proposes that initial grab sample locations will include sampling near Piezometer CTP to compare the two sampling methods (grab versus piezometer sampling). Specify that the piezometer will be sampled at the same time. The sampling plan proposes that grab ground water samples will be collected in the permeable zone based on the information collected during the installation of the Phase I piezometers. Specify continuous coring or CPT at grab samples locations to characterize the shallow lithology and to identify the permeable zone that is targeted for sampling at each location. Also, plan on confirming the total depth of contamination at multiple locations by sampling from underlying water-bearing zone(s).	The text has been revised to indicate that the piezometer CTP will be sampled at the same time as the collection of grab groundwater samples. The DQOs have been clarified to define the purpose of the investigation in the CTP area: to identify potential sources of carbon tetrachloride upgradient of the CTP piezometer, not to provide comprehensive vertical or lateral extent of carbon tetrachloride detections. The piezometer CTPdeep, screened from 30 to 40 feet, indicated no detections of carbon tetrachloride in groundwater during one event. Continuous coring or CPT are not proposed for this investigation, as the intent is to focus on the concentrations detected at piezometer CTP which is screened from 7-17 feet bgs. Groundwater samples for this investigation will be collected from this interval. Additional text has been added to further clarify the data quality objectives for this task.
7	Page 17, Section 3.3.1	MFA Mercury Sampling: Please identify the sample collection method, sample preparation and analytical method that will be used for methyl mercury samples.	Methyl mercury will be analyzed through Brooks-Rand method BR-0011. Text has been amended accordingly.

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August 3, 2012

Page 2 of 5

UC Berkeley Ref. No.	Page/ Sect No.	DTSC Comment	UC Berkeley Response
8	Figures 6-8	Historic Mercury Concentrations: Please superimpose the outline of the relevant California Cap Company Buildings on these figures.	Historic California Cap Company buildings have been added to Figures 6, 7, and 8.
9	Figure 7	Historic Mercury Concentrations 1 to 5 feet bgs: Please add the location label for sample MF 2-9. In addition it appears that when multiple samples were collected from soil borings, the highest concentration is not identified on the figure. For example, boring MF2-20 is identified as a green triangle, but one of the concentrations is 380 mg/kg. This concentration is greater than the commercial/industrial CHHSL of 180 mg/kg and should be depicted with a blue triangle. The data set presented on this figure should be reviewed and the correct icons included.	Figures 6, 7, and 8 have been reviewed to ensure they include all sample location labels. The color of the sample location indicates the highest concentration recorded at that location for the applicable depth interval presented in the respective figure.
10	Figure 11	Indicate on this figure which samples will be analyzed for PCBs and which samples will be analyzed for PAHs.	Figure 11 has been updated to indicate which samples will be analyzed for PCBs and PAHs.
11	Table 1	<p>Table 1 – Sample Registry and Rationale:</p> <ul style="list-style-type: none"> <li>a) Due to the elevated concentrations of lead and PAHs in sample CY03, add lead and PAHs to the analysis of samples. In addition, a fourth sample point, located to the northeast of location CY03 needs to be added to bound the contaminants previously detected. Also, correct the sample ID for point locations CY18 to CY1802.</li> <li>b) Point Location CY22 and 23: It is unclear why lead is included for analysis for these samples as the concentrations of lead from boring CY05 ranged from 5.82-25.1 mg/kg. It appears that the analysis should be for arsenic.</li> <li>c) Point Location CY27, CY28, and 29: Based on the elevated concentrations of arsenic (31.7 mg/kg) and lead (571 mg/kg) found in sample CY09, samples from these locations should be analyzed for lead and arsenic.</li> <li>d) Point Locations CY30, CY31, and CY32: Based on the elevated concentrations of arsenic (27.8 mg/kg) found in location CY10, add arsenic to these samples locations.</li> <li>e) Point Locations CY36, CY37, and CY38: Based on the elevated concentrations of arsenic (29.9 mg/kg) found in location CY12, add arsenic to these samples locations.</li> </ul>	<ul style="list-style-type: none"> <li>a) Lead and PAHs have been added to the analysis for the step-out samples around boring CY03. An additional step-out sample has been added to the northeast to bound the contaminants in this direction. The sample IDs in Table 1 were reviewed and corrected.</li> <li>b) Point locations with elevated concentrations of arsenic related to pyrite cinders identified at CY05 are not considered for step-out samples. Lead is not proposed as an analyte for Phase III at these locations.</li> <li>c) Point locations with elevated concentrations of arsenic related to pyrite cinders identified at CY09 are not considered for step-out samples. Lead has been added to the list of analytes for CY09.</li> <li>d) Point locations with elevated concentrations of arsenic related to pyrite cinders identified at CY10 are not considered for step-out samples.</li> <li>e) Point locations with elevated concentrations of arsenic related to pyrite cinders identified at CY12 are not considered for step-out samples.</li> </ul>
12	Page 6, Section 2.2.1	Mercury Fulminate Area. This section summarizes previous investigations that took place in this area. A sub-section should be added describing any removal of mercury-contaminated soil in the MFA. The figures depicting the MFA should be revised to clearly show the boundaries of those removal actions.	<p>No removal actions have occurred in the MFA; this has been clarified in the text.</p> <p>The remediated area south of the MFA has been added to this figure.</p>
13	Page 9, Section 2.2.6	Transformer and Corporation Yard Step-outs. This section summarizes previous investigations that took place in these areas. In the last paragraph of bullet (2), it is stated that total benzo(a)pyrene equivalents concentrations exceeded its California Human Health Screening Level (CHHSL). The text should be revised to clearly identify that the CHHSL used for comparison is the CHHSL assuming commercial/industrial land use.	The text has been amended to clarify that the screening value is the commercial/industrial CHHSL.

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August 3, 2012

Page 3 of 5

UC Berkeley Ref. No.	Page/ Sect No.	DTSC Comment	UC Berkeley Response
14	Page 9, Section 2.2.6 / Figure 12	Transformer and Corporation Yard step-outs. In bullet (3), three locations in the Corporation Yard were analyzed for dioxins based on the historic location of an incinerator. The approximate location of that incinerator should be shown on Figure 12.	The former incinerator was located inside of Building 120. This information is mentioned in the text and has been added to Figure 12.
15	Page 10, Section 3.2.1	DOOs for the Mercury Fulminate Area. As one of the goals of the study of this area, it will be determined if methyl mercury exists in sub-surface soil. In addition to methyl mercury, it should be determined if any residual mercury from historic manufacturing exists in its elemental form. Therefore, a DOO goal of the study of the MFA should be the speciation of mercury detected in this area.	Soil samples will be analyzed for total metals via EPA method 7471 and methyl mercury through Brooks-Rand method BR-0011.  Text has been amended to state that following review of total mercury results, seven samples (from approximately 10 percent of the total borehole locations) will be collected for evaluation of elemental mercury. The seven samples will be selected based on the highest total mercury concentrations detected. These samples will be evaluated for elemental mercury through Brooks-Rand method BR-0013.
16	Page 12, Section 3.2.2	DOOs for the Former Dry House Explosion, Building 128, and Building 201 Soil Mounds. A) The goal of the characterization of the former Dry House explosion area is to determine if explosive residue and metals are present. Please provide a rationale for not analyzing soil for dioxins that could have formed as a result of the explosion. B) Soil from zero to two feet below ground surface (bgs) will be investigated for deposition of contaminants from that explosion event. Since the explosion occurred many years ago, provide evidence that no grading has taken place in the intervening time period that could affect the depth at which contaminants from that event might be detected.	A) These samples will also be analyzed for dioxin. B) Buildings 128 and 275 have existed in their current locations since their first identification in Sanborn maps. This area was not disturbed during previous remedial activities in Area 4 and the construction of the asphalt pad. No evidence exists that grading occurred at this area, and to the best knowledge of staff interviews and historical information, no grading has occurred in this area.
17	Page 15, Section 3.2.4	DOOs for the Phase II Step-out Soil Samples; and, Figure 12. Proposed Corporation Yard Step-Out Sampling Locations. A) The soil gas sample, UCB-3, is identified in the problem statement. The location of that sample should be specified in the text and Figure 12 should be cited. B) The term "soil conditions" is used as a goal in several instances. This term should be clarified or another term used to describe the goal of the step-out samples. C) As a goal, chemicals of potential concern will be identified in the "study area". This term needs to be further defined in the bullets as the historic transformer locations or the Corporation Yard.	A) The Zeneca soil gas well with detected levels of TCE was mistakenly identified as UCB-3. The well is actually SG-121. This soil gas well has been added to Figure 12, and Figure 12 is referenced in the text. B) The term "soil condition" has been clarified in as the concentrations of chemicals present in the 6-inch sample sleeve submitted for analysis. C) The text has been amended to clarify that the "study area" is the extent of the historic transformer locations and the corporation yard.
18	Page 16, Section 3.2.4	DOOs for the Phase II Step-out Soil Samples. Under acceptance criteria, the text states that "The Phase II step-out soil sampling data will be screened against the commercial/industrial CHHSLs". This sentence should be revised to state that "the Phase II step-out soil sampling data will be screened against commercial/industrial CHHSLs, US EPA Regional Screening Levels, and other relevant screening levels, as appropriate".	The text has been amended to state, "the Phase II step-out soil sampling data will be screened against commercial/industrial CHHSLs, US EPA Regional Screening Levels, and other relevant screening levels, as appropriate."

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August 3, 2012

Page 4 of 5

UC Berkeley Ref. No.	Page/ Sect No.	DTSC Comment	UC Berkeley Response
19	Page 17, Section 3.3.1	MFA Mercury Sampling. It is proposed to analyze ten samples for methyl mercury within the MFA. Provide the criteria for choosing the sample locations to be so analyzed.	Rationale for locations and depth of methyl mercury samples have been added to Section 3.3.1.
20	Page 18, Section 3.3.2 and Figure 12	Dry House, Building 128, EPA Soil Mounds, and Phase II Step-out Soil Sampling Locations. Step-out soil sampling will take place to further investigate the boundaries of chemicals of potential concern detected in the Corporation Yard. Those chemicals should be listed in the text, and the locations where those chemicals will be analyzed for should be shown on Figure 12.	Figure 12 has been updated to include a small table that indicates the location ID and the analyses that will be performed at the step-out locations.
21	Figure 3	A) This figure is incomplete, as the remediated area south of the mercury fulminate area is not identified. Please correct the figure. B) This figure shows the location of the former US Briquette Company Buildings. If this location has never been investigated for PAHs, a common component of briquettes, this may be an additional data gap.	A) The remediated area has been added to this figure. B) The US Briquette Company buildings have been identified as a data gap in the CCR. This area will be sampled in a later phase of the FSW.
22	General Comment	Table 1 of the report lists several classes of Chemicals of Potential Concern (COCs) but does not list detection limits appropriate for protection of human health and the ecological receptors. Since this investigation is a continuation of previous studies, the report needs to include the detection limits from the earlier studies in the current report.	All chemical data for historic samples collected in the MFA have been added to Appendix A, detection limits for non-detect data are provided in the appendix indicated by a U qualifier.
23	Page 1, Section 1.1	Physical Setting, third paragraph. Reference to the site as consisting of three types of habitat is a little confusing since the bulk of the sampling is occurring in areas occupied by areas of the Field Station where site research and maintenance activities are occurring. There is no significant 'habitat' for ecological receptors in these areas.	The paragraph refers to the entire property within RFS. There is significant habitat for ecological receptors, including endangered species, within the Western Stege Marsh. Most of the sampling for this phase of the investigation will take place in the Upland Area, and some samples for the MFA investigation will be collected in the transition area, as indicated in the text.
24	Page 2, Section 1.1	Physical Setting, final paragraph of section. The report states 'Phase III sampling will occur in the Coastal Terrace Prairie, no sampling will occur in the Transition Area and Western Stege Marsh.' It is apparent the only sampling planned for the Coastal Terrace Prairie is additional groundwater sampling for carbon tetrachloride. ERAS understands it is assumed there were no assumed industrial activities in the prairie but there remains an apparent soil data gap for the prairie. At a minimum, soil samples should be proposed for the 0.0-0.6 inch below ground surface (bgs) and 1.0-2.0 depth intervals.	It is assumed that no industrial activities occurred in this area. Soil sampling is not proposed during this phase of the investigation. If, following the collection of additional groundwater samples it is apparent that soil samples need to be collected to close this data gap, soil samples will be proposed in a later phase of the FSW.

**Phase III Field Sampling Plan**  
**University of California, Richmond Field Station Site**  
**May 21, 2012**

**Response to Comments**  
**Department of Toxic Substances Control, June 22, 2012**

August 3, 2012

Page 5 of 5

UC Berkeley Ref. No.	Page/ Sect No.	DTSC Comment	UC Berkeley Response
25	Page 17, Section 3.3.1	MFA Mercury Sampling. Please add a discussion of methyl mercury sampling in this section. Table 1, (Sample Registry and rationale) lists 10 methyl mercury sampling locations. Please provide the rationale for the selection of methyl mercury sampling locations. Sample analysis is proposed to a depth of 12.5 feet but there is no proposal for the upper 0.0-0.5 below ground level (bgs) foot interval where the bulk of exposure most likely would occur. ERAS proposes addition of this sampling depth for analysis. Also, please state the methyl mercury test method. Data for other Chemicals of Concern in the MFA are not included in the report, inclusion of sampling for other COCs known to occur within the UC Field Station boundaries needs to be included in this section.	Rationale for locations and depth of methyl mercury samples have been added to Section 3.3.1. Additional samples for 0.0-0.5 foot bgs interval have been included in this discussion.  Methyl mercury will be analyzed through Brooks-Rand method BR-0011.