

**FINAL**

# IMPLEMENTATION REPORT

## PHASE 2-SUBUNIT 2A & 2B, MEADE STREET OPERABLE UNIT

UNIVERSITY OF CALIFORNIA,  
BERKELEY  
RICHMOND FIELD STATION  
RICHMOND, CALIFORNIA

(TASKS 2E, 3E, AND 5D, RWQCB ORDER  
NO. 01-102)

*Prepared for*  
Office of Capital Projects  
University of California Berkeley  
1936 University Avenue, 2<sup>nd</sup> Floor  
Berkeley, California 94720

December 3, 2004

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December 3, 2004

Project No. 26814100

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

**Subject: Phase 2 Completion Report - Richmond Field Station, Richmond, California**

Dear Mr. Felix:

In compliance with the California Regional Water Quality Control Board, San Francisco Bay Region's (RWQCB) Order No. 01-102, Task 2.e., 3.e., and 5.e., URS Corporation is pleased to submit the enclosed document titled *Implementation Report, Phase 2-Subunit 2A & 2B, Meade Street Operable Unit, University of California, Berkeley, Richmond Field Station, Richmond, California* on the behalf of the University of California, Berkeley.

If you have any questions or need further information, please call me at (510) 874-3284.

Sincerely,

**URS CORPORATION**

Michael Velzy  
Project Manager

Corinne Marks, P.E.  
Civil Engineer

Enclosure

cc: Michael Hryciw: Capital Projects, University of California, Berkeley  
Anna Moore: Environment, Health, & Safety, University of California, Berkeley  
Gene Barry: 4Leaf, Inc.  
William Copeland: BBL, Inc.  
File

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## List of Acronyms

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µg/L	micrograms per liter
AOCs	Areas of Concern
AWQC	Ambient Water Quality Criteria
BBL	Blasland, Bouck & Lee, Inc.
BCDC	San Francisco Bay Conservation and Development Commission
CEQA	California Environmental Quality Act
CKD	cement kiln dust
COCs	Chemicals of Concern
CSV	Cherokee Simeon Ventures
CQA	construction quality assurance
CWA	Clean Water Act
EBRPD	East Bay Regional Park District
E-SSTLs	Ecological Site-Specific Target Levels
HDPE	High density polyethylene
H-SSTLs	Human Health Site-Specific Target Levels
IR	Implementation Report
LFR	Levine Fricke
mg/kg	milligrams per kilogram
mg/m <sup>3</sup>	milligrams per cubic meter
MSDS	Material Safety Data Sheet
MSOU	Meade Street Operable Unit
NEPA	National Environmental Policy Act
NGVD	National Geodetic Vertical Datum
NWP	Nationwide Permit
PAH	polynuclear aromatic hydrocarbon
PCB	polychlorinated biphenyl
PEL	permissible exposure level
QA/QC	quality assurance/quality control
RAP	<i>Remedial Action Plan- Phase 2</i> (URS 2003a)
RCRA	Resource Conservation and Recovery Act
RDDR	<i>Remedial Design Details: Meade Street Operable Unit</i> (LFR 2002a)
RDDR Addendum 1	<i>Remedial Design Details – Addendum</i> (URS 2002c)
RDDR Addendum 2	<i>Remedial Design Details – Addendum 2</i> (URS 2002d)

RFS	Richmond Field Station
RWQCB	Regional Water Quality Control Board
SSTLs	Site-Specific Target Levels
SWPPP	Storm Water Pollution Prevention Plan
TSCA	Toxic Substances Control Act
Type A	Cinders or sediment from the RFS designated for limestone treatment and placement on Subunit 1
Type B	Cinders or sediment from the RFS designated for mercury pre-treatment, limestone treatment, and placement on Subunit 1
Type C	Cinders or sediment from the RFS designated for landfill disposal
Type D	TSCA-regulated cinders or sediment from the RFS designated for landfill disposal
UC Berkeley	University of California, Berkeley
URS	URS Corporation
USACE	U.S. Army Corps of Engineers
USC	U.S. Code
U.S. EPA	United States Environmental Protection Agency
Zeneca	Zeneca Inc.

## **1.0 INTRODUCTION**

This Implementation Report (IR) has been prepared by URS Corporation (URS) on behalf of University of California, Berkeley (UC Berkeley) in compliance with the California Environmental Protection Agency, Regional Water Quality Control Board, San Francisco Bay Region's (RWQCB) Order Number 01-102 (the Order), Tasks 2e, 3e, and 5d. This report documents the implementation of 2003 remedial activities (Phase 2) conducted at the UC Berkeley Richmond Field Station (RFS) property located at 1301 South 46<sup>th</sup> Street, Richmond, California. The location of the RFS is shown on Figure 1. The RFS has been designated as Subunit 2 of the Meade Street Operable Unit (MSOU) identified in the Order. Subunit 2 was further divided into Subunits 2A and 2B as shown on Figure 2. Phase 1 remedial activities were performed in a portion of Subunit 2A in 2002 and are documented in the Phase 1 Implementation Report (URS 2003c). Phase 2 remediation activities were performed in the remaining portion of Subunit 2A upland and marsh as well as a portion of Subunit 2B marsh. This IR documents the completed Phase 2 remedial measures, variances between the proposed remedial activities outlined in the Remedial Action Plan – Phase 2 (RAP) (URS 2003a) and the remedial measures actually implemented, as well as confirmation sampling demonstrating the remedial action compliance.

## **1.1 SITE DESCRIPTION**

The RFS site consists of both upland and offshore areas, as shown on Figures 1 and 2. It should be noted that the Order requirements only apply to the upland and inner marsh portions of the RFS property. The upland area is located north of Western Stege Marsh and occupies approximately 90 acres. The offshore area consists of an inner and outer portion of Western Stege Marsh. The outer portion of Western Stege Marsh is located south of the East Bay Regional Parks District (EBRPD) Bay Trail and includes approximately 60 acres of tidal mud flat, marsh, and open water. The inner marsh including the fill area known as 'the bulb' occupies approximately 12 acres. A 100-foot wide strip of Western Stege Marsh on either side of the EBRPD Bay Trail is owned by the EBRPD. UC Berkeley has used the RFS upland area for research and educational activities since its purchase of the land in October 1950. Western Stege Marsh is bounded on the east side by Subunit 1 (Cherokee Simeon Ventures [CSV] property, formerly the Zeneca Inc. [Zeneca] property). The property on the western shore and most of Meeker Slough is owned by the Richmond Redevelopment Agency.

The RWQCB Order identified two properties (UC Berkeley and Zeneca) as the MSOU. The MSOU is subdivided into two operable units identified as Subunits 1 and 2. Zeneca has been identified as the responsible party for the cleanup of Subunit 1 including Eastern Stege Marsh as well as a co-responsible party for Subunit 2A. UC Berkeley, as the property owner of the RFS, has been identified as the sole responsible party for the cleanup of Subunit 2B and co-responsible party for Subunit 2A. During cost allocation negotiations between UC Berkeley and Zeneca, the parties further subdivided Subunit 2A into Areas 1 through 4 as shown on Figure 3. It should be noted that a small part of Area 2 and 3 extend into Subunit 2B.

## **1.2 REGULATORY AND SITE BACKGROUND**

Stege Marsh, including Western Stege Marsh, has been identified by the RWQCB as one of the highest priority “Toxic Hot Spots” requiring cleanup in the San Francisco Bay. The RWQCB identified the marsh as a hot spot due to elevated levels of chemicals contained in the marsh sediments, detected during sampling conducted by the RWQCB in 1999 under the Bay Protection and Toxic Cleanup Program under the California Water Code Chapter 5.6.

In 1999, the RWQCB issued a request to UC Berkeley to investigate the source and extent of the contaminants detected in Western Stege Marsh. Site characterization results showed elevated concentrations of metals and low pH conditions in the southern section of the upland portion of the RFS and the eastern and central portions of Western Stege Marsh. Elevated concentrations of polychlorinated biphenyls (PCBs) were found in the sediment in and adjacent to Meeker Slough located along the western boundary of Western Stege Marsh.

Historical records were reviewed by UC Berkeley to identify the potential sources of the metals and PCBs found in the marsh and Meeker Slough. The results were reported to the RWQCB in UC Berkeley’s reports titled “Field Sampling and Analysis Plan and Tiered Risk Evaluation” (URS 1999) and “Field Sampling and Analyses Results: University of California Berkeley, Richmond Field Station” (URS 2000). These reports identified two primary sources of metals, one onsite and one offsite. A large part of the RFS property was previously owned by the California Cap Company (Cap Company), a manufacturer of blasting caps. During the Cap Company’s operations (1877-1948), mercury was released into the southern portion of the RFS property and adjacent marsh. In addition, Stauffer Chemical Company utilized the adjacent property (Subunit 1) to manufacture industrial and agricultural chemicals including pesticides, herbicides and proprietary chemicals. Sulfuric acid was manufactured from approximately 1897 to 1970. Pyrite cinders were generated as a by-product of the former sulfuric acid production operations. The pyrite cinders were placed on the RFS property and in Stege Marsh. The pyrite cinders are a source of metals, including arsenic, cadmium, copper, lead, mercury, selenium, and zinc, as well as low pH conditions. The source of the PCBs and pesticides is still under investigation. It should be noted that concurrent to the investigations and cleanup activities being conducted at the RFS, Zeneca, the former property owner, and CSV, the current property owner, have also been performing investigations and cleanup activities at Subunit 1, the former Stauffer Chemical property, adjacent to the RFS property.

### **1.2.1 RWQCB Orders and Current Status of Tasks**

In response to the findings of the investigations conducted at the RFS and Zeneca sites, the RWQCB issued two Orders (Orders No. 01-101 and No. 01-102) requiring the cleanup of the two properties and the inner portions of Eastern and Western Stege Marsh. The RWQCB Order No. 01-02 outlined a series of tasks that required investigation, design, and implementation of a remedial program to clean up the RFS site in a two-phased approach. The first series of tasks focused on the remedial activities required for Subunit 2A. The Order anticipated that Subunit 2A remediation would be completed in 2002 in conjunction with Subunit 1, and that remedial activity for Subunit 2B would be completed in 2003.

The first task required by RWQCB Order No. 01-102 was the preparation of a human health and ecological risk assessment for Subunit 2. URS prepared a report on behalf of UC Berkeley to

address this first task (URS 2001a). The report identified multiple Areas of Concern (AOCs) in both Subunits 2A and 2B.

Subsequent tasks required by the RWQCB Order included additional characterization of the upland and marsh portions of Subunit 2A as well as development of groundwater and surface water monitoring plans. Multiple rounds of soil, sediment, groundwater, and surface water sampling were conducted during the summer and fall of 2001. URS prepared two additional reports to comply with these requirements (URS 2001b and c).

After these tasks were completed, the RWQCB required the preparation of a conceptual remedial action plan and a Remedial Design Details Report (RDDR) for the upland and marsh areas in Subunit 2A. Levine Fricke (LFR), Zeneca's environmental consultant, prepared reports including a RDDR to comply with these requirements (LFR 2001a, LFR 2001b and LFR 2002a).

During the remedial design stage, the need arose for additional analytical data, and once obtained, these data prompted revisions to the remedial design. URS prepared the RDDR addendum detailing the revisions (URS 2002c).

During cost allocation negotiations prior to Phase 1, Zeneca agreed to accept, for placement on Zeneca's site, certain cinders and sediment containing elevated concentrations of mercury between 50 and 260 mg/kg, following initial treatment of the material by UC Berkeley. URS performed a treatability study to evaluate the effectiveness of multiple stabilization reagents that would achieve Zeneca's and the RWQCB leachate criteria for acceptance of the treated material, which was ten times the United States Environmental Protection Agency (U.S. EPA) Ambient Water Quality Criteria (AWQC) of 0.025 µg/L. AWQC were developed by U.S. EPA to provide guidance to the states in developing water quality standards under Section 304(c) to protect human health and aquatic life (EPA 2002). The results are described in the RDDR Addendum 2 (URS 2002d).

Zeneca and UC Berkeley agreed to remediate Subunit 2A concurrently with Subunit 1. Because Zeneca and UC Berkeley are jointly responsible for the remediation of Subunit 2A, they negotiated the allocation of cleanup costs between the two parties. During the negotiations, Subunit 2A was further subdivided into Areas 1 through 4, as shown on Figure 3. To coordinate remedial activities and reduce costs through project efficiency, it was decided that Zeneca's contractor would perform the Subunit 1 and Subunit 2A remediation in 2002.

Zeneca subsequently issued technical specifications for Phase 1 remediation in Subunits 1 and 2A (LFR 2002b). Zeneca received bids from several contractors, and awarded the construction contract to Geo-Con of Sacramento, California.

The majority of remedial activities were implemented for Subunit 2A (URS 2002c and d) during the fall 2002 construction season from September 2002 through December 2002 (Phase 1). The portions of Subunit 2A completed during Phase 1 Remediation are shown on Figure 3. These include Area 1, the eastern portion of Area 2, and Area 3. All of Subunit 2A remediation could not be completed in Phase 1 due to the short construction season imposed by the permits to limit construction to outside of the California Clapper Rail breeding season. Construction was permitted to occur only between September 1 through January 31. The remediation of the remainder of Subunit 2A was designated for the following year in Phase 2. Phase 2 remediation also included portions of Subunit 2B marsh. Zeneca and UC Berkeley decided that UC Berkeley's contractor would perform the Phase 2 remedial construction activities.



A RAP for Phase 2 was developed and submitted to the RWQCB on April 15, 2003 (URS 2003a). UC Berkeley subsequently issued technical specifications for Phase 2 remediation in Subunits 2A and 2B (UCB 2003a). UC Berkeley received bids from several contractors, and awarded the construction contract to Envirocon of Sacramento, California.

Phase 2 remedial activities for the remainder of Subunit 2A and portions of Subunit 2B marsh were performed from August 2003 through February 2004 and are shown on Figure 3. These areas include the remainder of Area 2, Area 4, M3, and M1a. This IR documents the completed Phase 2 remedial measures, variances between the RAP and the remedial measures actually implemented, and the confirmation sampling and surveying demonstrating the remedial action effectiveness.

**1.3 PHASE 2 PERMITTING**

Following Phase 1, UC Berkeley submitted a permit amendment request to the San Francisco Bay Conservation and Development Commission (BCDC) since most of the remaining work in Subunit 2A had been permitted in 2002. UC Berkeley also submitted a permit application to U.S. Army Corps of Engineers (USACE), and a biological assessment to the U.S. Fish and Wildlife Service in support of the USACE permit (BBL 2003). In addition, a City of Richmond (Richmond Redevelopment Agency) and EBRPD encroachment permits were requested and obtained. Copies of the permits are provided in Appendix F.

The following permits were issued for the Phase 2 work:

<b>Agency</b>	<b>Permit Type</b>	<b>Permit No.</b>
USACE	Nationwide Permit (NWP) No. 38	File No. 26417S
BCDC	BCDC Permit	No. M01-52(b) Amendment No. One
RWQCB	Clean Water Act (CWA) Section 401	NWP No. 38
USFWS	Biological Opinion	Requirement for USACE permit
City of Richmond, Richmond Redevelopment Agency	Encroachment Permit	
EBRPD	Encroachment Permit	049E-03-601
SWRCB	Construction Storm Water Permit	WDID # 207C324000

The project qualified for authorization under the USACE NWP No. 38 (Cleanup of Hazardous and Toxic Waste) (67 Federal Register 2020, January 15, 2002), pursuant to Section 404 of the Clean Water Act (CWA) (33 U.S. Code [USC] 1344) and Section 10 of the Rivers and Harbors Act of 1899 (33 USC 403). The executive director of the State Water Resources Control Board issued a CWA Section 401 water quality certification as occurs for all approved NWP No. 38 projects. An initial study (URS 2003b) with a negative declaration finding was prepared in conformance with the California Environmental Quality Act (CEQA).

Construction projects that disturb one or more acres of soil are required to obtain coverage under the General Permit for Discharges of Storm Water Associated with Construction Activity

(Construction General Permit, 99-08-DWQ). The Construction General Permit requires the development and implementation of a Storm Water Pollution Prevention Plan. A Notice of Intent (NOI) was submitted to the SWRCB for a construction storm water permit in September 2003. A Storm Water Pollution Prevention Plan was prepared in compliance with the permit in October 2003 (UCB 2003b).

## **1.4 CONSTRUCTION QUALITY ASSURANCE**

URS and Blasland, Bouck & Lee (BBL) provided construction quality assurance (CQA) services to UC Berkeley for Phase 2 remedial construction activities. The purpose of the CQA activity was to observe and verify that the work met the intent of the remedial design and the requirements of the plans and specifications. CQA activities included confirmation sampling, survey verification, air monitoring, and visual observations. 4LEAF, Inc. provided construction management services to UC Berkeley.

In addition to providing CQA services, URS implemented a program to monitor effects of the project on cultural resources in compliance with regulatory requirements including the National Environmental Policy Act (NEPA) and CEQA. A description and results of the cultural resources monitoring program, performed on the behalf of UC Berkeley, are presented in a technical report included as Appendix A.

## **1.5 REPORT ORGANIZATION**

This report discusses the Phase 2 remedial activities performed in 2003 by UC Berkeley in Subunit 2A and 2B. The remaining sections of this report contain descriptions of the remedial activities as follows:

- Section 2: Summary of Phase 2 Remedial Action Plan,
- Section 3: Phase 2 Remedial Activities,
- Section 4: Air Monitoring Program and Results,
- Section 5: Summary, and
- Section 6: References.

## **2.0 INTRODUCTION**

Under the Order, the cleanup of the RFS was separated into phases. The Order specifies a number of tasks to be completed for each Subunit. The Order anticipated that Subunit 2A remediation would be completed in 2002 in conjunction with Subunit 1 and the remedial activities for Subunit 2B would be completed in 2003. The portions of Subunit 2A remedial activities completed during the fall of 2002 are referred to as Phase 1. Remediation of the remainder of Subunit 2A and a portion of Subunit 2B marsh occurred in the fall of 2003 and is referred to as Phase 2. Figure 3 shows the portion of Subunit 2A completed during Phase 1 and the Phase 2 design excavation limits. The following sections summarize the Phase 2 remedial design and RWQCB approved modifications implemented during Phase 2 construction. Additional phases of work are anticipated through 2006.

## **2.1 SUMMARY OF REMEDIAL ACTION PLAN – PHASE 2**

The remedial design for Subunits 1 and 2A was submitted in the RDDR (LFR 2002a) to the RWQCB. The RDDR described the remedial activities to be conducted in Subunits 1 and 2A of the Meade Street Operable Unit designated in Order Nos. 01-101 and 01-102, respectively. URS subsequently prepared a RDDR Addendum (URS 2002c) on behalf of UC Berkeley that described the remedial design for Subunit 2A in further detail. RDDR Addendum 2 (URS 2002d) was submitted to the RWQCB describing the treatability study conducted to select a reagent and dosage to stabilize mercury in sediment and cinders to be placed and capped on Subunit 1. Since the construction season was limited by the California Clapper Rail breeding season, the remedial action described in the RDDR and addenda was split into two construction phases. The Phase 1 portion of the RDDR design was completed in the fall of 2002 and the Phase 2 portion was scheduled for the following fall. Prior to Phase 2, a RAP (URS 2003a) was submitted to the RWQCB describing the RDDR Addendum modifications to the RDDR Phase 2 portion (Phase 2 portion of Subunit 2A) and the remedial activities for Subunit 2B marsh areas M3 and M1a that were not described in the RDDR and addenda. The Phase 2 remedial design consisted of soil and sediment removal, treatment, placement at Subunit 1 or offsite disposal, and backfilling.

The Human Health and Ecological Tiered Risk Evaluation (URS 2001a) 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 site representative 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 tidal sloughs. The ecological receptors that were considered include the Salt Marsh Harvest Mouse and the California Clapper Rail.

The goal of the upland and marsh remediation activities in Subunit 2A and 2B was to reduce potential exposure risks through removal of source material. To identify this material, the analytical data for each sample location in Subunit 2A was screened against the proposed SSTLs developed for the site. An excavation plan was then developed based on the stratigraphy (fill, cinders, soft sediment, Bay Mud) of the materials and applicable treatment methodology based on the Chemicals of Concern (COCs) contained within the material to be excavated. The excavation plan for the depth of overburden and depth of marsh excavation was meant to be used

as a guide in conjunction with visual observations since cinders and the stiff tan clay are readily identifiable by color. Analytical sampling showed that COCs were not present in the Bay Mud six inches below the cinder layer in the upland nor six inches into the stiff tan clay below the soft sediment layer in the marsh. The final depth selected for the overburden excavation in Area 4 was based upon the elevation of the top of the cinder layer as visually observed in the field. The final depth of excavation in Area 4 was based upon analytical sampling results from site investigations. The final excavation depth elevation was six inches below the deepest sample that exceeded SSTLs and above samples that contained COCs less than the SSTLs. The final depth of the marsh excavations in Area 2, Area 3, M3 and M1a were based upon the elevation of the stiff tan clay below the soft marsh sediment as visually identified in the field. Excavation elevations based upon the analytical sample results collected prior to excavation precluded the need to perform post-excavation analytical confirmation sampling. Confirmation surveys of the excavated bottom elevations coupled with visual observations were planned to document the removal of COC-impacted material as per the RDDR and Addenda. Excavation bottom analytical samples were planned to be collected from the marsh to determine post-remediation residual risk.

The RDDR Addendum designates material types (A, B, C, and D) based upon the concentrations of mercury and PCBs and required treatment and disposal. Type A designated material that contained mercury less than 50 mg/kg and required limestone treatment prior to placement at Subunit 1. Type B material contained mercury greater than 50 mg/kg and less than 260 mg/kg and required mercury pretreatment prior to limestone treatment and placement at Subunit 1. Type C material contained mercury greater than 260 mg/kg and required offsite Class I landfill disposal as non-RCRA hazardous waste. Type D material contained PCBs greater than 50 mg/kg and was TSCA-regulated. Type D material originated from M1a and required offsite Class I landfill disposal.

Treatability studies were performed to determine the Type B mercury pretreatment reagent and dosage that was effective in reducing leachable mercury concentration to below 0.25 µg/L (10 times the AWQC). The studies determined that powdered activated carbon at a five percent by wet weight dosage was the most effective reagent and dosage for mercury pretreatment for the Phase 1 and 2 materials. The treatability study results were submitted to the RWQCB in RDDR Addendum 2.

Since the design details for Phase 2 were submitted to and approved by the RWQCB staff, only brief descriptions of the major design elements are presented herein. The major remedial design elements implemented for Phase 2, Subunit 2A (Area 2 and 4), as detailed in the RAP, consisted of the following:

- Only perform work in the marsh and inside of the 150-foot marsh buffer line during the period outside the California Clapper Rail breeding season during the months of September 1 to February 1;
- Construct three asphalt treatment pads;
- Excavate and stockpile clean overburden material from the upland portion of Subunit 2A (Area 4 only) and reuse it as backfill following the excavation of underlying materials. The depth of excavation was guided by the RAP excavation plan but was based upon visual field observations of cinders and the underlying sediment. Figure 4 shows the excavation limits of the upland area completed during Phase 2;

- Excavate cinders and sediment (Area 4 only) containing less than 50 mg/kg mercury as designated on the RAP excavation plans, transport to the Subunit 1 site, treat with 7.5 percent crushed limestone by dry weight as described in the RDDR, place along with cinders treated from Subunit 1, compact, and cap;
- Excavate cinders and sediment that contain between 50 mg/kg and 260 mg/kg mercury (Area 2 and 4) as designated on the RAP excavation plans. Pretreat the soil/cinders on the RFS site with 5 percent powdered activated carbon by wet weight to stabilize the mercury, treat with 7.5 percent limestone for Area 4 and cement kiln dust (CKD) for Area 2, and transport to and place on Subunit 1 with treated cinders from Subunit 1, compact, and cap;
- Excavate cinders and sediment containing greater than 260 mg/kg mercury (Area 4 only), solidify with a drying reagent such as CKD, and transport it to a Class I landfill for disposal;
- Backfill with overburden and clean soil in the upland areas and clean imported Bay Mud in the marsh;
- Contour Bay Mud in Area 2 for wetland restoration; and
- Remove soil berm installed as part of Phase 1.

The major remedial design elements implemented for Phase 2, Subunit 2B (M3 and M1a), as detailed in the RAP, consisted of the following:

- Construct a concrete treatment pad;
- Enclose M3 and M1a with turbidity barrier (silt screen);
- Excavate cinders and sediment from M3 and M1a, solidify with a drying reagent such as CKD, and transport it to a Class I landfill for disposal;
- Backfill with imported clean Bay Mud in the marsh; and
- Contour Bay Mud for wetland restoration.

## **2.2 MODIFICATIONS TO REMEDIAL DESIGN DETAILS**

The 2003 remedial activities were modified slightly from the proposed design presented in the RAP due to field conditions. These modifications were discussed with and approved by RWQCB staff during site visits and phone conversations. The following paragraphs summarize the approved modifications to the remedial design. Figures 4, 5, 6, and 7 show the actual excavation boundaries and depths of Phase 2 work.

1. Two asphalt treatment pads were constructed instead of three.
2. The silt screen design was modified due to field conditions. The original silt screen design was to have the permeable material hang from a series of floats at the water surface with the top connection consisting of a sliding connection (such as by a chain around a pile) to permit the screen to float up and down with the tide. The silt screen was modified by attaching the top of the silt screen to a horizontal pipe set above the high tide line instead of floats. The top of the silt screen remained above high tide rather than floating up and down with the tide.
3. The boundaries of the M1a marsh excavation were extended to the northern shoreline to simplify excavation and backfilling activities.

4. The southernmost 75 feet of the western storm drain line discharging into M1a were removed and replaced due to PCB-impacted sediment in the pipe.
5. The boundaries of the Area 4 excavation were modified based upon discovery of previously unknown cinders.
6. A portion of Area 4 cinders immediately under the pre-existing cracked sanitary sewer line that extended from Subunit 1 contained volatile organic compounds, pesticides, and PCBs. The material was excavated, sampled, and disposed of at Kettleman Class I landfill disposal facility.
7. Soil in Area 4 north of the seawall was sampled and transported to Allied Waste's Keller Canyon Class II landfill disposal facility located in Pittsburg, CA since no cinders were encountered.
8. The marsh portion of Subunit 2A was regraded to lower the elevation as part of marsh restoration activities.
9. Native California cordgrass (*Spartina foliosa*) was collected from M3, washed, and replanted in Subunit 2A marsh as part of marsh restoration activities.
10. Invasive, non-native cordgrass (*Spartina alterniflora*) located south of the EBRPD Trail and pampas grass (*Cortaderia jubata*) on the EBRPD Trail, the marsh "island" area north of the trail was removed by the Watershed Project working with the EBRPD.
11. All material was treated on the RFS property.
12. Removal of the southernmost 50 feet of the eastern storm drain line (replaced during Phase 1) discharging into Area 2 as part of marsh regrading activities.
13. During the regrading of the Phase 1 Area 2 portion of the marsh, approximately 3,000 cubic yards of sand was excavated to create additional marsh as mitigation for marsh disturbance as agreed to under the USACE permit. The sand had been placed during Phase 1 backfilling activities. The area was then backfilled with Bay Mud.

### 3.0 SUMMARY

Phase 2 construction activities conducted during the 2003 construction season (August 2003 - February 2004) included excavation and remediation of the remaining upland and marsh portion of Subunit 2A (Areas 4 and 2) and marsh portions of Subunit 2B (M3 and M1a). Excavated upland areas were backfilled with overburden from Area 4 and imported clean fill. Excavated marsh areas were backfilled with imported clean Bay Mud. Envirocon was the construction contractor selected to perform the work.

Approximately 38,200 in-situ cubic yards of materials were excavated from Areas 2, 4, M3, and M1a. Of the total amount, approximately 10,800 cubic yards of clean overburden were segregated and reused as backfill on site. Approximately 6,000 cubic yards of pyrite cinders were treated with limestone to stabilize cinder-related metals and placed and capped at Subunit 1 (Type A). Approximately 11,900 cubic yards of cinders were pretreated with 5 percent powdered activated carbon for mercury stabilization, treated with limestone or CKD to stabilize cinder-related metals, and placed and capped at Subunit 1 (Type B). Approximately 2,100 tons of vegetation from Area 2 and M3 were treated with limestone and disposed of at an offsite landfill. The rest of the excavated material, primarily marsh sediment, (approximately 8,500 cubic yards) was solidified with CKD as needed and disposed of at offsite landfills (Type C and M1a as Type D).

Construction activities began on August 4, 2003 and ended in February 2004. The following is a general chronological description and approximate dates of the major elements of the Phase 2 Remediation:

- Mobilization and site setup activities prior to September 1 outside the 150 foot buffer zone included (August 2003):
  - Site Fencing;
  - Stripping topsoil beneath the asphalt pads including removing surficial cinders (cinders later treated as Type A);
  - Construction of a temporary storm drain line to drain asphalt pads (removing and disposing as Type D soil from storm drain trench excavation inside the upland AOC 6);
  - Construction of one concrete and two asphalt treatment pads;
- Submitted NOI and prepared SWPPP (September-October 2003);
- Removing the remainder of the liner from the Phase 1 mercury treatment pond and transporting it to Keller Canyon Class II landfill (September-October 2003);
- Excavating overburden from Area 4 and stockpiling onsite (September-October 2003);
- Excavating cinders from Area 4 designated for limestone treatment (Type A) and transportation to the asphalt treatment pads. Type A material included portions of the Area 4 Hotspot. The shape of the Area 4 Hotspot was realigned based upon field observations of cinders (September-October 2003);
- Treating Type A material with 7.5% limestone, pH quality assurance/quality control (QA/QC) testing, transportation to and placement at Subunit 1 (September-October 2003);

- Excavating cinders from Area 4 designated for powdered activated carbon and limestone treatment (Type B), transportation to the asphalt treatment pads. Type B material included the extended excavation boundary on the northwestern side of Area 4 based upon visual observation of cinders (September-October 2003);
- Treating Type B material with 5% powdered activated carbon and 7.5% limestone (September-October 2003);
- Analysis of samples of treated material and leachate to confirm treatment to Zeneca's acceptance criteria (September-October 2003);
- After acceptance criteria were confirmed, transportation and placement of Type B material at Subunit 1 (September-October 2003);
- Excavation, testing, and disposal of soil with a strong chemical odor from below the pre-existing sanitary sewer line. Chemical results indicated the presence of volatile organic compounds, pesticides, and PCBs (September-October 2003);
- Excavating material from Area 4 designated for landfill disposal (Type C) (solidification with CKD as necessary) and transportation to Chemical Waste Management's Kettleman facility, an offsite Class I landfill located in Kettleman City, CA (Kettleman) (September-October 2003);
- Backfilling Area 4 below the groundwater table with granular fill (October 2003);
- Backfilling Area 4 with overburden and clean import fill above the groundwater table (October 2003);
- Treating Phase 1 marsh vegetation stockpiled on Subunit 1 and 2 with 7.5% limestone and transportation to Keller Canyon Class II landfill (Keller) (October 2003);
- Treating Area 2 and M3 marsh vegetation with 7.5% limestone and transportation to Keller as non-hazardous (October 2003);
- Importing and stockpiling additional Bay Mud for future remedial activities (October 2003);
- Excavating Area 2 to stiff tan clay, residual risk sampling, transportation of the excavated material to the asphalt treatment pads, treating the material with 5% powdered activated carbon and 5% CKD, transportation and placement at Subunit 1 (October 2003);
- Backfilling Area 2 with imported Bay Mud (October 2003);
- Grading Area 2 (November 2003);
- Grading the Phase 1 portion of the marsh including adding a new channel (November 2003);
- Installing silt screens around M3 and M1a (November 2003);
- Collecting *Spartina foliosa* from M3, washing it, and planting it in regraded marsh portion of Subunit 2A (November - December 2003);
- Excavating M3 to stiff tan clay, residual risk sampling, transportation of the excavated material to the asphalt treatment pads, solidification with CKD, and transportation to Kettleman as non-Resource Conservation and Recovery Act (RCRA) hazardous (November - December 2003);



- Backfilling M3 with imported Bay Mud (November - December 2003);
- Grading M3 (November - December 2003);
- In November 2003, samples were collected from four locations within the excavation and sent to a Certified Analytical Laboratory for gamma spectroscopic analysis. Locations sampled were: cinders in the sanitary sewer line excavation, M3 marsh, four feet below ground surface behind the seawall, and two feet below ground surface behind the seawall. There was no indication of any materials of interest in concentrations above naturally occurring background concentrations in those samples. The sample results are provided in Appendix G. (November 2003);
- Excavating M1a to stiff tan clay, residual risk sampling, transportation of the excavated material to the concrete treatment pad, solidification with CKD, and transportation to Kettleman as TSCA regulation, non-RCRA California hazardous (November - December 2003);
- Excavating the upland fill berm that was constructed in the marsh during Phase 1. The upper portion above the marsh plain was stockpiled on the bulb area and the lower portion that contacted the marsh sediment was disposed offsite as non-RCRA hazardous (December 2003-January 2004);
- Hydroflushing the southernmost 200 feet of the western storm drain pipe (November - December 2003);
- Excavating the southernmost 75 feet of the western storm drain line discharging into M1a, sampling under the pipe, replacement with a 24-inch polyethylene corrugated pipe, and backfilling over the replaced pipe with soil excavated from above the pipe (November - December 2003);
- Backfilling M1a with imported Bay Mud (November - December 2003);
- Grading M1a including a channel (November - December 2003);
- Installation of the new alignment of the sanitary sewer line (December 2003-January 2004);
- Removing M3 silt screen and cutting M1a silt screen off at sediment surface. Removing silt screen posts (December 2003-January 2004); and
- Decontamination of the asphalt and concrete treatment pads (February 2004).

Photographs with descriptions of the remedial activities are provided in Appendix B. A summary of excavated materials including surface areas, excavated volumes, and type of treatment by area follows:

# SECTION THREE

## Phase 2 Remedial Activities

Area	Description	Type of Material	Approximate Area (square feet)	Approximate Depth of Excavation (feet)	Excavated Volume (in-situ cubic yards)	Treatment
Area 4 + sanitary sewer line	Subunit 2A Rectangular Pond Area	Cinders, sediment, soil	80,850	Varies	14,899 (25,677 total including overburden)	<ul style="list-style-type: none"> <li>• Limestone for approximately 6,145 cubic yards (Type A)</li> <li>• Limestone &amp; Carbon for approximately 4,300 cubic yards (Type B)</li> <li>• CKD as needed for 3,785 cubic yards (Type C)</li> <li>• No Treatment - Soil behind the seawall 703 cubic yards</li> </ul>
Miscellaneous Upland Soil	Miscellaneous Upland Soil with cinders	Soil, cinders	N/A	Varies	1,496	<ul style="list-style-type: none"> <li>• Limestone for approximately 1,496 cubic yards (Type A)</li> </ul>
Western Portion of Area 2	Subunit 2A Marsh	Cinders, sediment, soil	40,175	5	7,721 (8,700 total including overburden, vegetation & debris)	<ul style="list-style-type: none"> <li>• CKD &amp; Carbon (Type B)</li> </ul>
M3 + removed soil berm <sup>1</sup>	Subunit 2B Marsh located adjacent to Area 2	Sediment	25,175	4	3,290 (3,563 total including vegetation & overburden)	<ul style="list-style-type: none"> <li>• Cement kiln dust (Type C)</li> </ul>
M1a	Subunit 2B Marsh PCB impacted, located at western stormdrain outfall	Sediment	2,600	5	464	<ul style="list-style-type: none"> <li>• Cement kiln dust (Type D)</li> </ul>

<sup>1</sup> Miscellaneous clean soil that was excavated as Type C soil and treated as Type C

### **3.1 SITE SETUP**

Construction activities began in August 2003, with a kickoff meeting with URS, BBL, 4LEAF, Envirocon, CSV, LFR, and UC Berkeley staff. URS staff discussed the project schedule, permits, issues of particular concern, air monitoring program, required dust control measures, and other health and safety issues. In addition, URS staff stressed the need for preservation of cultural resources and described procedures if artifacts were found (see Appendix A). Site set-up commenced with placing fencing around the work exclusion zone and clearing vegetation in the upland areas.

#### **3.1.1 Treatment Areas**

In early August, Envirocon began installing two asphalt treatment pads for treatment of excavated materials from Area 2, Area 4, and M3. A storm drain line was installed to drain the asphalt treatment pad to the western storm drain after remedial activities. The drain inlet on the asphalt pad was blocked during remedial activities. Soil from the storm drain trench within AOC 6 was segregated, sampled, and disposed of offsite as Type D material. The top 4 to 6 inches of topsoil outside of the AOCs beneath the pads was removed and stockpiled for potential reuse. The soil was sampled and analyzed for metals. The soil was disposed as non-RCRA hazardous material due to mercury concentrations. Surficial cinders below the asphalt pads that were encountered during topsoil removal were segregated and treated as Type A material. Imported soil was placed to achieve sloping necessary for the pad without excavating the underlying AOC. Two asphalt pads (Pads B and C) were constructed in the field north of Area 4. The pads were sloped to prevent liquids from flowing over the edge and asphalt berms were installed along the edges. Pad B was intended for stockpiling excavated material for treatment while Pad C was intended for stockpiling treated material prior to off-hauling (see Figure 3).

A concrete pad for M1a sediment treatment was constructed in the bulb area and was waterproofed with a penetrating sealant. The concrete pad was constructed to segregate and treat only M1a sediment. M1a sediment was TSCA-regulated due to elevated PCB concentrations which requires specific handling and decontamination procedures unlike non-TSCA regulated material.

### **3.2 AREA 4 UPLAND REMEDIATION**

The remedial action for Area 4 consisted of overburden excavation, Type A, B, and C excavation, Type A and B treatment and placement at Subunit 1, offhauling Type C material, and backfilling with overburden and clean import material.

#### **3.2.1 Excavation**

The initial excavation in Area 4 consisted of the removal of approximately 10,800 cubic yards of clean overburden soil. The depth of the overburden excavation was guided by the depths in the RAP, and was also determined using visual observations. The clean overburden soil was stockpiled west of Area 4 near M1a for later use as backfill material.

Approximately 6,000 cubic yards of Type A material below the overburden was excavated and hauled to the asphalt treatment pads for limestone treatment. The Type A material and the

limestone were combined in 30 cubic yard bins and mixed with an excavator. The material was stockpiled and tested for pH. Once the treated material passed pH QA/QC testing, the treated material was transported to Subunit 1, placed, and compacted.

Approximately 4,300 cubic yards of Type B material, below the overburden or Type A material, was excavated to the depths in the RAP and hauled to the asphalt treatment pads for powdered activated carbon and limestone treatment. The Type B material was also treated in bins in 30 cubic yard batches. Once the treated material passed pH and leachate QC testing, the treated material was transported to Subunit 1, placed, and compacted.

Approximately 3,800 cubic yards of Type C material, below the overburden, Type A, or Type B material, was excavated to the depths in the RAP as confirmed by survey, solidified with CKD as necessary, and hauled to Kettleman as non-RCRA hazardous.

The seawall was located further south than anticipated and material within Area 4 north of the seawall did not contain cinders. Approximately 700 cubic yards of this material was sampled, excavated, and transported to Keller Canyon as non-hazardous. Two four-point composite samples were collected from the soil and analyzed for metals, Total Petroleum Hydrocarbons (TPH) diesel and motor oil (both non-detect), PCBs (non-detect), TCLP mercury (non-detect), STLC arsenic and mercury (non-detect).

The Area 4 excavation also included the Area 4 Hotspot. The Area 4 Hotspot excavation boundaries were modified based upon field observations of cinders. Based upon aerial photographs and utility plans and records, the existing sanitary sewer line was installed in the early 1940's and ran from Stauffer Chemical Company and the war housing to the east to Meeker Slough. The alignment ran through Area 4 in an east-west direction along the RFS fence line. The line was later connected to a new sanitary sewer line that ran to the future Richmond Treatment plant and the outfall pipe to Meeker Slough was removed. During excavation, it was found that this line that had been placed on the tidal mudflats was installed in a layer of cinders 30 feet wide and 4 feet deep (see Appendix B Photographs). The 30-foot wide cinders extended along the sanitary sewer line alignment through Area 4 and the Area 4 Hotspot. The Area 4 Hotspot excavation boundaries were modified to remove the cinders from the trench between Area 4 and the former Area 4 Hotspot boundary. The cinders were sampled on October 13, 2003 and analyzed for mercury. Since mercury was detected at 1.8 mg/kg, the cinders were treated as Type A material. The excavation was not extended further than the western boundary of Area 4 Hotspot. It was observed that the sanitary sewer line installed in the cinders continued westerly. These cinders will be further investigated to determine their extent and evaluate any potential remedial action.

During the excavation of Area 4, the pre-existing sanitary sewer including two manholes was removed within the excavation limits. One manhole located in the western end of Area 4 was left in place (manhole number 20 located at North 2159949.10, East 6031819.76 in NAD83, Epoch date 1997.30). During the excavation of the line, it was observed that the line was cracked in many places. This confirmed pre-excavation site investigation observations during videotaping of the line. During the excavation of the pre-existing sanitary sewer line in the eastern portion of Area 4, soil with a strong chemical odor was encountered immediately below the line. A discrete screening sample of the soil was collected immediately below the pipe and analyzed for TPH diesel (5,000 mg/kg – chromatogram does not match standard) and motor oil (non-detect), gasoline (240 mg/kg chromatogram does not match standard), volatile organic compounds

(VOCs) (chlorobenzene at 140 mg/kg and 1,4-dichlorobenzene at 16 mg/kg), pesticides (4,4'-DDT at 33 mg/kg), PCBs (Aroclor 1248 at 57 mg/kg), and semi-volatile organic compounds (SVOCs) (1,4-dichlorobenzene at 23 mg/kg). All other analytes were below detection limits. The impacted soil was excavated, segregated, and stockpiled. Confirmation soil samples were collected from the sidewalls to confirm the impacted soil was removed. A composite sample was collected from the stockpile and analyzed for waste characterization purposes. The material was disposed at the Kettleman landfill. A new sanitary sewer line was installed along a new alignment in the uplands to replace the removed line after backfilling Area 4.

During the excavation of the northwestern portion of Area 4, cinders were observed in the sidewall. The cinders in the sidewall were sampled for mercury. Since mercury was detected at 92 mg/kg, the soil was designated Type B. The Area 4 excavation was extended and approximately 200 cubic yards was removed, treated as Type B, and placed and compacted on Subunit 1. The excavation could not be extended to remove all the cinders due to the surface obstructions created by the storage of activated carbon. The extent of the cinders will be further investigated after Phase 2 remedial activities are complete.

By mid-October, the excavation in Area 4 was completed and the limits and bottom elevations were surveyed to verify the finished grade. The survey results are shown on Figure 4B. The pH of the groundwater was tested to determine if the groundwater required neutralization prior to backfilling. The pH was within 7.5 to 8.0, therefore, no neutralization was necessary.

### **3.2.2 Treatment**

#### **3.2.2.1 Type A Cinders and Sediment**

The cinders and sediments with mercury concentrations less than 50 mg/kg (Type A) identified in the RAP excavation plan, were treated with 7.5 percent crushed limestone by dry weight to neutralize the pH, and then placed and compacted on Subunit 1.

After excavation, the material was transported to asphalt treatment Pad B and stockpiled. A loader then placed the material and the reagents into 30 cubic yard bins and an excavator mixed the material for approximately 15 minutes. The treated material was then unloaded by a second loader and stockpiled on asphalt Pad C for QA/QC testing. URS collected representative samples for pH to verify treatment effectiveness. The frequency of pH sampling was one 5-point composite sample per 500 cubic yards of mixed material. The pH requirement for the treated material was that it must have a pH greater than 6.0 with an average of 4 samples with no one sample being less than 5.5. The pH results are summarized in Table 1. The details of the limestone addition dosages and pH QA/QC testing are included in Appendix C and D. Once the treated material passed QA/QC testing, it was transported to Subunit 1 for placement and capping.

#### **3.2.2.2 Type B Cinders/Sediment**

The mercury-bearing (mercury between 50 and 260 mg/kg) cinders and sediment (Type B) from Area 4 that were identified in the RAP excavation plan were hauled to the asphalt treatment pads for treatment with 5 percent powdered activated carbon by wet weight and 7.5 percent crushed limestone by dry weight.

The Type B material was treated in batches in 30 cubic yard bins in the same manner as Type A material. URS collected representative samples of the treated material for analysis to verify treatment effectiveness.

The mercury leachate was tested at an initial frequency of one sample collected from each of the first five bins and composited for analysis. This procedure was performed on the first 15 bins treated. The soil/sediment was analyzed for total mercury and the 24-hour leachate samples were analyzed for dissolved mercury by a state-certified laboratory. Upon successful analytical results during the initial sampling period, the sampling rate was reduced to a frequency of one 5-point composite sample per 3,000 tons (2,000 cubic yards) of mixed material.

Zeneca/CSV provisionally accepted Type B material with post-excavation mercury concentrations less than 50 mg/kg. This material was transported to Subunit 1 while awaiting analytical results and final approval by Subunit 1. The analytical results from the soil and leachate tests are summarized in Table 2. Since all the concentrations in the leachate were well below the acceptance criteria of 0.25 micrograms per liter ( $\mu\text{g/L}$ ) mercury in the leachate, the treated material was placed, compacted, and capped at Subunit 1.

### **3.2.3 Type C Offsite Disposal**

Approximately 4,500 cubic yards of the Type C mercury-bearing (mercury greater than 260 mg/kg) cinders and sediment from Area 4 that were identified in the RAP excavation plan were hauled to Kettleman as non-RCRA California hazardous waste. Material excavated from below the water table that did not pass the paint filter test (U.S. EPA Method 9095A) was solidified with CKD on asphalt treatment Pad B prior to transportation.

### **3.2.4 Backfill**

In late October 2003, Envirocon began to backfill the Area 4 excavation. The portion of the excavation below the groundwater table was backfilled with imported granular fill. Above the granular fill, the excavation was backfilled with imported soil and clean overburden material previously excavated from Area 4. The imported granular fill came from a Presidio source, a San Francisco PG&E source, and a private San Francisco source. The imported backfill material came from the Stanley Hall construction on the UC Berkeley campus. As specified in the RAP, the backfill sources were sampled before placement to ensure compliance with chemical parameters. The analytical results of the upland backfill material samples are presented in Tables 3 through 6. All backfill was verbally approved for placement at the site by RWQCB staff.

### **3.2.5 Slurry Wall**

The remedial design, as described in the RDDR Addendum 1, includes installation of a low-permeability slurry wall along the eastern property boundary of the RFS (South 46th Street) to prevent any residual chemicals in Subunit 1 groundwater from flowing onto the RFS property. Zeneca is responsible for the design and construction of the slurry wall. The slurry wall was installed in December 2003. The slurry wall implementation will be described in the Subunit 1 Implementation Report to be submitted to the RWQCB by LFR on behalf of Zeneca. South 46<sup>th</sup> Street became impassible after the slurry wall was installed due to the bentonite slurry left on the

road surface and the destruction of portions of the road during installation. As a result, the truck route used by Envirocon was redirected through the RFS for the remainder of Phase 2 activities.

### **3.2.6 Sanitary Sewer**

The portion of the sanitary sewer that passed through Area 4 was removed during Area 4 excavation and replaced along a new alignment after Area 4 was backfilled. The new alignment is north of the original sewer line and connected into the old line at the eastern and western ends of Area 4 as shown in Figure 8. A trench was cut along the alignment and approximately 480 feet of new line and three manholes were installed. The trench sidewalls between sanitary sewer manholes 40 and 41 contained cinders. Three samples of the cinders were collected and analyzed for TPH diesel (less than 100 mg/kg) and motor oil (less than 200 mg/kg), mercury (100, 420, and 99 mg/kg), and PCB (non-detect). The sanitary sewer line design and installation was approved by the City of Richmond and an access easement was granted to the City by UC Berkeley. The pipe installation was inspected by UC Berkeley Capital Project inspectors at the direction of the City of Richmond. During the time between the excavation of the existing line and the new line installation (October to January), a vacuum truck pumped the sewage from a manhole on the eastern side of Area 4 to a manhole on the western side of Area 4.

### **3.2.7 Erosion Control Measures**

A Storm Water Pollution Prevention Plan (SWPPP) was developed to comply with the General Storm Water Permit obtained for the RFS Remediation and Restoration Project (UCB 2003b). Erosion control measures were installed in November prior to the first large rain event of the season in accordance with the SWPPP, including placement of wattles and silt fences along perimeters and stockpiles and hay bales around storm drain inlets. Inspections by URS, BBL, or UCB were conducted prior to, during, and after storm events in accordance with the SWPPP. Inspection findings were documented on checklists, and any deficiencies were communicated to and resolved by the contractor.

## **3.3 AREA 2 MARSH REMEDIATION**

The remedial action for Area 2 consisted of excavation, mercury and cinder-related metals treatment, placement at Subunit 1, and backfilling with clean Bay Mud material.

### **3.3.1 Site Setup**

A Bay Mud berm was constructed in the marsh along the east and south perimeter of Area 2 to provide equipment access during excavation.

### **3.3.2 Excavation**

The vegetation in Area 2 was removed prior to excavation. A vegetation layer of up to approximately 1.5 feet thick was removed from the marsh, transported to the asphalt treatment

pads, treated with 7.5% limestone, and transported to Keller Canyon Class II landfill. The vegetation from Areas 2 and 3 that was removed and stockpiled in Phase 1 was also treated with 7.5% limestone and transported to Keller Canyon Class II landfill. Approximately 1,844 tons of vegetation from the portion stockpiled from Phase 1 and the Phase 2 portion of Area 2 was disposed of offsite.

The Area 2 marsh sediment was then excavated to the underlying clean native stiff tan clay. Area 2 was excavated using a long stick excavator staged on berms. The excavation bottom was verified by visual observation and survey. The excavated sediment was loaded onto trucks and moved to the asphalt treatment pads where it was treated with CKD and powdered activated carbon. After treatment and testing, the materials were hauled for placement at Subunit 1. Approximately 7,600 cubic yards were excavated.

The Area 2 marsh excavation was completed by November 2003. The bottom of the marsh excavation was surveyed (shown on Figure 5) which verified visual inspections of the excavated grade during excavation. Five samples were collected from the bottom of the excavation to determine residual concentrations. The approximate locations of the samples are also shown on Figure 5. The analytical results for total metals are summarized in Table 7. The results show that the concentrations in the sediment remaining at the bottom of the excavation are well below the ecological and human health SSTLs developed for the marsh.

### **3.3.3 Treatment**

The marsh sediment from Area 2 was moved to the asphalt treatment pads. The material was mixed in 30 cubic yard bins with 5 percent powdered activated carbon by wet weight and CKD. The Area 2 material was treated in batches in the 30 cubic yard bins in the same manner as Area 4 material. The treated material was sampled for analysis to verify treatment effectiveness. The analytical results from the soil and leachate tests are summarized in Table 2. Since the concentrations in the leachate were well below the acceptance criteria of 0.25 µg/L mercury in the leachate, the treated material was transported to Subunit 1 for placement and capping.

### **3.3.4 Backfill**

Clean Bay Mud that was imported during Phase 1 was used for backfill in the marsh area. The material consisted of dewatered sediment dredged from the Martinez marina. The imported material was sampled during Phase 1 to ensure compliance with geotechnical and chemical criteria. The analytical data is provided in the Phase 1 Implementation Report (URS 2003c). An additional 12,000 cubic yards of Bay Mud from that source was imported during Phase 1 and stockpiled for future use in the marsh.

## **3.4 M3 MARSH REMEDIATION**

The remedial action for M3 consisted of installation of turbidity/sediment barrier (a silt screen), excavation, chemical drying and disposal, and backfilling with clean Bay Mud material.



### **3.4.1 Turbidity/Sediment Barrier**

Prior to the commencement of sediment removal activities, the M3 area was isolated with a silt screen turbidity barrier to control re-suspended sediment transport and maintain water quality outside of the excavation area during the implementation of remedial activities. The silt screen was installed along the south and west limits of M3 to provide full enclosure of M3. M3 was enclosed to the north by upland and to the east by the berm. The location of the silt screen is shown on Figure 3. A small trench was dug along the silt screen alignment and 10-foot long fence posts were driven to -5 feet National Geodetic Vertical Datum (NGVD) into the underlying stiff clay at 10-foot spacing. The fence posts were connected by a horizontal pipe across the top of the posts. The silt screen consisted of non-woven geotextile with a geogrid backing along a portion for additional strength. The silt screen had a chain sewn into each side of the fabric. The silt screen was draped over the horizontal pipe such that each end of the fabric with the chain was on each side of the posts and was able to sink into the mud.

The water quality outside M3 was visually monitored during excavation activities. Turbidity levels outside the silt screen were not visually above ambient turbidity levels in the surrounding area. The turbidity barrier remained in place until the area was backfilled. The posts and silt screen were then removed and disposed.

### **3.4.2 Excavation**

The vegetation in M3 was excavated and transported to the asphalt treatment pads, treated with 7.5% limestone, and transported to Keller as non-hazardous. A small portion of the cordgrass, (approximately 2,000 plants) was removed by hand, cleaned, and replanted in Areas 2 and 3 after they were excavated and backfilled with clean Bay Mud.

The M3 marsh sediment was then excavated approximately 4.5 feet, into clean, native, underlying stiff clay (-2 feet NGVD elevation) using a long-stick excavator. The equipment was staged on the soil berm and also on backfilled Bay Mud as the excavation progressed. The total volume of sediment excavated from M3 was approximately 3,500 cubic yards. The excavated marsh sediment from M3 was moved to the asphalt treatment pads where it was solidified with CKD. After solidification, the materials were hauled to an offsite Class I landfill as non-RCRA California hazardous.

The M3 marsh excavation was completed in December 2003. The bottom of the marsh excavation was surveyed (shown on Figure 6) which verified visual inspections of the excavated grade during excavation. Four (M3-CONF-1 through 4) samples were collected from the excavation bottom prior to backfilling to determine the post remediation residual concentrations. The samples were analyzed for metals and the results are presented in Table 7. The approximate locations of the samples are shown on Figure 6. The results show that the levels in the sediment remaining at the bottom of the excavation are well below the ecological and human health SSTLs developed for the marsh.

The soil berm placed along the western boundary of Areas 2 and 3 in Phase 1 was removed after M3 was excavated. The berm outside M3 was removed down to existing marsh grade. The berm within M3 was removed to -2 NGVD. One of the four confirmation samples was collected below the removed berm (M3-CONF-4). Soil above the original marsh grade was segregated as

clean and stockpiled on the bulb. Soil in M3 below original marsh grade was removed, treated as M3 material, and hauled to an offsite Class I landfill.

### **3.4.3 Treatment**

The marsh sediment from M3 was moved to the asphalt treatment pads and mixed in 30 cubic yard bins with CKD for solidification to pass the paint filter test. After solidification, the materials were hauled to Kettleman Class I landfill disposal facility as non-RCRA California hazardous waste.

### **3.4.4 Backfill**

Clean Bay Mud that was sampled and imported during Phase 1 was used for backfill in the marsh area. The marsh was backfilled and graded to the elevations shown in Figure 8.

## **3.5 M1A MARSH REMEDIATION**

The remedial action for M1a consisted of construction of a non-porous surface concrete pad, installation of turbidity/sediment barrier (silt screen), excavation, chemical drying and disposal, and backfilling with clean Bay Mud material. The remedial action also included flushing, excavating, and replacing the southernmost 75 feet of storm drain line. M1a sediment contained concentration of PCB above 50 mg/kg and was thus TSCA-regulated. TSCA regulations specify specific handling and decontamination procedures that must be followed. A concrete pad sealed with a penetrating sealant was constructed to segregate M1a sediment from the non-TSCA regulated material (Types A, B, and C) on the asphalt pads and to comply with TSCA handling and decontamination procedures. The penetrating sealant created a non-porous surface several centimeters thick that assisted decontamination procedures.

### **3.5.1 Turbidity/Sediment Barrier**

Prior to the commencement of sediment removal activities, the M1a area was isolated with a silt screen turbidity barrier to control re-suspended sediment transport and maintain water quality outside of the excavation area during the implementation of remedial activities. The silt screen was installed along the western marsh boundary of M1a to provide full enclosure of M1a. The location of the silt screen is shown on Figure 3. The silt screen design was the same as the M3 design.

The water quality outside M1a was visually monitored during excavation activities. Turbidity levels outside the silt screen were not visually above ambient turbidity levels in the surrounding area. The turbidity barrier remained in place until the area was backfilled. The posts were removed and the silt screen was cut off at the sediment surface.

### **3.5.2 Excavation**

The M1a marsh sediment was then excavated approximately 4.5 feet, into clean, native, underlying stiff tan clay (-2 foot NGVD elevation) using a long-stick excavator staged on the shoreline. The total volume of sediment excavated from M1a was 464 cubic yards. The boundary

of the excavation was extended beneath and upstream of the storm drain outlet to remove upstream COC impacted sediment.

The excavated marsh sediment from M1a was moved to the concrete treatment pad where it was solidified with CKD. After solidification and passing the paint filter test, the materials were hauled to Kettleman landfill.

The M1a marsh excavation was completed in December 2003. The survey of the bottom of the marsh excavation (shown on Figure 7) was verified by visual inspections of the excavated grade during excavation. Three samples were collected from the excavation bottom prior to backfilling to determine the post remediation residual concentrations. The samples were analyzed for metals, pesticides, and PCBs and the results are presented in Tables 7, 8, and 9. The approximate locations of the samples are shown on Figure 7. The results were conditionally approved by the RWQCB. Monitoring is required to show that the excavation bottom remains capped by two feet of Bay Mud.

In addition, the southernmost 75 feet of the western storm drain line discharging into M1a that had been installed pre-1940 were removed and replaced. The storm drain was hydroflushed three times, however some sediment remained adhered to the interior walls of the pipe. Due to the potential for the PCB-impacted sediment to dislodge at a later date, the southernmost 75 feet of the storm drain line was removed. In addition, the line consisted of two-foot sections of clay pipe that had the potential of leakage between the section breaks. Soil below the pipe was scraped, removed, and disposed as M1a material. Samples were collected below the removed storm drain line and no PCBs were detected. The results are presented in Table 9. Twenty-four inch diameter high-density polyethylene (HDPE) corrugated pipe was installed to replace the 24-inch clay pipe that was removed.

### **3.5.3 Treatment**

The marsh sediment from M1a was mixed in the concrete treatment pad with CKD for solidification to pass the paint filter test. After solidification, the materials were hauled to Kettleman Class I landfill disposal facility as Toxic Substances Control Act (TSCA) regulated, non-RCRA California hazardous waste.

### **3.5.4 Backfill**

Clean Bay Mud that was imported during Phase 1 was used for backfill in the marsh area. The marsh was backfilled and graded to the elevations shown in Figure 8.

## **3.6 MARSH RESTORATION**

In early January 2004, regrading activities were commenced for Area 2, the Phase 1 portion of the Subunit 2A marsh, M3, and M1a to create additional wetland in compliance with mitigation required by the USACE permit. The conceptual marsh restoration plan developed for Western Stege Marsh included regrading the remediated portion of the marsh to an elevation that will support cordgrass (*Spartina foliosa*) and pickleweed; extending channels to enhance tidal flushing; and habitat restoration through invasive species control and native species propagation. A Biological Assessment (BBL, 2003) was submitted to the USACE and the U.S. Fish and Wildlife Service in support of a Nationwide Permit 38 modification request submitted to the

USACE on June 24, 2003. The Biological Assessment proposed restoration of disturbed marsh and creation of new wetland with a mitigation ratio accepted by the USFWS. The marsh restoration activities were performed in compliance with these documents. The final grading is shown on Figure 8.

During grading, approximately the last 50 feet of the eastern storm drain line were removed since the pipe lay above the regraded marsh elevation and would have been an “upland island” surrounded by marsh. Additionally, approximately 3,000 cubic yards of sand were excavated during the regrading of the marsh to create new wetlands. The sand had been placed as backfill during Phase 1 remediation activities. The sand was excavated 2 feet below grade immediately east of the eastern storm drain line and was stockpiled in the bulb area. The excavation was backfilled with clean Bay Mud.

Once the area was graded to the appropriate elevations, native California cordgrass (*Spartina foliosa*) that had been collected from M3 and washed, was planted along the 2.5-foot contour in Areas 2 and 3. After the cordgrass was planted by Aquatic Outreach Institute subsequently renamed the Watershed Project, the soil berm placed along the western boundary of Areas 2 and 3 in Phase 1 was removed. The soil berm was removed to the excavation grade of -2 feet NGVD in M3 and to the existing grade of the surrounding marsh along the remainder of the berm. Removing the berm restored tidal flow to Areas 2 and 3 to support the transplanted cordgrass and native revegetation of the area.

In addition to native species propagation, invasive, non-native cordgrass (*Spartina alterniflora*) located south of the EBRPD Trail and pampas grass (*Cortaderia jubata*) on the EBRPD Trail, embankment, and the “marsh island” were abated. In addition, Bassia, star thistle, and pepperweed were removed from the upland area. The Watershed Project is continuing to remove non-native species, collect seed from local native plants, and propagate native plants for future restoration work.

### **3.7 SITE CLEANUP**

The work area was scraped to remove surface soils that may have come in contact with excavated soil or treatment reagents such as CKD. The treatment pads were decontaminated after material treatment activities. Confirmation rinsate samples were collected and analyzed for metals for the asphalt pads and for PCBs for the concrete pad. Rinsate samples were collected to evaluate potential total metals concentrations during a rainfall event. All results were non-detect. The results are presented in Table 10.

Post-construction storm water control measures were implemented according to the SWPPP. Measures included placing erosion control matting and silt fences and sediment controls.

## **4.0 BACKGROUND**

URS and BBL performed air monitoring for dust concentrations and mercury vapors during the Phase 2 remedial construction activities at the RFS to protect URS and UC Berkeley field personnel, nearby residents, and site employees from exposure to hazardous concentrations of metals in dust, and to assess the effectiveness of the dust control measures implemented at the site. The details of the air-monitoring program are discussed in the *Health and Safety Plan* (URS 2002b). Dust-control measures, primarily consisting of spraying surfaces with water, were implemented during all activities that appeared to generate dust.

## **4.1 DUST MONITORING RESULTS**

The dust monitoring results for the Phase 2 remedial construction activities are summarized in Table 11. Dust concentrations were monitored and recorded continuously at six locations along the site perimeter to monitor airborne dust leaving the site. The monitoring locations are labeled A through F on Figure 3. These locations were placed downwind of the construction and between the project site and nearby receptors. The predominant wind direction is from the south (on-shore) and the locations of nearby receptors include residences to the west and RFS offices to the north. URS/BBL personnel calibrated the dust monitors daily before work commenced. The monitors were placed on the site perimeter for the duration of each workday. At the end of the day, the monitors were collected, the log data downloaded to PC, the average and maximum dust concentrations were recorded, and the batteries were recharged or replaced for the next day.

The daily measurements for each station are presented in Appendix E. A summary of the average daily dust concentrations at each location is presented in Table 11. The time weighted average (TWA) daily dust concentrations measured at each monitoring location were significantly lower than the permissible exposure level (PEL) of 5 milligrams per cubic meter ( $\text{mg}/\text{m}^3$ ) for dust or the RFS site-specific PEL for contaminated dust of  $2.16 \text{ mg}/\text{m}^3$  (URS 2002b). The PEL is the concentration that is deemed safe for people exposed 8 hours per day and 5 days per week throughout their working career. The PEL is considered conservative since it was developed using the maximum mercury concentration in soil. The average dust concentrations were also well below the dust visibility threshold of approximately  $2 \text{ mg}/\text{m}^3$ . The low dust concentrations measured along the perimeter of the construction area indicate that dust-control measures were effective and no significant concentrations of dust were detected leaving the construction site.

During powdered activated carbon reagent addition, activated carbon dust left the work area at concentrations below the dust threshold of  $2 \text{ mg}/\text{m}^3$ . However, the carbon dust deposited and accumulated outside the work area during the project. Since activated carbon can be an irritant, shrubbery and several buildings on the RFS were cleaned. In addition, UCB held meetings with RFS workers with regard to the potential health effects of activated carbon.

## **4.2 MERCURY MONITORING RESULTS**

A Jerome Mercury Vapor Analyzer was used to monitor mercury vapors during excavation in areas with known elevated mercury concentrations in soil, cinders, or sediment, and during treatment of mercury-bearing material. Measurements were collected immediately downwind of the construction activities and in the breathing zone of construction workers. According to the

URS Health and Safety Plan (URS 2002b), the action level for mercury vapor in the breathing zone is  $0.025 \text{ mg/m}^3$ . At this level as detected by the Jerome Mercury Vapor Analyzer, respirators with mercury cartridges would be donned. The Jerome monitor consistently measured zero, or near the detection limit of  $0.003 \text{ mg/m}^3$ , at all sample locations, indicating that there were no significant concentrations of mercury vapor at the site throughout the monitored construction activities. The mercury monitoring results are presented in Table 12.

**5.0 SUMMARY**

The Phase 2 portion of Subunit 2A and 2B was remediated in accordance with the RAP with minimal deviations that were reviewed and approved by RWQCB staff during implementation. Soil, sediment, and cinders from the upland portion of Subunit 2A (Area 4) were excavated to the elevations designated in the RAP excavation plans. The marsh excavations (Area 2, M3, M1a) were excavated to the stiff tan clay as per the RAP. All Type A and B material was treated, placed on Subunit 1, and capped as per the RAP. The cinder material was treated with limestone and placed and capped on Subunit 1. The mercury-bearing material was treated with powdered activated carbon and limestone prior to placement and capping on Subunit 1. Type C and D material from Area 4, M3, and M1a material was solidified and transported to an offsite Class I landfill. The following table summarized the excavated material, treatment, and disposal location. Table 13 summarizes the number of truckloads of material disposed offsite and their respective disposal location. Area 4 was backfilled with overburden and clean material imported from offsite. Area 2, M3, and M1a were backfilled with clean imported Bay Mud. Marsh restoration activities were performed in the Phase 1 and Phase 2 portions of the marsh including grading and planting.

Phase 2 was successfully implemented in accordance with Tasks 2e, 3e, and 5d of the Order. The remainder of Subunit 2B will be remediated in future phases.

**Phase 2 Summary Table**

<b>Material Type</b>	<b>Material Source</b>	<b>Material Matrix</b>	<b>Volume [in-situ cubic yards]</b>	<b>COCs</b>	<b>Treatment</b>	<b>Placement Location</b>
Overburden	Area 4	Upland Soil	10,800	none	None	Reused as backfill in Area 4
UCB Type A	Misc. Upland Areas	Upland Soil	1,496	Cinder Metals	Limestone	Subunit 1
Type A	Area 4	Upland Soil	6,145	Cinder Metals	Limestone	Subunit 1
	Area 2	Upland Soil	129	Cinder Metals	Limestone	Subunit 1
Type B	Area 4	Upland Soil	4,300	Mercury > 50 mg/kg and < 260 mg/kg. Cinder Metals.	Limestone and Powdered Activated Carbon	Subunit 1
	Area 2	Marsh Sediment	7,600	Mercury > 50 mg/kg and < 260 mg/kg. Cinder Metals.	CKD and Powdered Activated Carbon	Subunit 1
Type C	Area 4	Upland Soil	3,785	Mercury > 260 mg/kg. Cinder Metals.	No waste treatment. Drying agent (CKD) addition for solidification.	Kettleman Class I Landfill
	M3	Marsh Sediment	3,290	Mercury > 20 mg/kg. Cinder Metals.	No waste treatment. Drying agent (CKD) addition for solidification.	Kettleman Class I Landfill
	M3	Vegetation	273	Low concentration of cinder metals and mercury	Limestone	Keller Canyon Class II Landfill and Kettleman when could not be separated from M3 sediment



# SECTION FIVE

## Summary

Material Type	Material Source	Material Matrix	Volume [in-situ cubic yards]	COCs	Treatment	Placement Location
	Area 2	Soil, Vegetation	978	Low concentration of cinder metals	Limestone	Keller Canyon Class II Landfill
	Phase 1 Area 2 and 3	Vegetation	2,046	Low concentration of cinder metals	Limestone	Keller Canyon Landfill
Type D	M1a	Marsh Sediment	464	PCBs > 50 mg/kg. Cinder Metals. DDE.	No waste treatment. Drying agent (CKD) addition for solidification.	Kettleman Class I Landfill
Area 4 Seawall	Area 4 (North of Old Seawall)	Upland Soil	703	Low concentration of cinder metals	None	Keller Canyon

- BBL. 2003. *Biological Assessment Report*. Prepared by Blasland, Bouck & Lee, Inc. for the University of California Berkeley. July.
- EPA. 2002. *National Recommended Water Quality Criteria: 2002*. United States Environmental Protection Agency, Office of Water, Office of Science and Technology. EPA-822-R-02-047. November.
- LFR. 2001a. *Soil Management Plan: Upland Remediation Subunit 1 and Subunit 2A, Meade Street Operable Unit, Zeneca Inc.* Prepared by Levine Fricke for University of California, Berkeley. January 10.
- LFR. 2001b. *Conceptual Remediation and Risk Management Plan for the Upland Portion of Subunit 2A, Meade Street Operable Unit, University of California Berkeley, Richmond Field Station.* Prepared by Levine Fricke for University of California, Berkeley. December 17.
- LFR. 2002a. *Remedial Design Details: Meade Street Operable Unit.* Prepared by Levine Fricke for University of California, Berkeley. January 31.
- LFR 2002b. *Issued for Bid, Technical Specifications: Subunit 1 and Subunit 2A, Upland Remediation, Meade Street Operable Unit, Richmond, California.* Prepared by Levine Fricke for Zeneca Inc. January.
- UCB. 2003a. *Construction Documents for RFS Phase 2 Remediation Project.* University of California Berkeley. June 2003.
- UCB 2003b. *Storm Water Pollution Prevention Plan, University of California, Berkeley, Richmond Field Station, Richmond, California, Remediation and Restoration Project.* Prepared by the Office of Environment, Health & Safety, University of California, Berkeley. October 10, 2003.
- URS. 1999. *Field Sampling and Analysis Plan and Tiered Risk Evaluation.* Prepared by URS Corporation for University of California, Berkeley. December 10.
- URS. 2000. *Field Sampling and Analyses Results: University of California Berkeley, Richmond Field Station.* Prepared by URS Corporation for University of California, Berkeley. December.
- URS. 2001a. *Human Health and Ecological Tiered Risk Evaluation: University of California Berkeley.* Prepared by URS Corporation for University of California, Berkeley. November.
- URS. 2001b. *Results of Additional Soil and Groundwater Investigations and Groundwater Monitoring Plan: Upland Portion of Subunit 2A, Richmond Field Station.* Prepared by URS Corporation for University of California, Berkeley. November 21.
- URS. 2001c. *Results of Additional Soil and Groundwater Investigations and Surface Water Monitoring Plan: Marsh Portion of Subunit 2A, Richmond Field Station.* Prepared by URS Corporation for University of California, Berkeley. November 21.
- URS. 2002a. *Meade Street Operable Unit, Subunits 1 and 2A,* addressed to Mr. Dan Buford of the USFWS and dated June 5.

- URS. 2002b. *Health and Safety Plan: University of California Berkeley, Richmond Field Station*. Prepared by URS Corporation for University of California, Berkeley. July 19.
- URS. 2002c. *Remedial Design Details – Addendum*. Prepared by URS Corporation for University of California, Berkeley. August 16.
- URS. 2002d. *Remedial Design Details – Addendum 2*. Prepared by URS Corporation for University of California, Berkeley. November 6.
- URS 2003a. *Remedial Action Plan – Phase 2*. Prepared by URS Corporation for University of California, Berkeley. April 15, 2003.
- URS 2003b. *Initial Study, California Environmental Quality Act*. Prepared by URS Corporation for University of California, Berkeley. May 28, 2003.
- URS. 2003c. *Implementation Report, Phase 1-Subunit 2A and 2B, Meade Street Operable Unit*. Prepared by URS Corporation for University of California, Berkeley. September 4, 2003.

## **TABLES**

**TABLE 1**  
**TREATED MATERIAL pH RESULTS**  
**PHASE 2 REMEDIATION**  
**RICHMOND FIELD STATION**

<b>Bin #</b>	<b>pH</b>	<b>Approx. Vol (Cubic Yards)</b>	<b>Comments</b>
<b>September 5, 2003</b>			
1	7.9	30	Mixing "Type A" material from onsite stockpiles and overburden
2	8.0	30	
3	8.0	30	
4	7.7	30	
<b>September 6, 2003</b>			
5	8.1	30	
6	7.9	30	
7	8.0	30	
8	8.8	30	
9	8.5	30	
10	7.9	30	
11-27	7.6	510	
28-44	7.8	510	
45-52	7.6	240	
<b>September 8, 2003</b>			
53-57	7.5	180	
<b>September 10, 2003</b>			
1	7.4	25	
2	7.1	25	
3	6.9	25	
4	7.3	25	
5	7.2	25	
6	7.1	25	
1-20	7.2	500	
<b>September 11, 2003</b>			
20-25	7.2	125	Untreated Stockpile (Type A) pH=6.9
1-21	7.3	525	
21-42	7.5	525	
	7.4		
42-	7.8		
	7.7		
<b>September 12, 2003</b>			
1-20	8.2	500	
21-40	8.2	500	
41-59	8.0	475	
60-75	8.5	375	
<b>September 13, 2003</b>			
1-20	7.7	500	Untreated Stockpile (Type A) pH=7.0
21-39	7.3	475	
40-51	7.6	300	
52-61	8.0	250	
<b>September 15, 2003</b>			
	6.9	500	091503-1
	7.2		091503-2
<b>September 16, 2003</b>			
	8.0		091603-1
	8.2		091603-2

**TABLE 1  
TREATED MATERIAL pH RESULTS  
PHASE 2 REMEDIATION  
RICHMOND FIELD STATION**

<b>Bin #</b>	<b>pH</b>	<b>Approx. Vol (Cubic Yards)</b>	<b>Comments</b>
<b>September 17, 2003</b>			Soil Type B
	8.9	150	091703-1
<b>September 18, 2003</b>			Soil Type B
	8.1	120	091803-1
	7.9		
	8.4		
	8.2		
<b>September 19, 2003</b>			Soil Type B
	8.9	150	091903-1
	8.7		
	9.3		
	8.6		
	8.4		
<b>September 24, 2003</b>			Soil TypeB
1-14	8.2	450	092403-1
<b>September 25, 2003</b>			Soil TypeB
31 bins	8.5		092503-1
<b>September 26, 2003</b>			Soil TypeB
27 bins	7.9	800	092603-1
<b>September 29, 2003</b>			Soil TypeB
31	8.1	800	092903-1
<b>September 30, 2003</b>			Soil TypeB
15 bins	8.7	450	093003-1
<b>October 1, 2003</b>			Soil Type A
20 bins	7.8	600	100103-1
22 bins	7.7	660	No stockpile (loaded directly), 14 bins mixed on 10/02
<b>October 3, 2003</b>			
1-29 bins	8.0		Type B
30-45 bins	7.6		Type B
46-62 bins	8.2		Type B
<b>October 6, 2003</b>			Soil Type B
1-5 bins	7.2	150	100603-1
5-10 bins	7.0-7.1	150	100603-2
10-15 bins	7.2	150	
16-27		360	
<b>October 7, 2003</b>			
13 bins	7.3	390	Type B
<b>October 8, 2003</b>			
13 bins	7.7	390	Type B
<b>October 9, 2003</b>			
13 bins	6.9	390	Type B
			Untreated Type B marsh
			Sediment pH = 6.7
<b>October 10, 2003</b>			
22	9.0		Type B CKD added
<b>October 11, 2003</b>			
6	9.0		Type B CKD added

**TABLE 1**  
**TREATED MATERIAL pH RESULTS**  
**PHASE 2 REMEDIATION**  
**RICHMOND FIELD STATION**

<b>Bin #</b>	<b>pH</b>	<b>Approx. Vol (Cubic Yards)</b>	<b>Comments</b>
<b>October 14, 2003</b>			Type B
	10.7		5%CKD
<b>October 15, 2003</b>			
67 bins	10.7	2000	Average of bins from 10/11 pm to 10/15 am. Type B with CKD
<b>October 18, 2003</b>			
	12.5		Mixed 10/15-10/18
			Untreated Type B marsh
			Sediment pH = 7.7
<b>October 21, 2003</b>			
	6.9		Type A
	5.9		untreated

**TABLE 2  
ANALYTICAL RESULTS FOR MERCURY TREATMENT  
PHASE 2 REMEDIATION  
RICHMOND FIELD STATION**

Sample ID	Sample Description	Total Mercury Concentration [mg/kg]	Leachable Mercury Concentration [ug/L]
<b><u>Area 4 Treated Samples</u></b>			
Treated Hg-092203-2	Area 4 Treated Soil Sample #1	84	0.054 J
Treated Hg-092203-3	Area 4 Treated Soil Sample #2	110	< 0.030 J
Treated Hg-092403	Area 4 Treated Soil Screening Sample	70	-
No leachate sample collected since collected soil sample early to screen soil for total mercury			
Treated Hg-092603	Area 4 Treated Soil Sample #3	66	
Treated Hg Leachate-092703	Area 4 Treated Soil Leachate Sample #3		< 0.20
Treated Hg-100103	Area 4 Treated Soil Sample #4	28	
Treated Hg Leachate 100203	Area 4 Treated Soil Leachate Sample #4		< 0.20
Treated Hg-100303	Area 4 Treated Soil Sample #5	19	
Treated Hg Leachate-100403	Area 4 Treated Soil Leachate Sample #5		< 0.20
<b><u>Area 2 Pretreatment Samples</u></b>			
Untreated Hg-101403	Soil	45	
Untreated Hg-101503	Soil	13	
ENV1-a,b,c,d	Soil	23	
<b><u>Area 2 Treated Samples</u></b>			
Treated Hg-100603-1	Area 2 Treated Soil Sample #1	29	
Hg Leachate 100603-1	Area 2 Treated Soil Leachate Sample #1		< 0.20
Treated Hg-100603-2	Area 2 Treated Soil Sample #2	28	
Hg Leachate 100603-2	Area 2 Treated Soil Leachate Sample #2		< 0.20
Treated Hg-100603-3	Area 2 Treated Soil Sample #3	23	
Treated Hg-Leachate-100803	Area 2 Treated Soil Leachate Sample #3		< 0.20
Treated Hg-100803	Area 2 Treated Soil Sample #4	28	
Treated Hg-Leachate-100903	Area 2 Treated Soil Leachate Sample #4		< 0.20
Treated Hg-101403	Area 2 Treated Soil Sample #5	41	
Treated Hg-Leachate-101503	Area 2 Treated Soil Leachate Sample #5		< 0.20
Treated Hg-101603	Area 2 Treated Soil Sample #6	20	
Treated Hg-Leachate-101703	Area 2 Treated Soil Leachate Sample #6		< 0.20
Treated Hg-101803	Area 2 Treated Soil Sample #7	21	
TreatedHg Leachate-101903	Area 2 Treated Soil Leachate Sample #7		< 0.20
TreatedHg-102203	Area 2 Treated Soil Sample #8	8.3	
Hg Leachate-102303	Area 2 Treated Soil Leachate Sample #8		< 0.20
Treated Hg-4.3%AC-102403	Area 2 4.3% PAC Treated Soil Sample #9	30	
Treated Hg-4.3%AC-Leachate-102503	Area 2 4.3% PAC Treated Soil Leachate Sample #9		< 0.20

**Notes:**

Treated soil with mercury less than 50 mg/kg was authorized to be moved to Subunit 1 prior to obtaining leachate result.  
Treated soil leachate must be less than 0.25 ug/L prior to placement at Subunit 1.  
PAC = Powdered Activated Carbon  
J = The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.  
mg/kg = milligram per kilogram      ug/L = micro gram per liter



**TABLE 3  
METALS AND TEPH IN UPLAND BACKFILL MATERIAL  
PHASE 2 REMEDIATION  
RICHMOND FIELD STATION**

Sample ID	Metals													TEPH			Percent Moisture (%)
	Antimony	Arsenic	Beryllium	Cadmium	Chromium	Copper	Lead	Mercury	Nickel	Selenium	Silver	Thallium	Zinc	Gasoline	Diesel	Motor Oil	
Upland Fill Criteria**	5.5	19.1	1.0	2.7	99.6	69.4	16.1	0.4	119.8	5.6	1.8	27.1	106	100	100	500	
Upland Fill Criteria***	31.3	19.1	7.5	7.4	99.6	230	50	2	200	10	40	27.1	106	100	100	500	

**Stanley Hall Material<sup>1</sup>**

COMPOSITE 1	2.9	3.1	0.64	1.9	19	33	13	0.059	40	<0.24	<0.24	<0.24	55	-	<1.1	<5.5	10%
COMPOSITE 2	<3.0	3.2	0.69	2.1	19	31	12	0.051	36	<0.25	<0.25	<0.25	58	-	<1.1	<5.5	8%
COMPOSITE 3	<3.0	3.8	0.47	1.9	33	26	13	0.14	42	<0.25	<0.25	<0.25	52	-	46 HY	190	8%
COMPOSITE 4	<3.1	6.3	0.63	2.3	40	32	12	0.082	54	<0.26	<0.26	<0.26	65	-	<1.2	<5.9	15%
COMPOSITE 5 <sup>3,4</sup>	<3.2	7.4	0.73	3.2	<b>200</b>	36	18	0.23	<b>240</b>	<0.26	<0.26	<0.26	76	-	22 HY	29	15%
COMPOSITE 6	<3.2	5.7	0.59	2.1	42	23	11	0.11	64	<0.26	<0.26	<0.26	50	-	<1.1	<5.7	12%
COMPOSITE 7	<3.2	7.7	0.73	3	77	43	15	0.093	130	<0.27	<0.27	0.81	83	-	<1.1	<5.7	13%
COMPOSITE 8	<3.1	5.9	0.55	2.2	34	34	14	0.12	51	<0.26	<0.26	<0.26	65	-	5.6 HY	27	15%
COMPOSITE 9	<3.1	5.7	0.50	2.1	34	31	12	0.090	55	<0.26	<0.26	0.34	60	-	<1.2	<5.8	14%
COMPOSITE 10	<3.3	6.3	0.52	2.4	39	36	17	0.15	61	<0.27	<0.27	<0.27	74	-	2.6 HY	8.7	15%
COMPOSITE 11	<3.2	6.5	0.65	2.6	39	40	13	0.057	60	<0.27	<0.27	0.70	78	-	<1.2	<6.0	16%
COMPOSITE 12	<3.1	4.7	0.56	2.1	35	31	13	0.050	57	<0.26	<0.26	<0.26	60	-	<1.2	<6.0	16%

**Presidio Sand Source<sup>2</sup>**

SF-05	<2.2	2.1	0.19	0.43	57	7.1	3.9	-	46	<0.18	<0.18	0.44	23	<1.0	2.7 H Y	23	
FILL-COMP1	<2.0	1.3	<0.50	<0.50	43	5.1	2.2	<0.050	36	<2.0	<1.0	<1.0	34	-	-	-	
FILL-COMP2	<2.0	1.5	<0.50	<0.50	45	6.3	3.5	<0.050	36	<2.0	<1.0	<1.0	35	-	-	-	
FILL-COMP3	<2.0	1.5	<0.50	<0.50	48	5.3	2.2	<0.050	37	<2.0	<1.0	<1.0	34	-	-	-	
FILL-COMP4	<2.0	1.9	<0.50	<0.50	49	6.3	2.6	<0.050	37	<2.0	<1.0	<1.0	36	-	-	-	

**PG&E SF Sand Source<sup>2</sup> (1,000 cubic yards)**

SF-03 <sup>3</sup>	<2.3	3.6	0.2	<0.19	42	16	<b>83</b>	0.13	50	<0.19	<0.19	0.77	34	<0.99	28 H Y	210 H	
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**Private SF Sand Source<sup>2</sup> (1,000 cubic yards)**

SF-04	<2.1	2.1	0.12	<0.18	35	3.2	1.7	0.028	20	<0.18	<0.18	<0.18	14	<1.1	11 H Y	27	
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**Notes:**

Results are in milligrams per kilogram.

<sup>1</sup> Results are presented in dry weight.

<sup>2</sup> Results are presented in wet weight.

<sup>3</sup> Soil with concentrations exceeding the Upland Fill Criteria (i.e., background metals concentrations) were approved by RWQCB staff for backfilling.

<sup>4</sup> Soil contained portions of the sandstone bedrock with naturally occurring metals. Soil with significant portions of bedrock were segregated and rejected.

\*\* Background metals concentrations listed in Lawrence Berkeley National Laboratory (LBNL) Protocol for Determining Background Concentrations of Metals in Soil at Lawrence Berkeley National Laboratory (August 1995). Fill criteria to be used as guidance.

TPH criteria was RWQCB Shallow Soil (< 3 meters) Groundwater is Drinking Source Residential RBSLs

\*\*\* Metal screening criteria based upon multiple sources. Fill criteria to be used as guidance.

TEPH = Total extractable petroleum hydrocarbons.

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.

H = Heavier hydrocarbons contributed to the quantitation

Y = Sample exhibits chromatographic pattern which does not resemble standard

**TABLE 4  
PESTICIDES IN UPLAND BACKFILL MATERIAL  
PHASE 2 REMEDIATION  
RICHMOND FIELD STATION**

Sample ID	Aldrin	Dieldrin	Endrin aldehyde	Endrin	Endrin ketone	Heptachlor	Heptachlor epoxide	4,4'-DDT	4,4'-DDE	4,4'-DDD	Endosulfan I	Endosulfan II	alpha-BHC	beta-BHC	gamma-BHC	delta-BHC	Endosulfan sulfate	4,4'-Methoxychlor	Chlordane	alpha-Chlordane	gamma-Chlordane	Toxaphene	Percent Moisture (%)	
Upland Fill Criteria*		30.3		10,700		108	53	1,720	1,720	2,430									1,620					

**Stanley Hall Material<sup>1</sup>**

COMPOSITE 1	<1.9	<3.7	<3.7	<3.7		<1.9	<1.9	<3.7	<3.7	<3.7	<1.9	<3.7	<1.9	<1.9	<1.9	<1.9	<3.7	<19		<1.9	<1.9	<67	10%
COMPOSITE 2	<1.8	<3.6	<3.6	<3.6		<1.8	<1.8	<3.6	<3.6	<3.6	<1.8	<3.6	<1.8	<1.8	<1.8	<1.8	<3.6	<18		<1.8	<1.8	<65	8%
COMPOSITE 3	<19	<36	<36	<36 b		<19 b	<19	<36	<36	<36	<19	<36	<19	<19	<19	<19	<36	<190		<19	<19	<650	8%
COMPOSITE 4	<2.0	<3.9	<3.9	<3.9 b		<2.0 b	<2.0	<3.9	<3.9	<3.9	<2.0	<3.9	<2.0	<2.0	<2.0	<2.0	<3.9	<20		<2.0	<2.0	<71	15%
COMPOSITE 5	<2.0	<3.8	<3.8	<3.8 b		<2.0 b	<2.0	<3.8	<3.8	<3.8	<2.0	<3.8	<2.0	<2.0	<2.0	<2.0	<3.8	<20		<2.0	<2.0	<70	15%
COMPOSITE 6	<1.9	<3.7	<3.7	<3.7 b		<1.9 b	<1.9	<3.7	<3.7	<3.7	<1.9	<3.7	<1.9	<1.9	<1.9	<1.9	<3.7	<19		<1.9	<1.9	<67	12%
COMPOSITE 7	<1.9	<3.8	<3.8	<3.8 b		<1.9 b	<1.9	<3.8	<3.8	<3.8	<1.9	<3.8	<1.9	<1.9	<1.9	<1.9	<3.8	<19		<1.9	<1.9	<69	13%
COMPOSITE 8	<2.0	<3.9	<3.9	<3.9 b		<2.0 b	<2.0	<3.9	<3.9	<3.9	<2.0	<3.9	<2.0	<2.0	<2.0	<2.0	<3.9	<20		<2.0	<2.0	<71	15%
COMPOSITE 9	<2.0	<3.8	<3.8	<3.8 b		<2.0 b	<2.0	<3.8	<3.8	<3.8	<2.0	<3.8	<2.0	<2.0	<2.0	<2.0	<3.8	<20		<2.0	<2.0	<69	14%
COMPOSITE 10	<2.0	<3.8	<3.8	<3.8 b		<2.0 b	<2.0	<3.8	<3.8	<3.8	<2.0	<3.8	<2.0	<2.0	<2.0	<2.0	<3.8	<20		<2.0	<2.0	<70	15%
COMPOSITE 11	<2.1	<4.0	<4.0	<4.0		<2.1	<2.1	<4.0	<4.0	<4.0	<2.1	<4.0	<2.1	<2.1	<2.1	<2.1	<4.0	<21		<2.1	<2.1	<72	16%
COMPOSITE 12	<2.0	<4.0	<4.0	<4.0		<2.0	<2.0	<4.0	<4.0	<4.0	<2.0	<4.0	<2.0	<2.0	<2.0	<2.0	<4.0	<20		<2.0	<2.0	<72	16%

**Presidio Sand Source<sup>2</sup>**

SF-05	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 50	-	-	< 100		
FILL-COMP1	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	63	2.9	3.9	< 100	
FILL-COMP2	< 2.0	2.8	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	55	3.1	3.6	< 100	
FILL-COMP3	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	54	2.8	3.5	< 100	
FILL-COMP4	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	70	3.9	4.9	< 100	

**PG&E SF Sand Source<sup>2</sup> (1,000 cubic yards)**

SF-03	< 8.5	< 16	-	-	-	< 8.5	< 8.5	< 16	< 16	< 16	< 8.5	< 16	< 8.5	< 8.5	< 8.5	< 8.5	< 16	-	-	< 8.5	< 8.5	< 300	
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**Private SF Sand Source<sup>2</sup> (1,000 cubic yards)**

SF-04	< 1.7	< 3.3	< 3.3	< 3.3	-	< 1.7	< 1.7	< 3.3	< 3.3	< 3.3	< 1.7	< 3.3	< 1.7	< 1.7	< 1.7	< 1.7	< 3.3	< 17	-	< 1.7	< 1.7	< 59	
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**Notes:**

Results are in micrograms per kilogram.

<sup>1</sup> Results are presented in dry weight.

<sup>2</sup> Results are presented in wet weight.

\* H-SSTL Residential Concentration developed for the RFS in *Human Health and Ecological Tiered Risk Evaluation*, University of California, Berkeley, Richmond Field Station/Siege Marsh, Richmond, California (November 2001).

**TABLE 5  
PAHs AND PCBs IN UPLAND BACKFILL MATERIAL  
PHASE 2 REMEDIATION  
RICHMOND FIELD STATION**

Sample ID	Polynuclear Aromatic Hydrocarbons (PAHs)																PCBs							Percent Moisture (%)
	Naphthalene	Acenaphthylene	Acenaphthene	Fluorene	Phenanthrene	Anthracene	Fluoranthene	Pyrene	Benzo(a)anthracene	Chrysene	Benzo(b)fluoranthene	Benzo(k)fluoranthene	Benzo(a)pyrene	Dibenzo(a,b)anthracene	Benzo(g,h,i)perylene	Indeno(1,2,3-cd)pyrene	Aroclor 1016	Aroclor 1221	Aroclor 1232	Aroclor 1242	Aroclor 1248	Aroclor 1254	Aroclor 1260	
<b>Upland Fill Criteria*</b>	42,000	13,000	16,000	8,900	11,000	2,800	40,000	85,000	620	6,100	620	610	62	62	27,000	620	3,900	220	220	220	220	220	220	220

**Stanley Hall Material<sup>1</sup>**

COMPOSITE 1	<37	<73	<37	<7.3	<3.7	<3.7	<7.3	<3.7	<3.7	<3.7	<7.3	<3.7	<3.7	<7.3	<7.3	<3.7	<13	<27	<13	<13	<13	<13	<13	<13	10%
COMPOSITE 2	<37	<73	<37	<7.3	<3.7	<3.7	<7.3	<3.7	<3.7	<3.7	<7.3	<3.7	<3.7	<7.3	<7.3	0.0064	<13	<26	<13	<13	<13	<13	<13	<13	8%
COMPOSITE 3	<360	<720	<360	<72	<36	<36	<72	39	<36	<36	<72	<36	<36	<72	<72	<36	<13	<26	<13	<13	<13	<13	<13	<13	8%
COMPOSITE 4	<39	<78	<39	<7.8	<3.9	<3.9	<7.8	<3.9	<3.9	<3.9	<7.8	<3.9	<3.9	<7.8	<7.8	<3.9	<14	<28	<14	<14	<14	<14	<14	<14	15%
COMPOSITE 5	<390	<780	<390	<78	270	<39	130	150	60	61	100	<39	65	170	130	<39	<14	<28	<14	<14	<14	<14	<14	<14	15%
COMPOSITE 6	<38	<75	<38	<7.5	<3.8	<3.8	<7.5	5.4	<3.8	<3.8	<7.5	<3.8	<3.8	<7.5	<7.5	7.3	<14	<27	<14	<14	<14	<14	<14	<14	12%
COMPOSITE 7	<39	<77	<39	<7.7	<3.9	<3.9	<7.7	<3.9	<3.9	<3.9	<7.7	<3.9	<3.9	<7.7	<7.7	<3.9	<14	<27	<14	<14	<14	<14	<14	<14	13%
COMPOSITE 8	<390	<790	<390	<79	<39	<39	<79	<39	<39	<39	<79	<39	<39	<79	<79	<39	<14	<28	<14	<14	<14	<14	<14	<14	15%
COMPOSITE 9	<39	<78	<39	<7.8	<3.9	<3.9	<7.8	<3.9	<3.9	<3.9	<7.8	<3.9	<3.9	<7.8	<7.8	<3.9	<14	<28	<14	<14	<14	<14	<14	<14	14%
COMPOSITE 10	<39	<78	<39	<7.8	7.4	<3.9	<7.8	6.2	<3.9	<3.9	<7.8	<3.9	4.3	<7.8	<7.8	11	<14	<28	<14	<14	<14	<14	<14	<14	14%
COMPOSITE 11	<40	<79	<40	<7.9	<4.0	<4.0	<7.9	<4.0	<4.0	<4.0	<7.9	<4.0	<4.0	<7.9	<7.9	<4.0	<14	<29	<14	<14	<14	<14	<14	<14	16%
COMPOSITE 12	<39	<78	<39	<7.8	8.1	<3.9	<7.8	5.8	<3.9	<3.9	<7.8	<3.9	<3.9	<7.8	<7.8	7.8	<14	<28	<14	<14	<14	<14	<14	<14	16%

**Presidio Sand Source<sup>2</sup>**

SF-05	< 33	< 67	< 33	< 6.7	3.4	< 3.3	6.7	< 3.3	4.7	6.2	8.3	< 3.3	5.4	14	< 6.7	< 3.3	< 12	< 24	< 12	< 12	< 12	< 12	< 12	< 12	
FILL-COMP1	< 67	< 67	< 67	< 67	< 67	< 67	< 67	< 67	< 67	< 67	< 67	< 67	< 67	< 67	< 67	< 67	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	
FILL-COMP2	< 67	< 67	< 67	< 67	< 67	< 67	< 67	< 67	< 67	< 67	< 67	< 67	< 67	< 67	< 67	< 67	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	
FILL-COMP3	< 67	< 67	< 67	< 67	< 67	< 67	< 67	< 67	< 67	< 67	< 67	< 67	< 67	< 67	< 67	< 67	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	
FILL-COMP4	< 67	< 67	< 67	< 67	< 67	< 67	< 67	< 67	< 67	< 67	< 67	< 67	< 67	< 67	< 67	< 67	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	

**PG&E SF Sand Source<sup>2</sup> (1,000 cubic yards)**

SF-03	< 33	< 67	< 33	< 6.7	69	26	100	110	59	100	79	28	57	< 6.7	28	32	< 12	< 24	< 12	< 12	< 12	< 12	< 12	< 12	
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**Private SF Sand Source<sup>2</sup> (1,000 cubic yards)**

SF-04	< 33	< 66	< 33	< 6.6	< 3.3	< 3.3	< 6.6	< 3.3	< 3.3	< 3.3	< 6.6	< 3.3	< 3.3	< 6.6	< 6.6	< 3.3	< 12	< 24	< 12	< 12	< 12	< 12	< 12	< 12	
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**Notes:**

Results are in micrograms per kilogram.

<sup>1</sup> Results are presented in dry weight.

<sup>2</sup> Results are presented in wet weight.

\* The lower of Residential Preliminary Remediation Goals (PRGs) and RWQCB Shallow Soil (< 3 meters) Groundwater is Drinking Source Commercial or Residential RBSLs were used to screen PAHs.

PCBs are screened against H-SSTL-Residential (equal to PRGs and RWQCB Residential RBSLs).

PAH = Polycyclic aromatic hydrocarbon.

PCB = Polychlorinated biphenyl.

**TABLE 6  
VOCs IN UPLAND BACKFILL MATERIAL  
PHASE 2 REMEDIATION  
RICHMOND FIELD STATION**

Sample ID	Stanley Hall <sup>1</sup>												Presidio Sand Source <sup>2</sup>					PG&E SF Sand Source <sup>2</sup> (1,000 cubic yards)	Private SF Sand Source <sup>2</sup> (1,000 cubic yards)
	COMP OSITE 1	COMP OSITE 2	COMP OSITE 3	COMP OSITE 4	COMP OSITE 5	COMP OSITE 6	COMP OSITE 7	COMP OSITE 8	COMP OSITE 9	COMP OSITE 10	COMP OSITE 11	COMP OSITE 12	SF-05	FILL-COMP1	FILL-COMP2	FILL-COMP3	FILL-COMP4	SF-03	SF-04
	1	2	3	4	5	6	7	8	9	10	11	12	SF-05	FILL-COMP1	FILL-COMP2	FILL-COMP3	FILL-COMP4	SF-03	SF-04
<b>Parameter</b>																			
Acetone	<22	<21	<22	<22	<23	<23	50	<23	<22	<23	<23	<25	< 20	-	-	-	-	< 19	< 20
Benzene	<5.4	<5.3	<5.5	<5.5	<5.8	<5.7	<5.4	<5.7	<5.5	<5.7	<5.7	<6.2	< 5.0	-	-	-	-	< 4.6	< 4.9
Bromodichloromethane	<5.4	<5.3	<5.5	<5.5	<5.8	<5.7	<5.4	<5.7	<5.5	<5.7	<5.7	<6.2	< 5.0	-	-	-	-	< 4.6	< 4.9
Bromobenzene	<5.4	<5.3	<5.5	<5.5	<5.8	<5.7	<5.4	<5.7	<5.5	<5.7	<5.7	<6.2	< 5.0	-	-	-	-	< 4.6	< 4.9
Bromochloromethane	<5.4	<5.3	<5.5	<5.5	<5.8	<5.7	<5.4	<5.7	<5.5	<5.7	<5.7	<6.2	< 5.0	-	-	-	-	< 4.6	< 4.9
Bromofom	<5.4	<5.3	<5.5	<5.5	<5.8	<5.7	<5.4	<5.7	<5.5	<5.7	<5.7	<6.2	< 5.0	-	-	-	-	< 4.6	< 4.9
Bromomethane	<11	<11	<11	<11	<12	<11	<11	<11	<11	<11	<11	<12	< 10	-	-	-	-	< 9.3	< 9.8
2-Butanone	<11	<11	<11	<11	16	<11	<11	<11	<11	<11	<11	<12	< 10	-	-	-	-	< 9.3	< 9.8
n-Butylbenzene	<5.4	<5.3	<5.5	<5.5	<5.8	<5.7	<5.4	<5.7	<5.5	<5.7	<5.7	<6.2	< 5.0	-	-	-	-	< 4.6	< 4.9
sec-Butylbenzene	<5.4	<5.3	<5.5	<5.5	<5.8	<5.7	<5.4	<5.7	<5.5	<5.7	<5.7	<6.2	< 5.0	-	-	-	-	< 4.6	< 4.9
tert-Butylbenzene	<5.4	<5.3	<5.5	<5.5	<5.8	<5.7	<5.4	<5.7	<5.5	<5.7	<5.7	<6.2	< 5.0	-	-	-	-	< 4.6	< 4.9
Carbon Disulfide	<5.4	<5.3	<5.5	<5.5	<5.8	<5.7	<5.4	<5.7	<5.5	<5.7	<5.7	<6.2	< 5.0	-	-	-	-	< 4.6	< 4.9
Carbon Tetrachloride	<5.4	<5.3	<5.5	<5.5	<5.8	<5.7	<5.4	<5.7	<5.5	<5.7	<5.7	<6.2	< 5.0	-	-	-	-	< 4.6	< 4.9
Chlorobenzene	<5.4	<5.3	<5.5	<5.5	<5.8	<5.7	<5.4	<5.7	<5.5	<5.7	<5.7	<6.2	< 5.0	-	-	-	-	< 4.6	< 4.9
Chloroethane	<11	<11	<11	<11	<12	<11	<11	<11	<11	<11	<11	<12	< 10	-	-	-	-	< 9.3	< 9.8
Chloroform	<5.4	<5.3	<5.5	<5.5	<5.8	<5.7	<5.4	<5.7	<5.5	<5.7	<5.7	<6.2	< 5.0	-	-	-	-	< 4.6	< 4.9
Chloromethane	<11	<11	<11	<11	<12	<11	<11	<11	<11	<11	<11	<12	< 10	-	-	-	-	< 9.3	< 9.8
2-Chlorotoluene	<5.4	<5.3	<5.5	<5.5	<5.8	<5.7	<5.4	<5.7	<5.5	<5.7	<5.7	<6.2	< 5.0	-	-	-	-	< 4.6	< 4.9
4-Chlorotoluene	<5.4	<5.3	<5.5	<5.5	<5.8	<5.7	<5.4	<5.7	<5.5	<5.7	<5.7	<6.2	< 5.0	-	-	-	-	< 4.6	< 4.9
Dibromochloromethane	<5.4	<5.3	<5.5	<5.5	<5.8	<5.7	<5.4	<5.7	<5.5	<5.7	<5.7	<6.2	< 5.0	-	-	-	-	< 4.6	< 4.9
1,2-Dichlorobenzene	<5.4	<5.3	<5.5	<5.5	<5.8	<5.7	<5.4	<5.7	<5.5	<5.7	<5.7	<6.2	< 5.0	-	-	-	-	< 4.6	< 4.9
1,3-Dichlorobenzene	<5.4	<5.3	<5.5	<5.5	<5.8	<5.7	<5.4	<5.7	<5.5	<5.7	<5.7	<6.2	< 5.0	-	-	-	-	< 4.6	< 4.9
1,4-Dichlorobenzene	<5.4	<5.3	<5.5	<5.5	<5.8	<5.7	<5.4	<5.7	<5.5	<5.7	<5.7	<6.2	< 5.0	-	-	-	-	< 4.6	< 4.9
1,3-Dichloropropane	<5.4	<5.3	<5.5	<5.5	<5.8	<5.7	<5.4	<5.7	<5.5	<5.7	<5.7	<6.2	< 5.0	-	-	-	-	< 4.6	< 4.9
2,2-Dichloropropane	<5.4	<5.3	<5.5	<5.5	<5.8	<5.7	<5.4	<5.7	<5.5	<5.7	<5.7	<6.2	< 5.0	-	-	-	-	< 4.6	< 4.9
1,1-Dichloropropene	<5.4	<5.3	<5.5	<5.5	<5.8	<5.7	<5.4	<5.7	<5.5	<5.7	<5.7	<6.2	< 5.0	-	-	-	-	< 4.6	< 4.9
1,2-Dibromo-3-Chloropropane	<5.4	<5.3	<5.5	<5.5	<5.8	<5.7	<5.4	<5.7	<5.5	<5.7	<5.7	<6.2	< 5.0	-	-	-	-	< 4.6	< 4.9
1,2-Dibromoethane	<5.4	<5.3	<5.5	<5.5	<5.8	<5.7	<5.4	<5.7	<5.5	<5.7	<5.7	<6.2	< 5.0	-	-	-	-	< 4.6	< 4.9
Dibromomethane	<5.4	<5.3	<5.5	<5.5	<5.8	<5.7	<5.4	<5.7	<5.5	<5.7	<5.7	<6.2	< 5.0	-	-	-	-	< 4.6	< 4.9
1,1-Dichloroethane	<5.4	<5.3	<5.5	<5.5	<5.8	<5.7	<5.4	<5.7	<5.5	<5.7	<5.7	<6.2	< 5.0	-	-	-	-	< 4.6	< 4.9
1,2-Dichloroethane	<5.4	<5.3	<5.5	<5.5	<5.8	<5.7	<5.4	<5.7	<5.5	<5.7	<5.7	<6.2	< 5.0	-	-	-	-	< 4.6	< 4.9
1,1-Dichloroethene	<5.4	<5.3	<5.5	<5.5	<5.8	<5.7	<5.4	<5.7	<5.5	<5.7	<5.7	<6.2	< 5.0	-	-	-	-	< 4.6	< 4.9
cis-1,2-Dichloroethene	<5.4	<5.3	<5.5	<5.5	<5.8	<5.7	<5.4	<5.7	<5.5	<5.7	<5.7	<6.2	< 5.0	-	-	-	-	< 4.6	< 4.9
trans-1,2-Dichloroethene	<5.4	<5.3	<5.5	<5.5	<5.8	<5.7	<5.4	<5.7	<5.5	<5.7	<5.7	<6.2	< 5.0	-	-	-	-	< 4.6	< 4.9
1,2-Dichloropropane	<5.4	<5.3	<5.5	<5.5	<5.8	<5.7	<5.4	<5.7	<5.5	<5.7	<5.7	<6.2	< 5.0	-	-	-	-	< 4.6	< 4.9
cis-1,3-Dichloropropene	<5.4	<5.3	<5.5	<5.5	<5.8	<5.7	<5.4	<5.7	<5.5	<5.7	<5.7	<6.2	< 5.0	-	-	-	-	< 4.6	< 4.9
trans-1,3,-Dichloropropene	<5.4	<5.3	<5.5	<5.5	<5.8	<5.7	<5.4	<5.7	<5.5	<5.7	<5.7	<6.2	< 5.0	-	-	-	-	< 4.6	< 4.9

**TABLE 6  
VOCs IN UPLAND BACKFILL MATERIAL  
PHASE 2 REMEDIATION  
RICHMOND FIELD STATION**

Sample ID	Stanley Hall <sup>1</sup>												Presidio Sand Source <sup>2</sup>					PG&E SF Sand Source <sup>2</sup> (1,000 cubic yards)	Private SF Sand Source <sup>2</sup> (1,000 cubic yards)
	COMP OSITE 1	COMP OSITE 2	COMP OSITE 3	COMP OSITE 4	COMP OSITE 5	COMP OSITE 6	COMP OSITE 7	COMP OSITE 8	COMP OSITE 9	COMP OSITE 10	COMP OSITE 11	COMP OSITE 12	SF-05	FILL-COMP1	FILL-COMP2	FILL-COMP3	FILL-COMP4	SF-03	SF-04
	Parameter																		
Ethylbenzene	<5.4	<5.3	<5.5	<5.5	<5.8	<5.7	<5.4	<5.7	<5.5	<5.7	<5.7	<6.2	< 5.0	-	-	-	-	< 4.6	< 4.9
Freon 113	<5.4	<5.3	<5.5	<5.5	<5.8	<5.7	<5.4	<5.7	<5.5	<5.7	<5.7	<6.2	< 5.0	-	-	-	-	< 4.6	< 4.9
Freon 12	<11	<11	<11	<11	<12	<11	<11	<11	<11	<11	<11	<12	< 10	-	-	-	-	< 9.3	< 9.8
Hexachlorobutadiene	<5.4	<5.3	<5.5	<5.5	<5.8	<5.7	<5.4	<5.7	<5.5	<5.7	<5.7	<6.2	< 5.0	-	-	-	-	< 4.6	< 4.9
2-Hexanone	<11	<11	<11	<11	<12	<11	<11	<11	<11	<11	<11	<12	< 10	-	-	-	-	< 9.3	< 9.8
Isopropylbenzene	<5.4	<5.3	<5.5	<5.5	<5.8	<5.7	<5.4	<5.7	<5.5	<5.7	<5.7	<6.2	< 5.0	-	-	-	-	< 4.6	< 4.9
para-Isopropyl Toluene	<5.4	<5.3	<5.5	<5.5	<5.8	<5.7	<5.4	<5.7	<5.5	<5.7	<5.7	<6.2	< 5.0	-	-	-	-	< 4.6	< 4.9
Methylene Chloride	<22	<21	<22	<22	<23	<23	<22	<23	<22	<23	<23	<25	25	-	-	-	-	< 19	< 20
4-Methyl-2-Pentanone	<11	<11	<11	<11	<12	<11	<11	<11	<11	<11	<11	<12	< 10	-	-	-	-	< 9.3	< 9.8
MTBE	<5.4	<5.3	<5.5	<5.5	<5.8	<5.7	<5.4	<5.7	<5.5	<5.7	<5.7	<6.2	< 5.0	-	-	-	-	< 4.6	< 4.9
Naphthalene	<5.4	<5.3	<5.5	<5.5	<5.8	<5.7	<5.4	<5.7	<5.5	<5.7	<5.7	<6.2	< 5.0	-	-	-	-	< 4.6	< 4.9
Propylbenzene	<5.4	<5.3	<5.5	<5.5	<5.8	<5.7	<5.4	<5.7	<5.5	<5.7	<5.7	<6.2	< 5.0	-	-	-	-	< 4.6	< 4.9
Styrene	<5.4	<5.3	<5.5	<5.5	<5.8	<5.7	<5.4	<5.7	<5.5	<5.7	<5.7	<6.2	< 5.0	-	-	-	-	< 4.6	< 4.9
1,1,1,2-Tetrachloroethane	<5.4	<5.3	<5.5	<5.5	<5.8	<5.7	<5.4	<5.7	<5.5	<5.7	<5.7	<6.2	< 5.0	-	-	-	-	< 4.6	< 4.9
1,1,2,2-Tetrachloroethane	<5.4	<5.3	<5.5	<5.5	<5.8	<5.7	<5.4	<5.7	<5.5	<5.7	<5.7	<6.2	< 5.0	-	-	-	-	< 4.6	< 4.9
Tetrachloroethene	<5.4	<5.3	<5.5	<5.5	<5.8	<5.7	<5.4	<5.7	<5.5	<5.7	<5.7	<6.2	< 5.0	-	-	-	-	< 4.6	< 4.9
Toluene	<5.4	<5.3	<5.5	<5.5	<5.8	<5.7	<5.4	<5.7	<5.5	<5.7	<5.7	<6.2	< 5.0	-	-	-	-	< 4.6	< 4.9
1,2,3-Trichlorobenzene	<5.4	<5.3	<5.5	<5.5	<5.8	<5.7	<5.4	<5.7	<5.5	<5.7	<5.7	<6.2	< 5.0	-	-	-	-	< 4.6	< 4.9
1,2,4-Trichlorobenzene	<5.4	<5.3	<5.5	<5.5	<5.8	<5.7	<5.4	<5.7	<5.5	<5.7	<5.7	<6.2	< 5.0	-	-	-	-	< 4.6	< 4.9
1,1,1-Trichloroethane	<5.4	<5.3	<5.5	<5.5	<5.8	<5.7	<5.4	<5.7	<5.5	<5.7	<5.7	<6.2	< 5.0	-	-	-	-	< 4.6	< 4.9
1,1,2-Trichloroethane	<5.4	<5.3	<5.5	<5.5	<5.8	<5.7	<5.4	<5.7	<5.5	<5.7	<5.7	<6.2	< 5.0	-	-	-	-	< 4.6	< 4.9
Trichloroethene	<5.4	<5.3	<5.5	<5.5	<5.8	<5.7	<5.4	<5.7	<5.5	<5.7	<5.7	<6.2	< 5.0	-	-	-	-	< 4.6	< 4.9
Trichlorofluoromethane	<5.4	<5.3	<5.5	<5.5	<5.8	<5.7	<5.4	<5.7	<5.5	<5.7	<5.7	<6.2	< 5.0	-	-	-	-	< 4.6	< 4.9
1,2,3-Trichloropropane	<5.4	<5.3	<5.5	<5.5	<5.8	<5.7	<5.4	<5.7	<5.5	<5.7	<5.7	<6.2	< 5.0	-	-	-	-	< 4.6	< 4.9
1,2,4-Trimethylbenzene	<5.4	<5.3	<5.5	<5.5	<5.8	<5.7	<5.4	<5.7	<5.5	<5.7	<5.7	<6.2	< 5.0	-	-	-	-	< 4.6	< 4.9
1,3,5-Trimethylbenzene	<5.4	<5.3	<5.5	<5.5	<5.8	<5.7	<5.4	<5.7	<5.5	<5.7	<5.7	<6.2	< 5.0	-	-	-	-	< 4.6	< 4.9
Vinyl Acetate	<5.4	<5.3	<5.5	<5.5	<5.8	<5.7	<5.4	<5.7	<5.5	<5.7	<5.7	<6.2	< 5.0	-	-	-	-	< 4.6	< 4.9
Vinyl Chloride	<11	<11	<11	<11	<12	<11	<11	<11	<11	<11	<11	<12	< 10	-	-	-	-	< 9.3	< 9.8
Total xylenes	<5.4	<5.3	<5.5	<5.5	<5.8	<5.7	<5.4	<5.7	<5.5	<5.7	<5.7	<6.2	< 5.0	-	-	-	-	< 4.6	< 4.9

**Notes:**  
 Results are in micrograms per kilogram.  
<sup>1</sup> Results are presented in dry weight.  
<sup>2</sup> Results are presented in wet weight.  
 VOC = Volatile Organic Compound

**TABLE 7  
METALS IN MARSH EXCAVATION BOTTOM SAMPLES  
PHASE 2 REMEDIATION  
RICHMOND FIELD STATION**

Sample ID	Antimony	Arsenic	Beryllium	Cadmium	Chromium	Copper	Lead	Mercury	Nickel	Silver	Selenium	Thallium	Zinc
<b>SCREENING CRITERIA*</b>													
RWQCB Wetland Foundation (> 3 feet)		70		9.6	370	270	218	0.7	120	3.7			410
E-SSTL (harvest mouse)	26	355	68	15	-	14,399	19,026	143	1,685	-	145	-	7,905
H-SSTL (recreator for tidal marsh)	8,180	35.4	38,800	155	9,340	100,000	400	4,380	100,000	100,000	100,000	1,350	100,000
E-SSTL (clapper rail)	1,698	685	-	57	-	598	576	3.8	2,778	-	110	-	5,244
<b>Area 2 Excavation Bottom Samples</b>													
B7-CONF-1**	< 2.0	< 1.0	< 0.50	< 0.50	34	19	3.1	0.094	38	< 2.0	< 1.0	< 1.0	32
B7-CONF-2	< 2.0	8.3	< 0.50	< 0.50	41	27	7.4	0.24	72	2.0	< 1.0	< 1.0	45
B7-CONF-3	< 2.0	4.3	< 0.50	< 0.50	31	19	3.0	0.18	40	< 2.0	< 1.0	< 1.0	32
B7-CONF-4	< 2.0	5.1	< 0.50	< 0.50	32	20	3.0	0.099	46	< 2.0	< 1.0	< 1.0	36
B7-CONF-5a	< 2.0	10.4	< 0.50	< 0.50	53	22	5.3	< 0.073	82	< 2.0	< 1.0	< 1.0	208
<b>M1a Excavation Bottom Samples</b>													
M1A-CONF-1	< 2.0	4.0	< 0.50	< 0.50	45	24	5.5	< 0.050	49	< 2.0	< 1.0	< 1.0	51
M1A-CONF-2	< 2.0	5.2	< 0.50	< 0.50	40	22	4.7	0.074	70	< 2.0	< 1.0	< 1.0	35
M1A-CONF-3	< 2.0	7.1	< 0.50	< 0.50	41	24	5.1	0.088	51	< 2.0	< 1.0	< 1.0	38
M1A-CONF-4	< 2.8	7.4	0.36	< 0.23	39	20	5.3	0.110	69	0.27	< 0.23	1.1	33
<b>M1a Storm Drain Excavation Bottom Samples</b>													
I7-LA-SDPIPE-CONF-1	< 2.0	3.1	< 0.50	< 0.50	44	32	5.4	< 0.050	49	< 2.0	< 1.0	< 1.0	49
<b>M3 Excavation Bottom Samples</b>													
M3-CONF-1	< 2.0	< 1.0	< 0.50	< 0.50	36	23	8.0	0.52	54	< 2.0	< 1.0	< 1.0	36
M3-CONF-2	< 2.0	14	< 0.50	< 0.50	68	46	5.9	0.27	86	< 2.0	< 1.0	< 1.0	62
M3-CONF-3	< 2.0	29	< 0.50	< 0.50	36	20	5.9	0.18	51	< 2.0	< 1.0	< 1.0	37
M3-CONF-4	< 3.4	9.2	1.45	< 0.29	49	25	6.6	0.14	87	< 0.29	0.34	1.4	42

**Notes:**

Results are in milligrams per kilogram.

Results are presented in dry weight.

\* Screening criteria are the site-specific target levels (SSTLs) developed for UC Berkeley's Human Health and Ecological Risk Assessment. SSTLs are presented in dry weight.

The calculated dry weight results were below the SSTLs.

\*\* Wet weight

**TABLE 8  
PESTICIDES IN MARSH EXCAVATION BOTTOM SAMPLES  
PHASE 2 REMEDIATION  
RICHMOND FIELD STATION**

Sample ID	Aldrin	Dieldrin	Endrin aldehyde	Endrin	Endrin ketone	Heptachlor	Heptachlor epoxide	4,4'-DDT	4,4'-DDE	4,4'-DDD	Endosulfan I	Endosulfan II	alpha-BHC	beta-BHC	gamma-BHC	delta-BHC	Endosulfan sulfate	4,4'-Methoxychlor	Chlordane	alpha-Chlordane	gamma-Chlordane	Toxaphene	Percent Moisture (%)	
<b>Marsh Fill Criteria*</b>		4.3		705		6.76	3.34	Total DDTs=46.1						5.03	17.6	24.2	7.86			2.3				

**M1a Excavation Bottom Samples**

M1A-CONF-1	< 2.9	< 2.9	< 2.9	< 2.9	< 2.9	< 2.9	< 2.9	< 2.9	< 2.9	< 2.9	< 2.9	< 2.9	< 2.9	< 2.9	< 2.9	< 2.9	< 2.9	< 2.9	< 73	< 2.9	< 2.9	< 141	15
M1A-CONF-2**	< 14	< 14	< 14	< 14	< 14	< 14	< 14	20	< 14	< 14	< 14	< 14	< 14	< 14	< 14	79	< 14	< 14	< 349	< 14	< 14	< 698	14
M1A-CONF-3	< 2.8	< 2.8	< 2.8	< 2.8	< 2.8	< 2.8	< 2.8	< 2.8	< 2.8	< 2.8	< 2.8	< 2.8	< 2.8	< 2.8	< 2.8	< 2.8	< 2.8	< 2.8	< 70	< 2.8	< 2.8	< 140	14

**Notes:**

Results are in micrograms per kilogram.

Results are presented in dry weight.

\* Criteria for pesticides were selected from the Wetland Foundation Material Screening Guidelines included in RWQCB Draft Staff Report: Beneficial Reuse of Dredged Materials: Sediment Screening and Testing Guidelines (May 2000) or the H-SSTL Angler receptors\*, developed for the RFS in Human Health and Ecological Tiered Risk Evaluation, University of California, Berkeley, Richmond Field Station/Stege Marsh, Richmond, California (November 2001).

\*\*Approved by RWQCB to leave sediment in place and backfill area. No additional excavation was required by the RWQCB.

**TABLE 9**  
**PCBs IN MARSH EXCAVATION BOTTOM SAMPLES**  
**PHASE 2 REMEDIATION**  
**RICHMOND FIELD STATION**

Sample ID	PCBs							Percent Moisture (%)
	*Aroclor 1016	*Aroclor1221	*Aroclor 1232	*Aroclor 1242	*Aroclor 1248	*Aroclor 1254	*Aroclor 1260	
<b>Marsh Fill Criteria*</b>	Total = 180							

**M1a Excavation Bottom Samples**

M1A-CONF-1	< 59	< 59	< 59	< 59	< 59	< 59	< 59	15
M1A-CONF-2**	< 1,395	< 1,395	< 1,395	< 1,395	4,767	< 1,395	< 1,395	14
M1A-CONF-3	< 58	< 58	< 58	< 58	< 58	< 58	< 58	14

**M1a Strom Drain Excavation Bottom Samples**

17-LA-SDPIPE-CONF	< 60	< 60	< 60	< 60	< 60	< 60	< 60	16
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**Notes:**

Results are in micrograms per kilogram.

Results are presented in dry weight.

PCB = Polychlorinated biphenyl.

\* Criteria for pesticides were selected from the Wetland Foundation Material Screening Guidelines included in RWQCB Draft Staff Report: Beneficial Reuse of Dredged Materials: Sediment Screening and Testing Guidelines (May 2000)

\*\*Approved by RWQCB to leave sediment in place and backfill area. No additional excavation was required by the RWQCB.



**TABLE 10**  
**ANALYTICAL RESULTS FOR RINSATE AND WIPE**  
**SAMPLES FOR ASPHALT AND CONCRETE TREATMENT PADS**  
**PHASE 2 REMEDIATION**  
**RICHMOND FIELD STATION**

**Asphalt Pad Rinsate Results**

Sample ID	Date	Total Metals [ug/L]												
		Antimony	Arsenic	Beryllium	Cadmium	Chromium	Copper	Lead	Mercury	Nickel	Selenium	Silver	Thallium	Zinc
ASPHALT PAD B RINSATE	2/24/2004	< 60	< 5.0	< 2.0	< 5.0	< 10	< 10	< 3.0	< 0.2	< 20	< 5.0	< 5.0	< 5.0	< 20
ASPHALT PAD C RINSATE	2/24/2004	< 60	< 5.0	< 2.0	< 5.0	< 10	< 10	< 3.0	< 0.2	< 20	< 5.0	< 5.0	< 5.0	< 20
WATERTRUCK WATER (CONTROL)	2/24/2004	< 60	< 5.0	< 2.0	< 5.0	< 10	< 10	< 3.0	< 0.2	< 20	< 5.0	< 5.0	< 5.0	< 20

**Concrete Pad Wipe Samples**

Sample ID	Date	PCBs [ug/100 cm]						
		Aroclor-1016	Aroclor-1221	Aroclor-1232	Aroclor-1242	Aroclor-1248	Aroclor-1254	Aroclor-1260
WATERWIPE1	3/4/2004	< 2.5	< 5.0	< 2.5	< 2.5	< 2.5	< 2.5	< 2.5
WATERWIPE2	3/4/2004	< 2.5	< 5.0	< 2.5	< 2.5	< 2.5	< 2.5	< 2.5

**TABLE 11**  
**DUST MONITORING RESULTS**  
**PHASE 2 REMEDIATION**  
**RICHMOND FIELD STATION**

Date	Concentrations at Locations A through F <sup>1,2</sup> (mg/m <sup>3</sup> )						
	A	B	C	C2	D	E	F
8/11/2003	NA	NA	NA	NA	NA	NA	NA
8/12/2003	NA	0.022	NA	NA	0.008	NA	NA
8/13/2003	NA	0.007	NA	NA	0.023	0.009	NA
8/14/2003	0.022	0.009	0.023	NA	0.024	0.024	NA
8/15/2003	0.024	0.007	NA	NA	NA	0.021	NA
8/16/2003	0.031	0.016	0.034	NA	0.021	0.026	NA
8/17/2003	NA	NA	NA	NA	NA	NA	NA
8/18/2003	0.010	0.004	0.000	NA	0.005	0.011	NA
8/19/2003	0.007	0.019	0.000	NA	0.004	0.006	NA
8/20/2003	0.018	0.005	0.012	NA	NA	0.006	NA
8/21/2003	0.021	0.012	0.053	NA	0.007	0.011	NA
8/22/2003	0.005	0.000	0.031	NA	0.003	0.005	NA
8/23/2003	0.010	0.000	0.025	NA	0.009	0.010	NA
8/24/2003	NA	NA	NA	NA	NA	NA	NA
8/25/2003	0.033	0.005	0.029	NA	0.032	0.044	NA
8/26/2003	0.022	0.019	--	NA	0.025	0.060	NA
8/27/2003	0.015	0.018	0.000	NA	0.013	0.038	NA
8/28/2003	0.016	0.012	0.004	NA	0.040	0.029	NA
8/29/2003	0.023	0.022	0.013	NA	0.023	0.027	NA
8/30/2003	NA	NA	NA	NA	NA	NA	NA
8/31/2003	NA	NA	NA	NA	NA	NA	NA
9/1/2003	NA	NA	NA	NA	NA	NA	NA
9/2/2003	0.019	0.010	0.009	NA	0.025	0.037	NA
9/3/2003	0.043	--	0.006	NA	0.027	0.057	NA
9/4/2003	0.019	0.004	0.000	NA	0.014	0.038	0.047
9/5/2003	0.047	0.000	0.014	NA	0.010	0.024	0.016
9/6/2003	0.000	0.007	0.050	NA	0.000	0.012	--
9/7/2003	NA	NA	NA	NA	NA	NA	NA
9/8/2003	0.010	0.004	0.010	NA	0.010	0.020	0.014
9/9/2003	0.063	0.000	0.000	NA	0.009	0.004	0.000
9/10/2003	0.027	0.014	0.029	NA	0.023	0.026	--
9/11/2003	0.031	0.000	0.001	NA	0.021	0.014	NA
9/12/2003	--	0.000	0.005	NA	0.034	0.022	NA
9/13/2003	0.029	0.001	0.000	NA	0.011	0.002	0.002
9/14/2003	NA	NA	NA	NA	NA	NA	NA
9/15/2003	0.014	0.064	0.005	NA	0.024	0.026	0.018
9/16/2003	0.009	0.019	0.019	NA	0.031	0.027	0.034
9/17/2003	0.006	0.000	0.016	NA	0.000	0.000	0.012
9/18/2003	0.030	0.000	0.014	NA	0.023	0.021	NA
9/19/2003	0.028	0.005	0.031	NA	0.017	0.021	NA
9/20/2003	0.026	0.000	0.049	NA	0.015	0.023	NA
9/21/2003	NA	NA	NA	NA	NA	NA	NA
9/22/2003	0.040	0.000	0.000	NA	0.023	0.018	0.023
9/23/2003	0.013	0.014	0.011	0.111	0.043	0.000	0.027
9/24/2003	0.005	0.015	0.000	0.041	0.013	0.020	0.025
9/25/2003	0.009	0.029	0.016	0.090	0.027	0.039	0.018
9/26/2003	0.028	0.038	0.036	0.067	0.025	0.045	0.074
9/27/2003	0.022	0.000	0.008	0.024	0.009	0.011	0.000
9/28/2003	NA	NA	NA	NA	NA	NA	NA
9/29/2003	0.003	0.000	0.009	0.033	0.022	0.015	0.007
9/30/2003	0.011	0.023	0.041	0.054	0.023	0.022	0.019
10/1/2003	0.008	0.007	--	0.028	0.014	0.028	0.002
10/2/2003	0.009	0.008	0.031	0.056	0.025	0.034	0.007
10/3/2003	0.007	0.000	0.046	0.083	0.020	0.021	0.000
10/4/2003	0.007	0.005	0.017	0.060	0.006	0.010	0.000
10/5/2003	NA	NA	NA	NA	NA	NA	NA
10/6/2003	0.005	0.009	0.031	0.082	0.025	0.027	0.000

**TABLE 11  
DUST MONITORING RESULTS  
PHASE 2 REMEDIATION  
RICHMOND FIELD STATION**

Date	Concentrations at Locations A through F <sup>1,2</sup> (mg/m <sup>3</sup> )						
	A	B	C	C2	D	E	F
10/7/2003	0.000	0.002	0.027	NA	0.000	0.006	0.000
10/8/2003	0.024	0.000	0.027	NA	0.032	0.013	0.007
10/9/2003	0.032	0.070	0.015	0.014	0.016	0.000	0.009
10/10/2003	0.014	0.009	0.000	0.026	0.016	0.009	0.003
10/11/2003	0.016	0.018	0.077	0.044	0.022	0.000	0.000
10/12/2003	NA	NA	NA	NA	NA	NA	NA
10/13/2003	0.044	0.045	0.038	0.034	0.045	0.016	0.036
10/14/2003	0.020	0.019	0.099	0.106	0.060	0.009	0.008
10/15/2003	0.003	0.031	0.068	0.040	0.041	0.000	0.022
10/16/2003	0.016	0.027	0.035	0.023	0.022	0.020	0.009
10/17/2003	0.035	0.030	0.028	0.016	0.032	0.032	0.019
10/18/2003	0.018	0.008	0.078	0.063	0.026	0.073	0.000
10/19/2003	0.019	0.012	0.034	0.037	0.010	0.009	0.000
10/20/2003	0.017	0.000	0.000	0.000	0.000	0.000	0.000
10/21/2003	0.013	0.013	0.004	0.007	0.000	0.006	0.000
10/22/2003	0.007	0.008	0.125	0.093	0.043	0.000	0.107
10/23/2003	0.025	0.032	0.054	0.041	0.037	0.019	NA
10/24/2003	0.025	0.037	0.009	0.000	0.003	0.018	0.011
10/25/2003	0.019	0.001	0.002	0.000	0.007	0.017	0.020
10/26/2003	0.019	0.001	0.000	0.001	0.004	0.003	0.006
10/27/2003	0.033	0.006	0.007	NA	0.000	0.000	0.005
10/28/2003	0.026	0.013	0.009	NA	0.006	0.002	0.005
10/29/2003	0.028	0.028	0.036	NA	NA	0.029	0.027
10/30/2003	0.013	0.005	0.005	NA	0.000	0.000	0.005
10/31/2003	0.010	0.001	0.001	NA	0.000	0.000	0.007
11/1/2003	NA	NA	NA	NA	NA	NA	NA
11/2/2003	NA	NA	NA	NA	NA	NA	NA
11/3/2003	0.001	0.000	0.056	NA	0.000	0.041	0.000
11/4/2003	0.012	0.025	0.004	NA	0.015	0.019	0.015
11/5/2003	0.016	0.017	0.012	NA	0.016	0.015	0.016
11/6/2003	0.047	0.032	0.036	NA	0.040	0.045	0.035
11/7/2003	0.039	0.051	0.040	NA	0.044	0.054	0.048
11/8/2003	0.006	0.002	0.000	NA	0.000	0.024	0.018
11/9/2003	NA	NA	NA	NA	NA	NA	NA
11/10/2003	0.006	0.004	0.000	NA	0.007	0.029	0.007
11/11/2003	0.011	0.001	0.000	NA	0.002	0.017	0.007
11/12/2003	0.014	0.008	0.011	NA	0.005	0.012	0.004
11/13/2003	0.015	0.019	0.001	NA	0.012	0.015	0.011
11/14/2003	0.000	0.036	--	NA	0.000	0.000	0.000
11/15/2003	NA due to heavy rain						
11/16/2003	NA	NA	NA	NA	NA	NA	NA
11/17/2003	0.021	0.063	0.018	NA	0.023	--	0.017
11/18/2003	0.013	0.016	0.009	NA	0.009	0.004	0.016
11/19/2003	0.033	0.043	0.031	NA	0.019	0.024	0.050
11/20/2003	0.001	0.012	0.003	NA	0.005	0.035	0.003
11/21/2003	0.027	0.008	0.007	NA	0.002	0.011	0.004
11/22/2003	0.021	0.000	0.000	NA	0.000	0.001	0.002
11/23/2003	NA	NA	NA	NA	NA	NA	NA
11/24/2003	0.028	0.036	0.035	NA	0.024	0.063	0.036
11/25/2003	0.021	0.015	0.009	NA	0.001	0.013	0.007
11/26/2003	0.000	0.000	--	NA	--	0.000	--
11/27/2003	NA	NA	NA	NA	NA	NA	NA
11/28/2003	NA	NA	NA	NA	NA	NA	NA
11/29/2003	NA	NA	NA	NA	NA	NA	NA
11/30/2003	NA	NA	NA	NA	NA	NA	NA
12/1/2003	NA	NA	NA	NA	NA	NA	NA
12/2/2003	NA	NA	NA	NA	NA	NA	NA

**TABLE 11  
DUST MONITORING RESULTS  
PHASE 2 REMEDIATION  
RICHMOND FIELD STATION**

Date	Concentrations at Locations A through F <sup>1,2</sup> (mg/m <sup>3</sup> )						
	A	B	C	C2	D	E	F
12/3/2003	NA	NA	0.035	NA	0.072	NA	NA
12/4/2003	NA	NA	NA	NA	NA	NA	NA
12/5/2003	NA	NA	NA	NA	NA	NA	NA
12/6/2003	NA	NA	NA	NA	NA	NA	NA
12/7/2003	NA	NA	NA	NA	NA	NA	NA
12/8/2003	0.001	--	--	NA	0.000	--	--
12/9/2003	NA	NA	NA	NA	NA	NA	NA
12/10/2003	NA	NA	NA	NA	NA	NA	NA
12/11/2003	NA	NA	NA	NA	NA	NA	NA
12/12/2003	NA	NA	NA	NA	NA	NA	NA
12/13/2003	NA	NA	NA	NA	NA	NA	NA
12/14/2003	NA	NA	NA	NA	NA	NA	NA

Notes:

<sup>1</sup> Location Descriptions:

- A Near RFS access gate (S of Bldg 102)
- B On fence at NE corner of Treatment Pad C
- C On fence at NE corner of Treatment Pad B, near northern access gate
- C2 Duplicate of C
- D On fence at NW corner of site, area north of Pad B
- E On fence SW of Bldg 128, at Heron Drive gate to EPA
- F On fence towards EPA, at gate north of Area M-1a

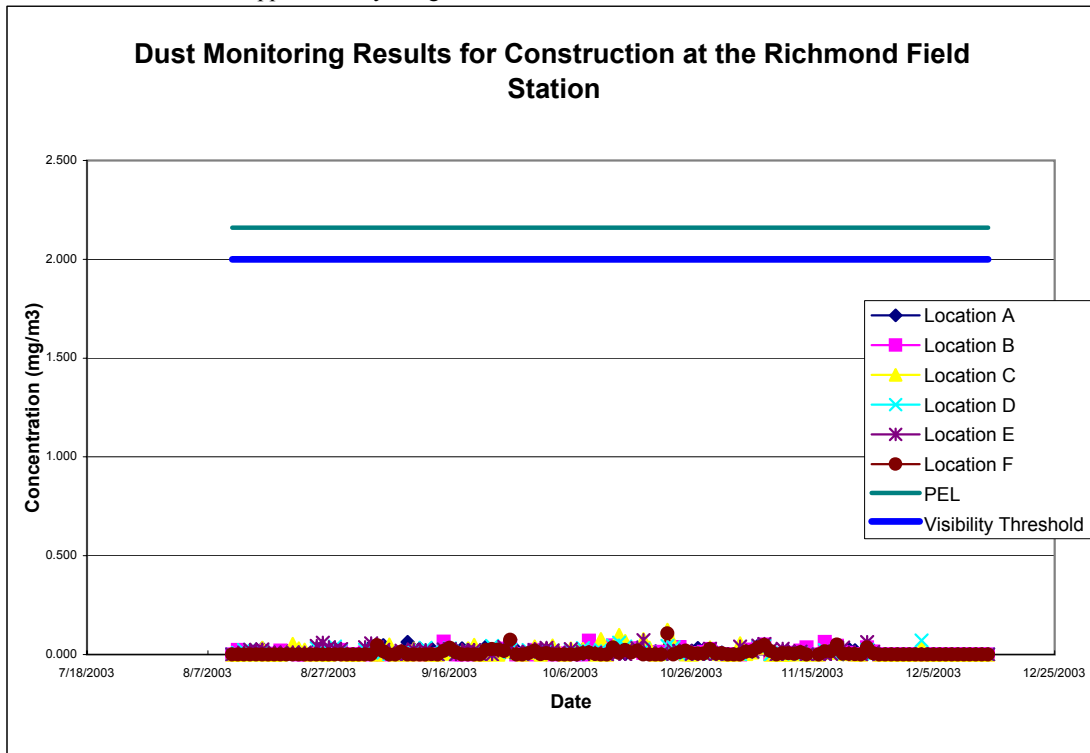
<sup>2</sup> Concentrations are in milligrams per cubic meter (mg/m<sup>3</sup>). Time weighted average.

NA = Not analyzed

PEL = Permissible Exposure Level, the level that is deemed safe for a worker, 8 hours per day, 40 hours per week, for a career.

PEL for dust from RFS site is 2.16 mg/m<sup>3</sup> based on maximum mercury concentration in soil.

Dust becomes visible at approximately 2 mg/m<sup>3</sup>



**TABLE 12  
MERCURY MONITORING RESULTS  
PHASE 2 REMEDIATION  
RICHMOND FIELD STATION**

Date/Time	Location	Hg [ $\mu\text{g}/\text{m}^3$ ]	Comments
9/12/03	1 (see map)	0.004	
	2 (see map)	0.004	
	3 (see map)	0.006	
	4 (see map)	0.000	
	5 (see map)	0.000	
	6 (see map)	0.000	
	7 (see map)	0.000	
	8 (see map)	0.004	
	9 (see map)	0.000	
	10 (see map)	0.000	

9/13/03	1 (see map)	0.000	
	2 (see map)	0.000	
	3 (see map)	0.000	
	4 (see map)	0.000	
	5 (see map)	0.000	
	6 (see map)	0.000	
	7 (see map)	0.000	
	8 (see map)	0.000	
	9 (see map)	0.000	
	10 (see map)	0.000	

9/15/03 9:30	1 (see map)	0.006	
	2 (see map)	0.004	
	3 (see map)	0.006	
	4 (see map)	0.004	
	5 (see map)	0.000	
	6 (see map)	0.000	
10:00	Type B stockpile	0.000	
	Type B stockpile	0.000	
	Type B stockpile	0.004	
	Type B stockpile	0.000	
	Type B stockpile	0.000	
	Type B stockpile	0.000	
10:30	1 (see map)	0.000	
	2 (see map)	0.000	
	3 (see map)	0.000	
	4 (see map)	0.000	
	5 (see map)	0.000	
	6 (see map)	0.000	
11:30	1 (see map)	0.000	
	2 (see map)	0.000	
	3 (see map)	0.000	
	4 (see map)	0.005	
	5 (see map)	0.000	
	6 (see map)	0.000	
13:15	North of Pad B	0.000	7 samples
	Worm Farm Area	0.000	several samples
13:30	1 (see map)	0.000	
	2 (see map)	0.000	
	3 (see map)	0.000	

**TABLE 12  
MERCURY MONITORING RESULTS  
PHASE 2 REMEDIATION  
RICHMOND FIELD STATION**

Date/Time	Location	Hg [ $\mu\text{g}/\text{m}^3$ ]	Comments
	4 (see map)	0.000	
	5 (see map)	0.000	
	6 (see map)	0.000	
14:30	1 (see map)	0.000	
	2 (see map)	0.000	
	3 (see map)	0.000	
	4 (see map)	0.000	
	5 (see map)	0.000	
	6 (see map)	0.000	
15:15	Treatment Pad B	0.000	8 samples around perimeter of Pad B
16:30	1 (see map)	0.000	
	2 (see map)	0.000	
	3 (see map)	0.000	
	4 (see map)	0.000	
	5 (see map)	0.000	
	6 (see map)	0.000	

9/16/03			
8:30	1 (see map)	0.000	
	2 (see map)	0.000	
	3 (see map)	0.000	
	4 (see map)	0.000	
	5 (see map)	0.000	
	6 (see map)	0.000	
	Type C Pile in Area 4	0.000	during unloading
11:30	1 (see map)	0.000	
	2 (see map)	0.000	
	3 (see map)	0.003	
	4 (see map)	0.000	
	5 (see map)	0.000	
	6 (see map)	0.000	
13:30	1 (see map)	0.000	
	2 (see map)	0.000	
	3 (see map)	0.000	
	4 (see map)	0.000	
	5 (see map)	0.000	
	6 (see map)	0.000	
16:30	1 (see map)		
	2 (see map)	0.000	
	3 (see map)	0.004	
	4 (see map)	0.005	
	5 (see map)		
	6 (see map)		

9/17/03			
9:30	1 (see map)	0.000	
	2 (see map)	0.000	
	3 (see map)	0.000	
	4 (see map)	0.000	
	5 (see map)	0.000	
	6 (see map)	0.000	

**TABLE 12  
MERCURY MONITORING RESULTS  
PHASE 2 REMEDIATION  
RICHMOND FIELD STATION**

Date/Time	Location	Hg [ $\mu\text{g}/\text{m}^3$ ]	Comments
	Type C Pile in Area 4	0.000	
11:30	1 (see map)	0.000	
	2 (see map)	0.000	
	3 (see map)	0.000	
	4 (see map)	0.000	
	5 (see map)	0.000	
	6 (see map)	0.000	
14:00	1 (see map)	0.000	
	2 (see map)	0.000	
	3 (see map)	0.000	
	4 (see map)	0.000	
	5 (see map)	0.000	
	6 (see map)	0.000	
	Type B stockpile Pad B	0.000	

9/18/03			
13:00	A (Dust Monitor)	0.000	
	B (Dust Monitor)	0.000	
	C (Dust Monitor)	0.000	
	D (Dust Monitor)	0.000	
	E (Dust Monitor)	0.000	
	middle of Area 4 excavation	0.004	
	middle of Area 4 excavation	0.000	
	middle of Area 4 excavation	0.000	
	stockpile pad B (~2" close)	0.003	

9/19/03			
10:30	1 (see map)	0.000	
	2 (see map)	0.000	
	3 (see map)	0.000	
	4 (see map)	0.000	
	5 (see map)	0.000	
	6 (see map)	0.000	
13:30	1 (see map)	0.000	
	2 (see map)	0.000	
	3 (see map)	0.000	
	4 (see map)	0.000	
	5 (see map)	0.000	
	6 (see map)	0.000	

9/22/03	Type B untreated stockpile	0.000	several samples around stockpile
11:30	1 (see map)	0.000	
	2 (see map)	0.000	
	3 (see map)	0.000	
	4 (see map)	0.004	
	5 (see map)	0.000	
	6 (see map)	0.000	
14:30	1 (see map)	0.000	
	2 (see map)	0.000	
	3 (see map)	0.000	
	4 (see map)	0.000	
	5 (see map)	0.000	

**TABLE 12  
MERCURY MONITORING RESULTS  
PHASE 2 REMEDIATION  
RICHMOND FIELD STATION**

Date/Time	Location	Hg [ $\mu\text{g}/\text{m}^3$ ]	Comments
	6 (see map)	0.000	
16:30	Type B untreated stockpile	0.000	4 samples around stockpile
9/23/03			
11:30	1 (see map)	0.000	
	2 (see map)	0.000	
	3 (see map)	0.000	
	4 (see map)	0.000	
	5 (see map)	0.000	
	6 (see map)	0.000	
13:30	1 (see map)	0.003	
	2 (see map)	0.000	
	3 (see map)	0.000	
	4 (see map)	0.004	
	5 (see map)	0.000	
	6 (see map)	0.000	
9/25/03			
15:30	untreated stockpile	0.000	6 samples
	type c stockpile	0.000	9 samples
	type c stockpile	0.004	1 sample
	each dust monitor location	0.000	
10/10/03			
13:30	C-3 excavation area & downwind	0.000	several samples
10/29/03			
13:00	C-1 & C-2 excavation perimeter	0.000	several samples
10/30/03			
8:00	C-1 excavation perimeter	0.000	several samples
11/6/03			
8:15	stockpile on pad B	0.000	5 samples around stockpile
	C-6 excavation perimeter	0.000	4 samples (2 directly off excavator bucket)
11/7/03			
13:25	C-5 excavation perimeter	0.000	excavator bucket
		0.000	downwind
		0.004	~ 0.5" from excavator bucket
11/10/03			
15:15	C-5 excavation perimeter	0.000	3 samples



**Table 13. Phase 2 Offsite Disposal Summary**

**Non-RCRA Hazardous Waste Manifests for Kettleman**

Date	Number of Truckloads (~18 yards/dumptruck ≈23 tons)	
9/30/03	20	Type C, Area 4
10/1/03	19	Type C, Area 4
10/24/03	28	Type C, Area 4
10/27/03	33	Type C, Area 4
10/28/03	31	Type C, Area 4
10/29/03	31	Type C, Area 4
10/30/03	14	Type C, Area 4
11/05/03	31	Type C, Area 4
11/06/03	23	Type C, Area 4, M3 (included veg)
11/11/03	40	Type C, Area M3
11/12/03	24	Type C, Area M3
11/13/03	29	Type C, Area M3
11/14/03	23	Type C, Area M3
11/17/03	24	Type C, Area M3
11/18/03	28	Type C, Area M3
11/19/03	33	Type D Area M1a, PCBs
11/21/03	17	Type C, Area M3
11/25/03	14	Type C, Area M3
11/25/03	01	Type D, Area M1a, PCBs
11/26/03	19	Type C, Area M3
12/18/03	32	Type C, Area M3
12/19/03	23	Type C, Area M3
12/22/03	14	Type C, Area M3
<b>Total Loads in 2003                    551 (12,673 tons)</b>		
01/13/04	05	Type C, Area M3
01/16/04	03	Type D, Area M1a, PCBs
01/21/04	30	Type C, Area M3 Berm
01/22/04	21	Type C, Area M3 Berm
01/22/04	10	Type C, Area 4 topsoil
01/22/04	05	Type A, Sewer line cinders
01/23/04	41~	Type C, Area M3 Berm
01/23/04	05~	Type A, sewer line cinders
02/05/04	01	Type D, Area M1a, PCBs debris
02/05/04	02	Type C, Area M3 Berm cleanup
02/13/04	04	Type C, Area M3 Berm cleanup
<b>Total Loads in 2004                    127 (2,921 tons)</b>		

**Total Loads for Phase 2: 678;      Total Tons: ~15,600**

**Table 13. Phase 2 Offsite Disposal Summary**

**Non-RCRA Hazardous Manifests to Kettleman in Drums**

<u>Date</u>	<u>Number of Drums</u>	
03/09/04	01	Type D, PCB pond cleanup
03/09/04	34	Type C, pad cleanup

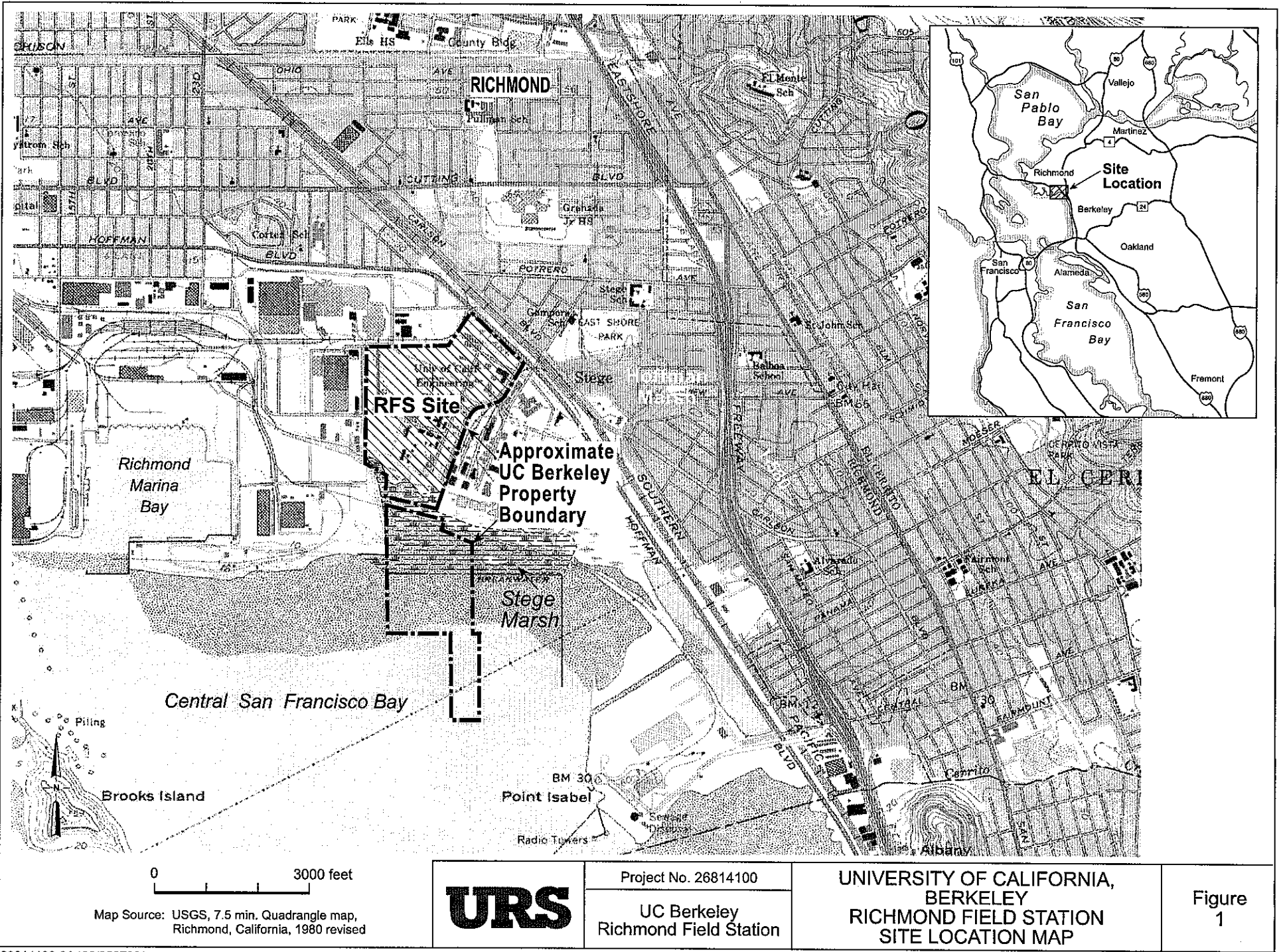
**Total Loads                    35 (~12 tons)**

**Nonhazardous Manifests for Keller Canyon**

<u>Date</u>	<u>Number of Truckloads</u>	
11/11/03	14	"special waste"
11/12/03	14	"special waste"
11/13/03	14	"special waste"
11/14/03	11	"special waste"
11/17/03	14	"special waste"
11/19/03	11	"special waste"
11/21/03	17	soil
11/22/03	09	soil and special waste
12/18/03	10	soil
01/13/04	05	soil
01/17/04	12	(8 soil, 2 liner, 2 grubbed)
01/23/04	03	(1 liner, 2 grubbed)
02/05/04	05	(debris)
02/07/04	04	(debris)

**Total Loads                    139 (~3,200 tons)**

## **FIGURES**







**LEGEND**

- Zeneca Property (Subunit 1)
- Richmond Field Station Property (Subunit 2 & Offshore Property)

Note: Offshore property located south of the EBRPD Bay Trail is not included within Subunit 2. The boundary of Subunit 2a is approximate.

Project No.  
26814100

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**University of California, Berkeley**  
Richmond Field Station



**Subunits 2A and 2B**  
Locations and Boundaries

March 2003

not to scale

Figure 2





**LEGEND**

- MARSH 150' BUFFER ZONE
- SILT SCREEN
- EXISTING SOIL BERM
- EXISTING CLAY BERM
- x FENCE
- x FENCE GATE (ALL FENCES)
- ↔ HAUL ROUTES
- ⊕ DUST MONITORING LOCATIONS
- SD— EXISTING STORM DRAIN
- SS— EXISTING SANITARY SEWER
- SD— NEW STORM DRAIN
- SS— NEW SANITARY SEWER
- EBRPD — EAST BAY REGIONAL PARK DISTRICT
- ▷ EASTERN STORM DRAIN OUTFALL
- STOCKPILE AND WORK AREAS
- PHASE 2 AREA OF CONCERN
- 12 KV OVERHEAD WIRES

0 75 150  
APPROX. SCALE: 1"=150'



University of California, Berkeley  
Richmond Field Station

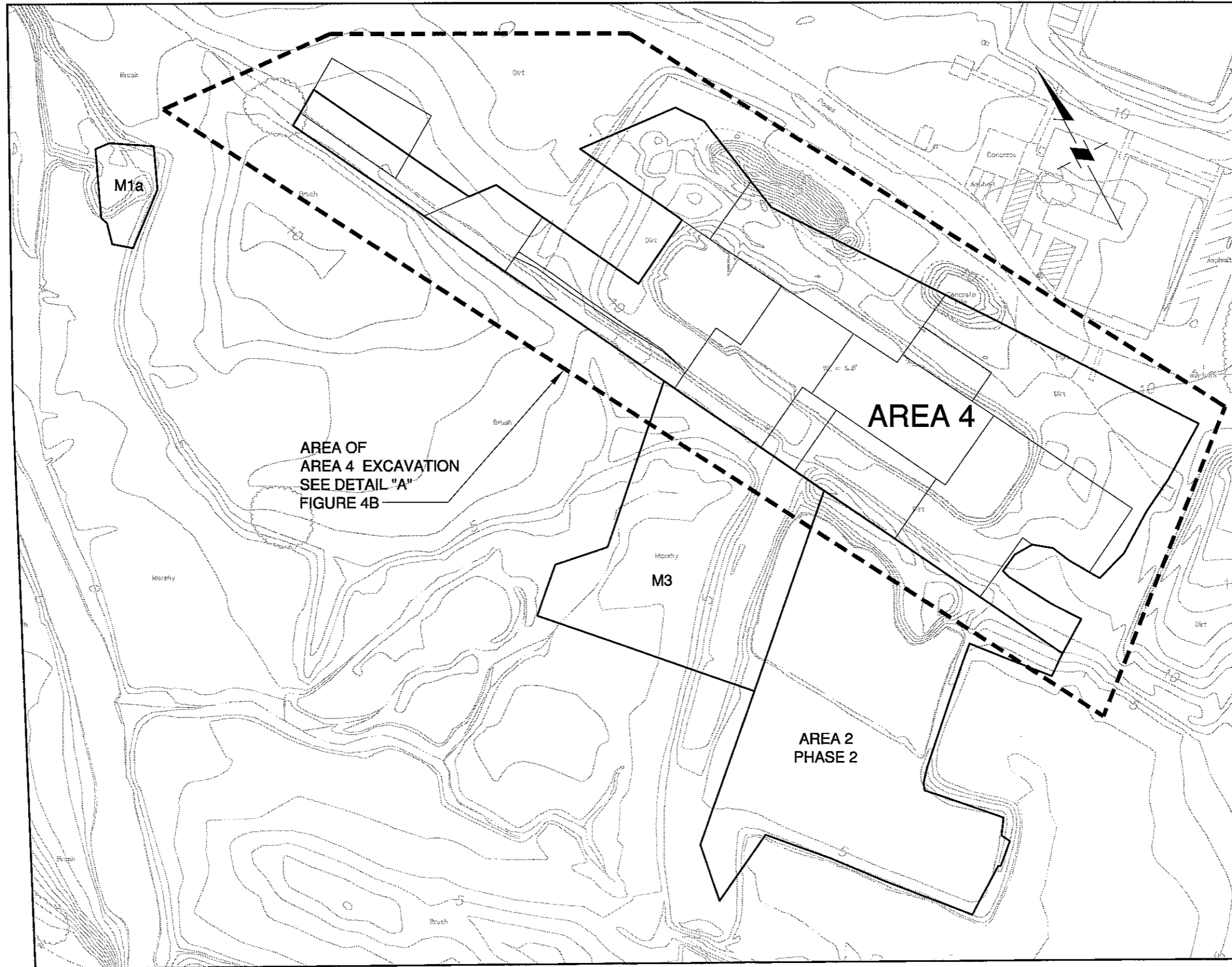
26814100

REMEDIAL DESIGN  
LAYOUT FACILITIES

FIGURE  
3

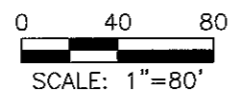
x:\env\waste\Berkeley,UC (RFS)\Report-phase 2 completion\Figures\Figure 3.dwg





**EXCAVATION LOCATION MAP**

**NOTE:**  
ELEVATIONS ARE SHOWN IN FEET NGVD 29

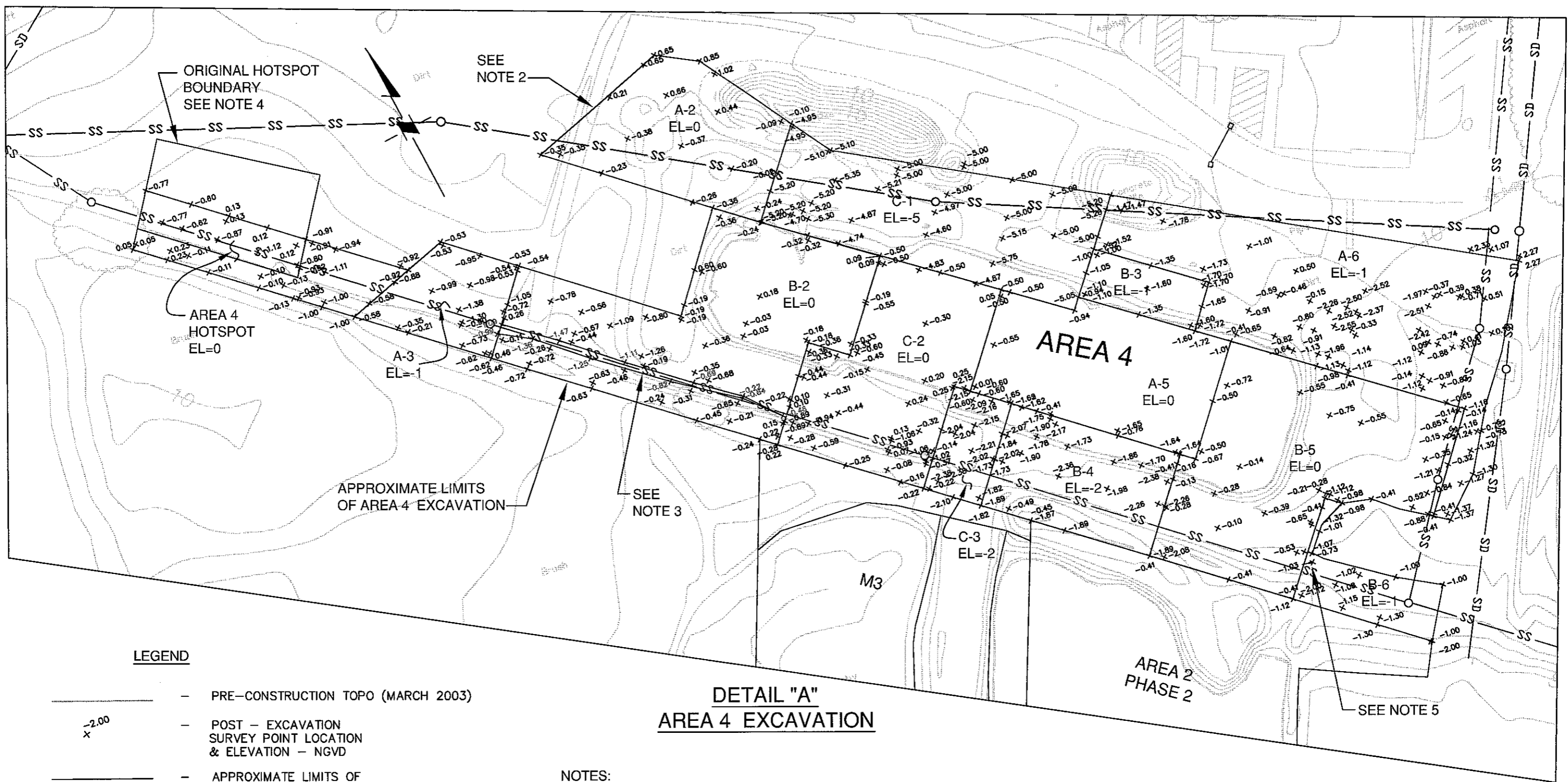


University of California, Berkeley  
Richmond Field Station

26814100

PHASE 2 REMEDIATION  
AREA 4 UPLAND EXCAVATION

FIGURE  
4A



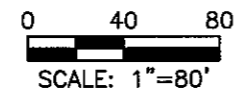
**DETAIL "A"**  
**AREA 4 EXCAVATION**

**LEGEND**

- PRE-CONSTRUCTION TOPO (MARCH 2003)
- 2.00  
- POST - EXCAVATION SURVEY POINT LOCATION & ELEVATION - NGVD
- APPROXIMATE LIMITS OF EXCAVATION
- EXCAVATION DESIGN ELEVATION
- SANITARY SEWER LINE REMOVED WITHIN AREA 4 DURING EXCAVATION
- TYPE A EXCAVATION
- TYPE B EXCAVATION
- TYPE C EXCAVATION

**NOTES:**

1. ELEVATIONS ARE SHOWN IN FEET NGVD 29.
2. AN ADDITIONAL 200 CUBIC YARDS OF TYPE B MATERIAL WAS REMOVED ADJACENT TO THIS BOUNDARY.
3. THIS AREA WAS THE LOCATION OF OLD SANITARY SEWER LINE. THE AREA WAS OVER EXCAVATED. BOTTOM ELEVATIONS OF SANITARY SEWER TRENCH ARE SCREENED BACK FOR CLARITY.
4. THE ORIGINAL AREA 4 HOTSPOT BOUNDARY WAS MODIFIED DURING CONSTRUCTION WHEN IT BECAME APPARENT THAT THE SANITARY SEWER TRENCH HAD BEEN BACKFILLED WITH CINDERS. THE AREA WAS MODIFIED TO REMOVE THE CINDERS AROUND THE LINE WITHIN THE HOTSPOT AREA.
5. APPROXIMATE LOCATION OF VOC, PCB, PESTICIDE IMPACTED SOIL UNDER THE SANITARY SEWER LINE.

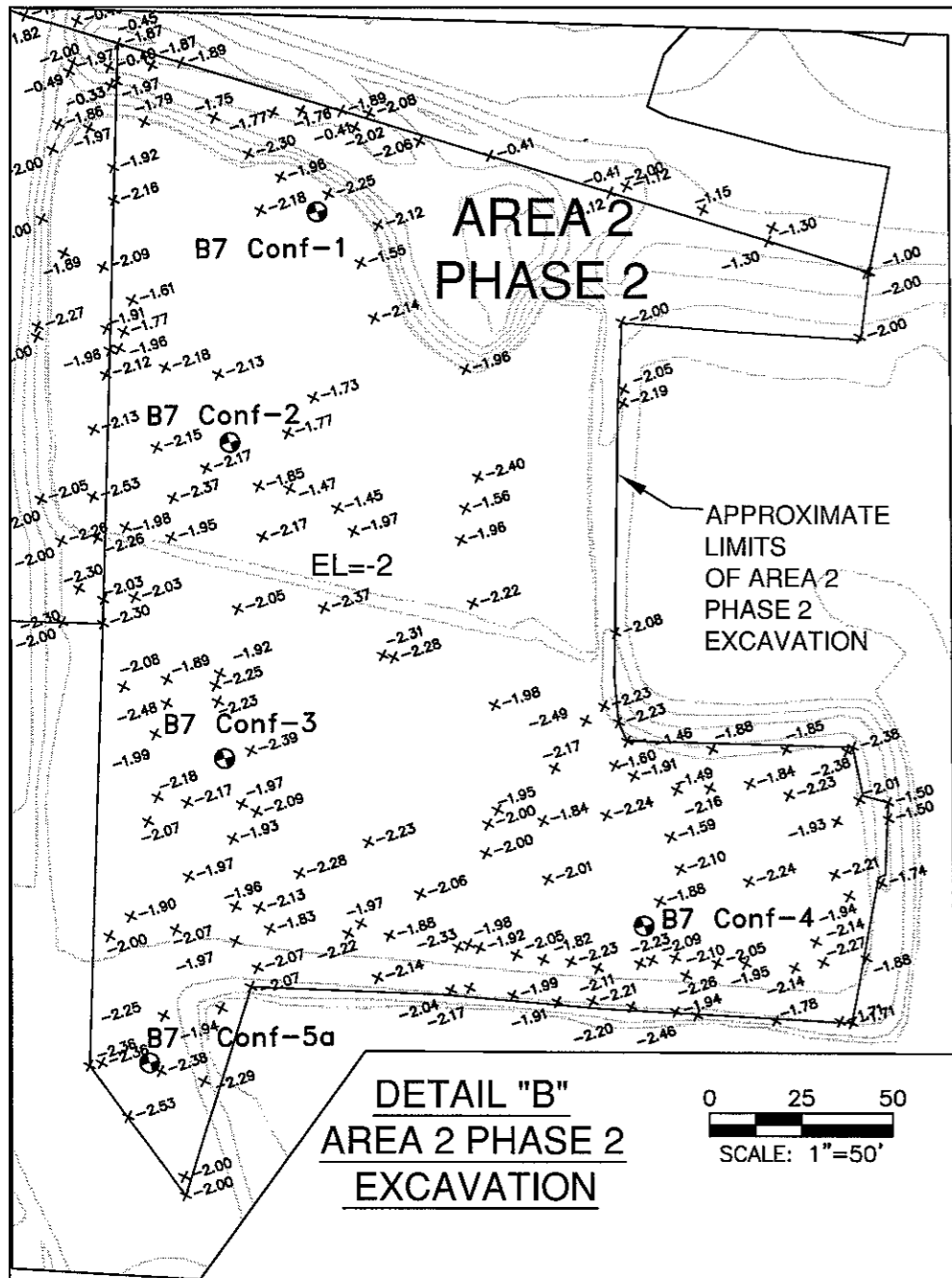


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 Richmond Field Station  
 26814100

PHASE 2 REMEDIATION  
 AREA 4 DETAIL  
 UPLAND EXCAVATION

FIGURE  
 4B





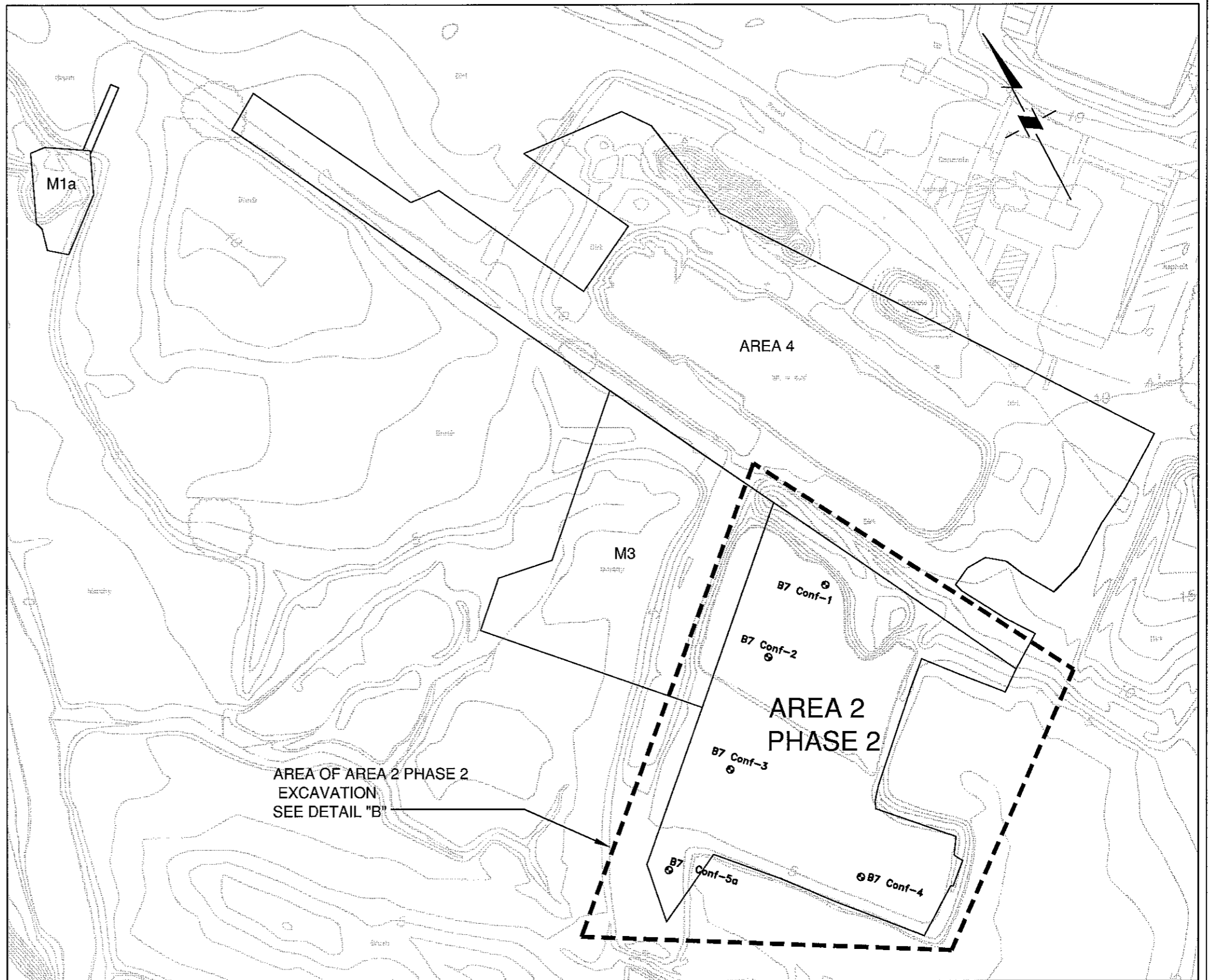
**DETAIL "B"**  
**AREA 2 PHASE 2**  
**EXCAVATION**

0 25 50  
 SCALE: 1"=50'

**LEGEND**

- PRE-CONSTRUCTION TOPO (MARCH 2003)
- POST - EXCAVATION SURVEY POINT LOCATION & ELEVATION - NGVD
- APPROXIMATE LIMITS OF EXCAVATION
- EXCAVATION DESIGN ELEVATION
- POST - EXCAVATION SAMPLE LOCATION

**NOTE:**  
 ELEVATIONS ARE SHOWN IN FEET NGVD 29



**EXCAVATION LOCATION MAP**

0 40 80  
 SCALE: 1"=80'



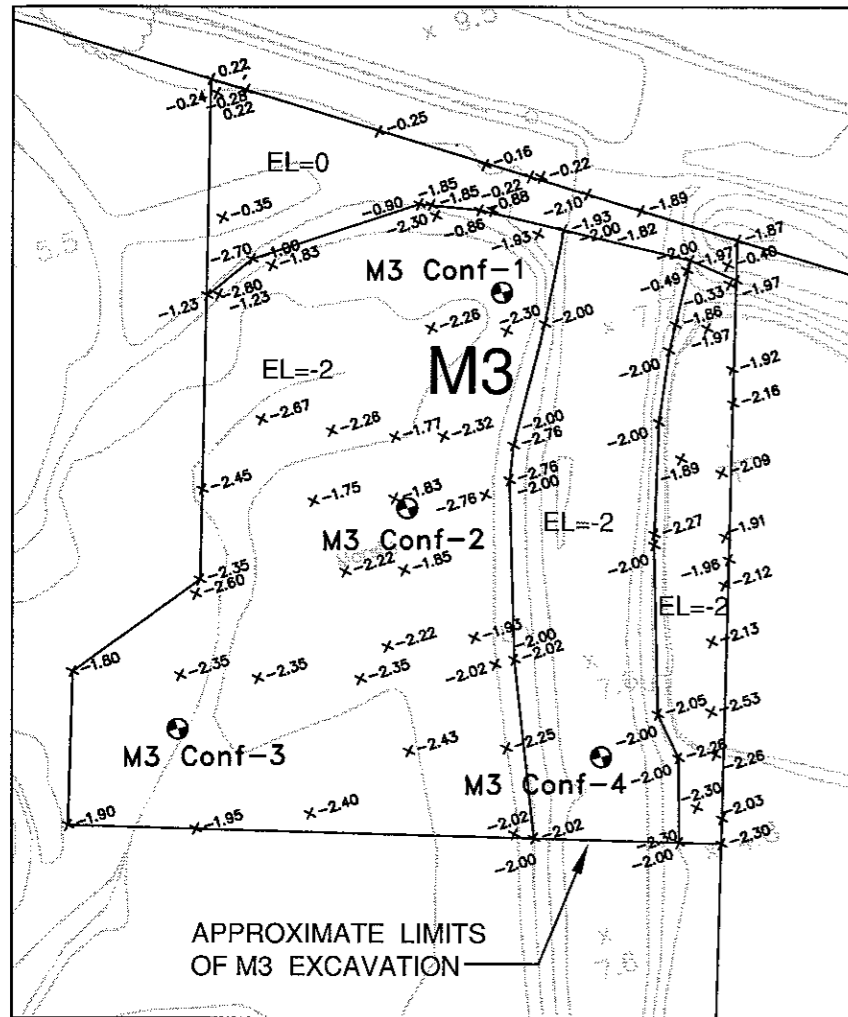
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 Richmond Field Station

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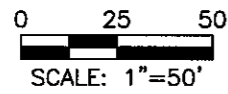
PHASE 2 REMEDIATION  
 AREA 2 PHASE 2 MARSH EXCAVATION &  
 POST-EXCAVATION SAMPLE LOCATIONS

**FIGURE**  
**5**

Oct 20, 2004 - 12:00pm  
 x:\x\_env\waste\Berkeley\_UC (RFS)\Report - Phase 2 Completion\Figures\Figure 6.dwg



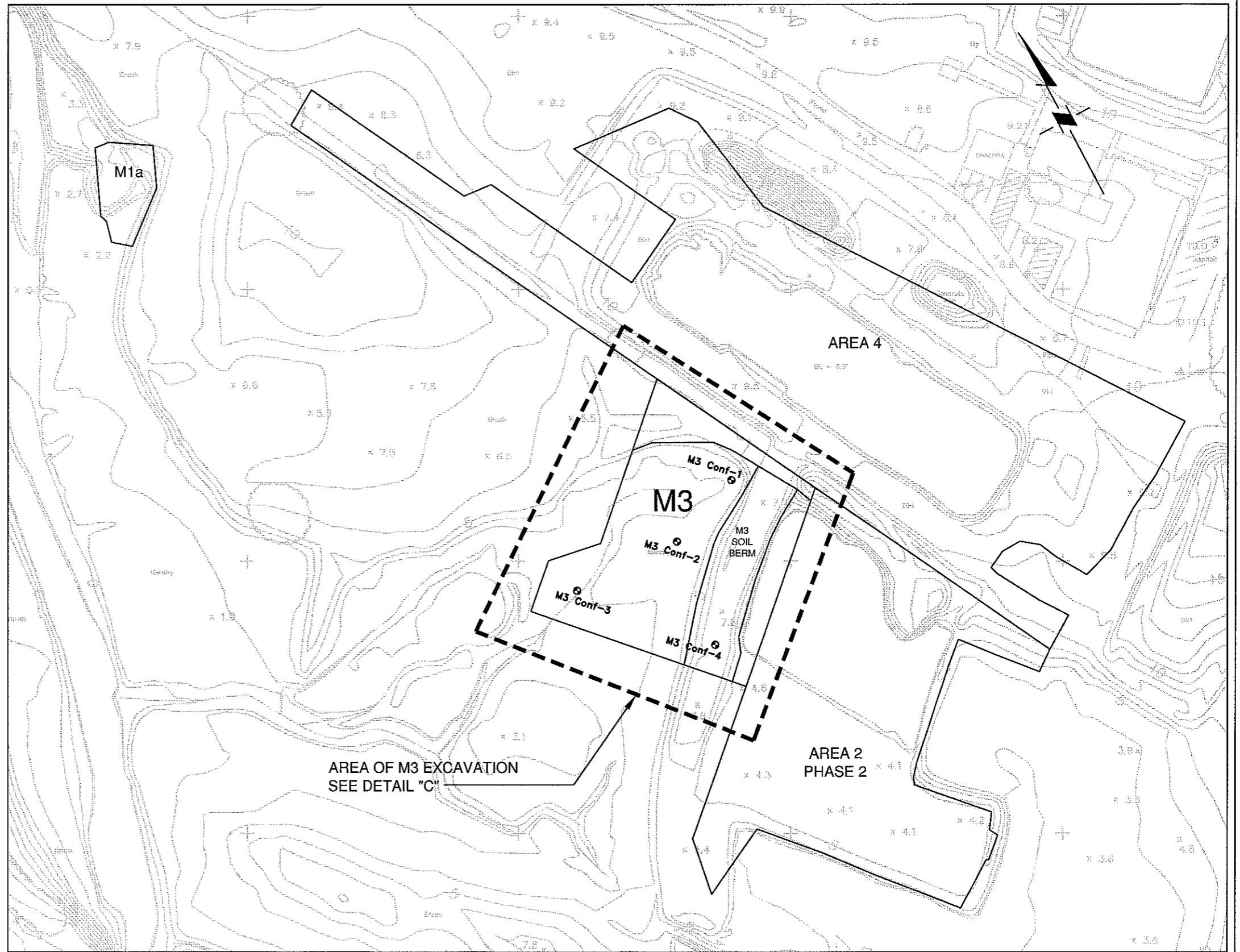
**DETAIL "C"**  
**M3 EXCAVATION**



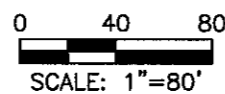
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  - APPROXIMATE LIMITS OF EXCAVATION
  - EXCAVATION DESIGN ELEVATION
  - POST - EXCAVATION SAMPLE LOCATION
- Area Conf-

**NOTE:**  
 ELEVATIONS ARE SHOWN IN FEET NGVD 29



**EXCAVATION LOCATION MAP**

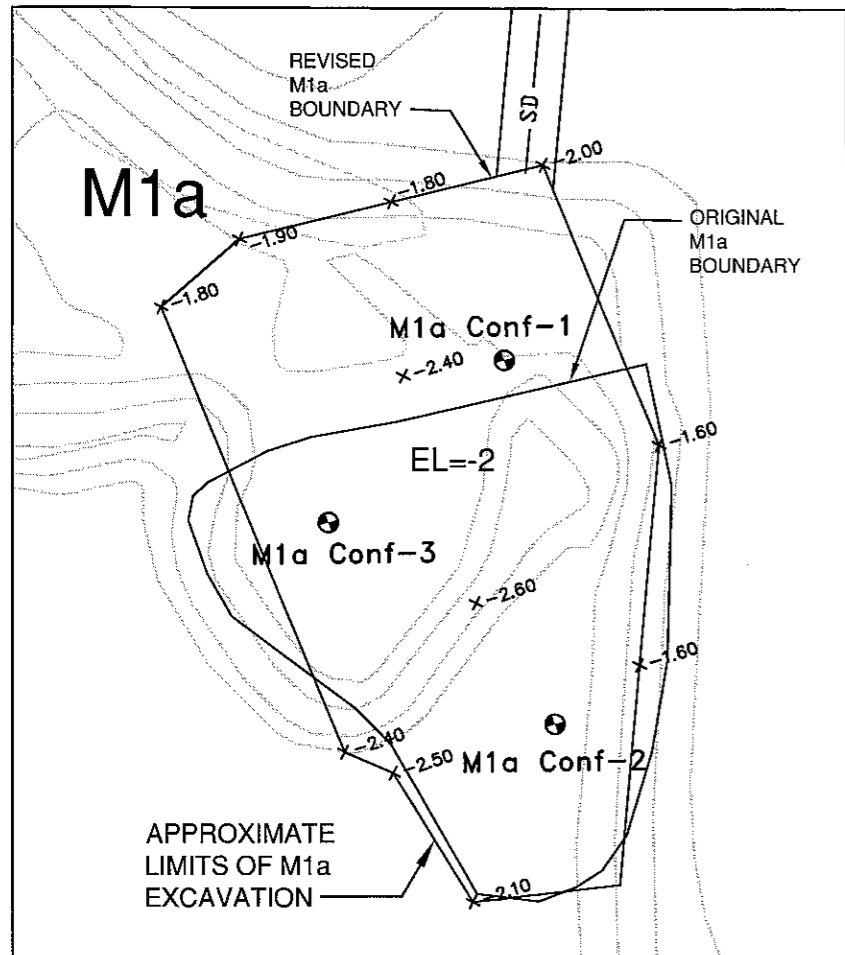


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 Richmond Field Station

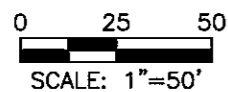
26814100

PHASE 2 REMEDIATION  
 M3 MARSH EXCAVATION &  
 POST-EXCAVATION SAMPLE LOCATIONS

**FIGURE**  
**6**



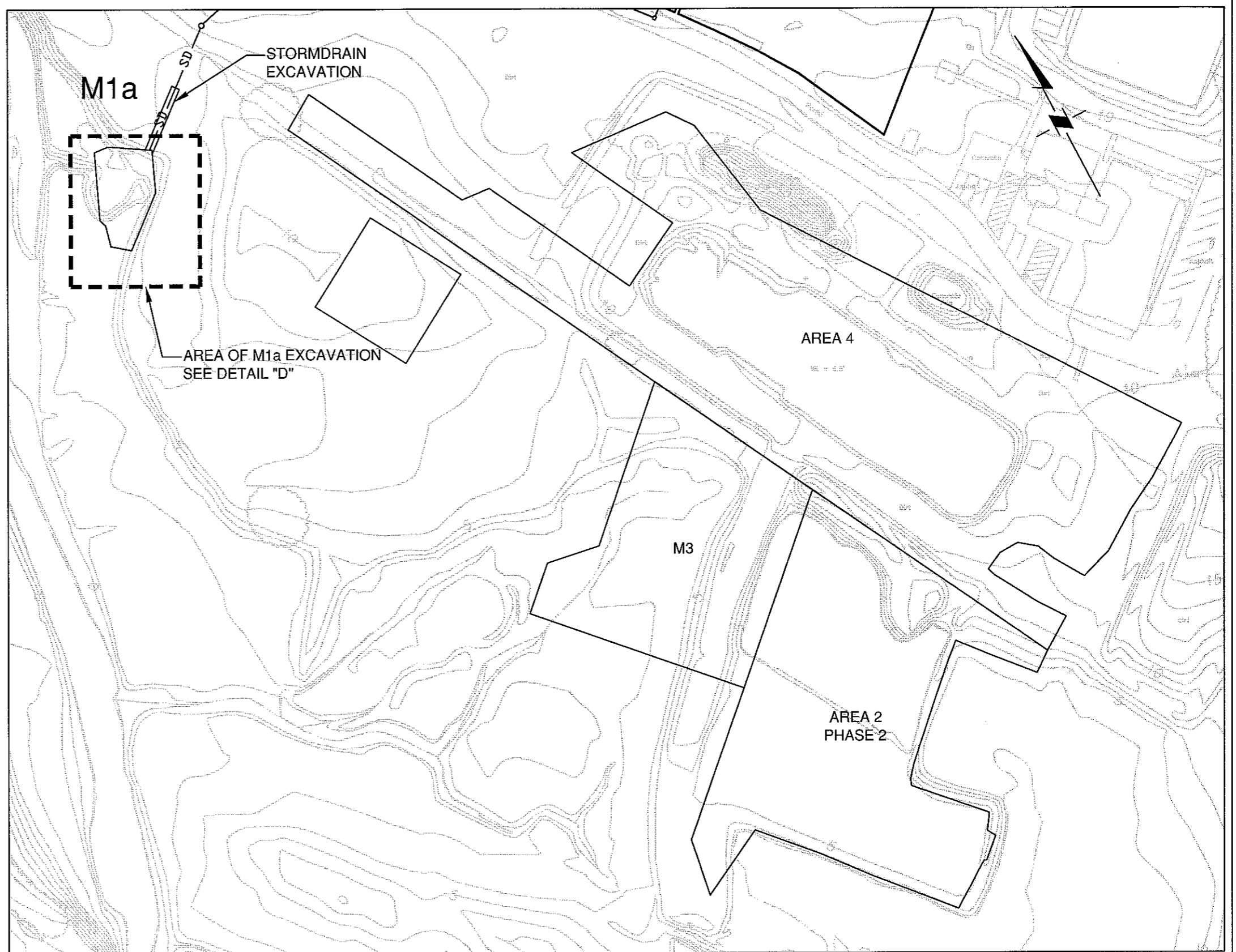
**DETAIL "D"**  
**M1a EXCAVATION**



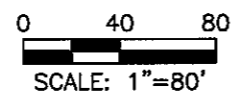
**LEGEND**

- PRE-CONSTRUCTION TOPO (MARCH 2003)
- POST - EXCAVATION SURVEY POINT LOCATION & ELEVATION - NGVD
- APPROXIMATE LIMITS OF EXCAVATION
- EXCAVATION DESIGN ELEVATION
- POST - EXCAVATION SAMPLE LOCATION

**NOTE:**  
ELEVATIONS ARE SHOWN IN FEET NGVD 29



**EXCAVATION LOCATION MAP**

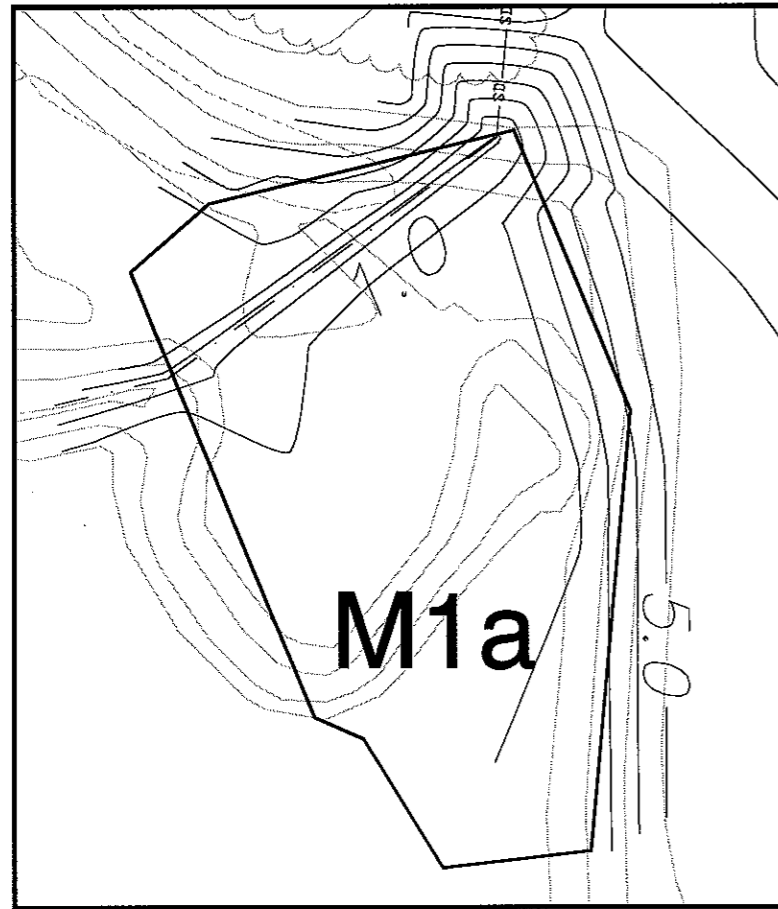


University of California, Berkeley  
Richmond Field Station

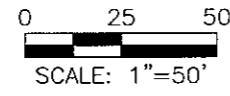
26814100

PHASE 2 REMEDIATION  
M1a MARSH EXCAVATION &  
POST-EXCAVATION SAMPLE LOCATIONS

**FIGURE**  
**7**



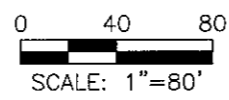
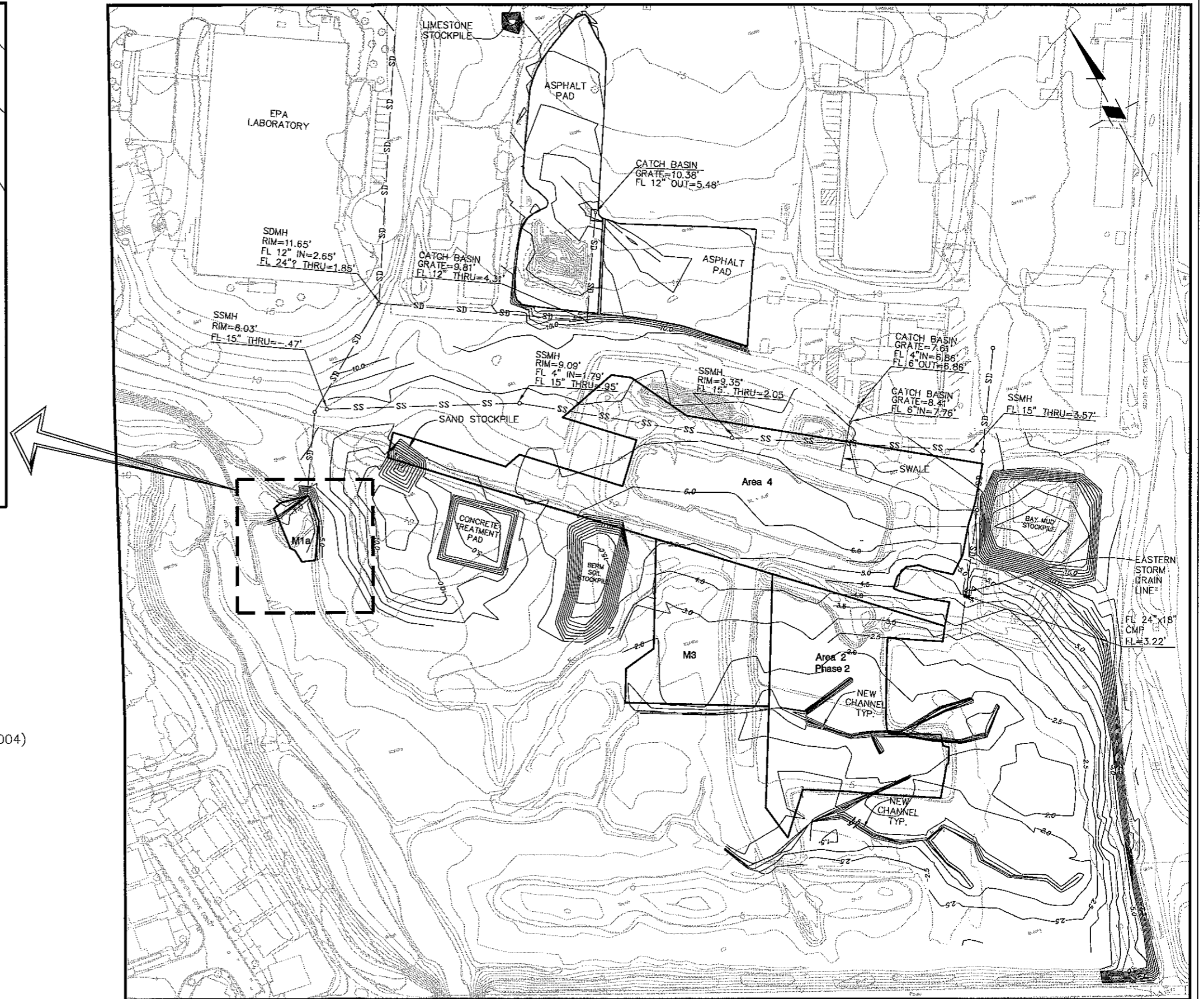
M1a



**LEGEND**

- FLOW LINE OF NEW CHANNEL
- - - PRE PHASE 2 CONTOURS (MARCH 2003)
- POST PHASE 2 CONTOURS (FEBRUARY 2004)
- SS — NEW SANITARY SEWER LINE
- SD — STORM DRAIN LINE

**NOTE:**  
 ELEVATIONS ARE SHOWN IN FEET NGVD 29



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**PRE AND POST  
 PHASE 2  
 REMEDIATION ELEVATIONS**

**FIGURE  
 8**

**Appendix A**  
**Phase 2 Cultural Resources Monitoring Program**

**A D D E N D U M**

**RICHMOND FIELD STATION  
REMEDIAATION PROJECT  
PHASE II**

**CULTURAL RESOURCES  
MONITORING PROGRAM**

**ADDENDUM TO THE 2003 PHASE  
I PROJECT REPORT**

*Prepared for*  
University of California, Berkeley

May 2004

**URS**

URS Corporation  
1333 Broadway, Suite 800  
Oakland, CA 94612

26814100.12000

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## **1.0 INTRODUCTION**

### **1.1 PURPOSE AND NEED FOR ADDENDUM REPORT**

This report is an addendum to the 2002 Cultural Resources Monitoring Program at UC Berkeley's Richmond Field Station (RFS). For a complete discussion of the site history and environmental setting please refer to the 2002 Phase I report titled *Richmond Field Station Remediation Project – Subunit 2A: Cultural Resources Monitoring Program for 2002* by URS. The Richmond Field Station Remediation Project is a multi-phased endeavor. This addendum supplements the data initially presented in the previous year's report and provides a summary of archaeological monitoring activities that occurred in the fall of 2003.

### **1.2 REGULATORY BACKGROUND**

All cultural resources work for this project was carried out under the direct supervision of archaeologists who meet the Secretary of the Interior's Standards and Guidelines for Archaeology and Historic Preservation (National Park Service 1983). The studies herein are consistent with the procedures for compliance with Section 106 of the National Historic Preservation Act (NHPA) and California Environmental Quality Act (CEQA) Sections 15064.5 and 15126.4. Brian Hatoff, M.A. and Christopher Lee, M.A. (candidate) prepared this technical report. Mr. Hatoff meets the professional archaeological standards of the Secretary of the Interior and is a certified archaeologist by the Register of Professional Archaeologists (RPA). Mr. Vance Bente, RPA and Mr. Sean Dexter, provided peer review of this addendum.

The potential effects of any project on cultural resources are evaluated under the National Environmental Policy Act (NEPA) and/or CEQA. The U.S. Army Corps of Engineers (USACE) is considered the lead federal agency for those portions of the Phase 2 remediation program that are within the jurisdictional footprint of the Nationwide 404 Permit issued for this project. The jurisdictional footprint encompasses areas below the 5-foot contour of the National Geodetic Vertical Datum of 1929. The Phase 2 remediation program has been conducted with respect to the requirements of NEPA, and compliance with Section 106 of the National Historic Preservation Act (NHPA). However, since Federal and California State evaluation criteria for cultural resources are generally consistent, the assessment is also consistent with CEQA, and the compliance procedures set forth in Sections 15064.5 and 15126.4. Application of one set of criteria essentially conforms to the other. Thus, resources determined to be eligible for the National Register of Historic Places (NRHP) would have a similar eligibility to the California Register of Historic Resources (CRHR).

The federal government formally recognized the importance of some cultural resources with passage of the 1906 Antiquities Act, 16 United States Code (USC) 431 et seq. In 1966, Congress passed the NHPA, which required all federal agencies to assess the effects of any agency-sponsored undertaking on cultural resources. Under NEPA (42 USC) Sections 4321–4327,

federal agencies are required to consider potential environmental impacts and appropriate mitigation measures for projects with federal involvement.

Evaluation criteria that are employed to determine a resource's eligibility to the NRHP, in accordance with the regulations outlined in 36 Code of Federal Regulations (CFR) 800, are identified at 36 CFR 60.4. These evaluation criteria, listed below, are used to help determine what properties should be considered for protection from destruction or impairment resulting from project-related activities (36 CFR 60.2).

The quality of significance in American history, architecture, archaeology, engineering, and culture is present in districts, sites, buildings, structures, and objects that possess integrity of location, design, setting, materials, workmanship, feeling, and association, and:

- Resources that are associated with events that have made a significant contribution to the broad patterns of our history; or
- Resources that are associated with the lives of persons significant in our past; or
- Resources that embody the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction, or
- Resources that have yielded, or may be likely to yield, information important in prehistory or history (36 CFR 60.4).

The American Indian Religious Freedom Act, 42 USC 1996, has been established to protect religious practices, ethnic heritage sites, and land uses of Native Americans. The Native American Graves Protection and Repatriation Act (NAGPRA) (1990), 25 USC 3001 et seq., defines cultural items, sacred objects, and objects of cultural patrimony, and establishes ownership hierarchy for remains found on federal lands. It also provides for specific case review, allows excavation of human remains, stipulates return of the remains according to ownership, sets penalties, calls for cultural resource inventories, and has provisions for the return of specified cultural items. NAGPRA is initiated when the project and the finds are situated on federal lands.

Under CEQA, cultural resources include archaeological and historical objects, sites and districts, historic buildings and structures, cultural landscapes, and sites and resources of concern to local Native American and other ethnic groups. In considering impact significance under CEQA, the significance of the resource itself must first be determined. At the state level, consideration of significance as an "important archaeological resource" is measured by cultural resource provisions considered under CEQA Sections 15064.5 and 15126.4, and the draft criteria regarding resource eligibility to the CRHR.

Generally under CEQA, a historical resource (these include built-environment historic and prehistoric archaeological resources) is considered significant if it meets the criteria for listing on the CRHR. These criteria are set forth in CEQA Section 15064.5 and defined as any resource that:

- Is associated with events that have made a significant contribution to the broad patterns of California's history and cultural heritage

- Is associated with lives of persons important in our past
- Embodies the distinctive characteristics of a type, period, region, or method of construction, or represents the work of an important creative individual, or possesses high artistic values; or
- Has yielded, or may be likely to yield, information important in prehistory or history

Section 15064.5 of CEQA also assigns special importance to human remains and specifies procedures to be used when Native American remains are discovered. These procedures are detailed under California Public Resources Code (PRC) Section 5097.98.

Impacts to “unique archaeological resources” and “unique paleontological resources” are also considered under CEQA, as described under PRC 21083.2. A unique archaeological resource implies an archaeological artifact, object, or site about which it can be clearly demonstrated that—without merely adding to the current body of knowledge—there is a high probability that it meets one of the following criteria:

- The archaeological artifact, object, or site contains information needed to answer important scientific questions, and there is a demonstrable public interest in that information; or
- The archaeological artifact, object, or site has a special and particular quality, such as being the oldest of its type or the best available example of its type; or
- The archaeological artifact, object, or site is directly associated with a scientifically recognized important prehistoric or historic event or person.

A non-unique archaeological resource indicates an archaeological artifact, object, or site that does not meet the above criteria. Impacts to non-unique archaeological resources and resources which do not qualify for listing on the CRHR receive no further consideration under CEQA.

Under CEQA Section 15064.5, a project potentially would have significant impacts if it would cause substantial adverse change in the significance of one of the following:

- A historical resource (i.e., a cultural resource eligible for the CRHR)
- A archaeological resource (defined as a unique archaeological resource which does not meet CRHR criteria)
- A unique paleontological resource or unique geologic feature (i.e., where the project would directly or indirectly destroy a site)
- Human remains (i.e., where the project would disturb or destroy burials)

A non-unique archaeological or paleontological resource is given no further consideration, other than the simple recording of its existence by the lead agency.

### **1.3 CULTURAL RESOURCES MONITORING PROGRAM**

Due to the nature of this remediation project it has been established that much of the site should be considered contaminated with toxic substances such as heavy metals. As a result of this

determination the decision was made before the Phase I investigations in 2002 that analysis of archaeological materials would be restricted to *in situ* examination of artifacts, photo documentation of archaeological features, and measurements of the buried seawall as appropriate. All appropriate safety procedures were to be observed when archaeologists were present during the use of heavy equipment such as backhoes, excavators, dump trucks, and front-loaders. The recovery, analysis, and/or curation of artifacts that contain toxic accretions are not viable ways to conduct this type of archaeological investigation. However, as will be revealed elsewhere in this report, two isolated artifacts of a unique nature were recovered by the remediation crew and sufficiently cleaned, and thus decontaminated, to be turned over to archaeologists for more detailed analysis.

All archaeologists who participated in this monitoring program have current Occupational Safety and Health Administration (OSHA) certification to work in sites containing hazardous materials through a Hazardous Waste Operations and Emergency Response (HAZWOPER) 40-hour training. In order for the cultural resources monitoring program to address the fundamental issues involving the cultural resources and to comply with the remediation program the following steps were taken:

- Prior to the Phase I remediation program extensive archival research was conducted by URS archaeologists and architectural historians. Research included examination of historic photographs, technical reports of past investigations in the area, and various historical materials contained in the archives at the Richmond Field Station and maintained by UC Berkeley. This research was expanded upon by information provided by the Northwest Information Center (NWIC) in Rohnert Park, CA at Sonoma State University. The NWIC is part of the state-wide California Historic Resources Information System (CHRIS).
- Because heavy equipment was employed at the site and since archaeologists were not present at all times during the remediation some responsibility was given to the remediation crews who were in the field everyday. To this end an education program was established and carried out before the first day of ground-disturbing work. The remediation crew was instructed concerning the overall legal responsibility of everyone involved to report to an archaeologist or crew supervisor any materials suspected of being archaeologically or historically significant. Added emphasis was given to the possibility, however unlikely, of discovery of Native American human remains. State laws related to the treatment of human remains were discussed as were the penalties that could be incurred if proper protocol were not observed after a discovery. By ensuring the prompt reporting of archaeological materials an in-field determination could be made concerning the significance of the find. In the event that further analysis may be required the remediation crew would commence work in an area well away from the archaeological find until a qualified archaeologist gave clearance that work could resume.
- The archaeological monitoring system established for the remediation program called for a qualified archaeologist to be present when removal of soil occurred in areas where archaeological deposits may be present such as near the former seawall. Remnants of the seawall were, in fact, discovered during the remediation activities and were recorded as

excavation took place. Completed site records and monitoring logs are included with this addendum report.

**2.0 AREA OF POTENTIAL EFFECT**

The Area of Potential Effects (APE) for this project can be defined as all areas of land with planned remediation/excavation activity for the autumn of 2003. For the UC Berkeley RFS property this consists of the area referred to as Subunit 2A that were not remediated in 2002, as well as Area 4, M1a, and M3. Figure 1 shows the APE as the “area of concern” from the fall of 2003.

**3.0 NATIVE AMERICAN CONSULTATION**

No known prehistoric or ethnographically recorded Native American sites are located within the project area. Protocols were established prior to the remediation to require work stoppage in the unlikely event Native American archaeological remains or human remains were encountered. Discovery of such materials would require consultation with the California Native American Heritage Commission and local Native Americans. No Native American archaeological remains or human remains were encountered during the 2003 remediation work addressed in this report.

#### 4.0 RESULTS OF PHASE II MONITORING ACTIVITIES

The results of the monitoring program resulted in the recordation of the remnant seawall, a portion of a box-flume, and the notation of an array of bottles, containers and other isolated artifacts that represent secondary deposition of refuse material thrown over the seawall. These types of artifacts were expected based on observations from the Phase I remediation work completed in 2002. Additionally, portions of the former seawall were exposed. The recorded features and noted isolates were located outside the jurisdictional area encompassed by the USACE 404 permit. All of these features and isolates were impregnated with potentially hazardous residues and were disposed of as part of the remediation program. Both the seawall and box-flume were recorded *in situ* on DPR 523 forms. As expected, all pyrite-contaminated soils were located on the outside of the seawall in the fill areas and marsh zone. The position of the seawall, in conjunction with chemical analysis of the soils, was therefore used as a guide to determine which soils required remediation. As a general rule excavation activities followed the line of the seawall, however it became apparent that the seawall was taking an unexpected turn of approximately 20 degrees toward the bay for approximately 40 feet before it turned back toward the northwest and followed its original, predicted path (Figure 2). Because the seawall turned where it did several hundred cubic meters of soil did not require excavation or remediation and plans were altered accordingly. The change in direction of the seawall was documented.

Another feature that was found to be associated with the seawall was a small box-flume (Figure 3). This flume extended out of the seawall, four feet from the top of the wall. The termination point for the flume is unknown as most traces of it were obliterated by the excavator. Visual observation of the flume, however, showed that it extended at least 20 feet into the marsh at an angle perpendicular to the seawall. The flume was encrusted in purple-stained soil, as a result of pyrite cinder contaminations. Therefore, recovery was not attempted and treatment was limited to in-field recordation only. Bill Copeland, a project manager at the Richmond Field Station site, said that the box-flume was associated with a building known to be a major mercury fulminate processing center for the California Cap Company.

In an aerial photo of the site dated March 24, 1947 there is a linear feature in the area of the flume that is positioned at a right angle to the seawall. Ten years later, the 1957 aerial photo of the site shows the marsh largely filled in and no remaining evidence of the linear feature from the 1947 photo. The flume appears to have been constructed of redwood planks on the sides and the bottom and topped with small rectangular pieces of the same type of wood measuring 1' X 1.5' X 2 ½ ". Figure 4 shows the flume, having been bisected by the excavator, continuing into marsh. The broken boards can be seen approximately two feet below the ground surface. Purple-stained, pyrite contaminated soil surrounds the flume on all four sides, which suggests that the flume predates the deposition of the pyrite cinders. However, the pyrite could have leached over time and stained the soil around the flume.





**Figure 2. Seawall changes direction.**



**Figure 3. Wooden Box-flume.**



**Figure 4. Wooden Box-flume continues into sidewall.**



During the course of remediation activities a crew member brought to the attention of archaeologists two unique artifacts that appear to be associated with the industrial nature of the businesses that once operated at the site. Figures 5 and 6 show two sides of a broken 'valve and cock' manufactured by the Maurice A. Knight Company of Akron, Ohio. Figure 7 shows a more recent version of the 'valve and cock' and possesses a slightly different method of manufacture



**Figure 5. Broken 'valve and cock' from the Maurice A. Knight Company.**



**Figure 6. Broken 'valve and cock' from the Maurice A. Knight Company.**

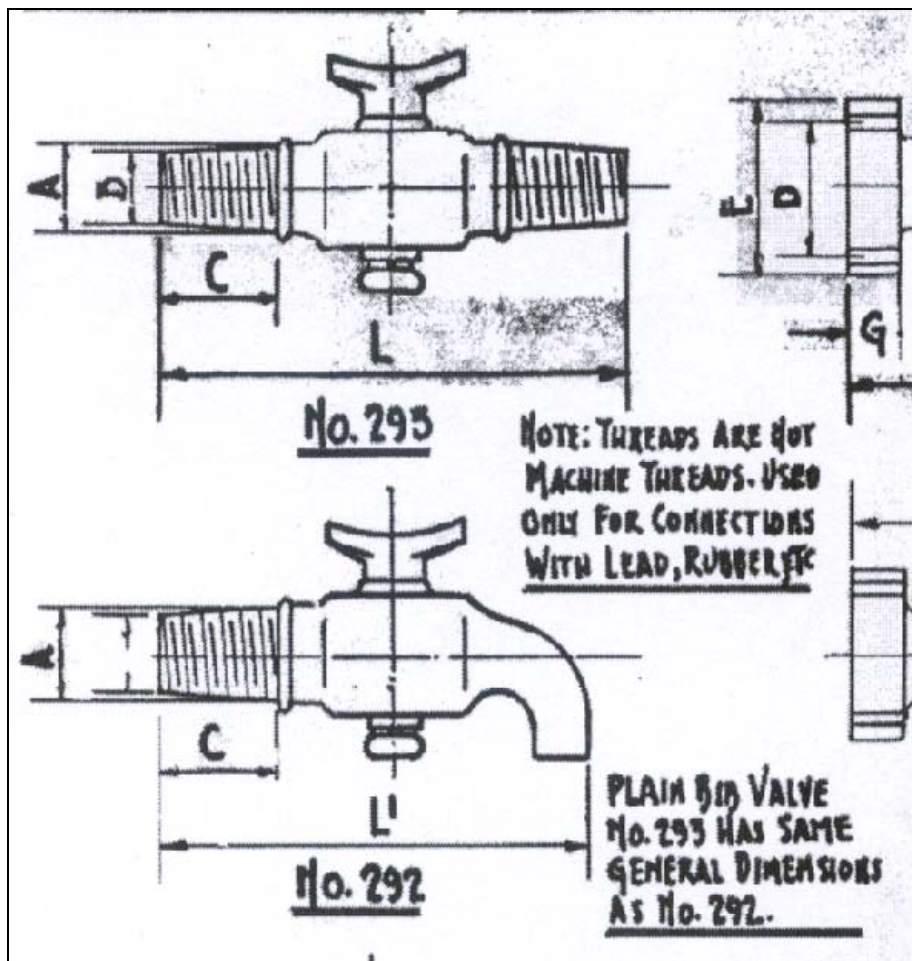


**Figure 7. Later model ‘valve and cock’ from the M.A. Knight Company**

than the ‘valve and cocks’ in Figures 5 and 6. The first valve and cock appears to have features applied by hand, namely six striations made with a hand tool as well as a maker’s mark. The maker’s mark consists of a knight’s head with words on the sides and top. After careful examination the words were deciphered and read, from left to top to right, “Acid Proof”, “Maurice A. Knight”, and “Stoneware.” The opposite side of this ‘valve and cock’ has the six striations repeated, but this time with the number “1234” stamped between the sets of striations. The ‘valve and cock’ depicted in Figure 7 has a shield on its side with the letters ‘D T S’ inside the shield and the letter B under the shield with the number 4 under that. Subsequent research led archaeologists to the Koch Knight Limited Liability Corporation, the surviving entity from the former merger in 1981 of the Maurice A. Knight Company with Koch Engineering Company, Incorporated. Conversations with a company representative revealed that the ‘valve and cocks’ recovered from the Richmond Field Station were used to regulate the flow of sulfuric acid between containers.

The Maurice A. Knight Company was founded in Akron, Ohio in 1910 and manufactured an industrial ceramic known as “KNIGHT-WARE” which was a chemical stoneware designed to withstand the corrosive properties of industrial acid. Prior to the Maurice A. Knight Company’s advent of “KNIGHT-WARE” the American chemical industry relied on England and Germany to supply them with stoneware for the production and storage of strong acid. Stoneware was manufactured in the United States for the chemical industry, but at the time the American product was considered inferior to its European counterpart. Maurice Knight realized that a market was open for domestically made stoneware and decided to make “KNIGHT-WARE” a vitreous ceramic that did not rely upon its glaze for acid resistance and that was strong enough to be made into large pieces of equipment. The two examples of broken “valve and cocks” from the Richmond Field Station are examples of this pioneering technology developed by Maurice

Knight. A spokesman for the Koch Knight LLC stated that these particular pieces of equipment ceased to be manufactured in the late 1920s. Although both examples are machine made the “valve and cock” in Figures 5 & 6 has a more crude salt glaze on the stoneware with hand-applied striations on both sides and color variations in the clay itself. The artifact in Figure 7 appears to have a more modern glaze and the clay is more granular, consistent in color, and lacks layers with varying textures. Figure 8 is an excerpt from a historical inventory provided to URS by the Koch Knight LLC during research investigations into the origin of the valve and cocks discovered at the Richmond Field Station. Of the many examples of ‘valve and cocks’ once manufactured by the Maurice A. Knight Company in the 1910s to 1920s the two depicted in Figure 7 most resemble those recovered during remediation activities at RFS in 2003.



**Figure 7. Diagrams of Valve and Cocks manufactured by the M.A. Knight Company. (Courtesy of Koch Knight LLC)**

**5.0 RECOMMENDATIONS AND CONCLUSIONS**

Neither of the portions of the seawall nor the box-flume qualified for inclusion on the NRHP or the CRHR nor are unique resources. The portion of the encountered during the remediation was only a small segment of what was once a much a more extensive feature. As such the seawall and the setting lack the necessary physical integrity to convey an association with events that have made a significant contribution to the broad patterns of California's history and cultural heritage. It was not associated with lives of persons important in our past. It did not retain the distinctive characteristics of a type, period, region, or method of construction, or represents the work of an important creative individual, or possesses high artistic values. Finally it did not contain the potential to yield information important in history.

The 2003 remediation program did not result in impacts to significant or unique cultural resources. This report satisfies U.C. Berkeley's obligations to address cultural resources as part of its 2003 remediation activities at the RFS.

- 2004 Koch Knight Limited Liability Corporation Internet Homepage.  
<http://www2.cr.nps.gov/laws/ProfQual83.htm>.
- 2003 Lee, Christopher M. and Brian Hatoff. *Richmond Field Station Remediation Project--Subunit 2A, Cultural Resources Monitoring Program for 2002*. URS Corporation, Oakland, CA.
- 1983 National Park Service. Professional Qualification Standards.  
<http://www2.cr.nps.gov/laws/ProfQual83.htm>





**LEGEND**

- MARSH 150' BUFFER ZONE
- EXISTING SOIL BERM
- EXISTING CLAY BERM
- SD — EXISTING STORM DRAIN
- FORMER SEAWALL
- BOX FLUME
- EBRPD — EAST BAY REGIONAL PARK DISTRICT
- STOCKPILE AND WORK AREAS
- PHASE 2 AREA OF CONCERN/AREA OF POTENTIAL EFFECT

0 75 150  
APPROX. SCALE: 1"=150'



University of California, Berkeley  
Richmond Field Station  
26814100

PHASE I & II AREAS OF  
POTENTIAL EFFECT & LOCATION  
OF FORMER SEA WALL

FIGURE  
1

x:\env\waste\Berkeley,UC (RFS)\Report-phase 2 completion\Figures\Figure 1.dwg



**Attachments**  
**Site Records and Monitoring Logs**

---

**PRIMARY RECORD**

Primary # \_\_\_\_\_  
 HRI # \_\_\_\_\_  
 Trinomial \_\_\_\_\_  
 NRHP Status Code \_\_\_\_\_

Other \_\_\_\_\_  
 Review Code \_\_\_\_\_ Reviewer \_\_\_\_\_ Date \_\_\_\_\_

Resource Name or #: (Assigned by recorder) Stege Marsh Sea Wall

P1. Other Identifier: \_\_\_\_\_

\*P2. Location:  Not for Publication  Unrestricted \*a. County Contra Costa  
 and (P2c, P2e, and P2b or P2d. Attach a Location Map as necessary.)

\*b. USGS 7.5' Quad Richmond Date 1959 Unsectioned portions of the San Pablo Land Grant

c. Address 1301 South 46<sup>th</sup> Street City Richmond, CA Zip 94804

d. UTM: (Give more than one for large and/or linear resources) Zone 10, 558634 mE/ 4196048 mN

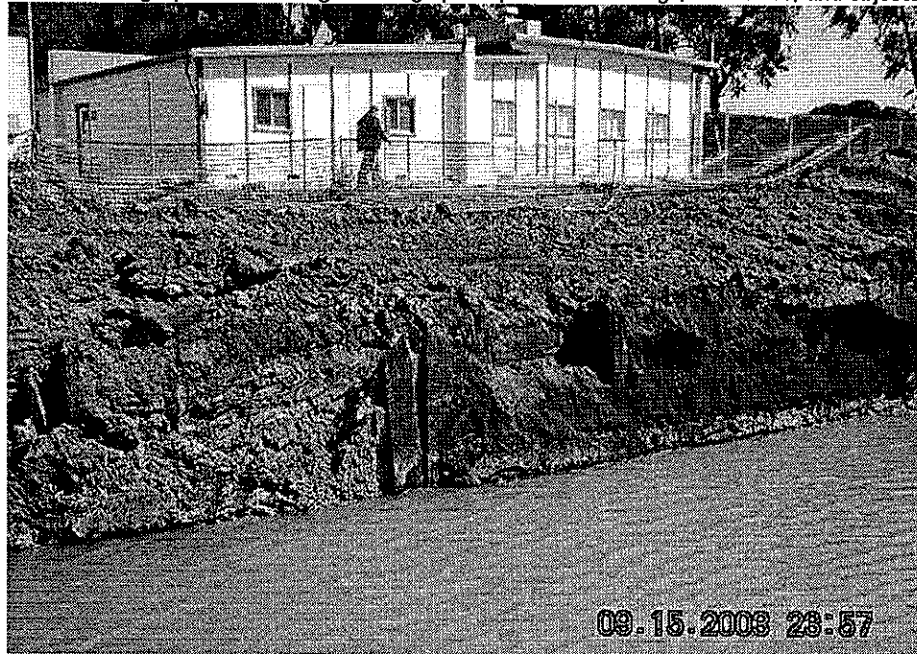
e. Other Locational Data: (e.g., parcel #, directions to resource, elevation, etc., as appropriate) From I-580 take Bayview Exit and turn left. Drive approximately 1/4 mile and turn left into Richmond Field Station.

\*P3a. Description: (Describe resource and its major elements. Include design, materials, condition, alterations, size, setting, and boundaries) The remnants of the former sea wall at the Richmond Field Station were uncovered during remediation activity of pyrite and mercury fulminate contaminated soils. The structure itself lacked much physical integrity as a result of the contaminating chemicals and the high level of ground water that rotted the wooden sea wall. Total length of the sea wall observed in the field was approximately 200 feet.

\*P3b. Resource Attributes: (List attributes and codes) AH 11 Wall/Fence

\*P4. Resources Present:  Building  Structure  Object  Site  District  Element of District  
 Other (Isolates, etc.)

P5a. Photograph or Drawing (Photograph required for buildings, structures, and objects.)



P5b. Description of Photo: (view, date, accession #) Sea Wall (facing East)

\*P6. Date Constructed/Age and Sources:  Historic  
 Prehistoric  Both

\*P7. Owner and Address:  
UC Berkeley Richmond Field Station. 1301 South 46<sup>th</sup> Street, Richmond, CA 94804

\*P8. Recorded by: (Name, affiliation, and address)  
Christopher M. Lee  
URS Corporation  
1333 Broadway, Suite 800  
Oakland, CA 94612

\*P9. Date Recorded: 9/16/03

\*P10. Survey Type: (Describe)  
Archaeological Monitoring Program

\*P11. Report Citation: (Cite survey

report and other sources, or enter "none.") RFSRP-Phase 2: Cultural Resources Monitoring Program, Addendum to the 2003 Phase I Project Report

\*Attachments:

- NONE  
 Location Map  Continuation Sheet  Building, Structure, and Object Record  
 Archaeological Record  District Record  Linear Feature Record  Milling Station Record  Rock Art Record  
 Artifact Record  Photograph Record  Other (List): Sketch map

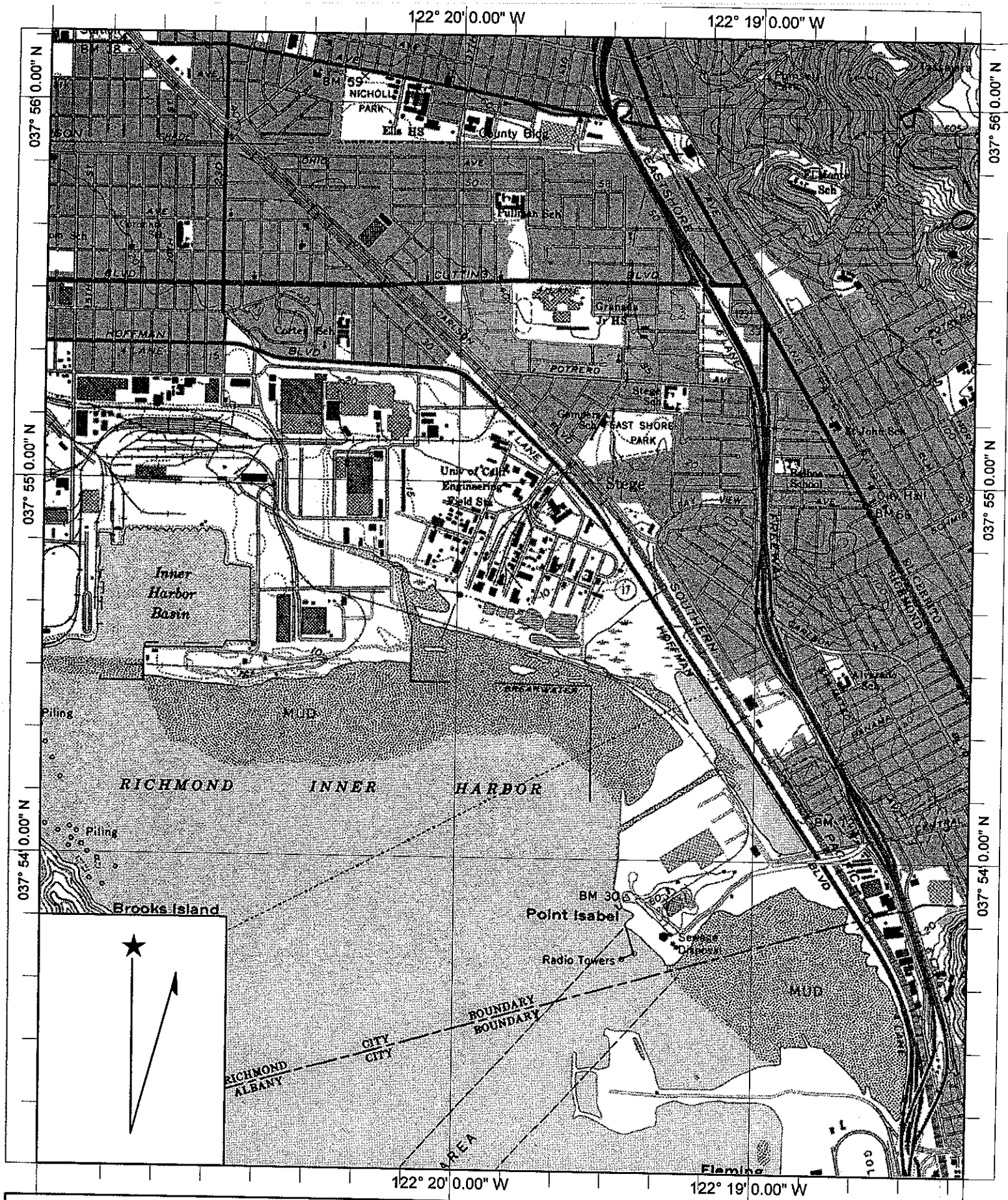
State of California – The Resources Agency  
DEPARTMENT OF PARKS AND RECREATION  
**ARCHAEOLOGICAL SITE RECORD**

Primary # \_\_\_\_\_  
Trinomial \_\_\_\_\_

Page 2 of 4

\*Resource Name or # (Assigned by Recorder) Stege Marsh Sea Wall

- \*A1. Dimensions:** a. Length 200 feet (NW) × b. Width (1 foot)  
Method of Measurement:  Paced  Taped  Visual estimate  Other: \_\_\_\_\_  
Method of Determination (Check any that apply.):  Artifacts  Features  Soil  Vegetation  Topography  
 Cut bank  Animal burrow  Excavation  Property boundary  Other (Explain): \_\_\_\_\_  
Reliability of Determination:  High  Medium  Low Explain: used tape measure  
Limitations (Check any that apply):  Restricted access  Paved/built over  Site limits incompletely defined  
 Disturbances  Vegetation  Other (Explain): the sea wall has previously been dismantled and built over
- A2. Depth: 3' 2" below surface overburden  None  Unknown Method of Determination: tape measure
- \*A3. Human Remains:**  Present  Absent  Possible  Unknown (Explain): \_\_\_\_\_
- \*A4. Features:** (Number, briefly describe, indicate size, list associated cultural constituents, and show location of each feature on sketch map.):  
One sea wall; the length of this remaining section of sea wall was exposed during Phase 2 remediation activity at the Richmond Field Station. The sea wall served as the boundary between clean and contaminated soils at the site.
- \*A5. Cultural Constituents:** (Describe and quantify artifacts, ecofacts, cultural residues, etc., not associated with features.)  
The site is littered with broken glass & ceramic jars reportedly used for storing mercury and various other chemicals.
- \*A6. Were Specimens Collected?**  No  Yes (If yes, attach Artifact Record or catalog and identify where specimens are curated.)
- \*A7. Site Condition:**  Good  Fair  Poor (Describe disturbances.): Destroyed during remediation activities in 2002 and 2003
- \*A8. Nearest Water:** (Type, distance, and direction.) San Francisco Bay = 300 meters southwest
- \*A9. Elevation:** approximately 3 feet above sea level
- A10. Environmental Setting: (Describe culturally relevant variables such as vegetation, fauna, soils, geology, landform, slope, aspect, exposure, etc.)  
The Stege Marsh Sea Wall is located 300 meters northeast of the San Francisco Bay and is adjacent to the marsh itself. Vegetation includes dense reeds and cattails.
- A11. Historical Information:  
The sea wall was constructed in the late 1880s during the site's early industrial phase to protect the property from storms.
- \*A12. Age:**  Prehistoric  Protohistoric  1542-1769  1769-1848  1848-1880  1880-1914  
 1914-1945  Post 1945  Undetermined Describe position in regional prehistoric chronology or factual historic dates if known:
- A13. Interpretations: (Discuss data potential, function(s), ethnic affiliation, and other interpretations)  
The sea wall lacks integrity as the majority of it was dismantled years ago with no records left. The remaining portion was highly disturbed and encrusted with pyrite and mercury contaminated soils.
- A14. Remarks: Remainder of seawall destroyed by 2002/2003 remediation activities. No remaining data predicted.
- A15. References: (Documents, informants, maps, and other references)  
1) Plat of the Rancho San Pablo (surveyed by: John La Croze, deputy surveyor, 1858; James T. Stratton, deputy surveyor, 1863)  
2) USGS San Francisco Quadrangle, 1915; 3) USGS 1971 "Preliminary Map of Historic Margins of Marshland, San Francisco Bay, CA"  
3) War Department, USACOE, San Francisco Quadrangle, Grid Zone "G", 1942
- A16. Photographs (List subjects, direction of view, and accession numbers or attach a Photograph Record.): \_\_\_\_\_  
Original Media/Negatives Kept at: URS Corporation, 500 12th Street, Suite 200, Oakland, CA 94607-4014
- \*A17. Form Prepared by:** Christopher M. Lee Date: 5/4/04  
Affiliation and Address: URS Corporation, 1333 Broadway, Suite 800, Oakland, CA 94612



Name: RICHMOND  
 Date: 5/25/2004  
 Scale: 1 inch equals 2000 feet

Location: 037° 54' 40.5" N 122° 19' 49.7" W  
 Caption: Richmond Field Station -- Location Map

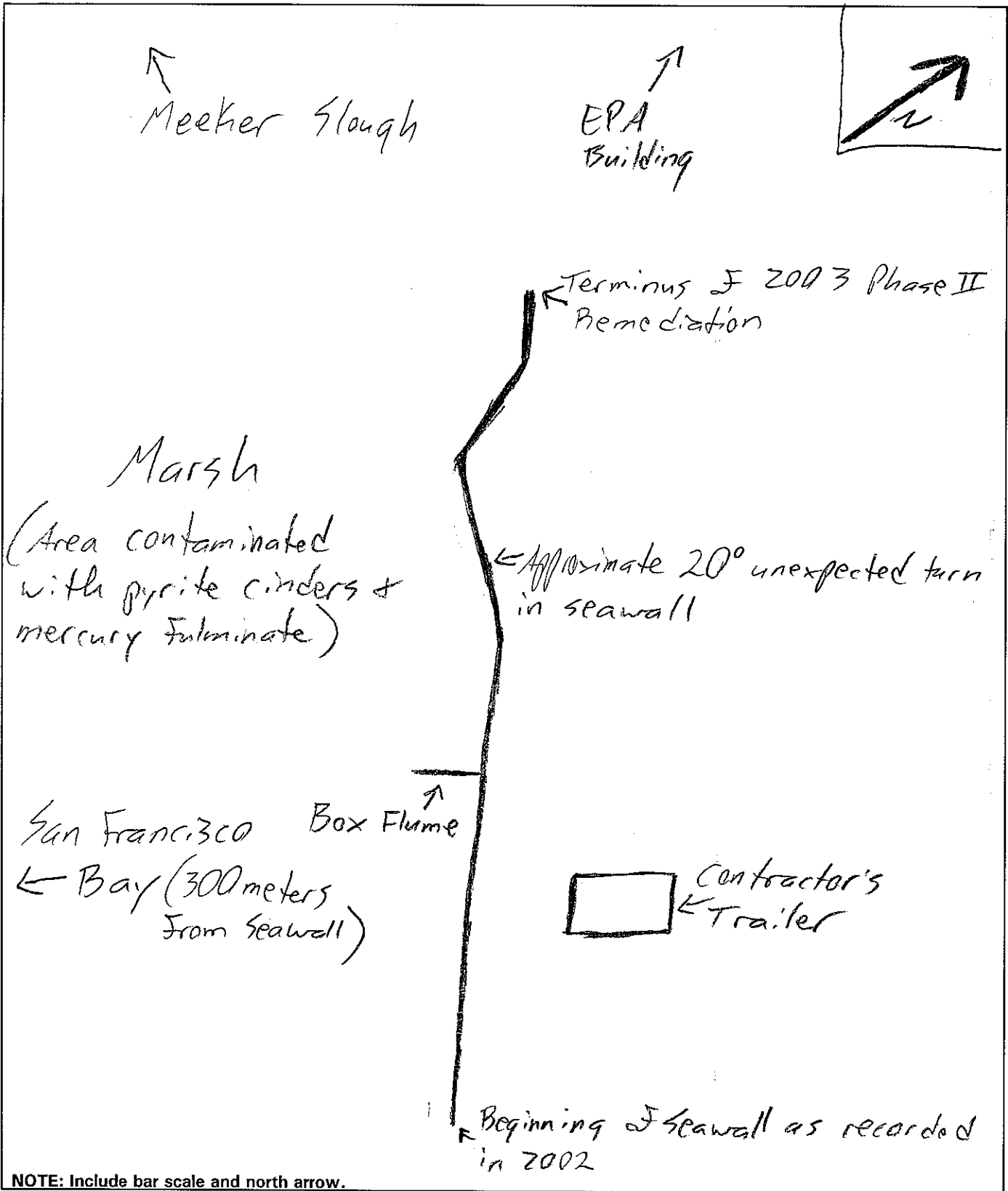
SKETCH MAP

Page 4 of 4

\*Resource Name or # (Assigned by recorder) Stege Marsh Sea Wall

\*Drawn by: Chris Lee

\*Date of map: 2004



NOTE: Include bar scale and north arrow.

**PRIMARY RECORD**

Primary # \_\_\_\_\_  
HRI # \_\_\_\_\_  
Trinomial \_\_\_\_\_  
NRHP Status Code \_\_\_\_\_  
Other \_\_\_\_\_  
Review Code \_\_\_\_\_ Reviewer \_\_\_\_\_ Date \_\_\_\_\_

**P1. Other Identifier:** \_\_\_\_\_

\*P2. Location:  Not for Publication  Unrestricted \*a. County Contra Costa  
and (P2c, P2e, and P2b or P2d. Attach a Location Map as necessary.)  
\*b. USGS 7.5' Quad Richmond Date 1959 Unsectioned portions of the San Pablo Land Grant  
c. Address 1301 South 46<sup>th</sup> Street City Richmond, CA Zip 94804  
d. UTM: (Give more than one for large and/or linear resources) Zone 10, 558634 mE/ 4196048 mN  
e. Other Locational Data: (e.g., parcel #, directions to resource, elevation, etc., as appropriate)

\*P3a. Description: (Describe resource and its major elements. Include design, materials, condition, alterations, size, setting, and boundaries) The remnants of the box flume were uncovered during remediation activities at the Richmond Field Station. The flume extended out of the side of the sea wall 3.5 feet below ground surface at a right angle to the seawall. The flume extended for at least 20 feet, but any remaining elements would have been destroyed by excavation equipment. The flume appeared to be constructed of redwood planks on the sides and bottom. The top of the flume was capped with rectangular pieces of wood measuring 1' X 1.5' X 2 1/2".

\*P3b. Resource Attributes: (List attributes and codes) AHG Water Conveyance Feature  
\*P4. Resources Present:  Building  Structure  Object  Site  District  Element of District  
 Other (Isolates, etc.)

**P5a. Photograph or Drawing (Photograph required for buildings, structures, and objects.)**



P5b. Description of Photo: (view, date, accession #) Box Flume (facing North)

\*P6. Date Constructed/Age and Sources:  Historic (Age Unknown)  
 Prehistoric  Both  
\*P7. Owner and Address: UC Berkeley Richmond Field Station, 1301 South 46<sup>th</sup> Street, Richmond, CA  
\*P8. Recorded by: (Name, affiliation, and address) Christopher M. Lee, URS Corporation, 1333 Broadway, Suite 800, Oakland, CA 94612  
\*P9. Date Recorded: 9/16/03  
\*P10. Survey Type: (Describe) Archaeological Monitoring Program

\*P11. Report Citation: (Cite survey report and other sources, or enter "none.") RFSRP-Phase 2: Cultural Resources Monitoring Program, Addendum to the 2003 Phase I Project Report

**\*Attachments:**

- NONE
- Location Map  Continuation Sheet  Building, Structure, and Object Record
- Archaeological Record  District Record  Linear Feature Record  Milling Station Record  Rock Art Record
- Artifact Record  Photograph Record  Other (List): Sketch Map



Page 2 of 4

\*Resource Name or # (Assigned by Recorder) **Stege Marsh Box Flume**

\*A1. Dimensions: a. Length 20 feet (SW) × b. Width 1 ½ feet (NE)

Method of Measurement:  Paced  Taped  Visual estimate  Other: \_\_\_\_\_

Method of Determination (Check any that apply.):  Artifacts  Features  Soil  Vegetation  Topography  
 Cut bank  Animal burrow  Excavation  Property boundary  Other (Explain): \_\_\_\_\_

Reliability of Determination:  High  Medium  Low Explain: visual measurements

Limitations (Check any that apply):  Restricted access  Paved/built over  Site limits incompletely defined  
 Disturbances  Vegetation  Other (Explain): The Box Flume was covered in toxic chemical accretions.  
Therefore only visual measurements were possible.

A2. Depth: 3' 2"  None  Unknown Method of Determination: tape measure

\*A3. Human Remains:  Present  Absent  Possible  Unknown (Explain): \_\_\_\_\_

\*A4. Features: (Number, briefly describe, indicate size, list associated cultural constituents, and show location of each feature on sketch map.):

One Box Flume. The box flume appeared to be constructed of redwood planks and measured 1 feet X 1 ½ feet X 2 ½ inches. The project manager on site said that the flume was in line with the primary building of the former California Cap Company that processed mercury fulminate.

\*A5. Cultural Constituents: (Describe and quantify artifacts, ecofacts, cultural residues, etc., not associated with features.)

The site is littered with broken glass & ceramic jars reportedly used for storing mercury and various other chemicals.

\*A6. Were Specimens Collected?  No  Yes (If yes, attach Artifact Record or catalog and identify where specimens are curated.)

\*A7. Site Condition:  Good  Fair  Poor (Describe disturbances.): Destroyed during remediation activities.

\*A8. Nearest Water: (Type, distance, and direction.) San Francisco Bay = 300 meters south

\*A9. Elevation: approximately 3 feet above sea level

A10. Environmental Setting: (Describe culturally relevant variables such as vegetation, fauna, soils, geology, landform, slope, aspect, exposure, etc.)

The Stege Marsh Box Flume is located 300 meters north of the San Francisco Bay and is adjacent to the marsh itself.

A11. Historical Information:

The box flume has no historical documents associated with it, however a 1947 aerial photo does show a linear feature in the same location of the flume. A 1957 aerial shows no evidence of the feature. It is unknown if this feature in the 1947 photo actually is the box flume.

\*A12. Age:  Prehistoric  Protohistoric  1542-1769  1769-1848  1848-1880  1880-1914  
 1914-1945  Post 1945  Undetermined Describe position in regional prehistoric chronology or factual historic dates if known:

A13. Interpretations: (Discuss data potential, function[s], ethnic affiliation, and other interpretations)

The box flume appeared to be constructed of redwood planks and measured 1' X 1 ½' X 2 ½". The project manager on site said that the flume was in line with the primary building of the former California Cap Company that processed mercury fulminate.

A14. Remarks:

A15. References: (Documents, informants, maps, and other references)

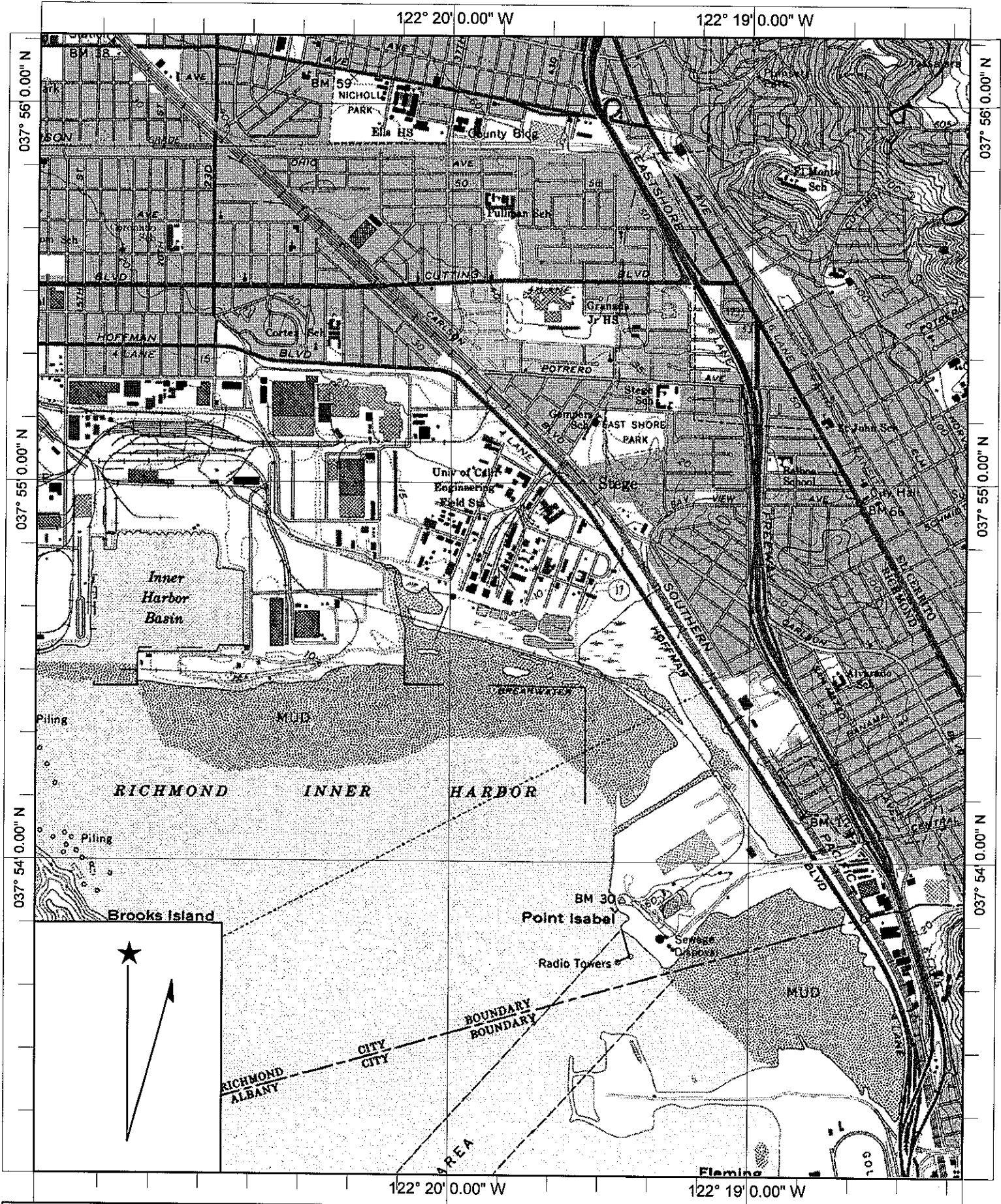
- 1) Plat of the Rancho San Pablo (surveyed by: John La Croze, deputy surveyor, 1858; James T. Stratton, deputy surveyor, 1863)
- 2) USGS San Francisco Quadrangle, 1915; 3) USGS 1971 "Preliminary Map of Historic Margins of Marshland, San Francisco Bay, CA"
- 3) Aerial Photos on file at Richmond Field Station.
- 4) War Department, USACOE, San Francisco Quadrangle, Grid Zone "G", 1942

A16. Photographs (List subjects, direction of view, and accession numbers or attach a Photograph Record.):

Original Media/Negatives Kept at: URS Corporation, 1333 Broadway, Suite 800, Oakland, CA 94612

\*A17. Form Prepared by: Christopher M. Lee Date: 5/4/04

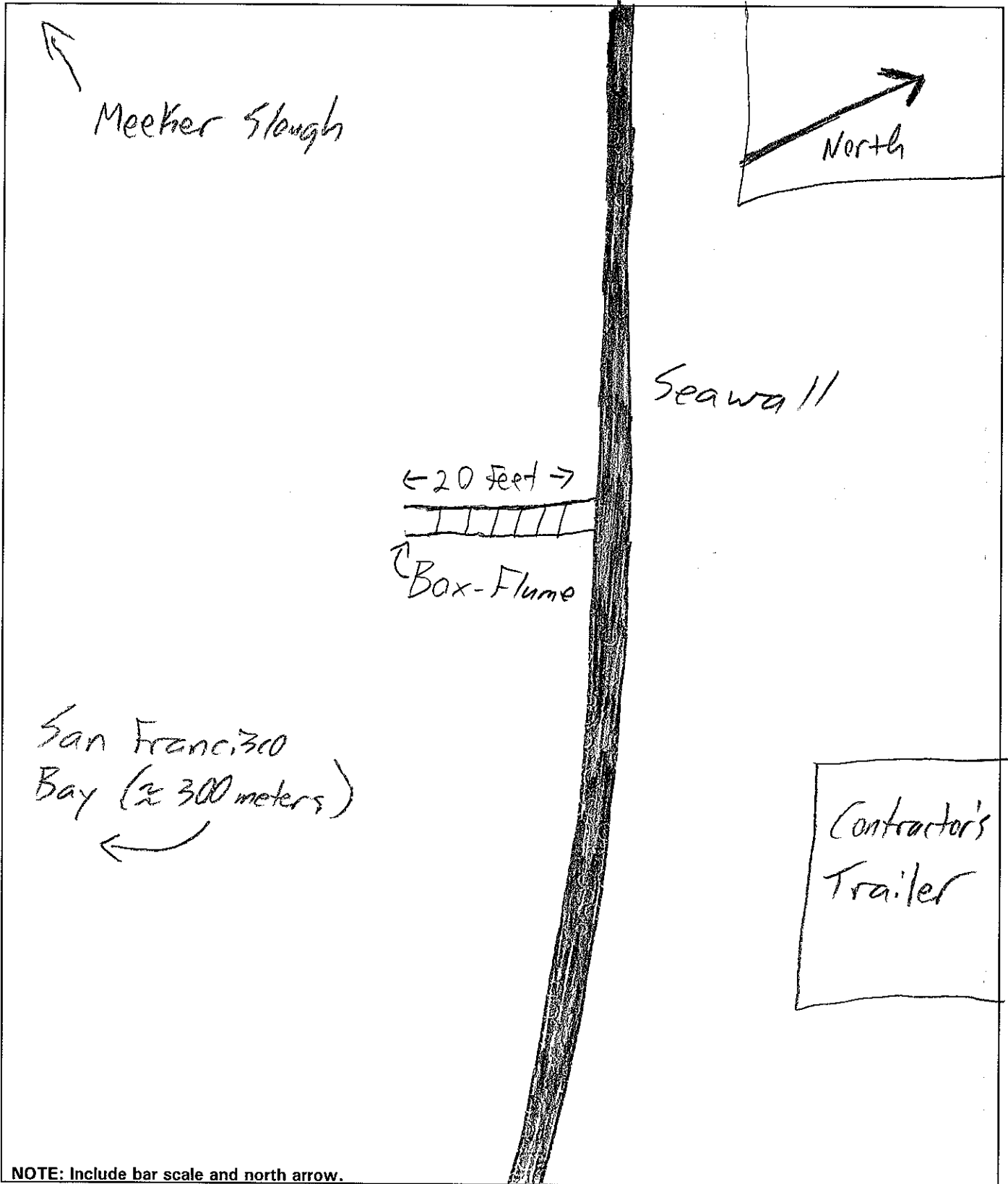
Affiliation and Address: URS Corporation, 1333 Broadway, Suite 800, Oakland, CA 94612



Name: RICHMOND  
 Date: 5/25/2004  
 Scale: 1 inch equals 2000 feet

Location: 037° 54' 40.5" N 122° 19' 49.7" W  
 Caption: Richmond Field Station -- Location Map





NOTE: Include bar scale and north arrow.

# Richmond Field Station

## DAILY ENVIRONMENTAL MONITORING LOG

Date: 9/6/03

Monitor(s): Sean Dexter/Brian Hatoff

Weather: Mostly Cloudy

Page 1 of 1

<b>A</b>	Follow-Up Required? No	<b>Subject:</b> <u>Cultural</u>
Follow-up date: / /		Construction Activities: Environmental remediation
Photos? Yes – digital		
Roll: Frame(s): 1-31 Digital, X:\x_env\culture\chris\projects\ Richmond Field Station\ photos\monitoring\09-06-03		Observation Summary: Was called to site because of "ceramics" found late Friday 9-5-03. There were large volumes of ceramic crock fragments (mercury fulminate containers). Also, one ash pit feature was observed.
Post Mile(s): Not Applicable		
<p><b>Additional Notes or Sketch:</b></p> <p>Artifacts observed appeared to be dumped previously along the former seawall structure. Remnants of posts from the seawall were still in-situ. Artifacts observed included red brick, yellow firebrick (embossing was largely illegible, but could make out " H &amp; _"), ceramic crock fragments (mercury fulminate containers?), two domestic ironstone plate fragments (white, no makers mark). The interiors of the fulminate containers were glazed with a salt glaze with a black color. The exteriors had a brown or a white glaze. One electrical cable was observed on the seaward side of the wall. Concrete rubble was also present. One ash concentration (a pit feature) was noted immediately landward of the seawall (see photos), and measured 48" across, at least 22" deep, and was buried under two feet of overburden. The ashes contained flecks of charcoal and some yellow firebrick.</p> <p>Small redwood/concrete post footings were noted further away from the seawall in the center of the remediation area. These probably were related to outbuildings from the earlier industrial use of the property. The soil surrounding these small features was heavily contaminated with pyrite cinders.</p>		

# Richmond Field Station

## DAILY ENVIRONMENTAL MONITORING LOG

Date: 9/ 10/ 03

Monitor(s): \_\_\_\_\_ B. Hatoff

Weather: Clear

Page 1 of 1

<b>A</b>	Follow-Up Required? Yes	Subject: Biological <u>Cultural</u> Paleontological
Follow-up date:    /    /    TBD		Construction Activities: Excavator working in Phase I area south of seawall, immediately south of the parking lot that is to the north of Heron Drive.
Photos?      No		
Roll:      Frame(s):		Observation Summary: Sulphuric acid cinders (brownish purple) containing metal fragments and wood fragments. No diagnostic artifacts observed. Excavation depth to approximately 10 feet.
Post Mile(s):		
<p>Additional Notes or Sketch: Conferred with Kathleen Abbott regarding reporting procedures when monitor no on site. She will call me if materials encountered other than scatters of mercury fulminate containers. Mercury fulminate container scatters will be noted, photographed and location recorded by Kathleen or Arndt if a monitor is not present.</p>		

# Richmond Field Station

## DAILY ENVIRONMENTAL MONITORING LOG

Date: 9/ 15/ 03

Monitor(s): \_\_\_\_\_ Chris Lee

Weather: \_\_\_\_\_ Clear

Page 1 of 1

<b>A</b>	Follow-Up Required? Yes	<b>Subject:</b> Biological <u>Cultural</u> Paleontological
Follow-up date:    /    /    TBD		Construction Activities: Excavator working in Phase II area near seawall.
Photos?      yes		
Roll:          Frame(s):		Observation Summary: Pyrite cinders present in large quantities in this area. No other diagnostic artifacts encountered.
Post Mile(s):		
<p>Additional Notes or Sketch: Discovered some sort of flume. It is constructed of wooden planks on the sides and bottom and capped with individual boards that measure 1' X 1 1/2' X 2 1/2". The flume comes from the area of the seawall and travels toward the marsh.</p>		

# Richmond Field Station

## DAILY ENVIRONMENTAL MONITORING LOG

Date: 9/ 16/ 03

Monitor(s): \_\_\_\_\_ Chris Lee

Weather: Clear

Page 1 of 1

<b>A</b>	Follow-Up Required? Yes	Subject: Biological <u>Cultural</u> Paleontological
	Follow-up date:    /    /    TBD	Construction Activities: Excavator working in Phase II area near seawall.
	Photos?      yes	
	Roll:            Frame(s):	Observation Summary: Pyrite cinders present in large quantities in this area. Soil stained purple from cinders. No other diagnostic artifacts encountered.
	Post Mile(s):	
<p>Additional Notes or Sketch: Further examination of the flume shows that it extended at least 20 feet past the sea wall. Bill Copeland says that the flume is aligned with a building that formerly was located just beyond the sea wall and was known to be the major mercury fulminate processing center of the California Cap Company. Likewise, the area in the marsh that the flume leads to is the main mercury "hot spot" of contamination at the Richmond Field Station site. The March 24, 1947 aerial photo of the site shows a linear feature at a right angle to the seawall in the area where the flume has now been documented. By the time of the 1957 aerial photo of the RFS site no visible evidence of the feature exists. Also, the level of the flume is about 3 feet lower than the top of the seawall suggesting it may have come through the wall into the marsh. Pyrite contaminated soil surrounds the flume on all four sides.</p>		

# Richmond Field Station

## DAILY ENVIRONMENTAL MONITORING LOG

Date: 9/ 18/ 03

Monitor(s): Chris Lee

Weather: Clear

Page 1 of 1

<b>A</b>	Follow-Up Required? Yes	Subject: Biological <u>Cultural</u> Paleontological
	Follow-up date: / / TBD	Construction Activities: Excavator working in Phase II area near seawall.
	Photos?      no	
	Roll: digital      Frame(s):	Observation Summary: Pyrite cinders present in large quantities in this area. Soil stained purple from cinders. No diagnostic artifacts encountered.
	Post Mile(s):	
<p>Additional Notes or Sketch: Excavation activities delayed. Stockpile of contaminated soil must be mixed with activated carbon to stabilize the soil. This is the majority of work being performed today. As excavation has indicated, the sea wall has taken an unexpected turn toward the marsh before it angles back toward the north. Remediation plans have been altered to only excavate soil starting from the seawall and going out toward the marsh as no contamination is present in the inland areas beyond the seawall. Again, excavation cannot proceed until the stockpile of dirt that has already been dug is treated and moved as it has reached its maximum size and additional soil cannot be added to it yet. Kathleen Abbot showed me a revised schedule that indicates excavation will continue through mid to late October. I will obtain a copy of this schedule from Corinne De Voe.</p>		

# Richmond Field Station

## DAILY ENVIRONMENTAL MONITORING LOG

Date: 9/ 22/ 03

Monitor(s): Chris Lee

Weather: Clear & Warm

Page 1 of 1

<b>A</b>	Follow-Up Required? Yes	Subject: Biological <u>Cultural</u> Paleontological
Follow-up date:    /    /    TBD		Construction Activities: Excavator working in Phase area near last year's exposed section of seawall.
Photos?      no		
Roll: digital    Frame(s):		Observation Summary: The dirt they're digging in looks like its just back dirt from last year. The pile of dirt is elevated about 8 feet above normal ground surface.
Post Mile(s):		
<p>Additional Notes or Sketch: one of the foremen brought me a ceramic conduit of some sort. It was found in a back dirt pile after being treated with activated carbon. The man who found it washed it. There is a maker's mark that consists of a knights helmet. Writing around the helmet says " acid proof " on the left side, "Maurice A. Knight" on the top, and "stoneware" on the right side. There is no writing on the bottom of the helmet.</p>		

# Richmond Field Station

## DAILY ENVIRONMENTAL MONITORING LOG

Date: 9/ 24/ 03

Monitor(s): Chris Lee

Weather: Clear & Warm

Page 1 of 1

<b>A</b>	Follow-Up Required? Yes	Subject: Biological <u>Cultural</u> Paleontological
Follow-up date:    /    /    TBD		Construction Activities: soil excavation in vicinity of seawall.
Photos?          no		
Roll: digital    Frame(s):		Observation Summary: miscellaneous pieces of wood (planks/boards), scattered industrial ceramics, bottles found in back dirt.
Post Mile(s):		Equipment: CAT 350 excavator with approx. 3 yard bucket
<p>Additional Notes or Sketch: This area is beyond the seawall and is contaminated with pyrite cinders down to about 5 feet below surface. Excavation is proceeding slowly as only 1 excavator and 1 dump truck are employed at the moment.</p>		



# Richmond Field Station

## DAILY ENVIRONMENTAL MONITORING LOG

Date: 9/ 26/ 03

Monitor(s): Chris Lee

Weather: foggy & cold

Page 1 of 1

<b>A</b>	Follow-Up Required? Yes	Subject: Biological <u>Cultural</u> Paleontological
Follow-up date:    /    /    TBD		Construction Activities: soil excavation in vicinity of seawall.
Photos?      no		
Roll: digital    Frame(s):		Observation Summary: pieces of wood—remnants of seawall encountered
Post Mile(s):		Equipment: CAT 350 excavator with approx. 3 yard bucket
<p>Additional Notes or Sketch: The seawall has taken an unexpected turn toward the bay. This has caused the remediation activity to be postponed near the seawall because there is no contamination in the upland areas (the land side of the seawall) therefore the remediation/excavation plan has to be altered so that no unnecessary and time-consuming excavation occurs of uncontaminated soil.</p>		

# Richmond Field Station

## DAILY ENVIRONMENTAL MONITORING LOG

Date: 10/ 03/ 03

Monitor(s): \_\_\_\_\_

Chris Lee

Weather: clear & cold

Page 1 of 1

<b>A</b>	Follow-Up Required? Yes	Subject: Biological <u>Cultural</u> Paleontological
Follow-up date:    /    /    TBD		Construction Activities: soil excavation
Photos?      no		
Roll: digital    Frame(s):		Observation Summary: excavation is still in areas away from the seawall. Arnt, from URS, says they are still waiting for the revised excavation plans.
Post Mile(s):		Equipment: CAT 350 excavator with approx. 3 yard bucket
Additional Notes or Sketch:		

# Richmond Field Station

## DAILY ENVIRONMENTAL MONITORING LOG

Date: 10/ 17/ 03

Monitor(s): \_\_\_\_\_

Chris Lee

Weather: clear and warm

Page 1 of 1

<b>A</b>	Follow-Up Required? Yes	Subject: Biological <u>Cultural</u> Paleontological
Follow-up date: / / TBD		Construction Activities: soil excavation at the east end of project area approximately 100 feet south of seawall.
Photos?      no		
Roll: digital      Frame(s):		Observation Summary: pieces of wood and pipe intermixed in excavation matrix.
Post Mile(s):		Equipment: CAT 350 excavator with approx. 3 yard bucket
<p>Additional Notes or Sketch: Called out to site today in anticipation of excavation reaching the seawall. This did not occur. Took time to inspect the overall excavation area. At the extreme west end of excavation activity to the south of the neutralizing facility 6 exposed pilings and a horizontal plank associated with the seawall were observed in the excavations. No other artifactual materials were observed. Queried on-site personnel and they had not observed any concentrations of artifacts or other exposed features.</p>		

**Appendix B**  
**Phase 2 Remedial Activities Photographs**



4LEAF, INC.



Elevated view of Y2002 Bay mud stockpile from top of Building 102 prior to Phase II activities.



4LEAF, INC.



**Marsh - Area 2**

**Marsh – Area M3**

**Y2002 on-site treatment cell – Area 4**

08-06-03

Elevated view of Area 4 and marsh from top of Building 102 prior to Phase II activities.





ASPHALT PAD CONSTRUCTION

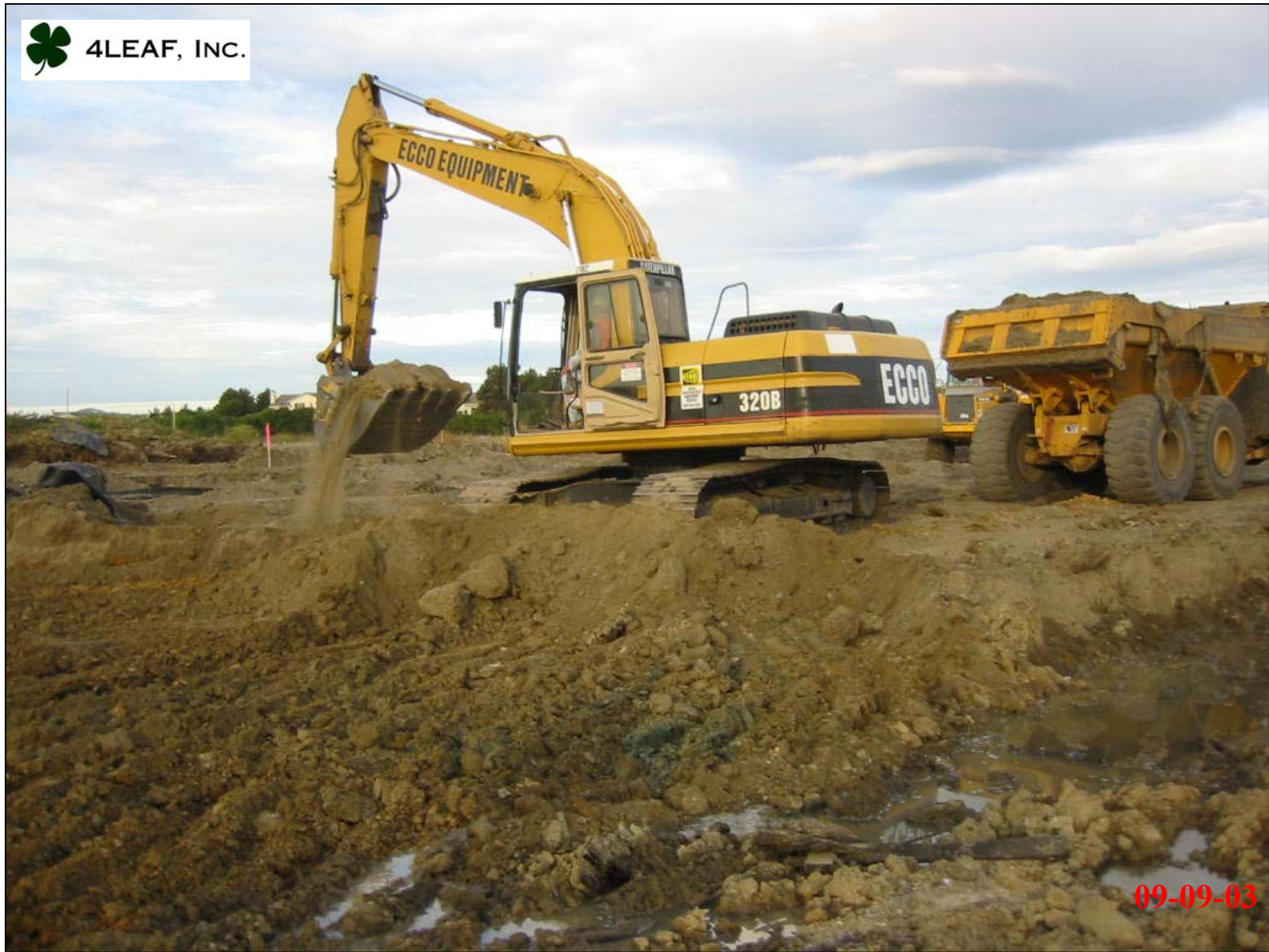


INSTALLING ASPHALT PAD BERMS





4LEAF, INC.



Excavating clean overburden from Area 4.



4LEAF, INC.

Clean overburden stockpiles



Treatment Pad C

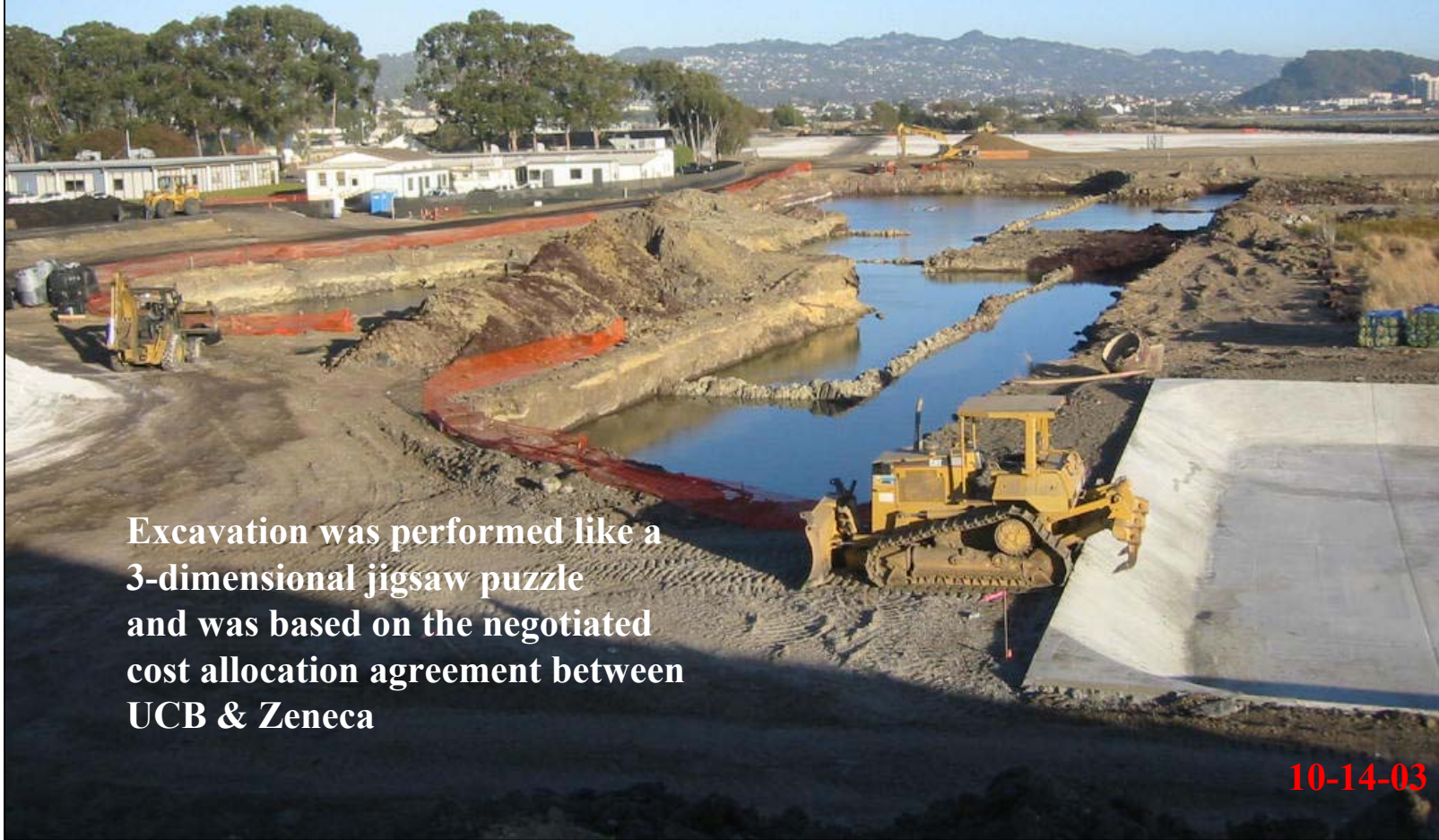
09-06-03

View of clean overburden stockpiled on western extent of project..





4LEAF, INC.



Excavation was performed like a 3-dimensional jigsaw puzzle and was based on the negotiated cost allocation agreement between UCB & Zeneca

10-14-03

Elevated view of Area 4 excavation from top of clean overburden stockpile.





AREA 4 EXCAVATION



AREA 4 EXCAVATION (CINDER SOUTH OF SEAWALL)





4LEAF, INC.

Lateral extents of excavation area A-4

Type A soil (cinders were placed as bedding material for sanitary sewer line)

Former sanitary sewer line

10-07-03

View of excavation area A-4 and Type A soil (cinder material) that was used as bedding material for former sanitary sewer line.



4LEAF, INC.



10-07-03

Excavating Type B soil from Marsh Area 2 (excavation area B-7).





4LEAF, INC.



Contaminated soil is excavated using excavators and transported using 25- and 35-ton capacity haul trucks.





4LEAF, INC.



The front-end loader places a measured amount of contaminated soil and reagent into mixing bin.



POWDERED ACTIVATED CARBON SACKS



LIMESTONE





4LEAF, INC.

**Type A soil (Hg < 50 ppm) treated with limestone**

**Type B soil (Hg between 50 and 260 ppm) treated with powdered activated carbon (PAC)**



Contaminated soils are mixed with reagents using excavator buckets.



SOIL MIXING



SOIL MIXING DUST CONTROL





4LEAF, INC.



Following receipt of positive QC results, the treated material (Type A or B) is loaded into trucks and transported to the adjacent Zeneca/CSV property for final placement.



4LEAF, INC.



Treated Type A material (placed over top of treated and compacted Type B material)

Treated Type B material (note darkend color due to mixing with activated carbon)

10-21-03

Spreading out and placing treated Type A and B material for final placement on Zeneca property.





4LEAF, INC.



10-25-03

View of placed and compacted treated Type A and B material placed on Zeneca property.





4LEAF, INC.



10-27-03

Spraying KUMA cap on top of treated Type A and B material on Zeneca property.



4LEAF, INC.



Treatment Pad C

11-12-03

Loading mixed and dried Type C soil into off-site transport truck for shipment to landfill.





4LEAF, INC.



09-30-03

Pressure washing transport truck tires on decon pad prior to trucks leaving site for landfill.



CONFIRMATION SURVEYING IN AREA 4



BACKFILLING AREA





4LEAF, INC.



11-04-03

Backfilling Marsh Area 2 with clean Bay mud.





SANITARY SEWER INSTALLATION



MERCURY VAPOR METER



DUST METER



WIND DIRECTION MONITORING





4LEAF, INC.

Mini digger used to excavate anchor trench  
and pound fence posts into Bay mud

Marsh Area M1a

11-03-03

Installing silt curtain fence around perimeter of Marsh Area M1a.





SILT SCREEN INSTALLATION



SILT SCREEN





4LEAF, INC.

Marsh Area M1a

Silt curtain fence

11-15-03

Installing silt curtain fence around perimeter of Marsh Area M1a.





M3 MARSH EXCAVATION



MARSH EXCAVATION BOTTOM





TRANSPORTING SEDIMENT TO TREATMENT PADS



POURING CONCRETE PAD





4LEAF, INC.



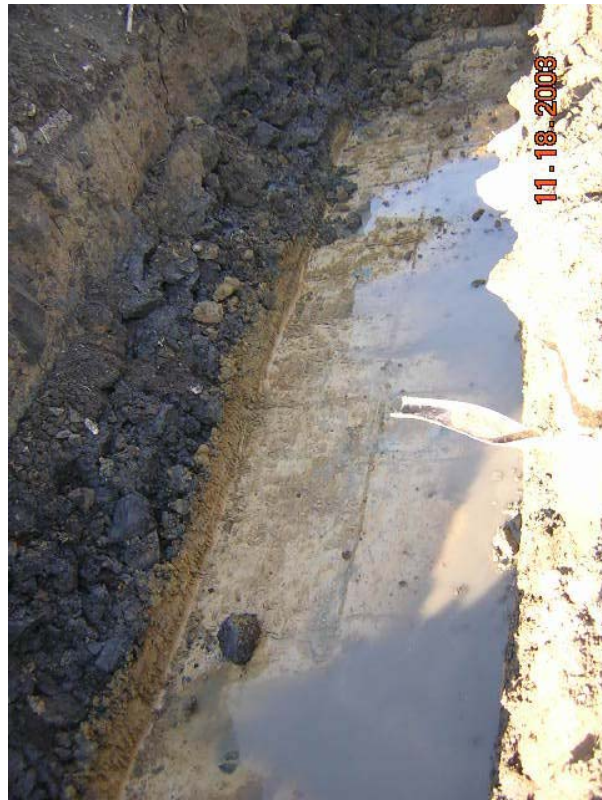
10-9-03

Placing wooden mats to protect perimeter berm and allow equipment on and off treatment pads.





M1A MARSH EXCAVATION



M1A STORM DRAIN EXCAVATION



M1A SEDIMENT MIXING IN CONCRETE PAD





4LEAF, INC.



Concrete treatment pad

11-19-03

Loading mixed and dried Type D soil into off-site transport truck for shipment to landfill.



4LEAF, INC.



11-24-03

Using pressure washer to decon surface of concrete treatment pad after Type D soil was off loaded.





4LEAF, INC.



Grade stakes

Approximately 0.5 to 1 feet of Bay mud was peeled off to match final grading plan for marsh area.

11-04-03

Using long-stick excavator to regrade portion of marsh that was excavated and backfilled during Y2002 activities.





4LEAF, INC.



Channels cut into surface

11-19-03

Regraded portion of marsh (excavated and backfilled during Y2002 activities).





PLANTING CORDGRASS



M1A GRADED CHANNEL



GRADED MARSH

**Appendix C**  
**Reagent Dosage QC Sheet**

















DATE: 1/7/2005

ENVIROCON, INC.  
RFS PHASE 2 REMEDIATION PROJECTQUALITY CONTROL TRACKING  
REAGENT DOSAGE

BATCH MIXING													SPEC REQUIREMENTS										
MIX INFORMATION				SOIL INFORMATION				LIMESTONE INFORMATION			CKD	CARBON INFORMATION			LIMESTONE			CKD			CARBON		
BAT NO.	DATE	BIN NO.	MIX DESIGN NO.	WET DENSITY (PCF)	WET WEIGHT (LBS)	MOIST CONT (%)	DRY WEIGHT (LBS)	WET WEIGHT (LBS)	MOIST CONT (%)	DRY WEIGHT (LBS)	WET WEIGHT (LBS)	NO. BAGS (LBS)	BAG WEIGHT (LBS)	TOTAL WEIGHT (LBS)	% LIME PER 100 LB CIND	EACH BATCH (+/- 20%)	AVER PER 10 (+/- 5%)	% CKD PER 100 LB CIND	EACH BATCH (+/- 20%)	AVER PER 10 (+/- 5%)	% CARB PER 100 LB CIND	EACH BATCH (+/- 20%)	AVER PER 10 (+/- 5%)
47	9/15/2003	2	0915	113.4	91854.00	12.6%	81575.5	5940.0	0.0%	5940.0	n/a	n/a	n/a	n/a	7.28%	-2.91%	-2.91%	n/a	n/a	n/a	n/a	n/a	n/a
48	9/15/2003	1	0915	113.4	91854.00	12.6%	81575.5	5940.0	0.0%	5940.0	n/a	n/a	n/a	n/a	7.28%	-2.91%	-2.91%	n/a	n/a	n/a	n/a	n/a	n/a
49	9/15/2003	2	0915	113.4	91854.00	12.6%	81575.5	5940.0	0.0%	5940.0	n/a	n/a	n/a	n/a	7.28%	-2.91%	-2.91%	n/a	n/a	n/a	n/a	n/a	n/a
50	9/15/2003	2	0915	113.4	91854.00	12.6%	81575.5	5940.0	0.0%	5940.0	n/a	n/a	n/a	n/a	7.28%	-2.91%	-2.91%	n/a	n/a	n/a	n/a	n/a	n/a
51	9/15/2003	1	0915	113.4	91854.00	12.6%	81575.5	5940.0	0.0%	5940.0	n/a	n/a	n/a	n/a	7.28%	-2.91%	-2.91%	n/a	n/a	n/a	n/a	n/a	n/a
52	9/15/2003	2	0915	113.4	91854.00	12.6%	81575.5	5940.0	0.0%	5940.0	n/a	n/a	n/a	n/a	7.28%	-2.91%	-2.91%	n/a	n/a	n/a	n/a	n/a	n/a
53	9/15/2003	1	0915	113.4	91854.00	12.6%	81575.5	5940.0	0.0%	5940.0	n/a	n/a	n/a	n/a	7.28%	-2.91%	-2.91%	n/a	n/a	n/a	n/a	n/a	n/a
54	9/15/2003	2	0915	113.4	91854.00	12.6%	81575.5	5940.0	0.0%	5940.0	n/a	n/a	n/a	n/a	7.28%	-2.91%	-2.91%	n/a	n/a	n/a	n/a	n/a	n/a
55	9/15/2003	1	0915	113.4	91854.00	12.6%	81575.5	5940.0	0.0%	5940.0	n/a	n/a	n/a	n/a	7.28%	-2.91%	-2.91%	n/a	n/a	n/a	n/a	n/a	n/a
56	9/15/2003	2	0915	113.4	91854.00	12.6%	81575.5	5940.0	0.0%	5940.0	n/a	n/a	n/a	n/a	7.28%	-2.91%	-2.91%	n/a	n/a	n/a	n/a	n/a	n/a
57	9/15/2003	1	0915	113.4	91854.00	12.6%	81575.5	5940.0	0.0%	5940.0	n/a	n/a	n/a	n/a	7.28%	-2.91%	-2.91%	n/a	n/a	n/a	n/a	n/a	n/a
58	9/15/2003	2	0915	113.4	91854.00	12.6%	81575.5	5940.0	0.0%	5940.0	n/a	n/a	n/a	n/a	7.28%	-2.91%	-2.91%	n/a	n/a	n/a	n/a	n/a	n/a
59	9/15/2003	1	0915	113.4	91854.00	12.6%	81575.5	5940.0	0.0%	5940.0	n/a	n/a	n/a	n/a	7.28%	-2.91%	-2.91%	n/a	n/a	n/a	n/a	n/a	n/a
1	9/17/2003	1	0917	108.2	60000.0	22.9%	48820.2	3830.0	4.6%	3661.6	n/a	3.0	1000.0	3000.0	7.50%	0.00%	n/a	n/a	n/a	n/a	5.00%	0.00%	n/a
2	9/17/2003	2	0917	108.2	60560.0	22.9%	49275.8	3430.0	4.6%	3279.2	n/a	3.0	1000.0	3000.0	6.65%	-11.27%	n/a	n/a	n/a	n/a	4.95%	-0.92%	n/a
3	9/17/2003	2	0917	108.2	60000.0	22.9%	48820.2	3830.0	4.6%	3661.6	n/a	3.0	1000.0	3000.0	7.50%	0.00%	n/a	n/a	n/a	n/a	5.00%	0.00%	n/a
4	9/17/2003	2	0917	108.2	59860.0	22.9%	48706.3	3690.0	4.6%	3527.7	n/a	3.0	1000.0	3000.0	7.24%	-3.43%	n/a	n/a	n/a	n/a	5.01%	0.23%	n/a
5	9/17/2003	2	0917	108.2	60390.0	22.9%	49137.5	3520.0	4.6%	3365.2	n/a	3.0	1000.0	3000.0	6.85%	-8.69%	n/a	n/a	n/a	n/a	4.97%	-0.65%	n/a
1	9/18/2003	2	0917	108.2	60330.0	22.9%	49088.7	3590.0	4.6%	3432.1	n/a	3.0	1000.0	3000.0	6.99%	-6.78%	n/a	n/a	n/a	n/a	4.97%	-0.55%	n/a
2	9/18/2003	2	0917	108.2	60390.0	22.9%	49137.5	3660.0	4.6%	3499.0	n/a	3.0	1000.0	3000.0	7.12%	-5.05%	n/a	n/a	n/a	n/a	4.97%	-0.65%	n/a
3	9/18/2003	2	0917	108.2	60560.0	22.9%	49275.8	3570.0	4.6%	3413.0	n/a	3.0	1000.0	3000.0	6.93%	-7.65%	n/a	n/a	n/a	n/a	4.95%	-0.92%	n/a
4	9/18/2003	2	0917	108.2	60010.0	22.9%	48828.3	3600.0	4.6%	3441.7	n/a	3.0	1000.0	3000.0	7.05%	-6.02%	n/a	n/a	n/a	n/a	5.00%	-0.02%	n/a
5	9/18/2003	2	0917	108.2	58310.0	22.9%	47445.1	3640.0	4.6%	3479.9	n/a	3.0	1000.0	3000.0	7.33%	-2.20%	-5.11%	n/a	n/a	n/a	5.14%	2.90%	-0.06%
1	9/19/2003	2	0917	115.0	60130.0	31.0%	45900.8	3730.0	4.6%	3566.0	n/a	3.0	1000.0	3000.0	7.77%	3.58%	-4.75%	n/a	n/a	n/a	4.99%	-0.22%	-0.08%
2	9/19/2003	2	0919	115.0	59730.0	31.0%	45595.4	3440.0	4.6%	3288.7	n/a	3.0	1000.0	3000.0	7.21%	-3.83%	-4.01%	n/a	n/a	n/a	5.02%	0.45%	0.06%
3	9/19/2003	2	0919	115.0	59910.0	31.0%	45732.8	3470.0	4.6%	3317.4	n/a	3.0	1000.0	3000.0	7.25%	-3.28%	-4.33%	n/a	n/a	n/a	5.01%	0.15%	0.07%
4	9/19/2003	2	0919	115.0	59780.0	31.0%	45633.6	3480.0	4.6%	3327.0	n/a	3.0	1000.0	3000.0	7.29%	-2.79%	-4.27%	n/a	n/a	n/a	5.02%	0.37%	0.09%
5	9/19/2003	2	0919	115.0	60360.0	31.0%	46076.3	3350.0	4.6%	3202.7	n/a	3.0	1000.0	3000.0	6.95%	-7.32%	-4.13%	n/a	n/a	n/a	4.97%	-0.60%	0.09%
6	9/19/2003	2	0919	115.0	60760.0	31.0%	46381.7	3370.0	4.6%	3221.8	n/a	3.0	1000.0	3000.0	6.95%	-7.38%	-4.20%	n/a	n/a	n/a	4.94%	-1.25%	0.02%
7	9/19/2003	2	0919	115.0	58970.0	31.0%	45015.3	3470.0	4.6%	3317.4	n/a	3.0	1000.0	3000.0	7.37%	-1.74%	-3.86%	n/a	n/a	n/a	5.09%	1.75%	0.26%
8	9/19/2003	2	0919	115.0	60190.0	31.0%	45946.6	3350.0	4.6%	3202.7	n/a	3.0	1000.0	3000.0	6.97%	-7.06%	-3.80%	n/a	n/a	n/a	4.98%	-0.32%	0.32%
9	9/19/2003	2	0919	115.0	59730.0	31.0%	45595.4	3380.0	4.6%	3231.4	n/a	3.0	1000.0	3000.0	7.09%	-5.51%	-3.75%	n/a	n/a	n/a	5.02%	0.45%	0.37%
10	9/19/2003	2	0919	115.0	60000.0	31.0%	45801.5	3390.0	4.6%	3240.9	n/a	3.0	1000.0	3000.0	7.08%	-5.65%	-4.10%	n/a	n/a	n/a	5.00%	0.00%	0.08%
1	9/20/2003	1	0919	115.0	60620.0	31.0%	46274.8	3500.0	4.6%	3346.1	n/a	3.0	1000.0	3000.0	7.23%	-3.59%	-4.82%	n/a	n/a	n/a	4.95%	-1.02%	0.00%
2	9/20/2003	2	0919	115.0	60410.0	31.0%	46114.5	3330.0	4.6%	3183.6	n/a	3.0	1000.0	3000.0	6.90%	-7.95%	-5.23%	n/a	n/a	n/a	4.97%	-0.68%	-0.11%
3	9/20/2003	1	0920	121.5	60090.0	25.3%	47956.9	3620.0	4.6%	3460.8	n/a	3.0	1000.0	3000.0	7.22%	-3.78%	-5.28%	n/a	n/a	n/a	4.99%	-0.15%	-0.14%
4	9/20/2003	1	0920	121.5	60020.0	25.3%	47901.0	3810.0	4.6%	3642.4	n/a	3.0	1000.0	3000.0	7.60%	1.39%	-4.86%	n/a	n/a	n/a	5.00%	-0.03%	-0.18%
5	9/20/2003	2	0920	121.5	60550.0	25.3%	48324.0	3650.0	4.6%	3489.5	n/a	3.0	1000.0	3000.0	7.22%	-3.72%	-4.50%	n/a	n/a	n/a	4.95%	-0.91%	-0.22%
6	9/20/2003	1	0920	121.5	60230.0	25.3%	48068.6	3640.0	4.6%	3479.9	n/a	3.0	1000.0	3000.0	7.24%	-3.47%	-4.11%	n/a	n/a	n/a	4.98%	-0.38%	-0.13%
7	9/20/2003	2	0920	121.5	60270.0	25.3%	48100.6	3720.0	4.6%	3556.4	n/a	3.0	1000.0	3000.0	7.39%	-1.42%	-4.08%	n/a	n/a	n/a	4.98%	-0.45%	-0.35%
8	9/20/2003	1	0920	121.5	60250.0	25.3%	48084.6	3680.0	4.6%	3518.2	n/a	3.0	1000.0	3000.0	7.32%	-2.45%	-3.61%	n/a	n/a	n/a	4.98%	-0.41%	-0.36%
9	9/20/2003	2	0920	121.5	60850.0	25.3%	48563.4	3770.0	4.6%	3604.2	n/a	3.0	1000.0	3000.0	7.42%	-1.04%	-3.17%	n/a	n/a	n/a	4.93%	-1.40%	-0.54%
10	9/20/2003	1	0920	121.5	59440.0	25.3%	47438.1	3690.0	4.6%	3527.7	n/a	3.0	1000.0	3000.0	7.44%	-0.85%	-2.69%	n/a	n/a	n/a	5.05%	0.94%	-0.45%
11	9/20/2003	2	0920	121.5	60220.0	25.3%	48060.7	3770.0	4.6%	3604.2	n/a	3.0	1000.0	3000.0	7.50%	-0.01%	-2.33%	n/a	n/a	n/a	4.98%	-0.37%	-0.38%
1	9/22/2003	1	0920	121.5	60560.0	25.3%	48332.0	3650.0	4.6%	3489.5	n/a	3.0	1000.0	3000.0	7.22%	-3.74%	-1.91%	n/a	n/a	n/a	4.95%	-0.92%	-0.41%
2	9/22/2003	2	0920	121.5	60110.0	25.3%	47972.9	3750.0	4.6%	3585.1	n/a	3.0	1000.0	3000.0	7.47%	-0.36%	-1.57%	n/a	n/a	n/a	4.99%	-0.18%	-0.41%
3	9/22/2003	1	0920	121.5	60090.0	25.3%	47956.9	3620.0	4.6%	3460.8	n/a	3.0	1000.0	3000.0	7.22%	-3.78%	-2.08%	n/a	n/a	n/a	4.99%	-0.15%	-0.42%
4	9/22/2003	2	0920	121.5	60020.0	25.3%	47901.0	3810.0	4.6%	3642.4	n/a	3.0	1000.0	3000.0	7.60%	1.39%	-1.57%	n/a	n/a	n/a	5.00%	-0.03%	-0.34%
5	9/22/2003	1	0920	121.5	60550.0	25.3%	48324.0	3650.0	4.6%	3489.5	n/a	3.0	1000.0	3000.0	7.22%	-3.72%	-1.60%	n/a	n/a	n/a	4.95%	-0.91%	-0.39%
6	9/22/2003	2	0920	121.5	60230.0	25.3%	48068.6	3640.0	4.6%	3479.9	n/a	3.0	1000.0	3000.0	7.24%	-3.47%	-1.80%	n/a	n/a	n/a	4.98%	-0.38%	-0.38%
7	9/22/2003	1	0920	121.5	60270.0	25.3%	48100.6	3720.0	4.6%	3556.4	n/a	3.0	1000.0	3000.0	7.39%	-1.42%	-1.70%	n/a	n/a	n/a	4.98%	-0.45%	-0.38%
8	9/22/2003	2	0920	121.5	60250.0	25.3%	48084.6	3680.0	4.6%	3518.2	n/a	3.0	1000.0	3000.0	7.32%	-2.45%	-1.84%	n/a	n/a	n/a	4.98%	-0.41%	-0.29%
9	9/22/2003	1	0920	121.5	60850.0	25.3%	48563.4	3770.0	4.6%	3604.2	n/a	3.0	1000.0	3000.0	7.42%	-1.04%	-1.86%	n/a	n/a	n/a	4.93%	-1.40%	-0.52%
10	9/22/2003	2	0920	121.5	59440.0	25.3%	47438.1	3690.0	4.6%	3527.7	n/a	3.0	1000.0	3000.0	7.44%	-0.85%	-1.94%	n/a	n/a	n/a	5.05%	0.94%	-0.39%
11	9/22/2003	1	0920	121.5	60220.0	25.3%	48060.7	3770.0	4.6%	3604.2	n/a	3.0	1000										

DATE: 1/7/2005

ENVIROCON, INC.  
RFS PHASE 2 REMEDIATION PROJECTQUALITY CONTROL TRACKING  
REAGENT DOSAGE

BATCH MIXING														SPEC REQUIREMENTS									
MIX INFORMATION				SOIL INFORMATION				LIMESTONE INFORMATION			CKD	CARBON INFORMATION			LIMESTONE			CKD			CARBON		
BAT NO.	DATE	BIN NO.	MIX DESIGN NO.	WET DENSITY (PCF)	WET WEIGHT (LBS)	MOIST CONT (%)	DRY WEIGHT (LBS)	WET WEIGHT (LBS)	MOIST CONT (%)	DRY WEIGHT (LBS)	WET WEIGHT (LBS)	NO. BAGS (LBS)	BAG WEIGHT (LBS)	TOTAL WEIGHT (LBS)	% LIME PER 100 LB CIND	EACH BATCH (+/- 20%)	AVER PER 10 (+/- 5%)	% CKD PER 100 LB CIND	EACH BATCH (+/- 20%)	AVER PER 10 (+/- 5%)	% CARB PER 100 LB CIND	EACH BATCH (+/- 20%)	AVER PER 10 (+/- 5%)
13	9/22/2003	1	0920	121.5	59800.0	25.3%	47725.5	3780.0	4.6%	3613.8	n/a	3.0	1000.0	3000.0	7.57%	0.96%	-0.93%	n/a	n/a	n/a	5.02%	0.33%	-0.25%
14	9/22/2003	2	0920	121.5	60100.0	25.3%	47964.9	3600.0	4.6%	3441.7	n/a	3.0	1000.0	3000.0	7.18%	-4.33%	-1.50%	n/a	n/a	n/a	4.99%	-0.17%	-0.26%
15	9/22/2003	1	0920	121.5	60450.0	25.3%	48244.2	3630.0	4.6%	3470.4	n/a	3.0	1000.0	3000.0	7.19%	-4.09%	-1.53%	n/a	n/a	n/a	4.96%	-0.74%	-0.24%
16	9/22/2003	2	0920	121.5	59270.0	25.3%	47302.5	3810.0	4.6%	3642.4	n/a	3.0	1000.0	3000.0	7.70%	2.67%	-0.92%	n/a	n/a	n/a	5.06%	1.23%	-0.08%
17	9/22/2003	2	0920	121.5	60020.0	25.3%	47901.0	3720.0	4.6%	3556.4	n/a	3.0	1000.0	3000.0	7.42%	-1.01%	-0.88%	n/a	n/a	n/a	5.00%	-0.03%	-0.04%
18	9/22/2003	1	0920	121.5	60670.0	25.3%	48419.8	3780.0	4.6%	3613.8	n/a	3.0	1000.0	3000.0	7.46%	-0.49%	-0.68%	n/a	n/a	n/a	4.94%	-1.10%	-0.11%
19	9/22/2003	2	0920	121.5	59710.0	25.3%	47653.6	3630.0	4.6%	3470.4	n/a	3.0	1000.0	3000.0	7.28%	-2.90%	-0.87%	n/a	n/a	n/a	5.02%	0.49%	0.08%
20	9/22/2003	1	0920	121.5	59770.0	25.3%	47701.5	3610.0	4.6%	3451.2	n/a	3.0	1000.0	3000.0	7.24%	-3.53%	-1.14%	n/a	n/a	n/a	5.02%	0.38%	0.02%
21	9/22/2003	2	0920	121.5	60090.0	25.3%	47956.9	3730.0	4.6%	3566.0	n/a	3.0	1000.0	3000.0	7.44%	-0.86%	-1.22%	n/a	n/a	n/a	4.99%	-0.15%	0.04%
22	9/22/2003	1	0920	121.5	59540.0	25.3%	47518.0	3720.0	4.6%	3556.4	n/a	3.0	1000.0	3000.0	7.48%	-0.21%	-1.38%	n/a	n/a	n/a	5.04%	0.77%	0.10%
23	9/22/2003	2	0920	121.5	60310.0	25.3%	48132.5	3720.0	4.6%	3556.4	n/a	3.0	1000.0	3000.0	7.39%	-1.48%	-1.62%	n/a	n/a	n/a	4.97%	-0.51%	0.02%
24	9/22/2003	1	0920	121.5	59450.0	25.3%	47446.1	3730.0	4.6%	3566.0	n/a	3.0	1000.0	3000.0	7.52%	0.21%	-1.17%	n/a	n/a	n/a	5.05%	0.93%	0.13%
25	9/22/2003	2	0920	121.5	60300.0	25.3%	48124.5	3710.0	4.6%	3546.8	n/a	3.0	1000.0	3000.0	7.37%	-1.73%	-0.93%	n/a	n/a	n/a	4.98%	-0.50%	0.15%
26	9/22/2003	1	0920	121.5	60090.0	25.3%	47956.9	3730.0	4.6%	3566.0	n/a	3.0	1000.0	3000.0	7.44%	-0.86%	-1.29%	n/a	n/a	n/a	4.99%	-0.15%	0.01%
27	9/22/2003	2	0920	121.5	59550.0	25.3%	47525.9	3800.0	4.6%	3632.9	n/a	3.0	1000.0	3000.0	7.64%	1.92%	-0.99%	n/a	n/a	n/a	5.04%	0.76%	0.09%
28	9/22/2003	2	0920	121.5	60230.0	25.3%	48068.6	3720.0	4.6%	3556.4	n/a	3.0	1000.0	3000.0	7.40%	-1.35%	-1.08%	n/a	n/a	n/a	4.98%	-0.38%	0.16%
29	9/22/2003	1	0920	121.5	59670.0	25.3%	47621.7	3740.0	4.6%	3575.5	n/a	3.0	1000.0	3000.0	7.51%	0.11%	-0.78%	n/a	n/a	n/a	5.03%	0.55%	0.17%
30	9/22/2003	1	0920	121.5	60060.0	25.3%	47933.0	3700.0	4.6%	3537.3	n/a	3.0	1000.0	3000.0	7.38%	-1.60%	-0.59%	n/a	n/a	n/a	5.00%	-0.10%	0.12%
31	9/22/2003	1	0920	121.5	59740.0	25.3%	47677.6	3740.0	4.6%	3575.5	n/a	3.0	1000.0	3000.0	7.50%	-0.01%	-0.50%	n/a	n/a	n/a	5.02%	0.44%	0.18%
1	9/23/2003	1	0920	121.5	60300.0	25.3%	48124.5	3780.0	4.6%	3613.8	n/a	3.0	1000.0	3000.0	7.51%	0.12%	-0.47%	n/a	n/a	n/a	4.98%	-0.50%	0.05%
2	9/23/2003	2	0920	121.5	60020.0	25.3%	47901.0	3640.0	4.6%	3479.9	n/a	3.0	1000.0	3000.0	7.26%	-3.14%	-0.63%	n/a	n/a	n/a	5.00%	-0.03%	0.10%
3	9/23/2003	1	0920	121.5	58970.0	22.8%	48021.2	3740.0	4.6%	3575.5	n/a	3.0	1000.0	3000.0	7.45%	-0.72%	-0.73%	n/a	n/a	n/a	5.09%	1.75%	0.18%
4	9/23/2003	2	0920	121.5	59740.0	22.8%	48648.2	3690.0	4.6%	3527.7	n/a	3.0	1000.0	3000.0	7.25%	-3.71%	-0.88%	n/a	n/a	n/a	5.02%	0.44%	0.28%
5	9/23/2003	1	0920	121.5	59790.0	22.8%	48688.9	3740.0	4.6%	3575.5	n/a	3.0	1000.0	3000.0	7.34%	-2.09%	-1.01%	n/a	n/a	n/a	5.02%	0.35%	0.33%
6	9/23/2003	2	0923	106.6	60090.0	31.6%	45661.1	3490.0	4.6%	3336.5	n/a	3.0	1000.0	3000.0	7.31%	-2.57%	-1.46%	n/a	n/a	n/a	4.99%	-0.15%	0.24%
7	9/23/2003	1	0923	106.6	60100.0	31.6%	45668.7	3590.0	4.6%	3432.1	n/a	3.0	1000.0	3000.0	7.52%	0.20%	-1.30%	n/a	n/a	n/a	4.99%	-0.17%	0.26%
8	9/23/2003	1	0923	106.6	59850.0	31.6%	45478.7	3580.0	4.6%	3422.6	n/a	3.0	1000.0	3000.0	7.53%	0.34%	-1.28%	n/a	n/a	n/a	5.01%	0.25%	0.23%
9	9/23/2003	2	0923	106.6	60480.0	31.6%	45957.4	3480.0	4.6%	3327.0	n/a	3.0	1000.0	3000.0	7.24%	-3.48%	-1.46%	n/a	n/a	n/a	4.96%	-0.79%	0.16%
10	9/23/2003	2	0923	106.6	60270.0	31.6%	45797.9	3650.0	4.6%	3489.5	n/a	3.0	1000.0	3000.0	7.62%	1.59%	-1.30%	n/a	n/a	n/a	4.98%	-0.45%	0.07%
11	9/23/2003	1	0923	106.6	59830.0	31.6%	45463.5	3610.0	4.6%	3451.2	n/a	3.0	1000.0	3000.0	7.59%	1.22%	-1.20%	n/a	n/a	n/a	5.01%	0.28%	0.15%
12	9/23/2003	2	0923	106.6	59970.0	31.6%	45569.9	3540.0	4.6%	3384.3	n/a	3.0	1000.0	3000.0	7.43%	-0.98%	-0.98%	n/a	n/a	n/a	5.00%	0.05%	0.16%
13	9/23/2003	1	0923	106.6	60310.0	31.6%	45828.3	3580.0	4.6%	3422.6	n/a	3.0	1000.0	3000.0	7.47%	-0.42%	-0.95%	n/a	n/a	n/a	4.97%	-0.51%	-0.07%
14	9/23/2003	2	0923	106.6	60010.0	31.6%	45600.3	3540.0	4.6%	3384.3	n/a	3.0	1000.0	3000.0	7.42%	-1.04%	-0.72%	n/a	n/a	n/a	5.00%	-0.02%	-0.12%
15	9/23/2003	1	0923	106.6	60580.0	31.6%	46033.4	3640.0	4.6%	3479.9	n/a	3.0	1000.0	3000.0	7.56%	0.79%	-0.43%	n/a	n/a	n/a	4.95%	-0.96%	-0.25%
16	9/23/2003	2	0923	106.6	60390.0	31.6%	45889.1	3480.0	4.6%	3327.0	n/a	3.0	1000.0	3000.0	7.25%	-3.33%	-0.51%	n/a	n/a	n/a	4.97%	-0.65%	-0.30%
17	9/23/2003	1	0923	106.6	60430.0	31.6%	45919.5	3570.0	4.6%	3413.0	n/a	3.0	1000.0	3000.0	7.43%	-0.90%	-0.62%	n/a	n/a	n/a	4.96%	-0.71%	-0.35%
18	9/23/2003	2	0923	106.6	60340.0	31.6%	45851.1	3470.0	4.6%	3317.4	n/a	3.0	1000.0	3000.0	7.24%	-3.53%	-1.01%	n/a	n/a	n/a	4.97%	-0.56%	-0.43%
19	9/23/2003	1	0923	106.6	60170.0	31.6%	45721.9	3520.0	4.6%	3365.2	n/a	3.0	1000.0	3000.0	7.36%	-1.86%	-0.85%	n/a	n/a	n/a	4.99%	-0.28%	-0.38%
20	9/23/2003	2	0923	106.6	60220.0	31.6%	45759.9	3450.0	4.6%	3298.3	n/a	3.0	1000.0	3000.0	7.21%	-3.90%	-1.40%	n/a	n/a	n/a	4.98%	-0.37%	-0.37%
21	9/23/2003	1	0923	106.6	60320.0	31.6%	45835.9	3430.0	4.6%	3279.2	n/a	3.0	1000.0	3000.0	7.15%	-4.61%	-1.98%	n/a	n/a	n/a	4.97%	-0.53%	-0.45%
22	9/23/2003	2	0923	106.6	60010.0	31.6%	45600.3	3450.0	4.6%	3298.3	n/a	3.0	1000.0	3000.0	7.23%	-3.56%	-2.24%	n/a	n/a	n/a	5.00%	-0.02%	-0.46%
23	9/23/2003	1	0923	106.6	60020.0	31.6%	45607.9	3500.0	4.6%	3346.1	n/a	3.0	1000.0	3000.0	7.34%	-2.18%	-2.41%	n/a	n/a	n/a	5.00%	-0.03%	-0.41%
1	9/24/2003	2	0923	106.6	59990.0	31.6%	45585.1	3550.0	4.6%	3393.9	n/a	3.0	1000.0	3000.0	7.45%	-0.73%	-2.38%	n/a	n/a	n/a	5.00%	0.02%	-0.41%
2	9/24/2003	1	0924	123.0	56430.0	22.8%	45952.8	3610.0	5.4%	3425.0	n/a	3.0	1000.0	3000.0	7.45%	-0.62%	-2.52%	n/a	n/a	n/a	5.32%	6.33%	0.32%
3	9/24/2003	1	0924	123.0	56550.0	22.8%	46050.5	3610.0	5.4%	3425.0	n/a	3.0	1000.0	3000.0	7.44%	-0.83%	-2.27%	n/a	n/a	n/a	5.31%	6.10%	0.99%
4	9/24/2003	2	0924	123.0	56150.0	22.8%	45724.8	3570.0	5.4%	3387.1	n/a	3.0	1000.0	3000.0	7.41%	-1.23%	-2.31%	n/a	n/a	n/a	5.34%	6.86%	1.75%
5	9/24/2003	1	0924	123.0	56990.0	22.8%	46408.8	3560.0	5.4%	3377.6	n/a	3.0	1000.0	3000.0	7.28%	-2.96%	-2.25%	n/a	n/a	n/a	5.26%	5.28%	2.34%
6	9/24/2003	2	0924	123.0	56540.0	22.8%	46042.3	3600.0	5.4%	3415.6	n/a	3.0	1000.0	3000.0	7.42%	-1.09%	-2.17%	n/a	n/a	n/a	5.31%	6.12%	2.98%
7	9/24/2003	1	0924	123.0	56500.0	22.8%	46009.8	3570.0	5.4%	3387.1	n/a	3.0	1000.0	3000.0	7.36%	-1.84%	-1.97%	n/a	n/a	n/a	5.31%	6.19%	3.63%
8	9/24/2003	2	0924	123.0	56190.0	22.8%	45757.3	3550.0	5.4%	3368.1	n/a	3.0	1000.0	3000.0	7.36%	-1.86%	-1.69%	n/a	n/a	n/a	5.34%	6.78%	4.36%
9	9/24/2003	1	0924	123.0	56390.0	22.8%	45920.2	3560.0	5.4%	3377.6	n/a	3.0	1000.0	3000.0	7.36%	-1.93%	-1.53%	n/a	n/a	n/a	5.32%	6.40%	5.00%
10	9/24/2003	2	0924	123.0	56390.0	22.8%	45920.2	3620.0	5.4%	3434.5	n/a	3.0	1000.0	3000.0	7.48%	-0.28%	-1.34%	n/a	n/a	n/a	5.32%	6.40%	5.65%
11	9/24/2003	1	0924	123.0	56650.0	22.8%	46131.9	3570.0	5.4%	3387.1	n/a	3.0	1000.0	3000.0	7.34%	-2.10%	-1.47%	n/a	n/a	n/a	5.30%	5.91%	6.24%
12	9/24/2003</																						

DATE: 1/7/2005

ENVIROCON, INC.  
RFS PHASE 2 REMEDIATION PROJECT

QUALITY CONTROL TRACKING  
REAGENT DOSAGE

BATCH MIXING														SPEC REQUIREMENTS									
MIX INFORMATION				SOIL INFORMATION				LIMESTONE INFORMATION			CKD	CARBON INFORMATION			LIMESTONE			CKD			CARBON		
BAT NO.	DATE	BIN NO.	MIX DESIGN NO.	WET DENSITY (PCF)	WET WEIGHT (LBS)	MOIST CONT (%)	DRY WEIGHT (LBS)	WET WEIGHT (LBS)	MOIST CONT (%)	DRY WEIGHT (LBS)	WET WEIGHT (LBS)	NO. BAGS (LBS)	BAG WEIGHT (LBS)	TOTAL WEIGHT (LBS)	% LIME PER 100 LB CIND	EACH BATCH (+/- 20%)	AVER PER 10 (+/- 5%)	% CKD PER 100 LB CIND	EACH BATCH (+/- 20%)	AVER PER 10 (+/- 5%)	% CARB PER 100 LB CIND	EACH BATCH (+/- 20%)	AVER PER 10 (+/- 5%)
1	9/25/2003	2	0925	121.0	56020.0	25.0%	44816.0	3530.0	5.4%	3349.1	n/a	3.0	1000.0	3000.0	7.47%	-0.36%	-1.50%	n/a	n/a	n/a	5.36%	7.10%	6.35%
2	9/25/2003	1	0925	121.0	56270.0	25.0%	45016.0	3560.0	5.4%	3377.6	n/a	3.0	1000.0	3000.0	7.50%	0.04%	-1.38%	n/a	n/a	n/a	5.33%	6.63%	6.41%
3	9/25/2003	1	0925	121.0	56260.0	25.0%	45008.0	3530.0	5.4%	3349.1	n/a	3.0	1000.0	3000.0	7.44%	-0.78%	-1.28%	n/a	n/a	n/a	5.33%	6.65%	6.45%
4	9/25/2003	2	0925	121.0	56790.0	25.0%	45432.0	3570.0	5.4%	3387.1	n/a	3.0	1000.0	3000.0	7.46%	-0.60%	-1.15%	n/a	n/a	n/a	5.28%	5.65%	6.34%
5	9/25/2003	1	0925	121.0	56440.0	25.0%	45152.0	3550.0	5.4%	3368.1	n/a	3.0	1000.0	3000.0	7.46%	-0.54%	-1.01%	n/a	n/a	n/a	5.32%	6.31%	6.33%
6	9/25/2003	2	0925	121.0	56500.0	25.0%	45200.0	3500.0	5.4%	3320.7	n/a	3.0	1000.0	3000.0	7.35%	-2.04%	-1.19%	n/a	n/a	n/a	5.31%	6.19%	6.31%
7	9/25/2003	1	0925	121.0	56500.0	25.0%	45200.0	3610.0	5.4%	3425.0	n/a	3.0	1000.0	3000.0	7.58%	1.03%	-0.87%	n/a	n/a	n/a	5.31%	6.19%	6.34%
8	9/25/2003	2	0925	121.0	56620.0	25.0%	45296.0	3640.0	5.4%	3453.5	n/a	3.0	1000.0	3000.0	7.62%	1.66%	-0.67%	n/a	n/a	n/a	5.30%	5.97%	6.28%
9	9/25/2003	1	0925	121.0	56170.0	25.0%	44936.0	3500.0	5.4%	3320.7	n/a	3.0	1000.0	3000.0	7.39%	-1.47%	-0.44%	n/a	n/a	n/a	5.34%	6.82%	6.33%
10	9/25/2003	2	0925	121.0	56480.0	25.0%	45184.0	3580.0	5.4%	3396.6	n/a	3.0	1000.0	3000.0	7.52%	0.23%	-0.28%	n/a	n/a	n/a	5.31%	6.23%	6.38%
11	9/25/2003	1	0925	121.0	56580.0	25.0%	45264.0	3470.0	5.4%	3292.2	n/a	3.0	1000.0	3000.0	7.27%	-3.02%	-0.55%	n/a	n/a	n/a	5.30%	6.04%	6.27%
12	9/25/2003	2	0925	121.0	56330.0	25.0%	45064.0	3620.0	5.4%	3434.5	n/a	3.0	1000.0	3000.0	7.62%	1.62%	-0.39%	n/a	n/a	n/a	5.33%	6.52%	6.26%
13	9/25/2003	1	0925	121.0	56270.0	25.0%	45016.0	3540.0	5.4%	3358.6	n/a	3.0	1000.0	3000.0	7.46%	-0.52%	-0.37%	n/a	n/a	n/a	5.33%	6.63%	6.26%
14	9/25/2003	2	0925	121.0	56550.0	25.0%	45240.0	3610.0	5.4%	3425.0	n/a	3.0	1000.0	3000.0	7.57%	0.94%	-0.21%	n/a	n/a	n/a	5.31%	6.10%	6.30%
15	9/25/2003	1	0925	121.0	56810.0	25.0%	45448.0	3520.0	5.4%	3339.7	n/a	3.0	1000.0	3000.0	7.35%	-2.02%	-0.36%	n/a	n/a	n/a	5.28%	5.62%	6.23%
16	9/25/2003	2	0925	121.0	56630.0	25.0%	45304.0	3590.0	5.4%	3406.1	n/a	3.0	1000.0	3000.0	7.52%	0.24%	-0.13%	n/a	n/a	n/a	5.30%	5.95%	6.21%
17	9/25/2003	1	0925	121.0	56000.0	25.0%	44800.0	3490.0	5.4%	3311.2	n/a	3.0	1000.0	3000.0	7.39%	-1.45%	-0.38%	n/a	n/a	n/a	5.36%	7.14%	6.30%
18	9/25/2003	2	0925	121.0	56310.0	25.0%	45048.0	3570.0	5.4%	3387.1	n/a	3.0	1000.0	3000.0	7.52%	0.25%	-0.52%	n/a	n/a	n/a	5.33%	6.55%	6.36%
19	9/25/2003	1	0925	121.0	56650.0	25.0%	45320.0	3520.0	5.4%	3339.7	n/a	3.0	1000.0	3000.0	7.37%	-1.75%	-0.55%	n/a	n/a	n/a	5.30%	5.91%	6.27%
20	9/25/2003	2	0925-2	121.0	56490.0	20.5%	46879.7	3700.0	5.4%	3510.4	n/a	3.0	1000.0	3000.0	7.49%	-0.16%	-0.59%	n/a	n/a	n/a	5.31%	6.21%	6.27%
21	9/25/2003	1	0925-2	121.0	56320.0	20.5%	46738.6	3640.0	5.4%	3453.5	n/a	3.0	1000.0	3000.0	7.39%	-1.48%	-0.43%	n/a	n/a	n/a	5.33%	6.53%	6.32%
22	9/25/2003	2	0925-2	121.0	56650.0	20.5%	47012.4	3690.0	5.4%	3500.9	n/a	3.0	1000.0	3000.0	7.45%	-0.71%	-0.66%	n/a	n/a	n/a	5.30%	5.91%	6.26%
23	9/25/2003	1	0925-2	121.0	56430.0	20.5%	46829.9	3740.0	5.4%	3548.4	n/a	3.0	1000.0	3000.0	7.58%	1.03%	-0.51%	n/a	n/a	n/a	5.32%	6.33%	6.23%
24	9/25/2003	1	0925-2	121.0	56170.0	20.5%	46614.1	3760.0	5.4%	3567.4	n/a	3.0	1000.0	3000.0	7.65%	2.04%	-0.40%	n/a	n/a	n/a	5.34%	6.82%	6.30%
25	9/25/2003	2	0925-2	121.0	56350.0	20.5%	46763.5	3770.0	5.4%	3576.9	n/a	3.0	1000.0	3000.0	7.65%	1.98%	0.00%	n/a	n/a	n/a	5.32%	6.48%	6.38%
26	9/25/2003	1	0925-2	121.0	56230.0	20.5%	46663.9	3680.0	5.4%	3491.5	n/a	3.0	1000.0	3000.0	7.48%	-0.24%	-0.05%	n/a	n/a	n/a	5.34%	6.70%	6.46%
27	9/25/2003	2	0925-2	121.0	56640.0	20.5%	47004.1	3680.0	5.4%	3491.5	n/a	3.0	1000.0	3000.0	7.43%	-0.96%	0.00%	n/a	n/a	n/a	5.30%	5.93%	6.34%
28	9/25/2003	1	0925-2	121.0	56150.0	20.5%	46597.5	3640.0	5.4%	3453.5	n/a	3.0	1000.0	3000.0	7.41%	-1.18%	-0.14%	n/a	n/a	n/a	5.34%	6.86%	6.37%
29	9/25/2003	2	0925-2	121.0	56590.0	20.5%	46962.7	3690.0	5.4%	3500.9	n/a	3.0	1000.0	3000.0	7.45%	-0.60%	-0.03%	n/a	n/a	n/a	5.30%	6.03%	6.38%
30	9/25/2003	1	0925-2	121.0	56430.0	20.5%	46829.9	3690.0	5.4%	3500.9	n/a	3.0	1000.0	3000.0	7.48%	-0.32%	-0.04%	n/a	n/a	n/a	5.32%	6.33%	6.39%
31	9/25/2003	2	0925-2	121.0	56290.0	20.5%	46713.7	3730.0	5.4%	3538.9	n/a	3.0	1000.0	3000.0	7.58%	1.01%	0.20%	n/a	n/a	n/a	5.33%	6.59%	6.40%
1	9/26/2003	1	0925-2	121.0	56320.0	20.5%	46738.6	3340.0	5.4%	3168.9	n/a	3.0	1000.0	3000.0	6.78%	-9.60%	-0.68%	n/a	n/a	n/a	5.33%	6.53%	6.46%
2	9/26/2003	2	0925-2	121.0	56300.0	20.5%	46722.0	3720.0	5.4%	3529.4	n/a	3.0	1000.0	3000.0	7.55%	0.72%	-0.72%	n/a	n/a	n/a	5.33%	6.57%	6.48%
3	9/26/2003	1	0926	118.6	56940.0	20.4%	47292.4	4110.0	5.4%	3899.4	n/a	3.0	1000.0	3000.0	8.25%	9.94%	0.07%	n/a	n/a	n/a	5.27%	5.37%	6.34%
4	9/26/2003	2	0926	118.6	57040.0	20.4%	47375.4	4070.0	5.4%	3861.5	n/a	3.0	1000.0	3000.0	8.15%	8.68%	0.74%	n/a	n/a	n/a	5.26%	5.19%	6.21%
5	9/26/2003	1	0926	118.6	57580.0	20.4%	47823.9	3810.0	5.4%	3614.8	n/a	3.0	1000.0	3000.0	7.56%	0.78%	0.85%	n/a	n/a	n/a	5.21%	4.20%	5.96%
6	9/26/2003	2	0926	118.6	56840.0	20.4%	47209.3	3750.0	5.4%	3557.9	n/a	3.0	1000.0	3000.0	7.54%	0.49%	0.99%	n/a	n/a	n/a	5.28%	5.56%	5.92%
7	9/26/2003	1	0926	118.6	55820.0	20.4%	46362.1	3840.0	5.4%	3643.3	n/a	3.0	1000.0	3000.0	7.86%	4.78%	1.59%	n/a	n/a	n/a	5.37%	7.49%	5.99%
8	9/26/2003	2	0926	118.6	56300.0	20.4%	46760.8	3690.0	5.4%	3500.9	n/a	3.0	1000.0	3000.0	7.49%	-0.17%	1.63%	n/a	n/a	n/a	5.33%	6.57%	6.04%
9	9/26/2003	1	0926	118.6	57520.0	20.4%	47774.1	3890.0	5.4%	3690.7	n/a	3.0	1000.0	3000.0	7.73%	3.00%	1.96%	n/a	n/a	n/a	5.22%	4.31%	5.84%
10	9/26/2003	2	0926	118.6	56190.0	20.4%	46669.4	3420.0	5.4%	3244.8	n/a	3.0	1000.0	3000.0	6.95%	-7.30%	1.13%	n/a	n/a	n/a	5.34%	6.78%	5.86%
11	9/26/2003	1	0926	118.6	56300.0	20.4%	46760.8	3720.0	5.4%	3529.4	n/a	3.0	1000.0	3000.0	7.55%	0.64%	2.15%	n/a	n/a	n/a	5.33%	6.57%	5.86%
12	9/26/2003	2	0926	118.6	57110.0	20.4%	47433.6	3730.0	5.4%	3538.9	n/a	3.0	1000.0	3000.0	7.46%	-0.52%	2.03%	n/a	n/a	n/a	5.25%	5.06%	5.71%
13	9/26/2003	1	0926	118.6	56560.0	20.4%	46976.7	3780.0	5.4%	3586.3	n/a	3.0	1000.0	3000.0	7.63%	1.79%	1.22%	n/a	n/a	n/a	5.30%	6.08%	5.78%
14	9/26/2003	1	0926	118.6	55780.0	20.4%	46328.9	3770.0	5.4%	3576.9	n/a	3.0	1000.0	3000.0	7.72%	2.94%	0.64%	n/a	n/a	n/a	5.38%	7.57%	6.02%
15	9/26/2003	2	0926	118.6	56750.0	20.4%	47134.6	3700.0	5.4%	3510.4	n/a	3.0	1000.0	3000.0	7.45%	-0.70%	0.49%	n/a	n/a	n/a	5.29%	5.73%	6.17%
16	9/26/2003	1	0926	118.6	56890.0	20.4%	47250.8	3820.0	5.4%	3624.3	n/a	3.0	1000.0	3000.0	7.67%	2.27%	0.67%	n/a	n/a	n/a	5.27%	5.47%	6.16%
17	9/26/2003	2	0926	118.6	56720.0	20.4%	47109.6	3750.0	5.4%	3557.9	n/a	3.0	1000.0	3000.0	7.55%	0.70%	0.26%	n/a	n/a	n/a	5.29%	5.78%	5.99%
18	9/26/2003	1	0926	118.6	57540.0	20.4%	47790.7	3970.0	5.4%	3766.6	n/a	3.0	1000.0	3000.0	7.88%	5.09%	0.79%	n/a	n/a	n/a	5.21%	4.28%	5.76%
19	9/26/2003	2	0926	118.6	56200.0	20.4%	46677.7	3170.0	5.4%	3007.6	n/a	3.0	1000.0	3000.0	6.44%	-14.09%	-0.92%	n/a	n/a	n/a	5.34%	6.76%	6.01%
20	9/26/2003	1	0926	118.6	56450.0	20.4%	46885.4	3710.0	5.4%	3519.9	n/a	3.0	1000.0	3000.0	7.51%	0.10%	-0.18%	n/a	n/a	n/a	5.31%	6.29%	5.96%
21	9/26/2003	2	0926	118.6	56840.0	20.4%	47209.3	3650.0	5.4%	3463.0	n/a	3.0	1000.0	3000.0	7.34%	-2.19%	-0.46%	n/a	n/a	n/a	5.28%	5.56%	5.86%
22	9/26/2003	1	0926	118.6	56210.0	20.4%	46686.0	3890.0	5.4%	3690.7	n/a	3.0	1000.0	3000.0	7.91%	5.40%	0.13%	n/a	n/a	n/a	5.34%		



DATE: 1/7/2005

ENVIROCON, INC.  
RFS PHASE 2 REMEDIATION PROJECTQUALITY CONTROL TRACKING  
REAGENT DOSAGE

BATCH MIXING															SPEC REQUIREMENTS								
MIX INFORMATION				SOIL INFORMATION				LIMESTONE INFORMATION			CKD	CARBON INFORMATION			LIMESTONE			CKD			CARBON		
BAT NO.	DATE	BIN NO.	MIX DESIGN NO.	WET DENSITY (PCF)	WET WEIGHT (LBS)	MOIST CONT (%)	DRY WEIGHT (LBS)	WET WEIGHT (LBS)	MOIST CONT (%)	DRY WEIGHT (LBS)	WET WEIGHT (LBS)	NO. BAGS (LBS)	BAG WEIGHT (LBS)	TOTAL WEIGHT (LBS)	% LIME PER 100 LB CIND	EACH BATCH (+/- 20%)	AVER PER 10 (+/- 5%)	% CKD PER 100 LB CIND	EACH BATCH (+/- 20%)	AVER PER 10 (+/- 5%)	% CARB PER 100 LB CIND	EACH BATCH (+/- 20%)	AVER PER 10 (+/- 5%)
3	9/29/2003	2	0926	118.6	56300.0	20.4%	46760.8	3660.0	5.4%	3472.5	n/a	3.0	1000.0	3000.0	7.43%	-0.99%	-1.45%	n/a	n/a	n/a	5.33%	6.57%	6.06%
4	9/29/2003	1	0926	118.6	56390.0	20.4%	46835.5	3560.0	5.4%	3377.6	n/a	3.0	1000.0	3000.0	7.21%	-3.84%	-1.91%	n/a	n/a	n/a	5.32%	6.40%	6.12%
5	9/29/2003	2	0926	118.6	56710.0	20.4%	47101.3	3600.0	5.4%	3415.6	n/a	3.0	1000.0	3000.0	7.25%	-3.31%	-2.75%	n/a	n/a	n/a	5.29%	5.80%	6.28%
6	9/29/2003	1	0926	118.6	56380.0	20.4%	46827.2	3590.0	5.4%	3406.1	n/a	3.0	1000.0	3000.0	7.27%	-3.02%	-1.64%	n/a	n/a	n/a	5.32%	6.42%	6.24%
7	9/29/2003	1	0926	118.6	56670.0	20.4%	47068.1	3570.0	5.4%	3387.1	n/a	3.0	1000.0	3000.0	7.20%	-4.05%	-2.06%	n/a	n/a	n/a	5.29%	5.88%	6.20%
8	9/29/2003	2	0926	118.6	56670.0	20.4%	47068.1	3650.0	5.4%	3463.0	n/a	3.0	1000.0	3000.0	7.36%	-1.90%	-2.03%	n/a	n/a	n/a	5.29%	5.88%	6.23%
9	9/29/2003	1	0926	118.6	56600.0	20.4%	47010.0	3520.0	5.4%	3339.7	n/a	3.0	1000.0	3000.0	7.10%	-5.28%	-3.10%	n/a	n/a	n/a	5.30%	6.01%	6.16%
10	9/29/2003	2	0926	118.6	56260.0	20.4%	46727.6	3580.0	5.4%	3396.6	n/a	3.0	1000.0	3000.0	7.27%	-3.08%	-3.32%	n/a	n/a	n/a	5.33%	6.65%	6.21%
11	9/29/2003	1	0926	118.6	56560.0	20.4%	46976.7	3600.0	5.4%	3415.6	n/a	3.0	1000.0	3000.0	7.27%	-3.06%	-3.09%	n/a	n/a	n/a	5.30%	6.08%	6.17%
12	9/29/2003	2	0926	118.6	56560.0	20.4%	46976.7	3620.0	5.4%	3434.5	n/a	3.0	1000.0	3000.0	7.31%	-2.52%	-3.10%	n/a	n/a	n/a	5.30%	6.08%	6.18%
13	9/29/2003	1	0926	118.6	56420.0	20.4%	46860.5	3530.0	5.4%	3349.1	n/a	3.0	1000.0	3000.0	7.15%	-4.71%	-3.48%	n/a	n/a	n/a	5.32%	6.35%	6.15%
14	9/29/2003	1	0926	118.6	56390.0	20.4%	46835.5	3500.0	5.4%	3320.7	n/a	3.0	1000.0	3000.0	7.09%	-5.47%	-3.64%	n/a	n/a	n/a	5.32%	6.40%	6.15%
15	9/29/2003	2	0926	118.6	56330.0	20.4%	46785.7	3610.0	5.4%	3463.0	n/a	3.0	1000.0	3000.0	7.40%	-1.31%	-3.44%	n/a	n/a	n/a	5.33%	6.52%	6.23%
16	9/29/2003	1	0926	118.6	56690.0	20.4%	47084.7	3650.0	5.4%	3425.0	n/a	3.0	1000.0	3000.0	7.27%	-3.01%	-3.44%	n/a	n/a	n/a	5.29%	5.84%	6.17%
17	9/29/2003	2	0926	118.6	56100.0	20.4%	46594.7	3530.0	5.4%	3349.1	n/a	3.0	1000.0	3000.0	7.19%	-4.16%	-3.45%	n/a	n/a	n/a	5.35%	6.95%	6.27%
18	9/29/2003	1	0926	118.6	56100.0	20.4%	46594.7	3490.0	5.4%	3311.2	n/a	3.0	1000.0	3000.0	7.11%	-5.25%	-3.78%	n/a	n/a	n/a	5.35%	6.95%	6.38%
19	9/29/2003	2	0926	118.6	56150.0	20.4%	46636.2	3620.0	5.4%	3434.5	n/a	3.0	1000.0	3000.0	7.36%	-1.81%	-3.44%	n/a	n/a	n/a	5.34%	6.86%	6.47%
20	9/29/2003	1	0926	118.6	56510.0	20.4%	46935.2	3510.0	5.4%	3330.2	n/a	3.0	1000.0	3000.0	7.10%	-5.40%	-3.67%	n/a	n/a	n/a	5.31%	6.18%	6.42%
21	9/29/2003	2	0926	118.6	56470.0	20.4%	46902.0	3630.0	5.4%	3444.0	n/a	3.0	1000.0	3000.0	7.34%	-2.09%	-3.57%	n/a	n/a	n/a	5.31%	6.25%	6.44%
22	9/29/2003	1	0929	118.3	56240.0	24.3%	45245.4	3550.0	4.1%	3410.2	n/a	3.0	1000.0	3000.0	7.54%	0.49%	-3.27%	n/a	n/a	n/a	5.33%	6.69%	6.50%
23	9/29/2003	2	0929	118.3	56330.0	24.3%	45317.8	3600.0	4.1%	3458.2	n/a	3.0	1000.0	3000.0	7.63%	1.75%	-2.62%	n/a	n/a	n/a	5.33%	6.52%	6.51%
24	9/29/2003	1	0929	118.3	56430.0	24.3%	45398.2	3460.0	4.1%	3323.7	n/a	3.0	1000.0	3000.0	7.32%	-2.38%	-2.32%	n/a	n/a	n/a	5.32%	6.33%	6.51%
25	9/29/2003	2	0929	118.3	56410.0	24.3%	45381.1	3520.0	4.1%	3381.4	n/a	3.0	1000.0	3000.0	7.45%	-0.66%	-2.25%	n/a	n/a	n/a	5.32%	6.36%	6.49%
26	9/29/2003	1	0929	118.3	56510.0	24.3%	45462.6	3440.0	4.1%	3304.5	n/a	3.0	1000.0	3000.0	7.27%	-3.08%	-2.26%	n/a	n/a	n/a	5.31%	6.18%	6.53%
27	9/29/2003	2	0929	118.3	56500.0	24.3%	45454.5	3510.0	4.1%	3371.8	n/a	3.0	1000.0	3000.0	7.42%	-1.10%	-1.95%	n/a	n/a	n/a	5.31%	6.19%	6.45%
28	9/29/2003	1	0929	118.3	56610.0	24.3%	45543.0	3630.0	4.1%	3487.0	n/a	3.0	1000.0	3000.0	7.66%	2.09%	-1.22%	n/a	n/a	n/a	5.30%	5.99%	6.35%
29	9/29/2003	2	0929	118.3	56400.0	24.3%	45374.1	3560.0	4.1%	3419.8	n/a	3.0	1000.0	3000.0	7.54%	0.49%	-0.99%	n/a	n/a	n/a	5.32%	6.38%	6.31%
30	9/29/2003	1	0929	118.3	56420.0	24.3%	45390.2	3600.0	4.1%	3458.2	n/a	3.0	1000.0	3000.0	7.62%	1.58%	-0.29%	n/a	n/a	n/a	5.32%	6.35%	6.32%
31	9/29/2003	2	0929	118.3	56490.0	24.3%	45446.5	3600.0	4.1%	3458.2	n/a	3.0	1000.0	3000.0	7.61%	1.46%	0.06%	n/a	n/a	n/a	5.31%	6.21%	6.32%
1	9/30/2003	1	0929	118.3	56860.0	24.3%	45744.2	3550.0	4.1%	3410.2	n/a	3.0	1000.0	3000.0	7.45%	-0.60%	-0.04%	n/a	n/a	n/a	5.28%	5.52%	6.20%
2	9/30/2003	1	0929	118.3	56480.0	24.3%	45438.5	3580.0	4.1%	3439.0	n/a	3.0	1000.0	3000.0	7.57%	0.91%	-0.13%	n/a	n/a	n/a	5.31%	6.23%	6.17%
3	9/30/2003	1	0929	118.3	56420.0	24.3%	45390.2	3530.0	4.1%	3391.0	n/a	3.0	1000.0	3000.0	7.47%	-0.39%	0.07%	n/a	n/a	n/a	5.32%	6.35%	6.18%
4	9/30/2003	2	0929	118.3	56360.0	24.3%	45341.9	3480.0	4.1%	3342.9	n/a	3.0	1000.0	3000.0	7.37%	-1.70%	-0.03%	n/a	n/a	n/a	5.32%	6.46%	6.19%
5	9/30/2003	1	0929	118.3	56430.0	24.3%	45398.2	3510.0	4.1%	3371.8	n/a	3.0	1000.0	3000.0	7.43%	-0.97%	0.18%	n/a	n/a	n/a	5.32%	6.33%	6.20%
6	9/30/2003	2	0929	118.3	56600.0	24.3%	45535.0	3550.0	4.1%	3410.2	n/a	3.0	1000.0	3000.0	7.49%	-0.14%	0.27%	n/a	n/a	n/a	5.30%	6.01%	6.18%
7	9/30/2003	1	0929	118.3	56100.0	24.3%	45132.7	3500.0	4.1%	3362.2	n/a	3.0	1000.0	3000.0	7.45%	-0.67%	0.00%	n/a	n/a	n/a	5.35%	6.95%	6.28%
8	9/30/2003	2	0929	118.3	56330.0	24.3%	45317.8	3540.0	4.1%	3400.6	n/a	3.0	1000.0	3000.0	7.50%	0.05%	-0.05%	n/a	n/a	n/a	5.33%	6.52%	6.29%
9	9/30/2003	1	0929	118.3	56620.0	24.3%	45551.1	3610.0	4.1%	3467.8	n/a	3.0	1000.0	3000.0	7.61%	1.51%	-0.05%	n/a	n/a	n/a	5.30%	5.97%	6.25%
10	9/30/2003	2	0929	118.3	56570.0	24.3%	45510.9	3590.0	4.1%	3448.6	n/a	3.0	1000.0	3000.0	7.58%	1.03%	-0.10%	n/a	n/a	n/a	5.30%	6.06%	6.24%
11	9/30/2003	1	0929	118.3	56410.0	24.3%	45381.1	3630.0	4.1%	3487.0	n/a	3.0	1000.0	3000.0	7.68%	2.45%	0.21%	n/a	n/a	n/a	5.32%	6.36%	6.32%
12	9/30/2003	2	0929	118.3	56510.0	24.3%	45462.6	3610.0	4.1%	3467.8	n/a	3.0	1000.0	3000.0	7.63%	1.70%	0.29%	n/a	n/a	n/a	5.31%	6.18%	6.32%
13	9/30/2003	1	0929	118.3	56190.0	24.3%	45205.1	3560.0	4.1%	3419.8	n/a	3.0	1000.0	3000.0	7.57%	0.87%	0.41%	n/a	n/a	n/a	5.34%	6.78%	6.36%
14	9/30/2003	2	0929	118.3	56620.0	24.3%	45551.1	3570.0	4.1%	3429.4	n/a	3.0	1000.0	3000.0	7.53%	0.38%	0.62%	n/a	n/a	n/a	5.30%	5.97%	6.31%
15	9/30/2003	1	0929	118.3	56390.0	24.3%	45366.0	3460.0	4.1%	3323.7	n/a	3.0	1000.0	3000.0	7.33%	-2.31%	0.49%	n/a	n/a	n/a	5.32%	6.40%	6.32%
1	10/1/2003	1	1001	119.0	66120.0	27.0%	52063.0	4060.0	4.8%	3874.0	n/a	n/a	n/a	n/a	7.44%	-0.79%	0.42%	n/a	n/a	n/a	n/a	n/a	n/a
2	10/1/2003	1	1001	119.0	65850.0	27.0%	51850.4	4070.0	4.8%	3883.6	n/a	n/a	n/a	n/a	7.49%	-0.13%	0.48%	n/a	n/a	n/a	n/a	n/a	n/a
3	10/1/2003	1	1001	119.0	66150.0	27.0%	52086.6	4040.0	4.8%	3855.0	n/a	n/a	n/a	n/a	7.40%	-1.32%	0.34%	n/a	n/a	n/a	n/a	n/a	n/a
4	10/1/2003	1	1001	119.0	65790.0	27.0%	51803.1	4080.0	4.8%	3893.1	n/a	n/a	n/a	n/a	7.52%	0.20%	0.21%	n/a	n/a	n/a	n/a	n/a	n/a
5	10/1/2003	1	1001	119.0	66300.0	27.0%	52204.7	3990.0	4.8%	3807.3	n/a	n/a	n/a	n/a	7.29%	-2.76%	-0.17%	n/a	n/a	n/a	n/a	n/a	n/a
6	10/1/2003	1	1001	119.0	65910.0	27.0%	51897.6	4100.0	4.8%	3912.2	n/a	n/a	n/a	n/a	7.54%	0.51%	-0.36%	n/a	n/a	n/a	n/a	n/a	n/a
7	10/1/2003	1	1001	119.0	65820.0	27.0%	51826.8	4130.0	4.8%	3940.8	n/a	n/a	n/a	n/a	7.60%	1.38%	-0.40%	n/a	n/a	n/a	n/a	n/a	n/a
8	10/1/2003	1	1001	119.0	65900.0	27.0%	51889.8	4030.0	4.8%	3845.4	n/a	n/a	n/a	n/a	7.41%	-1.19%	-0.60%	n/a	n/a	n/a	n/a	n/a	n/a
9	10/1/2003	1	1001	119.0	65960.0	27.0%	51937.0	3990.0	4.8%	3807.3	n/a	n/a	n/a	n/a	7.33%	-2.26%	-0.87%	n/a	n/a	n/a	n/a	n/a	n/a
10	10/1/2003	1	1001	119.0	65420.0	27.0%	51511.8	4010.0	4.8%	3826.3	n/a	n/a	n/a	n/a	7.43%	-0.96%	-0.73%	n/a	n/a	n/a	n/a	n/a	n/a
11	10/1/																						

DATE: 1/7/2005

ENVIROCON, INC.  
RFS PHASE 2 REMEDIATION PROJECT

QUALITY CONTROL TRACKING  
REAGENT DOSAGE

BATCH MIXING													SPEC REQUIREMENTS											
MIX INFORMATION				SOIL INFORMATION				LIMESTONE INFORMATION			CKD	CARBON INFORMATION			LIMESTONE			CKD			CARBON			
BAT NO.	DATE	BIN NO.	MIX DESIGN NO.	WET DENSITY (PCF)	WET WEIGHT (LBS)	MOIST CONT (%)	DRY WEIGHT (LBS)	WET WEIGHT (LBS)	MOIST CONT (%)	DRY WEIGHT (LBS)	WET WEIGHT (LBS)	NO. BAGS (LBS)	BAG WEIGHT (LBS)	TOTAL WEIGHT (LBS)	% LIME PER 100 LB CIND	EACH BATCH (+/- 20%)	AVER PER 10 (+/- 5%)	% CKD PER 100 LB CIND	EACH BATCH (+/- 20%)	AVER PER 10 (+/- 5%)	% CARB PER 100 LB CIND	EACH BATCH (+/- 20%)	AVER PER 10 (+/- 5%)	
13	10/1/2003	1	1001	119.0	65940.0	27.0%	51921.3	4020.0	4.8%	3835.9	n/a	n/a	n/a	n/a	7.39%	-1.49%	-0.93%	n/a	n/a	n/a	n/a	n/a	n/a	
14	10/1/2003	1	1001	119.0	66050.0	27.0%	52007.9	4100.0	4.8%	3912.2	n/a	n/a	n/a	n/a	7.52%	0.30%	-0.92%	n/a	n/a	n/a	n/a	n/a	n/a	
15	10/1/2003	1	1001	119.0	65880.0	27.0%	51874.0	3990.0	4.8%	3807.3	n/a	n/a	n/a	n/a	7.34%	-2.14%	-0.86%	n/a	n/a	n/a	n/a	n/a	n/a	
16	10/1/2003	1	1001	119.0	65960.0	27.0%	51937.0	4100.0	4.8%	3912.2	n/a	n/a	n/a	n/a	7.53%	0.43%	-0.87%	n/a	n/a	n/a	n/a	n/a	n/a	
17	10/1/2003	1	1001	119.0	66090.0	27.0%	52039.4	4040.0	4.8%	3855.0	n/a	n/a	n/a	n/a	7.41%	-1.23%	-1.13%	n/a	n/a	n/a	n/a	n/a	n/a	
18	10/1/2003	1	1001	119.0	65980.0	27.0%	51952.8	4080.0	4.8%	3893.1	n/a	n/a	n/a	n/a	7.49%	-0.09%	-1.02%	n/a	n/a	n/a	n/a	n/a	n/a	
19	10/1/2003	1	1001	119.0	65990.0	27.0%	51960.6	4120.0	4.8%	3931.3	n/a	n/a	n/a	n/a	7.57%	0.88%	-0.70%	n/a	n/a	n/a	n/a	n/a	n/a	
20	10/1/2003	1	1001	119.0	65810.0	27.0%	51818.9	4120.0	4.8%	3931.3	n/a	n/a	n/a	n/a	7.59%	1.15%	-0.49%	n/a	n/a	n/a	n/a	n/a	n/a	
21	10/1/2003	1	1001	119.0	66240.0	27.0%	52157.5	4010.0	4.8%	3826.3	n/a	n/a	n/a	n/a	7.34%	-2.19%	-0.70%	n/a	n/a	n/a	n/a	n/a	n/a	
22	10/1/2003	1	1001	119.0	65810.0	27.0%	51818.9	4090.0	4.8%	3902.7	n/a	n/a	n/a	n/a	7.53%	0.42%	-0.40%	n/a	n/a	n/a	n/a	n/a	n/a	
23	10/1/2003	1	1001	119.0	66200.0	27.0%	52126.0	4030.0	4.8%	3845.4	n/a	n/a	n/a	n/a	7.38%	-1.64%	-0.41%	n/a	n/a	n/a	n/a	n/a	n/a	
24	10/1/2003	1	1001	119.0	66070.0	27.0%	52023.6	4030.0	4.8%	3845.4	n/a	n/a	n/a	n/a	7.39%	-1.44%	-0.58%	n/a	n/a	n/a	n/a	n/a	n/a	
25	10/1/2003	1	1001	119.0	65780.0	27.0%	51795.3	4130.0	4.8%	3940.8	n/a	n/a	n/a	n/a	7.61%	1.45%	-0.22%	n/a	n/a	n/a	n/a	n/a	n/a	
26	10/1/2003	1	1001	119.0	65780.0	27.0%	51795.3	3990.0	4.8%	3807.3	n/a	n/a	n/a	n/a	7.35%	-1.99%	-0.47%	n/a	n/a	n/a	n/a	n/a	n/a	
27	10/1/2003	1	1001	119.0	66310.0	27.0%	52212.6	4120.0	4.8%	3931.3	n/a	n/a	n/a	n/a	7.53%	0.39%	-0.31%	n/a	n/a	n/a	n/a	n/a	n/a	
28	10/1/2003	1	1001	119.0	66150.0	27.0%	52086.6	4040.0	4.8%	3855.0	n/a	n/a	n/a	n/a	7.40%	-1.32%	-0.43%	n/a	n/a	n/a	n/a	n/a	n/a	
1	10/2/2003	1	1002	107.1	66200.0	17.1%	56532.9	4340.0	4.8%	4141.2	n/a	n/a	n/a	n/a	7.33%	-2.33%	-0.75%	n/a	n/a	n/a	n/a	n/a	n/a	
2	10/2/2003	2	1002	107.1	66020.0	17.1%	56379.2	4390.0	4.8%	4188.9	n/a	n/a	n/a	n/a	7.43%	-0.93%	-0.96%	n/a	n/a	n/a	n/a	n/a	n/a	
3	10/2/2003	1	1002	107.1	66100.0	17.1%	56447.5	4470.0	4.8%	4265.3	n/a	n/a	n/a	n/a	7.56%	0.75%	-0.67%	n/a	n/a	n/a	n/a	n/a	n/a	
4	10/2/2003	2	1002	107.1	66040.0	17.1%	56396.2	4350.0	4.8%	4150.8	n/a	n/a	n/a	n/a	7.36%	-1.87%	-0.89%	n/a	n/a	n/a	n/a	n/a	n/a	
5	10/2/2003	1	1002	107.1	66080.0	17.1%	56430.4	4500.0	4.8%	4293.9	n/a	n/a	n/a	n/a	7.61%	1.46%	-0.58%	n/a	n/a	n/a	n/a	n/a	n/a	
6	10/2/2003	2	1002	107.1	65740.0	17.1%	56140.1	4360.0	4.8%	4160.3	n/a	n/a	n/a	n/a	7.41%	-1.19%	-0.56%	n/a	n/a	n/a	n/a	n/a	n/a	
7	10/2/2003	1	1002	107.1	65890.0	17.1%	56268.1	4450.0	4.8%	4246.2	n/a	n/a	n/a	n/a	7.55%	0.62%	-0.64%	n/a	n/a	n/a	n/a	n/a	n/a	
8	10/2/2003	2	1002	107.1	66030.0	17.1%	56387.7	4460.0	4.8%	4255.7	n/a	n/a	n/a	n/a	7.55%	0.63%	-0.38%	n/a	n/a	n/a	n/a	n/a	n/a	
9	10/2/2003	1	1002	107.1	65890.0	17.1%	56268.1	4480.0	4.8%	4274.8	n/a	n/a	n/a	n/a	7.60%	1.30%	-0.29%	n/a	n/a	n/a	n/a	n/a	n/a	
10	10/2/2003	2	1002	107.1	66220.0	17.1%	56550.0	4490.0	4.8%	4284.4	n/a	n/a	n/a	n/a	7.58%	1.02%	-0.06%	n/a	n/a	n/a	n/a	n/a	n/a	
11	10/2/2003	1	1002	107.1	65770.0	17.1%	56165.7	4400.0	4.8%	4198.5	n/a	n/a	n/a	n/a	7.48%	-0.33%	0.14%	n/a	n/a	n/a	n/a	n/a	n/a	
12	10/2/2003	2	1002	107.1	66200.0	17.1%	56532.9	4410.0	4.8%	4208.0	n/a	n/a	n/a	n/a	7.44%	-0.75%	0.16%	n/a	n/a	n/a	n/a	n/a	n/a	
13	10/2/2003	1	1002	107.1	65840.0	17.1%	56225.4	4450.0	4.8%	4246.2	n/a	n/a	n/a	n/a	7.55%	0.69%	0.16%	n/a	n/a	n/a	n/a	n/a	n/a	
14	10/2/2003	2	1002-1	107.1	71110.0	17.1%	60725.9	4830.0	4.8%	4608.8	n/a	n/a	n/a	n/a	7.59%	1.19%	0.46%	n/a	n/a	n/a	n/a	n/a	n/a	
1	10/2/2003	2	1002-2	107.1	56020.0	17.1%	47839.5	3780.0	4.8%	3606.9	n/a	3.0	1000.0	3000.0	7.54%	0.53%	0.37%	n/a	n/a	n/a	n/a	5.36%	7.10%	n/a
2	10/2/2003	1	1002-2	107.1	56150.0	17.1%	47950.5	3810.0	4.8%	3635.5	n/a	3.0	1000.0	3000.0	7.58%	1.09%	0.60%	n/a	n/a	n/a	n/a	5.34%	6.86%	n/a
3	10/2/2003	1	1002-2	107.1	56320.0	17.1%	48095.6	3810.0	4.8%	3635.5	n/a	3.0	1000.0	3000.0	7.56%	0.79%	0.61%	n/a	n/a	n/a	n/a	5.33%	6.53%	n/a
4	10/2/2003	1	1002-2	107.1	56300.0	17.1%	48078.6	3770.0	4.8%	3597.3	n/a	3.0	1000.0	3000.0	7.48%	-0.24%	0.53%	n/a	n/a	n/a	n/a	5.33%	6.57%	n/a
5	10/2/2003	1	1002-2	107.1	56240.0	17.1%	48027.3	3770.0	4.8%	3597.3	n/a	3.0	1000.0	3000.0	7.49%	-0.13%	0.39%	n/a	n/a	n/a	n/a	5.33%	6.69%	n/a
6	10/2/2003	1	1002-2	107.1	56510.0	17.1%	48257.9	3830.0	4.8%	3654.6	n/a	3.0	1000.0	3000.0	7.57%	0.97%	0.38%	n/a	n/a	n/a	n/a	5.31%	6.18%	n/a
7	10/2/2003	2	1002-2	107.1	56170.0	17.1%	47967.5	3800.0	4.8%	3626.0	n/a	3.0	1000.0	3000.0	7.56%	0.79%	0.49%	n/a	n/a	n/a	n/a	5.34%	6.82%	n/a
8	10/2/2003	1	1002-2	107.1	56000.0	17.1%	47822.4	3850.0	4.8%	3673.7	n/a	3.0	1000.0	3000.0	7.68%	2.43%	0.81%	n/a	n/a	n/a	n/a	5.36%	7.14%	n/a
9	10/2/2003	2	1002-2	107.1	55950.0	17.1%	47779.7	3860.0	4.8%	3511.5	n/a	3.0	1000.0	3000.0	7.35%	-2.01%	0.54%	n/a	n/a	n/a	n/a	5.36%	7.24%	n/a
10	10/2/2003	1	1002-2	107.1	55980.0	17.1%	47805.3	3740.0	4.8%	3568.7	n/a	3.0	1000.0	3000.0	7.47%	-0.47%	0.37%	n/a	n/a	n/a	n/a	5.36%	7.18%	6.83%
11	10/2/2003	2	1002-2	107.1	56000.0	17.1%	47822.4	3750.0	4.8%	3578.2	n/a	3.0	1000.0	3000.0	7.48%	-0.24%	0.30%	n/a	n/a	n/a	n/a	5.36%	7.14%	6.83%
12	10/2/2003	1	1002-2	107.1	56220.0	17.1%	48010.2	3850.0	4.8%	3673.7	n/a	3.0	1000.0	3000.0	7.65%	2.02%	0.39%	n/a	n/a	n/a	n/a	5.34%	6.72%	6.82%
13	10/2/2003	1	1002-2	107.1	56240.0	17.1%	48027.3	3810.0	4.8%	3635.5	n/a	3.0	1000.0	3000.0	7.57%	0.93%	0.41%	n/a	n/a	n/a	n/a	5.33%	6.69%	6.84%
14	10/2/2003	2	1002-2	107.1	56420.0	17.1%	48181.0	3770.0	4.8%	3597.3	n/a	3.0	1000.0	3000.0	7.47%	-0.45%	0.38%	n/a	n/a	n/a	n/a	5.32%	6.35%	6.81%
15	10/2/2003	1	1002-2	107.1	56250.0	17.1%	48035.9	3750.0	4.8%	3578.2	n/a	3.0	1000.0	3000.0	7.45%	-0.68%	0.33%	n/a	n/a	n/a	n/a	5.33%	6.67%	6.81%
16	10/2/2003	2	1002-2	107.1	56280.0	17.1%	48061.5	3820.0	4.8%	3645.0	n/a	3.0	1000.0	3000.0	7.58%	1.12%	0.34%	n/a	n/a	n/a	n/a	5.33%	6.61%	6.86%
17	10/2/2003	1	1002-2	107.1	56300.0	17.1%	48078.6	3770.0	4.8%	3597.3	n/a	3.0	1000.0	3000.0	7.48%	-0.24%	0.24%	n/a	n/a	n/a	n/a	5.33%	6.57%	6.83%
18	10/2/2003	2	1002-2	107.1	56200.0	17.1%	47993.2	3790.0	4.8%	3616.4	n/a	3.0	1000.0	3000.0	7.54%	0.47%	0.05%	n/a	n/a	n/a	n/a	5.34%	6.76%	6.79%
1	10/3/2003	1	1002-2	107.1	56260.0	17.1%	48044.4	3750.0	4.8%	3578.2	n/a	3.0	1000.0	3000.0	7.45%	-0.70%	0.18%	n/a	n/a	n/a	n/a	5.33%	6.65%	6.73%
2	10/3/2003	2	1002-2	107.1	56340.0	17.1%	48112.7	3690.0	4.8%	3521.0	n/a	3.0	1000.0	3000.0	7.32%	-2.42%	-0.02%	n/a	n/a	n/a	n/a	5.32%	6.50%	6.67%
3	10/3/2003	1	1002-2	107.1	56170.0	17.1%	47967.5	3790.0	4.8%	3616.4	n/a	3.0	1000.0	3000.0	7.54%	0.52%	0.06%	n/a	n/a	n/a	n/a	5.34%	6.82%	6.63%
4	10/3/2003	2	1002-2	107.1	56270.0	17.1%	48052.9	3780.0	4.8%	3606.9	n/a	3.0	1000.0	3000.0	7.51%	0.08%	-0.14%	n/a	n/a	n/a	n/a	5.33%	6.63%	6.82%
5	10/3/2003	1	1002-2	107.1	56190.0	17.1%	47984.6	3840.0	4.8%	3664.1	n/a	3.0	1000.0	3000.0	7.64%	1.81%	-0.05%	n/a	n/a	n/a	n/a	5.34%	6.78%	6.63%
6	10/3/2003	2	1002-2	107.1	56370.0	17.1%	48138.3	3850.0	4.8%	3673.7	n/a	3.0	1000.0	3000.0	7.63%	1.75%	0.17%	n/a	n/a	n/a	n/a	5.32%	6.44%	6.64%
7	10/3/2003	1	1002-2	107.1	56310.0	17.1%	48087.1	3750.0	4.8%	3578.2	n/a	3.0	1000.0	3000.0	7.44%	-0.78%	0.16%	n/a	n/a	n/a	n/a	5.33%	6.55%	6.63%
8	10/3/200																							



DATE: 1/7/2005

ENVIROCON, INC.  
RFS PHASE 2 REMEDIATION PROJECTQUALITY CONTROL TRACKING  
REAGENT DOSAGE

BATCH MIXING														SPEC REQUIREMENTS									
MIX INFORMATION				SOIL INFORMATION				LIMESTONE INFORMATION			CKD	CARBON INFORMATION			LIMESTONE			CKD			CARBON		
BAT NO.	DATE	BIN NO.	MIX DESIGN NO.	WET DENSITY (PCF)	WET WEIGHT (LBS)	MOIST CONT (%)	DRY WEIGHT (LBS)	WET WEIGHT (LBS)	MOIST CONT (%)	DRY WEIGHT (LBS)	WET WEIGHT (LBS)	NO. BAGS (LBS)	BAG WEIGHT (LBS)	TOTAL WEIGHT (LBS)	% LIME PER 100 LB CIND	EACH BATCH (+/- 20%)	AVER PER 10 (+/- 5%)	% CKD PER 100 LB CIND	EACH BATCH (+/- 20%)	AVER PER 10 (+/- 5%)	% CARB PER 100 LB CIND	EACH BATCH (+/- 20%)	AVER PER 10 (+/- 5%)
7	10/6/2003	1	VEG	n/a	50160.0	0.0%	50160.0	3770.0	0.0%	3770.0	n/a	n/a	n/a	n/a	7.52%	0.21%	-0.05%	n/a	n/a	n/a	n/a	n/a	n/a
8	10/6/2003	2	VEG	n/a	49650.0	0.0%	49650.0	3810.0	0.0%	3810.0	n/a	n/a	n/a	n/a	7.67%	2.32%	0.49%	n/a	n/a	n/a	n/a	n/a	n/a
9	10/6/2003	1	VEG	n/a	49960.0	0.0%	49960.0	3790.0	0.0%	3790.0	n/a	n/a	n/a	n/a	7.59%	1.15%	0.80%	n/a	n/a	n/a	n/a	n/a	n/a
10	10/6/2003	2	VEG	n/a	50020.0	0.0%	50020.0	3790.0	0.0%	3790.0	n/a	n/a	n/a	n/a	7.58%	1.03%	0.75%	n/a	n/a	n/a	n/a	n/a	n/a
11	10/6/2003	1	VEG	n/a	50400.0	0.0%	50400.0	3750.0	0.0%	3750.0	n/a	n/a	n/a	n/a	7.44%	-0.79%	0.63%	n/a	n/a	n/a	n/a	n/a	n/a
12	10/6/2003	2	VEG	n/a	50060.0	0.0%	50060.0	3750.0	0.0%	3750.0	n/a	n/a	n/a	n/a	7.49%	-0.12%	0.50%	n/a	n/a	n/a	n/a	n/a	n/a
13	10/6/2003	1	VEG	n/a	50900.0	0.0%	50900.0	3840.0	0.0%	3840.0	n/a	n/a	n/a	n/a	7.54%	0.59%	0.79%	n/a	n/a	n/a	n/a	n/a	n/a
1	10/6/2003	1	1006	100.0	59810.0	66.9%	35835.8	2890.0	5.2%	2747.1	n/a	3.0	1000.0	3000.0	7.67%	2.21%	n/a	n/a	n/a	n/a	5.02%	0.32%	n/a
2	10/6/2003	2	1006	100.0	59760.0	66.9%	35805.9	2810.0	5.2%	2671.1	n/a	3.0	1000.0	3000.0	7.46%	-0.53%	n/a	n/a	n/a	n/a	5.02%	0.40%	n/a
3	10/6/2003	1	1006	100.0	59910.0	66.9%	35895.7	2820.0	5.2%	2680.6	n/a	3.0	1000.0	3000.0	7.47%	-0.43%	n/a	n/a	n/a	n/a	5.01%	0.15%	n/a
4	10/6/2003	2	1006	100.0	59720.0	66.9%	35781.9	2870.0	5.2%	2728.1	n/a	3.0	1000.0	3000.0	7.62%	1.66%	n/a	n/a	n/a	n/a	5.02%	0.47%	n/a
5	10/6/2003	1	1006	100.0	60110.0	66.9%	36015.6	2840.0	5.2%	2699.6	n/a	3.0	1000.0	3000.0	7.50%	-0.06%	n/a	n/a	n/a	n/a	4.99%	-0.18%	n/a
6	10/6/2003	2	1006	100.0	59860.0	66.9%	35865.8	2860.0	5.2%	2718.6	n/a	3.0	1000.0	3000.0	7.58%	1.07%	n/a	n/a	n/a	n/a	5.01%	0.23%	n/a
7	10/6/2003	1	1006	100.0	59830.0	66.9%	35847.8	2820.0	5.2%	2680.6	n/a	3.0	1000.0	3000.0	7.48%	-0.30%	n/a	n/a	n/a	n/a	5.01%	0.28%	n/a
8	10/6/2003	2	1006	100.0	60250.0	66.9%	36099.5	2810.0	5.2%	2671.1	n/a	3.0	1000.0	3000.0	7.40%	-1.34%	n/a	n/a	n/a	n/a	4.98%	-0.41%	n/a
9	10/6/2003	1	1006	100.0	60370.0	66.9%	36171.4	2870.0	5.2%	2728.1	n/a	3.0	1000.0	3000.0	7.54%	0.56%	n/a	n/a	n/a	n/a	4.97%	-0.61%	n/a
10	10/6/2003	2	1006	100.0	59800.0	66.9%	35829.8	2900.0	5.2%	2756.7	n/a	3.0	1000.0	3000.0	7.69%	2.58%	0.54%	n/a	n/a	n/a	5.02%	0.33%	0.10%
11	10/6/2003	1	1006	100.0	59600.0	66.9%	35710.0	2820.0	5.2%	2680.6	n/a	3.0	1000.0	3000.0	7.51%	0.09%	0.33%	n/a	n/a	n/a	5.03%	0.67%	0.13%
12	10/6/2003	2	1006	100.0	59680.0	66.9%	35757.9	2740.0	5.2%	2604.6	n/a	3.0	1000.0	3000.0	7.28%	-2.88%	0.10%	n/a	n/a	n/a	5.03%	0.54%	0.15%
13	10/6/2003	1	1006	100.0	60030.0	66.9%	35967.6	2840.0	5.2%	2699.6	n/a	3.0	1000.0	3000.0	7.51%	0.08%	0.15%	n/a	n/a	n/a	5.00%	-0.05%	0.13%
14	10/6/2003	2	1006	100.0	59970.0	66.9%	35931.7	2880.0	5.2%	2737.6	n/a	3.0	1000.0	3000.0	7.62%	1.59%	0.14%	n/a	n/a	n/a	5.00%	0.05%	0.08%
15	10/6/2003	1	1006	100.0	59800.0	66.9%	35829.8	2830.0	5.2%	2690.1	n/a	3.0	1000.0	3000.0	7.51%	0.11%	0.16%	n/a	n/a	n/a	5.02%	0.33%	0.14%
16	10/6/2003	2	1006	100.0	59970.0	66.9%	35931.7	2870.0	5.2%	2728.1	n/a	3.0	1000.0	3000.0	7.59%	1.23%	0.17%	n/a	n/a	n/a	5.00%	0.05%	0.12%
17	10/6/2003	1	1006	100.0	59730.0	66.9%	35787.9	2760.0	5.2%	2623.6	n/a	3.0	1000.0	3000.0	7.33%	-2.25%	-0.02%	n/a	n/a	n/a	5.02%	0.45%	0.14%
18	10/6/2003	2	1006	100.0	60070.0	66.9%	35991.6	2880.0	5.2%	2737.6	n/a	3.0	1000.0	3000.0	7.61%	1.42%	0.25%	n/a	n/a	n/a	4.99%	-0.12%	0.16%
19	10/6/2003	1	1006	100.0	59870.0	66.9%	35871.8	2760.0	5.2%	2623.6	n/a	3.0	1000.0	3000.0	7.31%	-2.48%	-0.05%	n/a	n/a	n/a	5.01%	0.22%	0.25%
20	10/6/2003	2	1006	100.0	60010.0	66.9%	35955.7	2820.0	5.2%	2680.6	n/a	3.0	1000.0	3000.0	7.46%	-0.60%	-0.37%	n/a	n/a	n/a	5.00%	-0.02%	0.21%
21	10/6/2003	1	1006	100.0	59940.0	66.9%	35913.7	2770.0	5.2%	2633.1	n/a	3.0	1000.0	3000.0	7.33%	-2.24%	-0.60%	n/a	n/a	n/a	5.01%	0.10%	0.16%
22	10/6/2003	2	1006	100.0	60170.0	66.9%	36051.5	2790.0	5.2%	2652.1	n/a	3.0	1000.0	3000.0	7.36%	-1.91%	-0.51%	n/a	n/a	n/a	4.99%	-0.28%	0.07%
23	10/6/2003	1	1006	100.0	59810.0	66.9%	35835.8	2860.0	5.2%	2718.6	n/a	3.0	1000.0	3000.0	7.59%	1.15%	-0.40%	n/a	n/a	n/a	5.02%	0.32%	0.11%
24	10/6/2003	2	1006	100.0	60170.0	66.9%	36051.5	2820.0	5.2%	2680.6	n/a	3.0	1000.0	3000.0	7.44%	-0.86%	-0.64%	n/a	n/a	n/a	4.99%	-0.28%	0.08%
25	10/6/2003	1	1006	100.0	60160.0	66.9%	36045.5	2740.0	5.2%	2604.6	n/a	3.0	1000.0	3000.0	7.23%	-3.66%	-1.02%	n/a	n/a	n/a	4.99%	-0.27%	0.02%
26	10/6/2003	2	1006	100.0	60110.0	66.9%	36015.6	2850.0	5.2%	2709.1	n/a	3.0	1000.0	3000.0	7.52%	0.29%	-1.11%	n/a	n/a	n/a	4.99%	-0.18%	-0.01%
27	10/6/2003	1	1006	100.0	59880.0	66.9%	35877.8	2880.0	5.2%	2737.6	n/a	3.0	1000.0	3000.0	7.63%	1.74%	-0.72%	n/a	n/a	n/a	5.01%	0.20%	-0.03%
1	10/7/2003	2	1007	100.0	63070.0	61.7%	39004.3	3030.0	4.4%	2902.3	n/a	3.0	1000.0	3000.0	7.44%	-0.79%	-0.94%	n/a	n/a	n/a	4.76%	-4.87%	-0.51%
2	10/7/2003	1	1007	100.0	62960.0	61.7%	38936.3	3060.0	4.4%	2931.0	n/a	3.0	1000.0	3000.0	7.53%	0.37%	-0.65%	n/a	n/a	n/a	4.76%	-4.70%	-1.00%
3	10/7/2003	2	1007	100.0	63370.0	61.7%	39189.9	3050.0	4.4%	2921.5	n/a	3.0	1000.0	3000.0	7.45%	-0.61%	-0.65%	n/a	n/a	n/a	4.73%	-5.32%	-1.53%
4	10/7/2003	2	1007	100.0	63330.0	61.7%	39165.1	2990.0	4.4%	2864.0	n/a	3.0	1000.0	3000.0	7.31%	-2.50%	-0.68%	n/a	n/a	n/a	4.74%	-5.26%	-2.06%
5	10/7/2003	1	1007	100.0	63170.0	61.7%	39066.2	3060.0	4.4%	2931.0	n/a	3.0	1000.0	3000.0	7.50%	0.04%	-0.48%	n/a	n/a	n/a	4.75%	-5.02%	-2.54%
6	10/7/2003	2	1007	100.0	63110.0	61.7%	39029.1	3060.0	4.4%	2931.0	n/a	3.0	1000.0	3000.0	7.51%	0.13%	-0.58%	n/a	n/a	n/a	4.75%	-4.93%	-3.06%
7	10/7/2003	2	1007	100.0	63290.0	61.7%	39140.4	3070.0	4.4%	2940.6	n/a	3.0	1000.0	3000.0	7.51%	0.17%	-0.48%	n/a	n/a	n/a	4.74%	-5.20%	-3.55%
8	10/7/2003	1	1007	100.0	63040.0	61.7%	38985.8	3100.0	4.4%	2969.3	n/a	3.0	1000.0	3000.0	7.62%	1.55%	0.04%	n/a	n/a	n/a	4.76%	-4.82%	-4.01%
9	10/7/2003	2	1007	100.0	62920.0	61.7%	38911.6	3000.0	4.4%	2873.6	n/a	3.0	1000.0	3000.0	7.38%	-1.54%	-0.14%	n/a	n/a	n/a	4.77%	-4.64%	-4.46%
10	10/7/2003	1	1007	100.0	63360.0	61.7%	39183.7	3070.0	4.4%	2940.6	n/a	3.0	1000.0	3000.0	7.50%	0.06%	-0.31%	n/a	n/a	n/a	4.73%	-5.30%	-5.01%
11	10/7/2003	2	1007	100.0	63160.0	61.7%	39060.0	3060.0	4.4%	2931.0	n/a	3.0	1000.0	3000.0	7.50%	0.05%	-0.23%	n/a	n/a	n/a	4.75%	-5.00%	-5.02%
12	10/7/2003	1	1007	100.0	63320.0	61.7%	39158.9	3100.0	4.4%	2969.3	n/a	3.0	1000.0	3000.0	7.58%	1.10%	-0.15%	n/a	n/a	n/a	4.74%	-5.24%	-5.07%
13	10/7/2003	2	1007	100.0	63260.0	61.7%	39121.8	2970.0	4.4%	2844.8	n/a	3.0	1000.0	3000.0	7.27%	-3.04%	-0.40%	n/a	n/a	n/a	4.74%	-5.15%	-5.06%
1	10/8/2003	2	1007	100.0	63100.0	61.7%	39022.9	3060.0	4.4%	2931.0	n/a	3.0	1000.0	3000.0	7.51%	0.15%	-0.13%	n/a	n/a	n/a	4.75%	-4.91%	-5.02%
2	10/8/2003	2	1007	100.0	63130.0	61.7%	39041.4	3120.0	4.4%	2988.5	n/a	3.0	1000.0	3000.0	7.65%	2.06%	0.07%	n/a	n/a	n/a	4.75%	-4.96%	-5.02%
3	10/8/2003	1	1007	100.0	63310.0	61.7%	39152.8	3090.0	4.4%	2959.8	n/a	3.0	1000.0	3000.0	7.56%	0.79%	0.14%	n/a	n/a	n/a	4.74%	-5.23%	-5.05%
4	10/8/2003	2	1007	100.0	63290.0	61.7%	39140.4	3080.0	4.4%	2950.2	n/a	3.0	1000.0	3000.0	7.54%	0.50%	0.17%	n/a	n/a	n/a	4.74%	-5.20%	-5.05%
5	10/8/2003	1	1007	100.0	63270.0	61.7%	39128.0	3060.0	4.4%	2835.2	n/a	3.0	1000.0	3000.0	7.25%	-3.39%	-0.32%	n/a	n/a	n/a	4.74%	-5.17%	-5.08%
6	10/8/2003	2	1007	100.0	63250.0	61.7%	39115.6	3110.0	4.4%	2978.9	n/a	3.0	1000.0	3000.0	7.62%	1.54%	-0.02%	n/a	n/a	n/a	4.74%	-5.14%	-5.13%
7	10/8/2003	1	1007	100.0	63160.0	61.7%	39060.0	3010.0	4.4%	2883.1	n/a	3.0	1000.0	3000.0	7.38%	-1.58%	-0.18%	n/a	n/a	n/a	4.75%	-5.00%	-5.10%
8	10/8/2003	2	1007	100.0	63180.0																		



DATE: 1/7/2005

ENVIROCON, INC.  
RFS PHASE 2 REMEDIATION PROJECTQUALITY CONTROL TRACKING  
REAGENT DOSAGE

BATCH MIXING											SPEC REQUIREMENTS												
MIX INFORMATION				SOIL INFORMATION				LIMESTONE INFORMATION			CKD	CARBON INFORMATION			LIMESTONE			CKD			CARBON		
BAT NO.	DATE	BIN NO.	MIX DESIGN NO.	WET DENSITY (PCF)	WET WEIGHT (LBS)	MOIST CONT (%)	DRY WEIGHT (LBS)	WET WEIGHT (LBS)	MOIST CONT (%)	DRY WEIGHT (LBS)	WET WEIGHT (LBS)	NO. BAGS (LBS)	BAG WEIGHT (LBS)	TOTAL WEIGHT (LBS)	% LIME PER 100 LB CIND	EACH BATCH (+/- 20%)	AVER PER 10 (+/- 5%)	% CKD PER 100 LB CIND	EACH BATCH (+/- 20%)	AVER PER 10 (+/- 5%)	% CARB PER 100 LB CIND	EACH BATCH (+/- 20%)	AVER PER 10 (+/- 5%)
10	10/8/2003	2	1007	100.0	63170.0	61.7%	39066.2	3140.0	4.4%	3007.7	n/a	3.0	1000.0	3000.0	7.70%	2.65%	0.69%	n/a	n/a	n/a	4.75%	-5.02%	-5.08%
11	10/8/2003	1	1007	100.0	63090.0	61.7%	39016.7	2980.0	4.4%	2854.4	n/a	3.0	1000.0	3000.0	7.32%	-2.46%	0.43%	n/a	n/a	n/a	4.76%	-4.90%	-5.08%
12	10/8/2003	2	1007	100.0	63330.0	61.7%	39165.1	3120.0	4.4%	2988.5	n/a	3.0	1000.0	3000.0	7.63%	1.74%	0.40%	n/a	n/a	n/a	4.74%	-5.26%	-5.11%
13	10/8/2003	2	1007	100.0	63000.0	61.7%	38961.0	3120.0	4.4%	2988.5	n/a	3.0	1000.0	3000.0	7.67%	2.27%	0.55%	n/a	n/a	n/a	4.76%	-4.76%	-5.06%
14	10/8/2003	1	VEG	n/a	49880.0	0.0%	49880.0	3800.0	0.0%	3800.0	n/a	n/a	n/a	n/a	7.62%	1.58%	n/a	n/a	n/a	n/a	n/a	n/a	n/a
15	10/8/2003	1	VEG	n/a	32430.0	0.0%	32430.0	2460.0	0.0%	2460.0	n/a	n/a	n/a	n/a	7.59%	1.14%	n/a	n/a	n/a	n/a	n/a	n/a	n/a
1	10/9/2003	2	1007	100.0	62900.0	61.7%	38899.2	3030.0	4.4%	2902.3	n/a	3.0	1000.0	3000.0	7.46%	-0.52%	0.45%	n/a	n/a	n/a	4.77%	-4.61%	-5.00%
2	10/9/2003	1	1007	100.0	63070.0	61.7%	39004.3	3080.0	4.4%	2950.2	n/a	3.0	1000.0	3000.0	7.56%	0.85%	0.87%	n/a	n/a	n/a	4.76%	-4.87%	-4.97%
3	10/9/2003	2	1007	100.0	63260.0	61.7%	39121.8	3060.0	4.4%	2931.0	n/a	3.0	1000.0	3000.0	7.49%	-0.11%	0.71%	n/a	n/a	n/a	4.74%	-5.15%	-4.97%
4	10/9/2003	1	1007	100.0	62770.0	61.7%	38818.8	2990.0	4.4%	2864.0	n/a	3.0	1000.0	3000.0	7.38%	-1.63%	0.70%	n/a	n/a	n/a	4.78%	-4.41%	-4.91%
5	10/9/2003	2	1007	100.0	63140.0	61.7%	39047.6	3030.0	4.4%	2902.3	n/a	3.0	1000.0	3000.0	7.43%	-0.90%	0.35%	n/a	n/a	n/a	4.75%	-4.97%	-4.91%
6	10/9/2003	2	1007	100.0	63150.0	61.7%	39053.8	2970.0	4.4%	2844.8	n/a	3.0	1000.0	3000.0	7.28%	-2.87%	-0.10%	n/a	n/a	n/a	4.75%	-4.99%	-4.89%
7	10/9/2003	2	1007	100.0	63190.0	61.7%	39078.5	3100.0	4.4%	2969.3	n/a	3.0	1000.0	3000.0	7.60%	1.31%	-0.23%	n/a	n/a	n/a	4.75%	-5.05%	-4.90%
8	10/9/2003	2	1007	100.0	63120.0	61.7%	39035.3	3080.0	4.4%	2950.2	n/a	3.0	1000.0	3000.0	7.56%	0.77%	0.09%	n/a	n/a	n/a	4.75%	-4.94%	-4.90%
9	10/9/2003	2	1007	100.0	63150.0	61.7%	39053.8	3030.0	4.4%	2902.3	n/a	3.0	1000.0	3000.0	7.43%	-0.91%	-0.17%	n/a	n/a	n/a	4.75%	-4.99%	-4.87%
10	10/9/2003	2	1007	100.0	63170.0	61.7%	39066.2	3020.0	4.4%	2892.7	n/a	3.0	1000.0	3000.0	7.40%	-1.27%	-0.53%	n/a	n/a	n/a	4.75%	-5.02%	-4.90%
11	10/9/2003	2	1007	100.0	62690.0	61.7%	38769.3	3110.0	4.4%	2978.9	n/a	3.0	1000.0	3000.0	7.68%	2.45%	-0.23%	n/a	n/a	n/a	4.79%	-4.29%	-4.87%
1	10/10/2003	2	1007	100.0	63190.0	61.7%	39078.5	1580.0	4.4%	1513.4	1250.0	3.0	1000.0	3000.0	3.87%	3.27%	0.01%	1.98%	n/a	n/a	4.75%	-5.05%	-4.89%
2	10/10/2003	1	1007	100.0	62990.0	61.7%	38954.9	1570.0	4.4%	1503.8	1250.0	3.0	1000.0	3000.0	3.86%	2.95%	0.32%	1.98%	n/a	n/a	4.76%	-4.75%	-4.85%
3	10/10/2003	2	1007	100.0	63150.0	61.7%	39053.8	1570.0	4.4%	1503.8	1500.0	3.0	1000.0	3000.0	3.85%	2.68%	0.75%	1.98%	n/a	n/a	4.75%	-4.99%	-4.90%
4	10/10/2003	1	1007	100.0	62720.0	61.7%	38787.9	1540.0	4.4%	1475.1	1020.0	3.0	1000.0	3000.0	3.80%	1.41%	0.98%	2.39%	n/a	n/a	4.78%	-4.34%	-4.84%
5	10/10/2003	2	1007	100.0	63020.0	61.7%	38973.4	1550.0	4.4%	1484.7	1300.0	3.0	1000.0	3000.0	3.81%	1.59%	1.42%	1.62%	n/a	n/a	4.76%	-4.79%	-4.82%
6	10/10/2003	1	1007	100.0	62950.0	61.7%	38930.1	1470.0	4.4%	1408.0	1210.0	3.0	1000.0	3000.0	3.62%	-3.55%	0.94%	2.07%	n/a	n/a	4.77%	-4.69%	-4.78%
7	10/10/2003	2	1007	100.0	63120.0	61.7%	39035.3	1590.0	4.4%	1523.0	1270.0	3.0	1000.0	3000.0	3.90%	4.04%	1.27%	1.92%	n/a	n/a	4.75%	-4.94%	-4.78%
8	10/10/2003	1	1007	100.0	62780.0	61.7%	38825.0	1530.0	4.4%	1465.5	1200.0	3.0	1000.0	3000.0	3.77%	0.66%	1.42%	2.02%	n/a	n/a	4.78%	-4.43%	-4.73%
9	10/10/2003	2	1007	100.0	63070.0	61.7%	39004.3	1520.0	4.4%	1455.9	1290.0	3.0	1000.0	3000.0	3.73%	-0.46%	1.50%	1.90%	n/a	n/a	4.76%	-4.87%	-4.71%
10	10/10/2003	1	1007	100.0	62900.0	61.7%	38899.2	1420.0	4.4%	1360.2	1210.0	3.0	1000.0	3000.0	3.50%	-6.76%	0.58%	2.05%	n/a	n/a	4.77%	-4.61%	-4.74%
11	10/10/2003	2	1007	100.0	63230.0	61.7%	39103.3	1530.0	4.4%	1465.5	1320.0	3.0	1000.0	3000.0	3.75%	-0.06%	0.25%	1.91%	n/a	n/a	4.74%	-5.11%	-4.75%
12	10/10/2003	1	1007	100.0	63180.0	61.7%	39072.4	1530.0	4.4%	1465.5	1330.0	3.0	1000.0	3000.0	3.75%	0.02%	-0.04%	2.09%	n/a	n/a	4.75%	-5.03%	-4.78%
13	10/10/2003	2	1007	100.0	62910.0	61.7%	38905.4	1550.0	4.4%	1484.7	1230.0	3.0	1000.0	3000.0	3.82%	1.76%	-0.13%	2.11%	n/a	n/a	4.77%	-4.63%	-4.74%
14	10/10/2003	1	1007	100.0	63350.0	61.7%	39177.5	1610.0	4.4%	1542.1	1250.0	3.0	1000.0	3000.0	3.94%	4.97%	0.22%	1.94%	n/a	n/a	4.74%	-5.29%	-4.84%
15	10/10/2003	2	1007	100.0	42140.0	61.7%	26060.6	1030.0	4.4%	986.6	1230.0	2.0	1000.0	2000.0	3.79%	0.95%	0.16%	2.97%	n/a	n/a	4.75%	-5.08%	-4.87%
16	10/10/2003	1	1007	100.0	62620.0	61.7%	38726.0	1530.0	4.4%	1465.5	1350.0	3.0	1000.0	3000.0	3.78%	0.92%	0.60%	1.96%	n/a	n/a	4.79%	-4.18%	-4.82%
17	10/10/2003	2	1007	100.0	62970.0	61.7%	38942.5	1550.0	4.4%	1484.7	1300.0	3.0	1000.0	3000.0	3.81%	1.67%	0.37%	2.14%	n/a	n/a	4.76%	-4.72%	-4.79%
18	10/10/2003	1	1007	100.0	63100.0	61.7%	39022.9	1470.0	4.4%	1408.0	1260.0	3.0	1000.0	3000.0	3.61%	-3.78%	-0.08%	2.06%	n/a	n/a	4.75%	-4.91%	-4.84%
19	10/10/2003	2	1007	100.0	63020.0	61.7%	38973.4	1470.0	4.4%	1408.0	1210.0	3.0	1000.0	3000.0	3.61%	-3.66%	-0.40%	2.00%	n/a	n/a	4.76%	-4.79%	-4.83%
20	10/10/2003	1	1007	100.0	63110.0	61.7%	39029.1	1540.0	4.4%	1475.1	1220.0	3.0	1000.0	3000.0	3.78%	0.79%	0.36%	1.92%	n/a	n/a	4.75%	-4.93%	-4.87%
21	10/10/2003	2	1007	100.0	63130.0	61.7%	39041.4	1530.0	4.4%	1465.5	1280.0	3.0	1000.0	3000.0	3.75%	0.10%	0.37%	1.93%	n/a	n/a	4.75%	-4.96%	-4.85%
22	10/10/2003	1	1007	100.0	62810.0	61.7%	38843.5	1500.0	4.4%	1436.8	1260.0	3.0	1000.0	3000.0	3.70%	-1.36%	0.24%	2.01%	n/a	n/a	4.78%	-4.47%	-4.80%
1	10/11/2003	2	1007	100.0	63300.0	61.7%	39146.6	n/a	n/a	n/a	2990.0	3.0	1000.0	3000.0	n/a	n/a	n/a	4.72%	-5.53%	n/a	4.74%	-5.21%	-4.85%
2	10/11/2003	1	1007	100.0	63140.0	61.7%	39047.6	n/a	n/a	n/a	3000.0	3.0	1000.0	3000.0	n/a	n/a	n/a	4.75%	-4.97%	n/a	4.75%	-4.97%	-4.82%
3	10/11/2003	2	1007	100.0	63120.0	61.7%	39035.3	n/a	n/a	n/a	3020.0	3.0	1000.0	3000.0	n/a	n/a	n/a	4.78%	-4.31%	n/a	4.75%	-4.94%	-4.81%
4	10/11/2003	1	1007	100.0	63120.0	61.7%	39035.3	n/a	n/a	n/a	3000.0	3.0	1000.0	3000.0	n/a	n/a	n/a	4.75%	-4.94%	n/a	4.75%	-4.94%	-4.89%
5	10/11/2003	2	1007	100.0	63330.0	61.7%	39165.1	n/a	n/a	n/a	2920.0	3.0	1000.0	3000.0	n/a	n/a	n/a	4.61%	-7.78%	n/a	4.74%	-5.26%	-4.94%
6	10/11/2003	1	1007	100.0	62820.0	61.7%	38849.7	n/a	n/a	n/a	3100.0	3.0	1000.0	3000.0	n/a	n/a	n/a	4.93%	-1.31%	n/a	4.78%	-4.49%	-4.90%
7	10/11/2003	2	1007	100.0	63080.0	61.7%	39010.5	n/a	n/a	n/a	2910.0	3.0	1000.0	3000.0	n/a	n/a	n/a	4.61%	-7.74%	n/a	4.76%	-4.88%	-4.91%
8	10/11/2003	1	1007	100.0	62850.0	61.7%	38868.3	n/a	n/a	n/a	2890.0	3.0	1000.0	3000.0	n/a	n/a	n/a	4.60%	-8.04%	n/a	4.77%	-4.53%	-4.87%
9	10/11/2003	2	1007	100.0	69950.0	61.7%	43259.1	n/a	n/a	n/a	3020.0	3.0	1000.0	3000.0	n/a	n/a	n/a	4.32%	-13.65%	n/a	4.29%	-14.22%	-5.79%
10	10/11/2003	1	1007	100.0	63240.0	61.7%	39109.5	n/a	n/a	n/a	3090.0	3.0	1000.0	3000.0	n/a	n/a	n/a	4.89%	-2.28%	-6.05%	4.74%	-5.12%	-5.86%
11	10/11/2003	2	1007	100.0	62990.0	61.7%	38954.9	n/a	n/a	n/a	2900.0	3.0	1000.0	3000.0	n/a	n/a	n/a	4.60%	-7.92%	-6.29%	4.76%	-4.75%	-5.81%
12	10/11/2003	2	1007	100.0	63030.0	61.7%	38979.6	n/a	n/a	n/a	3070.0	3.0	1000.0	3000.0	n/a	n/a	n/a	4.87%	-2.59%	-6.06%	4.76%	-4.81%	-5.80%
13	10/11/2003	1	1007	100.0	63040.0	61.7%	38985.8	n/a	n/a	n/a	2980.0	3.0	1000.0	3000.0	n/a	n/a	n/a	4.73%	-5.46%	-6.17%	4.76%	-4.82%	-5.78%
14	10/11/2003	2	1007	100.0	63000.0	61.7%	38961.0	n/a	n/a	n/a	2950.0	3.0	1000.0	3000.0	n/a	n/a	n/a	4.68%	-6.35%	-6.31%	4.76%	-4.76%	-5.77%

DATE: 1/7/2005

ENVIROCON, INC.  
RFS PHASE 2 REMEDIATION PROJECTQUALITY CONTROL TRACKING  
REAGENT DOSAGE

BATCH MIXING														SPEC REQUIREMENTS											
MIX INFORMATION				SOIL INFORMATION				LIMESTONE INFORMATION			CKD			CARBON INFORMATION			LIMESTONE			CKD			CARBON		
BAT NO.	DATE	BIN NO.	MIX DESIGN NO.	WET DENSITY (PCF)	WET WEIGHT (LBS)	MOIST CONT (%)	DRY WEIGHT (LBS)	WET WEIGHT (LBS)	MOIST CONT (%)	DRY WEIGHT (LBS)	WET WEIGHT (LBS)	NO. BAGS (LBS)	BAG WEIGHT (LBS)	TOTAL WEIGHT (LBS)	% LIME PER 100 LB CIND	EACH BATCH (+/- 20%)	AVER PER 10 (+/- 5%)	% CKD PER 100 LB CIND	EACH BATCH (+/- 20%)	AVER PER 10 (+/- 5%)	% CARB PER 100 LB CIND	EACH BATCH (+/- 20%)	AVER PER 10 (+/- 5%)		
18	10/11/2003	2	1007	100.0	63000.0	61.7%	38961.0	n/a	n/a	n/a	2950.0	3.0	1000.0	3000.0	n/a	n/a	n/a	4.68%	-6.35%	-6.96%	4.76%	-4.76%	-5.82%		
19	10/11/2003	1	1007	100.0	63220.0	61.7%	39097.1	n/a	n/a	n/a	2940.0	3.0	1000.0	3000.0	n/a	n/a	n/a	4.65%	-6.99%	-6.30%	4.75%	-5.09%	-4.90%		
20	10/11/2003	2	1007	100.0	62800.0	61.7%	38837.4	n/a	n/a	n/a	3070.0	3.0	1000.0	3000.0	n/a	n/a	n/a	4.89%	-2.23%	-6.29%	4.78%	-4.46%	-4.84%		
21	10/11/2003	2	1007	100.0	62760.0	61.7%	38812.6	n/a	n/a	n/a	3100.0	3.0	1000.0	3000.0	n/a	n/a	n/a	4.94%	-1.21%	-5.62%	4.78%	-4.40%	-4.80%		
1	10/13/2003	1	1007	100.0	63090.0	61.7%	39016.7	3030.0	4.4%	2902.3	n/a	3.0	1000.0	3000.0	7.44%	-0.82%	-0.82%	n/a	n/a	n/a	4.76%	-4.90%	-4.81%		
2	10/13/2003	2	1007	100.0	62990.0	61.7%	38954.9	2970.0	4.4%	2844.8	n/a	3.0	1000.0	3000.0	7.30%	-2.63%	-1.72%	n/a	n/a	n/a	4.76%	-4.75%	-4.80%		
3	10/13/2003	1	1007	100.0	62960.0	61.7%	38936.3	3090.0	4.4%	2959.8	n/a	3.0	1000.0	3000.0	7.60%	1.35%	-0.70%	n/a	n/a	n/a	4.76%	-4.70%	-4.80%		
4	10/13/2003	2	1007	100.0	62880.0	61.7%	38886.8	3000.0	4.4%	2873.6	n/a	3.0	1000.0	3000.0	7.39%	-1.47%	-0.89%	n/a	n/a	n/a	4.77%	-4.58%	-4.76%		
5	10/13/2003	1	1007	100.0	63350.0	61.7%	39177.5	2990.0	4.4%	2864.0	n/a	3.0	1000.0	3000.0	7.31%	-2.53%	-1.22%	n/a	n/a	n/a	4.74%	-5.29%	-4.78%		
6	10/13/2003	2	1007	100.0	63220.0	61.7%	39097.1	3060.0	4.4%	2931.0	n/a	3.0	1000.0	3000.0	7.50%	-0.04%	-1.02%	n/a	n/a	n/a	4.75%	-5.09%	-4.80%		
7	10/13/2003	1	1007	100.0	62860.0	61.7%	38874.5	3040.0	4.4%	2911.9	n/a	3.0	1000.0	3000.0	7.49%	-0.13%	-0.89%	n/a	n/a	n/a	4.77%	-4.55%	-4.78%		
8	10/13/2003	2	1007	100.0	63240.0	61.7%	39109.5	3010.0	4.4%	2883.1	n/a	3.0	1000.0	3000.0	7.37%	-1.71%	-1.00%	n/a	n/a	n/a	4.74%	-5.12%	-4.78%		
9	10/13/2003	1	1007	100.0	63030.0	61.7%	38979.6	3010.0	4.4%	2883.1	n/a	3.0	1000.0	3000.0	7.40%	-1.38%	-1.04%	n/a	n/a	n/a	4.76%	-4.81%	-4.82%		
10	10/13/2003	2	1007	100.0	63220.0	61.7%	39097.1	3100.0	4.4%	2969.3	n/a	3.0	1000.0	3000.0	7.59%	1.26%	-0.81%	n/a	n/a	n/a	4.75%	-5.09%	-4.89%		
11	10/13/2003	1	1007	100.0	63220.0	61.7%	39097.1	3030.0	4.4%	2902.3	n/a	3.0	1000.0	3000.0	7.42%	-1.02%	-0.83%	n/a	n/a	n/a	4.75%	-5.09%	-4.91%		
1	10/14/2003	2	1007	100.0	63220.0	61.7%	39097.1	n/a	n/a	n/a	3000.0	3.0	1000.0	3000.0	n/a	n/a	n/a	4.75%	-5.09%	-5.09%	4.75%	-5.09%	-4.94%		
2	10/14/2003	1	1007	100.0	63070.0	61.7%	39004.3	n/a	n/a	n/a	2970.0	3.0	1000.0	3000.0	n/a	n/a	n/a	4.71%	-5.82%	-5.46%	4.76%	-4.87%	-4.96%		
3	10/14/2003	2	1007	100.0	62750.0	61.7%	38806.4	n/a	n/a	n/a	3050.0	3.0	1000.0	3000.0	n/a	n/a	n/a	4.86%	-2.79%	-4.57%	4.78%	-4.38%	-4.94%		
4	10/14/2003	1	1007	100.0	63340.0	61.7%	39171.3	n/a	n/a	n/a	3010.0	3.0	1000.0	3000.0	n/a	n/a	n/a	4.75%	-4.96%	-4.66%	4.74%	-5.27%	-4.94%		
5	10/14/2003	2	1007	100.0	63180.0	61.7%	39072.4	n/a	n/a	n/a	3030.0	3.0	1000.0	3000.0	n/a	n/a	n/a	4.80%	-4.08%	-4.55%	4.75%	-5.03%	-4.93%		
6	10/14/2003	1	1007	100.0	63200.0	61.7%	39084.7	n/a	n/a	n/a	2910.0	3.0	1000.0	3000.0	n/a	n/a	n/a	4.60%	-7.91%	-5.11%	4.75%	-5.06%	-4.98%		
7	10/14/2003	2	1007	100.0	63130.0	61.7%	39041.4	n/a	n/a	n/a	2910.0	3.0	1000.0	3000.0	n/a	n/a	n/a	4.61%	-7.81%	-5.49%	4.75%	-4.96%	-4.97%		
8	10/14/2003	1	1007	100.0	62970.0	61.7%	38942.5	n/a	n/a	n/a	3050.0	3.0	1000.0	3000.0	n/a	n/a	n/a	4.84%	-3.13%	-5.20%	4.76%	-4.72%	-4.96%		
9	10/14/2003	2	1007	100.0	63220.0	61.7%	39097.1	n/a	n/a	n/a	3010.0	3.0	1000.0	3000.0	n/a	n/a	n/a	4.76%	-4.78%	-5.15%	4.75%	-5.09%	-4.96%		
10	10/14/2003	1	1007	100.0	63320.0	61.7%	39158.9	n/a	n/a	n/a	2960.0	3.0	1000.0	3000.0	n/a	n/a	n/a	4.67%	-6.51%	-5.29%	4.74%	-5.24%	-4.97%		
11	10/14/2003	2	1007	100.0	63290.0	61.7%	39140.4	n/a	n/a	n/a	3110.0	3.0	1000.0	3000.0	n/a	n/a	n/a	4.91%	-1.72%	-4.95%	4.74%	-5.20%	-4.98%		
12	10/14/2003	1	1007	100.0	62950.0	61.7%	38930.1	n/a	n/a	n/a	2950.0	3.0	1000.0	3000.0	n/a	n/a	n/a	4.69%	-6.27%	-5.00%	4.77%	-4.69%	-4.96%		
13	10/14/2003	2	1007	100.0	63010.0	61.7%	38967.2	n/a	n/a	n/a	2930.0	3.0	1000.0	3000.0	n/a	n/a	n/a	4.65%	-7.00%	-5.42%	4.76%	-4.78%	-5.00%		
14	10/14/2003	1	1007	100.0	63140.0	61.7%	39047.6	n/a	n/a	n/a	3020.0	3.0	1000.0	3000.0	n/a	n/a	n/a	4.78%	-4.34%	-5.36%	4.75%	-4.97%	-4.97%		
15	10/14/2003	2	1007	100.0	62960.0	61.7%	38936.3	n/a	n/a	n/a	2960.0	3.0	1000.0	3000.0	n/a	n/a	n/a	4.70%	-5.97%	-5.54%	4.76%	-4.70%	-4.94%		
16	10/14/2003	1	1007	100.0	63160.0	61.7%	39060.0	n/a	n/a	n/a	3040.0	3.0	1000.0	3000.0	n/a	n/a	n/a	4.81%	-3.74%	-5.13%	4.75%	-5.00%	-4.94%		
17	10/14/2003	2	1007	100.0	63190.0	61.7%	39078.5	n/a	n/a	n/a	2900.0	3.0	1000.0	3000.0	n/a	n/a	n/a	4.59%	-8.21%	-5.17%	4.75%	-5.05%	-4.94%		
18	10/14/2003	1	1007	100.0	62950.0	61.7%	38930.1	n/a	n/a	n/a	3060.0	3.0	1000.0	3000.0	n/a	n/a	n/a	4.86%	-2.78%	-5.13%	4.77%	-4.69%	-4.94%		
19	10/14/2003	2	1007	100.0	63040.0	61.7%	38985.8	n/a	n/a	n/a	2920.0	3.0	1000.0	3000.0	n/a	n/a	n/a	4.63%	-7.36%	-5.39%	4.76%	-4.82%	-4.91%		
20	10/14/2003	1	1007	100.0	63370.0	61.7%	39189.9	n/a	n/a	n/a	3050.0	3.0	1000.0	3000.0	n/a	n/a	n/a	4.81%	-3.74%	-5.11%	4.73%	-5.32%	-4.92%		
21	10/14/2003	2	1007	100.0	62890.0	61.7%	38893.0	n/a	n/a	n/a	2930.0	3.0	1000.0	3000.0	n/a	n/a	n/a	4.66%	-6.82%	-5.62%	4.77%	-4.60%	-4.86%		
22	10/14/2003	1	1007	100.0	62820.0	61.7%	38849.7	n/a	n/a	n/a	3060.0	3.0	1000.0	3000.0	n/a	n/a	n/a	4.87%	-2.58%	-5.25%	4.78%	-4.49%	-4.84%		
23	10/14/2003	2	1007	100.0	63000.0	61.7%	38961.0	n/a	n/a	n/a	2950.0	3.0	1000.0	3000.0	n/a	n/a	n/a	4.68%	-6.35%	-5.19%	4.76%	-4.76%	-4.84%		
24	10/14/2003	1	1007	100.0	62890.0	61.7%	38893.0	n/a	n/a	n/a	3060.0	3.0	1000.0	3000.0	n/a	n/a	n/a	4.87%	-2.69%	-5.02%	4.77%	-4.60%	-4.80%		
25	10/14/2003	2	1007	100.0	63290.0	61.7%	39140.4	n/a	n/a	n/a	3070.0	3.0	1000.0	3000.0	n/a	n/a	n/a	4.85%	-2.99%	-4.73%	4.74%	-5.20%	-4.85%		
26	10/14/2003	1	1007	100.0	62800.0	61.7%	38837.4	n/a	n/a	n/a	2900.0	3.0	1000.0	3000.0	n/a	n/a	n/a	4.62%	-7.64%	-5.12%	4.78%	-4.46%	-4.80%		
27	10/14/2003	2	1007	100.0	63120.0	61.7%	39035.3	n/a	n/a	n/a	2950.0	3.0	1000.0	3000.0	n/a	n/a	n/a	4.67%	-6.53%	-4.95%	4.75%	-4.94%	-4.79%		
28	10/14/2003	1	1007	100.0	62880.0	61.7%	38886.8	n/a	n/a	n/a	2990.0	3.0	1000.0	3000.0	n/a	n/a	n/a	4.76%	-4.90%	-5.16%	4.77%	-4.58%	-4.78%		
29	10/14/2003	2	1007	100.0	63070.0	61.7%	39004.3	n/a	n/a	n/a	2950.0	3.0	1000.0	3000.0	n/a	n/a	n/a	4.68%	-6.45%	-5.07%	4.76%	-4.87%	-4.78%		
30	10/14/2003	1	1007	100.0	63390.0	61.7%	39202.2	n/a	n/a	n/a	2990.0	3.0	1000.0	3000.0	n/a	n/a	n/a	4.72%	-5.66%	-5.26%	4.73%	-5.35%	-4.78%		
31	10/14/2003	2	1007	100.0	63350.0	61.7%	39177.5	n/a	n/a	n/a	2950.0	3.0	1000.0	3000.0	n/a	n/a	n/a	4.66%	-6.87%	-5.27%	4.74%	-5.29%	-4.85%		
32	10/14/2003	1	1007	100.0	63120.0	61.7%	39035.3	n/a	n/a	n/a	2970.0	3.0	1000.0	3000.0	n/a	n/a	n/a	4.71%	-5.89%	-5.60%	4.75%	-4.94%	-4.90%		
33	10/14/2003	2	1007	100.0	62890.0	61.7%	38893.0	n/a	n/a	n/a	2920.0	3.0	1000.0	3000.0	n/a	n/a	n/a	4.64%	-7.14%	-5.68%	4.77%	-4.60%	-4.88%		
34	10/14/2003	1	1007	100.0	63210.0	61.7%	39090.9	3010.0	4.4%	2883.1	n/a	3.0	1000.0	3000.0	7.38%	-1.66%	n/a	n/a	n/a	n/a	4.75%	-5.08%	-4.93%		
35	10/14/2003	2	1007	100.0	62840.0	61.7%	38862.1	3100.0	4.4%	2969.3	n/a	3.0	1000.0	3000.0	7.64%	1.88%	n/a	n/a	n/a	n/a	4.77%	-4.52%	-4.86%		
36	10/14/2003	1	1007	100.0	63400.0	61.7%	39208.4	3080.0	4.4%	2950.2	n/a	3.0	1000.0	3000.0	7.52%	0.33%	n/a	n/a	n/a	n/a	4.73%	-5.36%	-4.95%		
1	10/15/2003	2	1007	115.0	63030.0	61.7%	38979.6	3070.0	4.4%	2940.6	n/a	3.0	1000.0	3000.0	7.54%	0.59%	n/a	n/a	n/a	n/a	4.76%	-4.81%	-4.94%		
2	10/15/2003	2	1007	115.0	63310.0	61.7%	39152.8	3060.0	4.4%	2931.0	n/a	3.0	1000.0	3000.0	7.49%	-0.18%	n/a	n/a	n/a	n/a	4.74%	-5.23%	-5.00%		
3	10/15/2003	1	1007	115.0	62930.0	61.7%	38917.7	3010.0	4.4%	2883.1	n/a	3.0	1000.0	3000.0	7.41%	-1.22%	n/a	n/a	n/a	n/a	4.77%	-4.66%	-4.98%		
4	10/15/2003																								

DATE: 1/7/2005

ENVIROCON, INC.  
RFS PHASE 2 REMEDIATION PROJECTQUALITY CONTROL TRACKING  
REAGENT DOSAGE

BATCH MIXING														SPEC REQUIREMENTS									
MIX INFORMATION				SOIL INFORMATION				LIMESTONE INFORMATION			CKD	CARBON INFORMATION			LIMESTONE			CKD			CARBON		
BAT NO.	DATE	BIN NO.	MIX DESIGN NO.	WET DENSITY (PCF)	WET WEIGHT (LBS)	MOIST CONT (%)	DRY WEIGHT (LBS)	WET WEIGHT (LBS)	MOIST CONT (%)	DRY WEIGHT (LBS)	WET WEIGHT (LBS)	NO. BAGS (LBS)	BAG WEIGHT (LBS)	TOTAL WEIGHT (LBS)	% LIME PER 100 LB CIND	EACH BATCH (+/- 20%)	AVER PER 10 (+/- 5%)	% CKD PER 100 LB CIND	EACH BATCH (+/- 20%)	AVER PER 10 (+/- 5%)	% CARB PER 100 LB CIND	EACH BATCH (+/- 20%)	AVER PER 10 (+/- 5%)
6	10/15/2003	2	1007	115.0	63360.0	61.7%	39183.7	3010.0	4.4%	2883.1	n/a	3.0	1000.0	3000.0	7.36%	-1.89%	n/a	n/a	n/a	n/a	4.73%	-5.30%	-4.96%
7	10/15/2003	1	1007	115.0	63180.0	61.7%	39072.4	2970.0	4.4%	2844.8	n/a	3.0	1000.0	3000.0	7.28%	-2.92%	-0.34%	n/a	n/a	n/a	4.75%	-5.03%	-5.00%
8	10/15/2003	2	1007	115.0	63240.0	61.7%	39109.5	3060.0	4.4%	2931.0	n/a	3.0	1000.0	3000.0	7.49%	-0.07%	-0.18%	n/a	n/a	n/a	4.74%	-5.12%	-5.01%
9	10/15/2003	1	1007	115.0	63190.0	61.7%	39078.5	3040.0	4.4%	2911.9	n/a	3.0	1000.0	3000.0	7.45%	-0.65%	-0.43%	n/a	n/a	n/a	4.75%	-5.05%	-5.06%
10	10/15/2003	2	1007	115.0	63100.0	61.7%	39022.9	3030.0	4.4%	2902.3	n/a	3.0	1000.0	3000.0	7.44%	-0.83%	-0.55%	n/a	n/a	n/a	4.75%	-4.91%	-5.01%
11	10/15/2003	1	1007	115.0	63110.0	61.7%	39029.1	3100.0	4.4%	2969.3	n/a	3.0	1000.0	3000.0	7.61%	1.44%	-0.46%	n/a	n/a	n/a	4.75%	-4.93%	-5.03%
12	10/15/2003	2	1007	115.0	63100.0	61.7%	39022.9	2930.0	4.4%	2806.5	n/a	3.0	1000.0	3000.0	7.19%	-4.11%	-0.85%	n/a	n/a	n/a	4.75%	-4.91%	-4.99%
13	10/15/2003	1	1007	115.0	62850.0	61.7%	38868.3	3000.0	4.4%	2873.6	n/a	3.0	1000.0	3000.0	7.39%	-1.43%	-0.87%	n/a	n/a	n/a	4.77%	-4.53%	-4.98%
14	10/15/2003	2	1007	115.0	62980.0	61.7%	38948.7	3080.0	4.4%	2950.2	n/a	3.0	1000.0	3000.0	7.57%	0.99%	-0.85%	n/a	n/a	n/a	4.76%	-4.73%	-4.96%
15	10/15/2003	1	1007	115.0	63220.0	61.7%	39097.1	3040.0	4.4%	2911.9	n/a	3.0	1000.0	3000.0	7.45%	-0.70%	-1.02%	n/a	n/a	n/a	4.75%	-5.09%	-4.96%
16	10/15/2003	2	1007	115.0	63160.0	61.7%	39060.0	3090.0	4.4%	2959.8	n/a	3.0	1000.0	3000.0	7.58%	1.03%	-0.72%	n/a	n/a	n/a	4.75%	-5.00%	-4.93%
17	10/15/2003	1	1007	115.0	63170.0	61.7%	39066.2	3110.0	4.4%	2978.9	n/a	3.0	1000.0	3000.0	7.63%	1.67%	-0.26%	n/a	n/a	n/a	4.75%	-5.02%	-4.93%
18	10/15/2003	2	1007	115.0	63110.0	61.7%	39029.1	2940.0	4.4%	2816.1	n/a	3.0	1000.0	3000.0	7.22%	-3.80%	-0.64%	n/a	n/a	n/a	4.75%	-4.93%	-4.91%
19	10/15/2003	1	1007	115.0	63180.0	61.7%	39072.4	2900.0	4.4%	2777.8	n/a	3.0	1000.0	3000.0	7.11%	-5.21%	-1.09%	n/a	n/a	n/a	4.75%	-5.03%	-4.91%
20	10/15/2003	2	1007	115.0	62900.0	61.7%	38899.2	3090.0	4.4%	2959.8	n/a	3.0	1000.0	3000.0	7.61%	1.45%	-0.86%	n/a	n/a	n/a	4.77%	-4.61%	-4.88%
21	10/15/2003	1	1007	115.0	63260.0	61.7%	39121.8	3040.0	4.4%	2911.9	n/a	3.0	1000.0	3000.0	7.44%	-0.76%	-1.08%	n/a	n/a	n/a	4.74%	-5.15%	-4.90%
22	10/15/2003	2	1007	115.0	63310.0	61.7%	39152.8	3040.0	4.4%	2911.9	n/a	3.0	1000.0	3000.0	7.44%	-0.84%	-0.76%	n/a	n/a	n/a	4.74%	-5.23%	-4.93%
23	10/15/2003	1	1007	115.0	62900.0	61.7%	38899.2	2900.0	4.4%	2777.8	n/a	3.0	1000.0	3000.0	7.14%	-4.79%	-1.09%	n/a	n/a	n/a	4.77%	-4.61%	-4.94%
24	10/15/2003	2	1007	115.0	63450.0	61.7%	39239.3	3000.0	4.4%	2873.6	n/a	3.0	1000.0	3000.0	7.32%	-2.36%	-1.43%	n/a	n/a	n/a	4.73%	-5.44%	-5.01%
25	10/15/2003	1	1007	115.0	62800.0	61.7%	38837.4	3090.0	4.4%	2959.8	n/a	3.0	1000.0	3000.0	7.62%	1.61%	-1.20%	n/a	n/a	n/a	4.78%	-4.46%	-4.95%
26	10/15/2003	1	1007	115.0	63150.0	61.7%	39053.8	3140.0	4.4%	3007.7	n/a	3.0	1000.0	3000.0	7.70%	2.68%	-1.03%	n/a	n/a	n/a	4.75%	-4.99%	-4.95%
27	10/15/2003	2	1007	115.0	63070.0	61.7%	39004.3	3000.0	4.4%	2873.6	n/a	3.0	1000.0	3000.0	7.37%	-1.77%	-1.38%	n/a	n/a	n/a	4.76%	-4.87%	-4.93%
28	10/15/2003	1	1007	115.0	63350.0	61.7%	39177.5	3070.0	4.4%	2940.6	n/a	3.0	1000.0	3000.0	7.51%	0.08%	-0.99%	n/a	n/a	n/a	4.74%	-5.29%	-4.97%
29	10/15/2003	2	1007	115.0	62940.0	61.7%	38923.9	3100.0	4.4%	2969.3	n/a	3.0	1000.0	3000.0	7.63%	1.71%	-0.30%	n/a	n/a	n/a	4.77%	-4.67%	-4.93%
1	10/16/2003	1	1007	115.0	63180.0	61.7%	39072.4	3040.0	4.4%	2911.9	n/a	3.0	1000.0	3000.0	7.45%	-0.63%	-0.51%	n/a	n/a	n/a	4.75%	-5.03%	-4.97%
2	10/16/2003	2	1007	115.0	63270.0	61.7%	39128.0	3090.0	4.4%	2959.8	n/a	3.0	1000.0	3000.0	7.56%	0.86%	-0.34%	n/a	n/a	n/a	4.74%	-5.17%	-4.98%
3	10/16/2003	1	1007	115.0	63220.0	61.7%	39097.1	2910.0	4.4%	2787.4	n/a	3.0	1000.0	3000.0	7.13%	-4.94%	-0.75%	n/a	n/a	n/a	4.75%	-5.09%	-4.96%
4	10/16/2003	2	1007	115.0	63170.0	61.7%	39066.2	n/a	n/a	n/a	n/a	3.0	1000.0	3000.0	n/a	n/a	n/a	6.13%	2.11%	2.11%	4.75%	-5.02%	-5.00%
5	10/16/2003	1	1007	115.0	63220.0	61.7%	39097.1	n/a	n/a	n/a	3790.0	3.0	1000.0	3000.0	n/a	n/a	n/a	5.99%	-0.08%	1.01%	4.75%	-5.09%	-4.97%
6	10/16/2003	2	1007	115.0	63290.0	61.7%	39140.4	n/a	n/a	n/a	3720.0	3.0	1000.0	3000.0	n/a	n/a	n/a	5.88%	-2.04%	-0.01%	4.74%	-5.20%	-5.04%
7	10/16/2003	1	1007	115.0	63160.0	61.7%	39060.0	n/a	n/a	n/a	3730.0	3.0	1000.0	3000.0	n/a	n/a	n/a	5.91%	-1.57%	-0.40%	4.75%	-5.00%	-5.04%
8	10/16/2003	2	1007	115.0	63190.0	61.7%	39078.5	n/a	n/a	n/a	3700.0	3.0	1000.0	3000.0	n/a	n/a	n/a	5.86%	-2.41%	-0.80%	4.75%	-5.05%	-5.06%
9	10/16/2003	1	1007	115.0	63330.0	61.7%	39165.1	n/a	n/a	n/a	3900.0	3.0	1000.0	3000.0	n/a	n/a	n/a	6.16%	2.64%	-0.23%	4.74%	-5.26%	-5.06%
10	10/16/2003	2	1007	115.0	63220.0	61.7%	39097.1	n/a	n/a	n/a	3740.0	3.0	1000.0	3000.0	n/a	n/a	n/a	5.92%	-1.40%	-0.40%	4.75%	-5.09%	-5.10%
11	10/16/2003	1	1007	115.0	63230.0	61.7%	39103.3	n/a	n/a	n/a	3700.0	3.0	1000.0	3000.0	n/a	n/a	n/a	5.85%	-2.47%	-0.65%	4.74%	-5.11%	-5.11%
12	10/16/2003	2	1007	115.0	63250.0	61.7%	39115.6	n/a	n/a	n/a	3760.0	3.0	1000.0	3000.0	n/a	n/a	n/a	5.94%	-0.92%	-0.68%	4.74%	-5.14%	-5.11%
13	10/16/2003	1	1007	115.0	63140.0	61.7%	39047.6	n/a	n/a	n/a	3860.0	3.0	1000.0	3000.0	n/a	n/a	n/a	6.11%	1.89%	-0.43%	4.75%	-4.97%	-5.09%
14	10/16/2003	2	1007	115.0	63130.0	61.7%	39041.4	n/a	n/a	n/a	3720.0	3.0	1000.0	3000.0	n/a	n/a	n/a	5.89%	-1.79%	-0.82%	4.75%	-4.96%	-5.09%
15	10/16/2003	1	1007	115.0	63130.0	61.7%	39041.4	n/a	n/a	n/a	3750.0	3.0	1000.0	3000.0	n/a	n/a	n/a	5.94%	-1.00%	-0.91%	4.75%	-4.96%	-5.07%
1	10/17/2003	2	1007	115.0	63180.0	61.7%	39072.4	n/a	n/a	n/a	3750.0	3.0	1000.0	3000.0	n/a	n/a	n/a	5.94%	-1.08%	-0.81%	4.75%	-5.03%	-5.06%
2	10/17/2003	2	1007	115.0	63200.0	61.7%	39084.7	n/a	n/a	n/a	3810.0	3.0	1000.0	3000.0	n/a	n/a	n/a	6.03%	0.47%	-0.61%	4.75%	-5.06%	-5.06%
3	10/17/2003	2	1007	115.0	63160.0	61.7%	39060.0	n/a	n/a	n/a	3860.0	3.0	1000.0	3000.0	n/a	n/a	n/a	6.11%	1.86%	-0.18%	4.75%	-5.00%	-5.06%
4	10/17/2003	1	1007	115.0	62920.0	61.7%	38911.6	n/a	n/a	n/a	3870.0	3.0	1000.0	3000.0	n/a	n/a	n/a	6.15%	2.51%	-0.19%	4.77%	-4.64%	-5.00%
5	10/17/2003	2	1007	115.0	62970.0	61.7%	38942.5	n/a	n/a	n/a	3800.0	3.0	1000.0	3000.0	n/a	n/a	n/a	6.03%	0.58%	0.01%	4.76%	-4.72%	-4.96%
6	10/17/2003	1	1007	115.0	63160.0	61.7%	39060.0	n/a	n/a	n/a	3700.0	3.0	1000.0	3000.0	n/a	n/a	n/a	5.86%	-2.36%	0.02%	4.75%	-5.00%	-4.95%
7	10/17/2003	2	1007	115.0	62580.0	61.7%	38701.3	n/a	n/a	n/a	3650.0	3.0	1000.0	3000.0	n/a	n/a	n/a	5.83%	-2.79%	-0.17%	4.79%	-4.12%	-4.85%
8	10/17/2003	1	1007	115.0	63500.0	61.7%	39270.3	n/a	n/a	n/a	3780.0	3.0	1000.0	3000.0	n/a	n/a	n/a	5.95%	-0.79%	-0.44%	4.72%	-5.51%	-4.90%
9	10/17/2003	2	1007	115.0	63220.0	61.7%	39097.1	n/a	n/a	n/a	3920.0	3.0	1000.0	3000.0	n/a	n/a	n/a	6.20%	3.34%	0.07%	4.75%	-5.09%	-4.91%
10	10/17/2003	1	1007	115.0	62850.0	61.7%	38868.3	n/a	n/a	n/a	3900.0	3.0	1000.0	3000.0	n/a	n/a	n/a	6.21%	3.42%	0.52%	4.77%	-4.53%	-4.87%
11	10/17/2003	2	1007	115.0	62950.0	61.7%	38930.1	n/a	n/a	n/a	3870.0	3.0	1000.0	3000.0	n/a	n/a	n/a	6.15%	2.46%	0.87%	4.77%	-4.69%	-4.84%
12	10/17/2003	1	1007	115.0	63020.0	61.7%	38973.4	n/a	n/a	n/a	3800.0	3.0	1000.0	3000.0	n/a	n/a	n/a	6.03%	0.50%	0.87%	4.76%	-4.79%	-4.81%
13	10/17/2003	2	1007	115.0	63220.0	61.7%	39097.1	n/a	n/a	n/a	3790.0	3.0	1000.0	3000.0	n/a	n/a	n/a	5.99%	-0.08%	0.68%	4.75%	-5.09%	-4.82%
14	10/17/2003	1	1007	115.0	62900.0	61.7%	38899.2	n/a	n/a	n/a	3840.0	3.0	1000.0	3000.0	n/a	n/a	n/a	6.10%	1.07%	0.60%	4.77%	-4.61%	-4.82%
15	10/17/2003	1	1007	115.0	63310.0	61.7%	39152.8	n/a	n/a	n/a	3700.0	3.0	1000.0	3000.0	n/a	n/a	n/a	5					

DATE: 1/7/2005

ENVIROCON, INC.  
RFS PHASE 2 REMEDIATION PROJECTQUALITY CONTROL TRACKING  
REAGENT DOSAGE

BATCH MIXING													SPEC REQUIREMENTS											
MIX INFORMATION				SOIL INFORMATION				LIMESTONE INFORMATION			CKD		CARBON INFORMATION			LIMESTONE			CKD			CARBON		
BAT NO.	DATE	BIN NO.	MIX DESIGN NO.	WET DENSITY (PCF)	WET WEIGHT (LBS)	MOIST CONT (%)	DRY WEIGHT (LBS)	WET WEIGHT (LBS)	MOIST CONT (%)	DRY WEIGHT (LBS)	WET WEIGHT (LBS)	NO. BAGS (LBS)	BAG WEIGHT (LBS)	TOTAL WEIGHT (LBS)	% LIME PER 100 LB CIND	EACH BATCH (+/- 20%)	AVER PER 10 (+/- 5%)	% CKD PER 100 LB CIND	EACH BATCH (+/- 20%)	AVER PER 10 (+/- 5%)	% CARB PER 100 LB CIND	EACH BATCH (+/- 20%)	AVER PER 10 (+/- 5%)	
18	10/17/2003	2	1007	115.0	63080.0	61.7%	39010.5	n/a	n/a	n/a	3700.0	3.0	1000.0	3000.0	n/a	n/a	n/a	5.87%	-2.24%	0.89%	4.76%	-4.88%	-4.90%	
19	10/17/2003	1	1007	115.0	63280.0	61.7%	39134.2	n/a	n/a	n/a	3840.0	3.0	1000.0	3000.0	n/a	n/a	n/a	6.07%	1.14%	0.66%	4.74%	-5.18%	-4.91%	
20	10/17/2003	2	1007	115.0	62870.0	61.7%	38880.6	n/a	n/a	n/a	3700.0	3.0	1000.0	3000.0	n/a	n/a	n/a	5.89%	-1.91%	0.13%	4.77%	-4.56%	-4.91%	
21	10/17/2003	1	1007	115.0	63210.0	61.7%	39090.9	n/a	n/a	n/a	3750.0	3.0	1000.0	3000.0	n/a	n/a	n/a	5.93%	-1.12%	-0.23%	4.75%	-5.08%	-4.95%	
22	10/17/2003	2	1007	115.0	63090.0	61.7%	39016.7	n/a	n/a	n/a	3750.0	3.0	1000.0	3000.0	n/a	n/a	n/a	5.94%	-0.94%	-0.37%	4.76%	-4.90%	-4.96%	
23	10/17/2003	1	1007	115.0	63210.0	61.7%	39090.9	n/a	n/a	n/a	3790.0	3.0	1000.0	3000.0	n/a	n/a	n/a	6.00%	-0.07%	-0.37%	4.75%	-5.08%	-4.96%	
24	10/17/2003	2	1007	115.0	62960.0	61.7%	38936.3	n/a	n/a	n/a	3890.0	3.0	1000.0	3000.0	n/a	n/a	n/a	6.18%	2.98%	-0.25%	4.76%	-4.70%	-4.97%	
25	10/17/2003	1	1007	115.0	63220.0	61.7%	39097.1	n/a	n/a	n/a	3890.0	3.0	1000.0	3000.0	n/a	n/a	n/a	6.15%	2.55%	0.27%	4.75%	-5.09%	-4.96%	
26	10/17/2003	2	1007	115.0	63230.0	61.7%	39103.3	n/a	n/a	n/a	3720.0	3.0	1000.0	3000.0	n/a	n/a	n/a	5.88%	-1.95%	0.26%	4.74%	-5.11%	-4.99%	
27	10/17/2003	1	1007	115.0	63320.0	61.7%	39158.9	n/a	n/a	n/a	3800.0	3.0	1000.0	3000.0	n/a	n/a	n/a	6.00%	0.02%	-0.15%	4.74%	-5.24%	-4.98%	
28	10/17/2003	2	1007	115.0	63190.0	61.7%	39078.5	n/a	n/a	n/a	3880.0	3.0	1000.0	3000.0	n/a	n/a	n/a	6.14%	2.34%	0.30%	4.75%	-5.05%	-5.00%	
29	10/17/2003	1	1007	115.0	62950.0	61.7%	38930.1	n/a	n/a	n/a	3800.0	3.0	1000.0	3000.0	n/a	n/a	n/a	6.04%	0.61%	0.25%	4.77%	-4.69%	-4.95%	
30	10/17/2003	2	1007	115.0	63260.0	61.7%	39121.8	n/a	n/a	n/a	3700.0	3.0	1000.0	3000.0	n/a	n/a	n/a	5.85%	-2.52%	0.19%	4.74%	-5.15%	-5.01%	
31	10/17/2003	1	1007	115.0	63150.0	61.7%	39053.8	n/a	n/a	n/a	3850.0	3.0	1000.0	3000.0	n/a	n/a	n/a	6.10%	1.61%	0.46%	4.75%	-4.99%	-5.00%	
32	10/17/2003	2	1007	115.0	63180.0	61.7%	39072.4	n/a	n/a	n/a	3900.0	3.0	1000.0	3000.0	n/a	n/a	n/a	6.17%	2.88%	0.85%	4.75%	-5.03%	-5.01%	
33	10/17/2003	1	1007	115.0	63260.0	61.7%	39121.8	n/a	n/a	n/a	3870.0	3.0	1000.0	3000.0	n/a	n/a	n/a	6.12%	1.96%	1.05%	4.74%	-5.15%	-5.02%	
1	10/18/2003	1	1007	115.0	62860.0	61.7%	38874.5	n/a	n/a	n/a	3810.0	3.0	1000.0	3000.0	n/a	n/a	n/a	6.06%	1.02%	0.85%	4.77%	-4.55%	-5.01%	
2	10/18/2003	2	1007	115.0	62720.0	61.7%	38787.9	n/a	n/a	n/a	3800.0	3.0	1000.0	3000.0	n/a	n/a	n/a	6.06%	0.98%	0.69%	4.78%	-4.34%	-4.93%	
3	10/18/2003	1	1007	115.0	63190.0	61.7%	39078.5	n/a	n/a	n/a	3910.0	3.0	1000.0	3000.0	n/a	n/a	n/a	6.19%	3.13%	1.20%	4.75%	-5.05%	-4.92%	
4	10/18/2003	2	1007	115.0	63100.0	61.7%	39022.9	n/a	n/a	n/a	3800.0	3.0	1000.0	3000.0	n/a	n/a	n/a	6.02%	0.37%	1.24%	4.75%	-4.91%	-4.89%	
5	10/18/2003	1	1007	115.0	62880.0	61.7%	38886.8	n/a	n/a	n/a	3790.0	3.0	1000.0	3000.0	n/a	n/a	n/a	6.03%	0.46%	1.05%	4.77%	-4.58%	-4.84%	
6	10/18/2003	2	1007	115.0	63340.0	61.7%	39171.3	n/a	n/a	n/a	3700.0	3.0	1000.0	3000.0	n/a	n/a	n/a	5.84%	-2.64%	0.72%	4.74%	-5.27%	-4.90%	
7	10/18/2003	1	1007	115.0	63260.0	61.7%	39121.8	n/a	n/a	n/a	3900.0	3.0	1000.0	3000.0	n/a	n/a	n/a	6.17%	2.75%	1.25%	4.74%	-5.15%	-4.90%	
8	10/18/2003	2	1007	115.0	62900.0	61.7%	38899.2	n/a	n/a	n/a	3850.0	3.0	1000.0	3000.0	n/a	n/a	n/a	6.12%	2.01%	1.29%	4.77%	-4.61%	-4.87%	
9	10/18/2003	1	1007	115.0	63130.0	61.7%	39041.4	n/a	n/a	n/a	3700.0	3.0	1000.0	3000.0	n/a	n/a	n/a	5.86%	-2.32%	0.77%	4.75%	-4.96%	-4.86%	
10	10/18/2003	2	1007	115.0	62890.0	61.7%	38893.0	n/a	n/a	n/a	3890.0	3.0	1000.0	3000.0	n/a	n/a	n/a	6.19%	3.09%	0.88%	4.77%	-4.60%	-4.80%	
11	10/18/2003	1	1007	115.0	63100.0	61.7%	39022.9	n/a	n/a	n/a	3710.0	3.0	1000.0	3000.0	n/a	n/a	n/a	5.88%	-2.01%	0.58%	4.75%	-4.91%	-4.84%	
12	10/18/2003	2	1007	115.0	63100.0	61.7%	39022.9	n/a	n/a	n/a	3650.0	3.0	1000.0	3000.0	n/a	n/a	n/a	5.78%	-3.59%	0.12%	4.75%	-4.91%	-4.90%	
13	10/18/2003	1	1007	115.0	63150.0	61.7%	39053.8	n/a	n/a	n/a	3870.0	3.0	1000.0	3000.0	n/a	n/a	n/a	6.13%	2.14%	0.03%	4.75%	-4.99%	-4.89%	
14	10/18/2003	2	1007	115.0	63180.0	61.7%	39072.4	n/a	n/a	n/a	4210.0	3.0	1000.0	3000.0	n/a	n/a	n/a	6.66%	-4.81%	-0.49%	4.75%	-5.03%	-4.90%	
15	10/18/2003	1	1007	115.0	62990.0	61.7%	38954.9	n/a	n/a	n/a	4180.0	3.0	1000.0	3000.0	n/a	n/a	n/a	6.64%	-5.20%	-1.06%	4.76%	-4.75%	-4.92%	
16	10/18/2003	2	1007	115.0	63250.0	61.7%	39115.6	n/a	n/a	n/a	4400.0	3.0	1000.0	3000.0	n/a	n/a	n/a	6.96%	-0.62%	-0.86%	4.74%	-5.14%	-4.90%	
17	10/18/2003	1	1007	115.0	63150.0	61.7%	39053.8	n/a	n/a	n/a	4250.0	3.0	1000.0	3000.0	n/a	n/a	n/a	6.73%	-3.86%	-1.52%	4.75%	-4.99%	-4.89%	
18	10/18/2003	2	1007	115.0	63170.0	61.7%	39066.2	n/a	n/a	n/a	4530.0	3.0	1000.0	3000.0	n/a	n/a	n/a	7.17%	2.44%	-1.47%	4.75%	-5.02%	-4.93%	
19	10/18/2003	1	1007	115.0	63040.0	61.7%	38985.8	n/a	n/a	n/a	4500.0	3.0	1000.0	3000.0	n/a	n/a	n/a	7.14%	1.98%	-1.04%	4.76%	-4.82%	-4.92%	
20	10/18/2003	2	1007	115.0	63100.0	61.7%	39022.9	n/a	n/a	n/a	4480.0	3.0	1000.0	3000.0	n/a	n/a	n/a	7.10%	1.43%	-1.21%	4.75%	-4.91%	-4.95%	
21	10/18/2003	1	1007	115.0	62880.0	61.7%	38886.8	n/a	n/a	n/a	4350.0	3.0	1000.0	3000.0	n/a	n/a	n/a	6.92%	-1.17%	-1.13%	4.77%	-4.58%	-4.91%	
22	10/18/2003	2	1007	115.0	63140.0	61.7%	39047.6	n/a	n/a	n/a	4150.0	3.0	1000.0	3000.0	n/a	n/a	n/a	6.57%	-6.10%	-1.38%	4.75%	-4.97%	-4.92%	
23	10/18/2003	1	1007	115.0	63260.0	61.7%	39121.8	n/a	n/a	n/a	4560.0	3.0	1000.0	3000.0	n/a	n/a	n/a	7.21%	2.98%	-1.29%	4.74%	-5.15%	-4.94%	
24	10/18/2003	2	1007	115.0	63130.0	61.7%	39041.4	n/a	n/a	n/a	4270.0	3.0	1000.0	3000.0	n/a	n/a	n/a	6.76%	-3.37%	-1.15%	4.75%	-4.96%	-4.93%	
25	10/18/2003	1	1007	115.0	63060.0	61.7%	38998.1	n/a	n/a	n/a	4650.0	3.0	1000.0	3000.0	n/a	n/a	n/a	7.37%	5.34%	-0.10%	4.76%	-4.85%	-4.94%	
26	10/18/2003	2	1007	115.0	63130.0	61.7%	39041.4	n/a	n/a	n/a	4440.0	3.0	1000.0	3000.0	n/a	n/a	n/a	7.03%	0.47%	0.01%	4.75%	-4.96%	-4.92%	
27	10/18/2003	1	1007	115.0	63010.0	61.7%	38967.2	n/a	n/a	n/a	4460.0	3.0	1000.0	3000.0	n/a	n/a	n/a	7.08%	1.12%	0.51%	4.76%	-4.78%	-4.90%	
28	10/18/2003	2	1007	115.0	63100.0	61.7%	39022.9	n/a	n/a	n/a	4380.0	3.0	1000.0	3000.0	n/a	n/a	n/a	6.94%	-0.84%	0.18%	4.75%	-4.91%	-4.89%	
29	10/18/2003	1	1007	115.0	63070.0	61.7%	39004.3	n/a	n/a	n/a	4350.0	3.0	1000.0	3000.0	n/a	n/a	n/a	6.90%	-1.47%	-0.16%	4.76%	-4.87%	-4.89%	
30	10/18/2003	2	1007	115.0	62760.0	61.7%	38812.6	n/a	n/a	n/a	4220.0	3.0	1000.0	3000.0	n/a	n/a	n/a	6.72%	-3.94%	-0.70%	4.78%	-4.40%	-4.84%	
31	10/18/2003	1	1007	115.0	63080.0	61.7%	39010.5	n/a	n/a	n/a	4240.0	3.0	1000.0	3000.0	n/a	n/a	n/a	6.72%	-3.98%	-0.98%	4.76%	-4.88%	-4.87%	
32	10/18/2003	2	1007	115.0	63420.0	61.7%	39220.8	n/a	n/a	n/a	4210.0	3.0	1000.0	3000.0	n/a	n/a	n/a	6.64%	-5.17%	-0.89%	4.73%	-5.39%	-4.92%	
33	10/18/2003	1	1007	115.0	62810.0	61.7%	38843.5	n/a	n/a	n/a	4260.0	3.0	1000.0	3000.0	n/a	n/a	n/a	6.78%	-3.11%	-1.49%	4.78%	-4.47%	-4.85%	
1	10/19/2003	1	1007	115.0	62830.0	61.7%	38855.9	n/a	n/a	n/a	4200.0	3.0	1000.0	3000.0	n/a	n/a	n/a	6.68%	11.41%	-0.02%	4.77%	-4.50%	-4.80%	
2	10/19/2003	2	1007	115.0	63130.0	61.7%	39041.4	n/a	n/a	n/a	3900.0	3.0	1000.0	3000.0	n/a	n/a	n/a	6.18%	2.96%	-0.25%	4.75%	-4.96%	-4.81%	
3	10/19/2003	1	1007	115.0	62950.0	61.7%	38930.1	n/a	n/a	n/a	3950.0	3.0	1000.0	3000.0	n/a	n/a	n/a	6.27%	4.58%	0.16%	4.77%	-4.69%	-4.79%	
4	10/19/2003	2	1007	115.0	63200.0	61.7%	39084.7	n/a	n/a	n/a	4060.0	3.0	1000.0	3000.0	n/a	n/a	n/a	6.42%	7.07%	0.75%	4.75%	-5.06%	-4.81%	
5	10/19/2003	1	1007	115.0	63090.0	61.7%	39016.7	n/a	n/a	n/a	4160.0	3.0	1000.0	3000.0	n/a	n/a	n/a	6.59%	9.90%	1.83%	4.76%	-4.90%	-4.81%	
6	10/19/2003	2	1007	115.0	62800.0	61.7%	38837.4	n/a	n/a	n/a	3940.0	3.0												



DATE: 1/7/2005

ENVIROCON, INC.  
RFS PHASE 2 REMEDIATION PROJECTQUALITY CONTROL TRACKING  
REAGENT DOSAGE

BATCH MIXING													SPEC REQUIREMENTS										
MIX INFORMATION				SOIL INFORMATION				LIMESTONE INFORMATION			CKD	CARBON INFORMATION			LIMESTONE			CKD			CARBON		
BAT NO.	DATE	BIN NO.	MIX DESIGN NO.	WET DENSITY (PCF)	WET WEIGHT (LBS)	MOIST CONT (%)	DRY WEIGHT (LBS)	WET WEIGHT (LBS)	MOIST CONT (%)	DRY WEIGHT (LBS)	WET WEIGHT (LBS)	NO. BAGS (LBS)	BAG WEIGHT (LBS)	TOTAL WEIGHT (LBS)	% LIME PER 100 LB CIND	EACH (+/- 20%)	AVER PER 10 (+/- 5%)	% CKD PER 100 LB CIND	EACH (+/- 20%)	AVER PER 10 (+/- 5%)	% CARB PER 100 LB CIND	EACH (+/- 20%)	AVER PER 10 (+/- 5%)
8	10/19/2003	2	1007	115.0	62860.0	61.7%	38874.5	n/a	n/a	n/a	3970.0	3.0	1000.0	3000.0	n/a	n/a	n/a	6.32%	5.26%	4.23%	4.77%	-4.55%	-4.74%
9	10/19/2003	1	1007	115.0	63260.0	61.7%	39121.8	n/a	n/a	n/a	4150.0	3.0	1000.0	3000.0	n/a	n/a	n/a	6.56%	9.34%	5.68%	4.74%	-5.15%	-4.72%
10	10/19/2003	2	1007	115.0	63050.0	61.7%	38992.0	n/a	n/a	n/a	3950.0	3.0	1000.0	3000.0	n/a	n/a	n/a	6.26%	4.41%	6.43%	4.76%	-4.84%	-4.76%
1	10/20/2003	2	1020	115.0	59890.0	21.6%	49251.6	3960.0	4.2%	3800.4	n/a	n/a	n/a	n/a	7.72%	2.88%	n/a	n/a	n/a	n/a	n/a	n/a	n/a
2	10/20/2003	2	1020	115.0	60040.0	21.6%	49375.0	3990.0	4.2%	3829.2	n/a	n/a	n/a	n/a	7.76%	3.40%	n/a	n/a	n/a	n/a	n/a	n/a	n/a
3	10/20/2003	2	1020	115.0	59930.0	21.6%	49284.5	4040.0	4.2%	3877.2	n/a	n/a	n/a	n/a	7.87%	4.89%	n/a	n/a	n/a	n/a	n/a	n/a	n/a
4	10/20/2003	2	1020	115.0	60130.0	21.6%	49449.0	3960.0	4.2%	3800.4	n/a	n/a	n/a	n/a	7.69%	2.47%	n/a	n/a	n/a	n/a	n/a	n/a	n/a
5	10/20/2003	2	1020	115.0	59930.0	21.6%	49284.5	3890.0	4.2%	3733.2	n/a	n/a	n/a	n/a	7.57%	1.00%	n/a	n/a	n/a	n/a	n/a	n/a	n/a
6	10/20/2003	2	1020	115.0	60030.0	21.6%	49366.8	4000.0	4.2%	3838.8	n/a	n/a	n/a	n/a	7.78%	3.68%	n/a	n/a	n/a	n/a	n/a	n/a	n/a
7	10/20/2003	2	1020	115.0	60090.0	21.6%	49416.1	4010.0	4.2%	3848.4	n/a	n/a	n/a	n/a	7.79%	3.84%	n/a	n/a	n/a	n/a	n/a	n/a	n/a
8	10/20/2003	2	1020	115.0	59840.0	21.6%	49210.5	4020.0	4.2%	3858.0	n/a	n/a	n/a	n/a	7.84%	4.53%	n/a	n/a	n/a	n/a	n/a	n/a	n/a
9	10/20/2003	1	1020	115.0	60160.0	21.6%	49473.7	3810.0	4.2%	3656.4	n/a	n/a	n/a	n/a	7.39%	-1.46%	n/a	n/a	n/a	n/a	n/a	n/a	n/a
10	10/20/2003	2	1020	115.0	59850.0	21.6%	49218.8	3870.0	4.2%	3714.0	n/a	n/a	n/a	n/a	7.55%	0.61%	2.58%	n/a	n/a	n/a	n/a	n/a	n/a
11	10/20/2003	1	1020	115.0	59780.0	21.6%	49161.2	4070.0	4.2%	3906.0	n/a	n/a	n/a	n/a	7.95%	5.94%	2.89%	n/a	n/a	n/a	n/a	n/a	n/a
12	10/20/2003	2	1020	115.0	60100.0	21.6%	49424.3	3890.0	4.2%	3733.2	n/a	n/a	n/a	n/a	7.55%	0.71%	2.62%	n/a	n/a	n/a	n/a	n/a	n/a
13	10/20/2003	1	1020	115.0	60030.0	21.6%	49366.8	3920.0	4.2%	3762.0	n/a	n/a	n/a	n/a	7.62%	1.61%	2.29%	n/a	n/a	n/a	n/a	n/a	n/a
14	10/20/2003	1	1020	115.0	59980.0	21.6%	49325.7	3960.0	4.2%	3800.4	n/a	n/a	n/a	n/a	7.70%	2.73%	2.32%	n/a	n/a	n/a	n/a	n/a	n/a
15	10/20/2003	1	1020	115.0	60140.0	21.6%	49457.2	4030.0	4.2%	3867.6	n/a	n/a	n/a	n/a	7.82%	4.27%	2.65%	n/a	n/a	n/a	n/a	n/a	n/a
16	10/20/2003	1	1020	115.0	59900.0	21.6%	49259.9	3880.0	4.2%	3723.6	n/a	n/a	n/a	n/a	7.56%	0.79%	2.36%	n/a	n/a	n/a	n/a	n/a	n/a
17	10/20/2003	1	1020	115.0	60050.0	21.6%	49383.2	3920.0	4.2%	3762.0	n/a	n/a	n/a	n/a	7.62%	1.57%	2.13%	n/a	n/a	n/a	n/a	n/a	n/a
18	10/20/2003	1	1020	115.0	59830.0	21.6%	49202.3	4080.0	4.2%	3915.5	n/a	n/a	n/a	n/a	7.96%	6.11%	2.29%	n/a	n/a	n/a	n/a	n/a	n/a
19	10/20/2003	1	1020	115.0	59970.0	21.6%	49317.4	3960.0	4.2%	3800.4	n/a	n/a	n/a	n/a	7.71%	2.75%	2.71%	n/a	n/a	n/a	n/a	n/a	n/a
20	10/20/2003	1	1020	115.0	59840.0	21.6%	49210.5	3990.0	4.2%	3829.2	n/a	n/a	n/a	n/a	7.78%	3.68%	3.02%	n/a	n/a	n/a	n/a	n/a	n/a
21	10/20/2003	1	1020	115.0	59700.0	21.6%	49095.4	4060.0	4.2%	3896.4	n/a	n/a	n/a	n/a	7.94%	5.82%	3.01%	n/a	n/a	n/a	n/a	n/a	n/a
22	10/20/2003	1	1020	115.0	59830.0	21.6%	49202.3	3890.0	4.2%	3733.2	n/a	n/a	n/a	n/a	7.59%	1.17%	3.06%	n/a	n/a	n/a	n/a	n/a	n/a
23	10/20/2003	1	1020	115.0	59760.0	21.6%	49144.7	4010.0	4.2%	3848.4	n/a	n/a	n/a	n/a	7.83%	4.41%	3.34%	n/a	n/a	n/a	n/a	n/a	n/a
24	10/20/2003	2	1020	115.0	59910.0	21.6%	49268.1	3960.0	4.2%	3800.4	n/a	n/a	n/a	n/a	7.71%	2.85%	3.35%	n/a	n/a	n/a	n/a	n/a	n/a
25	10/20/2003	1	1020	115.0	60030.0	21.6%	49366.8	4000.0	4.2%	3838.8	n/a	n/a	n/a	n/a	7.78%	3.68%	3.29%	n/a	n/a	n/a	n/a	n/a	n/a
26	10/20/2003	2	1020	115.0	60220.0	21.6%	49523.0	4050.0	4.2%	3886.8	n/a	n/a	n/a	n/a	7.85%	4.65%	3.67%	n/a	n/a	n/a	n/a	n/a	n/a
27	10/20/2003	1	1020	115.0	59720.0	21.6%	49111.8	3880.0	4.2%	3723.6	n/a	n/a	n/a	n/a	7.58%	1.09%	3.63%	n/a	n/a	n/a	n/a	n/a	n/a
28	10/20/2003	2	1020	115.0	59980.0	21.6%	49325.7	3850.0	4.2%	3694.8	n/a	n/a	n/a	n/a	7.49%	-0.12%	3.00%	n/a	n/a	n/a	n/a	n/a	n/a
29	10/20/2003	1	1020	115.0	59890.0	21.6%	49251.6	4070.0	4.2%	3906.0	n/a	n/a	n/a	n/a	7.93%	5.74%	3.30%	n/a	n/a	n/a	n/a	n/a	n/a
30	10/20/2003	2	1020	115.0	59910.0	21.6%	49268.1	4050.0	4.2%	3886.8	n/a	n/a	n/a	n/a	7.89%	5.19%	3.45%	n/a	n/a	n/a	n/a	n/a	n/a
31	10/20/2003	1	1020	115.0	60000.0	21.6%	49342.1	4000.0	4.2%	3838.8	n/a	n/a	n/a	n/a	7.78%	3.73%	3.24%	n/a	n/a	n/a	n/a	n/a	n/a
32	10/20/2003	2	1020	115.0	59910.0	21.6%	49268.1	3860.0	4.2%	3704.4	n/a	n/a	n/a	n/a	7.52%	0.25%	3.15%	n/a	n/a	n/a	n/a	n/a	n/a
33	10/20/2003	1	1020	115.0	60020.0	21.6%	49358.6	3950.0	4.2%	3790.8	n/a	n/a	n/a	n/a	7.68%	2.40%	2.95%	n/a	n/a	n/a	n/a	n/a	n/a
34	10/20/2003	2	1020	115.0	60090.0	21.6%	49416.1	4080.0	4.2%	3915.5	n/a	n/a	n/a	n/a	7.92%	5.65%	3.23%	n/a	n/a	n/a	n/a	n/a	n/a
35	10/20/2003	1	1020	115.0	59830.0	21.6%	49202.3	3920.0	4.2%	3762.0	n/a	n/a	n/a	n/a	7.65%	1.95%	3.05%	n/a	n/a	n/a	n/a	n/a	n/a
36	10/20/2003	2	1020	115.0	59900.0	21.6%	49259.9	4080.0	4.2%	3915.5	n/a	n/a	n/a	n/a	7.95%	5.98%	3.19%	n/a	n/a	n/a	n/a	n/a	n/a
37	10/20/2003	1	1020	115.0	60030.0	21.6%	49366.8	3850.0	4.2%	3694.8	n/a	n/a	n/a	n/a	7.48%	-0.21%	3.06%	n/a	n/a	n/a	n/a	n/a	n/a
38	10/20/2003	2	1020	115.0	59930.0	21.6%	49284.5	4000.0	4.2%	3838.8	n/a	n/a	n/a	n/a	7.79%	3.85%	3.45%	n/a	n/a	n/a	n/a	n/a	n/a
39	10/20/2003	1	1020	115.0	60060.0	21.6%	49391.4	3900.0	4.2%	3742.8	n/a	n/a	n/a	n/a	7.58%	1.04%	2.98%	n/a	n/a	n/a	n/a	n/a	n/a
40	10/20/2003	1	1020	115.0	59980.0	21.6%	49325.7	3890.0	4.2%	3733.2	n/a	n/a	n/a	n/a	7.57%	0.91%	2.56%	n/a	n/a	n/a	n/a	n/a	n/a
41	10/20/2003	2	1020	115.0	59940.0	21.6%	49292.8	3970.0	4.2%	3810.0	n/a	n/a	n/a	n/a	7.73%	3.06%	2.49%	n/a	n/a	n/a	n/a	n/a	n/a
42	10/20/2003	1	1020	115.0	60060.0	21.6%	49391.4	3880.0	4.2%	3723.6	n/a	n/a	n/a	n/a	7.54%	0.52%	2.52%	n/a	n/a	n/a	n/a	n/a	n/a
43	10/20/2003	2	1020	115.0	59730.0	21.6%	49120.1	4030.0	4.2%	3867.6	n/a	n/a	n/a	n/a	7.87%	4.98%	2.77%	n/a	n/a	n/a	n/a	n/a	n/a
44	10/20/2003	1	1020	115.0	60060.0	21.6%	49391.4	4020.0	4.2%	3858.0	n/a	n/a	n/a	n/a	7.81%	4.15%	2.62%	n/a	n/a	n/a	n/a	n/a	n/a
45	10/20/2003	2	1020	115.0	59980.0	21.6%	49325.7	4030.0	4.2%	3867.6	n/a	n/a	n/a	n/a	7.84%	4.54%	2.88%	n/a	n/a	n/a	n/a	n/a	n/a
46	10/20/2003	1	1020	115.0	60350.0	21.6%	49629.9	4010.0	4.2%	3848.4	n/a	n/a	n/a	n/a	7.75%	3.39%	2.62%	n/a	n/a	n/a	n/a	n/a	n/a
47	10/20/2003	2	1020	115.0	60140.0	21.6%	49457.2	3850.0	4.2%	3694.8	n/a	n/a	n/a	n/a	7.47%	-0.39%	2.61%	n/a	n/a	n/a	n/a	n/a	n/a
48	10/20/2003	1	1020	115.0	60000.0	21.6%	49342.1	4030.0	4.2%	3867.6	n/a	n/a	n/a	n/a	7.84%	4.51%	2.67%	n/a	n/a	n/a	n/a	n/a	n/a
1	10/21/2003	1	1020	115.0	59900.0	21.6%	49259.9	4030.0	4.2%	3867.6	n/a	n/a	n/a	n/a	7.85%	4.68%	3.04%	n/a	n/a	n/a	n/a	n/a	n/a
2	10/21/2003	1	1020	115.0	59890.0	21.6%	49251.6	3950.0	4.2%	3790.8	n/a	n/a	n/a	n/a	7.70%	2.62%	3.21%	n/a	n/a	n/a	n/a	n/a	n/a
3	10/21/2003	1	1020	115.0	59740.0	21.6%	49128.3	4030.0	4.2%	3867.6	n/a	n/a	n/a	n/a	7.87%	4.96%	3.40%	n/a	n/a	n/a	n/a	n/a	n/a
4	10/21/2003	1	1020	115.0	60040.0	21.6%	49375.0	3990.0	4.2%	3829.2	n/a	n/a	n/a	n/a	7.76%	3.40%	3.69%	n/a	n/a	n/a	n/a	n/a	n/a
5	10/21/2003	1	1020	115.0	60000.0	21.6%	49342.1	3880.0	4.2%	3723.6	n/a	n/a	n/a	n/a	7.55%	0.62%	3.25%	n/a	n/a	n/a	n/a	n/a	n/a

DATE: 1/7/2005

ENVIROCON, INC.  
RFS PHASE 2 REMEDIATION PROJECT

QUALITY CONTROL TRACKING  
REAGENT DOSAGE

BATCH MIXING													SPEC REQUIREMENTS										
MIX INFORMATION				SOIL INFORMATION				LIMESTONE INFORMATION			CKD	CARBON INFORMATION			LIMESTONE			CKD			CARBON		
BAT NO.	DATE	BIN NO.	MIX DESIGN NO.	WET DENSITY (PCF)	WET WEIGHT (LBS)	MOIST CONT (%)	DRY WEIGHT (LBS)	WET WEIGHT (LBS)	MOIST CONT (%)	DRY WEIGHT (LBS)	WET WEIGHT (LBS)	NO. BAGS (LBS)	BAG WEIGHT (LBS)	TOTAL WEIGHT (LBS)	% LIME PER 100 LB CIND	EACH BATCH (+/- 20%)	AVER PER 10 (+/- 5%)	% CKD PER 100 LB CIND	EACH BATCH (+/- 20%)	AVER PER 10 (+/- 5%)	% CARB PER 100 LB CIND	EACH BATCH (+/- 20%)	AVER PER 10 (+/- 5%)
6	10/21/2003	1	1020	115.0	59800.0	21.6%	49177.6	3990.0	4.2%	3829.2	n/a	n/a	n/a	n/a	7.79%	3.82%	3.22%	n/a	n/a	n/a	n/a	n/a	n/a
7	10/21/2003	1	1020	115.0	60110.0	21.6%	49432.6	3990.0	4.2%	3829.2	n/a	n/a	n/a	n/a	7.75%	3.28%	3.09%	n/a	n/a	n/a	n/a	n/a	n/a
8	10/21/2003	1	1020	115.0	60150.0	21.6%	49465.5	4000.0	4.2%	3838.8	n/a	n/a	n/a	n/a	7.76%	3.47%	3.10%	n/a	n/a	n/a	n/a	n/a	n/a
9	10/21/2003	1	1020	115.0	59750.0	21.6%	49136.5	3900.0	4.2%	3742.8	n/a	n/a	n/a	n/a	7.62%	1.56%	3.29%	n/a	n/a	n/a	n/a	n/a	n/a
10	10/21/2003	1	1020	115.0	59950.0	21.6%	49301.0	3910.0	4.2%	3752.4	n/a	n/a	n/a	n/a	7.61%	1.48%	2.99%	n/a	n/a	n/a	n/a	n/a	n/a
11	10/21/2003	1	1020	115.0	59750.0	21.6%	49136.5	3850.0	4.2%	3694.8	n/a	n/a	n/a	n/a	7.52%	0.26%	2.55%	n/a	n/a	n/a	n/a	n/a	n/a
12	10/21/2003	1	1020	115.0	59800.0	21.6%	49177.6	3900.0	4.2%	3742.8	n/a	n/a	n/a	n/a	7.61%	1.48%	2.43%	n/a	n/a	n/a	n/a	n/a	n/a
13	10/21/2003	1	1020	115.0	60000.0	21.6%	49342.1	3940.0	4.2%	3781.2	n/a	n/a	n/a	n/a	7.66%	2.18%	2.16%	n/a	n/a	n/a	n/a	n/a	n/a
14	10/21/2003	1	1020	115.0	59960.0	21.6%	49309.2	3970.0	4.2%	3810.0	n/a	n/a	n/a	n/a	7.73%	3.02%	2.12%	n/a	n/a	n/a	n/a	n/a	n/a
15	10/21/2003	1	1020	115.0	60070.0	21.6%	49399.7	4000.0	4.2%	3838.8	n/a	n/a	n/a	n/a	7.77%	3.61%	2.42%	n/a	n/a	n/a	n/a	n/a	n/a
16	10/21/2003	1	1020	115.0	59810.0	21.6%	49185.9	4030.0	4.2%	3867.6	n/a	n/a	n/a	n/a	7.86%	4.84%	2.52%	n/a	n/a	n/a	n/a	n/a	n/a
17	10/21/2003	1	1020	115.0	60050.0	21.6%	49383.2	3800.0	4.2%	3646.8	n/a	n/a	n/a	n/a	7.38%	-1.54%	2.04%	n/a	n/a	n/a	n/a	n/a	n/a
18	10/21/2003	1	1020	115.0	60140.0	21.6%	49457.2	3880.0	4.2%	3723.6	n/a	n/a	n/a	n/a	7.53%	0.39%	1.73%	n/a	n/a	n/a	n/a	n/a	n/a
19	10/21/2003	1	1020	115.0	60180.0	21.6%	49490.1	3950.0	4.2%	3790.8	n/a	n/a	n/a	n/a	7.66%	2.13%	1.79%	n/a	n/a	n/a	n/a	n/a	n/a
20	10/21/2003	2	1020	115.0	60200.0	21.6%	49506.6	4050.0	4.2%	3886.8	n/a	n/a	n/a	n/a	7.85%	4.68%	2.10%	n/a	n/a	n/a	n/a	n/a	n/a
21	10/21/2003	1	1020	115.0	60110.0	21.6%	49432.6	3950.0	4.2%	3790.8	n/a	n/a	n/a	n/a	7.67%	2.25%	2.30%	n/a	n/a	n/a	n/a	n/a	n/a
22	10/21/2003	2	1020	115.0	60100.0	21.6%	49424.3	3810.0	4.2%	3656.4	n/a	n/a	n/a	n/a	7.40%	-1.36%	2.02%	n/a	n/a	n/a	n/a	n/a	n/a
23	10/21/2003	1	1020	115.0	59750.0	21.6%	49136.5	4050.0	4.2%	3886.8	n/a	n/a	n/a	n/a	7.91%	5.47%	2.35%	n/a	n/a	n/a	n/a	n/a	n/a
24	10/21/2003	2	1020	115.0	60000.0	21.6%	49342.1	3850.0	4.2%	3694.8	n/a	n/a	n/a	n/a	7.49%	-0.16%	2.03%	n/a	n/a	n/a	n/a	n/a	n/a
25	10/21/2003	1	1020	115.0	59840.0	21.6%	49210.5	3900.0	4.2%	3742.8	n/a	n/a	n/a	n/a	7.61%	1.41%	1.81%	n/a	n/a	n/a	n/a	n/a	n/a
26	10/21/2003	2	1020	115.0	59800.0	21.6%	49177.6	3910.0	4.2%	3752.4	n/a	n/a	n/a	n/a	7.63%	1.74%	1.50%	n/a	n/a	n/a	n/a	n/a	n/a
27	10/21/2003	1	1020	115.0	59980.0	21.6%	49325.7	4000.0	4.2%	3838.8	n/a	n/a	n/a	n/a	7.78%	3.77%	2.03%	n/a	n/a	n/a	n/a	n/a	n/a
28	10/21/2003	2	1020	115.0	59850.0	21.6%	49218.8	3830.0	4.2%	3675.6	n/a	n/a	n/a	n/a	7.47%	-0.43%	1.95%	n/a	n/a	n/a	n/a	n/a	n/a
29	10/21/2003	1	1020	115.0	59930.0	21.6%	49284.5	3970.0	4.2%	3810.0	n/a	n/a	n/a	n/a	7.73%	3.07%	2.04%	n/a	n/a	n/a	n/a	n/a	n/a
30	10/21/2003	2	1020	115.0	60080.0	21.6%	49407.9	3830.0	4.2%	3675.6	n/a	n/a	n/a	n/a	7.44%	-0.81%	1.50%	n/a	n/a	n/a	n/a	n/a	n/a
31	10/21/2003	1	1020	115.0	60200.0	21.6%	49506.6	4020.0	4.2%	3858.0	n/a	n/a	n/a	n/a	7.79%	3.90%	1.66%	n/a	n/a	n/a	n/a	n/a	n/a
1	10/22/2003	1	1022	115.0	63180.0	26.0%	50142.9	n/a	n/a	n/a	3800.0	3.0	1000.0	3000.0	n/a	n/a	n/a	6.01%	0.24%	n/a	4.75%	-5.03%	n/a
2	10/22/2003	2	1022	115.0	63040.0	26.0%	50031.7	n/a	n/a	n/a	3880.0	3.0	1000.0	3000.0	n/a	n/a	n/a	6.15%	2.58%	n/a	4.76%	-4.82%	n/a
3	10/22/2003	1	1022	115.0	63000.0	26.0%	50000.0	n/a	n/a	n/a	3960.0	3.0	1000.0	3000.0	n/a	n/a	n/a	6.29%	4.76%	n/a	4.76%	-4.76%	n/a
4	10/22/2003	2	1022	115.0	63230.0	26.0%	50182.5	n/a	n/a	n/a	3890.0	3.0	1000.0	3000.0	n/a	n/a	n/a	6.15%	2.54%	n/a	4.74%	-5.11%	n/a
5	10/22/2003	1	1022	115.0	62730.0	26.0%	49785.7	n/a	n/a	n/a	3880.0	3.0	1000.0	3000.0	n/a	n/a	n/a	6.19%	3.09%	n/a	4.78%	-4.35%	n/a
6	10/22/2003	2	1022	115.0	63180.0	26.0%	50142.9	n/a	n/a	n/a	3910.0	3.0	1000.0	3000.0	n/a	n/a	n/a	6.19%	3.14%	n/a	4.75%	-5.03%	n/a
7	10/22/2003	1	1022	115.0	62830.0	26.0%	49865.1	n/a	n/a	n/a	3740.0	3.0	1000.0	3000.0	n/a	n/a	n/a	5.95%	-0.79%	n/a	4.77%	-4.50%	n/a
8	10/22/2003	2	1022	115.0	63270.0	26.0%	50214.3	n/a	n/a	n/a	3870.0	3.0	1000.0	3000.0	n/a	n/a	n/a	6.12%	1.94%	n/a	4.74%	-5.17%	n/a
9	10/22/2003	1	1022	115.0	63260.0	26.0%	50206.3	n/a	n/a	n/a	3820.0	3.0	1000.0	3000.0	n/a	n/a	n/a	6.04%	0.64%	n/a	4.74%	-5.15%	n/a
10	10/22/2003	1	1022	115.0	62760.0	26.0%	49809.5	n/a	n/a	n/a	3810.0	3.0	1000.0	3000.0	n/a	n/a	n/a	6.07%	1.18%	1.93%	4.78%	-4.40%	-4.83%
11	10/22/2003	2	1022	115.0	63490.0	26.0%	50388.9	n/a	n/a	n/a	3860.0	3.0	1000.0	3000.0	n/a	n/a	n/a	6.08%	1.33%	2.04%	4.73%	-5.50%	-4.88%
12	10/22/2003	1	1022	115.0	63890.0	26.0%	50706.3	n/a	n/a	n/a	3950.0	3.0	1000.0	3000.0	n/a	n/a	n/a	6.18%	3.04%	2.09%	4.70%	-6.09%	-5.01%
13	10/22/2003	2	1022	115.0	63280.0	26.0%	50222.2	n/a	n/a	n/a	3750.0	3.0	1000.0	3000.0	n/a	n/a	n/a	5.93%	-1.23%	1.49%	4.74%	-5.18%	-5.05%
14	10/22/2003	1	1022	115.0	62880.0	26.0%	49904.8	n/a	n/a	n/a	3780.0	3.0	1000.0	3000.0	n/a	n/a	n/a	6.01%	0.19%	1.25%	4.77%	-4.58%	-5.00%
15	10/22/2003	2	1022	115.0	63180.0	26.0%	50142.9	n/a	n/a	n/a	3850.0	3.0	1000.0	3000.0	n/a	n/a	n/a	6.09%	1.56%	1.10%	4.75%	-5.03%	-5.06%
16	10/22/2003	1	1022	115.0	63320.0	26.0%	50254.0	n/a	n/a	n/a	3880.0	3.0	1000.0	3000.0	n/a	n/a	n/a	6.13%	2.13%	1.00%	4.74%	-5.24%	-5.08%
17	10/22/2003	2	1022	115.0	63270.0	26.0%	50214.3	n/a	n/a	n/a	3860.0	3.0	1000.0	3000.0	n/a	n/a	n/a	6.10%	1.68%	1.25%	4.74%	-5.17%	-5.15%
18	10/22/2003	1	1022	115.0	62470.0	26.0%	49579.4	n/a	n/a	n/a	3890.0	3.0	1000.0	3000.0	n/a	n/a	n/a	6.23%	3.78%	1.43%	4.80%	-3.95%	-5.03%
19	10/22/2003	2	1022	115.0	63040.0	26.0%	50031.7	n/a	n/a	n/a	3850.0	3.0	1000.0	3000.0	n/a	n/a	n/a	6.11%	1.79%	1.54%	4.76%	-4.82%	-5.00%
20	10/22/2003	1	1022	115.0	63660.0	26.0%	50523.8	n/a	n/a	n/a	3870.0	3.0	1000.0	3000.0	n/a	n/a	n/a	6.08%	1.32%	1.56%	4.71%	-5.75%	-5.13%
21	10/22/2003	2	1022	115.0	63010.0	26.0%	50007.9	n/a	n/a	n/a	3720.0	3.0	1000.0	3000.0	n/a	n/a	n/a	5.90%	-1.60%	1.27%	4.76%	-4.78%	-5.06%
22	10/22/2003	1	1022	115.0	62810.0	26.0%	49849.2	n/a	n/a	n/a	3860.0	3.0	1000.0	3000.0	n/a	n/a	n/a	6.15%	2.43%	1.20%	4.78%	-4.47%	-4.90%
23	10/22/2003	1	1022	115.0	63080.0	26.0%	50063.5	n/a	n/a	n/a	3910.0	3.0	1000.0	3000.0	n/a	n/a	n/a	6.20%	3.31%	1.66%	4.76%	-4.88%	-4.87%
24	10/22/2003	2	1022	115.0	63540.0	26.0%	50428.6	n/a	n/a	n/a	3900.0	3.0	1000.0	3000.0	n/a	n/a	n/a	6.14%	2.30%	1.87%	4.72%	-5.57%	-4.97%
25	10/22/2003	1	1022	115.0	63280.0	26.0%	50222.2	n/a	n/a	n/a	3830.0	3.0	1000.0	3000.0	n/a	n/a	n/a	6.05%	0.87%	1.80%	4.74%	-5.18%	-4.98%
26	10/22/2003	1	1022	115.0	63780.0	26.0%	50619.0	n/a	n/a	n/a	3820.0	3.0	1000.0	3000.0	n/a	n/a	n/a	5.99%	-0.18%	1.57%	4.70%	-5.93%	-5.05%
27	10/22/2003	2	1022	115.0	63260.0	26.0%	50206.3	n/a	n/a	n/a	3740.0	3.0	1000.0	3000.0	n/a	n/a	n/a	5.91%	-1.46%	1.25%	4.74%	-5.15%	-5.05%
28	10/22/2003	1	1022	115.0	63380.0	26.0%	50301.6	n/a	n/a	n/a	3830.0	3.0	1000.0	3000.0	n/a	n/a	n/a	6.04%	0.72%	0.95%	4.73%	-5.33%	-5.19%
29	10/22/2003	2	1022	115.0	63720.0	26.0%	50571.4	n/a	n/a	n/a	3720.0	3.0	1000.0	3000.0	n/a	n/a	n/a	5.84%	-2.70%	0.50%	4.71%	-5.84%	-5.29%
30	10/22/2003	1	1022	115.0	63150.0	26.0%	50119.0	n/a	n/a	n/a	3740.0	3.0	1000.0	3000.0	n/a	n/a	n/a	5.92%	-1.29%	0.24%	4.75%	-4.99%	-5.21%

DATE: 1/7/2005

ENVIROCON, INC.  
RFS PHASE 2 REMEDIATION PROJECT

QUALITY CONTROL TRACKING  
REAGENT DOSAGE

BATCH MIXING														SPEC REQUIREMENTS									
MIX INFORMATION				SOIL INFORMATION				LIMESTONE INFORMATION			CKD	CARBON INFORMATION			LIMESTONE			CKD			CARBON		
BAT NO.	DATE	BIN NO.	MIX DESIGN NO.	WET DENSITY (PCF)	WET WEIGHT (LBS)	MOIST CONT (%)	DRY WEIGHT (LBS)	WET WEIGHT (LBS)	MOIST CONT (%)	DRY WEIGHT (LBS)	WET WEIGHT (LBS)	NO. BAGS (LBS)	BAG WEIGHT (LBS)	TOTAL WEIGHT (LBS)	% LIME PER 100 LB CIND	EACH BATCH (+/- 20%)	AVER PER 10 (+/- 5%)	% CKD PER 100 LB CIND	EACH BATCH (+/- 20%)	AVER PER 10 (+/- 5%)	% CARB PER 100 LB CIND	EACH BATCH (+/- 20%)	AVER PER 10 (+/- 5%)
31	10/22/2003	2	1022	115.0	63650.0	26.0%	50515.9	n/a	n/a	n/a	3710.0	3.0	1000.0	3000.0	n/a	n/a	n/a	5.83%	-2.85%	0.11%	4.71%	-5.73%	-5.31%
32	10/22/2003	1	1022	115.0	62840.0	26.0%	49873.0	n/a	n/a	n/a	3870.0	3.0	1000.0	3000.0	n/a	n/a	n/a	6.16%	2.64%	0.13%	4.77%	-4.52%	-5.31%
33	10/22/2003	2	1022	115.0	63400.0	26.0%	50317.5	n/a	n/a	n/a	3770.0	3.0	1000.0	3000.0	n/a	n/a	n/a	5.95%	-0.89%	-0.29%	4.73%	-5.36%	-5.36%
34	10/22/2003	1	1022	115.0	62760.0	26.0%	49809.5	n/a	n/a	n/a	3900.0	3.0	1000.0	3000.0	n/a	n/a	n/a	6.21%	3.57%	-0.16%	4.78%	-4.40%	-5.24%
35	10/22/2003	2	1022	115.0	63000.0	26.0%	50000.0	n/a	n/a	n/a	3740.0	3.0	1000.0	3000.0	n/a	n/a	n/a	5.94%	-1.06%	-0.35%	4.76%	-4.76%	-5.20%
1	10/23/2003	1	1022	115.0	63170.0	26.0%	50134.9	n/a	n/a	n/a	3870.0	3.0	1000.0	3000.0	n/a	n/a	n/a	6.13%	2.11%	-0.12%	4.75%	-5.02%	-5.11%
2	10/23/2003	2	1022	115.0	63080.0	26.0%	50063.5	n/a	n/a	n/a	3850.0	3.0	1000.0	3000.0	n/a	n/a	n/a	6.10%	1.72%	0.20%	4.76%	-4.88%	-5.08%
3	10/23/2003	1	1022	115.0	63180.0	26.0%	50142.9	n/a	n/a	n/a	3820.0	3.0	1000.0	3000.0	n/a	n/a	n/a	6.05%	0.77%	0.20%	4.75%	-5.03%	-5.05%
4	10/23/2003	1	1022	115.0	62940.0	26.0%	49952.4	n/a	n/a	n/a	3700.0	3.0	1000.0	3000.0	n/a	n/a	n/a	5.88%	-2.02%	0.27%	4.77%	-4.67%	-4.94%
5	10/23/2003	2	1022	115.0	62960.0	26.0%	49968.3	n/a	n/a	n/a	3790.0	3.0	1000.0	3000.0	n/a	n/a	n/a	6.02%	0.33%	0.43%	4.76%	-4.70%	-4.91%
6	10/23/2003	1	1022	115.0	62950.0	26.0%	49960.3	n/a	n/a	n/a	3850.0	3.0	1000.0	3000.0	n/a	n/a	n/a	6.12%	1.93%	0.91%	4.77%	-4.69%	-4.80%
7	10/23/2003	2	1022	115.0	63160.0	26.0%	50127.0	n/a	n/a	n/a	3730.0	3.0	1000.0	3000.0	n/a	n/a	n/a	5.91%	-1.57%	0.49%	4.75%	-5.00%	-4.85%
8	10/23/2003	1	1022	115.0	63320.0	26.0%	50254.0	n/a	n/a	n/a	3900.0	3.0	1000.0	3000.0	n/a	n/a	n/a	6.16%	2.65%	0.84%	4.74%	-5.24%	-4.84%
9	10/23/2003	2	1022	115.0	62890.0	26.0%	49912.7	n/a	n/a	n/a	3860.0	3.0	1000.0	3000.0	n/a	n/a	n/a	6.14%	2.30%	0.72%	4.77%	-4.60%	-4.86%
10	10/23/2003	1	1022	115.0	63050.0	26.0%	50039.7	n/a	n/a	n/a	3830.0	3.0	1000.0	3000.0	n/a	n/a	n/a	6.07%	1.24%	0.95%	4.76%	-4.84%	-4.87%
11	10/23/2003	2	1022	115.0	63250.0	26.0%	50198.4	n/a	n/a	n/a	3850.0	3.0	1000.0	3000.0	n/a	n/a	n/a	6.09%	1.45%	0.88%	4.74%	-5.14%	-4.88%
12	10/23/2003	1	1022	115.0	62940.0	26.0%	49952.4	n/a	n/a	n/a	3870.0	3.0	1000.0	3000.0	n/a	n/a	n/a	6.15%	2.48%	0.96%	4.77%	-4.67%	-4.86%
13	10/23/2003	2	1022	115.0	62900.0	26.0%	49920.6	n/a	n/a	n/a	3830.0	3.0	1000.0	3000.0	n/a	n/a	n/a	6.09%	1.48%	1.03%	4.77%	-4.61%	-4.82%
14	10/23/2003	1	1022	115.0	63290.0	26.0%	50230.2	n/a	n/a	n/a	3770.0	3.0	1000.0	3000.0	n/a	n/a	n/a	5.96%	-0.72%	1.16%	4.74%	-5.20%	-4.87%
15	10/23/2003	2	1022	115.0	63130.0	26.0%	50103.2	n/a	n/a	n/a	3810.0	3.0	1000.0	3000.0	n/a	n/a	n/a	6.04%	0.59%	1.18%	4.75%	-4.96%	-4.89%
16	10/23/2003	1	1022	115.0	63310.0	26.0%	50246.0	n/a	n/a	n/a	3870.0	3.0	1000.0	3000.0	n/a	n/a	n/a	6.11%	1.88%	1.18%	4.74%	-5.23%	-4.95%
17	10/23/2003	2	1022	115.0	62800.0	26.0%	49841.3	n/a	n/a	n/a	3780.0	3.0	1000.0	3000.0	n/a	n/a	n/a	6.02%	0.32%	1.37%	4.78%	-4.46%	-4.89%
18	10/23/2003	1	1022	115.0	63260.0	26.0%	50206.3	n/a	n/a	n/a	3800.0	3.0	1000.0	3000.0	n/a	n/a	n/a	6.01%	0.12%	1.11%	4.74%	-5.15%	-4.88%
19	10/23/2003	2	1022	115.0	63180.0	26.0%	50142.9	n/a	n/a	n/a	3900.0	3.0	1000.0	3000.0	n/a	n/a	n/a	6.17%	2.88%	1.17%	4.75%	-5.03%	-4.93%
20	10/23/2003	1	1022	115.0	63110.0	26.0%	50087.3	n/a	n/a	n/a	3700.0	3.0	1000.0	3000.0	n/a	n/a	n/a	5.86%	-2.29%	0.82%	4.75%	-4.93%	-4.94%
21	10/23/2003	1	1022	115.0	63240.0	26.0%	50190.5	n/a	n/a	n/a	3940.0	3.0	1000.0	3000.0	n/a	n/a	n/a	6.23%	3.84%	1.06%	4.74%	-5.12%	-4.94%
22	10/23/2003	2	1022	115.0	63260.0	26.0%	50206.3	n/a	n/a	n/a	3820.0	3.0	1000.0	3000.0	n/a	n/a	n/a	6.04%	0.64%	0.87%	4.74%	-5.15%	-4.98%
23	10/23/2003	1	1022	115.0	63170.0	26.0%	50134.9	n/a	n/a	n/a	3850.0	3.0	1000.0	3000.0	n/a	n/a	n/a	6.09%	1.58%	0.88%	4.75%	-5.02%	-5.03%
24	10/23/2003	2	1022	115.0	62700.0	26.0%	49761.9	n/a	n/a	n/a	3850.0	3.0	1000.0	3000.0	n/a	n/a	n/a	6.14%	2.34%	1.19%	4.78%	-4.31%	-4.94%
25	10/23/2003	1	1022	115.0	63280.0	26.0%	50222.2	n/a	n/a	n/a	3830.0	3.0	1000.0	3000.0	n/a	n/a	n/a	6.05%	0.87%	1.22%	4.74%	-5.18%	-4.96%
26	10/23/2003	1	1022	115.0	63330.0	26.0%	50261.9	n/a	n/a	n/a	3760.0	3.0	1000.0	3000.0	n/a	n/a	n/a	5.94%	-1.05%	0.93%	4.74%	-5.26%	-4.96%
27	10/23/2003	2	1022	115.0	63030.0	26.0%	50023.8	n/a	n/a	n/a	3810.0	3.0	1000.0	3000.0	n/a	n/a	n/a	6.04%	0.75%	0.97%	4.76%	-4.81%	-5.00%
28	10/23/2003	1	1022	115.0	63320.0	26.0%	50254.0	n/a	n/a	n/a	3890.0	3.0	1000.0	3000.0	n/a	n/a	n/a	6.14%	2.39%	1.20%	4.74%	-5.24%	-5.01%
29	10/23/2003	2	1022	115.0	63230.0	26.0%	50182.5	n/a	n/a	n/a	3700.0	3.0	1000.0	3000.0	n/a	n/a	n/a	5.85%	-2.47%	0.66%	4.74%	-5.11%	-5.01%
30	10/23/2003	1	1022	115.0	63210.0	26.0%	50166.7	n/a	n/a	n/a	3830.0	3.0	1000.0	3000.0	n/a	n/a	n/a	6.06%	0.99%	0.99%	4.75%	-5.08%	-5.03%
31	10/23/2003	2	1022	115.0	63290.0	26.0%	50230.2	n/a	n/a	n/a	3900.0	3.0	1000.0	3000.0	n/a	n/a	n/a	6.16%	2.70%	0.87%	4.74%	-5.20%	-5.04%
32	10/23/2003	1	1022	115.0	63070.0	26.0%	50055.6	n/a	n/a	n/a	3900.0	3.0	1000.0	3000.0	n/a	n/a	n/a	6.18%	3.06%	1.12%	4.76%	-4.87%	-5.01%
33	10/23/2003	2	1022	115.0	63150.0	26.0%	50119.0	n/a	n/a	n/a	3750.0	3.0	1000.0	3000.0	n/a	n/a	n/a	5.94%	-1.03%	0.85%	4.75%	-4.99%	-5.00%
34	10/23/2003	1	1022	115.0	63120.0	26.0%	50095.2	n/a	n/a	n/a	3850.0	3.0	1000.0	3000.0	n/a	n/a	n/a	6.10%	1.66%	0.79%	4.75%	-4.94%	-5.07%
35	10/23/2003	2	1022	115.0	63210.0	26.0%	50166.7	n/a	n/a	n/a	3820.0	3.0	1000.0	3000.0	n/a	n/a	n/a	6.04%	0.72%	0.77%	4.75%	-5.08%	-5.06%
36	10/23/2003	1	1022	115.0	63140.0	26.0%	50111.1	n/a	n/a	n/a	3700.0	3.0	1000.0	3000.0	n/a	n/a	n/a	5.86%	-2.33%	0.64%	4.75%	-4.97%	-5.03%
37	10/23/2003	2	1022	115.0	62990.0	26.0%	49992.1	n/a	n/a	n/a	3870.0	3.0	1000.0	3000.0	n/a	n/a	n/a	6.14%	2.40%	0.81%	4.76%	-4.75%	-5.02%
38	10/23/2003	1	1022	115.0	62210.0	26.0%	49373.0	n/a	n/a	n/a	3900.0	3.0	1000.0	3000.0	n/a	n/a	n/a	6.27%	4.48%	1.02%	4.82%	-3.55%	-4.85%
1	10/24/2003	2	1024	115.0	63190.0	26.0%	50150.8	n/a	n/a	n/a	3830.0	3.0	1000.0	3000.0	n/a	n/a	n/a	6.06%	1.02%	1.37%	4.75%	-5.05%	-4.85%
2	10/24/2003	1	1024	115.0	63200.0	26.0%	50158.7	4080.0	3.8%	3930.6	n/a	3.0	1000.0	3000.0	7.84%	4.49%	4.49%	n/a	n/a	n/a	4.75%	-5.06%	-4.85%
3	10/24/2003	2	1024	115.0	63120.0	26.0%	50095.2	3960.0	3.8%	3815.0	n/a	3.0	1000.0	3000.0	7.62%	1.54%	3.01%	n/a	n/a	n/a	4.75%	-4.94%	-4.82%
4	10/24/2003	1	1024	115.0	63210.0	26.0%	50166.7	n/a	n/a	n/a	3870.0	3.0	1000.0	3000.0	n/a	n/a	n/a	6.12%	2.04%	1.12%	4.75%	-5.08%	-4.84%
5	10/24/2003	2	1024	115.0	62980.0	26.0%	49984.1	n/a	n/a	n/a	3170.0	3.0	1000.0	3000.0	n/a	n/a	n/a	5.03%	0.67%	1.33%	4.76%	-4.73%	-4.82%
6	10/24/2003	1	1024	115.0	63130.0	26.0%	50103.2	4030.0	3.8%	3882.5	n/a	3.0	1000.0	3000.0	7.75%	3.32%	3.12%	n/a	n/a	n/a	4.75%	-4.96%	-4.82%
7	10/24/2003	2	1024	115.0	63200.0	26.0%	50158.7	3960.0	3.8%	3815.0	n/a	3.0	1000.0	3000.0	7.61%	1.41%	2.69%	n/a	n/a	n/a	4.75%	-5.06%	-4.82%
8	10/24/2003	1	1024	115.0	63340.0	26.0%	50269.8	n/a	n/a	n/a	3060.0	3.0	1000.0	3000.0	n/a	n/a	n/a	4.83%	-3.38%	1.20%	4.74%	-5.27%	-4.85%
9	10/24/2003	2	1024	115.0	63110.0	26.0%	50087.3	n/a	n/a	n/a	3010.0	3.0	1000.0	3000.0	n/a	n/a	n/a	4.77%	-4.61%	0.04%	4.75%	-4.93%	-4.86%
10	10/24/2003	1	1024	115.0	62960.0	26.0%	49968.3	4140.0	3.8%	3988.4	n/a	3.0	1000.0	3000.0	7.98%	6.43%	3.44%	n/a	n/a	n/a	4.76%	-4.70%	-4.98%
11	10/24/2003	2	1024	115.0	63130.0	26.0%	50103.2	3940.0	3.8%	3795.8	n/a	3.0	1000.0	3000.0	7.58%	1.01%	3.03%	n/a	n/a	n/a	4.75%	-4.96%	-4.97%
12	10/24/2003	1	1024	115.0	63160.0																		

DATE: 1/7/2005

ENVIROCON, INC.  
RFS PHASE 2 REMEDIATION PROJECT

QUALITY CONTROL TRACKING  
REAGENT DOSAGE

BATCH MIXING													SPEC REQUIREMENTS										
MIX INFORMATION				SOIL INFORMATION				LIMESTONE INFORMATION			CKD	CARBON INFORMATION			LIMESTONE			CKD			CARBON		
BAT NO.	DATE	BIN NO.	MIX DESIGN NO.	WET DENSITY (PCF)	WET WEIGHT (LBS)	MOIST CONT (%)	DRY WEIGHT (LBS)	WET WEIGHT (LBS)	MOIST CONT (%)	DRY WEIGHT (LBS)	WET WEIGHT (LBS)	NO. BAGS (LBS)	BAG WEIGHT (LBS)	TOTAL WEIGHT (LBS)	% LIME PER 100 LB CIND	EACH BATCH (+/- 20%)	AVER PER 10 (+/- 5%)	% CKD PER 100 LB CIND	EACH BATCH (+/- 20%)	AVER PER 10 (+/- 5%)	% CARB PER 100 LB CIND	EACH BATCH (+/- 20%)	AVER PER 10 (+/- 5%)
14	10/24/2003	1	1024	115.0	63420.0	26.0%	50333.3	4030.0	3.8%	3882.5	n/a	3.0	1000.0	3000.0	7.71%	2.85%	3.00%	n/a	n/a	n/a	4.73%	-5.39%	-5.02%
15	10/24/2003	2	1024	115.0	63080.0	26.0%	50063.5	3960.0	3.8%	3815.0	n/a	3.0	1000.0	3000.0	7.62%	1.61%	2.77%	n/a	n/a	n/a	4.76%	-4.88%	-5.04%
16	10/24/2003	1	1024	115.0	69690.0	26.0%	55309.5	n/a	n/a	n/a	3490.0	3.0	1000.0	3000.0	n/a	n/a	n/a	5.01%	0.16%	2.65%	4.30%	0.11%	-4.53%
17	10/24/2003	2	1024	115.0	69880.0	26.0%	55460.3	n/a	n/a	n/a	3440.0	3.0	1000.0	3000.0	n/a	n/a	n/a	4.92%	-1.55%	1.95%	4.29%	-0.16%	-4.04%
18	10/24/2003	1	1024	115.0	69810.0	26.0%	55404.8	n/a	n/a	n/a	3370.0	3.0	1000.0	3000.0	n/a	n/a	n/a	4.83%	-3.45%	1.94%	4.30%	-0.06%	-3.52%
19	10/24/2003	2	1024	115.0	69790.0	26.0%	55388.9	n/a	n/a	n/a	3540.0	3.0	1000.0	3000.0	n/a	n/a	n/a	5.07%	1.45%	2.95%	4.30%	-0.03%	-3.03%
20	10/24/2003	1	1024	115.0	69900.0	26.0%	55476.2	n/a	n/a	n/a	3570.0	3.0	1000.0	3000.0	n/a	n/a	n/a	5.11%	2.15%	2.83%	4.29%	-0.19%	-2.58%
21	10/24/2003	2	1024	115.0	69920.0	26.0%	55492.1	n/a	n/a	n/a	3340.0	3.0	1000.0	3000.0	n/a	n/a	n/a	4.78%	-4.46%	1.92%	4.29%	-0.22%	-2.10%
22	10/24/2003	1	1024	115.0	70050.0	26.0%	55595.2	n/a	n/a	n/a	3440.0	3.0	1000.0	3000.0	n/a	n/a	n/a	4.91%	-1.78%	1.49%	4.28%	-0.40%	-1.64%
23	10/24/2003	2	1024	115.0	69480.0	26.0%	55142.9	n/a	n/a	n/a	3560.0	3.0	1000.0	3000.0	n/a	n/a	n/a	5.12%	2.48%	-0.63%	4.32%	0.41%	-1.08%
24	10/24/2003	1	1024	115.0	69790.0	26.0%	55388.9	n/a	n/a	n/a	3140.0	3.0	1000.0	3000.0	n/a	n/a	n/a	4.50%	-10.02%	-1.67%	4.30%	-0.03%	-0.55%
25	10/24/2003	2	1024	115.0	70440.0	26.0%	55904.8	n/a	n/a	n/a	3610.0	3.0	1000.0	3000.0	n/a	n/a	n/a	5.12%	2.50%	-1.25%	4.26%	-0.95%	-0.15%
1	10/25/2003	1	1025	115.0	70000.0	26.0%	55555.6	n/a	n/a	n/a	3500.0	3.0	1000.0	3000.0	n/a	n/a	n/a	5.00%	0.00%	-1.27%	4.29%	-0.33%	-0.20%
2	10/25/2003	1	1025	115.0	70000.0	26.0%	55555.6	n/a	n/a	n/a	3500.0	3.0	1000.0	3000.0	n/a	n/a	n/a	5.00%	0.00%	-1.11%	4.29%	-0.33%	-0.21%
3	10/25/2003	1	1025	115.0	70000.0	26.0%	55555.6	n/a	n/a	n/a	3500.0	3.0	1000.0	3000.0	n/a	n/a	n/a	5.00%	0.00%	-0.77%	4.29%	-0.33%	-0.24%
4	10/25/2003	1	1025	115.0	70000.0	26.0%	55555.6	n/a	n/a	n/a	3500.0	3.0	1000.0	3000.0	n/a	n/a	n/a	5.00%	0.00%	-0.91%	4.29%	-0.33%	-0.27%
5	10/25/2003	1	1025	115.0	70000.0	26.0%	55555.6	n/a	n/a	n/a	3500.0	3.0	1000.0	3000.0	n/a	n/a	n/a	5.00%	0.00%	-1.13%	4.29%	-0.33%	-0.29%

NOTES: 1) Total yards treated - based on unit weight

TYPE A 22.5 CY  
TYPE B 22.6 CY  
TYPE C n/a CY

- 2) Sept. 5 to Sept. 15 - Performed Type A Mixing using the "Volume Method". See daily mix design sheets
- 3) Sept. 17 to Oct. - Performed all mixing using the "Scale Method". See daily mix design sheets
- 4) Sept. 24 to Oct. 4 - Increase carbon to 5.3% (additional 0.3%) per Engineer's request.
- 5) Oct. 10 - Began using CKD for treatment of Type B (marsh) sediment. Limestone addition decreased to 3.75% while using a minimum 2% CKD per Engineer's approval.
- 6) Oct. 11 - Mixing performed using CKD and Carbon only; increased CKD treatment to 5%
- 7) Oct. 16 - Increased CKD treatment to 6%
- 8) Type B and A Treatment Ended on 10/25. Five batches of Type B were mixed on 10/25; cleanup batches; volumes are estimated.
- 9) TYPE C MATERIAL WAS TREATED AS NEEDED TO MEET OFFSITE DISPOSAL REQUIREMENTS ONLY (I.E. DRYING PURPOSES ONLY). TYPICAL REAGENT (CKD) ADDITION WAS BETWEEN 5 - 7% BY WET WEIGHT OF SOIL.



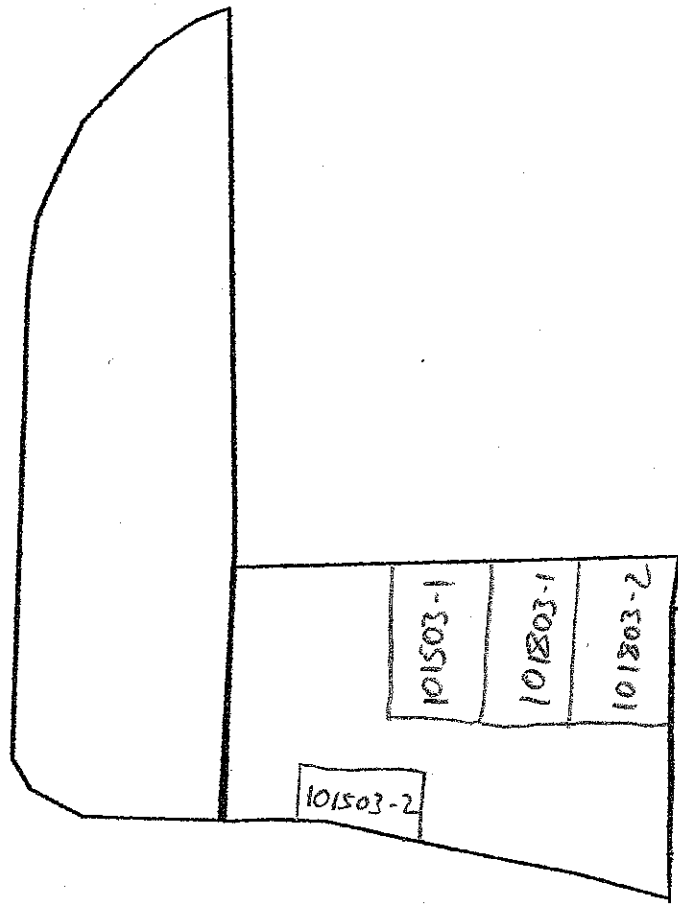
**Appendix D**  
**Treated Material pH QC Sheets**

DATE: 10/15 - 10/18/03

RFS PHASE 2 REMEDIATION PROJECT

LOT TRACKING FORM

Lot #	Batch Range	pH	Pass/Fail	Comments
<del>101503-1/2</del>	67 bins	7.7	Pass	mixed 10/15 → <sup>10/18</sup> no CKD, Type B
101803	67 bins	12.5	Pass	mixed 10/18 → CKD, Type B



Treatment Pad Diagram

DATE: 10/13 - 10/15/03

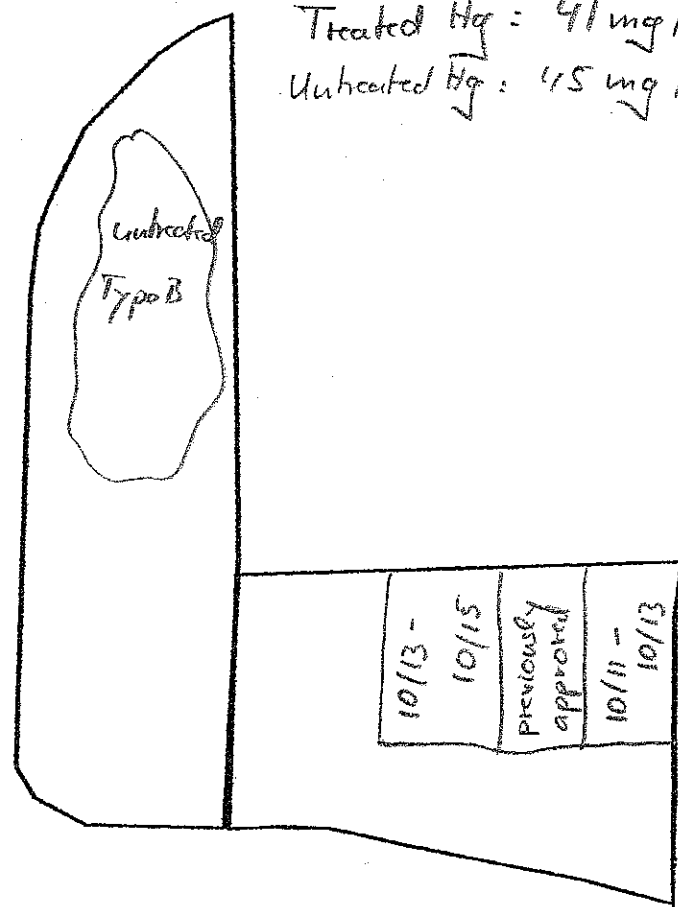
RFS PHASE 2 REMEDIATION PROJECT

LOT TRACKING FORM

Lot #	Batch Range	pH	Pass/Fail	Comments
101403	67 bins	10.7*	Pass	Mixed 15 bins on 10/11 afternoon
				10 bins on 10/13
				35 bins on 10/14
				7 bins on 10/15 morning
				Σ 67 bins ~ 2,000 cy

\* 5% CKD added

Treated Hg: 41 mg/kg → approved  
 Untreated Hg: 45 mg/kg



Treatment Pad Diagram

DATE: 10/7 - 10/10/03

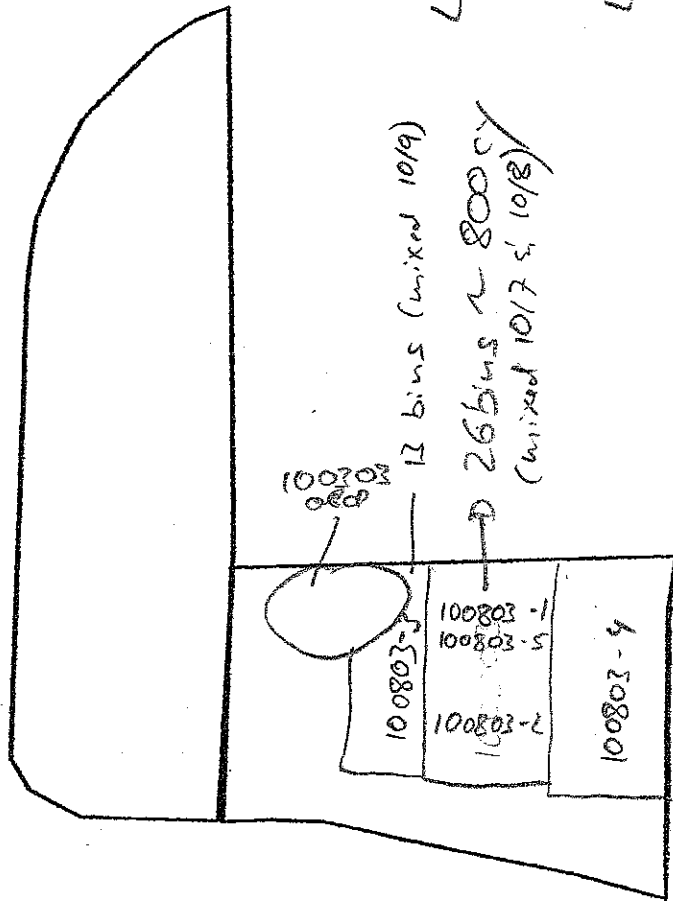
RFS PHASE 2 REMEDIATION PROJECT

LOT TRACKING FORM

Lot #	Batch Range	pH	Pass/Fail	Comments
100803-1	13	7.3	Pass	mixed 10/7/03, Type B
" -2	13	7.7	Pass	mixed 10/8/03, Type B
" -3	13	6.9	Pass	mixed 10/9/03, Type B
" -4	22	9.0	Pass	mixed 10/10/03, Type B (CKD added)
" -5	6	9.0	Pass	mixed 10/11/03 am, Type B ( " )
10/09/03	-	6.7		untreated Type B marsh sediment on pad B

Σ 2,010cy

total Hg: 28 mg / kg → approved



Treatment Pad Diagram

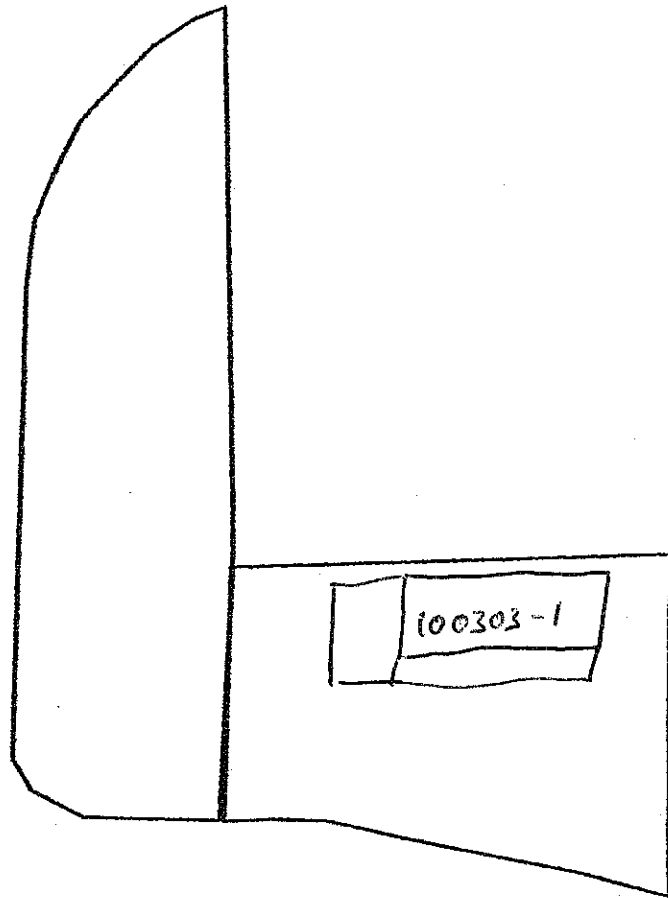


DATE: 10-03

RFS PHASE 2 REMEDIATION PROJECT

LOT TRACKING FORM

Lot #	Batch Range	pH	Pass/Fail	Comments
100303-1	1-29	8.0	Pass	Type B, mixed 10/3 am
"	30-45	7.6	↓	Type B, mixed 10/3 pm
"	46-62	8.2	↓	Type B, mixed 10/4



Treatment Pad Diagram

DATE: 9/25-10/02 (KMA)

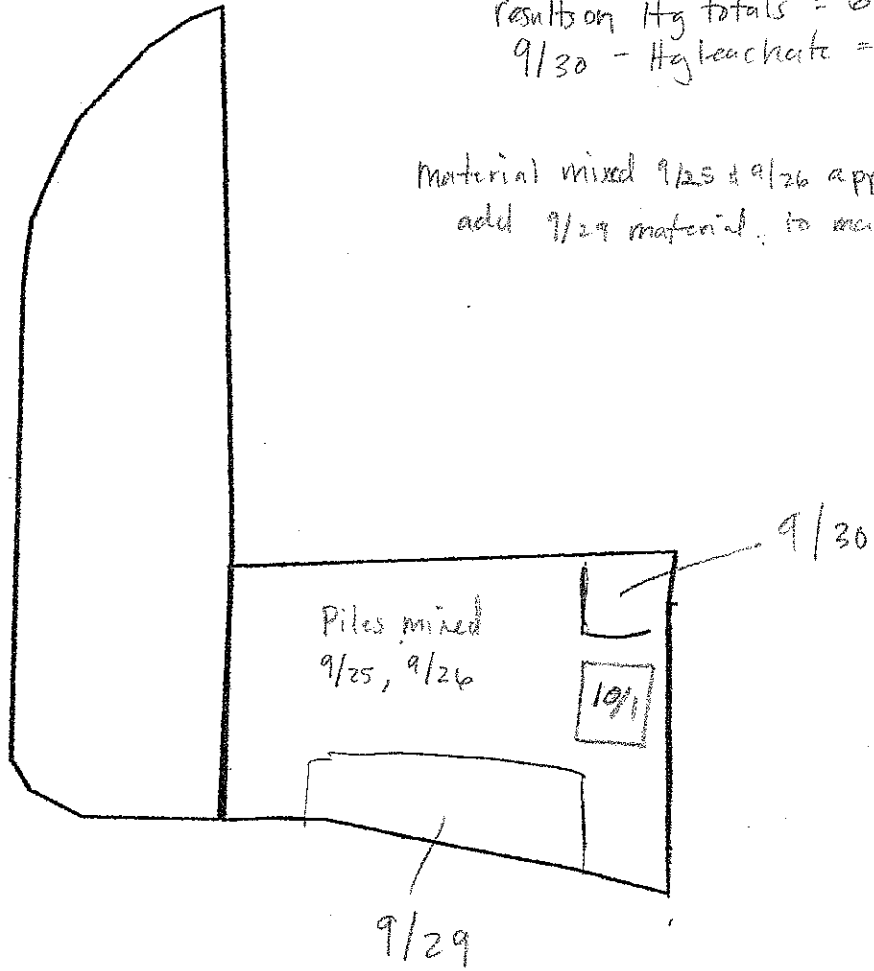
RFS PHASE 2 REMEDIATION PROJECT

LOT TRACKING FORM

Lot #	Batch Range	pH	Pass/Fail	Comments:
9/25	?	8.5	Pass	Type B
9/26	27 bins	7.9	↓	Type B
9/29	~30 bins	8.1		Type B
9/30	15 bins	8.7		Type B
10/1	20 bins	7.8		Type A
10/1	22 bins	7.7		Type A; mixed 14 bins on 10/2

Sample taken on Friday 9/26  
 results on Hg totals = 66 mg/Kg  
 9/30 - Hg leachate = ND

material mixed 9/25 & 9/26 approved  
 add 9/29 material to make 2,000cy



Treatment Pad Diagram

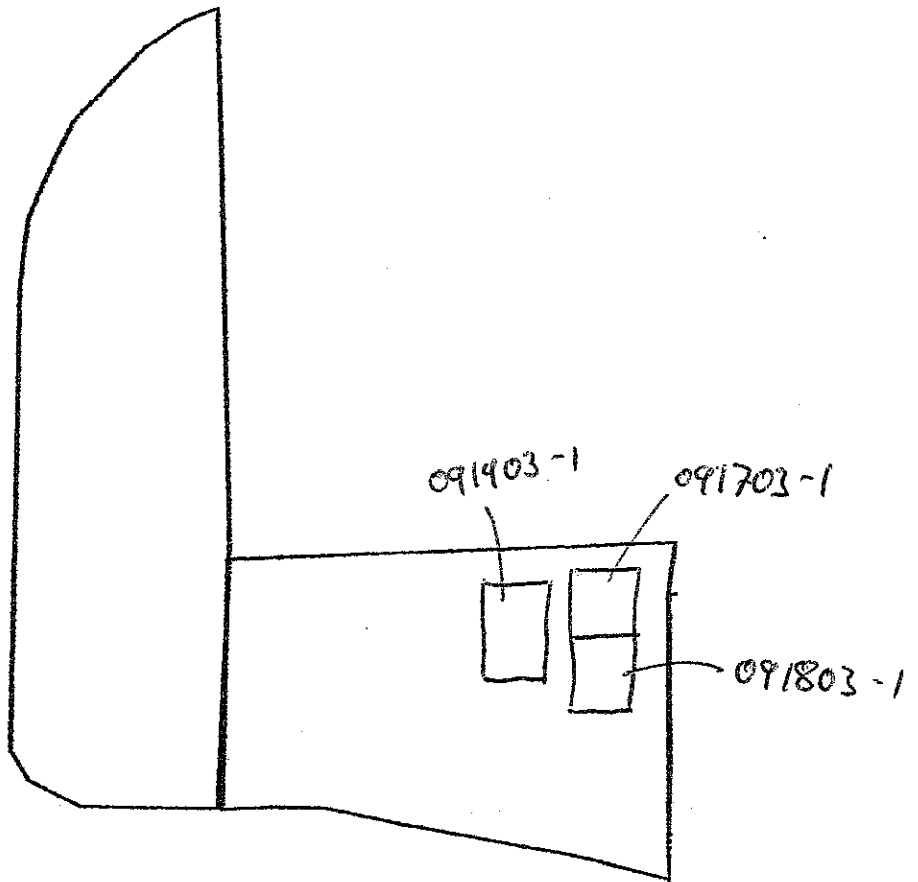
DATE: 9/17 thru 9/19/03

RFS PHASE 2 REMEDIATION PROJECT

LOT TRACKING FORM

Soil Type B

Lot #	Batch Range	pH	Pass/Fail	Comments
091703-1	1-5	8.9	Pass	tested batch 5 on 9/18
091803-1	1-4	8.2 (avg)	Pass	①=8.1; ②=7.9; ③=8.4; ④=8.2
091903-1	1-5	8.8 (avg)	Pass	①=8.9; ②=8.7; ③=9.3; ④=8.6; ⑤=8.4



Treatment Pad Diagram

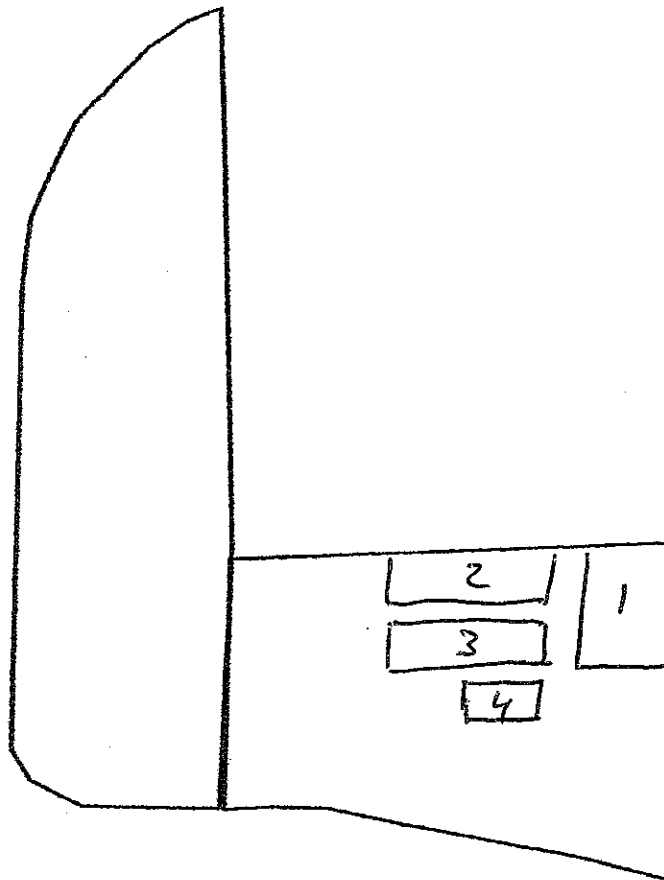
DATE: 9/13/03

RFS PHASE 2 REMEDIATION PROJECT

LOT TRACKING FORM

Lot #	Batch Range	pH	Pass/Fail	Comments
9/13-1	1-20	7.7	Pass hi	
9/13-2	21-39	7.3	Pass hi	
9/13-3	40-51	7.6	Pass hi	
9/13-4	52-61	8.0	Pass hi	
		7.0		untreated stockpile pad B

untreated material on pad B ~~pad B~~



Treatment Pad Diagram

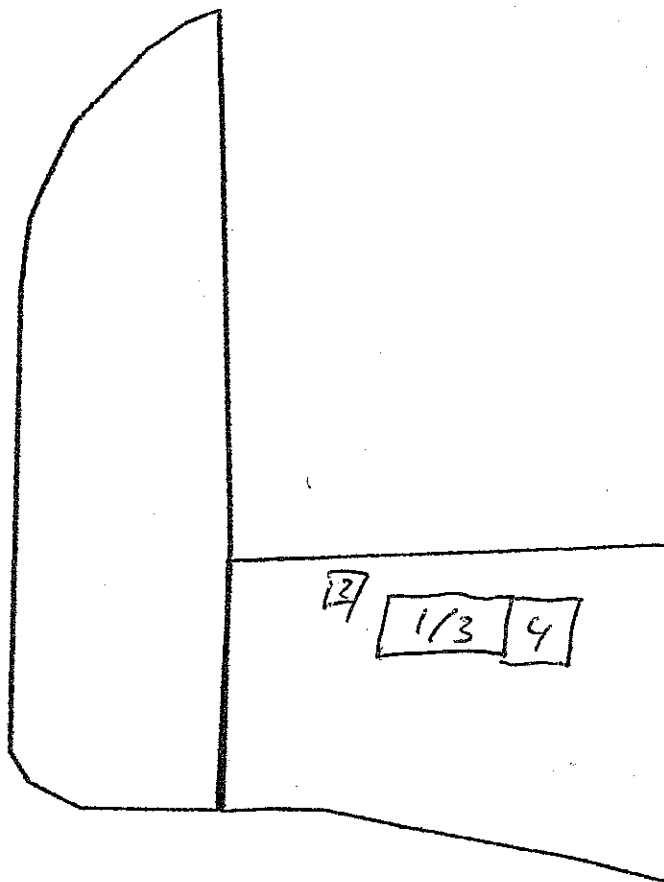


DATE: 9/12/03

RFS PHASE 2 REMEDIATION PROJECT

LOT TRACKING FORM

Lot #	Batch Range	pH	Pass/Fail	Comments
9/12-1	1 - 20	8.2	Pass li	
9/12-2	21 - 40	8.2	Pass li	
9/12-3	41 - 59	8.0	Pass li	
9/12-4	60 - 75	8.5	Pass li	



Treatment Pad Diagram

DATE: 9/11/03 (am) KMA

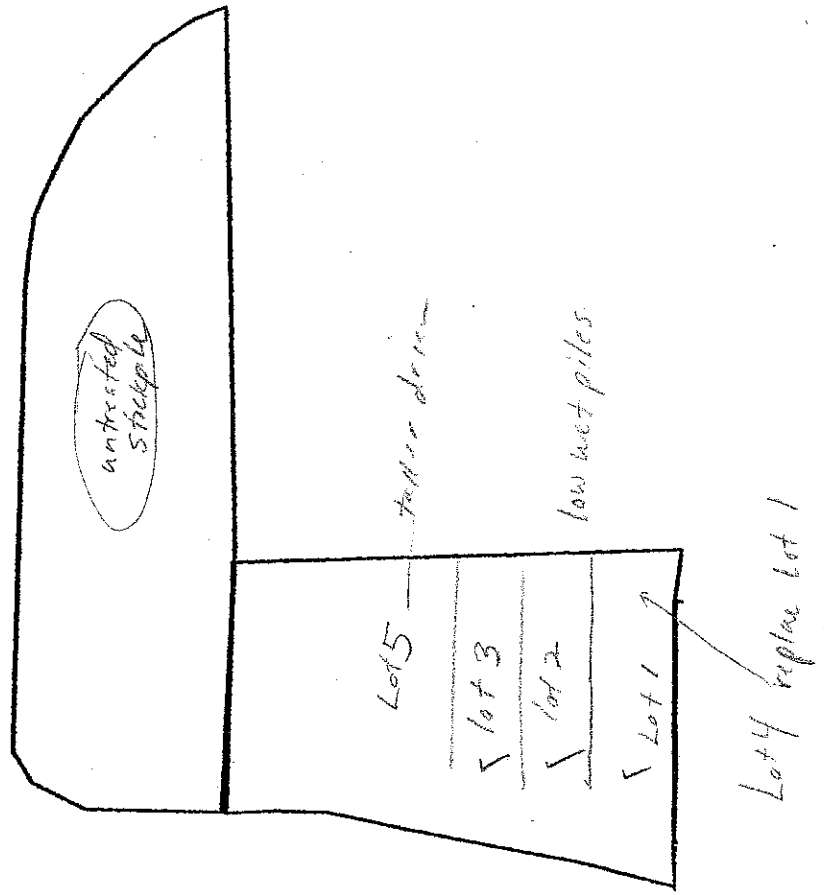
RFS PHASE 2 REMEDIATION PROJECT

LOT TRACKING FORM

9/11/03  
 7:12 pm  
 42 bins  
 x 25 cy  
 1050 cy  
 or 700 cy (9/10)

Lot #	Batch Range	pH	Pass/Fail	Comments:
-	1-6	6.9-7.4	PASS	Mixed & sampled on 9/10
1	1-20	7.2	PASS	Mixed & sampled on 9/10 ~ 520 cy
2	20-25	7.2	PASS	Mixed on 9/10 & 9/11 sampled on 9/11 8 am
3	1-21	7.3	PASS	noon
4				
5	21-42	7.5	PASS	noon

tested pH untreated Type A Stockpile (6.9)



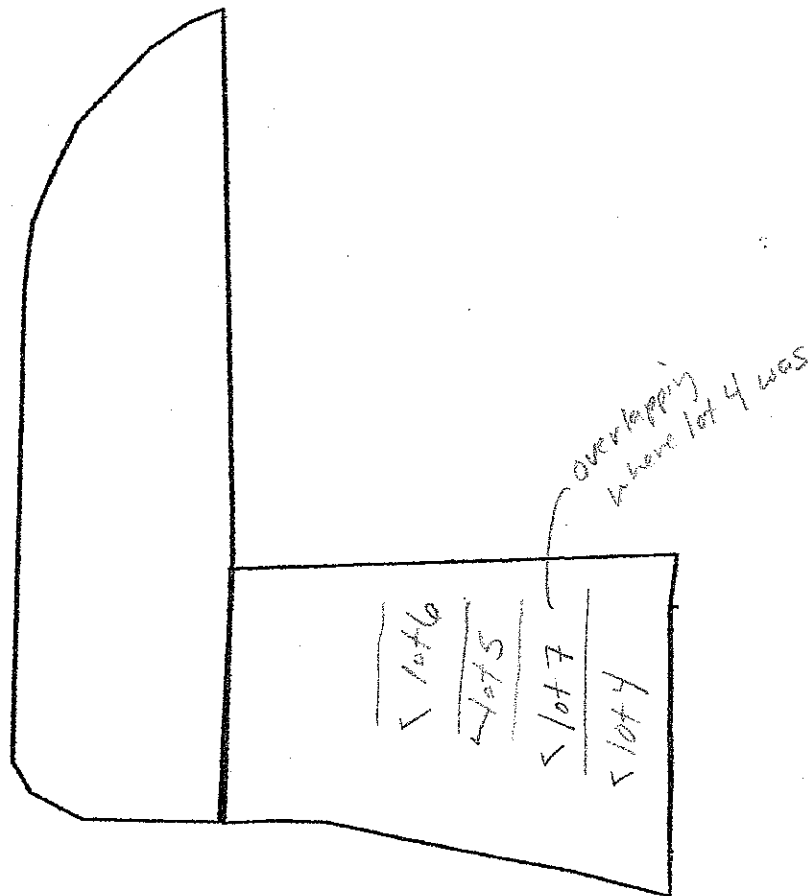
Treatment Pad Diagram

DATE: 9/11/03 (pm) KMA

RFS PHASE 2 REMEDIATION PROJECT

LOT TRACKING FORM

Lot #	Batch Range	pH	Pass/Fail	Comments:
6		7.4	PASS	very cindery wet 3pm
4	42-	7.8	PASS	dry-ish overburden looking 3pm
7		7.7	PASS	5pm



Treatment Pad Diagram

DATE: 9-8-03

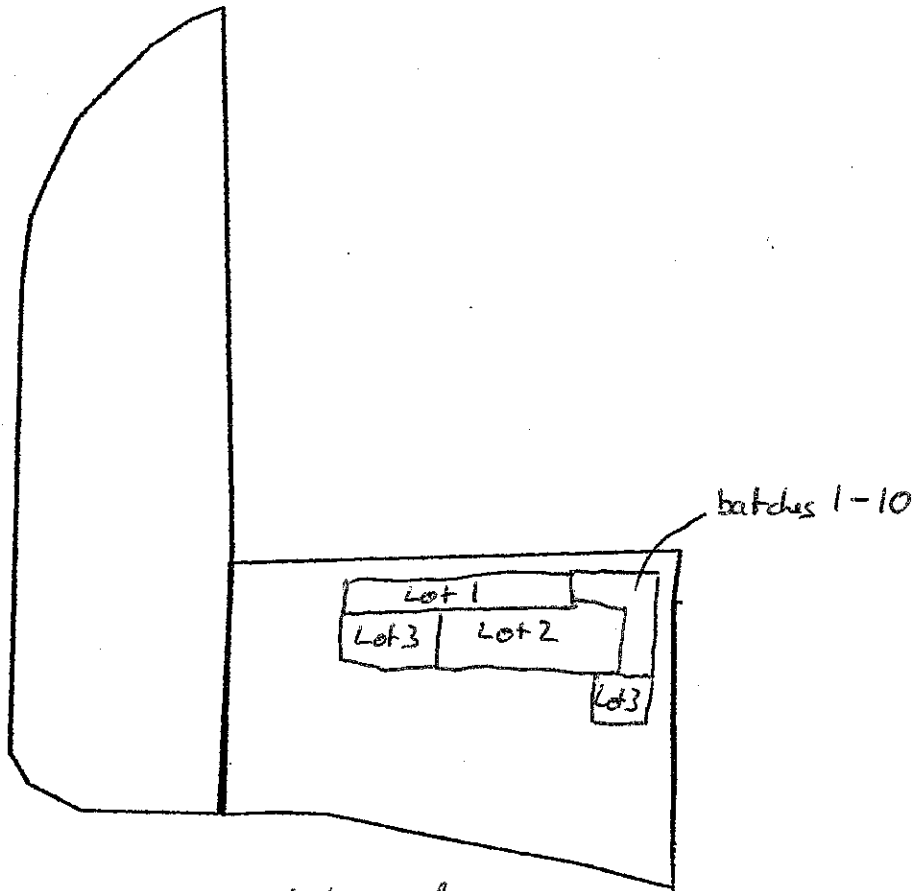
RFS PHASE 2 REMEDIATION PROJECT

LOT TRACKING FORM

Type & material from Stockpile on pad B

Lot #	Batch Range	pH	Pass/Fail	Comments:
-	1-4	1: 7.4 2: 8 3: 8 4: 7.7	Pass hi	mixed on 9-5-03
-	5-10	*	Pass hi	* 5: 8.1; 6: 7.9; 7: 8.0; 8: 8.8; 9: 8.5; 10: 7.9 <span style="float: right;">mixed 9/1</span>
1	11-27	7.6	Pass hi	mixed 9/6
2	28-44	7.8	Pass hi	- " -
3	45-52	7.6	Pass hi	- " - ; 3 point composite sample for 240cy
3 cont'd	53-57	7.5	Pass hi	mixed 9/8 ; 3 point composite sample for 180cy

Sampled by Arnd



- not to scale -

Treatment Pad Diagram

**Appendix E**  
**Dust Monitoring**



**AIR MONITORING DATA  
PHASE 2 REMEDIATION  
RICHMOND FIELD STATION**

Week Commencing: 8/11/2003

Date	Station	TWA	MAX	STEL	Date	Station	TWA	MAX	STEL
8/11/2003	A	NA	NA	NA	8/15/2003	A	0.024	0.032	0.376
Monday	B	NA	NA	NA	Friday	B	0.007	0.022	0.112
	C	NA	NA	NA		C	NA	0.012	0.134
	D	NA	NA	NA		D	NA	NA	NA
	E	NA	NA	NA		E	0.021	0.037	0.062
	F	NA	NA	NA		F	NA	NA	NA
8/12/2003	A	NA	NA	NA	8/16/2003	A	0.031	0.051	0.995
Tuesday	B	0.022	0.047	NA	Saturday	B	0.016	0.030	0.685
	C	NA	NA	NA		C	0.034	0.042	0.288
	D	0.008	0.028	NA		D	0.021	0.027	0.144
	E	NA	NA	NA		E	0.026	0.037	0.216
	F	NA	NA	NA		F	NA	NA	NA
8/13/2003	A	NA	NA	NA	8/17/2003	A	NA	NA	NA
Wednesday	B	0.007	0.021	0.158	Sunday	B	NA	NA	NA
	C	NA	NA	NA		C	NA	NA	NA
	D	0.023	0.046	0.469		D	NA	NA	NA
	E	0.009	0.022	0.052		E	NA	NA	NA
	F	NA	NA	NA		F	NA	NA	NA
8/14/2003	A	0.022	0.039	0.536					
Thursday	B	0.009	0.025	0.131					
	C	0.023	0.048	0.637					
	D	0.024	0.041	0.425					
	E	0.024	0.032	0.049					
	F	NA	NA	NA					

Notes:

All units are mg/m<sup>3</sup>

Dust becomes visible at approx. 2 mg/m<sup>3</sup>

Measurements are Total Dust

TWA = Time Weighted Average

MAX = Maximum

STEL = Short Term Exposure Limit

**AIR MONITORING DATA  
PHASE 2 REMEDIATION  
RICHMOND FIELD STATION**

Week Commencing: 8/18/2003

Date	Station	TWA	MAX	STEL	Date	Station	TWA	MAX	STEL
8/18/2003	A	0.010	0.430	0.014	8/22/2003	A	0.005	0.354	0.016
Monday	B	0.004	0.079	0.014	Friday	B	0.000	0.094	0.011
	C	0.000	0.161	0.005		C	0.031	4.947	0.157
	D	0.005	0.511	0.030		D	0.003	0.071	0.007
	E	0.011	0.188	0.036		E	0.005	0.091	0.013
	F	NA	NA	NA		F	NA	NA	NA
8/19/2003	A	0.007	0.185	0.023	8/23/2003	A	0.010	0.983	0.031
Tuesday	B	0.019	0.703	0.078	Saturday	B	0.000	0.956	0.020
	C	0.000	1.074	0.003		C	0.025	0.564	0.075
	D	0.004	0.061	0.019		D	0.009	2.565	0.033
	E	0.006	0.033	0.021		E	0.010	0.306	0.053
	F	NA	NA	NA		F	NA	NA	NA
8/20/2003	A	0.018	0.299	0.042	8/24/2003	A	NA	NA	NA
Wednesday	B	0.005	0.396	0.026	Sunday	B	NA	NA	NA
	C	0.012	0.719	0.053		C	NA	NA	NA
	D	NA	1.095	0.042		D	NA	NA	NA
	E	0.006	0.062	0.028		E	NA	NA	NA
	F	NA	NA	NA		F	NA	NA	NA
8/21/2003	A	0.021	1.161	0.144					
Thursday	B	0.012	0.949	0.083					
	C	0.053	0.977	0.146					
	D	0.007	0.169	0.010					
	E	0.011	0.055	0.029					
	F	NA	NA	NA					

Notes:

All units are mg/m<sup>3</sup>

Dust becomes visible at approx. 2 mg/m<sup>3</sup>

Measurements are Total Dust

TWA = Time Weighted Average

MAX = Maximum

STEL = Short Term Exposure Limit

**AIR MONITORING DATA  
PHASE 2 REMEDIATION  
RICHMOND FIELD STATION**

Week Commencing: 8/25/2003

Date	Station	TWA	MAX	STEL	Date	Station	TWA	MAX	STEL
8/25/2003	A	0.033	0.457	0.043	8/29/2003	A	0.023	0.679	0.049
Monday	B	0.005	0.108	0.018	Friday	B	0.022	0.440	0.051
	C	0.029	2.717	0.100		C	0.013	1.996	0.194
	D	0.032	1.514	0.076		D	0.023	1.190	0.040
	E	0.044	0.776	0.172		E	0.027	0.281	0.055
	F	NA	NA	NA		F	NA	NA	NA
8/26/2003	A	0.022	0.217	0.047	8/30/2003	A	NA	NA	NA
Tuesday	B	0.019	0.182	0.038	Saturday	B	NA	NA	NA
	C	--	--	--		C	NA	NA	NA
	D	0.025	0.738	0.093		D	NA	NA	NA
	E	0.060	0.628	0.186		E	NA	NA	NA
	F	NA	NA	NA		F	NA	NA	NA
8/27/2003	A	0.015	0.485	0.093	8/31/2003	A	NA	NA	NA
Wednesday	B	0.018	0.110	0.028	Sunday	B	NA	NA	NA
	C	0.000	0.202	0.018		C	NA	NA	NA
	D	0.013	1.266	0.085		D	NA	NA	NA
	E	0.038	0.757	0.203		E	NA	NA	NA
	F	NA	NA	NA		F	NA	NA	NA
8/28/2003	A	0.016	0.885	0.063					
Thursday	B	0.012	0.277	0.040					
	C	0.004	1.210	0.049					
	D	0.040	2.155	0.130					
	E	0.029	0.331	0.072					
	F	NA	NA	NA					

Notes:

All units are mg/m<sup>3</sup>

Dust becomes visible at approx. 2 mg/m<sup>3</sup>

Measurements are Total Dust

TWA = Time Weighted Average

MAX = Maximum

STEL = Short Term Exposure Limit

**AIR MONITORING DATA  
PHASE 2 REMEDIATION  
RICHMOND FIELD STATION**

Week Commencing: 9/1/2003

Date	Station	TWA	MAX	STEL	Date	Station	TWA	MAX	STEL
9/1/2003	A	NA	NA	NA	9/5/2003	A	0.047	2.480	0.262
Monday	B	NA	NA	NA	Friday	B	0.000	0.312	0.018
	C	NA	NA	NA		C	0.014	0.700	0.037
	D	NA	NA	NA		D	0.010	1.211	0.051
	E	NA	NA	NA		E	0.024	1.315	0.122
	F	NA	NA	NA		F	0.016	1.596	0.078
9/2/2003	A	0.019	0.321	0.039	9/6/2003	A	0.000	0.905	0.059
Tuesday	B	0.010	0.137	0.021	Saturday	B	0.007	1.678	0.029
	C	0.009	0.496	0.037		C	0.050	2.197	0.175
	D	0.025	1.230	0.133		D	0.000	0.520	0.033
	E	0.037	0.261	0.077		E	0.012	0.352	0.031
	F	NA	NA	NA		F	--	--	--
9/3/2003	A	0.043	1.910	0.101	9/7/2003	A	NA	NA	NA
Wednesday	B	--	--	--	Sunday	B	NA	NA	NA
	C	0.006	0.160	0.037		C	NA	NA	NA
	D	0.027	0.199	0.059		D	NA	NA	NA
	E	0.057	0.434	0.178		E	NA	NA	NA
	F	NA	NA	NA		F	NA	NA	NA
9/4/2003	A	0.019	3.072	0.058					
Thursday	B	0.004	0.200	0.023					
	C	0.000	0.198	0.007					
	D	0.014	0.703	0.099					
	E	0.038	0.216	0.096					
	F	0.047	2.685	0.125					

Notes:

All units are mg/m<sup>3</sup>

Dust becomes visible at approx. 2 mg/m<sup>3</sup>

Measurements are Total Dust

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**AIR MONITORING DATA  
PHASE 2 REMEDIATION  
RICHMOND FIELD STATION**

Week Commencing: 9/8/2003

Date	Station	TWA	MAX	STEL	Date	Station	TWA	MAX	STEL
9/8/2003	A	0.010	0.407	0.040	9/12/2003	A	--	--	--
Monday	B	0.004	0.179	0.018	Friday	B	0.000	0.406	0.035
	C	0.010	1.274	0.096		C	0.005	3.597	0.099
	D	0.010	0.600	0.033		D	0.034	0.322	0.054
	E	0.020	0.161	0.042		E	0.022	0.448	0.065
	F	0.014	1.189	0.090		F	NA	NA	NA
9/9/2003	A	0.063	2.399	0.702	9/13/2003	A	0.029	0.470	0.055
Tuesday	B	0.000	0.189	0.009	Saturday	B	0.001	0.914	0.050
	C	0.000	0.595	0.016		C	0.000	1.408	0.069
	D	0.009	0.990	0.040		D	0.011	0.311	0.035
	E	0.004	0.098	0.028		E	0.002	0.158	0.024
	F	0.000	3.627	0.182		F	0.002	0.132	0.015
9/10/2003	A	0.027	0.376	0.042	9/14/2003	A	NA	NA	NA
Wednesday	B	0.014	0.282	0.027	Sunday	B	NA	NA	NA
	C	0.029	0.568	0.069		C	NA	NA	NA
	D	0.023	0.480	0.060		D	NA	NA	NA
	E	0.026	0.136	0.049		E	NA	NA	NA
	F	--	--	--		F	NA	NA	NA
9/11/2003	A	0.031	0.921	0.070			NA	NA	NA
Thursday	B	0.000	0.345	0.019					
	C	0.001	0.526	0.059					
	D	0.021	0.430	0.049					
	E	0.014	0.188	0.036					
	F	NA	NA	NA					

Notes:

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Dust becomes visible at approx. 2 mg/m<sup>3</sup>

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**AIR MONITORING DATA  
PHASE 2 REMEDIATION  
RICHMOND FIELD STATION**

Week Commencing: 9/15/2003

Date	Station	TWA	MAX	STEL	Date	Station	TWA	MAX	STEL
9/15/2003	A	0.014	0.268	0.029	9/19/2003	A	0.028	1.240	0.076
Monday	B	0.064	0.920	0.159	Friday	B	0.005	1.809	0.333
	C	0.005	0.853	0.067		C	0.031	1.064	0.149
	D	0.024	0.560	0.045		D	0.017	0.223	0.046
	E	0.026	0.133	0.039		E	0.021	0.169	0.075
	F	0.018	0.219	0.037		F	NA	NA	NA
9/16/2003	A	0.009	0.362	0.020	9/20/2003	A	0.026	0.230	0.048
Tuesday	B	0.019	0.372	0.055	Saturday	B	0.000	0.030	0.008
	C	0.019	0.532	0.065		C	0.049	1.065	0.187
	D	0.031	4.110	0.133		D	0.015	0.418	0.047
	E	0.027	0.408	0.081		E	0.023	0.179	0.044
	F	0.034	0.704	0.042		F	NA	NA	NA
9/17/2003	A	0.006	0.353	0.019	9/21/2003	A	NA	NA	NA
Wednesday	B	0.000	0.162	0.005	Sunday	B	NA	NA	NA
	C	0.016	1.642	0.074		C	NA	NA	NA
	D	0.000	0.331	0.030		D	NA	NA	NA
	E	0.000	0.175	0.034		E	NA	NA	NA
	F	0.012	0.062	0.025		F	NA	NA	NA
9/18/2003	A	0.030	0.672	0.054			NA	NA	NA
Thursday	B	0.000	0.469	0.030					
	C	0.014	1.517	0.069					
	D	0.023	0.358	0.059					
	E	0.021	1.145	0.184					
	F	NA	NA	NA					

Notes:

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Dust becomes visible at approx. 2 mg/m<sup>3</sup>

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**AIR MONITORING DATA  
PHASE 2 REMEDIATION  
RICHMOND FIELD STATION**

Week Commencing: 9/22/2003

Date	Station	TWA	MAX	STEL	Date	Station	TWA	MAX	STEL
9/22/2003	A	0.040	0.955	0.166	9/26/2003	A	0.028	0.258	0.046
Monday	B	0.000	0.730	0.000	Friday	B	0.038	0.585	0.150
	C	0.000	1.395	0.073		C	0.036	0.809	0.122
	D	0.023	0.794	0.113		C2	0.067	0.928	0.145
	E	0.018	0.621	0.077		D	0.025	0.189	0.052
	F	0.023	0.354	0.038		E	0.045	0.116	0.066
9/23/2003	A	0.013	0.150	0.026		F	0.074	0.170	0.103
Tuesday	B	0.014	0.174	0.027	9/27/2003	A	0.022	0.740	0.060
	C	0.011	1.302	0.136	Saturday	B	0.000	0.051	0.006
	C2	0.111	1.481	0.260		C	0.008	0.885	0.031
	D	0.043	1.536	0.253		C2	0.024	1.134	0.047
	E	0.000	0.038	0.018		D	0.009	0.966	0.087
	F	0.027	0.082	0.038		E	0.011	0.075	0.021
9/24/2003	A	0.005	0.144	0.020		F	0.000	0.052	0.000
Wednesday	B	0.015	2.570	0.056	9/28/2003	A	NA	NA	NA
	C	0.000	8.113	0.082	Sunday	B	NA	NA	NA
	C2	0.041	9.124	0.209		C	NA	NA	NA
	D	0.013	0.223	0.032		C2	NA	NA	NA
	E	0.020	0.062	0.040		D	NA	NA	NA
	F	0.025	0.324	0.058		E	NA	NA	NA
9/25/2003	A	0.009	0.254	0.028		F	NA	NA	NA
Thursday	B	0.029	0.248	0.042					
	C	0.016	1.824	0.180					
	C2	0.090	2.049	0.239					
	D	0.027	0.560	0.094					
	E	0.039	0.618	0.090					
	F	0.018	0.428	0.055					

**Notes:**

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Dust becomes visible at approx. 2 mg/m<sup>3</sup>

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**AIR MONITORING DATA  
PHASE 2 REMEDIATION  
RICHMOND FIELD STATION**

Week Commencing: 9/29/2003

Date	Station	TWA	MAX	STEL	Date	Station	TWA	MAX	STEL
9/29/2003	A	0.003	1.606	0.024	10/3/2003	A	0.007	0.280	0.034
Monday	B	0.000	0.154	0.006	Friday	B	0.000	0.166	0.032
	C	0.009	0.950	0.147		C	0.046	1.488	0.245
	C2	0.033	1.093	0.194		C2	0.083	1.577	0.252
	D	0.022	0.493	0.128		D	0.020	0.573	0.114
	E	0.015	0.736	0.135		E	0.021	0.212	0.071
	F	0.007	1.273	0.066		F	0.000	0.039	0.026
9/30/2003	A	0.011	0.477	0.059	10/4/2003	A	0.007	1.199	0.043
Tuesday	B	0.023	2.799	0.115	Saturday	B	0.005	0.277	0.021
	C	0.041	1.431	0.269		C	0.017	2.031	0.289
	C2	0.054	1.465	0.268		C2	0.060	1.900	0.352
	D	0.023	1.362	0.068		D	0.006	1.420	0.132
	E	0.022	0.297	0.060		E	0.010	0.127	0.038
	F	0.019	0.275	0.073		F	0.000	0.408	0.003
10/1/2003	A	0.008	0.478	0.032	10/5/2003	A	NA	NA	NA
Wednesday	B	0.007	0.653	0.021	Sunday	B	NA	NA	NA
	C	--	--	--		C	NA	NA	NA
	C2	0.028	3.671	0.150		C2	NA	NA	NA
	D	0.014	0.529	0.050		D	NA	NA	NA
	E	0.028	0.238	0.037		E	NA	NA	NA
	F	0.002	0.038	0.008		F	NA	NA	NA
10/2/2003	A	0.009	0.296	0.034					
Thursday	B	0.008	0.140	0.027					
	C	0.031	1.625	0.218					
	C2	0.056	1.986	0.322					
	D	0.025	0.376	0.100					
	E	0.034	0.238	0.079					
	F	0.007	0.058	0.022					

**Notes:**

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Dust becomes visible at approx. 2 mg/m<sup>3</sup>

Measurements are Total Dust

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**AIR MONITORING DATA  
PHASE 2 REMEDIATION  
RICHMOND FIELD STATION**

Week Commencing: 10/6/2003

Date	Station	TWA	MAX	STEL	Date	Station	TWA	MAX	STEL
10/6/2003	A	0.005	0.414	0.026	10/10/2003	A	0.014	0.968	0.045
Monday	B	0.009	0.617	0.044	Friday	B	0.009	1.455	0.046
	C	0.031	1.943	0.254		C	0.000	1.285	0.080
	C2	0.082	--	--		C2	0.026	1.450	0.145
	D	0.025	0.817	0.144		D	0.016	1.329	0.090
	E	0.027	1.043	0.103		E	0.009	0.748	0.075
	F	0.000	0.879	0.040		F	0.003	0.096	0.019
10/7/2003	A	0.000	0.213	0.024	10/11/2003	A	0.016	0.659	0.036
Tuesday	B	0.002	0.238	0.023	Saturday	B	0.018	0.917	0.041
	C	0.027	1.236	0.025		C	0.077	1.224	0.270
	C2	NA	NA	NA		C2	0.044	0.983	0.213
	D	0.000	0.576	0.000		D	0.022	0.788	0.062
	E	0.006	0.091	0.044		E	0.000	0.328	0.006
	F	0.000	0.343	0.033		F	0.000	0.118	0.015
10/8/2003	A	0.024	0.670	0.053	10/12/2003	A	NA	NA	NA
Wednesday	B	0.000	0.121	0.023	Sunday	B	NA	NA	NA
	C	0.027	2.224	0.252		C	NA	NA	NA
	C2					C2	NA	NA	NA
	D	0.032	1.089	0.143		D	NA	NA	NA
	E	0.013	0.178	0.032		E	NA	NA	NA
	F	0.007	0.089	0.021		F	NA	NA	NA
10/9/2003*	A	0.032	1.040	0.057					
Thursday PM	B	0.070	1.553	0.269					
	C	0.015	0.671	0.037					
	C2	0.014	0.580	0.030					
	D	0.016	0.242	0.039					
	E	0.000	0.154	0.005					
	F	0.009	0.245	0.015					

**Notes:**

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Dust becomes visible at approx. 2 mg/m<sup>3</sup>

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*10/9/2003	A	0.044	5.371	0.337
Thursday AM	E	0.046	2.947	0.351

**AIR MONITORING DATA  
PHASE 2 REMEDIATION  
RICHMOND FIELD STATION**

Week Commencing: 10/13/2003

Date	Station	TWA	MAX	STEL	Date	Station	TWA	MAX	STEL
10/13/2003	A	0.044	3.349	0.127	10/17/2003	A	0.035	2.155	0.132
Monday	B	0.045	0.880	0.106	Friday	B	0.030	3.026	0.233
	C	0.038	1.040	0.150		C	0.028	1.146	0.124
	C2	0.034	0.658	0.109		C2	0.016	1.026	0.109
	D	0.045	0.558	0.154		D	0.032	0.505	0.089
	E	0.016	0.496	0.063		E	0.032	4.042	0.198
	F	0.036	3.979	0.167		F	0.019	0.118	0.047
10/14/2003	A	0.020	0.764	0.033	10/18/2003	A	0.018	0.996	0.052
Tuesday	B	0.019	0.411	0.043	Saturday	B	0.008	0.625	0.048
	C	0.099	2.465	0.447		C	0.078	1.905	0.411
	C2	0.106	1.963	0.391		C2	0.063	1.716	0.346
	D	0.060	1.447	0.273		D	0.026	1.580	0.181
	E	0.009	1.010	0.062		E	0.073	2.404	0.169
	F	0.008	0.147	0.026		F	0.000	0.128	0.022
10/15/2003	A	0.003	0.439	0.024	10/19/2003	A	0.019	2.979	0.152
Wednesday	B	0.031	0.619	0.079	Sunday	B	0.012	2.550	0.065
	C	0.068	3.136	0.517		C	0.034	1.545	0.251
	C2	0.040	2.613	0.431		C2	0.037	1.275	0.213
	D	0.041	0.917	0.186		D	0.010	0.545	0.105
	E	0.000	1.620	0.032		E	0.009	0.423	0.049
	F	0.022	1.258	0.075		F	0.000	0.067	0.006
10/16/2003	A	0.016	1.840	0.042					
Thursday	B	0.027	0.402	0.096					
	C	0.035	3.153	0.333					
	C2	0.023	2.473	0.278					
	D	0.022	1.115	0.218					
	E	0.020	1.640	0.138					
	F	0.009	0.874	0.054					

**Notes:**

All units are mg/m<sup>3</sup>

Dust becomes visible at approx. 2 mg/m<sup>3</sup>

Measurements are Total Dust

TWA = Time Weighted Average

MAX = Maximum

STEL = Short Term Exposure Limit



**AIR MONITORING DATA  
PHASE 2 REMEDIATION  
RICHMOND FIELD STATION**

Week Commencing: 10/20/2003

Date	Station	TWA	MAX	STEL	Date	Station	TWA	MAX	STEL
10/20/2003	A	0.017	4.345	0.110	10/24/2003	A	0.025	3.316	0.154
Monday	B	0.000	0.378	0.043	Friday	B	0.037	6.230	0.322
	C	0.000	0.148	0.000		C	0.009	1.312	0.097
	C2	0.000	0.112	0.000		C2	0.000	1.157	0.070
	D	0.000	0.332	0.007		D	0.003	1.206	0.135
	E	0.000	1.094	0.089		E	0.018	2.341	0.155
	F	0.000	0.245	0.000		F	0.011	0.321	0.035
10/21/2003	A	0.013	1.392	0.063	10/25/2003	A	0.019	3.073	0.070
Tuesday	B	0.013	0.900	0.068	Saturday	B	0.001	2.191	68.000
	C	0.004	0.285	0.056		C	0.002	3.926	0.105
	C2	0.007	0.316	0.056		C2	0.000	0.302	0.001
	D	0.000	0.188	0.037		D	0.007	0.805	0.042
	E	0.006	0.168	0.035		E	0.017	2.107	0.187
	F	0.000	0.157	0.029		F	0.020	0.902	0.094
10/22/2003	A	0.007	0.458	0.047	10/26/2003	A	0.019	2.207	0.102
Wednesday	B	0.008	3.416	0.072	Sunday	B	0.001	0.163	0.033
	C	0.125	2.223	0.488		C	0.000	5.345	0.096
	C2	0.093	2.475	0.379		C2	0.001	4.087	0.076
	D	0.043	1.361	0.234		D	0.004	0.154	0.034
	E	0.000	0.197	0.048		E	0.003	1.461	0.045
	F*	0.107	3.978	2.415		F	0.006	0.155	0.028
10/23/2003	A	0.025	1.410	0.185					
Thursday	B	0.032	0.878	0.096					
	C	0.054	2.540	0.282					
	C2	0.041	2.268	0.250					
	D	0.037	0.984	0.177					
	E	0.019	2.439	0.163					
	F	see yesterday							

Notes:

\* Left overnight, fog

All units are mg/m<sup>3</sup>

Dust becomes visible at approx. 2 mg/m<sup>3</sup>

Measurements are Total Dust

TWA = Time Weighted Average

MAX = Maximum

STEL = Short Term Exposure Limit

**AIR MONITORING DATA  
PHASE 2 REMEDIATION  
RICHMOND FIELD STATION**

Week Commencing: 10/27/2003

Date	Station	TWA	MAX	STEL	Date	Station	TWA	MAX	STEL
10/27/2003	A	0.033	2.899	0.096	10/31/2003	A	0.010	0.490	0.040
Monday	B	0.006	0.400	0.031	Friday	B	0.001	0.206	0.057
	C	0.007	1.367	0.040		C	0.001	0.166	0.034
	D	0.000	0.947	0.038		D	0.000	0.427	0.034
	E	0.000	4.471	0.075		E	0.000	0.316	0.000
	F	0.005	0.119	0.012		F	0.007	0.075	0.047
10/28/2003	A	0.026	3.059	0.100	11/1/2003	A	NA	NA	NA
Tuesday	B	0.013	0.788	0.036	Saturday	B	NA	NA	NA
	C	0.009	0.582	0.033		C	NA	NA	NA
	D	0.006	0.708	0.033		D	NA	NA	NA
	E	0.002	0.843	0.040		E	NA	NA	NA
	F	0.005	0.464	0.038		F	NA	NA	NA
10/29/2003	A	0.028	4.138	0.098	11/2/2003	A	NA	NA	NA
Wednesday	B	0.028	0.786	0.137	Sunday	B	NA	NA	NA
	C	0.036	0.682	0.168		C	NA	NA	NA
	D	left overnight				D	NA	NA	NA
	E	0.029	0.653	0.111		E	NA	NA	NA
	F	0.027	0.435	0.052		F	NA	NA	NA
10/30/2003	A	0.013	2.935	0.092					
Thursday	B	0.005	0.531	0.074					
	C	0.005	0.507	0.026					
	D	0.000	0.828	0.215					
	E	0.000	0.136	0.000					
	F	0.005	0.093	0.014					

Notes:

All units are mg/m<sup>3</sup>

Dust becomes visible at approx. 2 mg/m<sup>3</sup>

Measurements are Total Dust

TWA = Time Weighted Average

MAX = Maximum

STEL = Short Term Exposure Limit

**AIR MONITORING DATA  
PHASE 2 REMEDIATION  
RICHMOND FIELD STATION**

Week Commencing: 11/3/2003

Date	Station	TWA	MAX	STEL	Date	Station	TWA	MAX	STEL
11/3/2003	A	0.001	0.431	0.030	11/7/2003	A	0.039	0.203	0.070
Monday	B	0.000	0.083	0.008	Friday	B	0.051	1.861	0.150
	C	0.056	0.703	0.027		C	0.040	0.740	0.081
	D	0.000	0.134	0.017		D	0.044	0.236	0.082
	E	0.041	3.583	0.214		E	0.054	0.963	0.105
	F	0.000	0.813	0.019		F	0.048	0.189	0.085
11/4/2003	A	0.012	0.416	0.055	11/8/2003	A	0.006	0.128	0.016
Tuesday	B	0.025	1.123	0.104	Saturday	B	0.002	0.122	0.027
	C	0.004	0.287	0.043		C	0.000	0.115	0.011
	D	0.015	0.168	0.047		D	0.000	0.309	0.006
	E	0.019	0.070	0.053		E	0.024	6.152	0.377
	F	0.015	0.215	0.047		F	0.018	0.141	0.035
11/5/2003	A	0.016	0.969	0.038	11/9/2003	A	NA	NA	NA
Wednesday	B	0.017	0.237	0.035	Sunday	B	NA	NA	NA
	C	0.012	0.302	0.037		C	NA	NA	NA
	D	0.016	0.329	0.032		D	NA	NA	NA
	E	0.015	0.496	0.025		E	NA	NA	NA
	F	0.016	5.514	0.086		F	NA	NA	NA
11/6/2003	A	0.047	1.615	0.087					
Thursday	B	0.032	2.520	0.137					
	C	0.036	0.110	0.080					
	D	0.040	0.200	0.083					
	E	0.045	0.137	0.081					
	F	0.035	0.207	0.077					

**Notes:**

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**AIR MONITORING DATA  
PHASE 2 REMEDIATION  
RICHMOND FIELD STATION**

Week Commencing: 11/10/2003

Date	Station	TWA	MAX	STEL	Date	Station	TWA	MAX	STEL
11/10/2003	A	0.006	0.897	0.026	11/14/2003	A	0.000	1.124	0.044
Monday	B	0.004	0.044	0.017	Friday	B	0.036	0.164	0.032
	C	0.000	0.005	0.000		C	--	--	--
	D	0.007	0.035	0.016		D	0.000	0.145	0.007
	E	0.029	0.218	0.041		E	0.000	1.285	0.097
	F	0.007	0.108	0.025		F	0.000	0.038	0.017
11/11/2003	A	0.011	1.078	0.031	11/15/2003	A	NA due to heavy rain		
Tuesday	B	0.001	0.262	0.014	Saturday	B	NA due to heavy rain		
	C	0.000	0.477	0.030		C	NA due to heavy rain		
	D	0.002	0.204	0.029		D	NA due to heavy rain		
	E	0.017	0.103	0.032		E	NA due to heavy rain		
	F	0.007	0.127	0.018		F	NA due to heavy rain		
11/12/2003	A	0.014	2.494	0.049	11/16/2003	A	NA	NA	NA
Wednesday	B	0.008	0.628	0.028	Sunday	B	NA	NA	NA
	C	0.011	0.387	0.036		C	NA	NA	NA
	D	0.005	0.840	0.044		D	NA	NA	NA
	E	0.012	1.210	0.068		E	NA	NA	NA
	F	0.004	0.408	0.027		F	NA	NA	NA
11/13/2003	A	0.015	0.797	0.206					
Thursday	B	0.019	0.647	0.199					
	C	0.001	0.828	0.155					
	D	0.012	0.717	0.183					
	E	0.015	0.552	0.180					
	F	0.011	0.527	0.212					

Notes:

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Dust becomes visible at approx. 2 mg/m<sup>3</sup>

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**AIR MONITORING DATA  
PHASE 2 REMEDIATION  
RICHMOND FIELD STATION**

Week Commencing: 11/17/2003

Date	Station	TWA	MAX	STEL	Date	Station	TWA	MAX	STEL
11/17/2003	A	0.021	0.769	0.041	11/21/2003	A	0.027	4.570	0.157
Monday	B	0.063	9.344	0.512	Friday	B	0.008	0.356	0.022
	C	0.018	0.069	0.031		C	0.007	0.012	0.006
	D	0.023	0.060	0.037		D	0.002	0.050	0.006
	E	--	--	--		E	0.011	0.082	0.018
	F	0.017	0.459	0.038		F	0.004	0.029	0.009
11/18/2003	A	0.013	0.660	0.045	11/22/2003	A	0.021	1.638	0.060
Tuesday	B	0.016	0.128	0.073	Saturday	B	0.000	0.033	0.000
	C	0.009	0.062	0.043		C	0.000	0.251	0.004
	D	0.009	0.153	0.037		D	0.000	0.056	0.006
	E	0.004	4.105	0.229		E	0.001	0.031	0.007
	F	0.016	0.994	0.059		F	0.002	0.046	0.003
11/19/2003	A	0.033	2.301	0.066	11/23/2003	A	NA	NA	NA
Wednesday	B	0.043	0.363	0.144	Sunday	B	NA	NA	NA
	C	0.031	0.106	0.038		C	NA	NA	NA
	D	0.019	0.780	0.063		D	NA	NA	NA
	E	0.024	0.347	0.080		E	NA	NA	NA
	F	0.050	0.760	0.095		F	NA	NA	NA
11/20/2003	A	0.001	0.234	0.008					
Thursday	B	0.012	0.138	0.053					
	C	0.003	0.080	0.013					
	D	0.005	0.196	0.041					
	E	0.035	0.441	0.112					
	F	0.003	0.312	0.014					

**Notes:**

All units are mg/m<sup>3</sup>

Dust becomes visible at approx. 2 mg/m<sup>3</sup>

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**AIR MONITORING DATA  
PHASE 2 REMEDIATION  
RICHMOND FIELD STATION**

Week Commencing: 11/24/2003

Date	Station	TWA	MAX	STEL	Date	Station	TWA	MAX	STEL
11/24/2003	A	0.028	1.580	0.072	11/27/2003	A	NA	NA	NA
Monday	B	0.036	4.593	0.312	Friday	B	NA	NA	NA
	C	0.035	1.242	0.127		C	NA	NA	NA
	D	0.024	0.114	0.039		D	NA	NA	NA
	E	0.063	3.878	0.707		E	NA	NA	NA
	F	0.036	0.309	0.051		F	NA	NA	NA
11/25/2003	A	0.021	7.008	0.141	11/28/2003	A	NA	NA	NA
Tuesday	B	0.015	0.628	0.069	Saturday	B	NA	NA	NA
	C	0.009	0.355	0.027		C	NA	NA	NA
	D	0.001	0.583	0.028		D	NA	NA	NA
	E	0.013	0.708	0.041		E	NA	NA	NA
	F	0.007	0.358	0.036		F	NA	NA	NA
11/26/2003	A	0.000	0.924	0.022	11/29/2003	A	NA	NA	NA
Wednesday	B	0.000	0.136	0.005	Sunday	B	NA	NA	NA
	C	--	--	--		C	NA	NA	NA
	D	--	--	--		D	NA	NA	NA
	E	0.000	0.152	0.001		E	NA	NA	NA
	F	--	--	--		F	NA	NA	NA
11/26/2003	A	NA	NA	NA					
Thursday	B	NA	NA	NA					
	C	NA	NA	NA					
	D	NA	NA	NA					
	E	NA	NA	NA					
	F	NA	NA	NA					

Notes:

All units are mg/m<sup>3</sup>

Dust becomes visible at approx. 2 mg/m<sup>3</sup>

Measurements are Total Dust

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**AIR MONITORING DATA  
PHASE 2 REMEDIATION  
RICHMOND FIELD STATION**

Week Commencing: 12/1/2003

Date	Station	TWA	MAX	STEL	Date	Station	TWA	MAX	STEL
12/1/2003	A	NA	NA	NA	12/5/2003	A	NA	NA	NA
Monday	B	NA	NA	NA	Friday	B	NA	NA	NA
	C	NA	NA	NA		C	NA	NA	NA
	D	NA	NA	NA		D	NA	NA	NA
	E	NA	NA	NA		E	NA	NA	NA
	F	NA	NA	NA		F	NA	NA	NA
12/2/2003	A	NA	NA	NA	12/6/2003	A	NA	NA	NA
Tuesday	B	NA	NA	NA	Saturday	B	NA	NA	NA
	C	NA	NA	NA		C	NA	NA	NA
	D	NA	NA	NA		D	NA	NA	NA
	E	NA	NA	NA		E	NA	NA	NA
	F	NA	NA	NA		F	NA	NA	NA
12/3/2003	A	NA	NA	NA	12/7/2003	A	NA	NA	NA
Wednesday	B	NA	NA	NA	Sunday	B	NA	NA	NA
	C	0.035	0.100	0.070		C	NA	NA	NA
	D	0.072	0.142	0.111		D	NA	NA	NA
	E	NA	NA	NA		E	NA	NA	NA
	F	NA	NA	NA		F	NA	NA	NA
12/4/2003	A	NA	NA	NA					
Thursday	B	NA	NA	NA					
	C	NA	NA	NA					
	D	NA	NA	NA					
	E	NA	NA	NA					
	F	NA	NA	NA					

Notes:

All units are mg/m<sup>3</sup>

Dust becomes visible at approx. 2 mg/m<sup>3</sup>

Measurements are Total Dust

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MAX = Maximum

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**AIR MONITORING DATA  
PHASE 2 REMEDIATION  
RICHMOND FIELD STATION**

Week Commencing: 12/8/2003

Date	Station	TWA	MAX	STEL	Date	Station	TWA	MAX	STEL
12/8/2003	A	0.001	0.235	0.024	12/12/2003	A	NA	NA	NA
Monday	B	--	--	--	Friday	B	NA	NA	NA
	C	--	--	--		C	NA	NA	NA
	D	0.000	0.018	0.000		D	NA	NA	NA
	E	--	--	--		E	NA	NA	NA
	F	--	--	--		F	NA	NA	NA
12/9/2003	A	NA	NA	NA	12/13/2003	A	NA	NA	NA
Tuesday	B	NA	NA	NA	Saturday	B	NA	NA	NA
	C	NA	NA	NA		C	NA	NA	NA
	D	NA	NA	NA		D	NA	NA	NA
	E	NA	NA	NA		E	NA	NA	NA
	F	NA	NA	NA		F	NA	NA	NA
12/10/2003	A	NA	NA	NA	12/14/2003	A	NA	NA	NA
Wednesday	B	NA	NA	NA	Sunday	B	NA	NA	NA
	C	NA	NA	NA		C	NA	NA	NA
	D	NA	NA	NA		D	NA	NA	NA
	E	NA	NA	NA		E	NA	NA	NA
	F	NA	NA	NA		F	NA	NA	NA
12/11/2003	A	NA	NA	NA					
Thursday	B	NA	NA	NA					
	C	NA	NA	NA					
	D	NA	NA	NA					
	E	NA	NA	NA					
	F	NA	NA	NA					

Notes:

All units are mg/m<sup>3</sup>

Dust becomes visible at approx. 2 mg/m<sup>3</sup>

Measurements are Total Dust

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**Appendix F**  
**Phase 2 Permits**



DEPARTMENT OF THE ARMY  
SAN FRANCISCO DISTRICT, CORPS OF ENGINEERS  
333 MARKET STREET  
SAN FRANCISCO, CALIFORNIA 94105-2197

SEP 4 2003

Regulatory Branch

**SUBJECT: File Number 28135S – Western Stege Marsh Remediation and Restoration**

Mr. Mike Hryciw  
University of California, Berkeley  
Project Manager  
Capital Projects  
1936 University Avenue, 2<sup>nd</sup>. Floor  
Berkeley, California 94720

Dear Mr.Hryciw:

This letter is in reference to your submittal of June 24, 2003 concerning Department of the Army authorization to excavate and then restore between 3.71 and 5.23 acres of wetlands pursuant to a clean-up order (Number 01-02) from the Regional Water Quality Control Board (RWQCB) for property in and adjacent to Western Stege Marsh in Richmond, Contra Costa County, California. The property is south of South 46<sup>th</sup> Street and the Richmond Field Station, off Highway 580 in Richmond. The actual number of acres to be disturbed and restored is uncertain because the final acreage will be determined with RWQCB staff during the clean-up operation.

Based on a review of the information you submitted, your project qualifies for authorization under Department of the Army Nationwide Permit 38 (*Cleanup of Hazardous and Toxic Waste*), (67 FR 2020, January 15, 2002), pursuant to Section 404 of the Clean Water Act (33 U.S.C. 1344) and Section 10 of the Rivers and Harbors Act of 1899 (33 U.S.C. 403). See Enclosure 1.

The project must be in compliance with the General Conditions cited in Enclosure 2 for this Nationwide Permit authorization to remain valid. **Upon completion of the project and all associated mitigation requirements, you shall sign and return the Certification of Compliance**, Enclosure 3, verifying that you have complied with the terms and conditions of the permit. Non-compliance with any condition could result in the revocation, suspension or modification of the authorization for your project, thereby requiring you to obtain an individual permit from the Corps. This Nationwide Permit authorization does not obviate the need to obtain other State or local approvals required by law.

This authorization will remain valid for two years from the date of this letter unless the Nationwide Permit is modified, suspended or revoked. If you have commenced work or are under contract to commence work prior to the suspension, or revocation of the Nationwide Permit and the project would not comply with the resulting Nationwide Permit authorization, you



have twelve (12) months from that date to complete the project under the present terms and conditions of the Nationwide Permit.

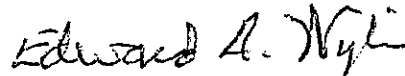
This authorization will not be effective until you have obtained Section 401 water quality certification or a waiver of certification from the San Francisco Bay Regional Water Quality Control Board (RWQCB), and a concurrence from the S.F. Bay Conservation and Development Commission with your certification that your project will comply with California's Coastal Zone Management Act. If the RWQCB fails to act on a valid request for certification within two (2) months after receipt, the Corps will presume a waiver of water quality certification has been obtained. If the Commission fails to act on a valid request for concurrence with your certification within six (6) months after receipt, the Corps will presume a concurrence has been obtained. You shall submit a copy of the certification or waiver and concurrence to the Corps prior to the commencement of work.

To ensure compliance with the Nationwide Permit, the following special conditions shall be implemented:

- 1) The project shall be implemented as shown on Figures 1 and 5-9 attached.
- 2) The project shall be implemented as described in the documents entitled "Nationwide Permit 38 Modification Request (ACOE File No. 26417S) Western Stege Marsh Remediation and Restoration Project at Richmond Field Station," dated June 2003 and prepared by BBL, and the "Richmond Field Station Remediation Project Biological Assessment Report," dated July 2003 and also prepared by BBL.
- 3) This Corps permit does not authorize you to take an endangered species, in particular the California clapper rail (*Rallus longirostrus obsoletus*). In order to legally take a listed species, you must have separate authorization under the Endangered Species Act (ESA). The Biological Opinion (BO) dated September 3, 2003, (copy enclosed), contains mandatory terms and conditions to implement the reasonable and prudent measures that are associated with "incidental take" that is also specified in the BO. Your authorization under this Corps permit is conditional upon your compliance with all of the mandatory terms and conditions associated incidental take of the attached BO, which terms and conditions are incorporated by reference in this permit. Failure to comply with the terms and conditions associated with incidental take of the BO, where a take of the listed species occurs, would constitute an unauthorized take, and it would also constitute non-compliance with your Corps permit. The Fish and Wildlife Service is the appropriate authority to determine compliance with the terms and conditions of its BO and with the ESA.

You may refer all questions to Molly Martindale of our Regulatory Branch at 415-977-8448. All correspondence should reference the file number 28135S.

Sincerely,



Edward A. Wylie  
Chief, South Section

Enclosures

Copy furnished (w/ enclosure):

Ms. Diane Mims  
Blasland, Bouck and Lee, Inc.  
Walnut Creek, CA

Copies furnished (w/o enclosures):

US F&WS, Sacramento, CA Attn: Dan Buford  
CA RWQCB, Oakland, CA Attn: Cecil Felix  
CA BCDC, San Francisco, CA Attn: Michelle Levinson

## 2002 Nationwide Permits

(effective 18 March 2002)

38. **Cleanup of Hazardous and Toxic Waste.** Specific activities required to effect the containment, stabilization, or removal of hazardous or toxic waste materials that are performed, ordered, or sponsored by a government agency with established legal or regulatory authority provided the permittee notifies the District Engineer in accordance with the "Notification" General Condition. For discharges in special aquatic sites, including wetlands, the notification must also include a delineation of affected special aquatic sites, including wetlands. Court ordered remedial action plans or related settlements are also authorized by this NWP. This NWP does not authorize the establishment of new disposal sites or the expansion of existing sites used for the disposal of hazardous or toxic waste. Activities undertaken entirely on a Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) site by authority of CERCLA as approved or required by EPA, are not required to obtain permits under Section 404 of the CWA or Section 10 of the Rivers and Harbors Act. (Sections 10 and 404)

## Nationwide Permit General Conditions - March 18, 2002

The following General Conditions must be followed in order for any authorization by an NWP to be valid:

1. Navigation. No activity may cause more than a minimal adverse effect on navigation.
2. Proper Maintenance. Any structure or fill authorized shall be properly maintained, including maintenance to ensure public safety.
3. Soil Erosion and Sediment Controls. Appropriate soil erosion and sediment controls must be used and maintained in effective operating condition during construction, and all exposed soil and other fills, as well as any work below the ordinary high water mark or high tide line, must be permanently stabilized at the earliest practicable date. Permittees are encouraged to perform work within waters of the United States during periods of low-flow or no-flow.
4. Aquatic Life Movements. No activity may substantially disrupt the necessary life-cycle movements of those species of aquatic life indigenous to the waterbody, including those species that normally migrate through the area, unless the activity's primary purpose is to impound water. Culverts placed in streams must be installed to maintain low flow conditions.
5. Equipment. Heavy equipment working in wetlands must be placed on mats, or other measures must be taken to minimize soil disturbance.
6. Regional and Case-By-Case Conditions. The activity must comply with any regional conditions that may have been added by the Division Engineer (See 33 CFR Part 330.4(e).) and with any case specific conditions added by the Corps or by the State or tribe in its Section 401 Water Quality Certification or Coastal Zone Management Act consistency determination.
7. Wild and Scenic Rivers. No activity may occur in a component of the National Wild and Scenic River System; or in a river officially designated by Congress as a "study river" for possible inclusion in the system, while the river is in an official study status; unless the appropriate Federal agency, with direct management responsibility for such river, has determined in writing that the proposed activity will not adversely affect the Wild and Scenic River designation, or study status. Information on Wild and Scenic Rivers may be obtained from the appropriate Federal land management agency in the area (e.g., National Park Service, U.S. Forest Service, Bureau of Land Management, U.S. Fish and Wildlife Service).
8. Tribal Rights. No activity or its operation may impair reserved tribal rights, including, but not limited to, reserved water rights and treaty fishing and hunting rights.
9. Water Quality.
  - (a) In certain states and tribal lands an individual Section 401 Water Quality Certification must be obtained or waived. (See 33 CFR Part 330.4(c).)
  - (b) For NWPs 12, 14, 17, 18, 32, 39, 40, 42, 43, and 44, where the state or tribal Section 401 certification (either generically or individually) does not require or approve water quality management measures, the permittee must provide water quality management measures that will ensure that the authorized work does not result in more than minimal degradation of water quality (or the Corps determines that compliance with state or local standards, where applicable, will ensure no more than minimal adverse effect on water quality). An important component of water quality management includes stormwater management that minimizes degradation of the downstream aquatic system, including water quality. (Refer to General Condition 21 for stormwater management requirements.) Another important component of water quality management is the establishment and maintenance of vegetated buffers next to open waters, including streams. (Refer to General Condition 19 for vegetated buffer requirements for the NWPs.)

This condition is only applicable to projects that have the potential to affect water quality. While appropriate measures must be taken, in most cases it is not necessary to conduct detailed studies to identify such measures or to require monitoring.
10. Coastal Zone Management. In certain states, an individual state coastal zone management consistency concurrence must be obtained or waived. (See 33 CFR Part 330.4(d).)
11. Endangered Species.
  - (a) No activity is authorized under any NWP which is likely to jeopardize the continued existence of a threatened or endangered species or a species proposed for such designation, as identified under the Federal Endangered Species Act (ESA), or which will destroy or adversely modify the critical habitat of such species. Non-federal permittees shall notify the District Engineer if any listed species or designated critical habitat might be affected or is in the vicinity of the project, or is located in the designated critical habitat and shall not begin work on the activity until notified by the District Engineer that the requirements of the ESA have been satisfied and that the activity is authorized. For activities that may affect Federally-listed endangered or threatened species or designated critical habitat, the notification must include the name(s) of the endangered or

are and the amount of wetlands that exists on the property. For parcels greater than 1/4 acre in size, formal wetland delineation must be prepared in accordance with the current method required by the Corps. (See Paragraph 13(f) below.);

(iv) A written description of all land (including, if available, legal descriptions) owned by the prospective permittee and/or the prospective permittee's spouse, within a one mile radius of the parcel, in any form of ownership (including any land owned as a partner, corporation, joint tenant, co-tenant, or as a tenant-by-the-entirety) and any land on which a purchase and sale agreement or other contract for sale or purchase has been executed;

(10) For NWP 31 (Maintenance of Existing Flood Control Facilities), the prospective permittee must either notify the District Engineer with a PCN prior to each maintenance activity or submit a five year (or less) maintenance plan. In addition, the PCN must include all of the following:

(i) Sufficient baseline information identifying the approved channel depths and configurations and existing facilities. Minor deviations are authorized, provided the approved flood control protection or drainage is not increased;

(ii) A delineation of any affected special aquatic sites, including wetlands; and

(iii) Location of the dredged material disposal site;

(11) For NWP 33 (Temporary Construction, Access, and Dewatering), the PCN must include a restoration plan of reasonable measures to avoid and minimize adverse effects to aquatic resources;

(12) For NWPs 39, 43, and 44, the PCN must also include a written statement to the District Engineer explaining how avoidance and minimization for losses of waters of the US were achieved on the project site;

(13) For NWP 39 and NWP 42, the PCN must include a compensatory mitigation proposal to offset losses of waters of the US or justification explaining why compensatory mitigation should not be required. For discharges that cause the loss of greater than 300 linear feet of an intermittent stream bed, to be authorized, the District Engineer must determine that the activity complies with the other terms and conditions of the NWP, determine adverse environmental effects are minimal both individually and cumulatively, and waive the limitation on stream impacts in writing before the permittee may proceed;

(14) For NWP 40 (Agricultural Activities), the PCN must include a compensatory mitigation proposal to offset losses of waters of the U.S. This NWP does not authorize the relocation of greater than 300 linear feet of existing serviceable drainage ditches constructed in non-tidal streams unless, for drainage ditches constructed in intermittent non-tidal streams, the District Engineer waives this criterion in writing, and the District Engineer has determined that the project complies with all terms and conditions of this NWP, and that any adverse impacts of the project on the aquatic environment are minimal, both individually and cumulatively;

(15) For NWP 43 (Stormwater Management Facilities), the PCN must include, for the construction of new stormwater management facilities, a maintenance plan (in accordance with state and local requirements, if applicable) and a compensatory mitigation proposal to offset losses of waters of the U.S. For discharges that cause the loss of greater than 300 linear feet of an intermittent stream bed, to be authorized, the District Engineer must determine that the activity complies with the other terms and conditions of the NWP, determine adverse environmental effects are minimal both individually and cumulatively, and waive the limitation on stream impacts in writing before the permittee may proceed;

(16) For NWP 44 (Mining Activities), the PCN must include a description of all waters of the U.S. adversely affected by the project, a description of measures taken to minimize adverse effects to waters of the U.S., a description of measures taken to comply with the criteria of the NWP, and a reclamation plan (for all aggregate mining activities in isolated waters and non-tidal wetlands adjacent to headwaters and any hard rock/mineral mining activities);

(17) For activities that may adversely affect Federally-listed endangered or threatened species, the PCN must include the name(s) of those endangered or threatened species that may be affected by the proposed work or utilize the designated critical habitat that may be affected by the proposed work; and

(18) For activities that may affect historic properties listed in, or eligible for listing in, the National Register of Historic Places, the PCN must state which historic property may be affected by the proposed work or include a vicinity map indicating the location of the historic property.

(c) Form of Notification: The standard Individual Permit application form (ENG FORM 4345) may be used as the notification but must clearly indicate that it is a PCN and must include all of the information required in Paragraphs (b) (1)-(18) of General Condition 13. A letter containing the requisite information may also be used.

(d) District Engineer's Decision: In reviewing the PCN for the proposed activity, the District Engineer will determine whether the activity authorized by the NWP will result in more than minimal individual or cumulative adverse environmental effects or may be contrary to the public interest. The prospective permittee may submit a proposed mitigation plan with the PCN to expedite the process. The District Engineer will consider any proposed compensatory mitigation the applicant has included in the proposal in determining whether the net adverse environmental effects to the aquatic environment of the proposed work are minimal. If the District Engineer determines that the activity complies with the terms and conditions of the NWP and that the adverse effects on the aquatic environment are minimal, after considering mitigation, the District Engineer will notify the permittee and include any conditions the District Engineer deems necessary. The District Engineer must approve any compensatory mitigation proposal before the permittee commences work. If the prospective permittee is required to submit a compensatory mitigation proposal with the PCN, the proposal may be either conceptual or detailed. If the prospective permittee elects to submit a compensatory mitigation plan with the PCN, the District Engineer will expeditiously review the proposed compensatory mitigation plan. The District Engineer must review the plan within 45 days of receiving a complete PCN and determine whether the conceptual or specific proposed mitigation would ensure no more than minimal adverse effects on the aquatic environment. If the net adverse effects of the project on the aquatic environment (after consideration of the compensatory mitigation proposal) are determined by the



(a) The project must be designed and constructed to avoid and minimize adverse effects to waters of the U.S. to the maximum extent practicable at the project site (i.e., on site).

(b) Mitigation in all its forms (avoiding, minimizing, rectifying, reducing or compensating) will be required to the extent necessary to ensure that the adverse effects to the aquatic environment are minimal.

(c) Compensatory mitigation at a minimum one-for-one ratio will be required for all wetland impacts requiring a PCN, unless the District Engineer determines in writing that some other form of mitigation would be more environmentally appropriate and provides a project-specific waiver of this requirement. Consistent with National policy, the District Engineer will establish a preference for restoration of wetlands as compensatory mitigation, with preservation used only in exceptional circumstances.

(d) Compensatory mitigation (i.e., replacement or substitution of aquatic resources for those impacted) will not be used to increase the acreage losses allowed by the acreage limits of some of the NWPs. For example, 1/4 acre of wetlands cannot be created to change a 3/4 acre loss of wetlands to a 1/2 acre loss associated with NWP 39 verification. However, 1/2 acre of created wetlands can be used to reduce the impacts of a 1/2 acre loss of wetlands to the minimum impact level in order to meet the minimal impact requirement associated with NWPs.

(e) To be practicable, the mitigation must be available and capable of being done considering costs, existing technology, and logistics in light of the overall project purposes. Examples of mitigation that may be appropriate and practicable include, but are not limited to: reducing the size of the project; establishing and maintaining wetland or upland vegetated buffers to protect open waters such as streams; and replacing losses of aquatic resource functions and values by creating, restoring, enhancing, or preserving similar functions and values, preferably in the same watershed.

(f) Compensatory mitigation plans for projects in or near streams or other open waters will normally include a requirement for the establishment, maintenance, and legal protection (e.g., easements, deed restrictions) of vegetated buffers to open waters. In many cases, vegetated buffers will be the only compensatory mitigation required. Vegetated buffers should consist of native species. The width of the vegetated buffers required will address documented water quality or aquatic habitat loss concerns. Normally, the vegetated buffer will be 25 to 50 feet wide on each side of the stream, but the District Engineer may require slightly wider vegetated buffers to address documented water quality or habitat loss concerns. Where both wetlands and open waters exist on the project site, the Corps will determine the appropriate compensatory mitigation (e.g., stream buffers or wetlands compensation) based on what is best for the aquatic environment on a watershed basis. In cases where vegetated buffers are determined to be the most appropriate form of compensatory mitigation, the District Engineer may waive or reduce the requirement to provide wetland compensatory mitigation for wetland impacts.

(g) Compensatory mitigation proposals submitted with the "notification" may be either conceptual or detailed. If conceptual plans are approved under the verification, then the Corps will condition the verification to require detailed plans be submitted and approved by the Corps prior to construction of the authorized activity in waters of the U.S.

(h) Permittees may propose the use of mitigation banks, in-lieu fee arrangements or separate activity-specific compensatory mitigation. In all cases that require compensatory mitigation, the mitigation provisions will specify the party responsible for accomplishing and/or complying with the mitigation plan.

**20. Spawning Areas.** Activities, including structures and work in navigable waters of the U.S. or discharges of dredged or fill material, in spawning areas during spawning seasons must be avoided to the maximum extent practicable. Activities that result in the physical destruction (e.g., excavate, fill, or smother downstream by substantial turbidity) of an important spawning area are not authorized.

**21. Management of Water Flows.** To the maximum extent practicable, the activity must be designed to maintain preconstruction downstream flow conditions (e.g., location, capacity, and flow rates). Furthermore, the activity must not permanently restrict or impede the passage of normal or expected high flows (unless the primary purpose of the fill is to impound waters) and the structure or discharge of dredged or fill material must withstand expected high flows. The activity must, to the maximum extent practicable, provide for retaining excess flows from the site, provide for maintaining surface flow rates from the site similar to preconstruction conditions, and provide for not increasing water flows from the project site, relocating water, or redirecting water flow beyond preconstruction conditions. Stream channelizing will be reduced to the minimal amount necessary, and the activity must, to the maximum extent practicable, reduce adverse effects such as flooding or erosion downstream and upstream of the project site, unless the activity is part of a larger system designed to manage water flows. In most cases, it will not be a requirement to conduct detailed studies and monitoring of water flow.

This condition is only applicable to projects that have the potential to affect waterflows. While appropriate measures must be taken, it is not necessary to conduct detailed studies to identify such measures or require monitoring to ensure their effectiveness. Normally, the Corps will defer to state and local authorities regarding management of water flow.

**22. Adverse Effects From Impoundments.** If the activity creates an impoundment of water, adverse effects to the aquatic system due to the acceleration of the passage of water, and/or the restricting of its flow shall be minimized to the maximum extent practicable. This includes structures and work in navigable waters of the U.S., or discharges of dredged or fill material.

**23. Waterfowl Breeding Areas.** Activities, including structures and work in navigable waters of the U.S. or discharges of dredged or fill material, into breeding areas for migratory waterfowl must be avoided to the maximum extent practicable.

Enclosure 3

Permittee: **University of California, Berkeley**

File No.: **28135S - Western Stege Marsh Remediation Project**

**Certification of Compliance  
for  
Nationwide Permit**

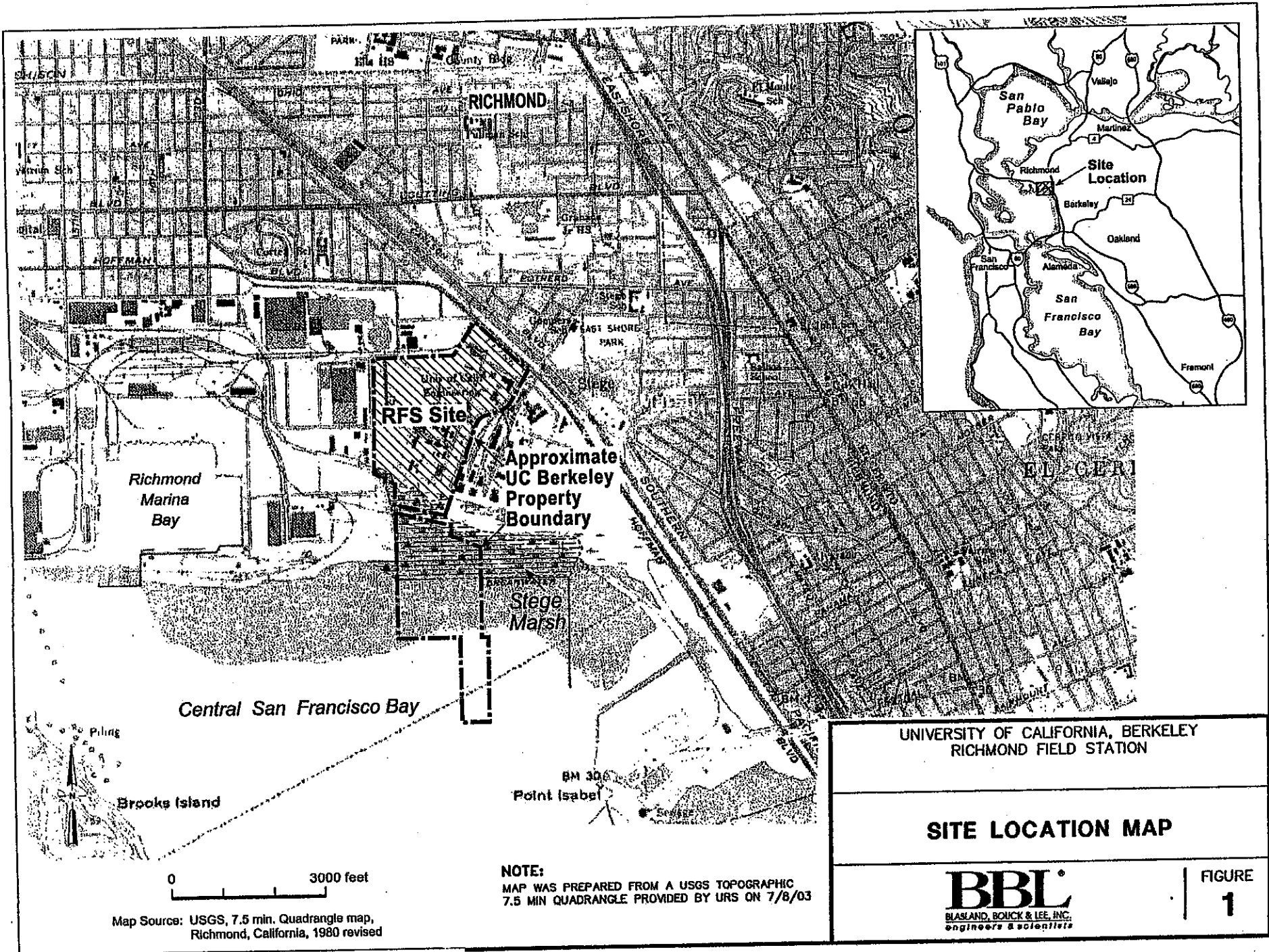
"I hereby certify that the work authorized by the above referenced file number and all required mitigation have been completed in accordance with the terms and conditions of the nationwide permit."

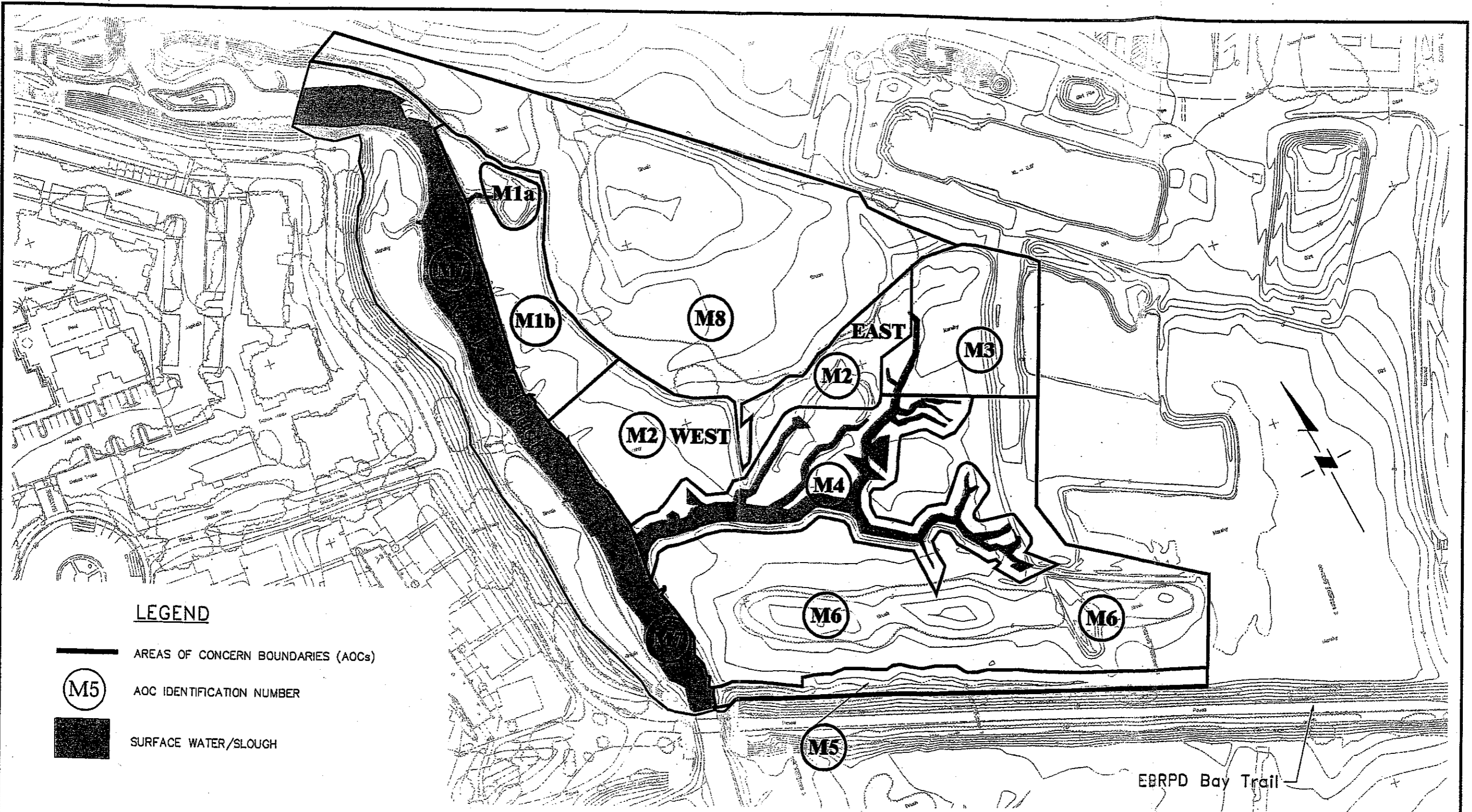
\_\_\_\_\_  
(permittee)

(date)




Return to:

Molly Martindale  
Department of the Army  
U.S. Army Engineer District, San Francisco  
333 Market Street, CESP-N-OR-R  
San Francisco, CA 94105-2197

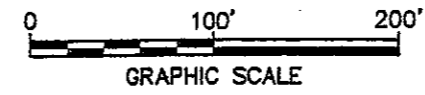




**LEGEND**

-  AREAS OF CONCERN BOUNDARIES (AOCs)
-  AOC IDENTIFICATION NUMBER
-  SURFACE WATER/SLOUGH

NOTE:  
 1) BASE MAP SUPPLIED BY URS ON 7/9/03 AT A SCALE OF 1"=100'.

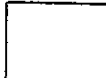




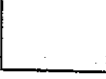
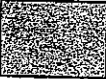

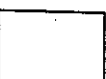


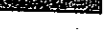




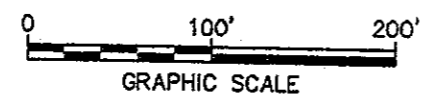
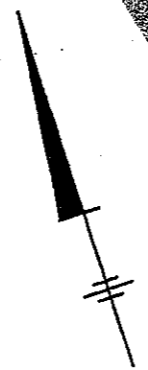
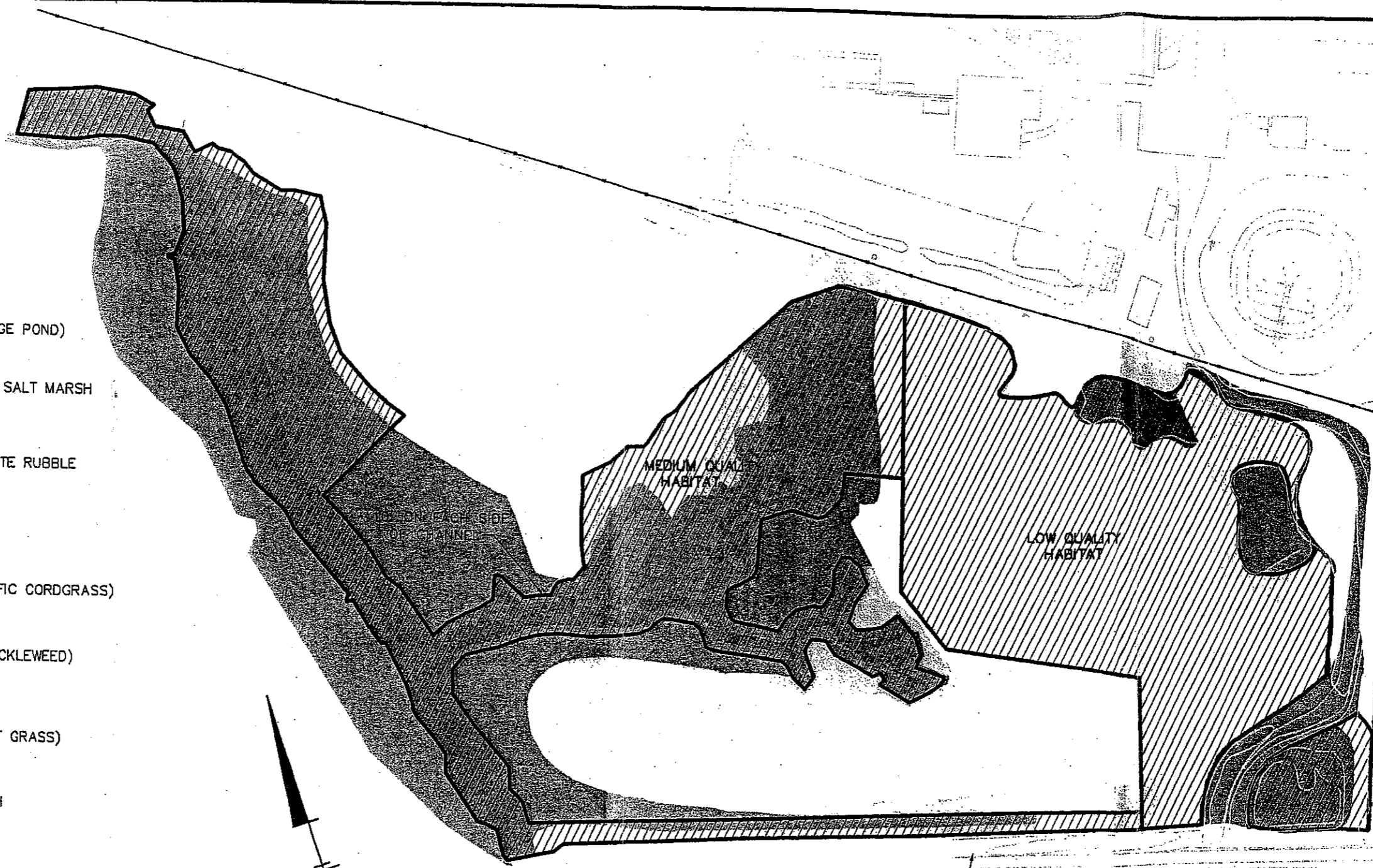
EBRPD Bay Trail

UNIVERSITY OF CALIFORNIA, BERKELEY RICHMOND FIELD STATION	
<b>LOCATIONS OF AOCs MARSH PORTION OF SUBUNIT 2B</b>	
<b>BBL</b> BLASLAND, BOUCK & LEE, INC. engineers & scientists	FIGURE <b>5</b>

X: BASE.DWG  
 L: OFF-REP  
 P: PAGESET/PLT-BL  
 7/11/03 IRV-80-JMS  
 F: /BIM/CAD/2003PROJ/24210/24210G04.DWG

**LEGEND**

-  PAMPAS GRASS  
0.2 ACRES
-  WALKING PATH  
0.25 ACRES
-  SURFACE WATER (ORANGE POND)  
0.1 ACRES
-  DISTRESSED/DEAD HIGH SALT MARSH (SALT GRASS)  
0.2 ACRES
-  COYOTE BRUSH/CONCRETE RUBBLE  
0.3 ACRES
-  MIXED RUDERAL SCRUB  
2.5 ACRES
-  LOW SALT MARSH (PACIFIC CORDGRASS)  
3 ACRES
-  MIDDLE SALT MARSH (PICKLEWEED)  
1.4 ACRES
-  HIGH SALT MARSH (SALT GRASS)  
3.7 ACRES
-  SURFACE WATER/SLOUGH  
1.1 ACRES
-  ALKALI BULRUSH  
0.1 ACRES
-  FENCE LINE
-  BOUNDARY OF DISTURBED AREA
-  DISTURBED HABITAT  
LOW QUALITY HABITAT = 2.31 ACRES  
MEDIUM QUALITY HABITAT = 2.92 ACRES



EBRPD Bay Trail

- NOTES:
- 1) SOME PORTIONS OF THE HIGH SALT MARSH (SALT GRASS) AREAS ALONG THE EBRPD BAY TRAIL ALSO CONTAIN INTERMITTENT PATCHES OF PICKLEWEED.
  - 2) BASE MAP SUPPLIED BY URS ON 7/9/03 AT A SCALE OF 1"=100'.

UNIVERSITY OF CALIFORNIA, BERKELEY  
RICHMOND FIELD STATION

**ALTERNATIVE 1  
DISTURBED AREAS**

















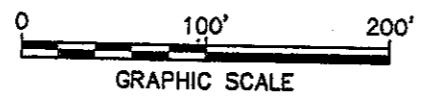
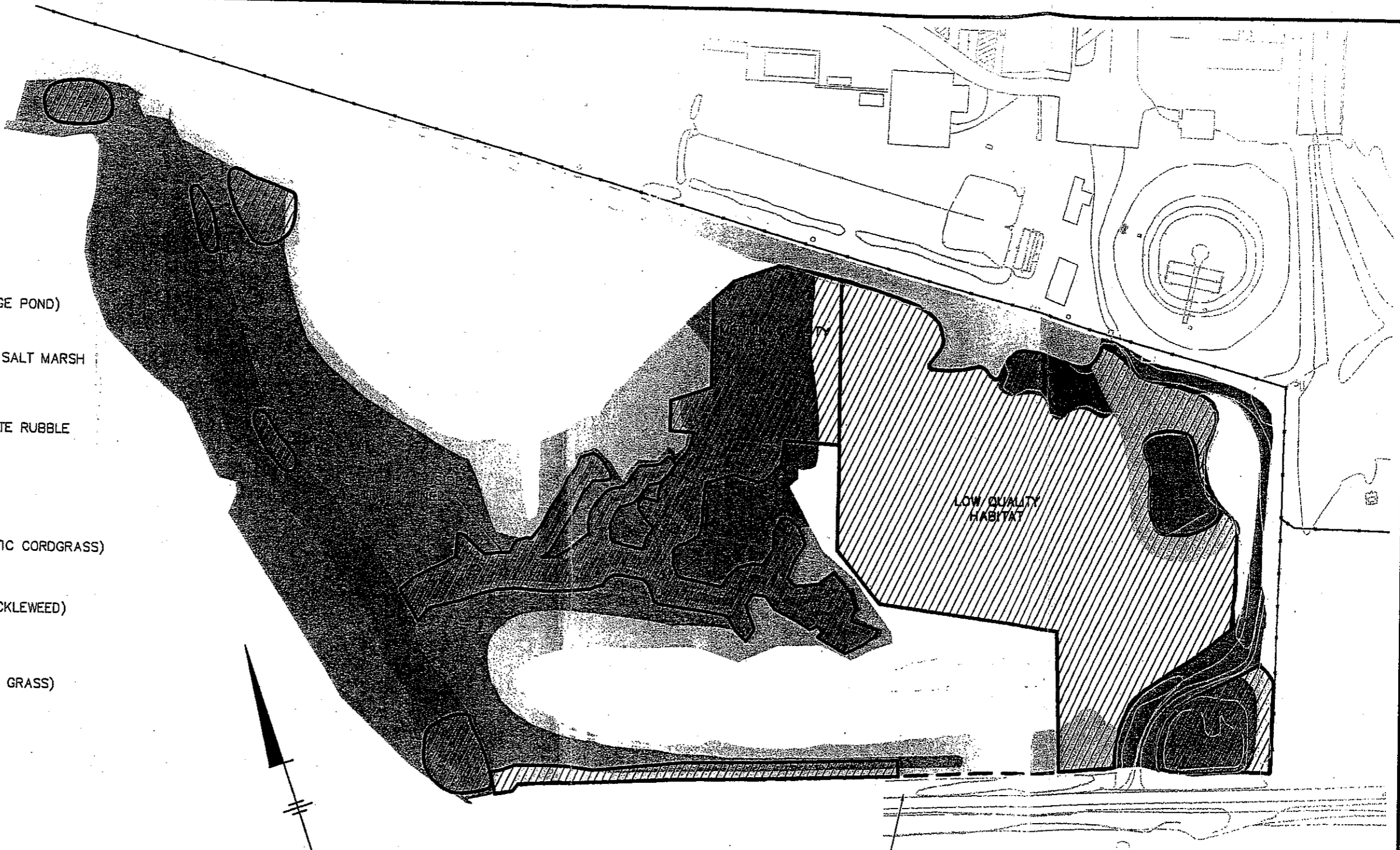
FIGURE  
**6**

W: (XREF)  
L: OFF-REF  
P: PAGESSET/PLT-BL  
7/11/03 IRV-60-JMS  
P: /BIM/CAD/2003PROJ/24210/24210G02.DWG



**LEGEND**

-  PAMPAS GRASS  
0.2 ACRES
-  WALKING PATH  
0.25 ACRES
-  SURFACE WATER (ORANGE POND)  
0.1 ACRES
-  DISTRESSED/DEAD HIGH SALT MARSH (SALT GRASS)  
0.2 ACRES
-  COYOTE BRUSH/CONCRETE RUBBLE  
0.3 ACRES
-  MIXED RUDERAL SCRUB  
2.5 ACRES
-  LOW SALT MARSH (PACIFIC CORDGRASS)  
3 ACRES
-  MIDDLE SALT MARSH (PICKLEWEED)  
1.4 ACRES
-  HIGH SALT MARSH (SALT GRASS)  
3.7 ACRES
-  SURFACE WATER/SLOUGH  
1.1 ACRES
-  ALKALI BULRUSH  
0.1 ACRES
-  FENCE LINE
-  BOUNDARY OF DISTURBED AREA
-  DISTURBED HABITAT  
LOW QUALITY HABITAT = 2.31 ACRES  
MEDIUM QUALITY HABITAT = 1.4 ACRES



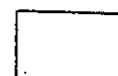



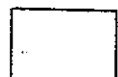
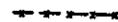


EBRPD Bay Trail

- NOTES:
- 1) SOME PORTIONS OF THE HIGH SALT MARSH (SALT GRASS) AREAS ALONG THE EBRPD BAY TRAIL ALSO CONTAIN INTERMITTENT PATCHES OF PICKLEWEED.
  - 2) BASE MAP SUPPLIED BY URS ON 7/9/03 AT A SCALE OF 1"=100'.

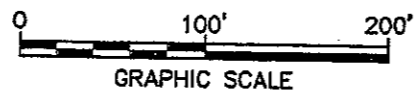
UNIVERSITY OF CALIFORNIA, BERKELEY RICHMOND FIELD STATION	
<b>ALTERNATIVE 2 DISTURBED AREAS</b>	
<b>BBL</b> <small>BLASLAND, BOUCK &amp; LEE, INC. engineers &amp; scientists</small>	FIGURE <b>7</b>

X: (XREF)  
L: OFF=REF  
P: PAGESET/PLT-BL  
7/11/03 IRV-80-3MS  
P:/IRM/CAD/2003PRQJ/24210/24210003.DWG

**LEGEND**


-  MIXED RUDERAL SCRUB
-  LOW SALT MARSH (PACIFIC CORDGRASS)
-  MIDDLE SALT MARSH (PICKLEWEED)
-  SURFACE WATER/SLOUGH
-  ECOTONE
-  FENCE LINE
-  DISTURBED AND RESTORED HABITAT  
LOW QUALITY HABITAT = 2.31 ACRES  
MEDIUM QUALITY HABITAT = 2.92 ACRES
-  CREATED WETLAND = 4.08 ACRES

TOTAL ACRES RESTORED AND CREATED = 9.31






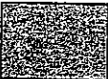

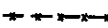


**NOTES:**

- 1) SOME PORTIONS OF THE HIGH SALT MARSH (SALT GRASS) AREAS ALONG THE EBRPD BAY TRAIL ALSO CONTAIN INTERMITTENT PATCHES OF PICKLEWEED.
- 2) BASE MAP SUPPLIED BY URS ON 7/9/03 AT A SCALE OF 1"=100'.

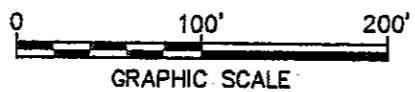
UNIVERSITY OF CALIFORNIA, BERKELEY RICHMOND FIELD STATION	
<b>ALTERNATIVE 1 CONCEPTUAL RESTORATION PLAN</b>	
 <small>BLASLAND, BUCK &amp; LEE, INC. engineers &amp; scientists</small>	<b>FIGURE 8</b>

L: OFF-REP  
P: PAGESET/PLY-BL  
7/16/03 IRV-BD-JMS  
R: IBM/CAD/2003PROJ/24210/24210G08.DWG

**LEGEND**

-  MIXED RUDERAL SCRUB
-  LOW SALT MARSH (PACIFIC CORDGRASS)
-  MIDDLE SALT MARSH (PICKLEWEED)
-  SURFACE WATER/SLOUGH
-  ECOTONE
-  FORMER FENCE LINE
-  DISTURBED AND RESTORED HABITAT  
LOW QUALITY HABITAT = 2.31 ACRES  
MEDIUM QUALITY HABITAT = 1.40 ACRES
-  CREATED WETLAND = 2.55 ACRES

TOTAL ACRES RESTORED AND CREATED = 6.26



**NOTES:**

- 1) SOME PORTIONS OF THE HIGH SALT MARSH (SALT GRASS) AREAS ALONG THE EBRPD BAY TRAIL ALSO CONTAIN INTERMITTENT PATCHES OF PICKLEWEED.
- 2) BASE MAP SUPPLIED BY URS ON 7/9/03 AT A SCALE OF 1"=100'.

UNIVERSITY OF CALIFORNIA, BERKELEY  
RICHMOND FIELD STATION

**ALTERNATIVE 2  
CONCEPTUAL RESTORATION PLAN**

**BBL**  
BLASLAND, BOUICK & LEE, INC.  
engineers & scientists

FIGURE

**9**



**United States Department of the Interior**  
**FISH AND WILDLIFE SERVICE**

Sacramento Fish and Wildlife Office  
2800 Cottage Way, Room W-2605  
Sacramento, California 95825-1846

IN REPLY REFER TO:  
1-1-03-F-0228

SEP 3 2003

Mr. Calvin C. Fong  
Chief, Regulatory Branch  
(Attn: Molly Martindale)  
U.S. Army Corps of Engineers  
San Francisco District  
333 Market Street  
San Francisco, California 94105-2197

Subject: Endangered Species Formal Consultation on U.C. Berkeley's Proposed  
Western Stege Marsh Remediation Project, Contra Costa County,  
California (Corps File No. 28135S)

Dear Mr. Fong:

This document transmits the U.S. Fish and Wildlife Service's (Service) biological opinion based upon our review of the University of California, Berkeley's (UC Berkeley) proposed Western Stege Marsh Remediation Project (Remediation Project) located in Contra Costa County, California, and its effects on the endangered California clapper rail (*Rallus obsoletus longirostris*) (clapper rail) in accordance with section 7 of the Endangered Species Act of 1973, as amended (16 U.S.C. 1531 et seq.) (Act). Your September 1, 2003, request for formal consultation was received in our office on September 3, 2003

This biological opinion is based on information provided in: (1) your September 1, 2003, letter initiating formal consultation; (2) Blasland, Bouck, and Lee's (BBL) June 2003 *Nationwide Permit 38 Modification Request, Western Stege Marsh Remediation and Restoration Project at Richmond Field Station*; (3) BBL's July 2003 *Richmond Field Station Remediation Project Biological Assessment Report (BA)*; and, (4) additional information contained in Service files. A complete administrative record of this consultation is on file at the Service's Sacramento Fish and Wildlife Office.



Mr. Calvin C. Fong

2

### CONSULTATION HISTORY

On July 31, 2002, the Corps requested informal consultation on the proposed action.

The applicant surveyed for clapper rails in Stege Marsh from February through May of 2003.

On May 13, 2002, the Service met with URS Corp

On June 26, 2003, the Service participated in a conference call with UC Berkeley, its consultants, and the Corps where the Service identified the need to initiate formal consultation.

### BIOLOGICAL OPINION

#### Description of the Proposed Action

The UC Berkeley will remediate contaminants occurring in western Stege Marsh and Meeker Slough. The UC Berkeley will implement one of two alternatives developed as proposals to meet the requirements of the San Francisco Bay Regional Water Quality Control Board (Regional Board). The alternative to be implemented will be determined between the Regional Board and UC Berkeley based on either the results of treatability studies or at the determination of the Regional Board. Remediation activities include: 1) removal of sediments and overlying vegetation using a combination of land-based excavation using mats or access roadways and/or dredging; 2) treatment and upland disposal to either Subunit 1 or transported to an approved offsite facility; 3) backfilling of treatment areas for restoration with clean bay mud; and, 4) management/monitoring in place of areas designated as low to moderate risk. Areas of work are designated as M1a, M2 east and M2 west, and M3 through M8.

The proposed Remediation Project will result in temporary impacts to occupied clapper rail habitat. Habitats impacted during removal actions will be backfilled with bay muds and restored. Implementation of Alternative 1 is expected to temporarily impact 5.23 acres of tidal marsh suitable for clapper rails. In the event Alternative 2 is implemented, 3.71 acres of occupied clapper rail habitat will be temporarily impacted.

To minimize and mitigate impacts to the clapper rail UC Berkeley will conduct remediation activities outside of the clapper rail's breeding season. All work within 200 feet of suitable clapper rail habitat will be completed between September 1 and January 31 of any given year.

UC Berkeley developed two restoration alternatives, corresponding with the two respective remediation alternatives. If Alternative 1 is implemented, UC Berkeley will restore the 5.23 acres impacted by the remediation and create an additional 4.07 acres of suitable clapper rail habitat. If Alternative 2 is implemented, UC Berkeley will restore the 3.71 acres of habitat that will be remediated, and will create an additional 2.55 acres of suitable clapper rail habitat.



Mr. Calvin C. Fong

**Action Area**

The action area includes Stege Marsh and its tidal sloughs and peripheral upland habitats.

**Status of the Species/Environmental Baseline**

*California clapper rail*

The clapper rail was federally listed as endangered in 1970 (35 FR 16047). A detailed account of the taxonomy, ecology, and biology of the clapper rail is presented in the Salt Marsh Harvest Mouse and California Clapper Rail Recovery Plan (Service 1984) and the references cited therein. The clapper rail is a fully protected species under California law (See California Fish and Game Code Section 3511).

The clapper rail is endemic to tidally influenced salt and brackish marshes of California. Historically, the clapper rail occurred in tidal marshes along California's coast from Morro Bay, San Luis Obispo County, to Humboldt Bay, Humboldt County. Currently, clapper rails are known to occur in tidal marshes in San Francisco, San Pablo, Grizzly, Suisun and Honker Bays.

The clapper rail is distinguishable from other rails by its large body size of 32-47 cm from bill to tail, and weighs approximately 250-350 g. It has a long, slightly decurved orange bill, a rufous breast, black and white barred flanks, and white undertail coverts (Ripley 1977). Clapper rails are sexually dimorphic, the males are slightly larger than females (Garcia 1995). Juveniles have a pale bill and dark plumage.

Clapper rails are typically found in the intertidal zone and sloughs of salt and brackish marshes dominated by pickleweed, Pacific cordgrass (*Spartina foliosa*), gumplant (*Grindelia spp.*), salt grass, jaumea (*Jaumea carnosa*) and adjacent upland refugia. They may also occupy habitats with other vegetative components, which include, but are not limited to bulrush (*Scirpus americanus* and *S. maritimus*), cattails (*Typha spp.*), and Baltic rush (*Juncus balticus*).

Clapper rails are capable of producing several vocalizations, most common of which is a series of keks or claps. Pair bonds are typically established during the month of February, and nesting typically occurs from March through August. Estimates of clapper rail clutch size range from 5-14 eggs (DeGroot 1927, Gill 1972). The clapper rail builds a bowl shaped platform nest of marsh vegetation and detritus (DeGroot 1927, Zucca 1954, Gill 1972, Harvey 1980, Foerster et al. 1990, Garcia 1995). The clapper rail typically feeds on benthic invertebrates, but its diet is wide ranging, and includes seeds, and occasionally small mammals such as the harvest mouse.

Suitable habitat for clapper rails has been significantly reduced by approximately 84 percent of historic in the San Francisco Bay Area due to habitat conversions for urban and agricultural uses, and is a primary factor in the species decline. Additional impacts which have contributed to the

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decline in clapper rail populations include over-harvesting, environmental contaminants, and erosion or subsidence of habitat.

According to the BA, Stege Marsh was surveyed for clapper rails from February 10 to March 11, 2003, consistent with a Service-approved protocol. Clapper rails were detected in the marsh both north and south of the East Bay Regional Park District trail and on either side of Meeker Slough. Surveyors witnessed courtship and copulation between a pair of rails. Based upon vocalizations and visual observations surveyors estimated the presence of 1-2 pairs. Existing contaminants have degraded conditions for clapper rails in areas to be remediated. Some areas do not support vegetation or a benthic invertebrate community, and thus lack foraging habitat and hiding cover.

### Effects of the Proposed Action

The Remediation Project will likely result in temporary direct impacts to occupied clapper rail habitat, and may result in harassment of non-breeding clapper rails. According to the BA, the removal of contaminants of concern will result in the temporary direct loss of 5.23 acres of suitable clapper rail habitat if Alternative 1 is implemented. According to the BA, Alternative 2 would result in the temporary direct loss of 3.71 acres of suitable clapper rail habitat. However, because neither alternative has been selected to be implemented, it is assumed that 5.23 acres of suitable clapper rail habitat will be impacted.

The Remediation Project is not likely to impact breeding clapper rails because the applicants will not conduct work during the clapper rail's breeding season. Dispersing or non-breeding clapper rails could be harassed by use of construction equipment and other work activities during the remediation of contaminants in Stege Marsh.

Remediation of contaminants in this portion of Stege Marsh will likely benefit the clapper rail by removing contaminants of concern, which currently reduce the quality of habitat for cover and foraging. Restoration of impacted sites will likely result in habitat of higher quality than what is impacted. The clapper rail will likely also benefit from newly created habitat. The amount of restoration and creation varied according to the alternative implemented. The clapper rail will benefit from the restoration of up to 5.23 acres of habitat and the creation of up to 4.07 acres of suitable clapper rail habitat.

Clapper rails could be harmed if disturbed tidal marsh habitat impacted by remediation and restoration is colonized by non-native plant species, especially *Lepidium* and non-native *Spartina* species.

### Cumulative Effects

Cumulative effects include the effects of future State, Tribal, local or private actions affecting listed species and their critical habitat that are reasonably certain to occur in the action area considered in this biological opinion. Future Federal actions that are unrelated to the proposed

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action are not considered in this section because they require separate consultation pursuant to section 7 of the Act.

Numerous activities continue to impact habitats of clapper rails in the action area. Habitat loss and degradation affecting the flora and fauna continues as a result of urbanization and trail usage and contaminant inputs. Clapper rails are also affected by increased predation associated with human development, and reduction of food sources. All of these non-Federal activities are expected to continue to adversely affect these listed species in the action area.

### Conclusion

After reviewing the current status of the clapper rail, the environmental baseline for the action area, the effects of the proposed action and cumulative effects, it is the Service's biological opinion that the Remediation Project, as proposed, is not likely to jeopardize the continued existence of clapper rail. No critical habitat has been designated for the clapper rail, therefore none will be affected.

### INCIDENTAL TAKE STATEMENT

Section 9(a)(1) of the Act and Federal regulation pursuant to section 4(d) of the Act prohibit the take of endangered and threatened fish and wildlife species without special exemption. Take is defined as harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect, or to attempt to engage in any such conduct. Harass is defined by the Service as an intentional or negligent act or omission which creates the likelihood of injury to a listed species by annoying it to such an extent as to significantly disrupt normal behavioral patterns which include, but are not limited to, breeding, feeding, or sheltering. Harm is defined by the Service to include significant habitat modification or degradation that results in death or injury to listed species by impairing behavioral patterns including breeding, feeding, or sheltering. Incidental take is defined as take that is incidental to, and not the purpose of, the carrying out of an otherwise lawful activity. Under the terms of section 7(b)(4) and section 7(o)(2), taking that is incidental to and not intended as part of the agency action is not considered to be prohibited taking under the Act provided that such taking is in compliance with this Incidental Take Statement.

The incidental take statement accompanying this biological opinion exempts take of the clapper rail carried out in accordance with the following reasonable and prudent measures and terms and conditions from the prohibitions contained in section 9 of the Endangered Species Act. It does not address the restrictions or requirements of other applicable laws.

The measures described below are non-discretionary, and must be implemented by the agency so that they become binding conditions of any grant or permit issued to the applicant, as appropriate, in order for the exemption in section 7(o)(2) to apply. The Corps has a continuing duty to regulate the activity covered by this incidental take statement. If the Corps (1) fails to

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require the applicant to adhere to the terms and conditions of the incidental take statement through enforceable terms that are added to the permit or grant document, and/or (2) fails to retain oversight to ensure compliance with these terms and conditions, the protective coverage of section 7(o)(2) may lapse.

#### **Amount or Extent of Take**

Conservation measures proposed by the project proponent and described above in the Description of the Proposed Action will reduce, but do not eliminate, the potential for incidental taking of this species during the project. The Service anticipates incidental take of the clapper rail will be difficult to detect or quantify because the elusive nature of these species, their small size, and cryptic coloration make the finding of a dead specimen unlikely. The Service considers the number of clapper rails subject to harassment from noise and vibrations to be impracticable to estimate. The Service, therefore, anticipates the following levels of take as a result of the proposed project. The proposed project would result in the temporary loss of 5.23 acres of tidal wetlands currently available to clapper rails, and would likely result in harassment of non-breeding clapper rails within 250 feet of project activities in tidal wetlands.

#### **Effect of the Take**

In the accompanying biological opinion the Service determined that the level of anticipated take is not likely to jeopardize the continued existence of the clapper rail, or result in destruction or adverse modification of critical habitat for this species.

#### **Reasonable and Prudent Measure**

The Service believes the following reasonable and prudent measure is necessary and appropriate to minimize the impact of take on the clapper rail:

Minimize the potential for harm and harassment of clapper rails.

#### **Terms and Conditions**

To be exempt from the prohibitions of section 9 of Act, the Corps must comply with the following terms and conditions, which implement the reasonable and prudent measures described above. These terms and conditions are nondiscretionary.

The Corps and UC Berkeley shall develop a management plan for non native species within the area of Stege Marsh within UC Berkeley's jurisdiction. This management plan shall address control of non-native species, including *Lepidium* and non-native *Spartina* species. The plan shall also address management of feral animals at the Richmond Field

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Station. The final Service-approved plan shall be completed, and implementation begun, by February 1, 2004.

### Reporting Requirements

The Service must be notified within 24 hours of the finding of any injured or dead clapper rail or any unanticipated damage to listed species habitat associated with project construction. Notification must include the date, time, and precise location of the specimen/incident, and any other pertinent information. The Service contact person is Division Chief, Endangered Species Program in the Sacramento Fish and Wildlife Office, at (916) 414-6600. Any dead or injured specimens shall be repositied with the Service's Division of Law Enforcement, 2800 Cottage Way, Room W-2928, Sacramento, California 95825, telephone (916) 414-6660.

### CONSERVATION RECOMMENDATIONS

Section 7(a)(1) of the Endangered Species Act directs Federal agencies to utilize their authorities to further the purpose of the Act by carrying out conservation programs for the benefit of endangered and threatened species. Conservation recommendations are discretionary agency activities that can be implemented to further the purposes of the Act, such as preservation of endangered species habitat, implementation of recovery actions, or development of information and database.

For the Service to be kept informed of actions minimizing or avoiding adverse effects or benefitting listed species or their habitats, the Service requests notification of the implementation of any conservation recommendations. We propose the following conservation recommendations:

1. Assist the Service in implementing recovery actions identified within most current clapper rail and salt marsh harvest mouse recovery plan.
2. Encourage participation of prospective permittees in a program being developed by Federal and State resource agencies to limit and reverse the spread on non-native *Spartina* within the San Francisco Bay Estuary.

### REINITIATION STATEMENT

This concludes formal consultation on the action outlined in your request. As provided in 50 CFR § 402.16, reinitiation of formal consultation is required where discretionary Federal agency involvement or control over the action has been retained (or is authorized by law) and if: (1) the amount or extent of incidental take is exceeded; (2) new information reveals effects of the agency action that may affect listed species or critical habitat in a manner or to an extent not considered



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in this opinion; (3) the agency action is subsequently modified in a manner that causes an effect to the listed species or critical habitat not considered in this opinion; or (4) a new species is listed or critical habitat designated that may be affected by the action. In instances where the amount or extent of incidental take is exceeded, the Corps shall not issue authorizations under this biological opinion.

If you have any questions regarding this opinion, please contact Dan Buford of the Sacramento Fish and Wildlife Office at (916) 414-6625.

Sincerely,



Cay C. Goude  
Acting Field Supervisor

cc:

CDFG, Yountville, CA  
SFB Regional Board, Oakland, CA

101 70 10A, 310-414-0710 SEP 3 2000 17.10 1.00

## LITERATURE CITED

- Dedrick, K. 1993. San Francisco Bay tidal marshland acreages: recent and historic values. In O.T. Magoon (ed.): Proceedings of the Sixth Symposium on Coastal and Ocean Management (Coastal Zone '89). Charleston, South Carolina, July 11-14, 1989. Publ. by Am. Society of Civil Eng.
- DeGroot, D.S. 1927. The California clapper rail: its nesting habitats, enemies, and habitat. *Condor*. 29:259-270.
- Foerster, K.S., J.E. Takekawa, and J.D. Albertson. 1990. Breeding density, nesting habitat, and predators of the California clapper rail. Unpubl. Rpt. No. SFBNWR-116400-90-1, prep. for San Francisco Bay NWR, Fremont, California. 46 pp.
- Garcia, E.J. 1995. Conservation of the California clapper rail: An analysis of survey methods and habitat use in Marin County, California. Master Thesis, University of California-Davis. 135 pp.
- Gill, R., Jr. 1972. South San Francisco Bay breeding bird survey, 1971. Wildlife Management Branch Administrative Report 72-6. Sacramento, California. 69 pp.
- Harvey, T.E. 1980. A breeding season survey of the California clapper rail in south San Francisco Bay, California. Unpubl. Final Rpt. prep. for San Francisco Bay NWR, Fremont, California. 45 pp.
- U.S. Fish and Wildlife Service. 1984. Salt Marsh Harvest Mouse and California Clapper Rail Recovery Plan. U.S. Fish and Wildlife Service, Portland, Oregon. 141 pp.
- Zucca, J.J. 1954. A study of the California clapper rail. *Wasmann Journal of Biology*. 12(2): 135-153.



*Making San Francisco Bay Better*

November 3, 2003

The Regents of the University of California  
Environmental, Health and Safety  
317 University Hall, #1150  
Berkeley, California 94720

**ATTENTION:** Karl Hans

**SUBJECT:** Corrected Amendment No. One to BCDC Permit No. M01-52(b)

Ladies and Gentlemen:

Recently, Diane Mims of Blasland, Bouck and Lee, Inc., notified staff of an error in Amendment No. One to BCDC Permit No. M01-52(b) issued to you on October 17, 2003. Ms. Mims has requested that Page 5 of the amended permit be corrected to state that the Richmond Redevelopment Agency owns a portion of the project site on which remedial activities will be conducted.

We have corrected Page 5 of the amended permit to reflect the requested clarification and have enclosed the corrected page. Please discard the previous Page 5, dated October 17, 2003, and replace the page in the "Recorder's Copy" and in your permittee's copy with the attached Page 5 and follow the remaining instructions as shown on the checklist attached to the permit as before.

Should you have any questions regarding this matter, please feel free to contact me at (415) 352-3659.

Very truly yours,

MICHELLE BURT LEVENSON  
Coastal Program Analyst

Enc.

MBL/mm

cc: Diane Mims, Blasland, Bouck and Lee, Inc.



Making San Francisco Bay Better

# Recorder's Copy

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PERMIT NO. M01-52(b)  
(Issued on June 27, 2002, As  
Amended Through October 17, 2003)  
AMENDMENT NO. ONE

The Regents of the University of California  
Environmental, Health and Safety  
317 University Hall, #1150  
Berkeley, California 94720

ATTENTION: Mr. Karl Hans

Ladies and Gentlemen:



CONTRA COSTA Co Recorder Office  
STEPHEN L. WEIR, Clerk-Recorder  
DOC- 2003-0597887-00

Wednesday, DEC 10, 2003 12:42:28

FRE \$0.00  
Ttl Pd \$0.00

Nbr-0001898471

lrc/R9/1-10

## I. Authorization

A. Subject to the conditions stated below, the permittee, the Regents of the University of California, is hereby authorized to do the following:

**Location:** In the Bay and within the 100-foot shoreline band, in the area in and around East and West Stege Marsh, at the Zeneca Richmond Facility, in the City of Richmond, Contra Costa County.

**Description:** In preparation for future restoration of East Stege Marsh and West Stege Marsh and development of the adjoining upland area, conduct soil remediation activities as mandated by the San Francisco Bay Regional Water Quality Control Board, including:

### Phase I Activities:

(1) Within Subunit 2A: (a) excavating 12,000 13,300 cubic yards of soils, sediments and spent pyrite ore (cinders) from a 7,500-square-foot area in the east end of West Stege Marsh; (2 b) backfilling the 7,500-square-foot area in West Stege Marsh with approximately 12,150 10,900 cubic yards of clean fill to return the area to its former elevation to achieve optimum pickleweed growth raise the area to an elevation approximately six inches higher than current elevations to prevent water from

higher than current elevations to prevent water from ponding in this area; (3 c) regrading the east bank of West Stege Marsh to create a less abrupt slope to foster the growth of transitional marsh plants; and (d) place a total of approximately 600 square feet of weed block fabric to smother invasive spartina alterniflora. [The Phase 1 activities originally authorized in BCDC Permit No. M01-52 occurred on property owned jointly by the University of California Zeneca.]

**Phase 2 Activities:**

In the Bay (a tidal marsh): (1) Within Subunit 2B: (a) excavate 7,300 cubic yards of soils that contain elevated levels of arsenic and mercury from a 40,100-square-foot area (area M3) and excavate 300 cubic yards of soils that contain elevated levels of PCBs from a 1,800-square-foot area (area M1a); and (2) backfill the excavated areas with a total of 7,600 cubic yards of clean fill material.

Within the 100-foot shoreline band: (1) Within Subunit 2B: (a) excavate 4,700 cubic yards of soils that contain elevated levels of arsenic and mercury from a 15,000-square-foot area (area M3); (2) install a ten-square-foot portion of an asphalt and concrete treatment pad; and (3) stockpile approximately 12,300 cubic yards of clean fill material to be used to fill excavated areas. [The Phase 2 activities authorized in BCDC Permit No. M01-52(b) occur on property solely owned by the University of California.]

B. This authority is generally pursuant to and limited by your the original application dated September 17, 2001, and received in our office on September 20, 2001, and the request to amend the original permit dated March 7, 2003 and June 27, 2003, including its accompanying exhibits and all conditions of this permit.



C. Work authorized herein must commence prior to June 25, 2004, or this amended permit will lapse and become null and void. Such work must also be diligently pursued to completion and must be completed within one year of commencement, or by June 25, 2005, whichever is earlier, unless an extension of time is granted by further amendment of this amended permit.

## II. Special Conditions

The authorization made herein shall be subject to the following special conditions, in addition to the standard conditions in Part IV:

A. **Public Access.** The permittee shall make every effort to minimize closures and impacts to the existing shoreline trail and connecting trails during project construction. These existing public access trails shall be open to the public after work hours and on weekends, whenever possible. Any closure of these trails exceeding two days must be approved by or on behalf of the Commission. In addition, signs shall be installed at all public access entrances informing the public of why the area is closed, when it will be open, possible detours, and when project construction will be completed. Upon completion of construction, the public access trails shall be restored to the condition they were in prior to commencement of construction.

B. **Notice to Contractor.** The permittee shall provide a copy of this permit to any contractor or person working in concert with the permittee to carry out the activities authorized herein and shall point out the special conditions contained herein.

### C. Marsh Protection.

1. **Best Management Practices.** All construction operations shall be performed to prevent construction materials from falling, washing, or blowing into the Bay. In the event that such material escapes or is placed in an area subject to tidal action of the Bay, the permittee shall immediately retrieve and remove such material at its expense. The permittee shall also employ best management practices, such as compaction, installation of an engineered containment system and/or a biologically active permeable barrier, etc. to assure that material placed upland will not erode into the Bay or leach into other water sources.
2. **Marsh and Upland Plant Protection During Construction.** The work authorized by this permit shall be performed in a manner that will prevent, avoid, or minimize to the extent possible any significant adverse impact on any tidal marsh, other sensitive wetland resources, and existing native upland vegetation. If any unforeseen adverse impacts occur to any such areas as a result of the activities authorized herein, the permittee shall restore the area to its previous condition, including returning the

disturbed area to its original elevation and soil composition and, if the area does not revegetate to its former condition within one year, the permittee shall plant all disturbed areas with appropriate native vegetation at appropriate elevations consistent with plans approved by or on behalf of the Commission. The permittee shall minimize impacts to wetland areas by minimizing all traffic in marsh areas.

3. **Protection of Nesting Shorebirds.** No work on the restoration site shall occur during the clapper rail breeding season, from February 1<sup>st</sup> through August 31<sup>st</sup>. Authorized remediation work that takes place from August through February must be conducted consistent with any additional United States Fish and Wildlife Service restrictions on the project, such as the requirement to create buffer zones around marsh areas.

**D. Marsh Restoration.** This permit is issued based, in part, on information from the permittee and its representatives that a future, large-scale restoration project will be conducted in East Stege Marsh and West Stege Marsh. This large scale restoration effort shall include monitoring of the areas in East Stege Marsh and West Stege Marsh restored pursuant to this authorization. In the event that the Commission does not receive an application for such restoration work by June 25, 2004, the permittee shall submit to the Commission a monitoring plan for any remediation and/or excavation areas authorized herein within West Stege Marsh, to be approved by on behalf of the Commission. Such monitoring plan shall include a minimum of five years of monitoring, measuring the sedimentation rate, percentage of the site revegetated, plant survival, approximate percentage representation of different plant species, and a plan for removing undesirable exotic plant species such as pepperweed (*Lepidium latifolium*), *spartina alterniflora*, pampas grass, and broom.

**E. Spartina Alterniflora Control.** The approximately 600 square feet of weed block fabric and stakes placed to eradicate spartina alterniflora shall be fully removed after the elimination of spartina alterniflora or by January 1, 2006, whichever is earlier. Within two months of removing the fabric or by March 1, 2006, the permittee shall submit to the Commission a brief written report on the efficacy of this control procedure on eradicating spartina alterniflora.

**E. F. Hold Harmless Agreement.** The permittee agrees to indemnify, defend and save harmless the State of California, its agencies, departments, officers, agents and employees from any and all claims, demands, losses or judgments accruing or resulting to any person, firm, corporation or entity who may be injured or damaged by work performed in accordance with the terms and conditions of this permit.

~~F.~~ G. **Notice to Contractor.** The permittee shall provide a copy of this permit to any contractor or person working in concert with the permittee to carry out the activities authorized herein and shall point out the special conditions contained herein.

~~G.~~ H. **Recording.** The permittee shall record this document or a notice specifically referring to this document on all parcels affected by this document with Contra Costa County within 30 days after execution of the permit issued pursuant to this authorization and shall, within 30 days after recordation, provide evidence of recordation to the Commission.

### III. Findings and Declarations

On behalf of the Commission, I find and declare that:

A. The project authorized by the original permit involved remediation of contaminated soils on property owned partially by the University of California and partially by Zeneca, Inc. The project authorized by Amendment No. One is the second phase of remedial activities that is solely the responsibility of the University of California. The land on which the activities will occur is primarily owned by the University of California, although a small portion of the remediation work will occur on lands owned by the Richmond Redevelopment Agency (RRA). An access agreement from the RRA has been granted to the University to perform the work on its property. To more accurately reflect the property ownership respective to the phasing of the remediation project the original permit, has been split into Amended Permit Nos. M01-52(a) and M01-52(b). Amended Permit No. M01-52(b) authorizes activities that occur on University of California property solely. The project authorized by this permit involves excavating approximately 7,600 cubic yards of contaminated soils from a tidal marsh and 4,700 cubic yards of contaminated soils from an adjoining upland area, disposal of the excavated contaminated soils at an authorized upland location outside of the Commission's jurisdiction, and placement of clean, imported fill material in the excavated areas. In addition, the work authorized herein involves the installation of a ten-square-foot portion of an asphalt and concrete treatment pad. As such, the work authorized herein involves: (1) new dredging of less than 100,000 cubic yards as defined in Regulation Section 10602(b), with disposal of the dredged material at a non-aquatic location, as defined in Regulation Section 10602(e); (2) a similar activity, as defined in Regulation Section 10601(e)(3) with no greater adverse impacts on the Bay than the placement of new protective works to improve fish and wildlife habitat, as defined in Regulation Section 10601(2)(A); and (3) the placement of small amounts of inert inorganic fill in the shoreline band that does not have a significant adverse effect on present or possible future maximum feasible public access, as defined in Regulation Section 10601(b)(1). Therefore, the activities authorized herein are considered "minor repairs or improvements" for which the Executive Director may issue a permit, pursuant to Government Code Section 66632(f) and Regulation Section 10622(a).

B. The project authorized by this amended permit is consistent with the McAteer-Petris Act and with the San Francisco Bay Plan in that it will not adversely affect the Bay nor public access to and enjoyment of the Bay. The purpose of the project is to comply with a clean up order

the Regional Water Quality Control Board and to improve existing environmental conditions at West Stege Marsh by removing and/or neutralizing soils contaminated by spent pyrite ore and PCB's. In achieving this purpose, the project will require some excavation and grading near and in a tidal marsh. Therefore, Special Conditions II-B, -C, and -D are included in this authorization to ensure that any adverse impacts to the marsh and the wildlife it supports are reduced and mitigated.

C. Amendment No. One. Amendment No. One authorizes additional remediation work that is similar to the work authorized in the original permit. In addition the amendment authorizes the placement of approximately 600 square feet of weed block fabric to eradicate spartina alterniflora. A special condition has been included requiring removal of the fabric after control of the invasive species of cordgrass or by March 1, 2006, whichever is earlier, and to report on the efficacy of this method of control. This condition is necessary to assure that the project is consistent with the San Francisco Bay Plan policies supporting the eradication of invasive species such as non-native cordgrass.

~~C.~~ D. The Commission further finds, declares, and certifies that the activity or activities authorized herein are consistent with the Commission's Amended Management Program for San Francisco Bay, as approved by the Department of Commerce under the Federal Coastal Zone Management Act of 1972, as amended.

~~D.~~ E. The lead agency, the University of California, certified a Mitigated Negative Declaration/ Initial Study for the project on July 17, 2003.

~~E.~~ F. Pursuant to Regulation Section 10620, the original project (activities authorized in BCDC Permit No. M01-52) was listed with the Commission on May 16, 2002.

#### IV. Standard Conditions

A. All required permissions from governmental bodies must be obtained before the commencement of work; these bodies include, but are not limited to, the U. S. Army Corps of Engineers, the State Lands Commission, the Regional Water Quality Control Board, and the city and/or county in which the work is to be performed, whenever any of these may be required. This amended permit does not relieve the permittee of any obligations imposed by State or Federal law, either statutory or otherwise.

B. The attached Notice of Completion and Declaration of Compliance form shall be returned to the Commission within 30 days following completion of the work.

C. Work must be performed in the precise manner and at the precise locations indicated in your application, as such may have been modified by the terms of the amended permit and any plans approved in writing by or on behalf of the Commission.

D. Work must be performed in a manner so as to minimize muddying of waters, and if diking is involved, dikes shall be waterproof. If any seepage returns to the Bay, the permittee will be subject to the regulations of the Regional Water Quality Control Board in that region.

E. The rights, duties, and obligations contained in this amended permit are assignable. When the permittee transfers any interest in any property either on which the authorized activity will occur or which is necessary to the full compliance of one or more conditions to this amended permit, the permittee/transferor and the transferee shall execute and submit to the Commission an amended permit assignment form acceptable to the Executive Director. An assignment shall not be effective until the assignee executes and the Executive Director receives an acknowledgment that the assignee has read and understands the amended permit and agrees to be bound by the terms and conditions of the amended permit, and the assignee is accepted by the Executive Director as being reasonably capable of complying with the terms and conditions of the amended permit.

F. Unless otherwise provided in this amended permit, all the terms and conditions of this amended permit shall remain effective for so long as the permit remains in effect or for so long as any use or construction authorized by this amended permit exists, whichever is longer.

G. Unless otherwise provided in this amended permit, the terms and conditions of this amended permit shall bind all future owners and future possessors of any legal interest in the land and shall run with the land.

H. Unless otherwise provided in this amended permit, any work authorized herein shall be completed within the time limits specified in this amended permit, or, if no time limits are specified in the amended permit, within three years. If the work is not completed by the date specified in the amended permit, or, if no date is specified, within three years from the date of the amended permit, the amended permit shall become null and void. If an amended permit becomes null and void for a failure to comply with these time limitations, any fill placed in reliance on this amended permit shall be removed by the permittee or its assignee upon receiving written notification by or on behalf of the Commission to remove the fill.

I. Except as otherwise noted, violation of any of the terms of this amended permit shall be grounds for revocation. The Commission may revoke any amended permit for such violation after a public hearing held on reasonable notice to the permittee or its assignee if the amended permit has been effectively assigned. If the amended permit is revoked, the Commission may



The Regents of the University of California  
(Issued on June 27, 2002, As  
Amended Through October 17, 2003)

AMENDMENT NO. ONE

Page 8

determine, if it deems appropriate, that all or part of any fill or structure placed pursuant to this permit shall be removed by the permittee or its assignee if the amended permit has been assigned.

J. This amended permit shall not take effect unless the permittee executes the original of this amended permit and returns it to the Commission within ten days after the date of the issuance of the amended permit. No work shall be done until the acknowledgment is duly executed and returned to the Commission.

K. Any area subject to the jurisdiction of the San Francisco Bay Conservation and Development Commission under either the McAteer-Petris Act or the Suisun Marsh Preservation Act at the time the amended permit is granted or thereafter shall remain subject to that jurisdiction notwithstanding the placement of any fill or the implementation of any substantial change in use authorized by this amended permit.


L. Any area not subject to the jurisdiction of the San Francisco Bay Conservation and Development Commission that becomes, as a result of any work or project authorized in this amended permit, subject to tidal action shall become subject to the Commission's "bay" jurisdiction.

M. Unless the Commission directs otherwise, this amended permit shall become null and void if any term, standard condition, or special condition of this amended permit shall be found illegal or unenforceable through the application of statute, administrative ruling, or court determination. If this amended permit becomes null and void, any fill or structures placed in reliance on this amended permit shall be subject to removal by the permittee or its assignee if the amended permit has been assigned to the extent that the Commission determines that such removal is appropriate. Any uses authorized shall be terminated to the extent that the Commission determines that such uses should be terminated.

Executed at San Francisco, California, on behalf of the San Francisco Bay Conservation and Development Commission on the date first above written.

WILL TRAVIS  
Executive Director  
San Francisco Bay Conservation and  
Development Commission

By:

  
ROBERT J. BATHA  
Chief of Permits

### CALIFORNIA ALL-PURPOSE ACKNOWLEDGMENT

STATE OF CALIFORNIA )

COUNTY OF San Francisco )

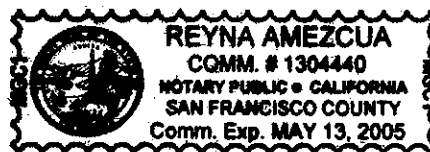
On October 17, 2003 before me, Reyna Amezcua, Notary Public  
DATE NAME, TITLE OF OFFICER - E.G., "JANE DOE, NOTARY PUBLIC"

personally appeared, Robert J. Batha

personally known to me (or proved to me on the basis of satisfactory evidence) to be the person(s) whose name(s) is/are subscribed to the within instrument and acknowledged to me that he/she/they executed the same in his/her/their authorized capacity(ies), and that by his/her/their signature(s) on the instrument the person(s), or the entity upon behalf of which the person(s) acted, executed the instrument.

WITNESS my hand and official seal.

Reyna Amezcua (SEAL)  
NOTARY PUBLIC SIGNATURE



#### OPTIONAL INFORMATION

~~THIS OPTIONAL INFORMATION SECTION IS NOT REQUIRED BY LAW BUT MAY BE BENEFICIAL TO PERSONS RELYING ON THIS NOTARIZED DOCUMENT.~~

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~~DATE OF DOCUMENT \_\_\_\_\_ NUMBER OF PAGES \_\_\_\_\_~~

~~SIGNER(S) OTHER THAN NAMED ABOVE \_\_\_\_\_~~

~~SIGNER'S NAME \_\_\_\_\_ SIGNER'S NAME \_\_\_\_\_~~

RIGHT THUMBPRINT

RIGHT THUMBPRINT

PERMIT NO. M01-52(b)

The Regents of the University of California

(Issued on June 27, 2002, As

Amended Through October 17, 2003)

AMENDMENT NO. ONE

Page 9

597887

cc: U. S. Army Corps of Engineers, Attn.: Regulatory Functions Branch  
 San Francisco Bay Regional Water Quality Control Board,  
 Attn.: Certification Section  
 Environmental Protection Agency, Attn: Mike Monroe, WTR-8  
 City of Richmond Planning Department  
 Brad Olson, East Bay Regional Parks District  
 Bruce Beyaert, Trails for Richmond Action Committee  
 Dianne Mimms, Blasland, Bouck & Lee, Inc.

\* \* \* \* \*

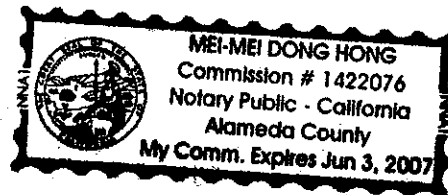
Receipt acknowledged, contents understood and agreed to:

Executed at Berkeley, CA

[Signature]  
 Applicant

On October 29, 2003

By: [Signature]  
 Executive Assistant to the Vice Chancellor  
 Title



END OF DOCUMENT



Winston H. Hickox  
Secretary for  
Environmental  
Protection

# State Water Resources Control Board

## Division of Water Quality

1001 I Street • Sacramento, California 95814 • (916) 341-5536  
Mailing Address: P.O. Box 1977 • Sacramento, California • 95812-1977  
FAX (916) 341-5543 • Internet Address: <http://www.swrcb.ca.gov>



Gray Davis  
Governor

October 11, 2003

Greg Haet  
Regents Of The Univ Of CA  
UC Berkeley EH&S #1150  
Berkeley, CA 94720-1150

### RECEIPT OF YOUR NOTICE OF INTENT

The State Water Resources Control Board (State Water Board) has received and processed your NOTICE OF INTENT TO COMPLY WITH THE TERMS OF THE GENERAL PERMIT TO DISCHARGE STORM WATER ASSOCIATED WITH CONSTRUCTION ACTIVITY. Accordingly, you are required to comply with the permit requirements.

The WDID identification number 207C324000.

Please use this number in any future communications regarding this permit.

### SITE DESCRIPTION

OWNER: Regents Of The Univ Of CA  
DEVELOPER: Uc Berkeley Capital Projects  
COUNTY: Contra Costa  
SITE ADDRESS: 1301 S 46th St Rfs  
Richmond, CA 94804-  
COMMENCEMENT DATE: 8/4/03  
EST. COMPLETION DATE: 12/30/05

When construction is complete or ownership has been transferred, dischargers are required to notify the Regional Water Board by submitting a Notice of Termination (NOT). All State and local requirements must be met in accordance with Special Provision No. 7 of the General Permit. If you do not notify the State Water Board that construction activity has been completed you will continue to be invoiced for the annual fee each October. Please visit the storm water web page at [www.swrcb.ca.gov/stormwtr/index.html](http://www.swrcb.ca.gov/stormwtr/index.html) to obtain an NOT and other storm water related information and forms.

If you have any questions regarding permit requirements, please contact your Regional Water Board at (510) 622-2300.

Storm Water Section  
Division of Water Quality

California Environmental Protection Agency



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- 24. A copy of this fully executed Encroachment Permit must be on site and presented to East Bay Regional Park District personnel upon request.

Subject to the above conditions, A PERMIT IS HEREBY ISSUED FOR: access to the shoulder of the San Francisco Bay Trail to excavate contaminated soils and conduct environmental sampling during 2003.

ISSUED BY: *[Signature]* DATE: 11/17/03  
 Louie Gross, Administrative Analyst

CONDITIONS ACCEPTED BY: *Helen HeWey* DATE: 11/12/03  
 Permittee *Real Estate Services Manager*



**Appendix G**  
**Gamma Spectoscopic Analyses**



# EBERLINE

SERVICES

January 7, 2004

Mr. Paul Lavelly  
 University of California at Berkeley  
 Office of Environmental Health Safety  
 2199 Addison Hall (University Hall)  
 Berkeley, CA 94720-1154

Reference: **Eberline Services Report R3-12-073-8198**

Dear Mr. Lavelly:

Attached is a data report for four solid samples received at Eberline Services on December 9, 2003 for gamma spectroscopic analysis. No holding times were exceeded. No problems were noted during sample receipt. The data results were reported by facsimile on January 7, 2004.

Quality Control samples consisted of a laboratory control spike and a method blank. All QC sample results were within control limits.

Gamma nuclide activities were determined by direct counting of the samples in calibrated geometries.

Please call me if you have any questions concerning this report.

Sincerely,

*Melissa Mannion*

Melissa Mannion  
 Senior Program Manager

MCM/njv

Attachments: *Report*  
*Chain of Custody*  
*Sample Receipt Checklist*

Post-it® Fax Note	7671	Date	1/7/4	# of pages	5
To	PAUL LAVELLY		From	M. MANNION	
Co./Dept.			Co.		
Phone #			Phone #		
Fax #	643-9495		Fax #		

Analytical Services  
 2030 Wright Avenue  
 P.O. Box 4040  
 Richmond, California 94804-0040  
 (510) 235-2633 Fax (510) 235-0438  
 Toll Free (800) 841-5487  
[www.eberlineservices.com](http://www.eberlineservices.com)

**Eberline Services**

**ANALYSIS RESULTS**

SDG <u>8198</u>	Client <u>UCB HEALTH</u>
Work Order <u>R312073-01</u>	Contract _____
Received Date <u>12/09/03</u>	Matrix <u>SOLID</u>

Client Sample ID	Lab Sample ID	Collected	Analyzed	Nuclide	Results ± 2σ	Units	MDA
CINDERS FROM SS LINE	8198-001	11/20/03	01/03/04	K40 (G)	3.93 ± 0.50	pCi/g	0.108
			01/03/04	Mn54 (G)	U	pCi/g	0.010
			01/03/04	Co58 (G)	U	pCi/g	0.013
			01/03/04	Co60 (G)	U	pCi/g	0.011
			01/03/04	Cs137 (G)	0.028 ± 0.008	pCi/g	0.009
			01/03/04	Ra226 (G)	0.238 ± 0.034	pCi/g	0.022
			01/03/04	Th228 (G)	0.217 ± 0.020	pCi/g	0.012
			01/03/04	Th232 (G)	0.243 ± 0.049	pCi/g	0.045
			01/03/04	U235 (G)	U	pCi/g	0.037
			01/03/04	U238 (G)	U	pCi/g	1.19
4ft BGS BEHIND SEAWALL	8198-002	11/20/03	01/05/04	K40 (G)	5.31 ± 0.39	pCi/g	0.259
			01/05/04	Mn54 (G)	U	pCi/g	0.022
			01/05/04	Co58 (G)	U	pCi/g	0.027
			01/05/04	Co60 (G)	U	pCi/g	0.024
			01/05/04	Cs137 (G)	U	pCi/g	0.019
			01/05/04	Ra226 (G)	0.460 ± 0.050	pCi/g	0.048
			01/05/04	Th228 (G)	0.697 ± 0.060	pCi/g	0.039
			01/05/04	Th232 (G)	0.628 ± 0.096	pCi/g	0.095
			01/05/04	U235 (G)	U	pCi/g	0.079
			01/05/04	U238 (G)	U	pCi/g	2.54
M3 MARSH SEDIMENT	8198-003	11/21/03	01/05/04	K40 (G)	7.39 ± 0.22	pCi/g	0.096
			01/05/04	Mn54 (G)	U	pCi/g	0.011
			01/05/04	Co58 (G)	U	pCi/g	0.013
			01/05/04	Co60 (G)	U	pCi/g	0.010
			01/05/04	Cs137 (G)	0.017 ± 0.008	pCi/g	0.010
			01/05/04	Ra226 (G)	0.310 ± 0.023	pCi/g	0.021
			01/05/04	Th228 (G)	0.343 ± 0.013	pCi/g	0.012
			01/05/04	Th232 (G)	0.366 ± 0.044	pCi/g	0.043
			01/05/04	U235 (G)	U	pCi/g	0.049
			01/05/04	U238 (G)	U	pCi/g	1.15

Certified by *[Signature]*  
 Report Date 01/08/04  
 Page 1

### Eberline Services

### ANALYSIS RESULTS

SDG <u>8198</u> Work Order <u>R312073-01</u> Received Date <u>12/09/03</u>	Client <u>UCB HEALTH</u> Contract _____ Matrix <u>SOLID</u>
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Client	Lab						
Sample ID	Sample ID	Collected	Analyzed	NUCLIDE	Results ± 2σ	Units	MOA
2ft BGS BEHIND SEAWALL	8198-004	11/20/03	01/05/04	K40 (G)	6.57 ± 0.35	pCi/g	0.172
			01/05/04	Mn54 (G)	U	pCi/g	0.017
			01/05/04	Co58 (G)	U	pCi/g	0.023
			01/05/04	Co60 (G)	U	pCi/g	0.017
			01/05/04	Ce137 (G)	U	pCi/g	0.018
			01/05/04	Ra226 (G)	0.481 ± 0.039	pCi/g	0.036
			01/05/04	Th228 (G)	0.678 ± 0.035	pCi/g	0.034
			01/05/04	Th232 (G)	0.593 ± 0.083	pCi/g	0.080
			01/05/04	U235 (G)	U	pCi/g	0.081
			01/05/04	U238 (G)	U	pCi/g	2.01

Certified by <u><i>n. Jamill</i></u> Report Date <u>01/07/04</u> Page <u>2</u>
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Eberline Services

QC RESULTS

SDG <u>B198</u>	Client <u>UCR HEALTH</u>
Work Order <u>R312073-01</u>	Contract _____
Received Date <u>12/09/03</u>	Matrix <u>SOLID</u>

Lab Sample ID	Nuclide	Results	Units	Amount Added	MDA	Evaluation
<u>LCS</u>						
8198-005	Co60 (G)	283 ± 15	pCi/Smpl	264	7.68	107% recovery
	Cs137 (G)	286 ± 12	pCi/Smpl	274	9.07	104% recovery
<u>BLANK</u>						
8198-006	K40 (G)	U	pCi/Smpl	NA	148	<MDA
	Mn54 (G)	U	pCi/Smpl	NA	4.31	<MDA
	Co58 (G)	U	pCi/Smpl	NA	3.97	<MDA
	Co60 (G)	U	pCi/Smpl	NA	4.92	<MDA
	Cs137 (G)	U	pCi/Smpl	NA	4.77	<MDA
	Ra226 (G)	U	pCi/Smpl	NA	10.2	<MDA
	Th228 (G)	U	pCi/Smpl	NA	6.92	<MDA
	Th232 (G)	U	pCi/Smpl	NA	22.1	<MDA
	U235 (G)	U	pCi/Smpl	NA	16.4	<MDA
	U238 (G)	U	pCi/Smpl	NA	558	<MDA

Certified by *[Signature]*  
 Report Date 01/07/04  
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