
Project Instructions for Coordinated Sediment Monitoring

Multiple Sites Carson and Wilmington, California

Prepared by:

**AECOM Environment
3995 Via Oro Avenue
Long Beach 90810**

Prepared for:

**BP West Coast Products LLC – Carson Refinery
ConocoPhillips – Los Angeles Refinery, Carson Plant
ExxonMobil Refining & Supply Company – Torrance Refinery**

September 2009

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Various Sites Carson and Wilmington, California

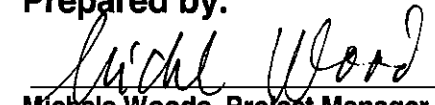
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ExxonMobil Refining & Supply Company – Torrance Refinery**

Prepared by:



Michele Woods, Project Manager

Reviewed by:



Jay Francisco, Environmental Scientist

September 2009

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1 Project Scope

The purpose of this document is to provide project instructions for personnel to safely and efficiently perform sediment monitoring activities for the coordinated sediment monitoring events. The monitoring event occurs annually during September. The annual event includes the following tasks:

- Planning and scheduling
- Reviewing and updating the Job Safety Analysis (JSA) and Project-Specific Health and Safety Plan (HASP)
- Recording observations and sampling 7 locations along the Dominguez Channel
- Submitting samples for analysis
- Preparing a monitoring report

As required in the facilities' NPDES permits, sediment samples will be collected from the following sediment sampling locations (see Figure 1) in the Dominguez Channel:

- S1 - Anaheim Road
- S2 - Pacific Coast Highway
- S3 - Sepulveda Boulevard
- S4 - Alameda Street
- S5 - Wilmington Avenue
- S6 - Avalon Boulevard
- S7 - Main Street

2 Project Objectives

The information collected during sediment monitoring is used in the sediment monitoring reports, which are submitted to the Los Angeles Regional Water Quality Control Board (LARWQCB). The objectives for these project instructions are to:

- Provide a site map showing sediment sampling locations
- Provide a mobilization checklist to be completed prior to commencement of field activities
- Present procedures and guidelines for sediment monitoring activities
- Outline client-specific requirements and identify report templates

All sediment monitoring activities will be performed according to these project instructions.

3 Roles and Responsibilities

The project team is comprised of the following people:

Role	Resource
Project Manager	Michele Woods
Environmental Scientists	Jay Francisco Anu Berry
Technical Staff	Miguel Monterosso (field technician) Shannon Ashurst (bioassay specialist) Sue Milcan (QA/QC specialist) Galen Cooter (EH&S Coordinator)

The Project Manager is responsible for:

- Managing implementation of the project to ensure that appropriate resources are provided to complete defined project scope on schedule and within budget
- Ensuring that the project scope is updated as appropriate to complete the defined scope (i.e., complete change orders when appropriate)
- Scheduling resources to complete the task at hand

The Technical Advisor is responsible for:

- Providing historical regulatory and technical support for the project

The Client Service Managers are responsible for:

- Ensuring that client-specific requirements are implemented
- Reviewing all documents to ensure that they receive appropriate internal (AECOM) and external (client) review

The Senior Reviewers are primarily responsible for:

- Providing senior expertise
- Reviewing all work products

The Technical Staff (database administrator, scientists, engineers, and others) are primarily responsible for:

- Completing assigned work within scope, on schedule, and within budget

4 Schedule

Sediment monitoring events commence at the beginning of March, and take approximately one day. Preparation activities are begun two to three weeks before the event begins. Two technicians/field engineers, a field supervisor, and a database administrator are required to perform the work.

Refer to the task schedule listed below:

Task	Schedule Due Date
Sampling	Early September 2009
Analysis	Mid-October 2009
Data Validation	Late October 2009
Draft report	1 st week of November 2009
Report comments	2 nd week of November 2009
Final report	3 rd week of November 2009

5 Field Procedures

All field activities will be conducted in a safe manner and according to the *Project-Specific Health and Safety Plan Dominguez Channel Sediment Sampling (AECOM, 2009)*. All team members are responsible for ensuring that work is conducted safely.

5.1 Event Preparation

Preparation for this event requires approximately two to three weeks. During this time, the JSEA (Appendix C) and chain-of-custody are reviewed and updated as necessary; field equipment is decontaminated, inspected, checked for proper operation and repaired as necessary, or rented as applicable; and the analytical laboratory is informed of the upcoming event to coordinate sample bottle delivery and courier service. This document will be reviewed and updated prior to each event to reflect changes in procedures, analytical parameters, laboratories, and important contact numbers prior to each event.

5.2 Sampling Procedures

This section describes the sampling methods, handling, nomenclature, documentation, decontamination, and disposal procedures to be used during sediment sampling. Before beginning sediment sampling, it is necessary to complete the mobilization checklist. This form is presented as Table 1. Do not attempt to conduct sediment sampling until this checklist has been completed.

5.2.1 Field QA/QC Procedures

Two different kinds of field quality assurance/quality control (QA/QC) samples are to be obtained during the sediment monitoring event.

- Equipment blank: Collect at the first location where sampling is performed. Pour deionized water through sampling equipment into sample containers.
- Blind duplicate sample: Collect an identical sample at a sampled location. Each sample is collected in an identical manner as the primary sample.

5.2.2 Sample Collection

Sampling will be conducted from the bridges that cross the Dominguez Channel at each sampling station. Sediment will be recovered from the channel bottom at approximately the center of the channel at each location using an Eckman-type grab sampler.

The Eckman-type grab sampler will be securely attached with a rope to a stationary object and lowered into the channel from the bridge access location. When the sampler is in the correct position a small metal device called a messenger will be sent down the rope line to the sampler, causing the device to close. Subsequently, the sampler will be pulled up and the grab sample will be transferred to a stainless steel bowl.

A second attempt to obtain a sample will be made at the initial sampling location if the sampler is unable to recover a sediment sample. If the sampler is still not able to obtain a sample, sampling will be reattempted 10 feet to the right and 10 feet to the left of the specified location. If a useable sample is not obtained after the six attempts, a sample will not be taken from this location.

The distance from the bridge to the channel bottom will be measured by measuring the length of rope with a measuring tape, and the lateral distance from the end of the bridge will be measured.

5.2.3 Sample Handling

Sediment grab samples will be composited in a stainless steel bowl, placed into the required sample containers for the monitoring event with minimal headspace, labeled, and stored on ice in insulated coolers while in the field; all under proper chain-of-custody (COC) procedures. Following the completion of each day's sample collection, chain of custody forms will be completed for each set of samples.

Sediment samples will be turned over to the laboratory courier as soon as possible. All samples delivered to the laboratory will be properly packed in coolers and maintained at 4°C. Original COC forms and analysis request forms will accompany the samples to the laboratory.

Sample holding time begins when the last grab sample for a location is collected. The bioassay samples must be delivered to the bioassay laboratory no later than 36 hours after collection (EPA 1000 series, and 100.4 methods – EPA Report #600/R-95-136).

5.2.4 Nomenclature / Sample Identification

There are seven sampling locations identified as R1-R7 (see Figure 1). Sample names will follow the following prescribed nomenclature to ensure that each sample will be both easily identified and unique.

R#-MMDDYY

Note: R# refers to the sampling location number in series from R1-R7.

Duplicates and equipment blanks will be identified as R8-MMDDYY and R9-MMDDYY, respectively.

5.2.5 Documentation

Field activity logs will be completed daily by the sampler. Sample characteristics will be noted in the field log and include the following:

- Sampling location, time, depth to water, depth to channel bottom, and tide elevation
- Sediment type, density/consistency, color
- Sediment sample ID number
- Aquatic life visible
- Odors
- Other distinguishing characteristics or features

Sample quality and texture will be described using ASTM specifications (ASTM 2488, 1993; ASTM 2487, 1993).

5.2.6 Decontamination

Decontamination methods will be conducted in accordance with AECOM SOP 120 (Appendix F). At a minimum, all sampling equipment (including compositing bowls and utensils) will be decontaminated prior to initial use and between sampling stations. Decontamination procedures include washing and scrubbing with a Liquinox soap solution, rinsing with tap water, and rinsing with deionized water.

5.2.7 Waste Disposal

Leftover or rejected sediment generated during field sampling activities will be returned to the Channel where the sample was collected. Any spilled sediment will be washed back to the Channel. Any leftover or rejected sediments that are collected and not analyzed will be disposed of by the laboratory.

5.2.8 Chain of Custody Forms

Electronic chain-of-custody (COC) forms are used for sample tracking. An example form and template is provided on:

- Projects\COOR-Coordinated Clients\DCCO\Technical, Field Data

Prior to sampling, edit the electronic COC form for proper sample ID, analytes, times, dates, and special instructions to the laboratory. COC forms are to be filled out with the appropriate information (e.g., analytes, sampling methods, wells, etc.), as listed in Section 6.2.9, prior to conducting the sampling and approved by the project manager. The requested subcontracted laboratories should be listed on the COC. All copies are to be signed by the sample relinquisher and receiver. An example is provided in Appendix E.

5.2.9 Sample Analysis and Laboratories

Samples will be submitted to a certified environmental analytical laboratory for testing for the required biological, chemical and physical parameters. ENSR currently subcontracts Calscience Environmental Laboratories (Calscience) to perform chemical and physical testing.

Chemical and physical testing will be conducted using the following methods:

Metals	Method	PAHs	Method
Cadmium	EPA 6010	Acenaphthene	EPA 8270
Chromium	EPA 6010	Anthracene	EPA 8270
Copper	EPA 6010	1,2-Benzanthracene	EPA 8270
Lead	EPA 6010	3,4-Benzofluoranthene	EPA 8270
Nickel	EPA 6010	Benzo(k)fluoranthene	EPA 8270
Zinc	EPA 6010	1,12-Benzoperylene	EPA 8270
		Benzo(a)pyrene	EPA 8270
		Chrysene	EPA 8270
		Dibenz(a,h)anthracene	EPA 8270
		Fluoranthene	EPA 8270
		Fluorene	EPA 8270
		Indeno(1,2,3-cd)pyrene	EPA 8270
		Pyrene	EPA 8270
Pesticides	Method	Miscellaneous Parameters	Method
Arochlor 1016	EPA 8081/8082	Sediment grain size	ASTM D4464M
Arochlor 1221	EPA 8081/8082	Chronic toxicity (E. Estuarius)	EPA/600/R-94/025
Arochlor 1232	EPA 8081/8082	Total organic carbon	EPA 9060
Arochlor 1242	EPA 8081/8082	TPH (C7-C44)	EPA 3550B/TPH - Carbon Range
Arochlor 1248	EPA 8081/8082		
Arochlor 1254	EPA 8081/8082		
Arochlor 1260	EPA 8081/8082		
4,4'-DDT	EPA 8081/8082		
4,4'-DDD	EPA 8081/8082		
4,4'-DDE	EPA 8081/8082		
2,4'-DDT	EPA 8081/8082		
2,4'-DDD	EPA 8081/8082	Tributyltin	GC/MS
2,4'-DDE	EPA 8081/8082		

AECOM coordinates with Calscience to ensure compliance with state protocols, detection limits, and QA/QC criteria. The current Calscience contact is listed below:

- Vik Patel: 714-895-5494 x211

For prompt service during the event, the laboratory should be given a one-week advance notice of the sampling event. The laboratory will provide the coolers, sample containers, and a courier service for sample container delivery and sample pickup. A pickup is usually scheduled at the end of each day.

6 Permitting

AECOM personnel must have a current copy of the Los Angeles County Department of Public Works (LADPW) – Flood Control District permit. This Flood Control District permit outlines restrictions for performing activities while working near or on the Dominguez Channel. The permit needs to be renewed annually each September. Refer to the following link for an example of the permit renewal application and a copy of the current permit:

- **Projects\COOR\DCCO\4 – Permits, Agreements, Orders\LADPW Flood Control District Permit**

7 Project Quality Assurance/Quality Control Objectives

Field personnel and the analytical laboratory will address the following specific QA/QC requirements to verify that data produced during the sediment investigation will be of sufficient quality for reporting. All laboratory data will be validated, as described below, prior to their use in project reporting. *Contact AECOM's Fort Collins QA/QC group three weeks in advance of receiving laboratory results to ensure data will be validated on time.*

7.1 Field QA/QC Protocol and Record Keeping

Proper sample collection, identification, preservation, storage and handling procedures, and COC records will be used to ensure that sampling data will be valid and usable. Procedures for these steps are discussed in the previous sections of this sampling plan.

7.1.1 Documentation

In addition to sample labels and chain of custody forms, field activity logs will be completed by the sampler to provide a daily record of significant events. The type of information that should be recorded in the field logs is described in the sampling methods. All entries will be signed and dated, made in non-erasable ink, and errors will be crossed out with a single line and initialed. The logs will be kept as a permanent record. All field measurements will be recorded on the appropriate sampling log forms.

7.1.2 Chain of Custody

Samples are considered to be in one's custody if they are:

- (1) in the custodian's possession or view;
- (2) in a secured location (under lock) with restricted access; or
- (3) in a container that is secured with an official seal(s) such that the sample cannot be reached without breaking the seal(s).

The principal documents used to identify samples and to document possession are COC records, field logbooks, and field tracking forms. COC procedures will be used for all samples at all stages in the analytical or transfer process and for all data and data documentation, whether in hard copy or electronic format.

7.2 Laboratory QA/QC Requirements

Sediment samples will be stored and analyzed in accordance with the holding time requirements of the specified methods. Analyses will be required to conform to accepted standard methods and rigorous internal QA/QC checks prior to final approval and reporting by the laboratory.

The laboratory will provide data reports that will include a cover letter describing any problems or deviations from standard protocols, results, and associated QA/QC materials. The bioassay laboratory will provide reference toxicant tests documenting that in-house breeding cultures are within sensitivity criteria.

7.3 Data Validation

After receipt of the analytical results, AECOM will review all raw data to verify that the laboratory has supplied the required QA/QC deliverables. Toxicity data will be validated by a bioassay specialist. Where data fail the laboratory will be contacted, and the data will be: 1) reanalyzed, 2) qualified, or 3) discarded.

Chemical and physical data will be validated by a QA/QC specialist. Where data fail, the data will be qualified or rejected. Data quality issues will be summarized in a brief data validation report.

8 Reports and Deliverables

The project team will report data collected in a sediment monitoring report submitted to the LARWQCB. Client-specific preparation of the report is detailed in this section.

BP Carson Refinery

- Requires two copies of the sediment report, one for agency submittal and one for their files
- Reports need to be 3-ring bound
- A BP cover letter needs to be prepared for the client representative's review and signature

ConocoPhillips Los Angeles Refinery

- Requires two copies of the sediment report, one for agency submittal and one for their files
- Reports need to be comb bound
- No tributyltin results should be included in these reports.

ExxonMobil Torrance Refinery

- Requires three copies of the sediment report, one for agency submittal and two for their files
- Reports need to be comb bound
- No tributyltin or Chronic toxicity results should be included in these reports.

9 Budgets

Each person working on a given task will be given a budgeted number of hours. If the scope of work changes due to site conditions, it is the responsibility of the Task Manager to notify the Project Manager that budgeted hours need to be revised. This is to be communicated before the budgeted hours are depleted. The Project Manager is responsible to then obtain written approval from the client for any changes in budget, scope, and schedule.

10 Internal Communications

Project work should be discussed only on a "need to know basis." Work scope should not be discussed with family members, friends, or coworkers who are not directly involved in this project.

Avoid discussing project issues in restaurants, elevators, and on airplanes where others that you do not know may hear the conversation. You should be especially sensitive to this issue when eating at restaurants that are located near the refineries and other petroleum and chemical facilities in the area.

Day-to-day project communications will be the responsibility of the Project and Task Managers. This would include daily update reports, resource needs, schedule issues, and data management. A project directory is provided in Appendix A.

Teleconference. Teleconferences will be used on an as needed basis to discuss specific project issues. Teleconferences should be scheduled a minimum of 48 hours in advance. Meetings should be announced via e-mail. Teleconference announcements should include a recommended date and time, list of participants, anticipated length, and brief agenda.

Faxes. Sensitive written material should be sent via fax if information is time critical.

Courier (e.g., FedEx). A courier should be used for distributing sensitive paper or e-copy (i.e., CD-ROM) information.

E-mail. E-mail should be used to convey brief messages, meeting announcements, and published information. For potentially sensitive items, couriers and faxes should be used for transferring draft deliverables and data.

Email may be used to facilitate coordinated client feedback, discussions and consensus when appropriate.

11 Client Communications

All team members will communicate with the client representatives as needed, but with the Client Service Managers and Project Manager's knowledge of the purpose of the communication.

12 Environmental, Health, and Safety

Field staff must review this project instruction and coordinate with the Project Manager to verify that all up-front logistics are completed. A Project-Specific Health and Safety Plan (HASP) for sediment monitoring activities are included in Appendix D. Additionally, a tailgate meeting must be attended at the beginning of each day; all activities programmed for the day must be documented and reviewed in a Job Safety Analysis (JSA) Form (Appendix C).

13 Project File

The Administrative Assistant maintains the central project files in the AECOM Long Beach office. The project files should be filed using the Long Beach office file procedures.

Personal files should be managed such that all materials identified as privileged and confidential are maintained as separate files and labeled accordingly. This includes both paper and electronic documents.

Draft documents distributed to the team are for review and comment only. Once a document has been issued as final, draft documents should be removed from the central project files and from personal files and destroyed. This applies to both paper and electronic documents.

When filing both paper and electronic documents, adhere to the following file structure:

For field forms, field data, and laboratory reports:

COOR – Coordinated Work (Multiple Clients)
DCCO – Dominguez Channel Compliance
9 – Technical / Field Data

For reports and transmittal letters:

COOR
DCCO – Dominguez Channel Compliance
6 – Reports

For invoices and monthly status reports:

COOR
DCCO – Dominguez Channel Compliance
1 – Invoices

For NPDES permits, agency orders, and LADPW permits:

COOR
DCCO – Dominguez Channel Compliance
4 – Permits / Agreements / Orders

For hardcopy and electronic correspondence with clients and agencies:

COOR
DCCO – Dominguez Channel Compliance
7 – Correspondence

Table

Sediment Sampling Mobilization Checklist

- ☐ Eckman Dredge
- ☐ 100 ft. of rope + extra rope
- ☐ Measuring tape
- ☐ Stainless steel collection bowl & spoon
- ☐ Liquinox
- ☐ Distilled water (5-10 gallons)
- ☐ De-ionized water from the laboratory (4-5 liters)
- ☐ Towels
- ☐ Sample bottles & coolers
- ☐ Chemical-resistant gloves
- ☐ Appropriate work gloves
- ☐ Field activity logs
- ☐ Sharpie pen
- ☐ Sample labels
- ☐ Ziplock bags (freezer type)
- ☐ Ice – bagged
- ☐ Cell Phone
- ☐ Orange cones or barricades
- ☐ PPE: Steel-toed boots, traffic vest, safety glasses, and hardhat
- ☐ Other (list):
 - Copy of the HASP
 - Copy of the Project Instructions
 - Copy of the reviewed and signed JSEA
 - Copy of the reviewed and signed STAR form

Figure

TOWARDS EXXONMOBIL
TORRANCE REFINERY

TORRANCE FLOOD
CONTROL LATERAL

CARSON ST.

223rd ST.

MAIN ST.

AVALON BLVD.

SEPULVEDA BLVD.

LOMITA BLVD.

CONOCOPHILLIPS LAR

PACIFIC COAST HWY.

ANAHEIM ST.

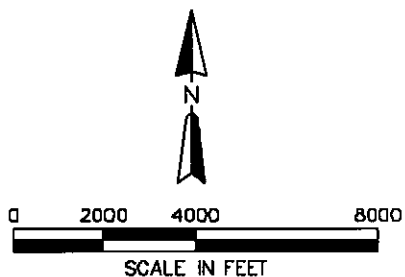
DOMINGUEZ CHANNEL

BP CARSON
REFINERY

SHELL LAR

LEGEND

● R1 SEDIMENT SAMPLING LOCATION



NPDES SEDIMENT SAMPLING
BP, ConocoPhillips, ExxonMobil and Shell

SAMPLING LOCATIONS
DOMINGUEZ CHANNEL

DATE: 04/30/03

DRWN: FC/LB

FILE: 4355S001

LAYOUT: LAYDLT1

FIGURE 1

Appendix A

Project Directory

Project Directory

Clients

Chris Huy
BP Carson Refinery
1801 E. Sepulveda Boulevard
Carson, CA 90749
Phone: (310) 847-5263
Chris.Huy@bp.com

Stephen Mallon
ConocoPhillips Los Angeles Refinery
1660 W. Anaheim Street
Wilmington, CA 90748
Phone: (310) 522-8038
Fax: (310) 552-6014
steve.mallon@conocophillips.com

James Phelan
ExxonMobil Torrance Refinery
3700 W. 190th Street
Torrance, CA 90504
Phone: (310) 212-4783
Fax: (310) 505-7510
James.M.Phelan@exxonmobil.com

Subcontractor

Calscience Environmental Laboratories
Vik Patel
Project Manager
7440 Lincoln Way
Garden Grove, CA 92841-1427
Phone: 714-895-5494 x211

AECOM

AECOM
3995 Via Oro Avenue
Long Beach, CA 90810
(562) 420-2933 Phone
(562) 420-2915 Fax

Client Service Managers –
Jennifer Bell (ConocoPhillips, ExxonMobil)
Bill Martin (BP)

Michele Woods – Project Manager
Jay Francisco – Environmental Scientist
Miguel Monterroso – Field Technician
Faraneh Chamran – Database Administrator
Galen Cooter – EH&S Coordinator

Shannon Ashurst – Bioassay Specialist

Sue Milcan – QA/QC Specialist

Appendix B
Directions to Hospital

Directions from each site to the Harbor/UCLA Medical Center (on the corner of Carson Street and Vermont Avenue):

- From R1:**
1. Head west on Anaheim Street.
 2. Turn RIGHT onto Avalon Blvd.
 3. Turn LEFT onto Carson Street.
- From R2:**
1. Head west on Pacific Coast Highway.
 2. Turn RIGHT onto Avalon Blvd.
 3. Turn LEFT onto Carson Street.
- From R3:**
1. Head west on Sepulveda Blvd.
 2. Turn LEFT onto Carson Blvd.
- From R4:**
1. Head south on Alameda Street.
 2. Turn RIGHT onto Sepulveda Blvd.
 3. Turn RIGHT onto Main Street.
 4. Turn LEFT onto Carson Blvd.
- From R5:**
1. Head north on Wilmington Avenue.
 2. Turn LEFT onto Carson Street.
- From R6:**
1. Head south on Avalon Blvd.
 2. Turn RIGHT onto Carson Street.
- From R7:**
1. Head south on Main Street.
 2. Turn RIGHT onto Carson Street.

Appendix C

Job Safety and Environmental Analysis (JSEA)

Job Safety Analysis

JSEA Type: <input checked="" type="checkbox"/> Field Operations <input type="checkbox"/> Office <input type="checkbox"/> Construction		<input type="checkbox"/> New <input checked="" type="checkbox"/> Revised	Date: 08/26/2009
Office: Long Beach		Clients: BP, ConocoPhillips, ExxonMobil	Loc: Carson and Wilmington, CA
Work Type: Environmental Compliance		Work Activity: Coordinated Sediment Monitoring	
Personal Protective Equipment (PPE): Minimum PPE is safety glasses or goggles, steel-toed boots, traffic vest, chemical-resistant gloves, and work gloves, with hearing protection and hardhat, as needed.			
Development Team	Position/Title	Reviewed By	Date
Michele Woods	Project Manager	Shelley Brown, Regional EHS Manager	08/26/2009
Field staff must review the sediment project instructions and coordinate with the project manager to verify that all up-front logistics are completed prior to starting work including, but not limited to, permitting, access agreements, and notification to required contacts (e.g. site managers, inspectors, clients, subcontractors, etc.). Additionally, a tailgate safety meeting must be performed and the JSA reviewed at the beginning of each workday.			
Task Description			
Location: Bridges over the Dominguez Channel. Refer to the project instructions for sampling location details.			
Site Features (terrain, utilities, structures): The 7 sampling points are located at bridges along high traffic streets. AECOM's vehicles can generally park at the entrance/exit to the access roads during sampling. At some locations, the vehicles need to be parked on side streets, requiring equipment and supplies to be transported to the sample location by foot. Caution should be used both when backing out of the access road and walking on the sidewalks due to high vehicular traffic on the streets. A spotter should be used when backing up as necessary.			
Field Work			
<ul style="list-style-type: none"> Once field personnel have set-up at each sample location, samples will be collected using an Eckman-type dredge and visual observations of the samples will be made. The distance from the Dominguez Channel bank to the sample location will be measured along with the distance from the bridge to the water and the distance from the bridge to the bottom of the channel. Once all work has been completed, load the samples and equipment into the vehicle and place disposable items in the proper receptacle. 			
HSE Observations & Reporting			
<ul style="list-style-type: none"> In the case that other hazards are observed not covered by this JSA, the observation should be reported to the project manager and an HSE Observation card should be filled out. Submit the HSE Observation card to the project manager for review. Submit the HSE Observation card to the EHS Coordinator. The HSE Manager and project manager will evaluate the need to update the JSA. 			
Evacuation/Emergency Response			
<ul style="list-style-type: none"> If an injury should occur to AECOM personnel, the injury must be reported to the project manager, EHS Coordinator, and client representative. Administer the appropriate medical response for the injured person. If the injury requires hospital attention, personnel should be taken to the Los Angeles County Harbor/UCLA Medical Center. Hospital directions specific to each sampling location are included as an attachment to this JSA. 			
① Job Steps	② Potential Hazard	③ Critical Actions	
1. Loading and driving vehicle	<ul style="list-style-type: none"> Heavy lifting Dropping equipment (i.e. onto hand and/or foot) Traffic and stationary structures Spills or leaks 	<ul style="list-style-type: none"> Use two people for carrying/lifting heavy objects and use proper lifting techniques Wear leather gloves and/or chemical-resistant gloves for hand protection if necessary Watch for oncoming traffic, traffic poles and structures Help guide driver if necessary 	
2. Unloading equipment and sample bottles from the vehicle	<ul style="list-style-type: none"> Heavy lifting Dropping equipment (i.e. onto 	<ul style="list-style-type: none"> Use two people for carrying/lifting heavy objects and use proper lifting techniques 	

	and carrying them to the sample locations	hand and/or foot)	<ul style="list-style-type: none"> • Wear leather gloves and/or chemical-resistant gloves for hand protection if necessary
3.	Sampling sediment from bridges	<ul style="list-style-type: none"> • Rope burn and/or hand injuries • Pinch points • Potential contact with chemical preservatives from sample bottles • Repetitive motion injury • Working on sidewalks near moving traffic 	<ul style="list-style-type: none"> • Work with AECOM partner to assist in operating the equipment if necessary • Wear heavy/thick work gloves for hand protection • Wear chemical-resistant gloves when handling sample bottles containing chemical preservatives • Take breaks from retrieving dredge • Team member not collecting sampling should be paying attention to traffic in the sampling vicinity.
4.	Loading and driving vehicle	<ul style="list-style-type: none"> • Heavy lifting • Dropping equipment (i.e. onto hand and/or foot) • Traffic and stationary structures 	<ul style="list-style-type: none"> • Use two people for carrying/lifting heavy objects and use proper lifting techniques • Wear leather gloves and/or chemical-resistant gloves for hand protection if necessary • Watch for oncoming traffic, traffic poles and structures • Help guide driver if necessary

Site Job Safety Analysis (JSA) Acknowledgment Form

I have been informed, understand, and will abide by all the procedures and protocols set forth in this Site JSEA for the Sediment Monitoring work site.

Project Number: 2009 Sediment Monitoring[illegible]

Appendix D

Health and Safety Plan



Project-Specific Health & Safety Plan Sediment Monitoring

BP Carson Refinery, ConocoPhillips Los Angeles Refinery and ExxonMobil Torrance Refinery

Project Information

Project Name:	Carson/LNAPL - Refinery O&M Recovery/Line Integrity Management
Project Location:	Multiple Refineries
Date HASP Issued or Updated: (Note: HASP must be updated annually at a minimum)	8/27/2009
Updated By:	Galen Cooter
Project Number:	See email briefing
Project Manager:	Michele Woods
Field Task Manager:	TBD

Emergency Contacts

Location	Contact Name	Telephone
Off Site	Carson Sherriff	9-1-1
Off Site	Fire Department	9-1-1
Off Site	Ambulance	9-1-1
Office	AECOM Office	(562) 420-2933

(Evacuation map and hospital route map included in Appendix B of the Project Instructions)

Incident Reporting Contacts (Also Refer to Incident Management Flowchart)

Contact Priority	Name	Office Phone	Cell/Home Phone	Pager	Text Pager
1	Galen Cooter HSSE Manager	(562) 213-4164	(805) 452-3523	--	--
2	Michele Woods Project Manager	(562) 213-4146	(562) 480-8789	--	--
4	AECOM Emergency Pager	--	--	(562) 685-8940	5626858940@ airmessage.net
5	Shelley Brown District SH&E Mgr.	(562) 213-4129	(562) 544-3506		

Note: Initiate contact in the order listed immediately after stabilizing situation. Make verbal contact: do not leave messages.

PURPOSE OF HASP

The AECOM Corporation developed this HASP on behalf of BP, ConocoPhillips, and ExxonMobil to outline pertinent information needed for employees, contractors, subcontractors, and regulatory agents to safely carry out field activities for this project.

Before starting fieldwork, all personnel will review this HASP at a project kick-off meeting. They will then sign the acknowledgement form at the end of this document to demonstrate their review.

TRAINING

All applicable project personnel are required to have completed at a minimum:

- The required 40-hour, Occupational Safety and Health Administration training for hazardous waste site activities with annual 8-hour refresher training
- The requirements of annual medical surveillance
- Individualized respirator fit testing

PROJECT DESCRIPTION

Project Name: Carson LNAPL - Refinery O&M

Project No.:

Multiple

Site Features (*terrain, utilities, structures*):

All sampling activities will be conducted on bridges spanning the Dominguez Channel. Terrain will consist of paved sidewalks and possibly dirt roads. No structures will be entered during sampling.

Scope of Work:

Refer to the Project Instructions for detailed scope.

Planning

- Prior to the sediment monitoring event, a sample kit for each of the sampling locations, a vehicle reservation, and a laboratory sample pick-up need to be made. Any necessary sample containers need to be requested from the designated contract laboratory.

Field Work

- Load the AECOM vehicle with the required equipment from the sediment sampling mobilization checklist.
- A health and safety meeting needs to be held with all AECOM personnel assigned to the task, the office HSSE Manager, and/or project manager. A JSA form is filled out during the meeting.
- Collect samples from each of the seven designated locations using an Eckman dredge. Perform visual observations of the sediment samples and Dominguez Channel. Record all field activities and visual observations on Field Activity Daily Log forms.
- Once all possible samples have been collected return to the AECOM office to unload samples and equipment and prepare sample pickup from the laboratory courier.

The Job Safety Analysis (JSA) for the above bulleted tasks has been emailed along with this HASP. The JSEA identifies the tasks to be performed, the hazards associated with the tasks, and the procedures/provisions used to eliminate, or minimize the hazards. The JSA will be reviewed with the site crew before the tasks begin on site. The JSA will be modified or changed if and when tasks and hazards change. The modified JSA will be reviewed with the site crews as a new JSA.

PROJECT DESCRIPTION

Project Name: Carson LNAPL - Refinery O&M

Project No.:

Multiple

Subcontractor(s):

No subcontractors will be utilized for this project.

Note: All subcontractors must have approved Subcontractor Safety Qualifications in place. For information on SQF status, see the Project Cost Accountant, or call Tina McHugh in the AECOM Monroeville office at (412) 380-0140.

Schedule:

- Annual.
- Work for 2009 is scheduled to begin on #####, 2009.

WASTE MANAGEMENT PLAN

Waste Types and Description:

Solid: ☐

Sludge: ☐

Liquid: ☐

LNAPL: ☐

Waste Management Plan:

None

No waste will be generated by this project.

POTENTIAL CHEMICAL HAZARDS

Chemicals to Be Used	MSDS Available On-Site
<input checked="" type="checkbox"/> Acids (HCl, H ₂ SO ₄ , or HNO ₃)	<input checked="" type="checkbox"/>
<input type="checkbox"/> Alcohols (Methanol or Isopropyl alcohol)	<input type="checkbox"/>
<input type="checkbox"/> Gasoline	<input type="checkbox"/>
<input type="checkbox"/> Diesel Fuel	<input type="checkbox"/>
<input checked="" type="checkbox"/> Detergents (Liquinox, Simple Green)	<input checked="" type="checkbox"/>
<input type="checkbox"/> Lubricants/Oils	<input type="checkbox"/>
<input type="checkbox"/> Calibration Solutions/Gases	<input type="checkbox"/>
<input checked="" type="checkbox"/> Dry Chemical Fire Extinguisher: Powder	<input checked="" type="checkbox"/>
<input type="checkbox"/> Other (list):	<input type="checkbox"/>

Note: Updated MSDS binder will be assigned to each member of the field team and should always accompany this HASP.

CHEMICAL HAZARD DATA

Chemical of Concern for Task	Chemical Name	Skin Absorption. Hazard (Y/N)	TWA			ACGIH STEL	IDLH	Routes of Exposure
			NIOSH REL	OSHA PEL	ACGIH TLV			
<input type="checkbox"/>	PAHs	Yes	0.1 mg/m ³	0.05 mg/m ³	0.2 mg/m ³	NA	80 mg/m ³	I, C
<input type="checkbox"/>	Diesel Fuel	Yes	NA	NA	15 ppm	NA	80 mg/m ³	I, G, C
<input type="checkbox"/>	Gasoline	No	NA	NA	300 ppm	500 ppm	NA	I, S, G, C
<input type="checkbox"/>	Benzene	Yes	0.1 ppm	1.0 ppm	0.5 ppm	2.5 ppm	500 ppm	I, S, G, C
<input type="checkbox"/>	Toluene	No	100 ppm	200 ppm	50 ppm	NA	500 ppm	I, S, G, C
<input type="checkbox"/>	Ethylbenzene	No	100 ppm	100 ppm	100 ppm	125 ppm	800 ppm	I, G, C
<input type="checkbox"/>	Xylenes, Total	Yes	100 ppm	100 ppm	100 ppm	150 ppm	NA	I, S, G, C
<input type="checkbox"/>	MTBE	Yes	NA	100 ppm	100 ppm	150 ppm	NA	I, S, G, C
<input type="checkbox"/>	Carbon Monoxide	No	35 ppm	50 ppm	25 ppm	NA	NA	I
<input type="checkbox"/>	Hydrogen Sulfide	No	10 ppm Ceiling = 10 min max	20 ppm (ceiling) 50 ppm (10 min max)	10 ppm	15 ppm (ACGIH)	100 ppm	I, C
<input type="checkbox"/>	Lead (inorganic)	No	0.01 mg/m ³	0.05 mg/m ³	0.05 mg/m ³	NA	100 mg/m ³	I, G, C
<input type="checkbox"/>	Other (list):	No	NE	NE	NE	NE	NE	
<input type="checkbox"/>	Other (list): Butane	No	800 ppm	NE	800 ppm	NE	NE	I, S, G, C

TWA = Time-Weighted Average
STEL = Short Term Exposure Limit

IDLH = Immediately Dangerous To Life or Health
REL = Recommended Exposure Limit
OSHA = Occupational Safety and Health Administration
PEL = Permissible Exposure Limit
ACGIH = American Conference of Governmental Industrial Hygienists

TLV = Threshold Limit Value
Routes of exposure: I = inhalation, S = skin absorption, G = ingestion, C = skin contact
mg/m³ = milligrams per cubic meter
NA = not applicable
ppm = parts per million
NIOSH = National Institute for Occupational Safety and Health
* = See JSEA for handling instructions.

SAFE WORK PROCEDURE SUMMARY

Potential Hazards Associated with Task	Pertinent Section of AECOM HSEMP	
<input checked="" type="checkbox"/> Incident Reporting and Notification	Section 7	
<input checked="" type="checkbox"/> Site Control	Section 5	
<input type="checkbox"/> Traffic Control	Section 15	
<input checked="" type="checkbox"/> PPE Selection	Section 3	
<input checked="" type="checkbox"/> Decontamination	Section 6	
<input checked="" type="checkbox"/> Emergency Response and Evacuation	Section 7	
<input type="checkbox"/> Drum Handling/Sampling	Section 8	
<input type="checkbox"/> Excavations and Trenching	Section 9	
<input type="checkbox"/> Confined Space Entry	Section 10	
<input type="checkbox"/> Lockout/Tagout	Section 11	
<input type="checkbox"/> Fall Protection	Section 12	
<input type="checkbox"/> Drilling Safety	Section 13	
<input type="checkbox"/> Work Near Railroads	Section 14	
<input checked="" type="checkbox"/> Preventing Heat/Cold Stress	Appendix L and M	
<input type="checkbox"/> Obtaining Permits	Section 5	
<input checked="" type="checkbox"/> Chemical Hazard Information	Section 2.4	

Note: Check each procedure applicable to work and ensure the work conducted in accordance with the pertinent procedure provided in the AECOM HSEMP.

PERSONAL PROTECTIVE EQUIPMENT FOR TASK

MINIMUM LEVEL OF PROTECTION REQUIRED FOR EACH STEP IN THE TASK	
Step	Level of Protection
Entering/exiting the vehicle at each sample location	Level D (Safety glasses, steel-toed boots), traffic vests; Have chemical-resistant gloves and work gloves available
Loading/unloading equipment and sample bottles from the vehicle	Level D, traffic vests, work gloves
Sample sediment from bridges	Level D, traffic vests, chemical-resistant gloves, work gloves

AIR MONITORING PROGRAM

Monitoring Parameters

- ☒ No Air Monitoring Required
- ☐ Organic Vapors
- ☐ Hydrogen Sulfide
- ☐ Combustible Gases
- ☐ Oxygen
- ☐ Carbon Monoxide
- ☐ Dust
- ☐ Other (list):

Personal Sampling

No Air Monitoring Required

DECONTAMINATION

All equipment contacting potentially contaminated materials will require proper disposal, decontamination with detergent (soap, Alconox, or Liquinox) and water.

DECONTAMINATION PROCEDURES

Items to Decon	Decon Method	Detergent/Solution	Waste Management	
			Solid	Liquid
Skin contact of sample preservatives	Wash with soap and water	Simple Green or Alconox	N/A	N/A

EXCLUSION ZONE

Minimum Size: To be determined by the HSSE Manager and/or Project Manager. The use of traffic cones and/or flagging is encouraged to isolate the work area. Be aware of unauthorized individuals entering the exclusion zone during work activities.

PERMITS REQUIRED

☒ Flood Control District Permit

ATTACHMENTS TO THIS HASP

Attached (check if yes)	Project Instruction Appendix:	Title/Contents
<input checked="" type="checkbox"/>	A	Hospital Route Directions
<input checked="" type="checkbox"/>	A	Completed Job Safety and Environmental Analysis
<input checked="" type="checkbox"/>	Email	Pertinent Field Forms

PREPARED BY:

Michele Woods

Date: 8/25/09

APPROVALS:

Michele Woods (Project Manager)

Michele Woods

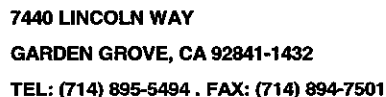
Date: 8/27/09

Galen Cooter (HSSE Manager)

Galen Cooter

Date: 8/27/09

Appendix E
Example Chain of Custody Form



DATE: _____

PAGE: 1 OF 1

LABORATORY CLIENT: AECOM				CLIENT NAME / NUMBER:												P.O. NO.:					
ADDRESS: 3995 Via Oro Avenue				Sediment Sampling												QUOTE NO.:					
CITY: Long Beach, CA 90810				PROJECT CONTACT: Jennifer Bell																	
TEL: 562/420-2933		FAX: 562/420-2915		SAMPLER(S): (SIGNATURE)												LAB USE ONLY					
TURNAROUND TIME SAME DAY 24 HR 48 HR 72 HR 5 DAYS 10 DAYS				REQUESTED ANALYSIS																	
SPECIAL REQUIREMENTS (ADDITIONAL COSTS MAY APPLY) <input type="checkbox"/> RWQCB REPORTING <input type="checkbox"/> ARCHIVE SAMPLES UNTIL ____/____/____ SPECIAL INSTRUCTIONS <input type="checkbox"/> Sediment Grain Size to PT <input checked="" type="checkbox"/> Chronic Bioassay to Nautilus Environmental DDT, DDD, and DDE Isomers (2,4' and 4,4') and PCBs to Lancaster Metals: 6010 (Cu,Cd,Cr,Pb,Ni,Zn)																					
LAB USE ONLY	SAMPLE ID	LOCATION/ DESCRIPTION	SAMPLING		MAT- RIX	NO. OF CONT.	Chronic Bioassay (E. Estuarius)	Sediment Grain Size ASTM D4464M	2,4'-DDT EPA 8081A	2,4'-DDD EPA 8081A	2,4'-DDE EPA 8081A	4,4'-DDT EPA 8081A	4,4'-DDD EPA 8081A	4,4'-DDE EPA 8081A	PCBs EPA 8082	TPH Carbon Chain (C7-C44)	Total Organic Carbon EPA 9060	Metals EPA 6010	PNAs EPA 8270		
			DATE	TIME																	
	R8-MMDDYY				SO	4		X	X	X	X	X	X	X	X	X	X	X	X		Do not analyze R8-MMDDYY for chronic toxicity.
	R7-MMDDYY				SO	4	X	X	X	X	X	X	X	X	X	X	X	X	X		
	R6-MMDDYY				SO	4	X	X	X	X	X	X	X	X	X	X	X	X	X		
	R5-MMDDYY				SO	4	X	X	X	X	X	X	X	X	X	X	X	X	X		
	R4-MMDDYY				SO	4	X	X	X	X	X	X	X	X	X	X	X	X	X		
	R3-MMDDYY				SO	4	X	X	X	X	X	X	X	X	X	X	X	X	X		
	R2-MMDDYY				SO	4	X	X	X	X	X	X	X	X	X	X	X	X	X		
	R1-MMDDYY				SO	4	X	X	X	X	X	X	X	X	X	X	X	X	X		
Relinquished by: (Signature)						Received by: (Signature)												Date:		Time:	
Relinquished by: (Signature)						Received by: (Signature)												Date:		Time:	
Relinquished by: (Signature)						Received by: (Signature)												Date:		Time:	

Appendix F
SOP 120
Decontamination

RETEC Standard Operating Procedure

(SOP) 120

Decontamination

1.0 Purpose and Applicability

The RETEC Group, Inc. (RETEC) SOP 120 describes the methods to be used for the decontamination of items which may become contaminated during field operations. Decontamination is performed as a quality assurance measure and as a safety precaution. It prevents cross-contamination between samples and also helps maintain a clean working environment. Equipment requiring decontamination may include hand tools, monitoring and testing equipment, personal protective equipment, or heavy equipment (e.g., loaders, backhoes, drill rigs, etc.).

Decontamination is achieved mainly by rinsing with liquids which may include: soap and/or detergent solutions, tap water, distilled water, and methanol. Equipment may be allowed to air dry after being cleaned or may be wiped dry with paper towels or chemical-free cloths.

All sampling equipment will be decontaminated prior to use and between each sample collection point. Waste products produced by the decontamination procedures such as rinse liquids, solids, rags, gloves, etc. will be collected and disposed of properly based on the nature of contamination and site protocols. Any materials and equipment which will be reused must be decontaminated or properly protected before being taken off site.

Specific project requirements as described in an approved Work Plan, Sampling Plan, Quality Assurance Project Plan, or Health & Safety Plan will take precedence over the procedures described in this document.

2.0 Responsibilities

It is the responsibility of the field sampling coordinator to ensure that proper decontamination procedures are followed and that all waste materials produced by decontamination are properly managed. It is the responsibility of any subcontractors (e.g., drilling or sampling contractors) to follow the proper designated decontamination procedures that are stated in their contracts and outlined in the project health and safety plan. It is the responsibility of all personnel involved with sample collection or decontamination to maintain a clean working

environment and to ensure that no contaminants are negligently introduced into the environment.

3.0 Supporting Materials

The following materials should be on hand in sufficient quantity to ensure that proper decontamination methods and procedures may be followed:

- Cleaning liquids and dispensers (soap and/or detergent solutions, tap water, distilled water, methanol, or isopropyl, etc.)
- Personal safety gear, as defined in the project health and safety plan
- Paper towels or chemical-free cloths
- Disposable gloves
- Waste-storage containers (e.g., drums, boxes, plastic bags)
- Drum labels, if necessary
- Cleaning containers (e.g., plastic and/or galvanized steel pans or buckets)
- Cleaning brushes
- Plastic sheeting

4.0 Methods and Procedures

The extent of known contamination will determine the degree of decontamination required. When the extent of contamination cannot be readily determined, cleaning should be done according to the assumption that the equipment is highly contaminated.

Standard operating procedures listed below describe the method for full field decontamination. If different technical procedures are required for a specific project, they will be spelled out in the project plans.

Such variations in decontamination may include all or an expanded scope of these decontamination procedures:

- Remove gross contamination from the equipment by brushing and then rinse with tap water.
- Wash with detergent or soap solution (e.g., Alconox and tap water).

- Rinse with tap water.
- Rinse with methanol or isopropyl.
- Rinse with distilled water.
- Repeat entire procedure or any parts of the procedure as necessary.
- After decontamination procedure is completed, avoid placing equipment directly on ground surface to avoid re-contamination.

Downhole drilling equipment, such as augers, split spoons, Shelby tubes, and sandlines, will be decontaminated with pressurized hot water or steam wash, followed by a fresh water rinse. No additional decontamination procedures will be required if the equipment appears to be visually clean. If contamination is visible after hot water/steam cleaning, then a detergent wash solution with brushes (if necessary) will be used.

5.0 Quality Assurance/Quality Control

To assess the adequacy of decontamination procedures, rinsate blanks should be collected and analyzed for the same parameters as the field samples. Specific number of blanks will be defined in the project specific sampling plan. In general, one rinsate blank will be collected per ten samples.

6.0 Documentation

Field notes describing procedures used to decontaminate equipment/personnel and for collection of the rinsate blanks will be documented by on-site personnel. Field notes will be retained in the project files.

Appendix G
SOP 110
Packing and Shipping

RETEC Standard Operating Procedure 110 (SOP)

Packing and Shipping Samples

1.0 Purpose And Applicability

The RETEC Group, Inc. (RETEC) Standard Operating Procedure (SOP) 110 describes proper packaging methods and shipment of samples to minimize the potential for sample breakage, leakage, or cross contamination, and provide a clear record of sample custody from collection to analysis. Specific project requirements as described in an approved Work Plan, Sampling Plan, Quality Assurance Project Plan, or Health & Safety Plan will take precedence over the procedures described in this document.

The EPA RCRA regulations (40 CFR Section 261.4 [d]) specify that samples of solid waste, water, soil, or air collected for the purpose of testing are exempt from regulation when any of the following conditions apply:

- Samples are being transported to a laboratory for analysis
- Samples are being transported to the collector from the laboratory after analysis
- Samples are being stored:
 - By the collector prior to shipment for analyses
 - By the analytical laboratory prior to analyses
 - By the analytical laboratory after testing but prior to return of sample to the collector or pending the conclusion of a court case

Samples collected by RETEC are generally qualified for these exemptions. RETEC SOP 110 deals only with these sample types.

2.0 Responsibilities

The field sampling coordinator is responsible for the enactment and completion of the chain-of-custody, and the packaging and shipping requirements outlined here and in project-specific sampling plans.

3.0 Supporting Materials

The following materials must be on hand and in sufficient quantity to ensure that proper packing and shipping methods and procedures may be followed:

- Chain-of-custody forms and tape
- Sample container labels
- Coolers or similar shipping containers
- Duct tape or transparent packaging tape
- Zip-lock type bags
- Protective wrapping and packaging materials
- Ice or cold packs
- Shipping labels for the exterior of the ice chest
- Transportation carrier forms (Federal Express, Airborne, etc.)

4.0 Methods And Procedures

All samples must be packaged so that they do not leak, break, vaporize, or cause cross-contamination of other samples. Waste samples and environmental samples (e.g., groundwater, soil, etc.) should not be placed in the same container. Each individual sample must be properly labeled and identified. Each shipping container must be accompanied by a chain-of-custody record. When refrigeration is required for sample preservation, samples must be kept cool during the time between collection and final packaging.

All samples must be clearly identified immediately upon collection. Each sample bottle label (Figure 1) will include the following information:

- Client or project name, or unique identifier, if confidential
- A unique sample description
- Sample collection date and time
- Sampler's name or initials
- Indication of filtering or addition of preservative, if applicable
- Analyses to be performed

After collection, identification, and preservation (if necessary), the samples will be maintained under chain-of-custody procedures as described below.

4.1 Chain-Of-Custody

A sample is considered to be under custody if it is in one's possession, view, or in a designated secure area. Transfers of sample custody must be documented by chain-of-custody forms (Figure 2). The chain-of-custody record will include, at a minimum, the following information:

- Client or project name, or unique identifier, if confidential
- Sample collector's name
- Company's (RETEC) mailing address and telephone number
- Designated recipient of data (name and telephone number)
- Analytical laboratory's name and city
- Description of each sample (i.e., unique identifier and matrix)
- Date and time of collection
- Quantity of each sample or number of containers
- Type of analysis required
- Date and method of shipment

Additional information may include type of sample containers, shipping identification air bill numbers, etc.

When transferring custody, both the individual(s) relinquishing custody of samples and the individual(s) receiving custody of samples will sign, date, and note the time on the form. If samples are to leave the collector's possession for shipment to the laboratory, the subsequent packaging procedures will be followed.

4.2 Packing for Shipment

To prepare a cooler for shipment, the sample bottles should be inventoried and logged on the chain-of-custody form. At least one layer of protective material should be placed in the bottom of the container. As each sample bottle is logged on the chain-of-custody form, it should be wrapped with protective material (e.g., bubble wrap, matting, plastic gridding, or similar material) to prevent breakage. Each sample bottle should be placed upright in the shipping container. Each sample bottle cap should be checked during wrapping and tightened if needed. Avoid over tightening, which may cause bottle cap to crack and allow leakage. Additional packaging material such as bubble wrap or styrofoam pellets should be spread throughout the voids between the sample bottles.

Most samples require refrigeration as a minimum preservative. Reusable cold packs or ice placed in heavy duty zip-lock type bags should be distributed over the top of the samples. Two

or more cold packs or bags should be used. Additional packing material should then be placed to fill the balance of the cooler or container.

Place the original completed chain-of-custody record in a zip-lock type plastic bag and place the bag on the top of the contents within the cooler or shipping container. Alternatively, the bag may be taped to the underside of the container lid. Retain a copy of the chain-of-custody record with the field records.

Close the top or lid of the cooler or shipping container and rotate/shake the container to verify that the contents are packed so that they do not move. Add additional packaging if needed and reclose. Place signed and dated chain-of-custody seal (Figure 3) at two different locations (front and back) on the cooler or container lid and overlap with transparent packaging tape. The chain-of-custody tape should be placed on the container in such a way that opening the container will destroy the tape. Packaging tape should encircle each end of the cooler at the hinges.

Sample shipment should be sent via an overnight express service that can guarantee 24-hour delivery. Retain copies of all shipment records as provided by the shipper.

5.0 Quality Assurance/Quality Control

Recipient of sample container should advise shipper and/or transporter immediately of any damage to container, breakage of contents, or evidence of tampering.

6.0 Documentation

The documentation for support of proper packaging and shipment will include RETEC or the laboratory chain-of-custody records and transportation carrier's airbill or delivery invoice. All documentation will be retained in the project files.

Appendix H
Field Activity Daily Log Sheet

Field Activity Daily Log

Project _____

Job No. _____

Day & Date _____

Completed By _____

Approved By _____

Sheet _____ of _____

Field Activity Subject:	
Time	Description of Daily Activities and Events:
Visitors On Site:	Changes from Plans and Specifications, and other special orders and important decisions:
Weather Conditions:	Important Telephone Calls:
Personnel on Site	