

Mr. Robert Lawrence
U.S. Army Corps of Engineers
1455 Market Street
San Francisco, CA 94103

August 12, 2010

Dear Mr. Lawrence:

On behalf of Mr. Edward Keller of the U.S. Army Corps of Engineers, I have enclosed two (2) copies of the report "Sampling and Analysis Results for Sediment Samples Collected from the San Rafael Channel." In addition, one copy of this report has been sent to the other DMMO participating agency representatives.

If you have any questions, please give me a call at (707) 207-7760. I look forward to hearing from you.

Sincerely,

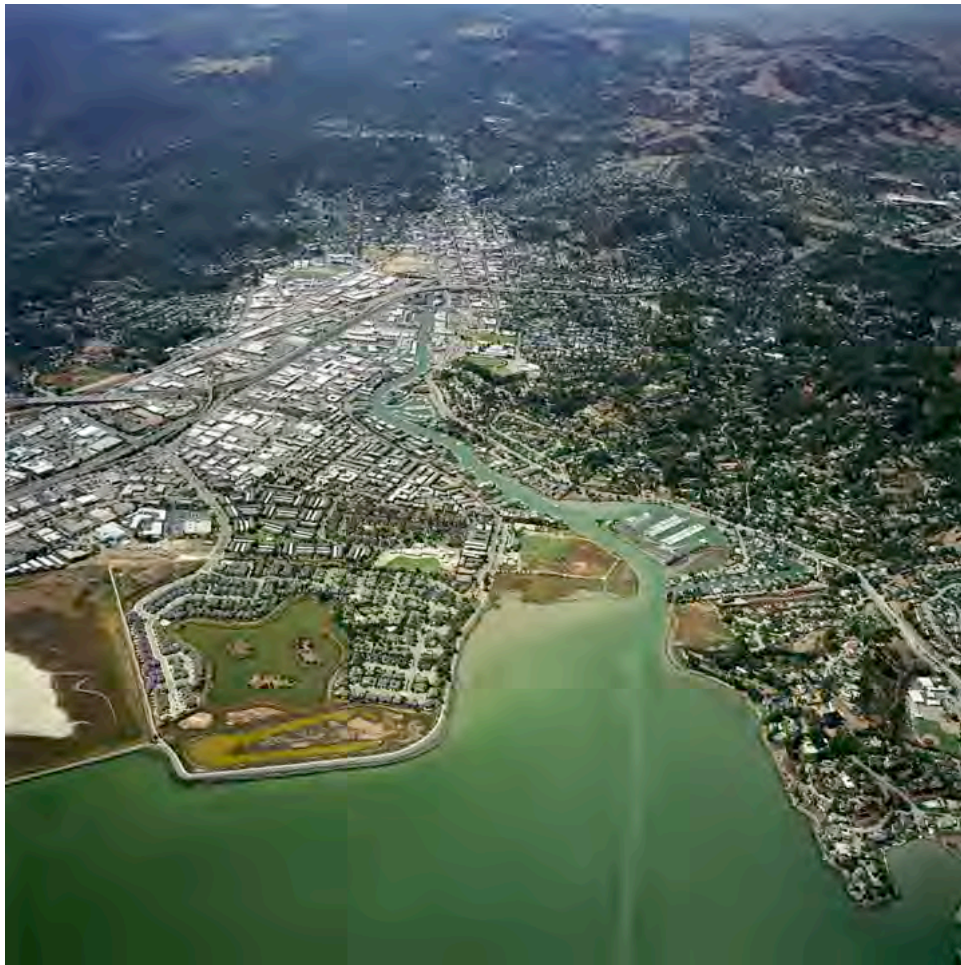
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This testing was performed under Lab Order 16087. The test results reported herein conform to the most current NELAC standards, where applicable, unless otherwise narrated in the body of the report, and only relate to the sample(s) tested. This report shall not be reproduced, except in full, without the written consent of Pacific EcoRisk.

SAMPLING AND ANALYSIS RESULTS FOR SEDIMENT SAMPLES COLLECTED FROM THE SAN RAFAEL CHANNEL FINAL REPORT

August 11, 2010



Prepared for

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List of Acronyms

ASTM	American Society for Testing and Materials
ATF	Across the Flats
Bay	San Francisco Bay
BCDC	Bay Conservation and Development Commission
CAS	Columbia Analytical Services
COC	Chain-of-custody
D.O.	dissolved oxygen
DDT	dichlorodiphenyltrichloroethane
DGPS	Differential global positioning system
DMMO	Dredged Material Management Office
EC	effect concentration
ESC	Elutriate Suitability Concentrations
ft	foot
g/L	grams per liter
GPS	Global positioning system
HDPE	high-density polyethylene
HWRP	Hamilton Wetland Restoration Project
ITM	Inland Testing Manual
KCl	potassium chloride
L	liter
LC	lethal concentration (e.g., LC50)
LTMS	Long Term Management Strategy
MDL	method detection limit
MET	Modified Elutriate Test
mg/kg	milligram/kilogram
mg/L	milligrams per liter
mL	milliliters
MLLW	Mean lower low water
MRL	method reporting limits
ng/kg	nanogram per kilogram
PAH	polycyclic aromatic hydrocarbon
PCB	polychlorinated biphenyl
PER	Pacific EcoRisk

List of Acronyms (continued)

QA/QC	Quality assurance/quality control
RPD	Relative percent difference
RWQCB	Regional Water Quality Control Board
SAP	Sampling and analysis plan
SET	Standard Elutriate Test
SF-10	San Pablo Bay disposal site
SF-11	Alcatraz Island disposal site
SLC	State Lands Commission
SOP	Standard operating procedures
SUAD	Suitable for undefined aquatic disposal
TEG	TEG Oceanographic Services
TOC	Total organic carbon
TPH	Total petroleum hydrocarbon
TSS	total suspended solids
USACE	U.S. Army Corps of Engineers
USEPA	U.S. Environmental Protection Agency
wt	weight
µg/kg	microgram per kilogram

1. INTRODUCTION

As part of their Operations and Maintenance Program, the United States Army Corps of Engineers (USACE) is planning to dredge accumulated sediment from within the San Rafael Channel (Figures 1-1 and 1-2) to restore navigation depths in the channel. The USACE has contracted Pacific EcoRisk (PER) to perform pre-dredge sampling and analysis in support of a determination of suitability for placement of dredged San Rafael Channel sediments at the Hamilton Wetland Restoration Project (HWRP) or at the San Pablo Bay (SF-10) and Alcatraz Island (SF-11) in-Bay sites. This Data Report has been prepared to provide the required characterization of these sediments.

1.1 Project Description

The San Rafael Channel is located within the City of San Rafael in Marin County, approximately 17 miles north of San Francisco. The San Rafael Channel can effectively be divided into two portions: the Inner Canal portion is located along the entire length of San Rafael Creek, and the 'Across the Flats' (ATF) portion extends out into the Bay from the mouth of the San Rafael Creek (Figure 1-2). The Inner Canal portion of the channel is authorized as a channel 60 ft wide, ~ 1.6 miles long from the mouth of the creek to Grand Street in San Rafael, with a depth of -6 ft mean lower low water (MLLW). This portion of the channel also has a turning basin at the San Rafael Yacht Club that is 100 ft wide, 200 ft long and -6 ft MLLW. The ATF portion of the channel is authorized as a channel 100 ft wide, ~ 2.4 miles long from the mouth of the creek out into the Bay, with a depth of -8 ft MLLW. In addition to the project depths, this project has an allowable over-depth of -2 ft.

The volume of shoaling in the channel was estimated based on the surveys performed in April 2009, and was presented in a previously approved Sampling and Analysis Plan (USACE 2010). The Inner Canal portion of the channel has an estimated volume of 25,000 cubic yards (yds³) above the project depth of -6 ft MLLW and has an estimated volume of 14,000 yds³ for each foot of over-depth, for an estimated total of 53,000 yds³. The ATF portion of the channel has an estimated volume of 138,000 yds³ above the project depth of -8 ft MLLW and has an estimated volume of 44,000 yds³ for each foot of over-depth, for an estimated total of 226,000 yds³.

A total of 35 sediment cores were collected over eight Composite Sample Areas. In addition to the samples collected for making a suitability determination, the USACE also collected deeper samples for informational purposes only. These deeper samples characterized the two ft of sediment beneath the allowable over-depth material (this was sediment from -8 to -10 ft MLLW for the Inner Canal portion of the project, and sediments from -10 to -12 ft MLLW for the ATF portion of the project). Lastly, a "Z" layer sample was collected to assess the post-dredged mudline (-8 to -8.5 feet MLLW) in the area of the Inner Canal portion of the channel represented by Composite Samples #7 and #8.

1.2 Objectives of the Sediment Investigation

The purpose of this pre-dredge sampling and analysis effort is to determine the suitability of sediment to be dredged from the San Rafael Channel for placement at HWRP or at the SF-10 or SF-11 in-Bay sites. The procedures for sediment sample collection, sample processing and preparation, physical and chemical analyses, biological testing and data analyses were presented in a previously approved SAP *San Rafael Channel FY 2010 Operations and Maintenance Sampling and Analysis Plan* (USACE 2010), and approved Master SAP *Master Sampling and Analysis Plan USACE SF-District O&M Dredging* (USACE 2004)

Guidance concerning necessary sampling and analytical protocols, quality assurance/quality control (QA/QC) procedures, and data interpretation can be found in:

- Evaluation of Dredged Material Proposed for Discharge in Waters of the U.S. – Testing Manual (ITM; USEPA/USACE 1998);
- USACE (1985) Technical Note EEDP 04-2. Interim Guidance for Predicting Quality of Effluent Discharged from Confined Dredged Material Disposal Areas During Dredging Operations. U.S. Army Engineer Waterways Experiment Station, Environmental Laboratory, June 1985;
- Public Notice 01-1: Guidelines for Implementing the Inland Testing Manual in the San Francisco Bay Region;
- Public Notice 93-2: Testing Guidelines for Dredged Material Disposal at San Francisco Bay Sites; and the Dredged Material Management Office (DMMO) review process; and
- Beneficial Reuse of Dredged Materials Sediment Screening and Testing Guidelines. Draft Staff Report. Central Valley Regional Water Quality Control Board. May 2000.

The specific objectives of the SAP scope-of-work are as follows:

- Collect core samples from within the designated sampling areas following field protocol detailed in the SAP; and
- Conduct chemical and biological analyses to determine whether sediments are suitable for wetland beneficial reuse or suitable for unconfined aquatic disposal (SUAD).

1.3 Overview of Field Activities and Lab Analyses

The Inner Canal and ATF portions of the channel were each divided into 4 “Composite Sample Areas” for a total eight Composite Sample Areas (Figure 3). A total of 35 sediment cores were collected via vibracore from within these eight Composite Sample Areas (Figures 2-1 through 2-7). For each Composite Sample Area, each sediment core was partitioned into appropriate sections (maintenance depth and the deeper ‘information only’ core sections). For cores from Composite Sample Areas 7 and 8, a ‘Z-Layer’ section consisting of the 0.5 ft of sediment immediately below the maintenance depth section (i.e., 8.0-8.5 ft MLLW) was collected; for these cores, the ‘information only’ sections were collected from immediately below the Z-layer section. Each resultant sediment core section was individually homogenized and a sub-sample of

the homogenized sediment was archived for subsequent analyses of the individual core section sediment, if needed. For each of the core section types from within each Composite Sample Area, proportionate amounts of the homogenized sediments were composited into a composite sample as described in the SAP (USACE 2010).

Samples of the maintenance depth composited sediments, Z-layer composited sediments, and ‘information only’ composited sediments for each Composite Sample Area were submitted for chemical and conventional analyses and/or biological testing and per the approved SAP (USACE 2010); note – biological testing was only performed on the maintenance depth core section materials. In addition, samples of the homogenized sediment from the maintenance depth section of the individual cores from Composite Sample Areas 7 and 8 were also submitted for analyses. The remainder of the samples were archived appropriately for subsequent analysis, if needed.

The results of these sediment analyses were used to determine the suitability of the proposed sediments for unconfined aquatic disposal. Suitability for disposal with respect to analytical chemistry will be determined by comparison to San Francisco Bay Ambient Levels (SFRWQCB 1998), reference site sediments, HWRP site-specific requirements, and the DMMO review process; biological testing results were compared to disposal site reference sediments.

1.4 Organization of this Document

Sample collection and handling procedures are discussed in Sections 2 and 3. Testing program methods are described in Section 4. Chemical analyses and bioassay results are provided in Section 5. A Quality Control (QC) summary is provided in Section 6. Section 7 presents the conclusions regarding suitability of the material for placement at the HWRP site or the SF-10 and SF-11 in-Bay disposal sites, and references are provided in Section 8. Appendices A-O contain supporting documentation for this study.

**Figure 1-1. Location Map: San Rafael Channel, San Rafael, CA**

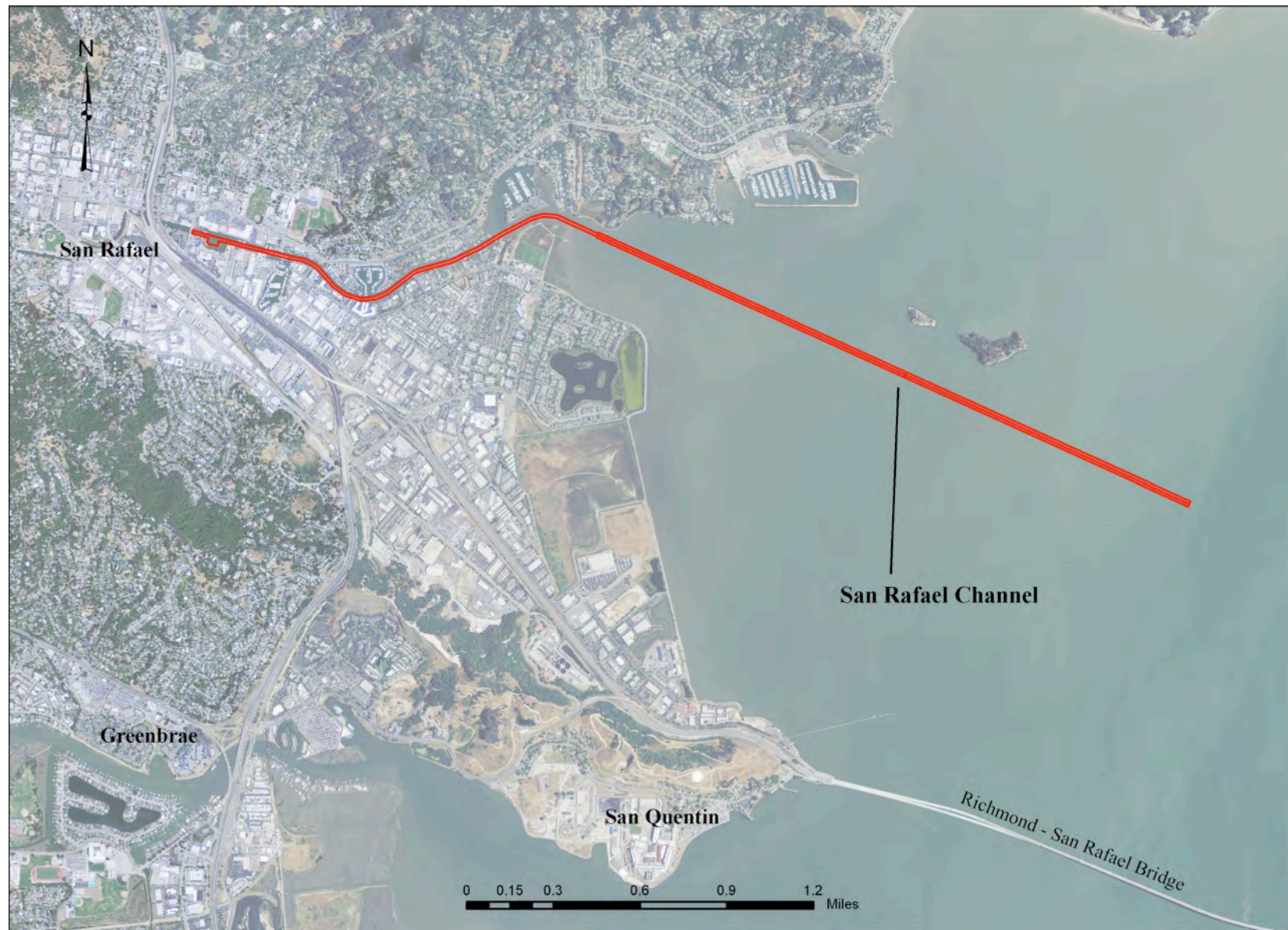


Figure 1-2. Vicinity Map: San Rafael Channel

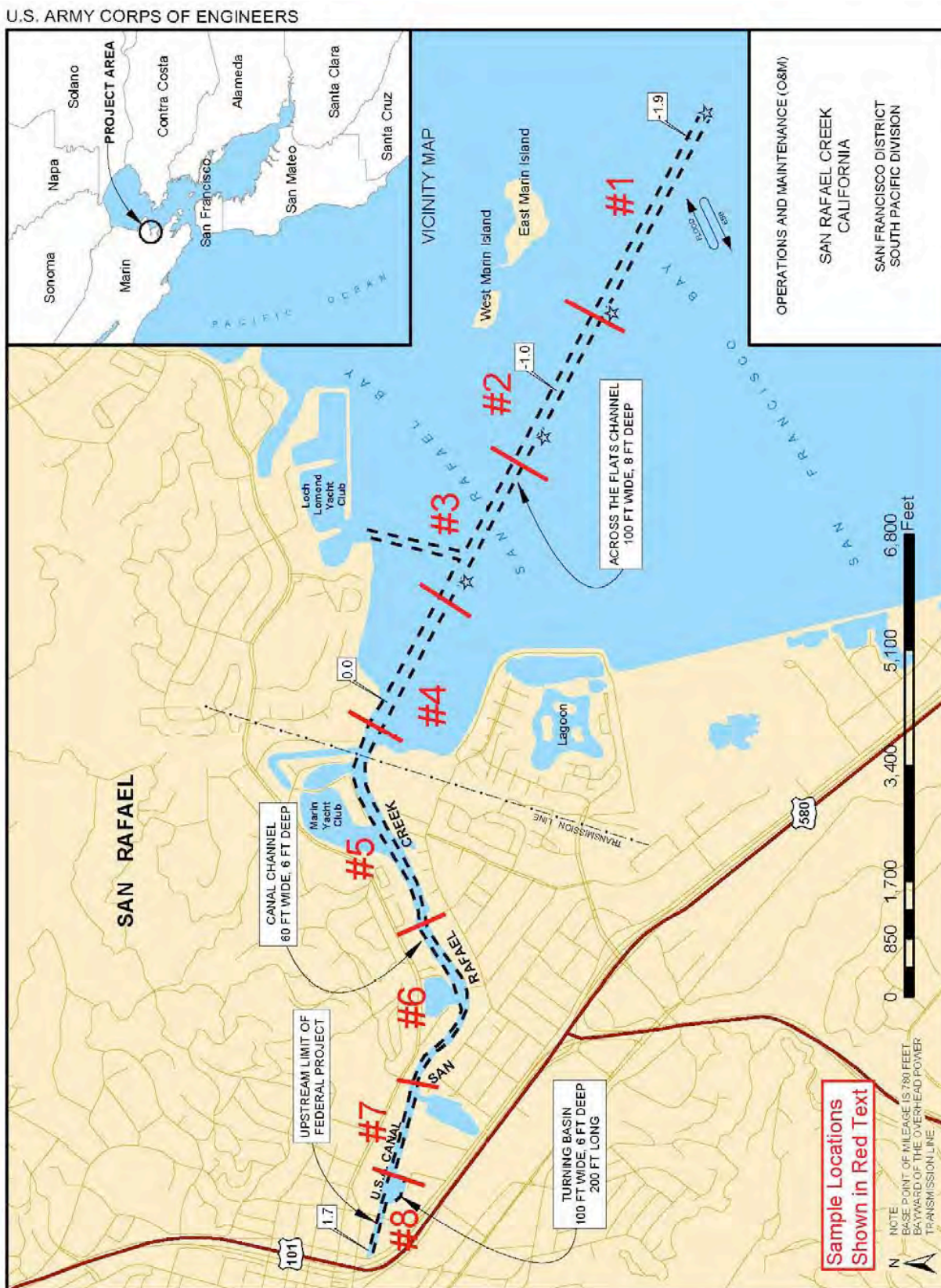


Figure 1-3. San Rafael Channel Composite Sample Areas #1-8

2. FIELD SEDIMENT SAMPLE COLLECTION

2.1 Collection of San Rafael Channel Sediment Cores

All sediments were collected in accordance with the SAP (USACE 2010). Sediment sampling was performed from June 8 to June 11, 2010, under the direction of Mr. Jeffrey Cotsifas of Pacific EcoRisk. Monterey Canyon Research Vessels provided the sampling vessel and on-board positioning system; TEG Oceanographic Services provided the vibracore sampling equipment. PER also provided additional Field Scientists to assist in sediment core collection.

Sediment cores were collected from 35 designated sites (Figures 2-1 through 2-7; Table 2-1). Final site positions were determined with a differential global positioning system (DGPS) and are accurate to ± 3 m. Table 2-1 lists station identifiers, DGPS coordinates for all core locations, mudline elevations, and core penetration depths for all stations; field logs are presented in Appendix A. With the exception of sediment core SRC-2010-2-3 that was relocated ~50 ft from the original station location in order to achieve project depth plus over-depth requirements, there were no deviations from the SAP (USACE 2010). It should be noted that Composite Area #8 (sediment cores SRC-2010-8-1 through SRC-2010-8-4) contained a high degree of organic debris at the mudline and each of the sediment cores had a strong petroleum odor.

2.1.1 Field Equipment Decontamination Procedure

The deck of the vessel was rinsed clean with site water between stations. All sampling equipment coming in contact with collected sediments was decontaminated between stations using the following procedures:

1. Rinse with site water and wash with scrub brush until free of sediment;
2. Wash with phosphate-free biodegradable soap solution; and
3. Rinse with site water taken from 3 ft. below the surface.

Any sampling equipment that could not be properly cleaned was not used for subsequent sampling activities.

2.1.2 On-Board Sample Processing and Labeling

Individual cores were extruded on board the sampling vessel and placed into a clean substrate lined with a food-grade polyethylene bag. The top section of the core liner was removed and the physical characteristics of each core were noted on the individual sediment core collection log. The samples were then partitioned into their appropriate sections (maintenance depth, Z-layer, and 'information only' core sections) and placed into separate food-grade polyethylene bags. Each individual sediment core section sediment sample was assigned a unique alphanumeric identifier as described in the SAP (USACE 2010). While aboard the vessel and during transportation to the PER lab facility, samples were temporarily stored on ice (or frozen "blue ice") within insulated coolers.

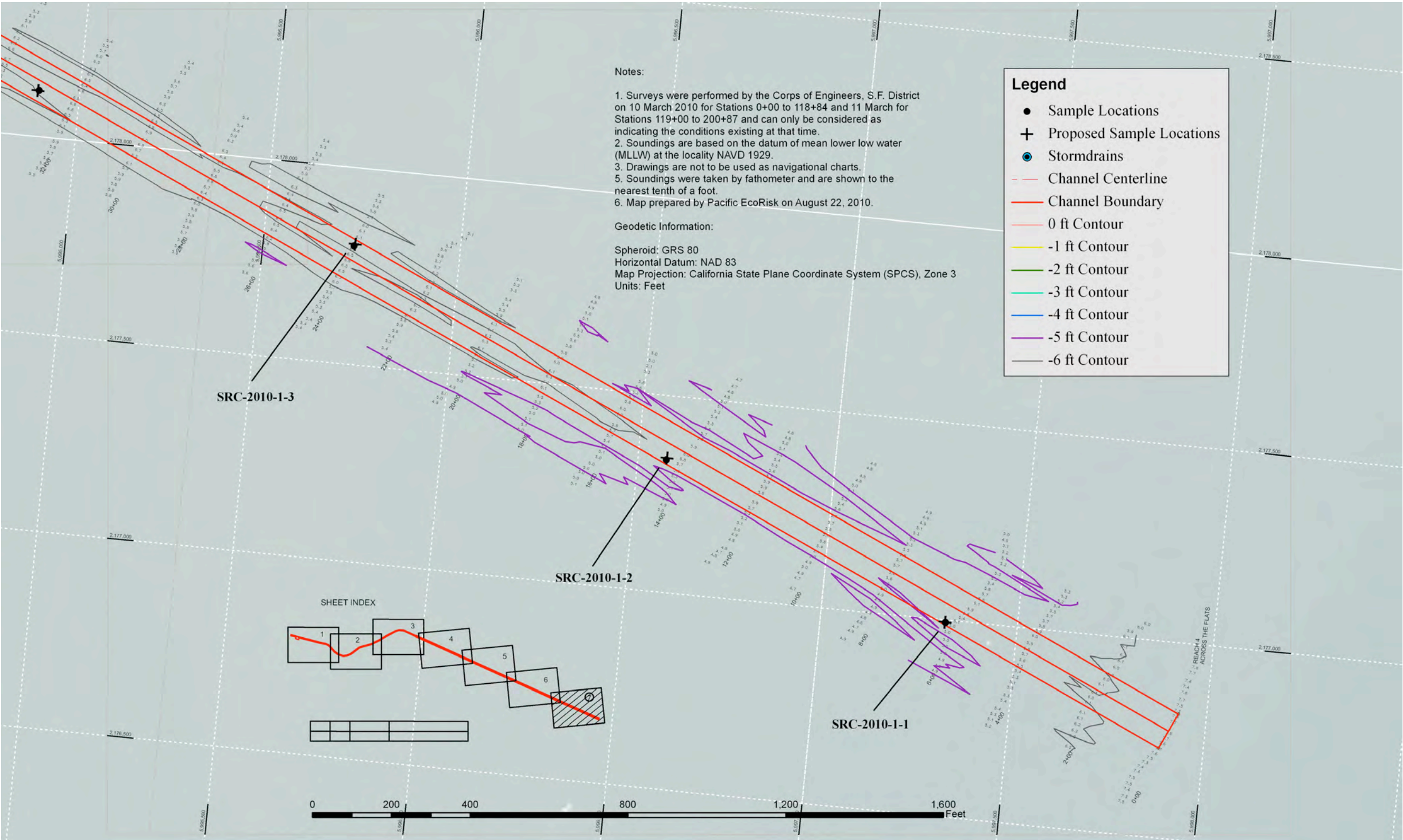


Figure 2-1. San Rafael Channel Sample Locations SRC-2010-1-1 through SRC-2010-1-4

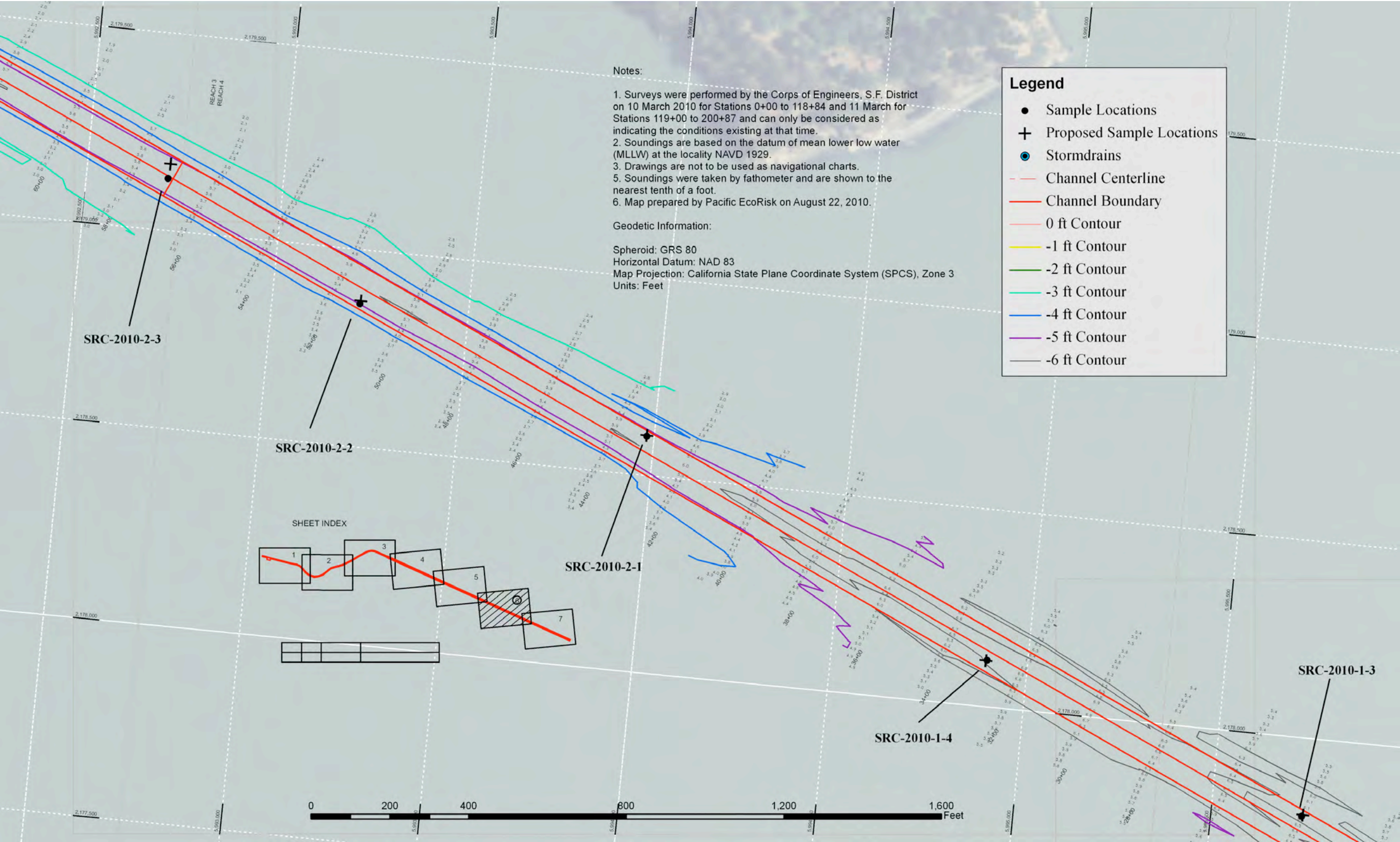


Figure 2-2. San Rafael Channel Sample Locations SRC-2010-1-3 through SRC-2010-2-3

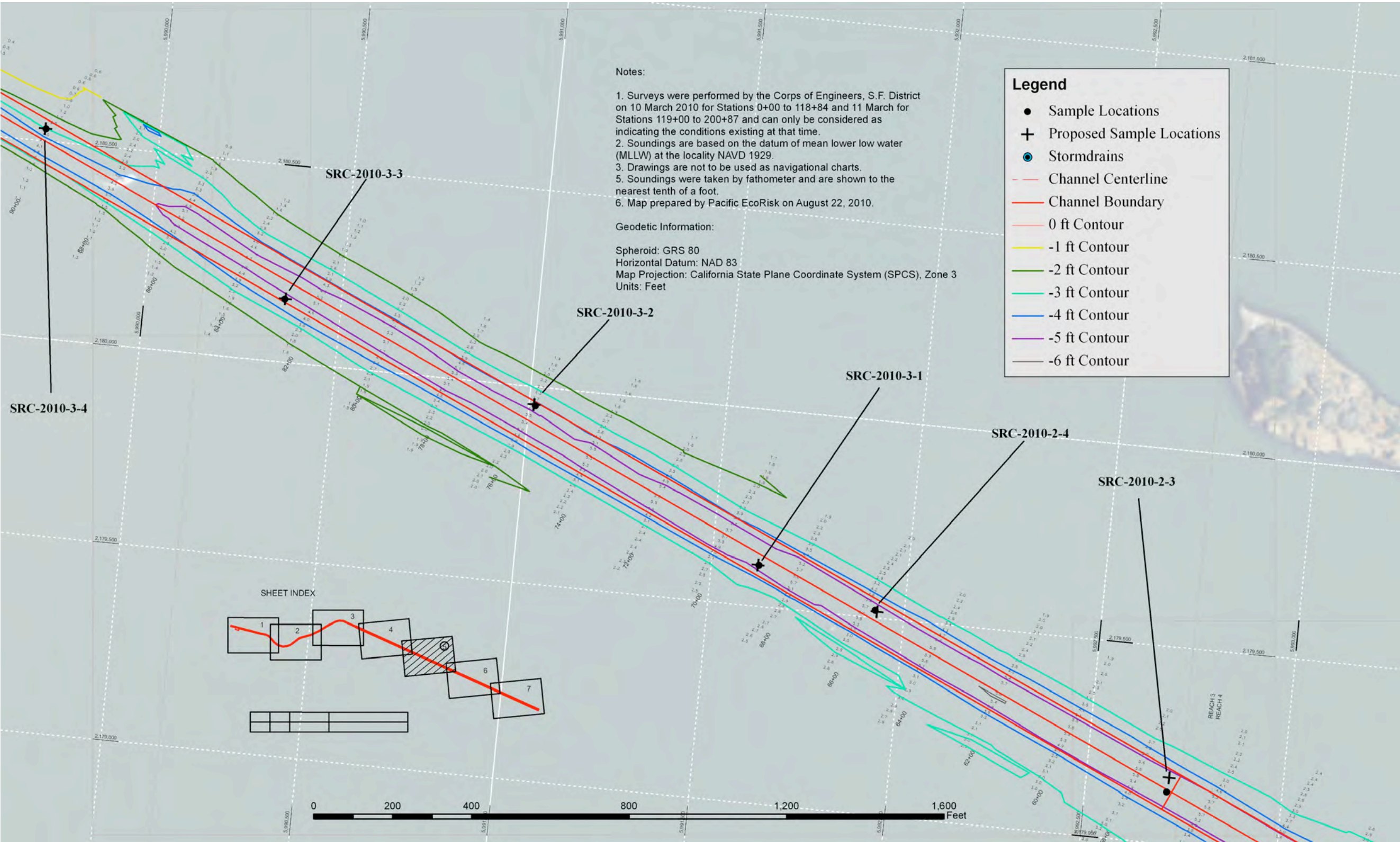


Figure 2-3. San Rafael Channel Sample Locations SRC-2010-2-3 through SRC-2010-3-4

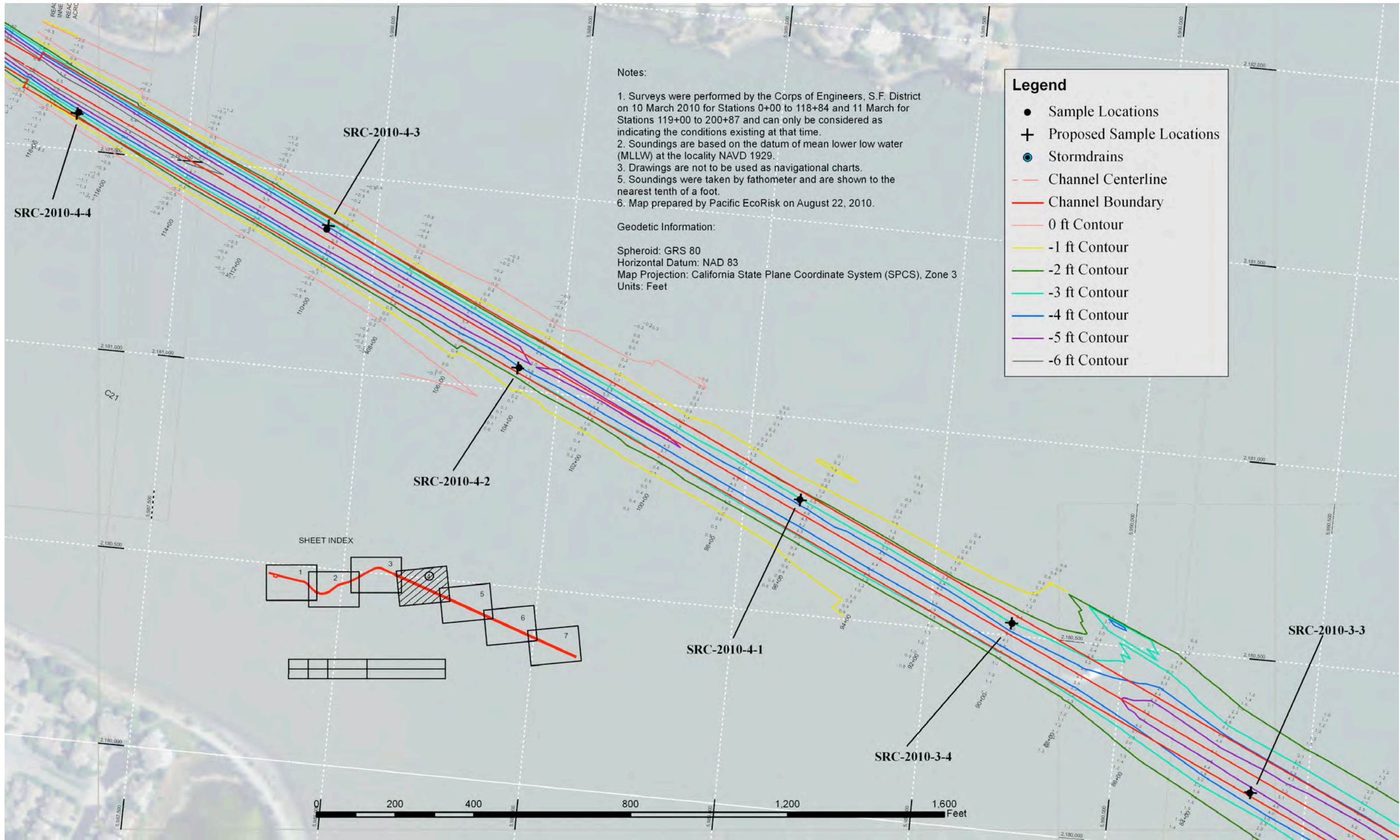


Figure 2-4. San Rafael Channel Sample Locations SRC-2010-3-3 through SRC-2010-4-4

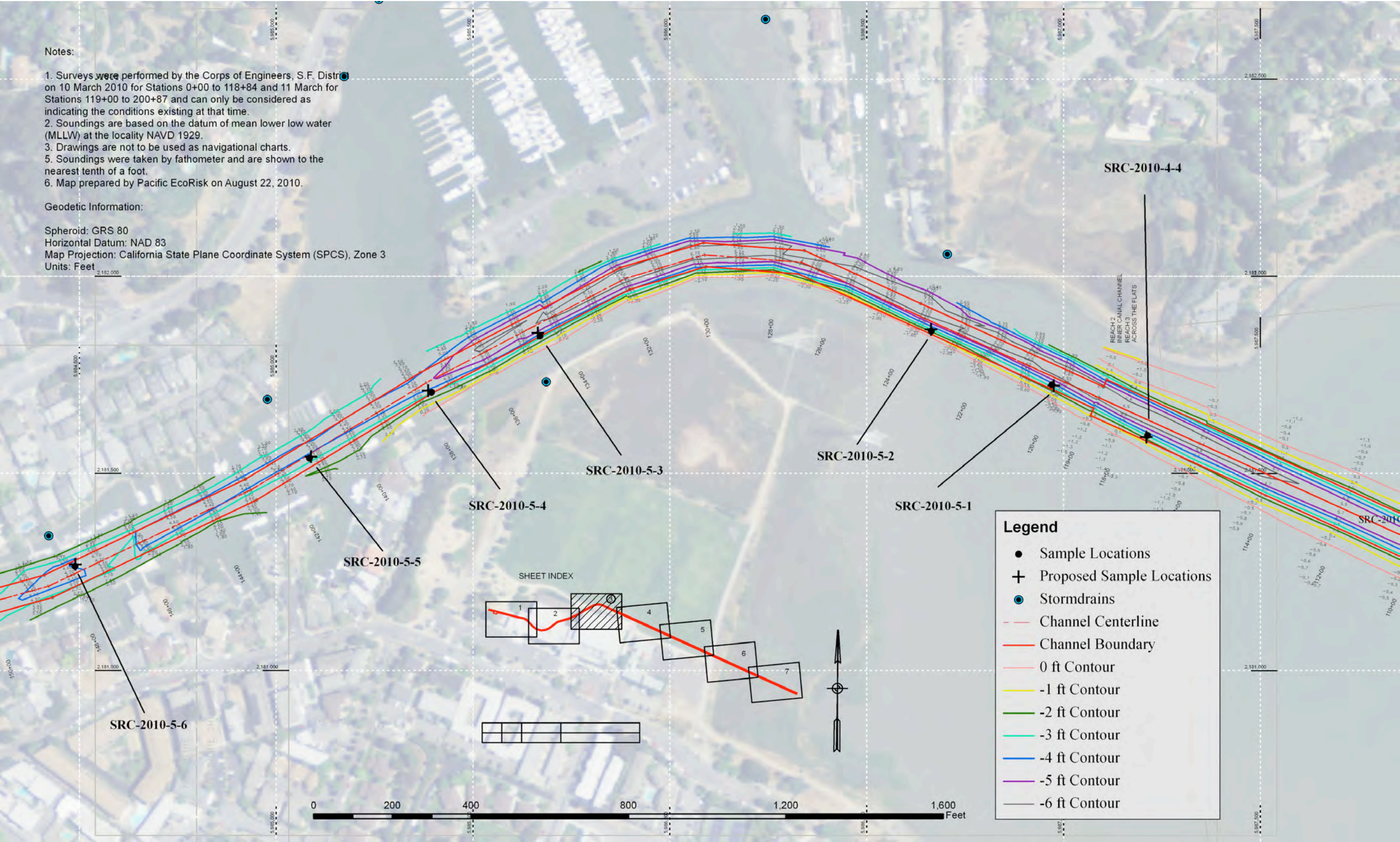


Figure 2-5. San Rafael Channel Sample Locations SRC-2010-5-1 through SRC-2010-5-6

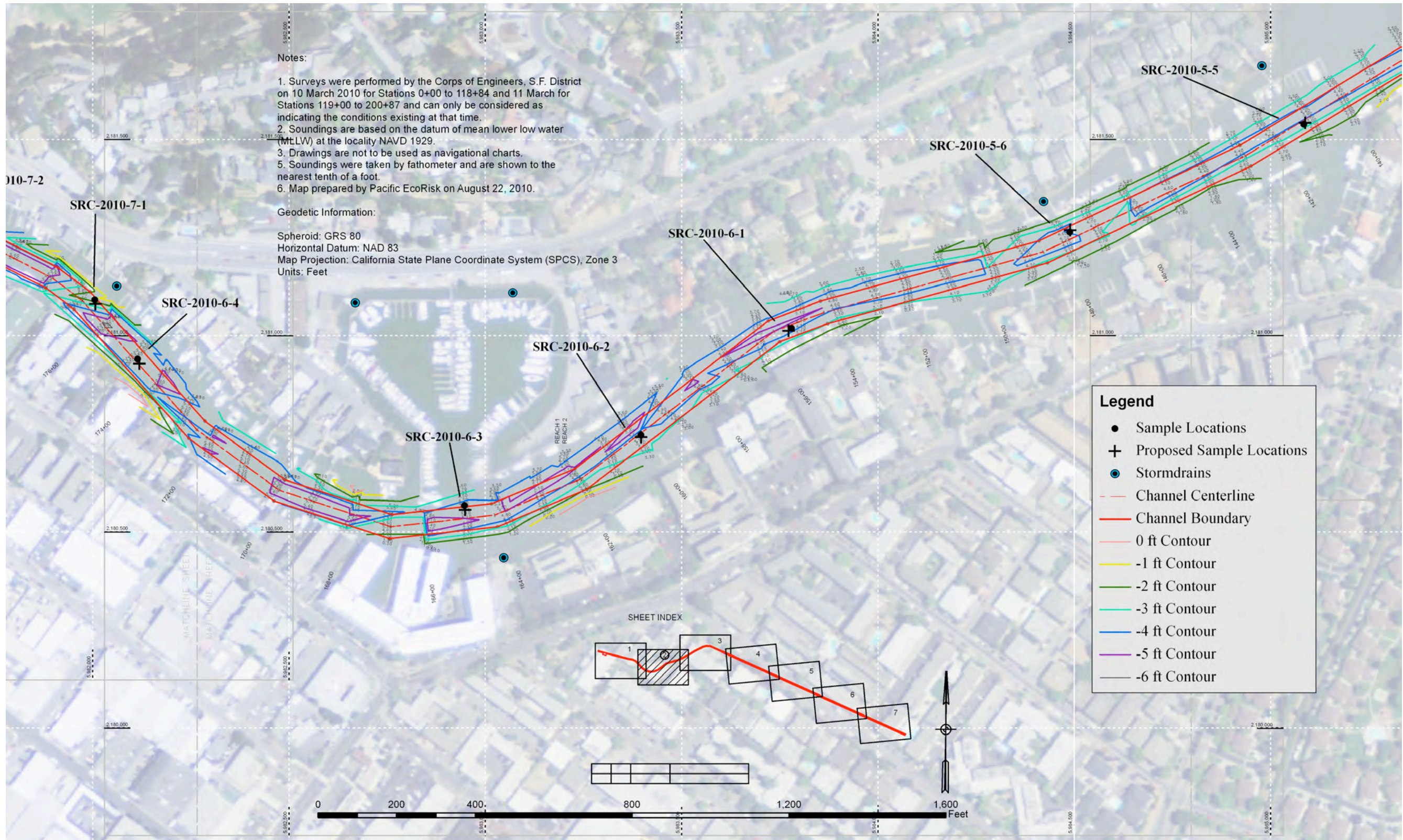


Figure 2-6. San Rafael Channel Sample Locations SRC-2010-5-5 through SRC-2010-7-1

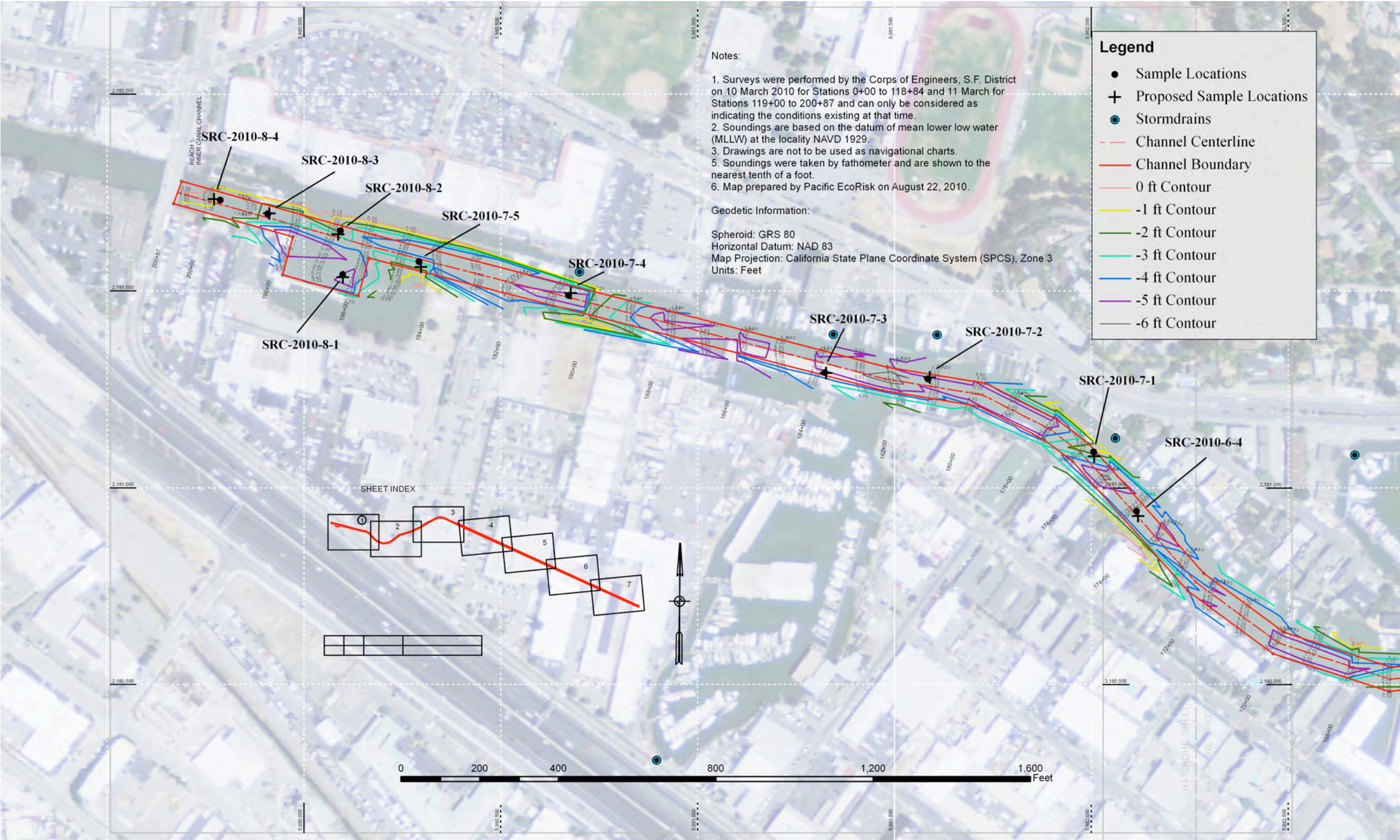


Table 2-1a. Sampling station locations and core depths - Maintenance Depth Sections.

SAMPLE ID	Latitude ^A (N) (deg-dec min)	Longitude ^A (W) (deg-dec min)	Mudline Elevation (ft MLLW)	Core Section Length (ft)	Maintenance Core Section Depth (ft MLLW)
SRC-2010-1-1	37°57.4468'	122°27.4544'	-4.9	5.1	-10
SRC-2010-1-2	37°57.5008'	122°27.6109'	-5.5	4.5	-10
SRC-2010-1-3	37°57.5744'	122°27.7880'	-5.4	4.6	-10
SRC-2010-1-4	37°57.6236'	122°27.9629'	-5.7	4.3	-10
SRC-2010-2-1	37°57.6998'	122°28.1555'	-5.3	4.7	-10
SRC-2010-2-2	37°57.7405'	122°28.3144'	-4.9	5.1	-10
SRC-2010-2-3	37°57.7830'	122°28.4229'	-5.7	4.3	-10
SRC-2010-2-4	37°57.8441'	122°28.5872'	-5.7	4.3	-10
SRC-2010-3-1	37°57.8571'	122°28.6511'	-5.3	4.7	-10
SRC-2010-3-2	37°57.9123'	122°28.7784'	-4.1	5.9	-10
SRC-2010-3-3	37°57.9442'	122°28.9166'	-4.2	5.8	-10
SRC-2010-3-4	37°58.0032'	122°29.0527'	-2.5	7.5	-10
SRC-2010-4-1	37°58.0442'	122°29.1723'	-2.9	7.1	-10
SRC-2010-4-2	37°58.0852'	122°29.3285'	-4.2	5.8	-10
SRC-2010-4-3	37°58.1334'	122°29.4386'	-3.5	6.5	-10
SRC-2010-4-4	37°58.1698'	122°29.5767'	-3.3	6.7	-10
SRC-2010-5-1	37°58.1902'	122°29.6279'	-3.4	4.6	-8
SRC-2010-5-2	37°58.2115'	122°29.6923'	-3.6	4.4	-8
SRC-2010-5-3	37°58.2060'	122°29.8990'	-3.6	4.4	-8
SRC-2010-5-4	37°58.1815'	122°29.9558'	-2.4	5.6	-8
SRC-2010-5-5	37°58.1529'	122°30.0195'	-2.9	5.1	-8
SRC-2010-5-6	37°58.1056'	122°30.1423'	-4.5	3.5	-8
SRC-2010-6-1	37°58.0627'	122°30.2888'	-3.5	4.5	-8
SRC-2010-6-2	37°58.0165'	122°30.3673'	-3.3	4.7	-8
SRC-2010-6-3	37°57.9853'	122°30.4600'	-4.0	4.0	-8
SRC-2010-6-4	37°58.0439'	122°30.6349'	-4.6	3.4	-8
SRC-2010-7-1	37°58.0683'	122°30.6583'	-5.0	3.0	-8
SRC-2010-7-2	37°58.0973'	122°30.7466'	-5.4	2.6	-8
SRC-2010-7-3	37°58.0990'	122°30.8012'	-3.8	4.2	-8
SRC-2010-7-4	37°58.1290'	122°30.9375'	-4.7	3.3	-8
SRC-2010-7-5	37°58.1418'	122°31.0170'	-3.7	4.9	-8
SRC-2010-8-1	37°58.1357'	122°31.0571'	-4.5	3.5	-8
SRC-2010-8-2	37°58.1526'	122°31.0598'	-3.3	1.0	-8
SRC-2010-8-3	37°58.1605'	122°31.0974'	-1.7	6.3	-8
SRC-2010-8-4	37°58.1658'	122°31.1227'	-0.1	7.9	-8

^A State Plane Coordinate System, California Zone 3, NAD 83.

Table 2-1b. Sampling station locations and core depths – ‘Information Only’ Section.

SAMPLE ID	Latitude ^A (N) (deg-dec min)	Longitude ^A (W) (deg-dec min)	Top of ‘Information Only’ Section (ft MLLW)	Core Section Length (ft)	‘Information Only’ Core Depth (ft MLLW)
SRC-2010-1-1-B	37°57.4468’	122°27.4544’	-10	2.0	-12
SRC-2010-1-2-B	37°57.5008’	122°27.6109’	-10	2.0	-12
SRC-2010-1-3-B	37°57.5744’	122°27.7880’	-10	2.0	-12
SRC-2010-1-4-B	37°57.6236’	122°27.9629’	-10	2.0	-12
SRC-2010-2-1-B	37°57.6998’	122°28.1555’	-10	2.0	-12
SRC-2010-2-2-B	37°57.7405’	122°28.3144’	-10	2.0	-12
SRC-2010-2-3-B	37°57.7830’	122°28.4229’	-10	2.0	-12
SRC-2010-2-4-B	37°57.8441’	122°28.5872’	-10	2.0	-12
SRC-2010-3-1-B	37°57.8571’	122°28.6511’	-10	2.0	-12
SRC-2010-3-2-B	37°57.9123’	122°28.7784’	-10	2.0	-12
SRC-2010-3-3-B	37°57.9442’	122°28.9166’	-10	2.0	-12
SRC-2010-3-4-B	37°58.0032’	122°29.0527’	-10	2.0	-12
SRC-2010-4-1-B	37°58.0442’	122°29.1723’	-10	2.0	-12
SRC-2010-4-2-B	37°58.0852’	122°29.3285’	-10	2.0	-12
SRC-2010-4-3-B	37°58.1334’	122°29.4386’	-10	2.0	-12
SRC-2010-4-4-B	37°58.1698’	122°29.5767’	-10	2.0	-12
SRC-2010-5-1-B	37°58.1902’	122°29.6279’	-8	2.0	-10
SRC-2010-5-2-B	37°58.2115’	122°29.6923’	-8	2.0	-10
SRC-2010-5-3-B	37°58.2060’	122°29.8990’	-8	2.0	-10
SRC-2010-5-4-B	37°58.1815’	122°29.9558’	-8	2.0	-10
SRC-2010-5-5-B	37°58.1529’	122°30.0195’	-8	2.0	-10
SRC-2010-5-6-B	37°58.1056’	122°30.1423’	-8	2.0	-10
SRC-2010-6-1-B	37°58.0627’	122°30.2888’	-8	2.0	-10
SRC-2010-6-2-B	37°58.0165’	122°30.3673’	-8	2.0	-10
SRC-2010-6-3-B	37°57.9853’	122°30.4600’	-8	2.0	-10
SRC-2010-6-4-B	37°58.0439’	122°30.6349’	-8	2.0	-10
SRC-2010-7-1-B	37°58.0683’	122°30.6583’	-8.5	1.5	-10
SRC-2010-7-2-B	37°58.0973’	122°30.7466’	-8.5	1.5	-10
SRC-2010-7-3-B	37°58.0990’	122°30.8012’	-8.5	1.5	-10
SRC-2010-7-4-B	37°58.1290’	122°30.9375’	-8.5	1.5	-10
SRC-2010-7-5-B	37°58.1418’	122°31.0170’	-8.5	1.5	-10
SRC-2010-8-1-B	37°58.1357’	122°31.0571’	-8.5	1.5	-10
SRC-2010-8-2-B	37°58.1526’	122°31.0598’	-8.5	1.5	-10
SRC-2010-8-3-B	37°58.1605’	122°31.0974’	-8.5	1.5	-10
SRC-2010-8-4-B	37°58.1658’	122°31.1227’	-8.5	1.5	-10

^A State Plane Coordinate System, California Zone 3, NAD 83.

Table 2-1c. Sampling station locations and core penetration depths – Z-Layer Section.

SAMPLE ID	Latitude ^A (N) (deg-dec min)	Longitude ^A (W) (deg-dec min)	Top of 'Z- Layer' Section (ft MLLW)	Core Length (ft)	Z-Layer Core Depth (ft MLLW)
SRC-2010-7-1-Z	37°58.0683'	122°30.6583'	-8	0.5	-8.5
SRC-2010-7-2-Z	37°58.0973'	122°30.7466'	-8	0.5	-8.5
SRC-2010-7-3-Z	37°58.0990'	122°30.8012'	-8	0.5	-8.5
SRC-2010-7-4-Z	37°58.1290'	122°30.9375'	-8	0.5	-8.5
SRC-2010-7-5-Z	37°58.1418'	122°31.0170'	-8	0.5	-8.5
SRC-2010-8-1-Z	37°58.1357'	122°31.0571'	-8	0.5	-8.5
SRC-2010-8-2-Z	37°58.1526'	122°31.0598'	-8	0.5	-8.5
SRC-2010-8-3-Z	37°58.1605'	122°31.0974'	-8	0.5	-8.5
SRC-2010-8-4-Z	37°58.1658'	122°31.1227'	-8	0.5	-8.5

^A State Plane Coordinate System, California Zone 3, NAD 83.

2.2 Collection of Site Water

Ambient surface water was collected from within the San Rafael Channel for use in preparing the sediment elutriates for biological testing. Briefly, site water was collected from approximately 3 ft. below the surface using a battery-operated peristaltic pump fitted with tygon tubing. Site water was “pre-pumped” through the tubing for approximately 3 minutes before the sample was collected. Water was then pumped into a 20-L polypropylene carboy, with the carboy being pre-rinsed 3 times with site water before the site water sample was collected. After the site water samples were collected, the carboys were sealed, labeled, and stored on ice, until delivered to the bioassay laboratory.

2.3 Collection of San Pablo (SF-10) and Alcatraz (SF-11) Reference Sediments

PER collected reference sediments from the San Pablo (SF-10) and Alcatraz (SF-11) disposal sites on June 15, 2010. The reference sediments were collected as grab samples, using a pipe dredge sampler. The DGPS coordinates for the reference sediment sample collections are listed in Table 2-2.

Table 2-2. Reference Site Sample Locations.

Sample ID	Latitude ^A (N) (deg-dec min)	Longitude ^A (W) (deg-dec min)
SF10-2010-01	38° 00.4032'	122° 25.1730'
SF10-2010-02	38° 00.5940'	122° 24.8958'
SF10-2010-03	38° 00.3600'	122° 25.0120'
SF10-2010-04	38° 00.5120'	122° 24.7814'
SF-11 (Station H)	37° 48.8280'	122° 25.5765'

^A State Plane Coordinate System, California Zone 3, NAD 83.

All sediment and water samples were maintained on ice until transported to the PER testing lab for processing. Upon receipt at PER, all samples were logged in and placed in cold storage at $\leq 4^{\circ}\text{C}$ in the dark until needed. Field log sheets are presented in Appendix A. There were no unusual circumstances encountered during the fieldwork, and no major deviations from the SAP (PER 2010).

3. SAMPLE PROCESSING

3.1 Homogenization and Compositing of Sediments

Homogenization and compositing of individual sediment cores was performed at the PER laboratory facility in Fairfield, CA. Each of the sediment cores were partitioned into appropriate sections (maintenance material, Z-layer, and ‘information only’ core sections) on board the sampling vessel as per the SAP (USACE 2010); upon receipt at the PER lab, all samples were stored at $\leq 4^{\circ}\text{C}$ until used in the testing program.

For each Composite Sample Area, the sediment core sections from each individual core were individually homogenized in a stainless-steel bowl or high-density polyethylene (HDPE) container. A 500-mL sub-sample of the homogenized sediment from each individual core section was archived to allow for additional chemical analyses, if necessary (archived samples will be stored frozen at $-20 \pm 10^{\circ}\text{C}$ for up to one [1] year after sample collection). For each of the core section types, representative portions of the remaining homogenized sediment from each of the core sections were composited and re-homogenized to form a homogenized composite sample. A 500-mL aliquot of each homogenized composite sample was archived as described above. A “Z-layer” section was collected for Composite Sample Areas 7 and 8 cores.

Appropriate volumes of each Composite Sample Area core section composite sample were collected into sample containers for submittal to analytical laboratories for physical and chemical analyses. Sample labels were filled out with an indelible-ink pen and affixed to the sample containers. Each label contained the project number, sample identification number, preservation technique, requested analyses, date and time of collection and preparation, and initials of the person preparing the sample. To protect the information on the sample labels, clear tape was placed around the labeled sample containers. The sample containers were then be placed into a sample freezer and frozen until shipped, with the exception of sediment samples slated for grain size analysis, which will be stored at $\leq 4^{\circ}\text{C}$.

Appropriate volumes of the Composite Sample Area core section composite sediments were stored at $\leq 4^{\circ}\text{C}$ for subsequent biological testing, as appropriate. The remaining sediments from each of the individual cores were also stored at $\leq 4^{\circ}\text{C}$.

The SF-10 and SF-11 reference sediments were also homogenized and similarly processed.

All sediment was processed following procedures outlined in the SAP (USACE 2010), with no deviations.

Samples of the maintenance depth composited sediments, Z-layer composited sediments, and ‘information only’ composited sediments were submitted for chemical and conventional analyses

and biological testing as per the approved SAP (USACE 2010). For Composite Sample Areas 7 and 8, samples of the composited maintenance depth core section for the individual cores were also submitted for analyses. The remainder of the samples were archived appropriately for subsequent analysis, if needed.

3.2 Sample Shipping

Prior to shipping to the analytical laboratory, sample containers were wrapped in bubble wrap and securely packed inside a cooler with ice packs or crushed ice. A temperature blank was included in each cooler. The original signed chain-of-custody (COC) forms were placed in a sealed plastic bag and taped to the inside lid of the cooler. Appropriate packaging tape was wrapped completely around the cooler. A *This Side Up* arrow label was attached on each side of the cooler, a *Glass-Handle with Care* label was attached to the top of the cooler, and the cooler was sealed with custody seals on both the front and the back lid seams.

Sediment samples were shipped by overnight delivery. The sub-contracting analytical laboratories are not to dispose of any samples for this project unless notified by PER in writing.

3.2.1 Chain-of-Custody (COC) Protocol

COC procedures were followed for all samples throughout the collection, handling, and analyses activities. The Sampling and Analysis Project Manager, or a designee, was responsible for all sample tracking and COC procedures. This person was responsible for final sample inventory, maintenance of sample custody documentation, and completion of COC forms prior to transferring samples to the analytical laboratory. A COC form accompanied each cooler of samples to the respective analytical laboratories. Each custodian of the samples signed the COC form; copies of the COC forms are retained in the project file.

4. METHODS

4.1 Sediment Analytical Chemistry Procedures

All sediment chemical and conventional analyses were conducted as per the SAP (USACE 2010) and in accordance with USACE/EPA guidelines (USACE/EPA 1998). The methods and targeted method reporting limits (MRL) for analyses of bulk sediment and sediment elutriate samples are provided in Tables 4-1 through 4-3. All sediment analytical results are presented on a dry weight basis (e.g., mg/kg or $\mu\text{g/kg}$, dry wt). Matrix spikes and sample duplicate analyses were performed on the site samples. All samples were maintained according to the appropriate holding times and temperatures for each analysis as per the SAP (USACE 2010).

4.2 Modified Elutriate Test (MET) Procedures

Preparation of MET elutriates for toxicity testing was initiated on July 6, 2010. All elutriate samples were prepared as described in USACE, 1985. All elutriates samples were prepared at a sediment slurry concentration of 150 g/L dry sediment wt basis (the dry weight basis of each homogenized sediment was determined by oven-drying a known volume of sediment. The resulting dry weight concentration of each sediment was used to calculate the volume of sediment and water that would be required to prepare an elutriate slurry at a sediment concentration of 150 g/L dry wt basis). Each elutriate slurry was prepared by mixing site water and sediment for 5 minutes, followed with vigorous aeration for 1 hr in a 4-L graduated cylinder, after which the slurry was allowed to settle for 24-hrs. After the settling period, the elutriate supernatant for each sample was collected from the cylinder by siphoning at a point midway between the water surface and settled sediment interface using clean silicone tubing. Extreme care was taken not to re-suspend any of the settled material. Aliquots of each MET elutriate were placed into pre-cleaned bottles provided by CAS and shipped, on ice and under chain-of-custody, on July 7, 2010. MET elutriate bioassay testing was initiated on July 7, 2010. All elutriate chemistry results are presented on a wet weight basis for the 100% elutriate (e.g., $\mu\text{g/L}$). Matrix spikes and sample duplicate analyses were performed on one of the site samples. All samples were maintained according to the appropriate holding times and temperatures for each analysis as per the SAP (USACE 2010).

Table 4-1. Standard List of Analytes, Methods, Targeted and Achieved Reporting Limits.

Analyte	Method Used	SAP Targeted MRL
Metals		
Arsenic	EPA 6020	2 mg/kg
Cadmium	EPA 6020	0.3 mg/kg
Chromium	EPA 6020	5 mg/kg
Copper	EPA 6020	5 mg/kg
Lead	EPA 6020	5 mg/kg
Mercury	EPA 7471A	0.02 mg/kg
Nickel	EPA 6020	5 mg/kg
Selenium	EPA 7742	0.1 mg/kg
Silver	EPA 6020	0.2 mg/kg
Zinc	EPA 6020	1 mg/kg
Pesticides		
Aldrin	EPA 8081B	2 µg/kg
<i>a</i> -BHC	EPA 8081B	2 µg/kg
<i>b</i> -BHC	EPA 8081B	2 µg/kg
<i>g</i> -BHC (Lindane)	EPA 8081B	2 µg/kg
<i>d</i> -BHC	EPA 8081B	2 µg/kg
Chlordane	EPA 8081B	20 µg/kg
2,4'-DDD	EPA 8081B	2 µg/kg
2,4'-DDE	EPA 8081B	2 µg/kg
2,4'-DDT	EPA 8081B	2 µg/kg
4,4'-DDD	EPA 8081B	2 µg/kg
4,4'-DDE	EPA 8081B	2 µg/kg
4,4'-DDT	EPA 8081B	2 µg/kg
Total DDT	EPA 8081B	2 µg/kg
Dieldrin	EPA 8081B	2 µg/kg
Endosulfan I	EPA 8081B	2 µg/kg
Endosulfan II	EPA 8081B	2 µg/kg
Endosulfan sulfate	EPA 8081B	2 µg/kg
Endrin	EPA 8081B	2 µg/kg
Endrin aldehyde	EPA 8081B	2 µg/kg
Heptachlor	EPA 8081B	2 µg/kg
Heptachlor epoxide	EPA 8081B	2 µg/kg
Toxaphene	EPA 8081B	20 µg/kg
Total Organotins	Krone 1989	10 µg/kg
Total PAHs	EPA 8270C	20 µg/kg
Total PCBs	EPA 8082	20 µg/kg
Grain Size	ASTM 1992	±0.1%
Total Solids	EPA 160.3	±0.1%
Total Organic Carbon (TOC)	EPA 415.1	±0.1%

Table 4-2. List of Hamilton Analytes, Methods, and Targeted Reporting Limits.

Analyte	Method Used	SAP Targeted MRL
Metals		
Barium	EPA 6020	190 mg/kg
Beryllium	EPA 6020	1.03 mg/kg
Boron	EPA 6020	36.9 mg/kg
Cobalt	EPA 6020	27.6 mg/kg
Manganese	EPA 6020	943 mg/kg
Vanadium	EPA 6020	118 mg/kg
Organics		
Pentachlorophenol	EPA 8270-GPC	17 µg/kg
Phenol	EPA 8270-GPC	130 µg/kg
TPH – diesel/motor oil	EPA 8015	144,000 µg/kg
TPH – gasoline/JP-4	EPA 8015	12,000 µg/kg
BHCs total	EPA 8081	0.99 µg/kg
Chlordane	EPA 8081	1.1 µg/kg
Dieldrin	EPA 8081	0.72 µg/kg
Heptachlor	EPA 8081	0.3 µg/kg
Heptachlor epoxide	EPA 8081	0.3 µg/kg
Methoxychlor	EPA 8081	90 µg/kg
Dioxins (total TCDD TEQ)	EPA 8290	0.02 µg/kg

Table 4-3. List of Analytes for MET Elutriate, Methods, and Targeted Reporting Limits.

Analyte	Method Used	SAP Targeted MRL
Total Suspended Solids	EPA	5 mg/L
Arsenic	EPA 6020	1 µg/L
Cadmium	EPA 6020	0.25 µg/L
Chromium	EPA 6020	1 µg/L
Copper	EPA 6020	1 µg/L
Lead	EPA 6020	0.25 µg/L
Mercury	EPA 7471A	0.005 µg/L
Nickel	EPA 6020	5 µg/L
Selenium	EPA 7742	0.5 µg/L
Zinc	EPA 6020	10 µg/L

4.3 Biological Testing Procedures

Biological testing was only performed for the maintenance depth core section materials. The methods used in conducting these evaluations followed established guidelines:

- Method E1367-99. Standard Guide for conducting 10-day static toxicity tests with marine and estuarine amphipods (ASTM 1999);
- Method E724-98. Standard Guide for conducting static acute toxicity tests starting with embryos of four species of seawater bivalve mollusk. (ASTM 1999);
- Method E1611-00. Standard Guide for conducting sediment tests with marine and estuarine polychaetous annelids. (ASTM 2000);
- Methods for Assessing the Toxicity of Sediment-Associated Contaminants with Estuarine and Marine Amphipods (US EPA 1994);
- U.S. EPA (1994) 'Methods for Assessing the Toxicity of Sediment-Associated Contaminants with Estuarine and Marine Amphipods', EPA-600/R-94/025. U.S. EPA, Env. Research Laboratory, Narragansett, RI;
- U.S. EPA (1994) 'Methods for Assessing the Toxicity of Sediment-Associated Contaminants with Estuarine and Marine Amphipods', EPA-600/R-94/025. U.S. EPA, Env. Research Laboratory, Narragansett, RI.

4.3.1 Source of Natural Seawater

The natural seawater used in these tests was obtained from the UC Davis Granite Canyon Marine Laboratory, and is characterized as “pristine”; this water was stored at the PER laboratory in a 3000-gallon insulated HDPE tank at 4°C. This seawater was 0.45- μ m filtered and then adjusted to the desired test salinity (e.g., 30 ppt) via addition of Type 1 lab water (reverse-osmosis, de-ionized water) prior to use in these tests (these diluted natural seawaters are referred to using the adjusted salinity level [e.g., ‘30 ppt seawater’]).

4.3.2 Sediment Porewater Characterization

Prior to the initiation of the sediment tests, the San Rafael composited, homogenized maintenance depth core section sediments were removed from refrigerated storage, and each sample was re-homogenized in a large stainless steel bowl. Aliquots of the re-homogenized maintenance depth core section composite sediments were centrifuged at 2,500 g for 15 minutes; the resulting supernatant porewaters were carefully collected and analyzed for routine water quality characteristics (Table 4-4).

Table 4-4. Sediment porewater initial water quality characteristics.

Sample ID	pH	Salinity (ppt)	Total Ammonia (mg/L N)	Total Sulfide (mg/L)
San Pablo (SF-10)	7.03	27.9	2.3	0.033
Alcatraz (SF-11)	7.48	28.5	<1.0	0.318
SRC-2010-1	7.76	25.1	25.6	0.117
SRC-2010-2	7.81	23.8	37.9	0.047
SRC-2010-3	7.85	23.7	27.9	0.044
SRC-2010-4	7.94	22.7	27.2	0.043
SRC-2010-5	7.87	23.9	27.3	0.042
SRC-2010-6	8.01	23.6	20.6	0.054
SRC-2010-7	7.90	24.9	23.2	0.073
SRC-2010-8	7.77	24.8	33.4	0.051

4.3.2.1 Purging of Sediment Porewater Ammonia for the Amphipod and Polychaete Tests

Due to the measurement of elevated sediment porewater ammonia concentrations in each composite sample that exceeded the US ACOE guidelines-recommended threshold of 15 mg/L, these sediments were purged of ammonia as per DMMO guidelines (PN01-01) by daily replacement of the overlying water with fresh 28 ppt seawater coupled with aeration until the porewater total ammonia levels were below 15 mg/L. The tests were initiated when analysis of the sediment porewater indicated that the total ammonia concentration for the site sediments were below 15 mg/L.

4.3.3 Solid-Phase Sediment Toxicity Testing with *Ampelisca abdita*

An initial set of tests were initiated on July 10, 2010; the test organisms used in this testing exhibited a unacceptable degree of mortality in the reference toxicant test, precluding the ability to determine the sensitivity of the test organisms. As a result, the sediments were re-tested with a new batch of organisms from a different supplier. This re-testing was initiated on August 1, 2010.

The *Ampelisca abdita* used in the re-tests were obtained from a commercial supplier (Brezina and Associates, Dillon, CA). The *Ampelisca* were maintained at a salinity of 28 ppt prior to shipment to the testing lab; upon receipt, the test organisms were held in 28 ppt seawater at 20°C.

On the day preceding test initiation, the test replicates were set-up. There were 5 replicates each for the composite samples and reference sites, each replicate consisting of a 1 L glass beaker to which approximately 4 cm depth of homogenized sediment was added. The overlying water consisted of 28 ppt seawater carefully poured into each test replicate so as to minimize disturbance of the sediment. Test replicates were similarly established for the Control treatment,

which consisted of a homogenized mixture of previously collected clean reference site sediments that is maintained “under culture” at the PER Lab. These test replicates were maintained in a temperature-controlled room at 20°C under continuous illumination from fluorescent lighting. Each test replicate was gently aerated.

The following day, and immediately prior to test initiation, routine water quality characteristics (temperature, pH, D.O., and salinity) were determined for the overlying water in each test replicate; in addition, a small sample of the overlying water was collected from each replicate and composited for each treatment for determination of the total ammonia in the overlying water at that treatment. The tests were then initiated with the random allocation of 20 randomly selected *Ampelisca* into each replicate container (aeration was shut off until the amphipods re-buried themselves, approximately 1 hr after their introduction). Each day, for the next 9 days, the temperature, pH, D.O., and salinity of the overlying water were measured in one test replicate for each treatment.

After 10 days exposure, routine water quality characteristics (temperature, pH, D.O., and salinity) were again determined for each test replicate; in addition, a small sample of the overlying water was collected from each replicate and composited for each treatment for determination of the total ammonia in the overlying water at that treatment. Then, the contents of each replicate beaker were sieved and examined, and the surviving amphipods were collected and counted. The resulting survival data were statistically analyzed using the CETIS® statistical software (TidePool Scientific, McKinleyville, CA). The results of these tests are summarized in Section 5.2.1.

4.3.3.1 Reference Toxicant Testing of the *Ampelisca abdita*

In order to assess the sensitivity of the organisms used in these tests to chemical stress, a concurrent reference toxicant test was performed. The reference toxicant test was performed as a 96-hr static waterborne exposure using test solutions consisting of 30 ppt seawater spiked with potassium chloride (KCl) at test concentrations of 0.25, 0.5, 1, 2, and 4 g/L.

There were 2 replicates at each treatment, each replicate consisting of 400 mL of test solution in a 600 mL HDPE beaker. The test was initiated by randomly allocating 10 amphipods into each replicate beaker. The beakers were placed in a temperature-controlled room at 20°C under continual darkness. Each replicate container was examined daily, and the number of live amphipods in each was recorded at this time. Routine water quality characteristics (D.O., pH, and temperature) of the treatment waters were measured and recorded for one randomly selected replicate per treatment each day.

After ~96 hrs, the number of live amphipods in each replicate beaker was determined. The resulting test response data were statistically analyzed to determine key dose-response point estimates (e.g., EC₅₀); all statistical analyses were made using the CETIS® software. These response endpoints were then compared to the typical response range established by the mean ±

2 SD of the point estimates generated by the 20 most recent previous reference toxicant tests performed by this lab. The results of these tests are summarized in Section 5.2.1.1.

4.3.4 Solid-Phase Sediment Toxicity Testing with *Neanthes arenaceodentata*

The *Neanthes arenaceodentata* used in these tests were obtained from a commercial supplier (Don Reisch, Long Beach, CA), and were maintained at a salinity of 30 ppt prior to shipment to the testing lab; upon receipt, the test organisms were held in 30 ppt seawater at 20°C.

These tests were initiated on July 11, 2010. There were 5 replicates for the each maintenance depth core section composite, each replicate consisting of a 1 L glass beaker to which approximately 200 mL (approximately 2.5 cm depth) of composited, homogenized sediment was added. The overlying water consisted of 30 ppt seawater; approximately 800 mL of this water was carefully poured into each test replicate so as to minimize disturbance of the sediment. Test replicates were similarly established for the Control treatment, which consisted of a homogenized mixture of previously collected clean reference site sediments that is maintained “under culture” at the PER Lab. These test replicates were then placed in a temperature-controlled room at 20°C, under cool white fluorescent lighting on a 12L:12D photoperiod. Each test replicate was gently aerated.

The following day, and immediately prior to test initiation, routine water quality characteristics (temperature, pH, D.O., and salinity) were determined for the overlying water in each test replicate; in addition, a small sample of the overlying water was collected from each replicate and composited for each treatment for determination of the total ammonia in the overlying water at that treatment. The tests were then initiated with the random allocation of 10 randomly selected *Neanthes* into each replicate container (aeration was shut off until the polychaetes re-buried themselves, approximately 1 hr after their introduction). Each day, for the next 9 days, the temperature, pH, D.O., and salinity of the overlying water were measured in one test replicate for each treatment.

After 10 days exposure, routine water quality characteristics (temperature, pH, D.O., and salinity) were again determined for each test replicate; in addition, a small sample of the overlying water was collected from each replicate and composited for each treatment for determination of the total ammonia in the overlying water at that treatment. Then, the contents of each replicate beaker were sieved and examined, and the surviving polychaetes were collected and counted. The resulting survival data were statistically analyzed using the CETIS® statistical software. The results of these tests are summarized in Section 5.2.2.

4.3.4.1 Reference Toxicant Testing of the *Neanthes arenaceodentata*

In order to assess the sensitivity of the organisms used in these tests to chemical stress, a concurrent reference toxicant test was performed. The reference toxicant test consists of a static

acute 96-hr survival toxicity test of waterborne KCl, at test treatment concentrations of 0.25, 0.5, 1, 2, and 4, g/L.

There were 2 replicates at each treatment, each replicate consisting of 400 mL of test media in a 600 mL HDPE beaker. The test was initiated by randomly allocating 5 polychaetes into each replicate beaker. The beakers were placed in a temperature-controlled room at 20°C under continual darkness. Each replicate container was examined daily, and the number of live polychaetes in each was recorded at this time. Routine water quality characteristics (D.O., pH and temperature) of the treatment waters were measured and recorded for one randomly selected replicate per treatment each day.

After ~96 hrs, the number of live organisms in each replicate beaker was determined. The resulting test response data were statistically analyzed to determine key dose-response point estimates (e.g., EC₅₀); all statistical analyses were made using the CETIS[®] software. These response endpoints were then compared to the typical response range established by the mean \pm 2 SD of the point estimates generated by the 20 most recent previous reference toxicant tests performed by this lab. The results of these tests are summarized in Section 5.2.2.1.

4.3.5 Water Column Toxicity Test Procedures

4.3.5.1 Standard Elutriate Test (SET) Procedures

SET elutriate preparation for the toxicity testing was initiated on July 7, 2010. All SET elutriate samples were prepared as described in USACE, 1998. Sediment elutriates were prepared by mixing each composited, homogenized maintenance depth core section sediment with site water at a 1:4 ratio on a stir plate for 30 minutes. After mixing, the resultant sediment slurries were allowed to settle for 1 hour. The resulting supernatants comprised the 100% SET elutriate test solutions.

4.3.5.2 Sediment Elutriate Toxicity Testing with *Mytilus galloprovincialis*

The sediment elutriate toxicity test with *Mytilus* embryos consists of a 48 hr static bioassay in which *Mytilus* embryos are exposed to site sediment elutriates, and the effects on embryo survival and development determined. The specific procedures used in these tests are described below. The sediment elutriate toxicity tests with *Mytilus* embryos were initiated on July 7, 2010.

4.3.5.2.1 Preparation of Bivalve Embryos - The adult *Mytilus* used to provide the embryos for the sediment elutriate tests were obtained from a commercial supplier (Dave Guttoff, San Diego, CA); upon receipt in the laboratory, the adult bivalves were placed in small tanks of 30 ppt seawater at 12°C where they were held until used to produce embryos later that same day.

The adult bivalves were rinsed thoroughly with 30 ppt seawater and then placed into holding tanks containing 30 ppt seawater at 20°C in order to induce spawning; spawning individuals were

subsequently placed into separate beakers containing 30 ppt seawater in order to isolate and collect gametes.

Samples of the gametes from spawning males and females were collected and evaluated for quality by visual inspection. For males exhibiting good sperm viability, overlying waters (containing the sperm) from the beakers containing spawning males were decanted off and pooled. The overlying waters (containing eggs) from the females exhibiting the best egg quality were also pooled, and then concentrated (or diluted) to provide an egg suspension of ~50 eggs/mL.

Fertilization of the eggs was accomplished by addition of sperm at a density of 10^5 to 10^7 sperm/mL. The resulting embryos were then placed in a temperature-controlled room at 15°C until being used for inoculation of test solutions (inoculation was initiated within 4 hrs of fertilization).

4.3.5.2.2 *Mytilus* Embryo Development Toxicity Test Procedures - The Lab Control/dilution water for these bioassays consisted of 30 ppt seawater. The Lab Control/dilution water and the 100% sediment elutriate solutions were used to prepare fresh test solutions at test treatment concentrations of 1, 10, 25, 50, and 100% elutriate for each of the composited maintenance depth core section sediments. Routine water quality characteristics (pH, D.O., and salinity) were measured for each treatment test solution prior to distribution into the test vials.

There were 5 replicates at each treatment level, each replicate consisting of 10 mL of test solution in a 20 mL glass scintillation vial. An extra replicate vial was established at each treatment for determination of final water quality characteristics; additional Lab Control treatment “observation” vials were established for confirmation of appropriate embryo development prior to test termination. Each test was initiated by randomly inoculating approximately 150-300 fertilized *Mytilus* embryos into each vial. The vials were randomly positioned in a temperature-controlled room at 16°C under a 16L:8D photoperiod.

After 48 (± 2) hrs, the Lab Control treatment “observation” vials were examined to confirm that the test organisms had achieved an acceptable degree of embryo development, after which the test was terminated. Routine water quality characteristics were determined for the ‘water quality’ replicates at test termination. The embryos in the test vials were immediately preserved with the addition of 0.5 mL of a 5% glutaraldehyde solution in filtered seawater.

The contents of each vial were later examined microscopically and the number of embryos that survived and developed normally or abnormally were determined. The resulting survival and development data were then statistically analyzed and key dose-response EC point estimates determined for each site sediment elutriate using the CETIS[®] statistical software. The results of these tests are summarized in Section 5.2.3.

4.3.5.2.3 Reference Toxicant Testing of the *Mytilus* Embryos - In order to assess the sensitivity of the mussel embryos to toxic stress, a reference toxicant test was performed. This reference toxicant test was performed similarly to the water column toxicity test, except that test solutions consisted of Lab Control water (30 ppt seawater) spiked with KCl at concentrations of 0.5, 1, 2, 3, and 4 g/L. The resulting test response data were analyzed to determine key dose-response point estimates (e.g., EC50); all statistical analyses were made using the CETIS[®] software. These response endpoints were then compared to the typical response range established by the mean \pm 2 SD of the point estimates generated by the 20 most recent previous reference toxicant tests performed by this lab. The results of this test are summarized in Section 5.2.3.1.

4.3.6 MET Sediment Elutriate Toxicity Testing with *Americamysis bahia*

The sediment MET elutriate toxicity test with *Americamysis bahia* consists of a 96-hr static bioassay in which mysids are exposed to the sediment MET elutriates, and the effects on mysid survival determined. The specific procedures used in this test are described below. These sediment MET elutriate tests were initiated on July 7, 2010.

The *Americamysis bahia* used in the sediment MET elutriate tests were obtained from a commercial supplier (Aquatic BioSystems, Fort Collins, CO); upon receipt in the laboratory, the mysids were maintained in small tanks of 30 ppt seawater at 20°C, and were fed brine shrimp nauplii *ad libitum*.

The Lab Control water for this test was prepared by salting up Type 1 lab water to a salinity of 25 ppt using a commercial artificial sea salt (Crystal Sea Salt[®]-bioassay grade). A Site Water Control was also tested concurrently with the sediment elutriate samples. The sediment MET elutriates were tested at the 100% elutriate concentration only. Initial routine water quality characteristics (pH, D.O., and salinity) were measured for each treatment test solution prior to use in these tests.

There were 5 test replicates at each treatment, each replicate consisting of a 400 mL glass beaker containing 200 mL of appropriate test solution. The tests were initiated with the allocation of 10 randomly-selected 5-day old mysids into each test replicate. The test replicates were randomly positioned in a temperature-controlled room at 20°C under a 16L:8D photoperiod.

Each day, water quality conditions were determined for one randomly-selected replicate per treatment, and the test replicates were examined to determine the number of surviving organisms, with any dead organisms being removed via pipette. Each replicate was fed brine shrimp nauplii daily.

After 96 (\pm 2) hrs exposure, the tests were terminated. At test termination, the final water quality conditions were determined for one randomly-selected replicate per treatment, after which each of the test replicates were examined to determine the number of surviving mysids. The resulting

survival data were then statistically analyzed using the CETIS[®] statistical software. The results of these tests are summarized in Section 5.2.4.

4.3.6.1 Reference Toxicant Testing of the *Americamysis bahia*

In order to assess the sensitivity of these test organisms to chemical stress, a reference toxicant test was performed concurrently with the MET elutriate tests. The reference toxicant test was performed similarly to the MET elutriate test, except that test solutions consisted of Lab Control water spiked with KCl at test concentrations of 0.125, 0.25, 0.5, 1, and 2 g/L. The resulting test response data were statistically analyzed to determine key dose-response point estimates (e.g., EC₅₀); all statistical analyses were made using the CETIS[®] software. These response endpoints were then compared to the typical response range established by the mean \pm 2 SD of the point estimates generated by the 20 most-recent previous reference toxicant tests performed by this lab. The results of this test are summarized in Section 5.2.4.1.

4.4 Data Analysis and Interpretation

Data were analyzed and are presented clearly so that suitability for disposal at an unconfined aquatic disposal or an upland wetland reuse site can be determined. All analytical data were reviewed for accuracy. The physical and chemical characteristics of sediment samples were evaluated consistent with the DMMO review process. Benthic sediment toxicity test results were compared to the organism responses in the SF-10 and SF-11 reference sediments according to the DMMO review process; water column toxicity test results were compared to the Elutriate Suitability Concentration (ESC) at the edge of the mixing zone for the SF-10 and SF-11 Disposal Sites.

4.4.1 Sediment Chemistry and Conventional Data Analyses

Sediment physical and chemical characteristics provide information about chemicals of concern present in the sediment and their potential bioavailability, and about non-chemical factors that could affect toxicity. Data analysis of sediment chemistry and conventional parameters consisted of tabulation and comparison with existing regulatory guidelines. Sediment chemistry results were also used to identify “hot spots” which may need further resolution (e.g., analysis of sediment material from individual cores), and/or to assist in evaluating appropriate disposal options.

4.4.2 Benthic Toxicity Test Data

ITM guidance requires that test sediment results be compared with disposal site and/or reference site sediment results or a reference site database (if it is available) to determine the potential impact of whole sediment on benthic organisms at and beyond the boundaries of the disposal site (USEPA/USACE 1998). As detailed in the ITM, comparative guidelines for acceptance were followed as listed below:

1. If survival is greater in the proposed dredged sediments than in reference site sediment(s) or the reference site sediment database, the proposed dredged sediments are not acutely toxic to benthic organisms.
2. If the difference between test sediment survival and reference sediment survival (or between test sediment survival and the 'reference site database survival') is $\leq 20\%$ for amphipods or $\leq 10\%$ for polychaetes, the test sediments are not acutely toxic to benthic organisms.
3. If the difference between test sediment survival and reference sediment survival is $>20\%$ for amphipods or $>10\%$ for polychaetes, then survival in the test sediment must be statistically compared to survival in the reference sediment. If a statistically significant reduction in survival is then observed for the proposed dredged sediment treatment, then the test sediments are considered to be acutely toxic to benthic organisms. Statistical analyses are not performed when reference site database values are used.

4.5 Water Column (Sediment Elutriate or Liquid Suspended Phase) Toxicity Test Data

Guidelines for interpretation of water column tests, as detailed in the ITM, are listed below:

1. If survival and normal embryo development in the 100% sediment elutriate treatment is \geq survival and normal embryo development in the Control (clean seawater) treatment, the dredged material is not predicted to be acutely toxic to water column organisms.
2. If the reduction in survival or normal embryo development in the 100% sediment elutriate treatment is $\leq 10\%$ relative to the Control treatment response, there is no need for statistical analyses and no indication of water column toxicity attributable to the test sediments.
3. If the reduction in survival or normal embryo development in the 100% sediment elutriate is $>10\%$ relative to the Control treatment response, then data must be evaluated statistically to determine the magnitude of toxicity. If there is $>50\%$ survival or normal embryo development in the 100% elutriate treatment, the LC₅₀/EC₅₀ is assumed to be $\geq 100\%$. If there is $<50\%$ survival or normal embryo development in at least one of the elutriate treatments, then an LC₅₀/EC₅₀ should be calculated and compared with existing acceptability standards.

4.5.1 Dilution Model Calculations

The Short Term Fate Model for open water barge and hopper discharges will ultimately be used to model the fate of disposed sediments and determine if the concentrations of chemicals of concern will meet water quality criteria at the edge of the mixing zones for the various disposal sites in San Francisco Bay; input parameters, unique to each site, are currently being developed. The dilution model currently used to calculate the concentration of sediment at the edge of the mixing zone uses the results of both grain size analysis (% clay and % silt) and water-column bioassay tests (LC₅₀/EC₅₀) to determine if the concentration of dredge material that is swept away from the barge will result in an exceedance at the edge of the disposal site mixing zone. A

sample is considered to exceed water quality criteria if 1% of the calculated LC50 or EC50 (whichever is more conservative) is lower than the projected suspended phase concentration of the dredge material at the edge of the mixing zone.

5. RESULTS OF LABORATORY ANALYSES

5.1 Results of Conventional and Chemical Analyses

Sediment and sediment elutriate samples were analyzed for the chemical and conventional parameters specified in the SAP (USACE 2010) and described in Section 2.0.

5.1.1 Sediment Analytical Chemistry Results

The results for analyses of composite area, individual sediment cores, and z-layer samples are summarized in Tables 5-1a-c. The full Data Reports for the conventional and chemical analyses that were submitted by CAS and CalScience are provided in Appendices B and C, respectively. Results for ‘information only’ composite samples are presented in Appendix D.

While the majority of compounds were similar to or below Bay Ambient concentrations or HWRP acceptance criteria, there were select sediment samples which were above these screening levels. Table 5-2 summarizes sediment cores for which analytical results were above either Bay Ambient concentrations or HWRP acceptance criteria.

5.1.2 Modified Elutriate Test Chemistry Analyses

The results of the MET elutriate analyses are summarized in Table 5-3 and were evaluated to predict concentrations of metals in decant water discharged from the HWRP site following the placement of dredged material. Total suspended solids (TSS) along with total and dissolved metals concentrations were determined and were compared to water quality objectives (WQOs) defined in the SF Bay Basin Plan (RWQCB 2007 and RWQCB 2009) for surface waters. Briefly, the measured total suspended solids (TSS) concentrations ranged from 25–382 mg/L. Any metals that exceeded a WQO value are highlighted in Table 4-7. With the exception of total mercury for sites SRC-2010-1, SRC-2010-4, SRC-2010-6, and SRC-2010-7 all metals measured in the sediment elutriate were below SFRWQCB WQOs. The dissolved mercury concentrations metals were all well below the WQO indicating that relative suspended solids are playing a significant roll in mercury above the WQO. A copy of the MET analytical chemistry report is presented in Appendix B.

Table 5-1a. San Rafael Channel 2010 Sediment Chemistries – Composite Sample Areas 1-6 Maintenance Depth Core Section Composites.

Analyte	Units	SF-10	SF-11	Bay Background (RWQCB 1998) ¹	HWRP Acceptance Criteria ²	SRC-2010-1	SRC-2010-2	SRC-2010-3	SRC-2010-4	SRC-2010-5	SRC-2010-6
Grain Size											
Gravel (>2.00 mm)	%, dry wt	14.4	2.34	<100% fines	NA	18.60	16.80	0.64	23.20	10.50	4.04
Sand (0.0625 mm to 2.00 mm)	%, dry wt	66.9	92.10			17.22	36.4	35.5	31.9	35.8	31.2
Silt (0.0039 mm to 0.0625 mm)	%, dry wt	11.4	0.67			31.50	19.50	30.80	19.30	25.60	24.50
Clay (< 0.0039 mm)	%, dry wt	10.8	1.39			36.1	18.50	30.00	21.80	26.90	41.80
Percent fines (Silt+Clay)	%, dry wt	22.2	2.06			67.6	38.0	60.8	41.1	52.5	66.3
% Solids	%	67.1	80.9	-	-	44.6	46.7	48.3	47.2	44.2	40.9
TOC	%	0.87	0.27	-	-	1.38	1.28	1.15	1.29	1.45	1.56
Metals											
Arsenic	mg/kg, dry wt	8.02	4.12	15.3	15.3	10.4	9.95	9.73	9.97	10.5	11
Cadmium	mg/kg, dry wt	0.145	0.035	0.33	0.7	0.221	0.189	0.184	0.182	0.203	0.236
Chromium	mg/kg, dry wt	42.2	21.4	112	112	76.6	74.7	71.9	75	81.1	84.8
Copper	mg/kg, dry wt	24.3	4.13	68.1	68.1	53	49.7	46.6	51.3	60	76.4
Lead	mg/kg, dry wt	14.1	6.84	43.2	43.2	23.1	22.1	21.8	24.7	27.9	39.1
Mercury	mg/kg, dry wt	0.138	0.033	0.43	0.43	0.311	0.287	0.306	0.309	0.395	0.356
Nickel	mg/kg, dry wt	59.9	27.4	112	112	87.3	85.1	79.7	83.9	89.9	93.5
Selenium	mg/kg, dry wt	0.04 J	0.03	0.64	0.64	0.27	0.35	0.27	0.36	0.39	0.30
Silver	mg/kg, dry wt	0.106	0.018 J	0.58	0.58	0.243	0.246	0.246	0.263	0.285	0.338
Zinc	mg/kg, dry wt	67.3	23.6	158	158	123	112	122	142	158	185
Butyltins											
Tetra-n-butyltin	µg/kg, dry wt	<0.64	<0.54	-	-	<0.98	<0.94	<0.89	<0.92	<1.0	<1.1
Tri-n-butyltin Cation	µg/kg, dry wt	<0.62	<0.53	-	-	<0.96	<0.92	1.3 J	<0.90	1.7 J	3.8
Di-n-butyltin Cation	µg/kg, dry wt	0.63 J	<0.24	-	-	2.1 J	1.5 J	2.3	1.6 J	5.0	14
n-Butyltin Cation	µg/kg, dry wt	0.93 J	<0.32	-	-	2.5	2.0 J	2.5	2.5	5.6	12
Σ detected Butylins	µg/kg, dry wt	1.56 J	<0.54	-	-	4.6	3.5 J	6.1	4.1	12.3	29.8
PCBs											
Aroclor 1016	µg/kg, dry wt	<2.0	<1.7	-	-	<2.4	<2.3	<2.2	<2.3	<2.4	<2.6
Aroclor 1221	µg/kg, dry wt	<2.0	<1.7	-	-	<2.4	<2.3	<2.2	<2.3	<2.4	<2.6
Aroclor 1232	µg/kg, dry wt	<2.0	<1.7	-	-	<2.4	<2.3	<2.2	<2.3	<2.4	<2.6
Aroclor 1242	µg/kg, dry wt	<2.0	<1.7	-	-	<2.4	<2.3	<2.2	<2.3	<2.4	<8.9
Aroclor 1248	µg/kg, dry wt	<2.0	<1.7	-	-	<2.4	<2.3	<2.2	<2.3	<2.4	<2.6
Aroclor 1254	µg/kg, dry wt	<2.0	<1.7	-	-	10 J	<4.2	3.8 J	<4.4	8.8 J	13 J
Aroclor 1260	µg/kg, dry wt	2.9 J	<1.7	-	-	9.6 J	<5.5	5.5 J	<2.3	8.7 J	5.0 J
Σ detected PCBs	µg/kg, dry wt	2.9 J	<1.7	22.7	22.7	19.6 J	<5.5	9.3 J	<4.4	17.5 J	18.0 J

Table 5-1a. San Rafael Channel 2010 Sediment Chemistries – Composite Sample Areas 1-6 Maintenance Depth Core Section Composites (continued).

Analyte	Units	SF-10	SF-11	Bay Background (RWQCB 1998) ¹	HWRP Acceptance Criteria ²	SRC-2010-1	SRC-2010-2	SRC-2010-3	SRC-2010-4	SRC-2010-5	SRC-2010-6
Organochlorine Pesticides											
Aldrin	µg/kg, dry wt	<0.069	<0.057	1.1	-	<0.18	<0.18	<0.17	<0.17	<0.19	<0.20
alpha-BHC	µg/kg, dry wt	<0.087	<0.072	-	-	<0.13	<0.12	<0.12	<0.12	<0.13	<0.14
beta-BHC	µg/kg, dry wt	<0.27	<0.23	-	-	<0.21	<0.20	<0.19	<0.20	<0.21	<0.22
delta-BHC	µg/kg, dry wt	<0.11	<0.087	-	-	0.10 J	<0.080	<0.077	<0.079	<0.084	<0.091
gamma-BHC (lindane)	µg/kg, dry wt	<0.076	<0.063	-	-	<0.090	<0.086	<0.083	<0.085	<1.2	<0.098
alpha-Chlordane	µg/kg, dry wt	<0.094	<0.078	-	-	<0.12	<0.11	<0.11	<0.11	0.26 J	0.53 J
gamma-Chlordane	µg/kg, dry wt	0.16 J	<0.070	-	-	0.29 J	0.12 J	<0.094	0.24 J	0.43 J	1.1 J
Chlordane	µg/kg, dry wt	<15	<13	1.1	1.1	<3.4	<2.7	<2.5	<2.1	3.5 J	9.1 J
4,4'-DDD	µg/kg, dry wt	0.44	<0.13	-	-	1.1 J	0.90 J	0.51 J	0.60 J	0.86 J	1.2 J
4,4'-DDE	µg/kg, dry wt	0.87	<0.059	-	-	2.0	1.4	1.0 J	0.96 J	1.3	2
4,4'-DDT	µg/kg, dry wt	<0.30	<0.071	-	-	<0.65	<0.46	<0.25	<0.20	<1.2	<1.3
2,4'-DDD	µg/kg, dry wt	0.17 J	<0.075	-	-	0.51 J	0.55 J	0.35 J	0.17 J	0.25 J	0.51 J
2,4'-DDE	µg/kg, dry wt	<0.093	<0.077	-	-	<0.18	<0.18	<0.17	<0.17	<0.19	<1.3
2,4'-DDT	µg/kg, dry wt	0.21 J	<0.055	-	-	0.44 J	0.24 J	0.21 J	0.22 J	0.40 J	0.70 J
Σ detected DDTs	µg/kg, dry wt	1.69	<0.13	7.0	7.0	4.05 J	3.09 J	2.07 J	1.95 J	2.81 J	4.41 J
Dieldrin	µg/kg, dry wt	<0.076	<0.063	0.44	0.72	<0.16	<0.15	<0.15	<0.18	<0.16	<0.18
Endosulfan I	µg/kg, dry wt	<0.084	<0.070	-	-	<0.071	<0.068	<0.066	<0.070	<0.072	<0.080
Endosulfan II	µg/kg, dry wt	<0.13	<0.111	-	-	<0.16	<0.15	<0.15	<0.15	<0.16	<0.18
Endosulfan sulfate	µg/kg, dry wt	<0.076	<0.063	-	-	<0.13	<0.12	<0.12	<0.12	<0.13	<0.14
Endrin	µg/kg, dry wt	<0.085	<0.071	0.78	-	<0.11	<0.11	<0.098	<0.10	<0.11	<0.12
Endrin aldehyde	µg/kg, dry wt	<0.072	<0.060	-	6.4	<0.14	<0.13	<0.13	<0.13	<0.14	<0.15
Heptachlor	µg/kg, dry wt	<0.069	<0.057	-	0.3	<0.14	<0.13	<0.15	<0.13	<0.14	<0.15
Heptachlor epoxide	µg/kg, dry wt	<0.072	<0.060	-	0.3	<0.095	<0.097	<0.087	<0.089	<0.095	<0.24
Toxaphene	µg/kg, dry wt	<3.6	<3.0	-	-	<13	<7.3	<9.9	<9.4	<18	<15
PAHs											
Naphthalene	µg/kg, dry wt	5.2	7.9	55.8	-	12	11	15	11	12	14
Acenaphthylene	µg/kg, dry wt	1.8 J	0.94 J	31.7	-	4.2 J	4.9 J	9.1	4.2 J	7.5	4.0 J
Acenaphthene	µg/kg, dry wt	1.4 J	<0.76	26.6	-	3.1 J	3.8 J	6.1	2.7 J	3.6 J	3.2 J
Fluorene	µg/kg, dry wt	3.1	1.7 J	25.3	-	5.1 J	4.8 J	7.9	4.0 J	6.8	5.0 J
Phenanthrene	µg/kg, dry wt	27	13	237	-	38	40	80	32	72	31
Anthracene	µg/kg, dry wt	16	4.0	88	-	10	13	30	9.9	23	9.3
Fluoranthene	µg/kg, dry wt	47	14	514	-	91	110	190	88	260	100
Pyrene	µg/kg, dry wt	57	15	665	-	150	190	300	150	360	200

Table 5-1a. San Rafael Channel 2010 Sediment Chemistries – Composite Sample Areas 1-6 Maintenance Depth Core Section Composites (continued).

Analyte	Units	SF-10	SF-11	Bay Background (RWQCB 1998) ¹	HWRP Acceptance Criteria ²	SRC-2010-1	SRC-2010-2	SRC-2010-3	SRC-2010-4	SRC-2010-5	SRC-2010-6
PAHs (cont.)											
Benzo(a)anthracene	µg/kg, dry wt	23	7.6	244	-	46	56	100	48	140	54
Chrysene	µg/kg, dry wt	26	7.1	289	-	54	79	120	62	180	78
Benzo(b)fluoranthene	µg/kg, dry wt	35	8.2	371	-	86	110	160	93	240	120
Benzo(k)fluoranthene	µg/kg, dry wt	13	2.9	258	-	27	32	51	31	74	37
Benzo(a)pyrene	µg/kg, dry wt	37	7.3	412	-	90	110	180	92	210	100
Indeno(1,2,3-cd)pyrene	µg/kg, dry wt	32	5.4	382	-	81	90	150	84	200	110
Dibenzo(a,h)anthracene	µg/kg, dry wt	3.9	1.5 J	32.7	-	9.2	10	16	8.9	24	13
Benzo(g,h,i)perylene	µg/kg, dry wt	39	6.6	310	-	99	110	170	100	210	140
Σ detected PAHs	µg/kg, dry wt	367	103	3390	3390	806	975	1585	821	2023	1019
Hamilton Metals											
Barium	mg/kg, dry wt	38.4	8.5	-	190	52.2	46.6	47.3	49.6	48.1	51.5
Beryllium	mg/kg, dry wt	0.352	0.14	-	1.03	0.566	0.535	0.503	0.543	0.626	0.643
Boron	mg/kg, dry wt	0.3	2.0 J	-	36.9	24	22	24	25	25	28
Cobalt	mg/kg, dry wt	13.7	7.09	-	27.6	17.9	17	16.1	16.3	17.8	17.6
Manganese	mg/kg, dry wt	434	303	-	943	733	654	619	659	598	506
Vanadium	mg/kg, dry wt	52.3	18.6	-	118	69.9	64.1	66.7	71	68.8	73.2
Hamilton Organics											
Phenol	µg/kg, dry wt	29 J	3.0 J	-	130	5.4 J	4.0 J	3.7 J	19 J	4.6 J	3.7 J
Pentachlorophenol	µg/kg, dry wt	<20	<20	-	17	<23	<22	<21	<22	<23	<24
TPH Diesel / motor oil	mg/kg, dry wt	42.8 J	20.9 J	-	144000	145	156	161	223	188	355
TPH Gasoline / JP-4	mg/kg, dry wt	<2.3	<1.7	-	12000	<3.8	<3.6	<3.4	<3.5	<3.7	<4.1
Methoxyclor	mg/kg, dry wt	<0.23	<0.19	-	90	<0.22	<0.21	<0.20	<0.21	<0.22	<0.24
Dioxins (TCDD)	ng/kg, dry wt	0.210	0.00392	-	20	0.479	0.128	0.0288	0.281	0.330	2.40

Notes:

¹ San Francisco Regional Water Quality Control Board (1998) Staff Report: Ambient Concentrations of Toxic Chemicals in San Francisco Bay Sediments. May 1998.

² Hamilton Wetlands Biological Opinion (USFWS 2005).

J – Analyte detected below the method reporting limit (MRL) and the reported value is therefore an estimate; as a result, J-flagged values are not identified as exceeding screening criteria.

Bold Font and Bold Outline = Reported Value > Bay Background.

Bold Font and Grey Shading = Value > HWRP Acceptance Criteria and Bay Background.

Table 5-1b. San Rafael Channel 2010 Sediment Chemistries – Composite Sample Area 7 Maintenance Depth and Z-Layer Core Section Composites and Individual Core Maintenance Depth Sections.

Analyte	Units	SF-10	SF-11	Bay Background (RWQCB 1998) ¹	HWRP Acceptance Criteria ²	SRC-2010-7	SRC-2010-7-Z	SRC-2010-7-1	SRC-2010-7-2	SRC-2010-7-3	SRC-2010-7-4	SRC-2010-7-5
Grain Size												
Gravel (>2.00 mm)	%, dry wt	14.4	2.34	<100% fines	NA	9.18	7.71	5.68	42.1	23.6	5.36	10
Sand (0.0625 mm to 2.00 mm)	%, dry wt	66.9	92.10			28.7	43.0	19.0	11.0	16.8	28.6	39.7
Silt (0.0039 mm to 0.0625 mm)	%, dry wt	11.4	0.67			10.40	21.40	34.10	22.1	29.9	35.9	27.7
Clay (< 0.0039 mm)	%, dry wt	10.8	1.39			41.90	26.00	44.80	26.6	30.7	29.3	22.2
Percent fines (Silt+Clay)	%, dry wt	22.2	2.06			52.3	47.4	78.90	48.70	60.60	65.20	49.90
% Solids	%	67.1	80.9	-	-	42.0	47.5	39.0	41.7	41.3	39.8	43.8
TOC	%	0.87	0.27	-	-	2.84	0.558	1.77	1.61	1.96	3.83	4.91
Metals												
Arsenic	mg/kg, dry wt	8.02	4.12	15.3	15.3	10.9	11.9	9.14	11.5	10.5	11.6	11.5
Cadmium	mg/kg, dry wt	0.145	0.035	0.33	0.7	0.441	0.505	0.191	0.278	0.295	0.517	0.726
Chromium	mg/kg, dry wt	42.2	21.4	112	112	91.1	101	80.6	89.9	86.3	97	101
Copper	mg/kg, dry wt	24.3	4.13	68.1	68.1	104	109	88.2	88.3	101	129	95.7
Lead	mg/kg, dry wt	14.1	6.84	43.2	43.2	78.3	138	33.3	57.7	49.6	91.3	162
Mercury	mg/kg, dry wt	0.138	0.033	0.43	0.43	0.461	0.728	0.359	0.534	0.412	0.438	0.541
Nickel	mg/kg, dry wt	59.9	27.4	112	112	101	110	88.6	98.7	95.8	109	119
Selenium	mg/kg, dry wt	0.04 J	0.03	0.64	0.64	0.45	0.22	0.40	0.33	0.24	0.18	0.31
Silver	mg/kg, dry wt	0.106	0.018 J	0.58	0.58	0.358	0.49	0.268	0.392	0.346	0.332	0.419
Zinc	mg/kg, dry wt	67.3	23.6	158	158	248	227	207	210	227	272	298
Butyltins												
Tetra-n-butyltin	µg/kg, dry wt	<0.64	<0.54	-	-	<1.1	<0.90	<1.2	<1.1	<1.1	<1.1	<1.1
Tri-n-butyltin Cation	µg/kg, dry wt	<0.62	<0.53	-	-	9.6	21	3.9	12	6.7	14	17
Di-n-butyltin Cation	µg/kg, dry wt	0.63 J	<0.24	-	-	33	50	15	68	30	51	63
n-Butyltin Cation	µg/kg, dry wt	0.93 J	<0.32	-	-	20	21	10	29	20	29.0	27
Σ detected Butylins	µg/kg, dry wt	1.56 J	<0.54	-	-	62.6	92	28.9	109	56.7	94	107
PCBs												
Aroclor 1016	µg/kg, dry wt	<2.0	<1.7	-	-	<2.5	<2.3	<2.7	<2.6	<2.6	<2.7	<2.4
Aroclor 1221	µg/kg, dry wt	<2.0	<1.7	-	-	<2.5	<2.3	<2.7	<2.6	<2.6	<2.7	<2.4
Aroclor 1232	µg/kg, dry wt	<2.0	<1.7	-	-	<2.5	<2.3	<2.7	<2.6	<2.6	<2.7	<2.4
Aroclor 1242	µg/kg, dry wt	<2.0	<1.7	-	-	34	91	9.2 J	<2.6	27	55	<2.4
Aroclor 1248	µg/kg, dry wt	<2.0	<1.7	-	-	<2.5	<2.3	<2.7	<2.6	<2.6	<2.7	180
Aroclor 1254	µg/kg, dry wt	<2.0	<1.7	-	-	47	100	<2.7	42	42	97	230
Aroclor 1260	µg/kg, dry wt	2.9 J	<1.7	-	-	45	64	14	33	37	66	170
Σ detected PCBs	µg/kg, dry wt	2.9 J	<1.7	22.7	22.7	126	255	23.2	75	106	218	580

Table 5-1b. San Rafael Channel 2010 Sediment Chemistries – Composite Sample Area 7 Maintenance Depth and Z-Layer Core Section Composites and Individual Core Maintenance Depth Sections (continued).

Analyte	Units	SF-10	SF-11	Bay Background (RWQCB 1998) ¹	HWRP Acceptance Criteria ²	SRC-2010-7	SRC-2010-7-Z	SRC-2010-7-1	SRC-2010-7-2	SRC-2010-7-3	SRC-2010-7-4	SRC-2010-7-5
Organochlorine Pesticides												
Aldrin	µg/kg, dry wt	<0.069	<0.057	1.1	-	<0.24	<0.17	<0.21	<0.20	<0.20	<0.67	<1.7
alpha-BHC	µg/kg, dry wt	<0.087	<0.072	-	-	<0.45	<0.12	<0.15	<0.14	<0.14	<0.14	<0.13
beta-BHC	µg/kg, dry wt	<0.27	<0.23	-	-	<0.50	<0.19	<0.24	<0.22	<0.22	<0.23	<0.21
delta-BHC	µg/kg, dry wt	<0.11	<0.087	-	-	<0.089	<0.083	<0.095	<0.089	<0.090	<0.13	<0.55
gamma-BHC (lindane)	µg/kg, dry wt	<0.076	<0.063	-	-	<0.096	<1.1	<0.12	<0.096	<0.097	<0.26	0.82 J
alpha-Chlordane	µg/kg, dry wt	<0.094	<0.078	-	-	5.2	3.6	1.1 J	0.95 J	2.4	8.7	30
gamma-Chlordane	µg/kg, dry wt	0.16 J	<0.070	-	-	<7.3	6.7	1.3	2.3	3.7	11	43
Chlordane	µg/kg, dry wt	<15	<13	1.1	1.1	64	48	12 J	18	32	96	380
4,4'-DDD	µg/kg, dry wt	0.44	<0.13	-	-	7.5	13	1.5	2.4	2.8	16	66
4,4'-DDE	µg/kg, dry wt	0.87	<0.059	-	-	6.8	11	2.4	3.6	4.4	13	33
4,4'-DDT	µg/kg, dry wt	<0.30	<0.071	-	-	<1.2	4.5	1.6	<2.0	<2.2	<1.9	<9.7
2,4'-DDD	µg/kg, dry wt	0.17 J	<0.075	-	-	2.7	4.2	0.69 J	1.0 J	<1.1	4.5	18
2,4'-DDE	µg/kg, dry wt	<0.093	<0.077	-	-	<1.2	<2.1	<1.3	<1.2	<1.3	<1.3	<5.2
2,4'-DDT	µg/kg, dry wt	0.21 J	<0.055	-	-	1.9	3.5	<1.3	1.7	1.8	3.6	7.3
Σ detected DDTs	µg/kg, dry wt	1.69	<0.13	7.0	7.0	18.9	36.2	6.19	8.7	9.0	37.1	124.3
Dieldrin	µg/kg, dry wt	<0.076	<0.063	0.44	0.72	0.46 J	<1.1	<0.18	<1.2	<0.33	1.2 J	2.8
Endosulfan I	µg/kg, dry wt	<0.084	<0.070	-	-	<1.2	1.1 J	<0.14	0.34 J	<1.3	<1.3	<3.8
Endosulfan II	µg/kg, dry wt	<0.13	<0.111	-	-	<0.70	<0.15	<0.18	<0.17	<0.21	<1.1	<1.2
Endosulfan sulfate	µg/kg, dry wt	<0.076	<0.063	-	-	<0.69	<0.12	<0.15	<0.14	<0.14	<1.3	<1.2
Endrin	µg/kg, dry wt	<0.085	<0.071	0.78	-	<0.12	<0.099	<0.13	<0.20	<0.17	<0.53	<1.2
Endrin aldehyde	µg/kg, dry wt	<0.072	<0.060	-	6.4	0.31 J	<1.1	<0.16	<0.15	0.19 J	<0.27	<1.2
Heptachlor	µg/kg, dry wt	<0.069	<0.057	-	0.3	<0.15	<0.13	<0.16	<0.15	<0.15	<0.16	<1.2
Heptachlor epoxide	µg/kg, dry wt	<0.072	<0.060	-	0.3	<0.74	<1.1	<0.18	<0.53	<0.54	<0.11	<0.096
Toxaphene	µg/kg, dry wt	<3.6	<3.0	-	-	<44	<39	<21	<49	<42	<89	<210
PAHs												
Naphthalene	µg/kg, dry wt	5.2	7.9	55.8	-	16	11	11	13	12	13	25
Acenaphthylene	µg/kg, dry wt	1.8 J	0.94 J	31.7	-	9.4	3.4 J	5.5 J	5.8 J	7.5	6.6	11
Acenaphthene	µg/kg, dry wt	1.4 J	<0.76	26.6	-	12	4.6 J	2.7 J	2.6 J	3.5 J	4.5 J	33
Fluorene	µg/kg, dry wt	3.1	1.7 J	25.3	-	16	5.4	4.3 J	4.3 J	5.2 J	5.5 J	42
Phenanthrene	µg/kg, dry wt	27	13	237	-	170	28	44	44	65	69	230
Anthracene	µg/kg, dry wt	16	4.0	88	-	47	8.5	15	11	18	20	59
Fluoranthene	µg/kg, dry wt	47	14	514	-	490	100	130	140	200	250	750
Pyrene	µg/kg, dry wt	57	15	665	-	780	200	180	230	340	450	1000

Table 5-1b. San Rafael Channel 2010 Sediment Chemistries – Composite Sample Area 7 Maintenance Depth and Z-Layer Core Section Composites and Individual Core Maintenance Depth Sections (continued).

Analyte	Units	SF-10	SF-11	Bay Background (RWQCB 1998) ¹	HWRP Acceptance Criteria ²	SRC-2010-7	SRC-2010-7-Z	SRC-2010-7-1	SRC-2010-7-2	SRC-2010-7-3	SRC-2010-7-4	SRC-2010-7-5
PAHs (cont.)												
Benzo(a)anthracene	μg/kg, dry wt	23	7.6	244	-	270	48	59	56	91	110	310
Chrysene	μg/kg, dry wt	26	7.1	289	-	380	73	92	86	140	110	360
Benzo(b)fluoranthene	μg/kg, dry wt	35	8.2	371	-	510	110	130	150	220	260	500
Benzo(k)fluoranthene	μg/kg, dry wt	13	2.9	258	-	170	35	38	46	64	72	150
Benzo(a)pyrene	μg/kg, dry wt	37	7.3	412	-	450	100	110	140	180	210	430
Indeno(1,2,3-cd)pyrene	μg/kg, dry wt	32	5.4	382	-	420	100	130	170	200	220	430
Dibenzo(a,h)anthracene	μg/kg, dry wt	3.9	1.5 J	32.7	-	56	9.9	20	23	24	27	53
Benzo(g,h,i)perylene	μg/kg, dry wt	39	6.6	310	-	460	130	130	180	220	250	490
Σ detected PAHs	μg/kg, dry wt	367	103	3390	3390	4256	967	1102	1302	1790	2078	4873
Hamilton Metals												
Barium	mg/kg, dry wt	38.4	8.5	-	190	65.4	64.7	48.8	54.1	56.3	62.5	80.4
Beryllium	mg/kg, dry wt	0.352	0.14	-	1.03	0.653	0.704	0.638	0.739	0.651	0.767	0.741
Boron	mg/kg, dry wt	0.3	2.0 J	-	36.9	33	27	33	28.0	30.0	38	47
Cobalt	mg/kg, dry wt	13.7	7.09	-	27.6	17	17.7	16.5	17.7	16.6	17.8	17.2
Manganese	mg/kg, dry wt	434	303	-	943	392	382	444	496	463	364	347
Vanadium	mg/kg, dry wt	52.3	18.6	-	118	64	66.2	70.7	74.5	71.5	64.4	58.1
Hamilton Organics												
Phenol	μg/kg, dry wt	29 J	3.0 J	-	130	150 J	<11	4.4 J	4.2 J	5.0 J	7.4 J	6.7 J
Pentachlorophenol	μg/kg, dry wt	<20	<20	-	17	<240	<110	<26	<24	<24	<26	<23
TPH Diesel / motor oil	mg/kg, dry wt	42.8 J	20.9 J	-	144000	1240	880	376	530	620	1590	2950
TPH Gasoline / JP-4	mg/kg, dry wt	<2.3	<1.7	-	12000	5.0 J	7.1 J	<4.3	<3.9	<4.1	<4.3	6.4 J
Methoxyclor	mg/kg, dry wt	<0.23	<0.19	-	90	<1.2	<0.20	<0.29	<0.23	<0.64	<1.3	1.70
Dioxins (TCDD)	ng/kg, dry wt	0.210	0.00392	-	20	5.00	5.12	-	-	-	-	-

Notes:

¹ San Francisco Regional Water Quality Control Board (1998) Staff Report: Ambient Concentrations of Toxic Chemicals in San Francisco Bay Sediments. May 1998.

² HWRP Biological Opinion (USFWS 2005).

J – Analyte detected below the method reporting limit (MRL) and the reported value is therefore an estimate; as a result, J-flagged values are not identified as exceeding screening criteria.

Bold Font and Bold Outline = Value > Bay Background.

Bold Font and Grey Shading = Value > HWRP Acceptance Criteria and Bay Background.

Table 5-1c. San Rafael Channel 2010 Sediment Chemistries – Composite Sample Area 8 Maintenance Depth and Z-Layer Core Section Composites and Individual Core Maintenance Depth Sections.

Analyte	Units	SF-10	SF-11	Bay Background (RWQCB 1998) ¹	HWRP Acceptance Criteria ²	SRC-2010-8	SRC-2010-8-Z	SRC-2010-8-1	SRC-2010-8-2	SRC-2010-8-3	SRC-2010-8-4
Grain Size											
Gravel (>2.00 mm)	%, dry wt	14.4	2.34	<100% fines	NA	8.91	7.25	5.56	16.9	10.8	3.89
Sand (0.0625 mm to 2.00 mm)	%, dry wt	66.9	92.10			67.0	61.6	35.8	66.6	65.7	36.3
Silt (0.0039 mm to 0.0625 mm)	%, dry wt	11.4	0.67			14.4	18.10	34.5	8.84	19.3	41.7
Clay (< 0.0039 mm)	%, dry wt	10.8	1.39			8.5	15.60	31.2	6.97	9.84	18.1
Percent fines (Silt+Clay)	%, dry wt	22.2	2.06			22.9	33.7	65.7	15.8	29.1	59.8
% Solids	%	67.1	80.9	-	-	54.4	47.5	42.7	59.8	38.1	45.4
TOC	%	0.87	0.27	-	-	4.26	4.75	2.70	9.50	7.60	3.80
Metals											
Arsenic	mg/kg, dry wt	8.02	4.12	15.3	15.3	5.58	12.1	17.1	8.59	10.5	5.88
Cadmium	mg/kg, dry wt	0.145	0.035	0.33	0.7	0.363	0.845	1.11	1.03	1.13	0.577
Chromium	mg/kg, dry wt	42.2	21.4	112	112	47.8	106	111	70.7	82.5	47.8
Copper	mg/kg, dry wt	24.3	4.13	68.1	68.1	52.7	107	75.0	79.2	115	39.5
Lead	mg/kg, dry wt	14.1	6.84	43.2	43.2	60.3	200	126	86.5	227	131
Mercury	mg/kg, dry wt	0.138	0.033	0.43	0.43	0.279	0.503	1.54	0.293	0.332	0.262
Nickel	mg/kg, dry wt	59.9	27.4	112	112	61.4	127	130	85.8	94.9	56.5
Selenium	mg/kg, dry wt	0.04 J	0.03	0.64	0.64	0.12	0.29	0.603	0.528	0.462	0.217
Silver	mg/kg, dry wt	0.106	0.018 J	0.58	0.58	0.152	0.425	0.763	0.316	0.499	0.165
Zinc	mg/kg, dry wt	67.3	23.6	158	158	184	323	237	358	392	201
Butyltins											
Tetra-n-butyltin	µg/kg, dry wt	<0.64	<0.54	-	-	<0.81	1.3 J	<0.75	<0.84	<0.82	<0.59
Tri-n-butyltin Cation	µg/kg, dry wt	<0.62	<0.53	-	-	5.9	11	<0.71	7.2	23	18
Di-n-butyltin Cation	µg/kg, dry wt	0.63 J	<0.24	-	-	12	25	6.1	16	67	32
n-Butyltin Cation	µg/kg, dry wt	0.93 J	<0.32	-	-	12	27	<2.1	<2.3	<2.2	<1.6
Σ detected Butylins	µg/kg, dry wt	1.56 J	<0.54	-	-	29.9	64.3	6.1	23.2	90	50
PCBs											
Aroclor 1016	µg/kg, dry wt	<2.0	<1.7	-	-	<23	<50	<4.3	<4.7	<4.6	<3.3
Aroclor 1221	µg/kg, dry wt	<2.0	<1.7	-	-	<6.4	<23	<4.2	<4.7	<4.6	<3.3
Aroclor 1232	µg/kg, dry wt	<2.0	<1.7	-	-	<29	<110	<4.2	<4.7	<4.6	<3.3
Aroclor 1242	µg/kg, dry wt	<2.0	<1.7	-	-	<39	<29	<4.2	<4.7	<4.6	<3.3
Aroclor 1248	µg/kg, dry wt	<2.0	<1.7	-	-	<38	<61	<4.2	<4.7	<4.6	<3.3
Aroclor 1254	µg/kg, dry wt	<2.0	<1.7	-	-	<57	<58	<4.2	<4.7	<4.6	<3.3
Aroclor 1260	µg/kg, dry wt	2.9 J	<1.7	-	-	60	76	<4.7	<5.2	<5.1	<3.7
Σ detected PCBs	µg/kg, dry wt	2.9 J	<1.7	22.7	22.7	60	76	<4.7	<5.2	<5.1	<3.7

Table 5-1c. San Rafael Channel 2010 Sediment Chemistries – Composite Sample Area 8 Maintenance Depth and Z-Layer Core Section Composites and Individual Core Maintenance Depth Sections (continued).

Analyte	Units	SF-10	SF-11	Bay Background (RWQCB 1998) ¹	HWRP Acceptance Criteria ²	SRC-2010-8	SRC-2010-8-Z	SRC-2010-8-1	SRC-2010-8-2	SRC-2010-8-3	SRC-2010-8-4
Organochlorine Pesticides											
Aldrin	µg/kg, dry wt	<0.069	<0.057	1.1	-	0.55 J	0.83 J	<0.65	<0.73	<0.70	<0.51
alpha-BHC	µg/kg, dry wt	<0.087	<0.072	-	-	<0.43	<0.64	<0.62	<0.69	<0.67	<0.49
beta-BHC	µg/kg, dry wt	<0.27	<0.23	-	-	<0.18	<0.21	<0.54	<0.60	<0.58	<0.42
delta-BHC	µg/kg, dry wt	<0.11	<0.087	-	-	<0.074	<0.38	<0.67	<0.75	<0.72	<0.53
gamma-BHC (lindane)	µg/kg, dry wt	<0.076	<0.063	-	-	<0.22	<1.3	<0.48	<0.54	<0.52	<0.38
alpha-Chlordane	µg/kg, dry wt	<0.094	<0.078	-	-	12	15	1.2 J	10	18	16
gamma-Chlordane	µg/kg, dry wt	0.16 J	<0.070	-	-	18	23	2.8	11	36	23
Chlordane	µg/kg, dry wt	<15	<13	1.1	1.1	130	170	<8.5	170	250	190
4,4'-DDD	µg/kg, dry wt	0.44	<0.13	-	-	22	43	76	15	29	29
4,4'-DDE	µg/kg, dry wt	0.87	<0.059	-	-	13	18	16	13	21	14
4,4'-DDT	µg/kg, dry wt	<0.30	<0.071	-	-	<4.3	<2.7	44	<0.77	7.1	<0.54
2,4'-DDD	µg/kg, dry wt	0.17 J	<0.075	-	-	4	7.1	<0.42	<0.47	<0.46	<0.33
2,4'-DDE	µg/kg, dry wt	<0.093	<0.077	-	-	<1.5	<2.0	<0.38	<0.42	<0.41	<0.29
2,4'-DDT	µg/kg, dry wt	0.21 J	<0.055	-	-	3.3	4.2	0.45	<0.33	<0.32	<0.23
Σ detected DDTs	µg/kg, dry wt	1.69	<0.13	7.0	7.0	42.3	72.3	136	28	57.1	43
Dieldrin	µg/kg, dry wt	<0.076	<0.063	0.44	0.72	3.1	4.0	1.8	<0.53	5.1	4.2
Endosulfan I	µg/kg, dry wt	<0.084	<0.070	-	-	3.9	5.3	<0.75	<0.84	<0.81	<0.59
Endosulfan II	µg/kg, dry wt	<0.13	<0.11	-	-	<0.92	<0.16	<0.37	<0.41	<0.40	<0.29
Endosulfan sulfate	µg/kg, dry wt	<0.076	<0.063	-	-	<0.92	<1.2	1.2 J	<0.62	<0.60	<0.44
Endrin	µg/kg, dry wt	<0.085	<0.071	0.78	-	<0.92	0.18 J	<0.43	<0.47	<0.46	<0.33
Endrin aldehyde	µg/kg, dry wt	<0.072	<0.060	-	6.4	<0.92	<0.14	<0.41	<0.46	<0.45	<0.32
Heptachlor	µg/kg, dry wt	<0.069	<0.057	-	0.3	<0.12	<0.14	<0.47	<0.52	<0.51	<0.37
Heptachlor epoxide	µg/kg, dry wt	<0.072	<0.060	-	0.3	<0.92	<1.2	2.5	<0.43	<0.42	<0.30
Toxaphene	µg/kg, dry wt	<3.6	<3.0	-	-	<90	<130	<18	<20	<19	<14
PAHs											
Naphthalene	µg/kg, dry wt	5.2	7.9	55.8	-	10	37	30	36	22 J	19
Acenaphthylene	µg/kg, dry wt	1.8 J	0.94 J	31.7	-	5.6	21	15 J	65	13 J	9.6 J
Acenaphthene	µg/kg, dry wt	1.4 J	<0.76	26.6	-	93	21	13 J	69	18 J	29
Fluorene	µg/kg, dry wt	3.1	1.7 J	25.3	-	85	20	17 J	130	42	32
Phenanthrene	µg/kg, dry wt	27	13	237	-	1400	230	41	130	150	410
Anthracene	µg/kg, dry wt	16	4.0	88	-	300	54	16 J	39	45	74
Fluoranthene	µg/kg, dry wt	47	14	514	-	2100	990	150	290	370	570
Pyrene	µg/kg, dry wt	57	15	665	-	2200	1600	320	560	400	820

Table 5-1c. San Rafael Channel 2010 Sediment Chemistries – Composite Sample Area 8 Maintenance Depth and Z-Layer Core Section Composites and Individual Core Maintenance Depth Sections (continued).

Analyte	Units	SF-10	SF-11	Bay Background (RWQCB 1998) ¹	HWRP Acceptance Criteria ²	SRC-2010-8	SRC-2010-8-Z	SRC-2010-8-1	SRC-2010-8-2	SRC-2010-8-3	SRC-2010-8-4
PAHs (cont.)											
Benzo(a)anthracene	μg/kg, dry wt	23	7.6	244	-	1000	300	41	110	140	290
Chrysene	μg/kg, dry wt	26	7.1	289	-	900	400	80	170	210	350
Benzo(b)fluoranthene	μg/kg, dry wt	35	8.2	371	-	790	670	84	150	190	210
Benzo(k)fluoranthene	μg/kg, dry wt	13	2.9	258	-	280	170	67	130	170	210
Benzo(a)pyrene	μg/kg, dry wt	37	7.3	412	-	680	710	110	160	190	290
Indeno(1,2,3-cd)pyrene	μg/kg, dry wt	32	5.4	382	-	450	850	86	100	120	140
Dibenzo(a,h)anthracene	μg/kg, dry wt	3.9	1.5 J	32.7	-	97	61	13 J	28	26	30
Benzo(g,h,i)perylene	μg/kg, dry wt	39	6.6	310	-	480	970	140	170	190	210
Σ detected PAHs	μg/kg, dry wt	367	103	3390	3390	10871	7104	1223	2337	2296	3694
Hamilton Metals											
Barium	mg/kg, dry wt	38.4	8.5	-	190	58.7	98.9	70.4	58.3	78.1	85.5
Beryllium	mg/kg, dry wt	0.352	0.14	-	1.03	0.276	0.721	0.611	0.519	0.496	0.570
Boron	mg/kg, dry wt	0.3	2.0 J	-	36.9	25.1	40	38.5	21.0	55.0	37.9
Cobalt	mg/kg, dry wt	13.7	7.09	-	27.6	11.0	17.6	14.8	12.4	11.1	15.2
Manganese	mg/kg, dry wt	434	303	-	943	241	372	337	299	254	326
Vanadium	mg/kg, dry wt	52.3	18.6	-	118	32.9	63.6	60.5	32.0	39.0	53.2
Hamilton Organics											
Phenol	μg/kg, dry wt	29 J	3.0 J	-	130	<0.83	<23	<24	29 J	<590	<22
Pentachlorophenol	μg/kg, dry wt	<20	<20	-	17	<25	<230	<240	<200	<270	<220
TPH Diesel / motor oil	mg/kg, dry wt	42.8 J	20.9 J	-	144000	262	2620	2060	1500	3440	3510
TPH Gasoline / JP-4	mg/kg, dry wt	<2.3	<1.7	-	12000	15	4.9 J	<4.0	<2.6	<4.4	7.2 J
Methoxyclor	mg/kg, dry wt	<0.23	<0.19	-	90	<2.0	<2.8	<0.35	<0.39	<0.38	<0.28
Dioxins (TCDD)	ng/kg, dry wt	0.210	0.00392	-	20	6.15	10.2	-	-	-	-

Notes:

¹ San Francisco Regional Water Quality Control Board (1998) Staff Report: Ambient Concentrations of Toxic Chemicals in San Francisco Bay Sediments. May 1998.

² HWRP Biological Opinion (USFWS 2005)

J – Analyte detected below the method reporting limit (MRL) and the reported value is therefore an estimate; as a result, J-flagged values are not identified as exceeding screening criteria.

Bold Font and Bold Outline = Value > Bay Background

Bold Font and Grey Shading = Value > HWRP Acceptance Criteria and Bay Background

Table 5-2. Compounds Measured Above San Francisco Bay Ambient Levels or HWRP Acceptance Criteria.

Sample ID	Analytes Above Bay Ambient Levels (SFRWQCB 1998)	Analytes Above HWRP Acceptance Criteria (USFWS 2003)
SRC-2010-1	none	none
SRC-2010-2	none	none
SRC-2010-3	none	none
SRC-2010-4	none	none
SRC-2010-5	none	none
SRC-2010-6	Copper, Zinc	Copper, Zinc
SRC-2010-7	Cadmium, Copper, Lead, Mercury, Zinc, Chlordane, DDTs, Dieldrin, PCBs, and PAHs	Copper, Lead, Mercury, Zinc, Chlordane, DDTs, PCBs, and PAHs
SRC-2010-7-Z	Cadmium, Copper, Lead, Mercury, Zinc, Chlordane, DDTs, and PCBs	Copper, Lead, Mercury, Zinc, Chlordane, DDTs, and PCBs
SRC-2010-7-1	Copper, Zinc, and Chlordane	Copper, Zinc, and Chlordane
SRC-2010-7-2	Copper, Lead, Mercury, Zinc, Chlordane, DDTs, and PCBs	Copper, Lead, Mercury, Zinc, Chlordane, DDTs, and PCBs
SRC-2010-7-3	Copper, Lead, Zinc, Chlordane, DDTs, and PCBs	Copper, Lead, Zinc, Chlordane, DDTs, and PCBs
SRC-2010-7-4	Cadmium, Copper, Lead, Mercury, Zinc, Chlordane, DDTs, and PCBs	Copper, Lead, Mercury, Zinc, Chlordane, DDTs, and PCBs
SRC-2010-7-5	Cadmium, Copper, Lead, Mercury, Nickel, Zinc, Chlordane, DDTs, Dieldrin, PCBs, and PAHs	Cadmium, Copper, Lead, Mercury, Nickel, Zinc, Chlordane, DDTs, Dieldrin, PCBs, and PAHs
SRC-2010-8	Cadmium, Lead, Zinc, Chlordane, DDTs, Dieldrin, PCBs, and PAHs	Lead, Zinc, Chlordane, DDTs, Dieldrin, PCBs, and PAHs
SRC-2010-8-Z	Cadmium, Copper, Lead, Mercury, Nickel, Zinc, Chlordane, DDTs, Dieldrin, PCBs, and PAHs	Cadmium, Copper, Lead, Mercury, Nickel, Zinc, Chlordane, DDTs, Dieldrin, PCBs, and PAHs
SRC-2010-8-1	Arsenic, Cadmium, Copper, Lead, Mercury, Nickel, Silver, Zinc, DDTs, Dieldrin, and Heptachlor epoxide	Arsenic, Boron, Cadmium, Copper, Lead, Mercury, Nickel, Silver, Zinc, DDTs, Dieldrin, and Heptachlor epoxide
SRC-2010-8-2	Cadmium, Copper, Lead, Zinc, Chlordane, and DDTs	Cadmium, Copper, Lead, Zinc, Chlordane, and DDTs
SRC-2010-8-3	Cadmium, Copper, Lead, Zinc, Chlordane, DDTs, and Dieldrin	Boron, Cadmium, Copper, Lead, Zinc, Chlordane, DDTs, and Dieldrin
SRC-2010-8-4	Lead, Zinc, Chlordane, DDTs, Dieldrin, and PAHs	Boron, Lead, Zinc, Chlordane, DDTs, Dieldrin, and PAHs

Table 5-3. Modified Elutriate Test Chemistry Results.

Analytes	SRC-2010-1	SRC-2010-2	SRC-2010-3	SRC-2010-4	SRC-2010-5	SRC-2010-6	SRC-2010-7	SRC-2010-8	Water Quality Objective ^A
TSS	56	382	169	42.7	25.5	48	172	28.0	-
Total Metals (µg/L)									
Arsenic	4.86	11.9	7.09	5.11	14.9	18.6	9.23	3.19	NA
Cadmium	0.034	0.035	0.010J	0.027J	0.017J	0.028J	0.061	0.010J	NA
Chromium	2.00	3.10	0.27	2.73	1.33	2.96	4.35	0.21J	NA
Copper	3.430	5.640	0.569	3.910	2.250	6.830	12.1	0.602	NA
Lead	1.620	2.840	0.178	2.120	1.100	3.510	8.590	0.640	NA
Mercury	0.0392	0.0036	0.0035	0.0263	0.0059	0.0725	0.0843	0.0019	0.025
Nickel	5.99	7.28	1.89	7.44	3.25	5.93	9.75	2.53	NA
Selenium	0.3J	0.3J	0.2U	0.2U	0.2U	0.2U	0.2U	0.2U	5.0
Zinc	6.30	10.8	2.30	7.32	4.24	9.39	21.0	1.31	NA
Dissolved Metals (µg/L)									
Arsenic	2.83	7.24	3.99	3.22	13.4	15.3	8.77	2.07	36
Cadmium	0.014J	0.018J	0.016J	0.014J	0.011J	0.010J	0.029J	0.011J	9.3
Chromium	0.04J	0.07J	0.06J	0.07J	0.09J	0.08J	0.09J	0.05J	50
Copper	1.070	1.790	1.790	1.450	1.040	1.400	2.880	0.562	6.0 ^B
Lead	0.014J	0.016J	0.023J	0.019J	0.018U	0.081	0.068	0.036	8.1
Mercury	0.0014	0.0014	0.0010	0.0008	0.0009	0.0015	0.0006	0.0007	0.025
Nickel	2.10	2.51	2.29	2.38	1.45	1.14	1.86	2.10	8.2
Selenium	0.2U	0.2U	0.2U	0.2U	0.2U	0.2U	0.2U	0.2U	NA
Zinc	0.62	1.53	1.09	0.64J	0.58J	0.56J	3.94	1.31	81.0

A – Chronic criteria (four-day average) from the SF Bay Basin Plan (RWQCB, 2007) unless otherwise noted.

B – New chronic criteria set by USEPA and promulgated by the RWQCB in the January Executive Officer's Report (RWQCB, 2009).

NA – Not applicable.

5.2 Biological Testing Results

There were 4 different biological tests performed for each Composite Sample Area maintenance depth core section composited sediment:

1. a 10-day amphipod bulk-sediment survival test with *Ampelisca abdita*,
2. a 10-day juvenile polychaete bulk-sediment survival test with *Neanthes arenaceodentata*,
3. a 48-hr SET sediment elutriate survival test with *Mytilus galloprovincialis*, and
4. a 96-hr MET sediment elutriate survival test with the mysid *Americamysis bahia*.

A summary table of the bulk-sediment tests water quality characteristics and sediment porewater water quality characteristics at test initiation and test termination are presented in Appendix E.

5.2.1 Effects of the San Rafael Channel Sediments on *Ampelisca abdita*

The results of these tests are summarized in Table 5-4. There was 85% survival at the Control treatment, which was slightly below an acceptable survival response by the test organisms. However, there was 92% and 91% survival in the SF-10 and SF-11 reference site sediments, respectively. There was $\geq 84\%$ survival each of the sediment composite samples, which was less than a 20% reduction in survival relative to both the SF-10 and SF-11 reference sediments.

The test data and summary of statistical analyses for these tests are attached as Appendix F.

Table 5-4. *Ampelisca abdita* survival in the San Rafael Channel test sediments.

Sediment Site	% Survival in Test Replicates					Overall Mean % Survival
	Rep A	Rep B	Rep C	Rep D	Rep E	
Lab Control	80	90	80	85	90	85
SF-10 (San Pablo)	95	90	95	90	90	92
SF-11 (Alcatraz)	95	100	85	90	85	91
SRC-2010-1	90	95	95	85	100	93
SRC-2010-2	80	80	100	100	90	90
SRC-2010-3	100	95	95	90	90	94
SRC-2010-4	100	90	90	90	80	90
SRC-2010-5	100	80	90	100	100	94
SRC-2010-6	90	85	85	90	90	88
SRC-2010-7	100	100	90	100	90	96
SRC-2010-8	75	90	70	85	100	84

5.2.1.1 Reference Toxicant Toxicity to *Ampelisca abdita*

The results of this testing are presented in Tables 5-5 and 5-6. There was 95% survival in the Lab Control treatment. The EC₅₀ for this test is consistent with the typical response range established by previous performance of this test in our laboratory (Table 5-6), indicating that these test organisms were responding to toxic stress in a typical fashion.

The test data and summary of statistical analyses for this test are attached as Appendix G.

Table 5-5. Reference toxicant testing: Effects of KCl on *Ampelisca abdita* (7/10/10).

KCl Treatment (g/L)	Mean% Survival
Lab Control	95
0.25	95
0.5	90
1	65
2	0
4	0
EC ₅₀ =	1.1 g/L KCl

* The survival response at this treatment was significantly less than the Lab Control at $p < 0.05$.

Table 5-6. Summary of Reference Toxicant Database for *Ampelisca abdita*.

Current LC ₅₀ Value	Typical Response Range (mean \pm 2SD)
1.1 g/L KCl	0.52 – 1.8 g/L KCl

5.2.2 Effects of the San Rafael Channel Sediments on *Neanthes arenaceodentata*

The results of these tests are summarized in Table 5-7. There was 94% survival at the Control treatment, indicating an acceptable survival response by the test organisms. There was also $\geq 90\%$ survival in the SF-10 and SF-11 reference site sediments. There was $\geq 86\%$ survival in each of the San Rafael Channel samples. The survival response for each of the site sediments was $<10\%$ less than the reference site sediment survival responses. In addition, the survival response for each of the site sediments was also $<10\%$ less than both the reference site sediments and the Lab Control sediment survival response indicating that the sediments are ***not*** toxic to polychaetes.

The test data and summary of statistical analyses for these tests are attached as Appendix H.

Table 5-7. *Neanthes arenaceodentata* survival in the San Rafael Channel test sediments.

Sediment Site	% Survival in Test Replicates					Overall Mean % Survival
	Rep A	Rep B	Rep C	Rep D	Rep E	
Lab Control	80	100	100	90	100	94
SF-10 (San Pablo)	90	100	90	90	100	94
SF-11 (Alcatraz)	90	90	90	90	90	90
SRC-2010-1	100	90	100	90	100	96
SRC-2010-2	90	100	90	90	100	94
SRC-2010-3	90	80	80	80	100	86
SRC-2010-4	90	90	90	80	100	90
SRC-2010-5	100	80	90	90	90	90
SRC-2010-6	100	100	100	80	100	96
SRC-2010-7	90	90	100	90	100	94
SRC-2010-8	100	90	100	80	90	92

5.2.2.1 Reference Toxicant Toxicity to *Neanthes arenaceodentata*

The results of this test are presented in Table 5-8. There was 100% survival in the Lab Control treatment. The EC₅₀ was 2.3 g/L KCl, which is consistent with the typical response range established by previous performance of this test in our laboratory (Table 5-9), indicating that these test organisms were responding to toxic stress in a typical fashion.

The test data and summary of statistical analyses for this test are presented in Appendix I.

Table 5-8. Reference toxicant testing: Effects of KCl on *Neanthes arenaceodentata*.

KCl Treatment (g/L)	Mean% Survival
Lab Control	100
0.25	100
0.5	100
1	100
2	70*
4	0*
EC ₅₀ =	2.3 g/L KCl

* The survival response at this treatment was significantly less than the Lab Control at $p < 0.05$.

Table 5-9. Summary of Reference Toxicant Database for *Neanthes arenaceodentata*.

Current LC ₅₀ Value	Typical Response Range (mean \pm 2SD)
2.3 g/L KCl	0.83 – 2.7 g/L KCl

5.2.3 Toxicity of the San Rafael Channel Sediment SET Elutriates to *Mytilus galloprovincialis*

The results of these tests are summarized below in Tables 5-10 through 5-20. The Lab Control treatments ranged from 80.9-90.1% survival and 96.7-97.8% normal development, indicating an acceptable response by the test organisms.

Table 5-10. Effects of San Rafael Channel SET sediment elutriates on *Mytilus galloprovincialis*.

Elutriate Treatment	Survival LC ₅₀	Development EC ₅₀	ESC Acceptable?
SF-10	50.3% elutriate	72.8% elutriate	YES
SF-11	>100% elutriate	>100% elutriate	YES
SRC-2010-1	48.8% elutriate	48.6% elutriate	YES
SRC-2010-2	35.4% elutriate	37.5% elutriate	YES
SRC-2010-3	39.2% elutriate	44.5% elutriate	YES
SRC-2010-4	35.0% elutriate	37.5% elutriate	YES
SRC-2010-5	35.1% elutriate	37.5% elutriate	YES
SRC-2010-6	34.8% elutriate	37.5% elutriate	YES
SRC-2010-7	35.2% elutriate	37.5% elutriate	YES
SRC-2010-8	32.5% elutriate	37.3% elutriate	YES

The test data and the summary of statistical analyses for these tests are presented in Appendix J. Elutriate suitability calculations are presented in Appendix K.

Table 5-11. Effects of SF-10 sediment elutriate on *Mytilus galloprovincialis*.

Elutriate Treatment	Mean % Survival	Mean % Normal Development
Lab Control	90.7	97.5
1%	68.1	74.1
10%	77.5	98.0
50%	60.3*	95.2
100%	0*	0*
Site Water Control	88.1	99.2
Survival LC50 or Development EC50 =	50.3% elutriate	72.8% elutriate

* The survival response at this treatment was significantly less than the Lab Control at $p < 0.05$.

Table 5-12. Effects of SF-11 sediment elutriate on *Mytilus galloprovincialis*.

Elutriate Treatment	Mean % Survival	Mean % Normal Development
Lab Control	90.7	97.5
1%	95.2	99.4
10%	89.1	98.2
50%	74.9*	98.2
100%	65.7*	98.6
Site Water Control	88.1	99.2
Survival LC50 or Development EC50 =	>100% elutriate	>100% elutriate

* The survival response at this treatment was significantly less than the Lab Control at $p < 0.05$.

Table 5-13. Effects of SRC-2010-1 sediment elutriate on *Mytilus galloprovincialis*.

Elutriate Treatment	Mean % Survival	Mean % Normal Development
Lab Control	90.7	97.5
1%	84.5	98.3
10%	93.2	98.8
25%	90.5	99.0
50%	42.9*	45.6*
100%	0*	0*
Site Water Control	88.1	99.2
Survival LC50 or Development EC50 =	48.8% elutriate	48.6% elutriate

* The survival response at this treatment was significantly less than the Lab Control at $p < 0.05$.

Table 5-14. Effects of SRC-2010-2 sediment elutriate on *Mytilus galloprovincialis*.

Elutriate Treatment	Mean % Survival	Mean % Normal Development
Lab Control	90.7	97.5
1%	89.7	99.2
10%	98.6	99.3
25%	93.8	98.6
50%	0.11*	0.15*
100%	0*	0*
Site Water Control	88.1	99.2
Survival LC50 or Development EC50 =	35.4% elutriate	37.5% elutriate

* The survival response at this treatment was significantly less than the Lab Control at $p < 0.05$.

Table 5-15. Effects of SRC-2010-3 sediment elutriate on *Mytilus galloprovincialis*.

Elutriate Treatment	Mean % Survival	Mean % Normal Development
Lab Control	90.7	97.5
1%	90.9	99.2
10%	83.0	99.2
25%	89.0	98.1
50%	30.0*	35.3*
100%	0*	0*
Site Water Control	88.1	99.2
Survival LC50 or Development EC50 =	39.2% elutriate	44.5% elutriate

* The survival response at this treatment was significantly less than the Lab Control at $p < 0.05$.

Table 5-16. Effects of SRC-2010-4 sediment elutriate on *Mytilus galloprovincialis*.

Elutriate Treatment	Mean % Survival	Mean % Normal Development
Lab Control	90.7	97.5
1%	88.1	98.6
10%	89.7	98.4
25%	88.5	98.3
50%	0*	0*
100%	0*	0*
Site Water Control	88.1	99.2
Survival LC50 or Development EC50 =	35% elutriate	37.5% elutriate

*The survival response at this treatment was significantly less than the Lab Control at $p < 0.05$.

Table 5-17. Effects of SRC-2010-5 sediment elutriate on *Mytilus galloprovincialis*.

Elutriate Treatment	Mean % Survival	Mean % Normal Development
Lab Control	90.7	97.5
1%	87.6	98.9
10%	88.5	97.8
25%	89.8	98.8
50%	0*	0*
100%	0*	0*
Site Water Control	88.1	99.2
Survival LC50 or Development EC50 =	35.1% elutriate	37.5% elutriate

* The survival response at this treatment was significantly less than the Lab Control at $p < 0.05$.

Table 5-18. Effects of SRC-2010-6 sediment elutriate on *Mytilus galloprovincialis*.

Elutriate Treatment	Mean % Survival	Mean % Normal Development
Lab Control	90.7	97.5
1%	90.8	98.3
10%	93.8	98.2
25%	90.1	98.5
50%	0*	0*
100%	0*	0*
Site Water Control	88.1	99.2
Survival LC50 or Development EC50 =	34.8% elutriate	37.5% elutriate

* The survival response at this treatment was significantly less than the Lab Control at $p < 0.05$.

Table 5-19. Effects of SRC-2010-7 sediment elutriate on *Mytilus galloprovincialis*.

Elutriate Treatment	Mean % Survival	Mean % Normal Development
Lab Control	90.7	97.5
1%	88.9	99.0
10%	93.0	98.3
25%	90.4	98.9
50%	0*	0*
100%	0*	0*
Site Water Control	88.1	99.2
Survival LC50 or Development EC50 =	35.2% elutriate	37.5% elutriate

* The survival response at this treatment was significantly less than the Lab Control at $p < 0.05$.

Table 5-20. Effects of SRC-2010-8 sediment elutriate on *Mytilus galloprovincialis*.

Elutriate Treatment	Mean % Survival	Mean % Normal Development
Lab Control	90.7	97.5
1%	90.2	98.6
10%	92.1	98.6
25%	81.5	96.7
50%	0*	0*
100%	0*	0*
Site Water Control	88.1	99.2
Survival LC50 or Development EC50 =	32.5% elutriate	37.3% elutriate

* The survival response at this treatment was significantly less than the Lab Control at $p < 0.05$.

5.2.3.1 Reference Toxicant Toxicity to *Mytilus galloprovincialis* Embryos

The results of this test are presented in Table 5-21. There was 98.9% normal embryo development at the Lab Control treatment. The embryo development EC50 was 2.5 g/L KCl, which is consistent with the typical response range established by reference toxicant testing previously performed in this lab (Table 5-22), indicating that these test organisms were responding to toxic stress in a typical fashion.

The test data and summary of statistical analyses for this test are attached as Appendix L.

Table 5-21. Reference toxicant testing: Effects of KCl on *Mytilus galloprovincialis*.

KCl Treatment (g/L)	Mean % Normal Embryo Development
Lab Control	98.9
0.5	97.7
1	98.4
2	92.6*
3	0*
4	0*
EC50 =	2.5 g/L KCl

* Significantly less than the Lab Control treatment response at $p < 0.05$.

Table 5-22. Summary of Reference Toxicant Database for *Mytilus galloprovincialis*.

Current EC50	Typical Response Range (mean \pm 2SD)
2.5 g/L KCl	1.7–2.9 g/L KCl

5.2.4 Toxicity of the San Rafael Channel Sediment Elutriates to *Americamysis bahia*

The results of these tests are summarized below in Table 5-23. There was $\geq 96\%$ survival at the Control treatments, indicating an acceptable survival response by the test organisms; there was 96% survival at the Site Water Control treatment. The test data and summary of statistical analyses for these tests are attached as Appendix M.

Table 5-23. Effects of San Rafael Channel MET elutriates on *Americamysis bahia*.

Test Treatment	% Survival in Test Replicates					Mean % Survival
	Rep A	Rep B	Rep C	Rep D	Rep E	
Lab Control 1	100	90	90	100	100	96
Site Water Control	90	100	100	100	90	96
SRC-2010-1	100	90	100	100	100	98
SRC-2010-2	100	90	100	90	100	96
SRC-2010-3	90	100	100	100	100	98
SRC-2010-4	100	90	100	100	100	98
Lab Control 2	90	100	100	100	100	98
SRC-2010-5	90	100	100	100	100	98
SRC-2010-6	100	100	100	100	100	100
SRC-2010-7	90	100	100	100	100	98
SRC-2010-8	90	100	100	100	90	96

5.2.4.1 Reference Toxicant Toxicity to *Americamysis bahia*

The results of this test are summarized in Table 5-24. There was a mean of 95% survival in the Lab Control treatment; the LC₅₀ was 0.39 g/L KCl, which is consistent with the typical response range established by previous performance of this test in our laboratory (Table 5-26), indicating that these test organisms were responding to toxic stress in a typical fashion. The test data and summary of statistical analyses for this test are attached as Appendix N.

Table 5-24. Reference toxicant testing: Effects of KCl on *Americamysis bahia*.

KCl Treatment (g/L)	Mean % Survival
Lab Control	95
0.125	90
0.25	100
0.5	15*
1	0*
2	0*
LC ₅₀ =	0.39 g/L KCl

* Significantly less than the Lab Control treatment response at $p < 0.05$.

Table 5-25. Summary of Reference Toxicant Database for *Americamysis bahia*.

Current LC50	Typical Response Range (mean \pm 2SD)
0.39 g/L KCl	0.31–0.75 g/L KCl

6. QUALITY CONTROL REVIEW

6.1 Conventional and Chemical Analytical Quality Control Summary

The QA/QC review entailed reviewing the contract lab Data Reports for sample integrity, correct methodology, and compliance with all appropriate quality Lab Control requirements. The overall data quality assessment found that all data were usable. Appendix C contains the conventional and chemical analysis reports, which include the contract laboratory QA/QC narrative.

A review summary of the analytical methods, the targeted reporting limits and the achieved method reporting and detection limits are presented in Tables 6-1 through 6-3. A review of this data indicated that for some samples, Pentachlorophenol, Phenol, DDE, DDT, Chlordane, Endosulfan I, PCBs, Dieldrin, Heptachlor, Heptachlor epoxide, or Toxaphene detection limits were elevated above the targeted method reporting limits due to matrix interferences or the need to dilute the sample due to elevated levels of the target analyte (e.g., the reporting limit for DDT was elevated for the SRC-2010-8-1 sample, however, the analyte was detected at an order of magnitude greater than the reporting level and as a result, the elevated reporting limit is inconsequential); all other analytes were at or below targeted MRLs.

6.2 Biological Testing Quality Lab Control Summary

The biological testing of the San Rafael Channel sediments incorporated standard QA/QC procedures to ensure that the test results were valid. Standard QA/QC procedures included the use of negative Lab Controls, positive Lab Controls, test replicates, and measurements of water quality during testing.

Quality assurance procedures that were used for sediment testing are consistent with methods described in the U.S.EPA/ACOE (1998). Sediments for the bioassay testing were stored appropriately at $\leq 4^{\circ}\text{C}$ and were used within the 8 week holding time period. Sediment interstitial water characteristics were within test acceptability limits at the start of the tests. Sediment elutriates were prepared using site water. The tests were performed using high-quality natural seawater.

All measurements of routine water quality characteristics were performed as described in the PER Lab Standard Operating Procedures (SOPs). All biological testing water quality conditions were within the appropriate limits. Laboratory instruments were calibrated daily according to Lab SOPs, and calibration data were logged and initialed. Standard test conditions are presented in Appendix O.

Negative Lab Control – With the exception of the *Ampelisca abdita* testing, the biological responses for all the test organisms at the negative Lab Control treatments were within acceptable limits for the sediment and sediment elutriate tests.

Positive Lab Control – The accuracy of the responses of the test organisms to toxic stress was also evaluated using positive Lab Controls (reference toxicant testing). The key test dose-response LC and/or EC point estimates determined for each test species were all within the respective typical response ranges for these species, indicating that these test organisms were responding to toxic stress in a typical fashion.

Table 6-1. Standard List of Analytes, Methods, and Targeted Reporting Limits.

Analyte	Units	Method Used	SAP Targeted MRL	Achieved MDL	Achieved MRL
Metals					
Arsenic	mg/kg	EPA 6020	2	0.05-0.07	0.51-0.71
Cadmium	mg/kg	EPA 6020	0.3	0.004-0.006	0.020-0.028
Chromium	mg/kg	EPA 6020	5	0.02	0.20-0.29
Copper	mg/kg	EPA 6020	5	0.06-0.6	0.10-2.0
Lead	mg/kg	EPA 6020	5	0.006-0.009	0.050-0.071
Mercury	mg/kg	EPA 7471A	0.02	0.001-0.002	0.010-0.020
Nickel	mg/kg	EPA 6020	5	0.02-0.03	0.20-0.29
Selenium	mg/kg	EPA 7742	0.1	0.03-0.04	0.10-0.14
Silver	mg/kg	EPA 6020	0.2	0.008-0.011	0.020-0.028
Zinc	mg/kg	EPA 6020	1	0.2-0.4	0.5-2.9
Pesticides					
Aldrin	μg/kg	EPA 8081B	2	0.16-1.7	0.92-1.7
a-BHC	μg/kg	EPA 8081B	2	0.12-0.64	0.92-1.3
b-BHC	μg/kg	EPA 8081B	2	0.18-0.50	0.92-1.3
γ-BHC (Lindane)	μg/kg	EPA 8081B	2	0.092-1.3	0.92-1.3
d-BHC	μg/kg	EPA 8081B	2	0.074-0.13	0.92-1.3
Chlordane	μg/kg	EPA 8081B	20	1.9-11	9.2-58
2,4'-DDD	μg/kg	EPA 8081B	2	0.13-1.1	0.92-1.3
2,4'-DDE	μg/kg	EPA 8081B	2	0.17-5.2	0.13-5.2
2,4'-DDT	μg/kg	EPA 8081B	2	0.058-1.3	0.92-1.3
4,4'-DDD	μg/kg	EPA 8081B	2	0.11-0.63	0.92-5.8
4,4'-DDE	μg/kg	EPA 8081B	2	0.11-0.15	0.92-1.3
4,4'-DDT	μg/kg	EPA 8081B	2	0.18-9.7	1.2-9.7
Total DDT	μg/kg	EPA 8081B	2	0.058-9.7	0.13-4.3
Dieldrin	μg/kg	EPA 8081B	2	0.14-1.2	0.92-1.3
Endosulfan I	μg/kg	EPA 8081B	2	0.063-3.8	0.92-3.8
Endosulfan II	μg/kg	EPA 8081B	2	0.15-1.2	0.92-1.3
Endosulfan sulfate	μg/kg	EPA 8081B	2	0.12-1.3	0.92-1.3
Endrin	μg/kg	EPA 8081B	2	0.098-1.2	0.92-1.3
Endrin aldehyde	μg/kg	EPA 8081B	2	0.13-1.2	0.92-1.3
Heptachlor	μg/kg	EPA 8081B	2	0.12-1.2	0.92-1.3
Heptachlor epoxide	μg/kg	EPA 8081B	2	0.087-1.2	0.92-1.3
Toxaphene	μg/kg	EPA 8081B	20	13-210	52-210
Total Organotins	μg/kg	Krone 1989	10	0.24-1.2	1.3-2.6
Total PAHs	μg/kg	EPA 8270C	20	0.58-4.9	2.5-23
Total PCBs	μg/kg	EPA 8082	20	1.7-110	3.1-110
Grain Size	%	ASTM 1992	0.1	0.01	0.01
Total Solids	%	EPA 160.3	0.10	0.1	0.1
Total Organic Carbon (TOC)	%	EPA 415.1	0.10	0.20	0.050

Table 6-2. List of Hamilton Analytes, Methods, and Targeted Reporting Limits (dry weight).

Analyte	Units	Method Used	SAP Targeted MRL	Achieved MDL	Achieved MRL
Metals					
Barium	mg/kg	EPA 6020	190	0.3-0.4	2.0-2.9
Beryllium	mg/kg	EPA 6020	1.03	0.003-0.004	0.020-0.028
Boron	mg/kg	EPA 6020	36.9	0.3-0.4	9.9-14
Cadmium	mg/kg	EPA 6020	0.7	0.004-0.006	0.020-0.028
Chromium	mg/kg	EPA 6020	5	0.02	0.20-0.29
Cobalt	mg/kg	EPA 6020	27.6	0.001	0.020-0.028
Manganese	mg/kg	EPA 6020	943	0.04-0.06	1.98-2.85
Vanadium	mg/kg	EPA 6020	118	0.4-0.6	2.0-2.9
Organics					
Pentachlorophenol	µg/kg	EPA 8270-GPC	17	20-270	100-1400
Phenol	µg/kg	EPA 8270-GPC	130	2.0-590	30-590
TPH – diesel/motor oil	mg/kg	EPA 8015	144	2.0-7.6	31-65
TPH – gasoline/JP-4	mg/kg	EPA 8015	12	1.7-4.4	6.6-17
Chlordane	µg/kg	EPA 8081B	1.1	1.9-11	9.2-58
Dieldrin	µg/kg	EPA 8081B	0.72	0.14-1.2	0.92-1.3
Heptachlor	µg/kg	EPA 8081B	0.3	0.12-1.2	0.92-1.3
Heptachlor epoxide	µg/kg	EPA 8081B	0.3	0.087-1.2	0.92-1.3
Methoxychlor	µg/kg	EPA 8081	90	0.19-2.8	0.25-2.8
Dioxins (total TCDD TEQ)	ng/kg	EPA 8290	20	0.0273-0.810	1.03-11.5

Table 6-3. List of Analytes for Modified Elutriate Tests, Methods, and Targeted Reporting Limits (dry weight)

Analyte	Units	Method Used	SAP Targeted MRL	Achieved MDL	Achieved MRL
Arsenic	µg/L	EPA 6020	1	0.04-0.08	0.50-1.00
Cadmium	µg/L	EPA 6020	0.25	0.002-0.004	0.020-0.040
Chromium	µg/L	EPA 6020	1	0.03-0.06	0.20-0.40
Copper	µg/L	EPA 6020	1	0.004-0.008	0.100-0.200
Lead	µg/L	EPA 6020	0.25	0.009-0.018	0.020-0.040
Mercury	µg/L	EPA 7471A	0.005	0.00006	0.001
Nickel	µg/L	EPA 6020	5	0.03-0.06	0.20-0.40
Selenium	µg/L	EPA 7742	0.5	0.2	1.0
Zinc	µg/L	EPA 6020	10	0.06-0.12	0.50-1.00

7. SUMMARY

The San Rafael Channel sediments were analyzed to determine suitability of the material to be dredged for placement at HWRP or aquatic placement at San Pablo (SF-10) or Alcatraz (SF-11). A summary of the chemical and biological evaluations assessing each of the three potential placement/disposal options is provided below in Table 7-1. It should be noted that the SRC-2010-5 and SRC-2010-6 sediment composite samples had measured copper and zinc above reported Bay Ambient concentrations (SFRWQCB 1998) and HWRP screening criteria (USFWS 2005); however, the biological testing indicated that these sediments were not toxic. As a result, the SRC-2010-5 and SRC-2010-6 sediments are considered suitable for placement at either the HWRP, SF-10, or SF-11 sites.

Table 7-1. Recommended Suitability Determinations for San Rafael Channel test sediments.

Composite ID	Suitable for In-bay Disposal at SF-10 or SF-11		Suitable for Placement at HWRP	
	Chemistry	Biological	Chemistry	Biological
SRC-2010-1	Yes	Yes	Yes	Yes
SRC-2010-2	Yes	Yes	Yes	Yes
SRC-2010-3	Yes	Yes	Yes	Yes
SRC-2010-4	Yes	Yes	Yes	Yes
SRC-2010-5	Yes	Yes	Yes	Yes
SRC-2010-6	Yes	Yes	Yes	Yes
SRC-2010-7	No	Yes	No	Yes
SRC-2010-8	No	Yes	No	Yes

8. REFERENCES

ASTM (1999) Method E724-98. Standard Guide for conducting static acute toxicity tests starting with embryos of four species of seawater bivalve mollusk. ASTM Standards on Biological Effects and Environmental Fate. American Society for Testing and Materials, Philadelphia, PA.

ASTM (1999) Method E1367-99. Standard Guide for conducting 10-day static toxicity tests with marine and estuarine amphipods. ASTM Standards on Biological Effects and Environmental Fate. American Society for Testing and Materials, Philadelphia, PA.

ASTM (2000) Method E1611-00. Standard Guide for conducting sediment tests with marine and estuarine polychaetous annelids. ASTM Standards on Biological Effects and Environmental Fate. American Society for Testing and Materials, Philadelphia, PA.

ASTM (2003) Method 1688-00a. Standard Guide for the Bioaccumulation of sediment-associated contaminants by benthic invertebrates. ASTM Standards on Biological Effects and Environmental Fate. American Society for Testing and Materials, Philadelphia, PA.

SFRWQCB (1998) Ambient concentrations of toxic chemicals in San Francisco Bay Sediments: Draft Staff Report. San Francisco Regional Water Quality Lab Control Board, Oakland, CA.

USACE (2010) San Rafael Channel FY 2010 Maintenance Dredging Sampling and Analysis Plan Revised April 22, 2010. U.S. Army Corps of Engineers San Francisco District, Engineering and Technical Services Division Planning Branch, Environmental Section B.

USACE (2004) Master Sampling and Analysis Plan USACE SF-District O&M Dredging. U.S. Army Corps of Engineers San Francisco District, Engineering and Technical Services Division Planning Branch, Environmental Sciences Section, Material Management Unit.

USACE (1985) Technical Note EEDP 04-2. Interim Guidance for Predicting Quality of Effluent Discharged from Confined Dredged Material Disposal Areas During Dredging Operations. U.S. Army Engineer Waterways Experiment Station, Environmental Laboratory, June 1985.

US EPA (1994) 'Methods for Assessing the Toxicity of Sediment-Associated Contaminants with Estuarine and Marine Amphipods', EPA-600/R-94/025. U.S. EPA, Env. Research Laboratory, Narragansett, RI.

U.S.EPA/ACOE (1998) Evaluation of Dredged Material Proposed for Discharge in Waters of the U.S. – Testing Manual (Inland Testing Manual). U.S. Environmental Protection Agency/U.S. Army Corps of Engineers. EPA/823/B-94/002. Office of Water. Washington, DC 20460.

US EPA (1991) 'Methods for Measuring the Acute Toxicity of Effluents and Receiving Waters to Freshwater and Marine Organisms', fifth edition. EPA/821/R-02/012. U.S. EPA, Environmental Office of Research and Development, Washington DC.

USFWS (2005) Endangered Species Consultation for the Proposed Wetland Restoration Project at the Former Hamilton Army Airfield, City of Novato, Marin County, California. 1-1-05-F-0068. Prepared by the U.S. Fish and Wildlife Service Sacramento, CA.

Appendix A

Sampling Field Logs and Data Sheets



Pacific EcoRisk
Environmental Consulting and Testing

Pacific EcoRisk
2250 Cordelia Road
Fairfield, CA 94534
Phone: (707) 207-7760
Fax: (707) 207-7916

Sediment Core Collection Form

Station ID: SRC - 2010-1-1 Date: 6/8/10

Project Name: San Rafael Channel Project No.: 16087

Coordinates:
Lat/Northing: 37°57.4468' Long/Easting: 122°27.4544'

Vertical Datum: MLLW MLW Other:

Depth Measurement: Sounder Leadline

Project Depth: 8.0' Overdredge: 2.0' + 2.0' Extra

	Attempt 1	Attempt 2
Time:	<u>09:20</u>	
(A) Measured Water Depth	<u>3.1' B.O'</u>	
(B) Tide Height	<u>3.1'</u>	
(C) Mudline Elevation (A-B=C)	<u>4.9'</u>	
(D) Calculated Core Length (PD+OD-C=D)	<u>7.1'</u>	
Estimated Penetration	<u>7.1'</u>	
Description of Core Drive	<u>Smooth</u>	
Refusal Encountered?	<u>No</u>	
Total Core Length Recovered	<u>7.1'</u>	

Core Characteristics

Sediment Type	cobble, gravel, sand C M F, <u>silt clay</u> , organic matter	cobble, gravel, sand C M F, silt clay, organic matter
Sediment Color	<u>gray, black</u> , brown, brown surface, olivine	gray, black, brown, brown surface, olivine
Sediment Odor	<u>None</u> , slight, mod, strong H ₂ S, petroleum, septic	None, slight, mod, strong H ₂ S, petroleum, septic
Any Layering Homogenous	<u>*</u>	
Comments: <u>EPE: 4'</u> <u>SRC-2010-1-1 : Sediment surface - 10.0'</u> <u>SRC-2010-1-1-B 10.0' - 12.0'</u>		<u>* - Layer of shell fragments 1.0' B.S.S</u> <u>- black layer @ 2.6' B.S.S. (2" thick)</u>

Recorded by: DC



Pacific EcoRisk
Environmental Consulting and Testing

Pacific EcoRisk
2250 Cordelia Road
Fairfield, CA 94534
Phone: (707) 207-7760
Fax: (707) 207-7916

Sediment Core Collection Form

Station ID: SRC-2010-1-2 Date: 6/8/10

Project Name: San Rafael Channel Project No.: 16087

Coordinates:
Lat/Northing: 37° 57.5008' Long/Easting: 122° 27.6109'

Vertical Datum: MLLW MLW Other:

Depth Measurement: Sounder Leadline

Project Depth: 8.0' Overdredge: 2.0' + 2.0' Extra

	Attempt 1	Attempt 2
Time:	<u>10:10</u>	
(A) Measured Water Depth	<u>9.0'</u>	
(B) Tide Height	<u>3.5'</u>	
(C) Mudline Elevation (A-B=C)	<u>5.5'</u>	
(D) Calculated Core Length (PD+OD-C=D)	<u>6.5'</u>	
Estimated Penetration	<u>6.5'</u>	
Description of Core Drive	<u>Smooth</u>	
Refusal Encountered?	<u>No</u>	
Total Core Length Recovered	<u>6.5'</u>	

Core

Characteristics

Sediment Type	cobble, gravel, <u>sand</u> C M F, <u>silt clay</u> , organic matter	cobble, gravel, sand C M F, silt clay, organic matter
Sediment Color	<u>gray</u> , black, brown, brown surface, olivine	gray, black, brown, brown surface, olivine
Sediment Odor	<u>None</u> , slight, mod, strong H ₂ S, petroleum, septic	None, slight, mod, strong H ₂ S, petroleum, septic
Any Layering Homogenous	<u>Thin band of Sand 5' BSS</u> <u>otherwise homogenous</u>	
Comments: <u>EPE! 6'</u> <u>SRC-2010-1-2: 0-4.5' B.S.S.</u> <u>SRC-2010-1-2-B: 4.5' - 6.5' BSS</u>		

Material all the same except for Thin band of Sand 5.0' B.S.S.

Recorded by: [Signature]



Pacific EcoRisk
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Sediment Core Collection Form

Station ID: SRC-2010-1-3a Date: 6/8/10
Project Name: San Rafael Channel Project No.: 16087
Coordinates:
Lat/Northing: 37° 57. 5744' Long/Easting: 122° 27. 7880'
Vertical Datum: MLLW MLW Other:
Depth Measurement: Sounder Leadline
Project Depth: 8.0' Overdredge: 2' + 2' Extra

	Attempt 1	Attempt 2
Time:	<u>10:55</u>	
(A) Measured Water Depth	<u>9.0'</u>	
(B) Tide Height	<u>3.6'</u>	
(C) Mudline Elevation (A-B=C)	<u>5.4'</u>	
(D) Calculated Core Length (PD+OD-C=D)	<u>6.6'</u>	
Estimated Penetration	<u>6.6'</u>	
Description of Core Drive	<u>Smooth</u>	
Refusal Encountered?	<u>No</u>	
Total Core Length Recovered	<u>6.6'</u>	

Core Characteristics

Sediment Type	cobble, gravel, sand C M F, <u>silt clay</u> , organic matter	cobble, gravel, sand C M F, silt clay, organic matter
Sediment Color	<u>gray</u> , black, brown, brown surface, <u>olive</u>	gray, black, brown, brown surface, olive
Sediment Odor	<u>None</u> , slight, mod, strong H ₂ S, petroleum, septic	None, slight, mod, strong H ₂ S, petroleum, septic
Any Layering Homogenous	<u>Homogenous</u>	

Comments: EPE: 6'
SRC-2010-1-3 : 0.0' - 4.6'
SRC-2010-1-3-B: 4.6-6.6

Sediment was olive^{dr} from surface to 6.6 B.S.S.
GRAY

Recorded by: 20



Pacific EcoRisk
Environmental Consulting and Testing

Pacific EcoRisk
2250 Cordelia Road
Fairfield, CA 94534
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Sediment Core Collection Form

Station ID: SRC-2010-1-4 Date: 6/8/10
Project Name: San Rafael Channel Project No.: 16087
Coordinates:
Lat/Northing: 37° 57.6236' Long/Easting: 122° 27.9629'
Vertical Datum: MLLW MLW Other:
Depth Measurement: Sounder Leadline
Project Depth: 8.0' Overdredge: 2' + 2' Extra

	Attempt 1	Attempt 2
Time:	<u>11:50</u>	
(A) Measured Water Depth	<u>9.2</u>	
(B) Tide Height	<u>3.5'</u>	
(C) Mudline Elevation (A-B=C)	<u>5.7'</u>	
(D) Calculated Core Length (PD+OD-C=D)	<u>6.3'</u>	
Estimated Penetration	<u>6.3'</u>	
Description of Core Drive	<u>SMOOTH</u>	
Refusal Encountered?	<u>No</u>	
Total Core Length Recovered	<u>6.3'</u>	

Core

Characteristics

Sediment Type	cobble, gravel, sand C M F, <u>silt clay</u> , organic matter	cobble, gravel, sand C M F, silt clay, organic matter
Sediment Color	<u>gray black</u> brown, <u>brown surface</u> olivine	gray, black, brown, brown surface, olivine
Sediment Odor	<u>None</u> , slight, mod, strong H ₂ S, petroleum, septic	None, slight, mod, strong H ₂ S, petroleum, septic
Any Layering Homogenous	<u>Layering *</u>	

Comments: EPE:

SRC-2010-1-4 : 0.0'-4.3'
SRC-2010-1-4-B : 4.3'-6.3'

* Dark Layers at 1.75'-2.0' and 4.3'-5.3', otherwise sediment was light gray in color.

Recorded by: DB



Pacific EcoRisk
Environmental Consulting and Testing

Pacific EcoRisk
2250 Cordelia Road
Fairfield, CA 94534
Phone: (707) 207-7760
Fax: (707) 207-7916

Sediment Core Collection Form

Station ID: SRC-2010-2-1 Date: ~~6/8/10~~ 6/9/10

Project Name: San Rafael Channel Project No.: 16087

Coordinates:
Lat/Northing: 37° 57.6998' Long/Easting: 122° 28.1555'

Vertical Datum: MLLW MLW Other: _____

Depth Measurement: Sounder Leadline

Project Depth: 8.0' Overdredge: 2.0' + 20' Extra

	Attempt 1	Attempt 2
Time:	08:00	
(A) Measured Water Depth	6.7'	
(B) Tide Height	1.4'	
(C) Mudline Elevation (A-B=C)	5.3'	
(D) Calculated Core Length (PD+OD-C=D)	6.7'	
Estimated Penetration	6.7'	
Description of Core Drive	Smooth	
Refusal Encountered?	No	
Total Core Length Recovered	6.7'	

Core

Characteristics

Sediment Type	cobble, gravel, sand C M F, silt clay, organic matter	cobble, gravel, sand C M F, silt clay, organic matter
Sediment Color	gray, black, brown, brown surface, olivine	gray, black, brown, brown surface, olivine
Sediment Odor	None, slight, mod, strong H ₂ S, petroleum, septic	None, slight, mod, strong H ₂ S, petroleum, septic
Any Layering Homogenous	Layering *	
Comments: EPE: 6' SRC-2010-2-1 : 0.0' - 4.7' SRC-2010-2-1-B : 4.7' - 6.7'		

* 2" thick black sand/clay layer 1.0' B.S.S.
all other material homogeneous gray material

Recorded by: [Signature]



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Sediment Core Collection Form

Station ID: SRC-2010-2-2 Date: 6/9/10

Project Name: San Rafael Channel Project No.: 16087

Coordinates:
Lat/Northing: 37° 57.7405' Long/Easting: 122° 28.3144'

Vertical Datum: MLLW MLW Other: _____

Depth Measurement: Sounder Leadline

Project Depth: 8.0' Overdredge: 2.0' + 2.0' Extra

	Attempt 1	Attempt 2
Time:	<u>08:45</u>	
(A) Measured Water Depth	<u>6.8</u>	
(B) Tide Height	<u>1.9'</u>	
(C) Mudline Elevation (A-B=C)	<u>4.9</u>	
(D) Calculated Core Length (PD+OD-C=D)	<u>7.1'</u>	
Estimated Penetration	<u>7.1'</u>	
Description of Core Drive	<u>Smooth</u>	
Refusal Encountered?	<u>No</u>	
Total Core Length Recovered	<u>7.1'</u>	

Core

Characteristics

Sediment Type	cobble, gravel, sand C M F, <u>silt clay</u> , organic matter	cobble, gravel, sand C M F, silt clay, organic matter
Sediment Color	<u>gray, black</u> , brown, <u>brown surface</u> , olivine	gray, black, brown, brown surface, olivine
Sediment Odor	<u>None</u> , slight, mod, strong H ₂ S, petroleum, septic	None, slight, mod, strong H ₂ S, petroleum, septic
Any Layering Homogenous	<u>Layering</u>	
Comments: <u>EPE: 6'</u> <u>SRC-2010-2-2: 0.0' - 5.1'</u> <u>SRC-2010-2-2-B: 5.1' - 7.1'</u>		

Dark gray layers @ 1.25 and 5.25 B.S.S. each layer was 2" thick.

Recorded by: Dr



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Sediment Core Collection Form

Station ID: SRC-2010-2-3 Date: 6/9/10

Project Name: San Rafael Channel Project No.: 16087

Coordinates: Lat/Northing: 37° 57.7830' Long/Easting: 122° 29.4229'

Vertical Datum: MLLW MLW Other: _____

Depth Measurement: Sounder Leadline

Project Depth: 8.0' Overdredge: 2.0' + 2.0' Extra

	Attempt 1	Attempt 2
Time:	<u>09:20</u>	
(A) Measured Water Depth	<u>8.4'</u>	
(B) Tide Height	<u>2.7'</u>	
(C) Mudline Elevation (A-B=C)	<u>5.7'</u>	
(D) Calculated Core Length (PD+OD-C=D)	<u>6.3'</u>	
Estimated Penetration	<u>6.3'</u>	
Description of Core Drive	<u>smooth</u>	
Refusal Encountered?	<u>No</u>	
Total Core Length Recovered	<u>6.3'</u>	

Core

Characteristics

Sediment Type	cobble, gravel, <u>sand</u> C M F, <u>silt</u> clay, organic matter	cobble, gravel, sand C M F, silt clay, organic matter
Sediment Color	<u>gray</u> , <u>black</u> , brown, <u>brown surface</u> , olivine	gray, black, brown, brown surface, olivine
Sediment Odor	<u>None</u> , slight, mod, strong H ₂ S, petroleum, septic	None, slight, mod, strong H ₂ S, petroleum, septic
Any Layering Homogenous	<u>Layering *</u>	
Comments: <u>EPE: 6'</u> <u>SRC-2010-2-3 : 0.0'-4.3'</u> <u>SRC-2010-2-3-B : 4.3'-6.3'</u>		

Black Sandy Layer from 1.75' - 2.0' B.S.S. all other material gray silt/clay

Recorded by: DR



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Sediment Core Collection Form

Station ID: SRC-2010-2-4 Date: 6/9/10

Project Name: San Rafael Channel Project No.: 16087

Coordinates:
Lat/Northing: 37° 57. 8441' Long/Easting: 122° 28. 5872'

Vertical Datum: MLLW MLW Other:

Depth Measurement: Sounder Leadline

Project Depth: 8.0' Overdredge: 2.0' + 2.0' Extra

	Attempt 1	Attempt 2
Time:	<u>10:15</u>	
(A) Measured Water Depth	<u>9.0'</u>	
(B) Tide Height	<u>3.3'</u>	
(C) Mudline Elevation (A-B=C)	<u>5.7'</u>	
(D) Calculated Core Length (PD+OD-C=D)	<u>6.3'</u>	
Estimated Penetration	<u>6.3'</u>	
Description of Core Drive	<u>Smooth</u>	
Refusal Encountered?	<u>No</u>	
Total Core Length Recovered	<u>6.3'</u>	

Core Characteristics

Sediment Type	cobble, gravel, sand C M F, <u>silt clay</u> organic matter	cobble, gravel, sand C M F, silt clay, organic matter
Sediment Color	<u>gray black</u> , brown, <u>brown surface</u> , olivine	gray, black, brown, brown surface, olivine
Sediment Odor	<u>None</u> , slight, mod, strong H ₂ S, petroleum, septic	None, slight, mod, strong H ₂ S, petroleum, septic
Any Layering Homogenous	<u>Layering x</u>	
Comments: <u>EPE: 6'</u> <u>SRC-2010-2-4 : 0.0' - 4.3'</u> <u>SRC-2010-2-4-B : 4.3' - 6.3'</u>		

Thin black layers of clay (~1" thick) at 1.25, 1.75 and 2.5' B.S.S. Also, dark gray clay layer from 5.3' - 6.3' B.S.S.

Recorded by: [Signature]



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Sediment Core Collection Form

Station ID: SRC-2010-3-1 Date: 6/9/10

Project Name: San Rafael Channel Project No.: 16087

Coordinates:
Lat/Northing: 37° 57.8571' Long/Easting: 122° 28.6511'

Vertical Datum: MLLW MLW Other:

Depth Measurement: Sounder Leadline

Project Depth: 8.0' Overdredge: 2.0' + 2.0' Extra

	Attempt 1	Attempt 2
Time:	<u>11:05</u>	
(A) Measured Water Depth	<u>9.0'</u>	
(B) Tide Height	<u>3.7'</u>	
(C) Mudline Elevation (A-B=C)	<u>5.3'</u>	
(D) Calculated Core Length (PD+OD-C=D)	<u>6.7'</u>	
Estimated Penetration	<u>6.7'</u>	
Description of Core Drive	<u>Smooth</u>	
Refusal Encountered?	<u>No</u>	
Total Core Length Recovered	<u>6.7'</u>	

Core Characteristics

Sediment Type	cobble, gravel, sand C M F, <u>silt clay</u> , organic matter	cobble, gravel, sand C M F, silt clay, organic matter
Sediment Color	<u>gray/black</u> brown, <u>brown surface</u> , olivine	gray, black, brown, brown surface, olivine
Sediment Odor	<u>None</u> , slight, mod, strong H ₂ S, petroleum, septic	None, slight, mod, strong H ₂ S, petroleum, septic
Any Layering Homogenous	<u>Lapping *</u>	
Comments: <u>EDF: 6'</u> <u>SRC-2010-3-1:</u> <u>SRC-2010-3-1-B:</u>	<u>* 5" Brown Surface Black Clay Layers (1" Thick) at 1.5' and 2.5' B.S.S.</u>	

Recorded by: DE



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Sediment Core Collection Form

Station ID: SRC-2010-3-2 Date: 6/9/10

Project Name: San Rafael Channel Project No.: 16087

Coordinates:
Lat/Northing: 37° 57.9123' Long/Easting: 122° 28.7784'

Vertical Datum: MLLW MLW Other:

Depth Measurement: Sounder Leadline

Project Depth: 8.0' Overdredge: 2.0' + 2.0' Extra

	Attempt 1	Attempt 2
Time:	<u>11:40</u>	
(A) Measured Water Depth	<u>8.0'</u>	
(B) Tide Height	<u>3.9'</u>	
(C) Mudline Elevation (A-B=C)	<u>4.1'</u>	
(D) Calculated Core Length (PD+OD-C=D)	<u>7.9</u>	
Estimated Penetration	<u>7.9'</u>	
Description of Core Drive	<u>Smooth</u>	
Refusal Encountered?	<u>No</u>	
Total Core Length Recovered	<u>7.9'</u>	

Core

Characteristics

Sediment Type	cobble, gravel, sand C M F, <u>silt</u> clay, organic matter	cobble, gravel, sand C M F, silt clay, organic matter
Sediment Color	<u>gray/black</u> , brown, <u>brown</u> surface, olivine	gray, black, brown, brown surface, olivine
Sediment Odor	<u>None</u> , slight, mod, strong H ₂ S, petroleum, septic	None, slight, mod, strong H ₂ S, petroleum, septic
Any Layering Homogenous	<u>Layering</u>	
Comments: <u>EPE: 6'</u> <u>SRC-2010-3-2:</u> <u>SRC-2010-3-2-B:</u>		

* Black silt/clay layer @ 2.75-3.0' B.S.S.

Recorded by: [Signature]



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Sediment Core Collection Form

Station ID: SRC-2010-3-3 Date: 6/9/10

Project Name: San Rafael Channel Project No.: 16087

Coordinates:
Lat/Northing: 37° 57.9442' Long/Easting: 122° 28.9166'

Vertical Datum: MLLW MLW Other:

Depth Measurement: Sounder Leadline

Project Depth: 8.0' Overdredge: 2.0' + 2.0' Extra

	Attempt 1	Attempt 2
Time:	<u>12:25</u>	
(A) Measured Water Depth	<u>8.0'</u>	
(B) Tide Height	<u>3.8'</u>	
(C) Mudline Elevation (A-B=C)	<u>4.2'</u>	
(D) Calculated Core Length (PD+OD-C=D)	<u>7.8'</u>	
Estimated Penetration	<u>7.8'</u>	
Description of Core Drive	<u>Smooth</u>	
Refusal Encountered?	<u>No</u>	
Total Core Length Recovered	<u>7.8'</u>	

Core Characteristics

Sediment Type	cobble, gravel, sand C M F, <u>silt clay</u> , organic matter	cobble, gravel, sand C M F, silt clay, organic matter
Sediment Color	<u>gray black</u> , brown, <u>brown surface</u> , olivine	gray, black, brown, brown surface, olivine
Sediment Odor	<u>None</u> , slight, mod, strong H ₂ S, petroleum, septic	None, slight, mod, strong H ₂ S, petroleum, septic
Any Layering Homogenous	<u>Layering*</u>	
Comments: <u>EPE: 6'</u> <u>SRC-2010-3-3 2.0-5.8'</u> <u>SRC-2010-3-3-B: 5.8'-7.8'</u>		

* Bank of black silt/clay from 2.75-3.0' and 5.0-5.1' B.S.S.
Dark Gray material from 7.2-7.9' B.S.S.

Recorded by: [Signature]



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Sediment Core Collection Form

Station ID: SRC-2010-3-4 Date: 6/11/10

Project Name: San Rafael Channel Project No.: 16087

Coordinates: 37° 58.0032' 122° 29.0527'

Lat/Northing: 37° 57.9454' N Long/Easting: 122° 28.9170' W

Vertical Datum: MLLW MLW Other:

Depth Measurement: Sounder Leadline

Project Depth: 8.0' Overdredge: 2.0' + 2.0' Extra

	Attempt 1	Attempt 2
Time:	<u>07:55</u>	
(A) Measured Water Depth	<u>2.0'</u>	
(B) Tide Height	<u>-0.5'</u>	
(C) Mudline Elevation (A-B=C)	<u>2.5'</u>	
(D) Calculated Core Length (PD+OD-C=D)	<u>9.5'</u>	
Estimated Penetration	<u>9.5'</u>	
Description of Core Drive	<u>Smooth</u>	
Refusal Encountered?	<u>No</u>	
Total Core Length Recovered	<u>9.5'</u>	

Core Characteristics

Sediment Type	cobble, gravel, sand C M F, silt clay, organic matter	cobble, gravel, sand C M F, silt clay, organic matter
Sediment Color	gray, black, brown, brown surface, olivine	gray, black, brown, brown surface, olivine
Sediment Odor	None, slight, mod, strong H ₂ S, petroleum, septic	None, slight, mod, strong H ₂ S, petroleum, septic
Any Layering Homogenous	<u>Layering</u>	
Comments: <u>EPE: 6'</u> <u>SRC-2010-3-4 : 0.0'-7.5'</u> <u>SRC-2010-3-4-B : 7.5'-9.5'</u>	<u>- 1" band of sand @ -2.0'. Otherwise all material was uniform (gray silt/clay).</u>	

Recorded by: EG



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Sediment Core Collection Form

Station ID: SRC-2010-4-1 Date: 6/11/10

Project Name: San Rafael Channel Project No.: 16087

Coordinates:
Lat/Northing: 37° 58.0442 Long/Easting: 122° 29.1723

Vertical Datum: MLLW MLW Other:

Depth Measurement: Sounder Leadline

Project Depth: 8.0' Overdredge: 2.0' + 2.0' Extra

	Attempt 1	Attempt 2
Time:	<u>08:40</u>	
(A) Measured Water Depth	<u>3.0'</u>	
(B) Tide Height	<u>0.1'</u>	
(C) Mudline Elevation (A-B=C)	<u>2.9'</u>	
(D) Calculated Core Length (PD+OD-C=D)	<u>9.1'</u>	
Estimated Penetration	<u>9.1'</u>	
Description of Core Drive	<u>Smooth</u>	
Refusal Encountered?	<u>No</u>	
Total Core Length Recovered	<u>9.1'</u>	

Core Characteristics

Sediment Type	cobble, gravel, <u>sand</u> C M F, <u>silt</u> clay, organic matter	cobble, gravel, sand C M F, silt clay, organic matter
Sediment Color	<u>gray</u> , black, brown, brown surface, olivine	gray, black, brown, brown surface, olivine
Sediment Odor	<u>None</u> , slight, mod, strong H ₂ S, petroleum, septic	None, slight, mod, strong H ₂ S, petroleum, septic
Any Layering Homogenous	<u>Layering</u>	
Comments: <u>EPE: 6'</u> <u>SRC-2010-4-1 : 0.0'-7.1'</u> <u>SRC-2010-4-1-B : 7.1'-9.1'</u>		

1" thick layer of sand 1.75' B.S.S. otherwise all material uniform in color and texture.

Recorded by: DE



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Sediment Core Collection Form

Station ID: SRC-2010-4-2 Date: 6/11/10

Project Name: San Rafael Channel Project No.: 16087

Coordinates:
Lat/Northing: 37° 58.0852' Long/Easting: 122° 29.3285'

Vertical Datum: MLLW MLW Other:

Depth Measurement: Sounder Leadline

Project Depth: 8.0' Overdredge: 2.0' + 2.0' Extra

	Attempt 1	Attempt 2
Time:	<u>09:15</u>	
(A) Measured Water Depth	<u>5.0'</u>	
(B) Tide Height	<u>0.8'</u>	
(C) Mudline Elevation (A-B=C)	<u>4.2'</u>	
(D) Calculated Core Length (PD+OD-C=D)	<u>8.3' 7.8'</u>	
Estimated Penetration	<u>8.3' 7.8'</u>	
Description of Core Drive	<u>Smooth</u>	
Refusal Encountered?	<u>No</u>	
Total Core Length Recovered	<u>7.8'</u>	

Core Characteristics

Sediment Type	cobble, gravel, sand C M F, <u>silt</u> clay, organic matter	cobble, gravel, sand C M F, silt clay, organic matter
Sediment Color	<u>gray</u> black, brown, brown surface, olivine	gray, black, brown, brown surface, olivine
Sediment Odor	<u>None</u> , slight, mod, strong H ₂ S, petroleum, septic	None, slight, mod, strong H ₂ S, petroleum, septic
Any Layering Homogenous	<u>Homogenous</u>	
Comments: <u>EPE: 6'</u> <u>SRC-2010-4-2:</u> <u>SRC-2010-4-2-B:</u> <u>Entire Core Consisted of gray silt/clay material.</u>		

Recorded by: DB



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Sediment Core Collection Form

Station ID: SRC-2010-4-3 Date: 6/11/10

Project Name: San Rafael Channel Project No.: 16087

Coordinates:
Lat/Northing: 37°58.1334' Long/Easting: ~~57~~ 122°29.4386'

Vertical Datum: MLLW MLW Other:

Depth Measurement: Sounder Leadline

Project Depth: 8.0' Overdredge: 2.0' + 2.0' Extra

	Attempt 1	Attempt 2
Time:	<u>09:50</u>	
(A) Measured Water Depth	<u>4.9'</u>	
(B) Tide Height	<u>1.4'</u>	
(C) Mudline Elevation (A-B=C)	<u>3.5'</u>	
(D) Calculated Core Length (PD+OD-C=D)	<u>8.5'</u>	
Estimated Penetration	<u>8.5'</u>	
Description of Core Drive	<u>Smooth</u>	
Refusal Encountered?	<u>No</u>	
Total Core Length Recovered	<u>8.5'</u>	

Core

Characteristics

Sediment Type	cobble, gravel, sand C M F, <u>silt</u> clay, organic matter	cobble, gravel, sand C M F, silt clay, organic matter
Sediment Color	<u>gray</u> , black, brown, brown surface, olivine	gray, black, brown, brown surface, olivine
Sediment Odor	<u>None</u> , slight, mod, strong H ₂ S, petroleum, septic	None, slight, mod, strong H ₂ S, petroleum, septic
Any Layering Homogenous	<u>Laminar</u>	
Comments: <u>EPE: 6'</u> <u>SRC-2010-4-3 : 0.0' - 6.5'</u> <u>SRC-2010-4-3-B: 6.5' - 8.5'</u>		

2" thick band of sediment 1.7' below the surf B.S.S.
that was dark gray in color. Otherwise sediment was
uniform medium gray in color.

Recorded by: DE



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Sediment Core Collection Form

Station ID: SRC-2010-4-4 Date: 6/11/10

Project Name: San Rafael Channel Project No.: 16087

Coordinates:
Lat/Northing: 37° 58.1698' Long/Easting: 122° 29.5767'

Vertical Datum: MLLW MLW Other:

Depth Measurement: Sounder Leadline

Project Depth: 80' Overdredge: 2.0' + 2.0' Extra

	Attempt 1	Attempt 2
Time:	<u>10:30</u>	
(A) Measured Water Depth	<u>5.4'</u>	
(B) Tide Height	<u>2.1'</u>	
(C) Mudline Elevation (A-B=C)	<u>3.3'</u>	
(D) Calculated Core Length (PD+OD-C=D)	<u>8.7'</u>	
Estimated Penetration	<u>8.7'</u>	
Description of Core Drive	<u>Smooth</u>	
Refusal Encountered?	<u>No</u>	
Total Core Length Recovered	<u>8.7'</u>	

Core

Characteristics

Sediment Type	cobble, gravel, sand C M F, <u>silt clay</u> , organic matter	cobble, gravel, sand C M F, silt clay, organic matter
Sediment Color	<u>gray</u> , black, brown, brown surface, olivine	gray, black, brown, brown surface, olivine
Sediment Odor	<u>None</u> slight, mod, strong H ₂ S, petroleum, septic	None, slight, mod, strong H ₂ S, petroleum, septic
Any Layering Homogenous	<u>Layering</u>	
Comments: <u>EPE: 6'</u> <u>SRC-2010-4-4: 0.0'-6.7'</u> <u>SRC-2010-4-4-B: 6.7'-8.7'</u>		
<u>Two dark gray bands of sediment at 1.0' B.S.S. and 1.75 B.S.S. otherwise all material was gray silt/clay</u>		

Recorded by: DE



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Sediment Core Collection Form

Station ID: SRC-2010-5-1 Date: 6/8/10

Project Name: San Rafael Channel Project No.: 16087

Coordinates:
Lat/Northing: 37° 58' 19.02" N Long/Easting: 122° 29' 62.79" W

Vertical Datum: MLLW MLW Other: _____

Depth Measurement: Sounder Leadline

Project Depth: 6.0' Overdredge: 2.0' + 2.0' Extra

	Attempt 1	Attempt 2
Time:	<u>14:45</u>	
(A) Measured Water Depth	<u>5.8'</u>	/
(B) Tide Height	<u>2.4'</u>	
(C) Mudline Elevation (A-B=C)	<u>2.4' to 3.4'</u>	
(D) Calculated Core Length (PD+OD-C=D)	<u>6.6'</u>	
Estimated Penetration	<u>6.6'</u>	
Description of Core Drive	<u>Smooth</u>	
Refusal Encountered?	<u>No</u>	
Total Core Length Recovered	<u>6.6'</u>	

Core Characteristics

Sediment Type	cobble, gravel, sand C M F, <u>silt clay</u> organic matter	cobble, gravel, sand C M F, silt clay, organic matter
Sediment Color	<u>gray</u> black, brown, brown surface, olivine	gray, black, brown, brown surface, olivine
Sediment Odor	<u>None</u> slight, mod, strong H ₂ S, petroleum, septic	None, slight, mod, strong H ₂ S, petroleum, septic
Any Layering Homogenous	<u>Layering *</u>	
Comments: EPE: 6' SRC-2010-5-1 SRC-2010-5-1 : 0.0' - 4.6' SRC-2010-5-1-B : 4.6' - 6.6'		

*1" bands of black sediment @ 1.75 and 2.0' B.S.S.
otherwise all sediment gray and homogenous.

Recorded by: JS



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Sediment Core Collection Form

Station ID: SRC-2010-5-2 Date: 6/8/10

Project Name: San Rafael Channel Project No.: 16087

Coordinates: 2115
Lat/Northing: 37° 58' 6923" N Long/Easting: 122° 29' 2115" W

Vertical Datum: MLLW MLW Other: _____

Depth Measurement: Sounder Leadline

Project Depth: 6.0' Overdredge: 2.0' + 2.0' Extra

	Attempt 1	Attempt 2
Time:	<u>15:10</u>	
(A) Measured Water Depth	<u>5.8'</u>	
(B) Tide Height	<u>2.2'</u>	
(C) Mudline Elevation (A-B=C)	<u>3.6'</u>	
(D) Calculated Core Length (PD+OD-C=D)	<u>6.4'</u>	
Estimated Penetration	<u>6.4'</u>	
Description of Core Drive	<u>Smooth</u>	
Refusal Encountered?	<u>No</u>	
Total Core Length Recovered	<u>6.4'</u>	

Core Characteristics

Sediment Type	cobble, gravel, sand C M F, <u>silt</u> clay, organic matter	cobble, gravel, sand C M F, silt clay, organic matter
Sediment Color	<u>gray/black</u> , brown, brown surface, olivine	gray, black, brown, brown surface, olivine
Sediment Odor	None <u>slight</u> , mod, strong H ₂ S, <u>petroleum</u> , septic	None, slight, mod, strong H ₂ S, petroleum, septic
Any Layering Homogenous	<u>Layering</u>	
Comments: <u>EPE: 6'</u> <u>SRC-2010-5-2 : 0.0' - 4.4'</u> <u>SRC-2010-5-2-B: 4.4' - 6.4'</u>		

Black Layers of Sediment @ 1.0' and 2.0' B.S.S.
Petroleum odor observed in SRC-2010-5-2-B
Section of Core

Recorded by: DE



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Fax: (707) 207-7916

Sediment Core Collection Form

Station ID: SRC-2010-5-3 Date: 6/8/10

Project Name: San Rafael Channel Project No.: 16087

Coordinates:
Lat/Northing: 37°58.2060' Long/Easting: 122°29.8990'

Vertical Datum: MLLW MLW Other:

Depth Measurement: Sounder Leadline

Project Depth: 6.0' Overdredge: 2.0' + 2.0' Extra

	Attempt 1	Attempt 2
Time:	<u>16:20</u>	
(A) Measured Water Depth	<u>6.0'</u>	
(B) Tide Height	<u>2.4'</u>	
(C) Mudline Elevation (A-B=C)	<u>3.6'</u>	
(D) Calculated Core Length (PD+OD-C=D)	<u>6.4'</u>	
Estimated Penetration	<u>6.4'</u>	
Description of Core Drive	<u>Smooth</u>	
Refusal Encountered?	<u>No</u>	
Total Core Length Recovered	<u>6.4'</u>	

Core

Characteristics

Sediment Type	cobble, gravel, sand C M F, <u>silt clay</u> , organic matter	cobble, gravel, sand C M F, silt clay, organic matter
Sediment Color	<u>gray</u> , black, brown, brown surface, olivine	gray, black, brown, brown surface, olivine
Sediment Odor	None, <u>slight</u> , mod, strong <u>H₂S</u> , petroleum, septic	None, slight, mod, strong H ₂ S, petroleum, septic
Any Layering Homogenous	<u>Homogenous</u>	
Comments: <u>EPE: 6'</u> <u>SRC-2010-5-3 : 0.0' - 4.4'</u> <u>SRC-2010-5-3-B: 4.4' - 6.4'</u>		

No stratification evident. Core was all the same gray material.

Recorded by: de



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Sediment Core Collection Form

Station ID: SRC-2010-5-4 Date: 6/9/10
Project Name: San Rafael Channel Project No.: 16087
Coordinates: Lat/Northing: 37° 58.1815' Long/Easting: 122° 29.9558'
Vertical Datum: MLLW MLW Other:
Depth Measurement: Sounder Leadline
Project Depth: ~~8.0~~ 6.0' Overdredge: 2.0' + 2.0' Extra

	Attempt 1	Attempt 2
Time:	<u>13:35</u>	
(A) Measured Water Depth	<u>5.8'</u>	
(B) Tide Height	<u>2.4 2.4 3.4'</u>	
(C) Mudline Elevation (A-B=C)	<u>2.4'</u>	
(D) Calculated Core Length (PD+OD-C=D)	<u>7.6'</u>	
Estimated Penetration	<u>7.6'</u>	
Description of Core Drive	<u>Smooth</u>	
Refusal Encountered?	<u>No</u>	
Total Core Length Recovered	<u>7.6'</u>	

Core Characteristics

Sediment Type	cobble, gravel, sand C M F, <u>silt</u> clay, organic matter	cobble, gravel, sand C M F, silt clay, organic matter
Sediment Color	<u>gray</u> , black, brown, <u>brown surface</u> , olivine	gray, black, brown, brown surface, olivine
Sediment Odor	<u>None</u> , slight, mod, strong H ₂ S, petroleum, septic	None, slight, mod, strong H ₂ S, petroleum, septic
Any Layering Homogenous	<u>Homogenous</u>	
Comments: <u>EPE: 6'</u> <u>SRC-2010-5-4 : 0.0' - 5.6'</u> <u>SRC-2010-5-4-B : 5.6' - 7.6'</u> Except for sediment surface, all material was uniform in color and texture.		

Recorded by: de



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Sediment Core Collection Form

Station ID: SRC-2010-5-5 Date: 6/9/10

Project Name: San Rafael Channel Project No.: 16087

Coordinates:
Lat/Northing: 37° 58.1529' Long/Easting: 122° 30.015'

Vertical Datum: MLLW MLW Other:

Depth Measurement: Sounder Leadline

Project Depth: 6.0' Overdredge: 2.0' + 2.0' Extra

	Attempt 1	Attempt 2
Time:	<u>14:15</u>	
(A) Measured Water Depth	<u>6.0'</u>	
(B) Tide Height	<u>3.2 3.1'</u>	
(C) Mudline Elevation (A-B=C)	<u>3 2.9'</u>	
(D) Calculated Core Length (PD+OD-C=D)	<u>7.1'</u>	
Estimated Penetration	<u>7.1'</u>	
Description of Core Drive	<u>Smooth</u>	
Refusal Encountered?	<u>No</u>	
Total Core Length Recovered	<u>7.1'</u>	

Core Characteristics

Sediment Type	cobble, gravel, sand C M F, <u>silt</u> clay, organic matter	cobble, gravel, sand C M F, silt clay, organic matter
Sediment Color	<u>gray</u> black, brown, brown surface, olivine	gray, black, brown, brown surface, olivine
Sediment Odor	None, <u>slight</u> , mod, strong H ₂ S, <u>petroleum</u> , septic	None, slight, mod, strong H ₂ S, petroleum, septic
Any Layering Homogenous	<u>Layering +</u>	
Comments: <u>EPE: 6'</u> <u>SRC-2010-5-5: 0.0' - 5.1'</u> <u>SRC-2010-5-5-B: 5.1' - 7.1'</u>		

- all material gray except for 2" band of black sediment with shell fragments 3.8' B.S.S.
B-Layer had slight petroleum odor.

Recorded by: JS



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Sediment Core Collection Form

Station ID: SRC-2010-5-6 Date: 6/9/10

Project Name: San Rafael Channel Project No.: 16087

Coordinates:
Lat/Northing: 37° 58.1056' Long/Easting: 122° 30.1423'

Vertical Datum: MLLW MLW Other:

Depth Measurement: Sounder Leadline

Project Depth: 6.0' Overdredge: 2.0' + 2.0' Extra

	Attempt 1	Attempt 2
Time:	<u>14:55</u>	
(A) Measured Water Depth	<u>7.3</u>	
(B) Tide Height	<u>2.8'</u>	
(C) Mudline Elevation (A-B=C)	<u>4.5</u>	
(D) Calculated Core Length (PD+OD-C=D)	<u>5.5</u>	
Estimated Penetration	<u>5.5'</u>	
Description of Core Drive	<u>Smooth</u>	
Refusal Encountered?	<u>No</u>	
Total Core Length Recovered	<u>5.5'</u>	

Core

Characteristics

Sediment Type	cobble, gravel, sand C M F, <u>silt</u> clay, organic matter	cobble, gravel, sand C M F, silt clay, organic matter
Sediment Color	<u>gray</u> , black, brown, <u>brown surface</u> , olivine	gray, black, brown, brown surface, olivine
Sediment Odor	<u>None</u> , slight, mod, strong H ₂ S, petroleum, septic	None, slight, mod, strong H ₂ S, petroleum, septic
Any Layering Homogenous	<u>Homogenous</u>	
Comments: <u>EPE: 6'</u> <u>SRC-2010-5-6: 0.0' - 3.5'</u> <u>SRC-2010-5-6-B: 3.5' - 5.5'</u> <u>- Sediment core was homogenous with the exception of the brown surface.</u>		

Recorded by: DR



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Sediment Core Collection Form

Station ID: SRC-2010-6-1 Date: 6/9/10

Project Name: San Rafael Channel Project No.: 16087

Coordinates:
Lat/Northing: 37°58 0627' Long/Easting: 122°30.2888'

Vertical Datum: MLLW MLW Other:

Depth Measurement: Sounder Leadline

Project Depth: 6.0' Overdredge: 2.0' + 2.0' Extra

	Attempt 1	Attempt 2
Time:	<u>15:30</u>	
(A) Measured Water Depth	<u>6.0'</u>	
(B) Tide Height	<u>2.5'</u>	
(C) Mudline Elevation (A-B=C)	<u>3.5'</u>	
(D) Calculated Core Length (PD+OD-C=D)	<u>6.5'</u>	
Estimated Penetration	<u>6.5'</u>	
Description of Core Drive	<u>SMOOTH</u>	
Refusal Encountered?	<u>No</u>	
Total Core Length Recovered	<u>6.5'</u>	

Core Characteristics

Sediment Type	cobble, gravel, sand C M F, <u>silt clay</u> , organic matter	cobble, gravel, sand C M F, silt clay, organic matter
Sediment Color	<u>gray</u> , black, brown, <u>brown surface</u> , olivine	gray, black, brown, brown surface, olivine
Sediment Odor	<u>None</u> , slight, mod, strong H ₂ S, petroleum, septic	None, slight, mod, strong H ₂ S, petroleum, septic
Any Layering Homogenous		

Comments: EPE: 6'
SRC-2010-6-1 : 0.0' - 4.5'
SRC-2010-6-1-B : 4.5' - 6.5'

Except for brown surface, entire core was composed of gray silt/clay.

Recorded by: DB



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Sediment Core Collection Form

Station ID: SRC-2010-6-2 Date: 6/9/10

Project Name: San Rafael Channel Project No.: 16087

Coordinates: 38° 58' 01.65" N Lat/Northing: 122° 30.3673' W Long/Easting:

Vertical Datum: MLLW MLW Other:

Depth Measurement: Sounder Leadline

Project Depth: 6.0' Overdredge: 2.0' + 2.0' Extra

	Attempt 1	Attempt 2
Time:	<u>15:50</u>	
(A) Measured Water Depth	<u>5.8'</u>	
(B) Tide Height	<u>2.5'</u>	
(C) Mudline Elevation (A-B=C)	<u>3.3'</u>	
(D) Calculated Core Length (PD+OD-C=D)	<u>6.7'</u>	
Estimated Penetration	<u>6.7'</u>	
Description of Core Drive	<u>Smooth</u>	
Refusal Encountered?	<u>No</u>	
Total Core Length Recovered	<u>6.7'</u>	

Core

Characteristics

Sediment Type	cobble, gravel, sand C M F, <u>silt clay</u> , organic matter	cobble, gravel, sand C M F, silt clay, organic matter
Sediment Color	<u>gray/black</u> , brown, brown surface, olivine	gray, black, brown, brown surface, olivine
Sediment Odor	<u>None</u> , slight, mod, strong H ₂ S, petroleum, septic	None, slight, mod, strong H ₂ S, petroleum, septic
Any Layering Homogenous	<u>*</u>	
Comments: <u>EPE 6.1</u> <u>SRC-2010-6-2:</u> <u>SRC-2010-6-2-B:</u>	<u>* No Layering was evident, but sediment was marble-like with gray/black alternating all throughout core.</u>	

Recorded by: AR



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Sediment Core Collection Form

Station ID: SRC-2010-6-3 Date: 6/9/10
Project Name: San Rafael Channel Project No.: 16087
Coordinates:
Lat/Northing: 37° 57.4563', 9853' Long/Easting: 122° 30.4600'
Vertical Datum: MLLW MLW Other:
Depth Measurement: Sounder Leadline
Project Depth: 6.0' Overdredge: 2.0' + 2.0' Extra

	Attempt 1	Attempt 2
Time:	<u>16:35</u>	
(A) Measured Water Depth	<u>6.5'</u>	
(B) Tide Height	<u>2.5'</u>	
(C) Mudline Elevation (A-B=C)	<u>4.0'</u>	
(D) Calculated Core Length (PD+OD-C=D)	<u>6.0'</u>	
Estimated Penetration	<u>6.0'</u>	
Description of Core Drive	<u>smooth</u>	
Refusal Encountered?	<u>No</u>	
Total Core Length Recovered	<u>6.0'</u>	

Core

Characteristics

Sediment Type	cobble, gravel, sand C M F, <u>silt clay</u> , organic matter	cobble, gravel, sand C M F, silt clay, organic matter
Sediment Color	<u>gray</u> , black, brown, brown surface, olivine	gray, black, brown, brown surface, olivine
Sediment Odor	<u>None</u> slight, mod, strong H ₂ S, petroleum, septic	None, slight, mod, strong H ₂ S, petroleum, septic
Any Layering Homogenous	<u>Homogeneous</u>	
Comments: <u>EPE: 6</u> <u>SRC-2010-6-3: 0.0' - 4.0'</u> <u>SRC-2010-6-3-B: 4.0' - 6.0'</u>		

Recorded by: DE



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Sediment Core Collection Form

Station ID: SRC-2010-6-4 Date: 6/10/10

Project Name: San Rafael Channel Project No.: 16087

Coordinates:
Lat/Northing: 37° 58.0439' Long/Easting: 122° 30.6349'

Vertical Datum: MLLW MLW Other:

Depth Measurement: Sounder Leadline

Project Depth: 6.0' Overdredge: 2.0'+2.0'

	Attempt 1	Attempt 2
Time:	<u>08:25</u>	
(A) Measured Water Depth	<u>5.4</u>	
(B) Tide Height	<u>0.8</u>	
(C) Mudline Elevation (A-B=C)	<u>4.6</u>	
(D) Calculated Core Length (PD+OD-C=D)	<u>5.4</u>	
Estimated Penetration	<u>5.4'</u>	
Description of Core Drive	<u>Smooth</u>	
Refusal Encountered?	<u>No</u>	
Total Core Length Recovered	<u>5.4'</u>	

Core Characteristics

Sediment Type	cobble, gravel, sand C M F, <u>silt clay</u> , organic matter	cobble, gravel, sand C M F, silt clay, organic matter
Sediment Color	<u>gray</u> , black, brown, brown surface, olivine	gray, black, brown, brown surface, olivine
Sediment Odor	<u>None</u> , slight, mod, strong H ₂ S, petroleum, septic	None, slight, mod, strong H ₂ S, petroleum, septic
Any Layering Homogenous	<u>Homogenous</u>	
Comments: <u>EPE: 6'</u> <u>SRC-2010-6-4 : 0.0'-3.4'</u> <u>SRC-2010-6-4-B : 3.4'-5.4'</u>		

Recorded by: JP



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Sediment Core Collection Form

Station ID: SRC-2010-7-1 Date: 6/10/10

Project Name: San Rafael Channel Project No.: 16087

Coordinates: 0683'
Lat/Northing: 37°58.0688 Long/Easting: 122°30.6583'

Vertical Datum: MLLW MLW Other:

Depth Measurement: Sounder Leadline

Project Depth: 6.0' Overdredge: 2.0' + 2.0' Extra

	Attempt 1	Attempt 2
Time:	<u>09:00</u>	
(A) Measured Water Depth	<u>6.4'</u>	
(B) Tide Height	<u>1.4'</u>	
(C) Mudline Elevation (A-B=C)	<u>5.0'</u>	
(D) Calculated Core Length (PD+OD-C=D)	<u>5.0'</u>	
Estimated Penetration	<u>5.0'</u>	
Description of Core Drive	<u>smooth Hit Refusal @ 5.0' B.S.S.</u>	
Refusal Encountered?	<u>Yes</u>	
Total Core Length Recovered	<u>5.0'</u>	

Core

Characteristics

Sediment Type	cobble, gravel, sand C M F, <u>silt clay</u> , organic matter	cobble, gravel, sand C M F, silt clay, organic matter
Sediment Color	<u>gray</u> , black, <u>brown</u> , brown surface, olivine	gray, black, brown, brown surface, olivine
Sediment Odor	<u>None</u> , slight, mod, strong H ₂ S, petroleum, septic	None, slight, mod, strong H ₂ S, petroleum, septic
Any Layering Homogenous	<u>Layering?</u>	
Comments: <u>EPE: 6'</u> <u>SRC-2010-7-1 : 0.0-3.0</u> <u>SRC-2010-7-1-B : 3.0-3.5</u> <u>SRC-2010-7-1-B : 3.5-5.0</u>	<u>Entire core consisted of gray silt/clay, with the exception of hard brown clay material at bottom of core. This brown clay material was almost dry.</u>	

Recorded by: DE



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Sediment Core Collection Form

Station ID: SRC-2010-7-2 Date: 6/10/10

Project Name: San Rafael Channel Project No.: 16087

Coordinates:
Lat/Northing: 37° 58.0973' Long/Easting: 122° 30.7466'

Vertical Datum: MLLW MLW Other:

Depth Measurement: Sounder Leadline

Project Depth: 6.0' Overdredge: 2.0' + 2.0' Extra

	Attempt 1	Attempt 2
Time:	<u>09:40</u>	
(A) Measured Water Depth	<u>7.5'</u>	
(B) Tide Height	<u>2.1'</u>	
(C) Mudline Elevation (A-B=C)	<u>5.4'</u>	
(D) Calculated Core Length (PD+OD-C=D)	<u>4.6'</u>	
Estimated Penetration	<u>4.6'</u>	
Description of Core Drive	<u>Smooth</u>	
Refusal Encountered?	<u>No</u>	
Total Core Length Recovered	<u>4.6'</u>	

Core Characteristics

Sediment Type	cobble, gravel, sand C M F, <u>silt clay</u> , organic matter	cobble, gravel, sand C M F, silt clay, organic matter
Sediment Color	<u>gray</u> , black, brown, brown surface, olivine	gray, black, brown, brown surface, olivine
Sediment Odor	<u>None</u> , slight, mod, strong H ₂ S, petroleum, septic	None, slight, mod, strong H ₂ S, petroleum, septic
Any Layering Homogenous		

Comments: EPE: 6'
SRC-2010-7-2: 0.0'-2.6'
SRC-2010-7-2-B: 2.6'-3.1'
SRC-2010-7-2-B: 3.1'-4.6'

- Entire Core composed of The same gray silt/clay from surface to 4.6' B.S.S.

Recorded by: DE



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Sediment Core Collection Form

Station ID: SRC-2010-7-3 Date: 6/10/10

Project Name: Son Rafael Channel Project No.: 16087

Coordinates:
Lat/Northing: 37° 58.0990' Long/Easting: 122° 30.8012'

Vertical Datum: MLLW MLW Other: _____

Depth Measurement: Sounder Leadline

Project Depth: 6.0' Overdredge: 2.0' + 2.0' Extra

	Attempt 1	Attempt 2
Time:	10:10	
(A) Measured Water Depth	6.5'	
(B) Tide Height	2.7'	
(C) Mudline Elevation (A-B=C)	3.8'	
(D) Calculated Core Length (PD+OD-C=D)	6.2'	
Estimated Penetration	6.2'	
Description of Core Drive	Smooth	
Refusal Encountered?	No	
Total Core Length Recovered	6.2'	

Core Characteristics

Sediment Type	cobble, gravel, sand C M F, silt clay, organic matter	cobble, gravel, sand C M F, silt clay, organic matter
Sediment Color	gray, black, brown, brown surface, olivine	gray, black, brown, brown surface, olivine
Sediment Odor	None, slight, mod, strong H ₂ S, petroleum, septic	None, slight, mod, strong H ₂ S, petroleum, septic
Any Layering Homogenous	Layering	
Comments: EPE 6' SRC-2010-7-3 : 0.0'-4.2' SRC-2010-7-3-Z : 4.2'-4.7' SRC-2010-7-3-B : 4.7'-6.2'	- Sediment Core gray from except for black lenticles 3.0'-3.3' and 4.3'-4.5' - moderate petroleum odor detected in lower portion of 7-3 and in 7-3-Z, but not in 7-3-B.	

Recorded by: ES



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Sediment Core Collection Form

Station ID: SRC-2010-7-4 Date: 6/10/10

Project Name: San Rafael Channel Project No.: 16087

Coordinates:
Lat/Northing: 37° 58.1290' Long/Easting: 122° 30.9375'

Vertical Datum: MLLW MLW Other:

Depth Measurement: Sounder Leadline

Project Depth: 6.0' Overdredge: 2.0' + 2.0' Extra

	Attempt 1	Attempt 2
Time:	<u>10:35</u>	
(A) Measured Water Depth	<u>7.7'</u>	
(B) Tide Height	<u>3.0'</u>	
(C) Mudline Elevation (A-B=C)	<u>4.7'</u>	
(D) Calculated Core Length (PD+OD-C=D)	<u>5.3'</u>	
Estimated Penetration	<u>5.3'</u>	
Description of Core Drive	<u>Smooth</u>	
Refusal Encountered?	<u>No</u>	
Total Core Length Recovered	<u>5.3'</u>	

Core Characteristics

Sediment Type	cobble, gravel, sand C M F, <u>silt clay</u> , <u>organic matter</u>	cobble, gravel, sand C M F, silt clay, organic matter
Sediment Color	<u>gray</u> , <u>black</u> , brown, brown surface, olivine	gray, black, brown, brown surface, olivine
Sediment Odor	None, slight <u>mod</u> , <u>strong</u> <u>H₂S</u> , <u>petroleum</u> , septic	None, slight, mod, strong H ₂ S, petroleum, septic
Any Layering Homogenous		
Comments: EPE: 6' SRC-2010-7-4: 0.0'-3.3' SRC-2010-7-4-2: 3.3'-3.8' SRC-2010-7-4-8: 3.8'-5.3' - Strong H ₂ S odor from 1.0'-2.0' B.S.S. - lots of organic material. - Moderate Petroleum odor from 2.5'-3.8' B.S.S. (Black sediment also in this region) - Rest of core was gray		

Recorded by: DC



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Sediment Core Collection Form

Station ID: SRC-2010-7-5 Date: 6/10/10

Project Name: San Rafael Channel Project No.: 16087

Coordinates: ATT 2: 37° 58.1418' 122° 31.070'
Lat/Northing: 37° 58.1411' Long/Easting: 122° 31.0161'

Vertical Datum: MLLW MLW Other:

Depth Measurement: Sounder Leadline

Project Depth: 6.0' Overdredge: 2.0' + 2.0' Extra

	Attempt 1	Attempt 2
Time:	<u>11:00</u>	<u>11:15</u>
(A) Measured Water Depth	<u>7.0</u>	<u>6.7'</u>
(B) Tide Height	<u>3.3'</u>	<u>3.6'</u>
(C) Mudline Elevation (A-B=C)	<u>3.7'</u>	<u>3.1'</u>
(D) Calculated Core Length (PD+OD-C=D)	<u>6.3'</u>	<u>6.9'</u>
Estimated Penetration	<u>6.3' 5.0'</u>	<u>6.9'</u>
Description of Core Drive	<u>Hard refusal @ 5.0'</u>	<u>Smooth</u>
Refusal Encountered?	<u>Yes</u>	<u>No</u>
Total Core Length Recovered	<u>5.0'</u>	<u>6.9'</u>

Core

Characteristics

Sediment Type	cobble, gravel, sand C M F, silt clay, <u>organic matter</u>	cobble, gravel, sand C M F, silt clay, <u>organic matter</u>
Sediment Color	gray, <u>black</u> , brown, brown surface, olivine	<u>gray black</u> , brown, brown surface, olivine
Sediment Odor	None, slight <u>mod.</u> strong <u>H₂S</u> , petroleum, septic	None <u>slight mod.</u> strong <u>H₂S</u> , petroleum, septic
Any Layering Homogenous		
Comments: <u>EPE: 6'</u> <u>SRC-2010-7-5: 0.0-4.3' 0.0-4.9'</u> <u>SRC-2010-7-5-2: 4.3'-4.8' 4.9-5.4'</u> <u>SRC-2010-7-5-B: 4.8'-6.9' 5.4'-6.9'</u>		

* Hard Refusal at initial sampling location shot 10' towards Center of Channel to Collect a 2nd Core.
* Retained 2nd Core.

Recorded by: DE

- Top 4.0' full of organic material, mild H₂S odor. Color was black.
- Moderate petroleum odor from 5.0'-6.9' B.S.S. sediment was all dark gray silt/clay.



Pacific EcoRisk
Environmental Consulting and Testing

Pacific EcoRisk
2250 Cordelia Road
Fairfield, CA 94534
Phone: (707) 207-7760
Fax: (707) 207-7916

Sediment Core Collection Form

Station ID: SRC-2010-8-1 Date: 6/10/10

Project Name: San Rafael Channel Project No.: 16087

Coordinates:
Lat/Northing: 37° 58.1357' Long/Easting: 122° 31.0571'

Vertical Datum: MLLW MLW Other: _____

Depth Measurement: Sounder Leadline

Project Depth: 6.0' Overdredge: 2.0' + 2.0' Extra

	Attempt 1	Attempt 2
Time:	<u>11:55</u>	
(A) Measured Water Depth	<u>8.5'</u>	/
(B) Tide Height	<u>4.0'</u>	
(C) Mudline Elevation (A-B=C)	<u>4.5'</u>	
(D) Calculated Core Length (PD+OD-C=D)	<u>5.5'</u>	
Estimated Penetration	<u>5.5'</u>	
Description of Core Drive	<u>Smooth</u>	
Refusal Encountered?	<u>No</u>	
Total Core Length Recovered	<u>5.5'</u>	

Core Characteristics

Sediment Type	cobble, gravel, sand C M F, <u>silt clay</u> , organic matter	cobble, gravel, sand C M F, silt clay, organic matter
Sediment Color	<u>gray, black</u> , brown, brown surface, olivine	gray, black, brown, brown surface, olivine
Sediment Odor	None, slight, <u>mod</u> , strong <u>H₂S</u> , petroleum, septic	None, slight, mod, strong H ₂ S, petroleum, septic
Any Layering Homogenous	<u>Layering</u>	
Comments: <u>EPE: 6'</u> <u>SRC-2010-8-1 : 0.0-3.5'</u> <u>SRC-2010-8-1-Z : 3.5'-4.0'</u> <u>SRC-2010-8-1-B : 4.0'-5.5'</u>		

- Top 0.5' - gray silt/clay
- 0.5' - 2.5' Black organic/silt material
- 2.5' - Bottom dark gray sediment with moderate petroleum odor.

Recorded by: DE



Pacific EcoRisk
Environmental Consulting and Testing

Pacific EcoRisk
2250 Cordelia Road
Fairfield, CA 94534
Phone: (707) 207-7760
Fax: (707) 207-7916

Sediment Core Collection Form

Station ID: SRC-2010-8-2 Date: 6/10/10

Project Name: San Rafael Channel Project No.: 16087

Coordinates:
Lat/Northing: 37° 58.1526' Long/Easting: 122° 31.0598'

Vertical Datum: MLLW MLW Other:

Depth Measurement: Sounder Leadline

Project Depth: 6.0' Overdredge: 2.0' + 2.0' Extra

	Attempt 1	Attempt 2
Time:	<u>12:45</u>	
(A) Measured Water Depth	<u>7.5'</u>	
(B) Tide Height	<u>4.2'</u>	
(C) Mudline Elevation (A-B=C)	<u>3.3'</u>	
(D) Calculated Core Length (PD+OD-C=D)	<u>6.7'</u>	
Estimated Penetration	<u>6.7'</u>	
Description of Core Drive	<u>Smooth</u>	
Refusal Encountered?	<u>No</u>	
Total Core Length Recovered	<u>3.0'</u>	

Core

Characteristics

Sediment Type	cobble, gravel, sand C M F, <u>silt clay, organic matter</u>	cobble, gravel, sand C M F, silt clay, organic matter
Sediment Color	<u>gray/black</u> , brown, brown surface, olivine	gray, black, brown, brown surface, olivine
Sediment Odor	None, slight, <u>mod</u> , strong <u>H₂S</u> , petroleum, septic	None, slight, mod, strong H ₂ S, petroleum, septic
Any Layering Homogenous	<u>Layering</u>	
Comments: <u>EPE: 6'</u> <u>SRC-2010-8-2</u> <u>SRC-2010-8-2-2:</u> <u>SRC-2010-8-2-8:</u>	<u>Core transported to Lab intact.</u>	

Recorded by: DE



Pacific EcoRisk
Environmental Consulting and Testing

Pacific EcoRisk
2250 Cordelia Road
Fairfield, CA 94534
Phone: (707) 207-7760
Fax: (707) 207-7916

Sediment Core Collection Form

Station ID: SRC-2010-8-3 Date: 6/10/10

Project Name: San Rafael Channel Project No.: 16087

Coordinates:
Lat/Northing: 37° 58.1605' Long/Easting: 122° 31.0974'

Vertical Datum: MLLW MLW Other:

Depth Measurement: Sounder Leadline

Project Depth: 6.0' Overdredge: 2.0' + 2.0' Extra

	Attempt 1	Attempt 2
Time:	<u>13:30</u>	
(A) Measured Water Depth	<u>5.8'</u>	
(B) Tide Height	<u>4.1'</u>	
(C) Mudline Elevation (A-B=C)	<u>1.7'</u>	
(D) Calculated Core Length (PD+OD-C=D)	<u>8.3'</u>	
Estimated Penetration	<u>8.3'</u>	
Description of Core Drive	<u>Smooth</u>	
Refusal Encountered?	<u>No</u>	
Total Core Length Recovered	<u>8.3' 4.6'</u>	

Core

Characteristics

Sediment Type	cobble, gravel, sand C M F, <u>silt clay</u> , organic matter	cobble, gravel, sand C M F, silt clay, organic matter
Sediment Color	<u>gray black</u> , brown, brown surface, olivine	gray, black, brown, brown surface, olivine
Sediment Odor	None, slight, <u>mod</u> , strong <u>H₂S</u> petroleum, septic	None, slight, <u>mod</u> , strong H ₂ S, petroleum, septic
Any Layering Homogenous	<u>Layering</u>	
Comments: <u>EPE: 6'</u> <u>SRC-2010-8-3:</u> <u>SRC-2010-8-3-2:</u> <u>SRC-2010-8-3-B:</u>	<u>- kept Core intact for sectioning at PER</u>	

Recorded by: DE



Pacific EcoRisk
Environmental Consulting and Testing

Pacific EcoRisk
2250 Cordelia Road
Fairfield, CA 94534
Phone: (707) 207-7760
Fax: (707) 207-7916

Sediment Core Collection Form

Station ID: SRC-2010-8-4 Date: 6/11/10

Project Name: San Rafael Channel Project No.: 16087

Coordinates: 37° 58.1658 122° 31.1227
Lat/Northing: 37° 58.1658 N Long/Easting: 122° 31.1227 W

Vertical Datum: MLLW MLW Other:

Depth Measurement: Sounder Leadline

Project Depth: 6.0' Overdredge: 2.0' + 2.0' Extra

	Attempt 1	Attempt 2
Time:	<u>11:40</u>	
(A) Measured Water Depth	<u>5.0'</u>	
(B) Tide Height	<u>3.5'</u>	
(C) Mudline Elevation (A-B=C)	<u>1.5'</u>	
(D) Calculated Core Length (PD+OD-C=D)	<u>8.5'</u>	
Estimated Penetration	<u>5.5'</u>	
Description of Core Drive	<u>Hard Refusal @ 5.5'</u>	
Refusal Encountered?	<u>Yes</u>	
Total Core Length Recovered	<u>5.5'</u>	

Core

Characteristics

Sediment Type	cobble, <u>gravel</u> , <u>sand</u> C M F, silt clay <u>organic matter</u>	cobble, gravel, sand C M F, silt clay, organic matter
Sediment Color	gray, <u>black</u> , brown, brown surface, olivine	gray, black, brown, brown surface, olivine
Sediment Odor	None, slight, mod, <u>strong</u> <u>H₂S</u> , petroleum, septic	None, slight, mod, strong H ₂ S, petroleum, septic
Any Layering Homogenous	<u>Layering</u>	
Comments: <u>EPE: 6'</u>	<u>- Hard refusal @ -5.5' organic material on surface, sand and gravel below that.</u> <u>- Retained core intact for sectioning @ PER</u>	

Recorded by: DE

Appendix B

Analytical Chemistry Laboratory Data Report Submitted by Columbia Analytical Services

Acronyms

ASTM	American Society for Testing and Materials
A2LA	American Association for Laboratory Accreditation
CARB	California Air Resources Board
CAS Number	Chemical Abstract Service registry Number
CFC	Chlorofluorocarbon
CFU	Colony-Forming Unit
DEC	Department of Environmental Conservation
DEQ	Department of Environmental Quality
DHS	Department of Health Services
DOE	Department of Ecology
DOH	Department of Health
EPA	U. S. Environmental Protection Agency
ELAP	Environmental Laboratory Accreditation Program
GC	Gas Chromatography
GC/MS	Gas Chromatography/Mass Spectrometry
LUFT	Leaking Underground Fuel Tank
M	Modified
MCL	Maximum Contaminant Level is the highest permissible concentration of a substance allowed in drinking water as established by the USEPA.
MDL	Method Detection Limit
MPN	Most Probable Number
MRL	Method Reporting Limit
NA	Not Applicable
NC	Not Calculated
NCASI	National Council of the Paper Industry for Air and Stream Improvement
ND	Not Detected
NIOSH	National Institute for Occupational Safety and Health
PQL	Practical Quantitation Limit
RCRA	Resource Conservation and Recovery Act
SIM	Selected Ion Monitoring
TPH	Total Petroleum Hydrocarbons
tr	Trace level is the concentration of an analyte that is less than the PQL but greater than or equal to the MDL.

Inorganic Data Qualifiers

- * The result is an outlier. See case narrative.
- # The control limit criteria is not applicable. See case narrative.
- B The analyte was found in the associated method blank at a level that is significant relative to the sample result as defined by the DOD or NELAC standards.
- E The result is an estimate amount because the value exceeded the instrument calibration range.
- J The result is an estimated value that was detected outside the quantitation range.
- U The analyte was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL.
DOD-QSM 4.1 definition: Analyte was not detected and is reported as less than the LOD or as defined by the project. The detection limit is adjusted for dilution.
- i The MRL/MDL or LOQ/LOD is elevated due to a matrix interference.
- X See case narrative.
- Q See case narrative. One or more quality control criteria was outside the limits.

Metals Data Qualifiers

- # The control limit criteria is not applicable. See case narrative.
- J The result is an estimated value that was detected outside the quantitation range.
- E The percent difference for the serial dilution was greater than 10%, indicating a possible matrix interference in the sample.
- M The duplicate injection precision was not met.
- N The Matrix Spike sample recovery is not within control limits. See case narrative.
- S The reported value was determined by the Method of Standard Additions (MSA).
- U The analyte was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL.
DOD-QSM 4.1 definition: Analyte was not detected and is reported as less than the LOD or as defined by the project. The detection limit is adjusted for dilution.
- W The post-digestion spike for furnace AA analysis is out of control limits, while sample absorbance is less than 50% of spike absorbance.
- i The MRL/MDL or LOQ/LOD is elevated due to a matrix interference.
- X See case narrative.
- + The correlation coefficient for the MSA is less than 0.995.
- Q See case narrative. One or more quality control criteria was outside the limits.

Organic Data Qualifiers

- * The result is an outlier. See case narrative.
- # The control limit criteria is not applicable. See case narrative.
- A A tentatively identified compound, a suspected aldol-condensation product.
- B The analyte was found in the associated method blank at a level that is significant relative to the sample result as defined by the DOD or NELAC standards.
- C The analyte was qualitatively confirmed using GC/MS techniques, pattern recognition, or by comparing to historical data.
- D The reported result is from a dilution.
- E The result is an estimate amount because the value exceeded the instrument calibration range.
- J The result is an estimated value that was detected outside the quantitation range.
- N The result is presumptive. The analyte was tentatively identified, but a confirmation analysis was not performed.
- P The GC or HPLC confirmation criteria was exceeded. The relative percent difference is greater than 40% between the two analytical results.
- U The analyte was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL.
DOD-QSM 4.1 definition: Analyte was not detected and is reported as less than the LOD or as defined by the project. The detection limit is adjusted for dilution.
- i The MRL/MDL or LOQ/LOD is elevated due to a chromatographic interference.
- X See case narrative.
- Q See case narrative. One or more quality control criteria was outside the limits.

Additional Petroleum Hydrocarbon Specific Qualifiers

- F The chromatographic fingerprint of the sample matches the elution pattern of the calibration standard.
- L The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of lighter molecular weight constituents than the calibration standard.
- H The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of heavier molecular weight constituents than the calibration standard.
- O The chromatographic fingerprint of the sample resembles an oil, but does not match the calibration standard.
- Y The chromatographic fingerprint of the sample resembles a petroleum product eluting in approximately the correct carbon range, but the elution pattern does not match the calibration standard.
- Z The chromatographic fingerprint does not resemble a petroleum product.

Columbia Analytical Services, Inc.
Kelso, WA
State Certifications, Accreditations, and Licenses

Program	Number
Alaska DEC UST	UST-040
Arizona DHS	AZ0339
Arkansas - DEQ	88-0637
California DHS	2286
Colorado DPHE	-
Florida DOH	E87412
Hawaii DOH	-
Idaho DHW	-
Indiana DOH	C-WA-01
Louisiana DEQ	3016
Louisiana DHH	LA050010
Maine DHS	WA0035
Michigan DEQ	9949
Minnesota DOH	053-999-368
Montana DPHHS	CERT0047
Nevada DEP	WA35
New Jersey DEP	WA005
New Mexico ED	-
North Carolina DWQ	605
Oklahoma DEQ	9801
Oregon - DHS	WA200001
South Carolina DHEC	61002
Utah DOH	COLU
Washington DOE	C1203
Wisconsin DNR	998386840
Wyoming (EPA Region 8)	-

Case Narrative

COLUMBIA ANALYTICAL SERVICES, INC.

Client: Pacific EcoRisk Laboratories
Project: ACOE San Rafael Channel
Sample Matrix: Sediment

Service Request No.: K1006480
Date Received: 06/23/10

CASE NARRATIVE

All analyses were performed consistent with the quality assurance program of Columbia Analytical Services, Inc. (CAS). This report contains analytical results for samples designated for Tier II data deliverables. When appropriate to the method, method blank results have been reported with each analytical test. Surrogate recoveries have been reported for all applicable organic analyses. Additional quality control analyses reported herein include: Laboratory Duplicate (DUP), Matrix Spike (MS), Matrix/Duplicate Matrix Spike (MS/DMS), Laboratory Control Sample (LCS), and Laboratory/Duplicate Laboratory Control Sample (LCS/DLCS).

Sample Receipt

One sediment sample was received for analysis at Columbia Analytical Services on 06/23/10. The samples were received in good condition and consistent with the accompanying chain of custody form. The samples were stored in a refrigerator at 4°C upon receipt at the laboratory.

General Chemistry Parameters

No anomalies associated with the analysis of these samples were observed.

Total Metals

Matrix Spike Recovery Exceptions:

The control criteria for matrix spike recovery of Lead for the Batch QC sample were not applicable. The analyte concentration in the sample was significantly higher than the added spike concentration, preventing accurate evaluation of the spike recovery.

No other anomalies associated with the analysis of these samples were observed.

PCB Aroclors by EPA Method 8082

Elevated Detection Limits:

The detection limits were elevated for Aroclors 1016 thru 1254 in sample SRC-2010-8-Comp. The chromatogram indicated the presence of Organochlorine pesticides and other non-target background components. The matrix interference prevented adequate resolution of the target compounds at the normal limits. The results were flagged to indicate the matrix interference.

No other anomalies associated with the analysis of these samples were observed.

Organotin Compounds

Calibration Verification (CCV) Exceptions:

The analysis of Butyltins requires the use of dual column confirmation. When the (CCV criterion is met for both columns, the higher of the two sample results is generally reported. The primary evaluation criteria were not met on the confirmation column for Di-n-butyltin. The results were reported from the column with an acceptable CCV. The data quality was not affected. No further corrective action was necessary.

No other anomalies associated with the analysis of these samples were observed.

Approved by _____

Date 07/20/10

REVISED

5:41 pm, Jul 20, 2010

Polynuclear Aromatic Hydrocarbons by EPA Method 8270C

No anomalies associated with the analysis of these samples were observed.

Organochlorine Pesticides by EPA 8081

Sample Confirmation Notes:

The confirmation comparison criteria of 40% difference for at least one analyte was exceeded in sample SRC-2010-8-Comp. The higher of the two values was reported when no evidence of a matrix interference was observed, or the lower of the two values was reported when there was an apparent interference on the alternate column that produced the higher value.

Elevated Detection Limits:

The detection limit was elevated for a few analytes in sample SRC-2010-8-Comp. The chromatogram indicated the presence of non-target background components. The matrix interference prevented adequate resolution of the target compounds at the normal limit. The results were flagged to indicate the matrix interference.

No other anomalies associated with the analysis of these samples were observed.

Approved by DP Date 07/20/10

REVISED

5:41 pm, Jul 20, 2010

Chain of Custody

ANALYTE LIST

Pacific EcoRisk
2250 Cordelia Rd.
Fairfield, CA 94534

Project Proponent: Pacific EcoRisk

Project #: 16087

Site #: Samples on COC #004

Standard Ocean Disposal List (SF Bay)

Solids, Total	160.3	X
Solids, Volatile	160.4	
Total Organic Carbon	ASTM D4129-82M	X
Sulfides	9030M	
Particle Size	PSEP	X
Ammonia as Nitrogen	350.3M	
Arsenic	6020	X
Cadmium	6020	X
Chromium	6020	X
Copper	6020	X
Lead	6020	X
Nickel	6020	X
Silver	6020	X
Zinc	6020	X
Mercury	7471A	X
Selenium	7740 - GFAA	X
2,4'-DDD	8081A	X
2,4'-DDE	8081A	X
2,4'-DDT	8081A	X
4,4'-DDD	8081A	X
4,4'-DDE	8081A	X
4,4'-DDT	8081A	X
Aldrin	8081A	X
alpha-BHC	8081A	X
alpha-Chlordane	8081A	X
beta-BHC	8081A	X
Chlordane	8081A	X
delta-BHC	8081A	X
Dieldrin	8081A	X
Endosulfan I	8081A	X
Endosulfan II	8081A	X
Endosulfan Sulfate	8081A	X
Endrin	8081A	X
Endrin Aldehyde	8081A	X
gamma-BHC (Lindane)	8081A	X
gamma-Chlordane	8081A	X
Heptachlor	8081A	X
Heptachlor Epoxide	8081A	X
Toxaphene	8081A	X
Aroclor 1016	8082	X
Aroclor 1221	8082	X
Aroclor 1232	8082	X
Aroclor 1242	8082	X
Aroclor 1248	8082	X
Aroclor 1254	8082	X

Aroclor 1260	8082	X
Aroclor 1262	8082	X
Aroclor 1268	8082	X
Acenaphthene	8270C-SIM PAH	X
Acenaphthylene	8270C-SIM PAH	X
Anthracene	8270C-SIM PAH	X
Benz(a)anthracene	8270C-SIM PAH	X
Benzo(a)pyrene	8270C-SIM PAH	X
Benzo(b)fluoranthene	8270C-SIM PAH	X
Benzo(g,h,i)perylene	8270C-SIM PAH	X
Benzo(k)fluoranthene	8270C-SIM PAH	X
Chrysene	8270C-SIM PAH	X
Dibenz(a,h)anthracene	8270C-SIM PAH	X
Fluoranthene	8270C-SIM PAH	X
Fluorene	8270C-SIM PAH	X
Indeno(1,2,3-cd)pyrene	8270C-SIM PAH	X
Naphthalene	8270C-SIM PAH	X
Phenanthrene	8270C-SIM PAH	X
Pyrene	8270C-SIM PAH	X
Di-n-butyltin	Organotins	X
n-Butyltin	Organotins	X
Tetra-n-butyltin	Organotins	X
Tri-n-butyltin	Organotins	X
QA/QC		
DMMO QA/QC Performed on one of these site samples. Performed as per San Rafael SOW and as PN 01.1		X

If you have any questions regarding this request as checked,
please call Jeff Cotsifas at (707)207-7760

Columbia Analytical Services, Inc.
Cooler Receipt and Preservation Form

PC Pradeep

Client / Project: PAC. Fedrisk Service Request K10 06480
Received: 6/23/10 Opened: 6/23/10 By: aj

1. Samples were received via? *Mail* Fed Ex *UPS* *DHL* *PBX* *Courier* *Hand Delivered*
2. Samples were received in: (circle) Cooler *Box* *Envelope* *Other* NA
3. Were custody seals on coolers? *NA* *Y* N If yes, how many and where? _____
If present, were custody seals intact? *Y* *N* If present, were they signed and dated? *Y* *N*

Cooler Temp °C	Temp Blank °C	Thermometer ID	Cooler/COC ID	NA	Tracking Number	NA	Filed
0.3	2.0	269			748784387489		X
1.0	5.4	223			743661755787		

7. Packing material used. *Inserts* Baggies Bubble Wrap Gel Packs *Wet Ice* *Sleeves* *Other* _____
8. Were custody papers properly filled out (ink, signed, etc.)? *NA* Y *N*
9. Did all bottles arrive in good condition (unbroken)? *Indicate in the table below.* *NA* Y *N*
10. Were all sample labels complete (i.e analysis, preservation, etc.)? *NA* Y *N*
11. Did all sample labels and tags agree with custody papers? *Indicate major discrepancies in the table on page 2.* *NA* Y *N*
12. Were appropriate bottles/containers and volumes received for the tests indicated? *NA* Y *N*
13. Were the pH-preserved bottles (see SMO GEN SOP) received at the appropriate pH? *Indicate in the table below* *NA* Y *N*
14. Were VOA vials received without headspace? *Indicate in the table below.* *NA* Y *N*
15. Was C12/Res negative? *NA* Y *N*

Sample ID on Bottle	Sample ID on COC	Identified by:

Sample ID	Bottle Count	Bottle Type	Out of Temp	Head-space	Broke	pH	Reagent	Volume added	Reagent Lot Number	Initials	Time

Notes, Discrepancies, & Resolutions: _____

Total Solids

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Pacific EcoRisk Laboratories
Project: ACOE San Rafael Chan/16087
Sample Matrix: Sediment

Service Request: K1006480

Total Solids

Prep Method: NONE
Analysis Method: 160.3M
Test Notes:

Units: PERCENT
Basis: Wet

Sample Name	Lab Code	Date Collected	Date Received	Date Analyzed	Result	Result Notes
SRC-2010-8-Comp	K1006480-001	06/10/2010	06/23/2010	06/26/2010	54.4	

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Pacific EcoRisk Laboratories
Project: ACOE San Rafael Chan/16087
Sample Matrix: Sediment

Service Request: K1006480
Date Collected: 06/10/2010
Date Received: 06/23/2010
Date Analyzed: 06/26/2010

Duplicate Sample Summary
Total Solids

Prep Method: NONE
Analysis Method: 160.3M
Test Notes:

Units: PERCENT
Basis: Wet

Sample Name	Lab Code	Sample Result	Duplicate Sample Result	Average	Relative Percent Difference	Result Notes
SRC-2010-8-Comp	K1006480-001	54.4	58.3	56.4	7	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Pacific EcoRisk Laboratories
Project: ACOE San Rafael Chan/16087
Sample Matrix: Sediment

Service Request: K1006480

Total Solids

Prep Method: NONE
Analysis Method: 160.3M
Test Notes:

Units: PERCENT
Basis: Wet

Sample Name	Lab Code	Date Collected	Date Received	Date Analyzed	Result	Result Notes
SRC-2010-8-Comp	K1006480-001	06/10/2010	06/23/2010	06/26/2010	54.4	

General Chemistry Parameters

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client : Pacific EcoRisk Laboratories
Project Name : ACOE San Rafael Channel
Project Number : 16087
Sample Matrix : SEDIMENT

Service Request : K1006480
Date Collected : 06/10/10
Date Received : 06/23/10

Carbon, Total Organic (TOC)

Prep Method : Method
Analysis Method : ASTM D4129-82M
Test Notes :

Units : Percent
Basis : Dry, per method

Sample Name	Lab Code	MRL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Result	Result Notes
SRC-2010-8-Comp	K1006480-001	0.050	0.020	1	6/24/2010	07/10/10	4.26	
Method Blank	K1006480-MB	0.050	0.020	1	NA	07/10/10	ND	

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client : Pacific EcoRisk Laboratories
Project Name : ACOE San Rafael Channel
Project Number : 16087
Sample Matrix : SEDIMENT

Service Request : K1006480
Date Collected : NA
Date Received : NA
Date Prepared : NA
Date Analyzed : 07/10/10

Duplicate Summary Inorganic Parameters

Sample Name : Batch QC
Lab Code : K1006477-001DUP
Test Notes :

Units : Percent
Basis : Dry, per method

Analyte	Prep Method	Analysis Method	MRL	Sample Result	Duplicate Sample Result	Average	Relative Percent Difference	Result Notes
Carbon, Total Organic (TOC)	Method	ASTM D4129-82M	0.050	4.33	3.56	3.95	19	

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client : Pacific EcoRisk Laboratories
Project Name : ACOE San Rafael Channel
Project Number : 16087
Sample Matrix : SEDIMENT

Service Request : K1006480
Date Collected : NA
Date Received : NA
Date Prepared : NA
Date Analyzed : 07/10/10

Matrix Spike/Duplicate Matrix Spike Summary

Sample Name : Batch QC
Lab Code : K1006477-001MS K1006477-001DMS
Test Notes :

Units : Percent
Basis : Dry, per method

Analyte	Prep Method	Analysis Method	MRL	Spike Level		Sample Result	Spike Result		Spike Recovery		CAS Acceptance Limits	Relative Percent Difference	Result Notes
				MS	DMS		MS	DMS	MS	DMS			
Carbon, Total Organic (TOC)	Method	ASTM D4129-82M	0.050	12.0	10.8	4.33	14.8	15.5	87	103	77-155	17	

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client : Pacific EcoRisk Laboratories
Project Name : ACOE San Rafael Channel
Project Number : 16087
Sample Matrix : SOIL

Service Request : K1006480
Date Collected : NA
Date Received : NA
Date Prepared : NA
Date Analyzed : 07/10/10

Laboratory Control Sample Summary
Inorganic Parameters

Sample Name : Lab Control Sample
Lab Code : K1006480-LCS
Test Notes :

Units : Percent
Basis : Dry, per method

Analyte	Prep Method	Analysis Method	True Value	Result	Percent Recovery	CAS Percent Recovery	Result Notes
						Acceptance Limits	
Carbon, Total Organic (TOC)	Method	ASTM D4129-82M	0.550	0.476	87	82-119	

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client : Pacific EcoRisk Laboratories
Project : ACOE San Rafael Channel

Service Request : K1006480
Date Collected : NA
Date Received : NA

Carbon, Total Organic (TOC)
ASTM D4129-82M
Units: Percent

CONTINUING CALIBRATION VERIFICATION (CCV)

	Date Analyzed	True Value	Measured Value	Percent Recovery
CCV1 Result	7/10/2010	20.0	19.7	99
CCV2 Result	7/10/2010	20.0	19.6	98
CCV3 Result	7/10/2010	20.0	19.1	96

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client : Pacific EcoRisk Laboratories

Project : ACOE San Rafael Channel

Service Request : K1006480

Date Collected : NA

Date Received : NA

Carbon, Total Organic (TOC)

ASTM D4129-82M

Units: Percent

CONTINUING CALIBRATION BLANK (CCB)

	Date Analyzed	MRL	Blank Value
CCB1 Result	7/10/2010	0.050	ND
CCB2 Result	7/10/2010	0.050	ND
CCB3 Result	7/10/2010	0.050	ND

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: Pacific EcoRisk Laboratories
Project: ACOE San Rafael Channel/16087
Sample Matrix: Sediment

Service Request: K1006480
Date Collected: 6/10/2010
Date Received: 6/23/2010
Date Analyzed: 6/25/2010

Particle Size Determination
 Puget Sound Estuary Program Protocol

Sample Name: SRC-2010-8-Comp
Lab Code: K1006480-001

Sand Fraction: Dry Weight (Grams) 30.4661
 Sand Fraction: Weight Recovered (Grams) 30.3107
 Sand Fraction: Percent Recovery 99.5

Description	Phi Size	Dry Weight (Grams)	Percent of Total Weight Recovered
Gravel (>2.00 mm)	<-1 Ø	3.4749	8.91
Sand, Very Coarse (1.00 mm to 2.00 mm)	-1 to 0 Ø	2.7814	7.13
Sand, Coarse (0.50	0 to 1 Ø	3.6610	9.39
Sand, Medium (0.250 mm to 0.500 mm)	1 to 2 Ø	8.4088	21.6
Sand, Fine (0.125 mm to 0.250 mm)	2 to 3 Ø	8.0306	20.6
Sand, Very Fine (0.0625 mm to 0.125 mm)	3 to 4 Ø	3.2141	8.24
Silt (0.0039 mm to 0.0625 mm)	4 to 8 Ø	5.6200	14.4
Clay (< 0.0039 mm)	> 8 Ø	3.3150	8.50
Total		38.5058	98.8

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: Pacific EcoRisk Laboratories
Project: ACOE San Rafael Channel/16087
Sample Matrix: Sediment

Service Request: K1006480
Date Collected: NA
Date Received: NA
Date Analyzed: 6/29/2010

Particle Size Determination
 Puget Sound Estuary Program Protocol

Sample Name: Batch QC
Lab Code: K1006482-002

Sand Fraction: Dry Weight (Grams) 27.9243
 Sand Fraction: Weight Recovered (Grams) 27.9318
 Sand Fraction: Percent Recovery 100

Description	Phi Size	Dry Weight (Grams)	Percent of Total Weight Recovered
Gravel (>2.00 mm)	<-1 Ø	5.5516	16.9
Sand, Very Coarse (1.00 mm to 2.00 mm)	-1 to 0 Ø	2.5425	7.73
Sand, Coarse (0.50	0 to 1 Ø	3.6567	11.1
Sand, Medium (0.250 mm to 0.500 mm)	1 to 2 Ø	6.5425	19.9
Sand, Fine (0.125 mm to 0.250 mm)	2 to 3 Ø	2.9954	9.10
Sand, Very Fine (0.0625 mm to 0.125 mm)	3 to 4 Ø	6.1913	18.8
Silt (0.0039 mm to 0.0625 mm)	4 to 8 Ø	2.9100	8.84
Clay (< 0.0039 mm)	> 8 Ø	2.2950	6.97
Total		32.6850	99.3

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: Pacific EcoRisk Laboratories
Project: ACOE San Rafael Channel/16087
Sample Matrix: Sediment

Service Request: K1006480
Date Collected: NA
Date Received: NA
Date Analyzed: 6/29/2010

Particle Size Determination
 Puget Sound Estuary Program Protocol

Sample Name: Batch QC
Lab Code: K1006482-002DUP

Sand Fraction: Dry Weight (Grams) 27.4730
 Sand Fraction: Weight Recovered (Grams) 27.4749
 Sand Fraction: Percent Recovery 100

Description	Phi Size	Dry Weight (Grams)	Percent of Total Weight Recovered
Gravel (>2.00 mm)	<-1 Ø	6.3628	20.6
Sand, Very Coarse (1.00 mm to 2.00 mm)	-1 to 0 Ø	2.7957	9.06
Sand, Coarse (0.50	0 to 1 Ø	3.4387	11.1
Sand, Medium (0.250 mm to 0.500 mm)	1 to 2 Ø	6.3038	20.4
Sand, Fine (0.125 mm to 0.250 mm)	2 to 3 Ø	5.7238	18.6
Sand, Very Fine (0.0625 mm to 0.125 mm)	3 to 4 Ø	2.4253	7.86
Silt (0.0039 mm to 0.0625 mm)	4 to 8 Ø	2.8800	9.34
Clay (< 0.0039 mm)	> 8 Ø	2.2200	7.20
Total		32.1501	104

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: Pacific EcoRisk Laboratories
Project: ACOE San Rafael Channel/16087
Sample Matrix: Sediment

Service Request: K1006480
Date Collected: NA
Date Received: NA
Date Analyzed: 6/29/2010

Particle Size Determination
 Puget Sound Estuary Program Protocol

Sample Name: Batch QC
Lab Code: K1006482-002TRP

Sand Fraction: Dry Weight (Grams) 30.1017
 Sand Fraction: Weight Recovered (Grams) 30.6925
 Sand Fraction: Percent Recovery 102

Description	Phi Size	Dry Weight (Grams)	Percent of Total Weight Recovered
Gravel (>2.00 mm)	<-1 Ø	6.3363	20.5
Sand, Very Coarse (1.00 mm to 2.00 mm)	-1 to 0 Ø	2.9863	9.68
Sand, Coarse (0.50	0 to 1 Ø	4.1688	13.5
Sand, Medium (0.250 mm to 0.500 mm)	1 to 2 Ø	7.2684	23.6
Sand, Fine (0.125 mm to 0.250 mm)	2 to 3 Ø	7.0336	22.8
Sand, Very Fine (0.0625 mm to 0.125 mm)	3 to 4 Ø	2.5376	8.23
Silt (0.0039 mm to 0.0625 mm)	4 to 8 Ø	1.0450	3.39
Clay (< 0.0039 mm)	> 8 Ø	2.3050	7.47
Total		33.6810	109

Metals

Columbia Analytical Services

- Cover Page - INORGANIC ANALYSIS DATA PACKAGE

Client: Pacific EcoRisk Laboratories
Project Name: ACOE San Rafael Channel
Project No.: 16087

Service Request: K1006480

Sample Name:

Batch QC1D

Batch QC1S

SRC-2010-8-Comp

SRC-2010-8-CompD

SRC-2010-8-CompS

Method Blank

Batch QC2D

Batch QC2S

Lab Code:

K1006477-001D

K1006477-001S

K1006480-001

K1006480-001D

K1006480-001S

K1006480-MB

K1006518-001D

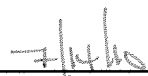
K1006518-001S

Comments:

Approved By:



Date:



Metals**- 1 -****INORGANIC ANALYSIS DATA PACKAGE**

Client: Pacific EcoRisk Laboratories **Service Request:** K1006480
Project No.: 16087 **Date Collected:** 06/10/10
Project Name: ACOE San Rafael Channel **Date Received:** 06/23/10
Matrix: SEDIMENT **Units:** mg/Kg
Basis: DRY

Sample Name: SRC-2010-8-Comp **Lab Code:** K1006480-001

Analyte	Analysis Method	MRL	MDL	Dil. Factor	Date Extracted	Date Analyzed	Result	C	Q
Arsenic	6020	0.51	0.05	5.0	07/08/10	07/12/10	5.58		
Cadmium	6020	0.020	0.004	5.0	07/08/10	07/12/10	0.363		
Chromium	6020	0.20	0.02	5.0	07/08/10	07/12/10	47.8		
Copper	6010B	2.0	0.6	2.0	07/08/10	07/09/10	52.7		
Lead	6020	0.051	0.006	5.0	07/08/10	07/12/10	60.3		
Mercury	7471A	0.020	0.002	1.0	06/30/10	07/02/10	0.279		
Nickel	6020	0.20	0.02	5.0	07/08/10	07/12/10	61.4		
Selenium	7742	0.10	0.03	2.0	07/08/10	07/09/10	0.12		
Silver	6020	0.020	0.008	5.0	07/08/10	07/13/10	0.152		
Zinc	6020	0.5	0.2	5.0	07/08/10	07/12/10	184		

% Solids: 54.4

Comments:

Metals**- 1 -****INORGANIC ANALYSIS DATA PACKAGE**

Client: Pacific EcoRisk Laboratories **Service Request:** K1006480
Project No.: 16087 **Date Collected:**
Project Name: ACOE San Rafael Channel **Date Received:**
Matrix: SEDIMENT **Units:** mg/Kg
Basis: DRY

Sample Name: Method Blank **Lab Code:** K1006480-MB

Analyte	Analysis Method	MRL	MDL	Dil. Factor	Date Extracted	Date Analyzed	Result	C	Q
Arsenic	6020	0.50	0.05	5.0	07/08/10	07/12/10	0.05	U	
Cadmium	6020	0.020	0.004	5.0	07/08/10	07/12/10	0.004	U	
Chromium	6020	0.20	0.02	5.0	07/08/10	07/12/10	0.08	J	
Copper	6010B	2.0	0.6	2.0	07/08/10	07/09/10	0.6	U	
Lead	6020	0.050	0.006	5.0	07/08/10	07/12/10	0.030	J	
Mercury	7471A	0.020	0.002	1.0	06/30/10	07/02/10	0.002	U	
Nickel	6020	0.20	0.02	5.0	07/08/10	07/12/10	0.02	U	
Selenium	7742	0.10	0.03	2.0	07/08/10	07/09/10	0.03	U	
Silver	6020	0.020	0.008	5.0	07/08/10	07/13/10	0.008	U	
Zinc	6020	0.5	0.2	5.0	07/08/10	07/12/10	0.2	U	

% Solids: 100.0

Comments:

Metals

- 5A -

SPIKE SAMPLE RECOVERY

Client: Pacific EcoRisk Laboratories Service Request: K1006480
Project No.: 16087 Units: MG/KG
Project Name: ACOE San Rafael Channel Basis: DRY
Matrix: SEDIMENT % Solids: 51.0

Sample Name: Batch QC1S

Lab Code: K1006477-001S

Analyte	Control Limit %R	Spike Result	C	Sample Result	C	Spike Added	%R	Q	Method
Arsenic	57 - 133	114		11.4		101.60	101.0		6020
Cadmium	68 - 137	12.3		1.190		10.16	109.4		6020
Chromium	34 - 175	136		93.6		40.64	104.3		6020
Lead		567		427		101.60	137.8		6020
Nickel	59 - 132	212		103		101.60	107.3		6020
Selenium	57 - 134	2.30		0.34		2.05	95.6		7742
Zinc	37 - 162	450		306		101.60	141.7		6020

An empty field in the Control Limit column indicates the control limit is not applicable

Metals

- 5A -

SPIKE SAMPLE RECOVERY

Client: Pacific EcoRisk Laboratories Service Request: K1006480
 Project No.: 16087 Units: MG/KG
 Project Name: ACOE San Rafael Channel Basis: DRY
 Matrix: SEDIMENT % Solids: 54.4

Sample Name: SRC-2010-8-CompS

Lab Code: K1006480-001S

Analyte	Control Limit %R	Spike Result	C	Sample Result	C	Spike Added	%R	Q	Method
Copper	24 - 173	106		52.7		50.50	105.5		6010B
Silver	62 - 131	10.6		0.152		10.10	103.4		6020

An empty field in the Control Limit column indicates the control limit is not applicable

Metals
- 5A -

SPIKE SAMPLE RECOVERY

Client: Pacific EcoRisk Laboratories Service Request: K1006480
Project No.: 16087 Units: MG/KG
Project Name: ACOE San Rafael Channel Basis: DRY
Matrix: SEDIMENT % Solids: 56.6

Sample Name: Batch QC2S Lab Code: K1006518-001S

Analyte	Control Limit %R	Spike Result	C	Sample Result	C	Spike Added	%R	Q	Method
Mercury	60 - 135	0.474		0.046		0.49	87.3		7471A

An empty field in the Control Limit column indicates the control limit is not applicable

Metals

- 6 -

DUPLICATES

Client: Pacific EcoRisk Laboratories Service Request: K1006480
Project No.: 16087 Units: MG/KG
Project Name: ACOE San Rafael Channel Basis: DRY
Matrix: SEDIMENT % Solids: 51.0

Sample Name: Batch QC1D

Lab Code: K1006477-001D

Analyte	Control Limit	Sample (S)	C	Duplicate (D)	C	RPD	Q	Method
Arsenic	20	11.4		11.3		0.9		6020
Cadmium	20	1.190		1.230		3.3		6020
Chromium	20	93.6		90.1		3.8		6020
Lead	20	427		427		0.0		6020
Nickel	20	103		98.1		4.9		6020
Selenium		0.34		0.33		3.0		7742
Zinc	20	306		309		1.0		6020

An empty field in the Control Limit column indicates the control limit is not applicable.

Metals

- 6 -

DUPLICATES

Client: Pacific EcoRisk Laboratories Service Request: K1006480
 Project No.: 16087 Units: MG/KG
 Project Name: ACOE San Rafael Channel Basis: DRY
 Matrix: SEDIMENT % Solids: 54.4

Sample Name: SRC-2010-8-CompD

Lab Code: K1006480-001D

Analyte	Control Limit	Sample (S)	C	Duplicate (D)	C	RPD	Q	Method
Copper	30	52.7		63.0		17.8		6010B
Silver	20	0.152		0.152		0.0		6020

An empty field in the Control Limit column indicates the control limit is not applicable.

Metals

- 6 -

DUPLICATES

Client:

Pacific EcoRisk Laboratories

Service Request:

K1006480

Project No.:

16087

Units:

MG/KG

Project Name:

ACOE San Rafael Channel

Basis:

DRY

Matrix:

SEDIMENT

% Solids:

56.6

Sample Name:Batch QC2D

Lab Code:K1006518-001D

Analyte	Control Limit	Sample (S)	C	Duplicate (D)	C	RPD	Q	Method
Mercury		0.046		0.046		0.0		7471A

An empty field in the Control Limit column indicates the control limit is not applicable.

Metals

- 7 -

LABORATORY CONTROL SAMPLE

Client: Pacific EcoRisk Laboratories Service Request: K1006480

Project No.: 16087

Project Name: ACOE San Rafael Channel

Aqueous LCS Source: Solid LCS Source: ERA D065540

Analyte	Aqueous: ug/L			Solid: mg/kg					
	True	Found	%R	True	Found	C	Limits	%R	
Arsenic				88.3	92.3		78 122	104.5	
Cadmium				91	100		81 119	109.9	
Chromium				144	152		80 119	105.6	
Copper				237	255		83 116	107.6	
Lead				104	121		79 121	116.3	
Mercury				6.8	6.580		71 128	96.8	
Nickel				200	223		81 118	111.5	
Selenium				192	191		80 120	99.5	
Silver				76.4	83.5		66 134	109.3	
Zinc				292	286		73 121	97.9	

Butyltins

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Pacific EcoRisk Laboratories
Project: ACOE San Rafael Channel/16087
Sample Matrix: Sediment

Service Request: K1006480
Date Collected: 06/10/2010
Date Received: 06/23/2010

Butyltins (as cation)

Sample Name: SRC-2010-8-Comp
Lab Code: K1006480-001
Extraction Method: SOC-OSWT
Analysis Method: Krone

Units: ug/Kg
Basis: Dry
Level: Low

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Tetra-n-butyltin	ND	U	1.9	0.81	1	06/24/10	07/14/10	KWG1006888	
Tri-n-butyltin Cation	5.9		1.9	0.79	1	06/24/10	07/14/10	KWG1006888	
Di-n-butyltin Cation	12		1.9	0.35	1	06/24/10	07/14/10	KWG1006888	
n-Butyltin Cation	12		1.9	0.48	1	06/24/10	07/14/10	KWG1006888	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Tri-n-propyltin	72	18-95	07/14/10	Acceptable

Comments: _____

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Pacific EcoRisk Laboratories
Project: ACOE San Rafael Channel/16087
Sample Matrix: Sediment

Service Request: K1006480
Date Collected: NA
Date Received: NA

Butyltins (as cation)

Sample Name: Method Blank
Lab Code: KWG1006888-4
Extraction Method: SOC-OSWT
Analysis Method: Krone

Units: ug/Kg
Basis: Dry
Level: Low

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Tetra-n-butyltin	ND	U	0.97	0.44	1	06/24/10	07/14/10	KWG1006888	
Tri-n-butyltin Cation	ND	U	0.97	0.43	1	06/24/10	07/14/10	KWG1006888	
Di-n-butyltin Cation	ND	U	0.97	0.19	1	06/24/10	07/14/10	KWG1006888	
n-Butyltin Cation	ND	U	0.97	0.26	1	06/24/10	07/14/10	KWG1006888	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Tri-n-propyltin	89	18-95	07/14/10	Acceptable

Comments: _____

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Pacific EcoRisk Laboratories
Project: ACOE San Rafael Channel/16087
Sample Matrix: Sediment

Service Request: K1006480

Surrogate Recovery Summary
Butyltins (as cation)

Extraction Method: SOC-OSWT
Analysis Method: Krone

Units: PERCENT
Level: Low

<u>Sample Name</u>	<u>Lab Code</u>	<u>Sur1</u>
SRC-2010-8-Comp	K1006480-001	72
Method Blank	KWG1006888-4	89
Batch QC	K1006486-001	60
Batch QCMS	KWG1006888-1	95
Batch QCDMS	KWG1006888-2	70
Lab Control Sample	KWG1006888-3	76

Surrogate Recovery Control Limits (%)

Sur1 = Tri-n-propyltin 18-95

Results flagged with an asterisk (*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Pacific EcoRisk Laboratories
Project: ACOE San Rafael Channel/16087
Sample Matrix: Sediment

Service Request: K1006480
Date Extracted: 06/24/2010
Date Analyzed: 07/14/2010

Matrix Spike/Duplicate Matrix Spike Summary
Butyltins (as cation)

Sample Name: Batch QC
Lab Code: K1006486-001
Extraction Method: SOC-OSWT
Analysis Method: Krone

Units: ug/Kg
Basis: Dry
Level: Low
Extraction Lot: KWG1006888

Analyte Name	Sample Result	Batch QCMS KWG1006888-1 Matrix Spike			Batch QCDMS KWG1006888-2 Duplicate Matrix Spike			%Rec Limits	RPD	RPD Limit
		Result	Expected	%Rec	Result	Expected	%Rec			
Tetra-n-butyltin	ND	57.0	56.7	101	44.6	56.4	79	10-120	24	40
Tri-n-butyltin Cation	3.3	44.9	50.3	83	34.3	50.1	62	10-118	27	40
Di-n-butyltin Cation	3.6	40.6	43.5	85	29.4	43.3	60	10-145	32	40
n-Butyltin Cation	9.4	52.8	35.4	123	47.6	35.2	109	10-126	10	40

Results flagged with an asterisk (*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Pacific EcoRisk Laboratories
Project: ACOE San Rafael Channel/16087
Sample Matrix: Sediment

Service Request: K1006480
Date Extracted: 06/24/2010
Date Analyzed: 07/14/2010

Lab Control Spike Summary
Butyltins (as cation)

Extraction Method: SOC-OSWT
Analysis Method: Krone

Units: ug/Kg
Basis: Dry
Level: Low
Extraction Lot: KWG1006888

Analyte Name	Lab Control Sample KWG1006888-3 Lab Control Spike			%Rec Limits
	Result	Expected	%Rec	
Tetra-n-butyltin	19.1	25.0	76	30-110
Tri-n-butyltin Cation	20.1	22.2	91	25-101
Di-n-butyltin Cation	12.6	19.2	66	35-108
n-Butyltin Cation	18.5	15.6	119	20-123

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

Polychlorinated Biphenyls

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Pacific EcoRisk Laboratories
Project: ACOE San Rafael Channel/16087
Sample Matrix: Sediment

Service Request: K1006480
Date Collected: 06/10/2010
Date Received: 06/23/2010

Polychlorinated Biphenyls (PCBs)

Sample Name: SRC-2010-8-Comp
Lab Code: K1006480-001
Extraction Method: EPA 3541
Analysis Method: 8082

Units: ug/Kg
Basis: Dry
Level: Low

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Aroclor 1016	ND	Ui	23	23	1	06/24/10	07/08/10	KWG1006548	
Aroclor 1221	ND	Ui	19	6.4	1	06/24/10	07/08/10	KWG1006548	
Aroclor 1232	ND	Ui	29	29	1	06/24/10	07/08/10	KWG1006548	
Aroclor 1242	ND	Ui	39	39	1	06/24/10	07/08/10	KWG1006548	
Aroclor 1248	ND	Ui	38	38	1	06/24/10	07/08/10	KWG1006548	
Aroclor 1254	ND	Ui	57	57	1	06/24/10	07/08/10	KWG1006548	
Aroclor 1260	60		9.2	2.1	1	06/24/10	07/08/10	KWG1006548	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Decachlorobiphenyl	102	35-133	07/08/10	Acceptable

Comments: _____

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Pacific EcoRisk Laboratories
Project: ACOE San Rafael Channel/16087
Sample Matrix: Sediment

Service Request: K1006480
Date Collected: NA
Date Received: NA

Polychlorinated Biphenyls (PCBs)

Sample Name: Method Blank
Lab Code: KWG1006548-4
Extraction Method: EPA 3541
Analysis Method: 8082

Units: ug/Kg
Basis: Dry
Level: Low

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Aroclor 1016	ND	U	5.0	2.1	1	06/24/10	07/07/10	KWG1006548	
Aroclor 1221	ND	U	10	2.1	1	06/24/10	07/07/10	KWG1006548	
Aroclor 1232	ND	U	5.0	2.1	1	06/24/10	07/07/10	KWG1006548	
Aroclor 1242	ND	U	5.0	2.1	1	06/24/10	07/07/10	KWG1006548	
Aroclor 1248	ND	U	5.0	2.1	1	06/24/10	07/07/10	KWG1006548	
Aroclor 1254	ND	U	5.0	2.1	1	06/24/10	07/07/10	KWG1006548	
Aroclor 1260	ND	U	5.0	2.1	1	06/24/10	07/07/10	KWG1006548	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Decachlorobiphenyl	87	35-133	07/07/10	Acceptable

Comments: _____

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Pacific EcoRisk Laboratories
Project: ACOE San Rafael Channel/16087
Sample Matrix: Sediment

Service Request: K1006480

**Surrogate Recovery Summary
Polychlorinated Biphenyls (PCBs)**

Extraction Method: EPA 3541
Analysis Method: 8082

Units: PERCENT
Level: Low

<u>Sample Name</u>	<u>Lab Code</u>	<u>Sur1</u>
SRC-2010-8-Comp	K1006480-001	102
Method Blank	KWG1006548-4	87
Batch QC	K1006486-001	78
Batch QCMS	KWG1006548-1	74
Batch QCDMS	KWG1006548-2	68
Lab Control Sample	KWG1006548-3	88

Surrogate Recovery Control Limits (%)

Sur1 = Decachlorobiphenyl	35-133
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Results flagged with an asterisk (*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Pacific EcoRisk Laboratories
Project: ACOE San Rafael Channel/16087
Sample Matrix: Sediment

Service Request: K1006480
Date Extracted: 06/24/2010
Date Analyzed: 07/08/2010

Matrix Spike/Duplicate Matrix Spike Summary
Polychlorinated Biphenyls (PCBs)

Sample Name: Batch QC
Lab Code: K1006486-001
Extraction Method: EPA 3541
Analysis Method: 8082

Units: ug/Kg
Basis: Dry
Level: Low
Extraction Lot: KWG1006548

Analyte Name	Sample Result	Batch QCMS KWG1006548-1 Matrix Spike			Batch QCDMS KWG1006548-2 Duplicate Matrix Spike			%Rec Limits	RPD	RPD Limit
		Result	Expected	%Rec	Result	Expected	%Rec			
Aroclor 1016	ND	162	227	71	144	227	63	27-174	12	40
Aroclor 1260	3.7	179	227	77	157	227	67	20-185	13	40

Results flagged with an asterisk (*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Pacific EcoRisk Laboratories
Project: ACOE San Rafael Channel/16087
Sample Matrix: Sediment

Service Request: K1006480
Date Extracted: 06/24/2010
Date Analyzed: 07/07/2010

Lab Control Spike Summary
Polychlorinated Biphenyls (PCBs)

Extraction Method: EPA 3541
Analysis Method: 8082

Units: ug/Kg
Basis: Dry
Level: Low
Extraction Lot: KWG1006548

Lab Control Sample KWG1006548-3 Lab Control Spike				
Analyte Name	Result	Expected	%Rec	%Rec Limits
Aroclor 1016	169	200	84	48-121
Aroclor 1260	177	200	88	53-129

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

Polynuclear Aromatic Hydrocarbons

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Pacific EcoRisk Laboratories
Project: ACOE San Rafael Channel/16087
Sample Matrix: Sediment

Service Request: K1006480
Date Collected: 06/10/2010
Date Received: 06/23/2010

Polynuclear Aromatic Hydrocarbons

Sample Name: SRC-2010-8-Comp
Lab Code: K1006480-001
Extraction Method: EPA 3541
Analysis Method: 8270C SIM

Units: ug/Kg
Basis: Dry
Level: Low

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Naphthalene	10		4.5	0.60	1	06/24/10	07/01/10	KWG1006323	
Acenaphthylene	5.6		4.5	0.59	1	06/24/10	07/01/10	KWG1006323	
Acenaphthene	93		4.5	0.76	1	06/24/10	07/01/10	KWG1006323	
Fluorene	85		4.5	0.61	1	06/24/10	07/01/10	KWG1006323	
Phenanthrene	1400		4.5	1.4	1	06/24/10	07/01/10	KWG1006323	
Anthracene	300		4.5	0.58	1	06/24/10	07/01/10	KWG1006323	
Fluoranthene	2100	D	23	4.9	5	06/24/10	07/06/10	KWG1006323	
Pyrene	2200	D	23	3.8	5	06/24/10	07/06/10	KWG1006323	
Benzo(b)fluoranthene	790		4.5	0.92	1	06/24/10	07/01/10	KWG1006323	
Benzo(k)fluoranthene	280		4.5	0.87	1	06/24/10	07/01/10	KWG1006323	
Benz(a)anthracene	1000		4.5	0.72	1	06/24/10	07/01/10	KWG1006323	
Chrysene	900		4.5	0.80	1	06/24/10	07/01/10	KWG1006323	
Benzo(a)pyrene	680		4.5	0.76	1	06/24/10	07/01/10	KWG1006323	
Indeno(1,2,3-cd)pyrene	450		4.5	0.87	1	06/24/10	07/01/10	KWG1006323	
Dibenz(a,h)anthracene	97		4.5	0.80	1	06/24/10	07/01/10	KWG1006323	
Benzo(g,h,i)perylene	480		4.5	0.85	1	06/24/10	07/01/10	KWG1006323	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Fluorene-d10	50	17-104	07/01/10	Acceptable
Fluoranthene-d10	56	27-106	07/01/10	Acceptable
Terphenyl-d14	59	35-109	07/01/10	Acceptable

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Pacific EcoRisk Laboratories
Project: ACOE San Rafael Channel/16087
Sample Matrix: Sediment

Service Request: K1006480
Date Collected: NA
Date Received: NA

Polynuclear Aromatic Hydrocarbons

Sample Name: Method Blank
Lab Code: KWG1006323-5
Extraction Method: EPA 3541
Analysis Method: 8270C SIM

Units: ug/Kg
Basis: Dry
Level: Low

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Naphthalene	2.3	J	2.4	0.60	1	06/24/10	07/01/10	KWG1006323	
Acenaphthylene	ND	U	2.4	0.59	1	06/24/10	07/01/10	KWG1006323	
Acenaphthene	ND	U	2.4	0.76	1	06/24/10	07/01/10	KWG1006323	
Fluorene	ND	U	2.4	0.61	1	06/24/10	07/01/10	KWG1006323	
Phenanthrene	ND	U	2.4	1.4	1	06/24/10	07/01/10	KWG1006323	
Anthracene	ND	U	2.4	0.58	1	06/24/10	07/01/10	KWG1006323	
Fluoranthene	ND	U	2.4	0.98	1	06/24/10	07/01/10	KWG1006323	
Pyrene	ND	U	2.4	0.76	1	06/24/10	07/01/10	KWG1006323	
Benzo(b)fluoranthene	ND	U	2.4	0.92	1	06/24/10	07/01/10	KWG1006323	
Benzo(k)fluoranthene	ND	U	2.4	0.87	1	06/24/10	07/01/10	KWG1006323	
Benz(a)anthracene	ND	U	2.4	0.72	1	06/24/10	07/01/10	KWG1006323	
Chrysene	ND	U	2.4	0.80	1	06/24/10	07/01/10	KWG1006323	
Benzo(a)pyrene	ND	U	2.4	0.76	1	06/24/10	07/01/10	KWG1006323	
Indeno(1,2,3-cd)pyrene	ND	U	2.4	0.87	1	06/24/10	07/01/10	KWG1006323	
Dibenz(a,h)anthracene	ND	U	2.4	0.80	1	06/24/10	07/01/10	KWG1006323	
Benzo(g,h,i)perylene	ND	U	2.4	0.85	1	06/24/10	07/01/10	KWG1006323	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Fluorene-d10	68	17-104	07/01/10	Acceptable
Fluoranthene-d10	67	27-106	07/01/10	Acceptable
Terphenyl-d14	83	35-109	07/01/10	Acceptable

Comments: _____

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Pacific EcoRisk Laboratories
Project: ACOE San Rafael Channel/16087
Sample Matrix: Sediment

Service Request: K1006480

Surrogate Recovery Summary
Polynuclear Aromatic Hydrocarbons

Extraction Method: EPA 3541
Analysis Method: 8270C SIM

Units: PERCENT
Level: Low

<u>Sample Name</u>	<u>Lab Code</u>	<u>Sur1</u>	<u>Sur2</u>	<u>Sur3</u>
SRC-2010-8-Comp	K1006480-001	50	56	59
Method Blank	KWG1006323-5	68	67	83
Batch QC	K1006486-001	56	63	67
Batch QCMS	KWG1006323-1	52	63	60
Batch QCDMS	KWG1006323-2	57	65	67
Lab Control Sample	KWG1006323-3	58	59	64
Duplicate Lab Control Sample	KWG1006323-4	72	70	80

Surrogate Recovery Control Limits (%)

Sur1 = Fluorene-d10	17-104
Sur2 = Fluoranthene-d10	27-106
Sur3 = Terphenyl-d14	35-109

Results flagged with an asterisk (*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Pacific EcoRisk Laboratories
Project: ACOE San Rafael Channel/16087
Sample Matrix: Sediment

Service Request: K1006480
Date Extracted: 06/24/2010
Date Analyzed: 07/01/2010

Matrix Spike/Duplicate Matrix Spike Summary
Polynuclear Aromatic Hydrocarbons

Sample Name: Batch QC
Lab Code: K1006486-001
Extraction Method: EPA 3541
Analysis Method: 8270C SIM

Units: ug/Kg
Basis: Dry
Level: Low
Extraction Lot: KWG1006323

Analyte Name	Sample Result	Batch QCMS KWG1006323-1 Matrix Spike			Batch QCDMS KWG1006323-2 Duplicate Matrix Spike			%Rec Limits	RPD	RPD Limit
		Result	Expected	%Rec	Result	Expected	%Rec			
Naphthalene	4.1	366	546	66	330	545	60	11-119	10	40
Acenaphthylene	1.3	395	546	72	356	545	65	32-106	11	40
Acenaphthene	1.1	392	546	72	361	545	66	29-110	8	40
Fluorene	3.1	413	546	75	395	545	72	29-117	4	40
Phenanthrene	13	495	546	88	448	545	80	19-128	10	40
Anthracene	2.1	414	546	75	401	545	73	31-115	3	40
Fluoranthene	38	497	546	84	454	545	76	22-138	9	40
Pyrene	50	478	546	78	477	545	78	11-148	0	40
Benzo(b)fluoranthene	30	447	546	76	432	545	74	15-136	3	40
Benzo(k)fluoranthene	10	434	546	78	420	545	75	29-126	3	40
Benz(a)anthracene	14	424	546	75	417	545	74	25-128	2	40
Chrysene	19	445	546	78	429	545	75	25-132	4	40
Benzo(a)pyrene	25	446	546	77	425	545	73	24-131	5	40
Indeno(1,2,3-cd)pyrene	32	475	546	81	464	545	79	20-136	2	40
Dibenz(a,h)anthracene	4.1	423	546	77	415	545	75	29-124	2	40
Benzo(g,h,i)perylene	41	508	546	86	500	545	84	24-127	2	40

Results flagged with an asterisk (*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Pacific EcoRisk Laboratories
Project: ACOE San Rafael Channel/16087
Sample Matrix: Sediment

Service Request: K1006480
Date Extracted: 06/24/2010
Date Analyzed: 07/01/2010

Lab Control Spike/Duplicate Lab Control Spike Summary
Polynuclear Aromatic Hydrocarbons

Extraction Method: EPA 3541
Analysis Method: 8270C SIM

Units: ug/Kg
Basis: Dry
Level: Low
Extraction Lot: KWG1006323

Analyte Name	Lab Control Sample KWG1006323-3 Lab Control Spike			Duplicate Lab Control Sample KWG1006323-4 Duplicate Lab Control Spike			%Rec Limits	RPD	RPD Limit
	Result	Expected	%Rec	Result	Expected	%Rec			
Naphthalene	386	500	77	402	500	80	43-99	4	40
Acenaphthylene	417	500	83	439	500	88	41-110	5	40
Acenaphthene	406	500	81	428	500	86	44-104	5	40
Fluorene	424	500	85	459	500	92	49-105	8	40
Phenanthrene	406	500	81	470	500	94	47-104	15	40
Anthracene	427	500	85	454	500	91	47-112	6	40
Fluoranthene	395	500	79	435	500	87	51-111	10	40
Pyrene	441	500	88	456	500	91	48-113	4	40
Benzo(b)fluoranthene	431	500	86	437	500	87	51-113	1	40
Benzo(k)fluoranthene	444	500	89	467	500	93	56-114	5	40
Benz(a)anthracene	416	500	83	427	500	85	51-111	2	40
Chrysene	430	500	86	449	500	90	54-111	4	40
Benzo(a)pyrene	447	500	89	461	500	92	52-118	3	40
Indeno(1,2,3-cd)pyrene	444	500	89	460	500	92	42-123	3	40
Dibenz(a,h)anthracene	444	500	89	459	500	92	44-119	3	40
Benzo(g,h,i)perylene	474	500	95	493	500	99	46-114	4	40

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Pacific EcoRisk Laboratories
Project: ACOE San Rafael Channel/16087
Sample Matrix: Sediment

Service Request: K1006480
Date Collected: 06/10/2010
Date Received: 06/23/2010

Organochlorine Pesticides

Sample Name: SRC-2010-8-Comp
Lab Code: K1006480-001
Extraction Method: EPA 3541
Analysis Method: 8081A

Units: ug/Kg
Basis: Dry
Level: Low

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
alpha-BHC	ND	Ui	0.92	0.43	1	06/24/10	07/16/10	KWG1006549	
alpha-Chlordane	12		0.92	0.10	1	06/24/10	07/16/10	KWG1006549	
beta-BHC	ND	U	0.92	0.18	1	06/24/10	07/16/10	KWG1006549	
gamma-BHC (Lindane)	ND	Ui	0.92	0.22	1	06/24/10	07/16/10	KWG1006549	
delta-BHC	ND	U	0.92	0.074	1	06/24/10	07/16/10	KWG1006549	
Heptachlor	ND	U	0.92	0.12	1	06/24/10	07/16/10	KWG1006549	
Aldrin	0.55	JP	0.92	0.16	1	06/24/10	07/16/10	KWG1006549	
gamma-Chlordane†	18		0.92	0.090	1	06/24/10	07/16/10	KWG1006549	
Heptachlor Epoxide	ND	Ui	0.92	0.92	1	06/24/10	07/16/10	KWG1006549	
Endosulfan I	3.9	P	0.92	0.063	1	06/24/10	07/16/10	KWG1006549	
Dieldrin	3.1		0.92	0.14	1	06/24/10	07/16/10	KWG1006549	
4,4'-DDE	13	P	0.92	0.11	1	06/24/10	07/16/10	KWG1006549	
Endrin	ND	Ui	0.92	0.92	1	06/24/10	07/16/10	KWG1006549	
Endosulfan II	ND	Ui	0.92	0.92	1	06/24/10	07/16/10	KWG1006549	
4,4'-DDD	22		0.92	0.11	1	06/24/10	07/16/10	KWG1006549	
Endrin Aldehyde	ND	Ui	0.92	0.92	1	06/24/10	07/16/10	KWG1006549	
Endosulfan Sulfate	ND	Ui	0.92	0.92	1	06/24/10	07/16/10	KWG1006549	
4,4'-DDT	ND	Ui	4.3	4.3	1	06/24/10	07/16/10	KWG1006549	
Toxaphene	ND	Ui	90	90	1	06/24/10	07/16/10	KWG1006549	
Chlordane	130		9.2	1.9	1	06/24/10	07/16/10	KWG1006549	
2,4'-DDE	ND	Ui	1.5	1.5	1	06/24/10	07/16/10	KWG1006549	
2,4'-DDD	4.0	P	0.92	0.13	1	06/24/10	07/16/10	KWG1006549	
2,4'-DDT	3.3	P	0.92	0.058	1	06/24/10	07/16/10	KWG1006549	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Tetrachloro-m-xylene	54	21-112	07/16/10	Acceptable
Decachlorobiphenyl	94	15-130	07/16/10	Acceptable

REVISED

5:42 pm, Jul 20, 2010

Comments: _____

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Pacific EcoRisk Laboratories
Project: ACOE San Rafael Channel/16087
Sample Matrix: Sediment

Service Request: K1006480
Date Collected: 06/10/2010
Date Received: 06/23/2010

Organochlorine Pesticides

Sample Name: SRC-2010-8-Comp
Lab Code: K1006480-001

Units: ug/Kg
Basis: Dry

† Analyte Comments

gamma-Chlordane

For this analyte (CAS Registry No. 5103-74-2), USEPA has corrected the name to be beta-Chlordane, also known as trans-Chlordane.

REVISED

5:42 pm, Jul 20, 2010

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Pacific EcoRisk Laboratories
Project: ACOE San Rafael Channel/16087
Sample Matrix: Sediment

Service Request: K1006480
Date Collected: NA
Date Received: NA

Organochlorine Pesticides

Sample Name: Method Blank
Lab Code: KWG1006549-10
Extraction Method: EPA 3541
Analysis Method: 8081A

Units: ug/Kg
Basis: Dry
Level: Low

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
alpha-BHC	ND	U	0.50	0.11	1	06/24/10	07/16/10	KWG1006549	
alpha-Chlordane	ND	U	0.50	0.10	1	06/24/10	07/16/10	KWG1006549	
beta-BHC	ND	U	0.50	0.18	1	06/24/10	07/16/10	KWG1006549	
gamma-BHC (Lindane)	ND	U	0.50	0.080	1	06/24/10	07/16/10	KWG1006549	
delta-BHC	ND	U	0.50	0.074	1	06/24/10	07/16/10	KWG1006549	
Heptachlor	ND	U	0.50	0.12	1	06/24/10	07/16/10	KWG1006549	
Aldrin	ND	U	0.50	0.16	1	06/24/10	07/16/10	KWG1006549	
gamma-Chlordane†	ND	U	0.50	0.090	1	06/24/10	07/16/10	KWG1006549	
Heptachlor Epoxide	ND	U	0.50	0.084	1	06/24/10	07/16/10	KWG1006549	
Endosulfan I	ND	U	0.50	0.063	1	06/24/10	07/16/10	KWG1006549	
Dieldrin	ND	U	0.50	0.14	1	06/24/10	07/16/10	KWG1006549	
4,4'-DDE	ND	U	0.50	0.11	1	06/24/10	07/16/10	KWG1006549	
Endrin	ND	U	0.50	0.094	1	06/24/10	07/16/10	KWG1006549	
Endosulfan II	ND	U	0.50	0.14	1	06/24/10	07/16/10	KWG1006549	
4,4'-DDD	ND	U	0.50	0.11	1	06/24/10	07/16/10	KWG1006549	
Endrin Aldehyde	ND	U	0.50	0.12	1	06/24/10	07/16/10	KWG1006549	
Endosulfan Sulfate	ND	U	0.50	0.11	1	06/24/10	07/16/10	KWG1006549	
4,4'-DDT	ND	U	0.50	0.17	1	06/24/10	07/16/10	KWG1006549	
Toxaphene	ND	U	25	4.8	1	06/24/10	07/16/10	KWG1006549	
Chlordane	ND	U	5.0	1.9	1	06/24/10	07/16/10	KWG1006549	
2,4'-DDE	ND	U	0.50	0.16	1	06/24/10	07/16/10	KWG1006549	
2,4'-DDD	ND	U	0.50	0.13	1	06/24/10	07/16/10	KWG1006549	
2,4'-DDT	ND	U	0.50	0.058	1	06/24/10	07/16/10	KWG1006549	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Tetrachloro-m-xylene	59	21-112	07/16/10	Acceptable
Decachlorobiphenyl	64	15-130	07/16/10	Acceptable

REVISED

5:42 pm, Jul 20, 2010

Comments: _____

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Pacific EcoRisk Laboratories
Project: ACOE San Rafael Channel/16087
Sample Matrix: Sediment

Service Request: K1006480
Date Collected: NA
Date Received: NA

Organochlorine Pesticides

Sample Name: Method Blank
Lab Code: KWG1006549-10

Units: ug/Kg
Basis: Dry

† Analyte Comments

gamma-Chlordane

For this analyte (CAS Registry No. 5103-74-2), USEPA has corrected the name to be beta-Chlordane, also known as trans-Chlordane.

REVISED

5:42 pm, Jul 20, 2010

Comments: _____

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Pacific EcoRisk Laboratories
Project: ACOE San Rafael Channel/16087
Sample Matrix: Sediment

Service Request: K1006480

Surrogate Recovery Summary
Organochlorine Pesticides

Extraction Method: EPA 3541
Analysis Method: 8081A

Units: PERCENT
Level: Low

<u>Sample Name</u>	<u>Lab Code</u>	<u>Sur1</u>	<u>Sur2</u>
SRC-2010-8-Comp	K1006480-001	54	94
Method Blank	KWG1006549-10	59	64
Batch QC	K1006486-001	49	57
Batch QCMS	KWG1006549-1	51	57
Batch QCDMS	KWG1006549-2	45	54
Batch QCMS	KWG1006549-4	58	59
Batch QCDMS	KWG1006549-5	53	55
Batch QCMS	KWG1006549-7	50	57
Batch QCDMS	KWG1006549-8	51	59
Lab Control Sample	KWG1006549-3	61	71

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5:42 pm, Jul 20, 2010

Surrogate Recovery Control Limits (%)

Sur1 = Tetrachloro-m-xylene	21-112
Sur2 = Decachlorobiphenyl	15-130

Results flagged with an asterisk (*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Pacific EcoRisk Laboratories
Project: ACOE San Rafael Channel/16087
Sample Matrix: Sediment

Service Request: K1006480
Date Extracted: 06/24/2010
Date Analyzed: 07/17/2010

Matrix Spike/Duplicate Matrix Spike Summary
Organochlorine Pesticides

Sample Name: Batch QC
Lab Code: K1006486-001
Extraction Method: EPA 3541
Analysis Method: 8081A

Units: ug/Kg
Basis: Dry
Level: Low
Extraction Lot: KWG1006549

Analyte Name	Sample Result	Batch QCMS KWG1006549-1 Matrix Spike			Batch QCDMS KWG1006549-2 Duplicate Matrix Spike			%Rec Limits	RPD	RPD Limit
		Result	Expected	%Rec	Result	Expected	%Rec			
alpha-BHC	ND	14.3	22.7	63	12.6	22.7	55	23-133	13	40
alpha-Chlordane	ND	13.0	22.7	57	12.3	22.7	54	24-132	6	40
beta-BHC	ND	12.9	22.7	57	11.6	22.7	51	22-142	11	40
gamma-BHC (Lindane)	ND	14.3	22.7	63	12.8	22.7	56	26-135	11	40
delta-BHC	ND	16.1	22.7	71	14.4	22.7	64	25-148	11	40
Heptachlor	ND	16.0	22.7	70	14.3	22.7	63	21-136	11	40
Aldrin	ND	14.2	22.7	63	12.6	22.7	55	22-135	12	40
gamma-Chlordane	ND	14.6	22.7	64	13.2	22.7	58	24-133	10	40
Heptachlor Epoxide	ND	14.5	22.7	64	13.1	22.7	58	25-129	10	40
Endosulfan I	ND	12.8	22.7	56	11.5	22.7	51	15-119	10	40
Dieldrin	ND	14.5	22.7	64	13.2	22.7	58	26-133	10	40
4,4'-DDE	ND	24.5	22.7	108	24.8	22.7	109	22-142	1	40
Endrin	ND	14.5	22.7	64	13.2	22.7	58	22-145	10	40
Endosulfan II	ND	13.0	22.7	57	11.9	22.7	52	13-129	9	40
4,4'-DDD	ND	24.4	22.7	107	23.4	22.7	103	19-143	4	40
Endrin Aldehyde	ND	13.6	22.7	60	12.4	22.7	55	10-129	9	40
Endosulfan Sulfate	ND	14.4	22.7	63	13.2	22.7	58	20-134	9	40
4,4'-DDT	0.26	18.8	22.7	82	18.2	22.7	79	19-154	4	40

REVISED

5:42 pm, Jul 20, 2010

Results flagged with an asterisk (*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Pacific EcoRisk Laboratories
Project: ACOE San Rafael Channel/16087
Sample Matrix: Sediment

Service Request: K1006480
Date Extracted: 06/24/2010
Date Analyzed: 07/17/2010

Matrix Spike/Duplicate Matrix Spike Summary
Organochlorine Pesticides

Sample Name: Batch QC
Lab Code: K1006486-001
Extraction Method: EPA 3541
Analysis Method: 8081A

Units: ug/Kg
Basis: Dry
Level: Low
Extraction Lot: KWG1006549

Analyte Name	Sample Result	Batch QCMS KWG1006549-4 Matrix Spike			Batch QCDMS KWG1006549-5 Duplicate Matrix Spike			%Rec Limits	RPD	RPD Limit
		Result	Expected	%Rec	Result	Expected	%Rec			
Toxaphene	ND	218	227	96	216	227	95	20-155	1	40
Chlordane	ND	182	227	80	167	227	74	46-139	8	40

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5:42 pm, Jul 20, 2010

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Results flagged with a pound (#) indicate the control criteria is not applicable.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Pacific EcoRisk Laboratories
Project: ACOE San Rafael Channel/16087
Sample Matrix: Sediment

Service Request: K1006480
Date Extracted: 06/24/2010
Date Analyzed: 07/17/2010

Matrix Spike/Duplicate Matrix Spike Summary
Organochlorine Pesticides

Sample Name: Batch QC
Lab Code: K1006486-001
Extraction Method: EPA 3541
Analysis Method: 8081A

Units: ug/Kg
Basis: Dry
Level: Low
Extraction Lot: KWG1006549

Analyte Name	Sample Result	Batch QCMS KWG1006549-7 Matrix Spike			Batch QCDMS KWG1006549-8 Duplicate Matrix Spike			%Rec Limits	RPD	RPD Limit
		Result	Expected	%Rec	Result	Expected	%Rec			
2,4'-DDE	ND	14.3	22.7	63	15.3	22.7	68	24-141	7	40
2,4'-DDD	0.19	12.8	22.7	55	14.0	22.7	61	12-147	10	40
2,4'-DDT	0.42	15.4	22.7	66	17.0	22.7	73	15-141	10	40

REVISED

5:42 pm, Jul 20, 2010

Results flagged with an asterisk (*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Pacific EcoRisk Laboratories
Project: ACOE San Rafael Channel/16087
Sample Matrix: Sediment

Service Request: K1006480
Date Extracted: 06/24/2010
Date Analyzed: 07/16/2010

**Lab Control Spike Summary
Organochlorine Pesticides**

Extraction Method: EPA 3541
Analysis Method: 8081A

Units: ug/Kg
Basis: Dry
Level: Low
Extraction Lot: KWG1006549

Analyte Name	Lab Control Sample KWG1006549-3 Lab Control Spike			%Rec Limits
	Result	Expected	%Rec	
alpha-BHC	13.8	20.0	69	36-139
alpha-Chlordane	12.4	20.0	62	41-134
beta-BHC	13.2	20.0	66	38-142
gamma-BHC (Lindane)	13.9	20.0	69	40-142
delta-BHC	15.0	20.0	75	48-145
Heptachlor	12.0	20.0	60	39-135
Aldrin	13.3	20.0	66	37-134
gamma-Chlordane	13.6	20.0	68	41-135
Heptachlor Epoxide	13.9	20.0	69	45-118
Endosulfan I	12.6	20.0	63	35-121
Dieldrin	14.3	20.0	72	46-136
4,4'-DDE	17.6	20.0	88	46-141
Endrin	13.6	20.0	68	40-152
Endosulfan II	13.2	20.0	66	39-128
4,4'-DDD	18.6	20.0	93	46-146
Endrin Aldehyde	12.3	20.0	62	32-132
Endosulfan Sulfate	14.1	20.0	71	43-138
4,4'-DDT	17.0	20.0	85	46-151
Toxaphene	190	200	95	53-133
Chlordane	159	200	80	52-140
2,4'-DDE	15.1	20.0	75	49-112
2,4'-DDD	15.0	20.0	75	53-115
2,4'-DDT	16.0	20.0	80	44-120

REVISED**5:42 pm, Jul 20, 2010**

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

July 23, 2010

Analytical Report for Service Request No: K1006480

Jeffrey Cotsifas
Pacific EcoRisk Laboratories
2250 Cordelia Road
Fairfield, CA 94534

RE: ACOE San Rafael Channel/16087

Dear Jeffrey:


Enclosed are the additional pages for the sample submitted to our laboratory on June 23, 2010. For your reference, these analyses have been assigned our service request number K1006480.

Data for Methoxychlor by 8081A is enclosed.

Analyses were performed according to our laboratory's NELAP-approved quality assurance program. The test results meet requirements of the current NELAP standards, where applicable, and except as noted in the laboratory case narrative provided. For a specific list of NELAP-accredited analytes, refer to the certifications section at www.caslab.com. All results are intended to be considered in their entirety, and Columbia Analytical Services, Inc. (CAS) is not responsible for use of less than the complete report. Results apply only to the items submitted to the laboratory for analysis and individual items (samples) analyzed, as listed in the report.

Please call if you have any questions. My extension is 3281. You may also contact me via Email at PDivvela@caslab.com.

Respectfully submitted,

Columbia Analytical Services, Inc.
Pradeep Divvela
Project Chemist

PD/afs

Page 65 of 71**ADDENDUM**

Methoxychlor by EPA 8081A

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Pacific EcoRisk Laboratories
Project: ACOE San Rafael Channel/16087
Sample Matrix: Sediment

Service Request: K1006480
Date Collected: 06/10/2010
Date Received: 06/23/2010

Organochlorine Pesticides

Sample Name: SRC-2010-8-Comp
Lab Code: K1006480-001
Extraction Method: EPA 3541
Analysis Method: 8081A

Units: ug/Kg
Basis: Dry
Level: Low

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Methoxychlor	ND	Ui	2.0	2.0	1	06/24/10	07/16/10	KWG1006549	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Tetrachloro-m-xylene	54	21-112	07/16/10	Acceptable
Decachlorobiphenyl	94	15-130	07/16/10	Acceptable

Comments: _____

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Pacific EcoRisk Laboratories
Project: ACOE San Rafael Channel/16087
Sample Matrix: Sediment

Service Request: K1006480
Date Collected: NA
Date Received: NA

Organochlorine Pesticides

Sample Name: Method Blank
Lab Code: KWG1006549-10
Extraction Method: EPA 3541
Analysis Method: 8081A

Units: ug/Kg
Basis: Dry
Level: Low

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Methoxychlor	ND	U	0.50	0.19	1	06/24/10	07/16/10	KWG1006549	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Tetrachloro-m-xylene	59	21-112	07/16/10	Acceptable
Decachlorobiphenyl	64	15-130	07/16/10	Acceptable

Comments: _____

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Pacific EcoRisk Laboratories
Project: ACOE San Rafael Channel/16087
Sample Matrix: Sediment

Service Request: K1006480

Surrogate Recovery Summary
Organochlorine Pesticides

Extraction Method: EPA 3541
Analysis Method: 8081A

Units: PERCENT
Level: Low

<u>Sample Name</u>	<u>Lab Code</u>	<u>Sur1</u>	<u>Sur2</u>
SRC-2010-8-Comp	K1006480-001	54	94
Method Blank	KWG1006549-10	59	64
Batch QC	K1006486-001	49	57
Batch QCMS	KWG1006549-1	51	57
Batch QCDMS	KWG1006549-2	45	54
Lab Control Sample	KWG1006549-3	61	71

Surrogate Recovery Control Limits (%)

Sur1 = Tetrachloro-m-xylene	21-112
Sur2 = Decachlorobiphenyl	15-130

Results flagged with an asterisk (*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Pacific EcoRisk Laboratories
Project: ACOE San Rafael Channel/16087
Sample Matrix: Sediment

Service Request: K1006480
Date Extracted: 06/24/2010
Date Analyzed: 07/17/2010

Matrix Spike/Duplicate Matrix Spike Summary
Organochlorine Pesticides

Sample Name: Batch QC
Lab Code: K1006486-001
Extraction Method: EPA 3541
Analysis Method: 8081A

Units: ug/Kg
Basis: Dry
Level: Low
Extraction Lot: KWG1006549

Analyte Name	Sample Result	Batch QCMS KWG1006549-1 Matrix Spike			Batch QCDMS KWG1006549-2 Duplicate Matrix Spike			%Rec Limits	RPD	RPD Limit
		Result	Expected	%Rec	Result	Expected	%Rec			
Methoxychlor	ND	17.7	22.7	78	16.5	22.7	73	24-151	7	40

Results flagged with an asterisk (*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Pacific EcoRisk Laboratories
Project: ACOE San Rafael Channel/16087
Sample Matrix: Sediment

Service Request: K1006480
Date Extracted: 06/24/2010
Date Analyzed: 07/16/2010

Lab Control Spike Summary
Organochlorine Pesticides

Extraction Method: EPA 3541
Analysis Method: 8081A

Units: ug/Kg
Basis: Dry
Level: Low
Extraction Lot: KWG1006549

Lab Control Sample
KWG1006549-3
Lab Control Spike

Analyte Name	Result	Expected	%Rec	%Rec Limits
Methoxychlor	15.6	20.0	78	42-147

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

July 16, 2010

Analytical Report for Service Request No: K1006356

Jeffrey Cotsifas
Pacific EcoRisk Laboratories
2250 Cordelia Road
Fairfield, CA 94534

RE: USACE San Rafael Channel/16087


Dear Jeffrey:

Enclosed are the results of the rush samples submitted to our laboratory on June 18, 2010. For your reference, these analyses have been assigned our service request number K1006356.

Analyses were performed according to our laboratory's NELAP-approved quality assurance program. The test results meet requirements of the current NELAP standards, where applicable, and except as noted in the laboratory case narrative provided. For a specific list of NELAP-accredited analytes, refer to the certifications section at www.caslab.com. All results are intended to be considered in their entirety, and Columbia Analytical Services, Inc. (CAS) is not responsible for use of less than the complete report. Results apply only to the items submitted to the laboratory for analysis and individual items (samples) analyzed, as listed in the report.

Please call if you have any questions. My extension is 3281. You may also contact me via Email at PDivvela@caslab.com.

Respectfully submitted,

Columbia Analytical Services, Inc.
Pradeep Divvela
Project Chemist

PD/ln

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Acronyms

ASTM	American Society for Testing and Materials
A2LA	American Association for Laboratory Accreditation
CARB	California Air Resources Board
CAS Number	Chemical Abstract Service registry Number
CFC	Chlorofluorocarbon
CFU	Colony-Forming Unit
DEC	Department of Environmental Conservation
DEQ	Department of Environmental Quality
DHS	Department of Health Services
DOE	Department of Ecology
DOH	Department of Health
EPA	U. S. Environmental Protection Agency
ELAP	Environmental Laboratory Accreditation Program
GC	Gas Chromatography
GC/MS	Gas Chromatography/Mass Spectrometry
LUFT	Leaking Underground Fuel Tank
M	Modified
MCL	Maximum Contaminant Level is the highest permissible concentration of a substance allowed in drinking water as established by the USEPA.
MDL	Method Detection Limit
MPN	Most Probable Number
MRL	Method Reporting Limit
NA	Not Applicable
NC	Not Calculated
NCASI	National Council of the Paper Industry for Air and Stream Improvement
ND	Not Detected
NIOSH	National Institute for Occupational Safety and Health
PQL	Practical Quantitation Limit
RCRA	Resource Conservation and Recovery Act
SIM	Selected Ion Monitoring
TPH	Total Petroleum Hydrocarbons
tr	Trace level is the concentration of an analyte that is less than the PQL but greater than or equal to the MDL.

Inorganic Data Qualifiers

- * The result is an outlier. See case narrative.
- # The control limit criteria is not applicable. See case narrative.
- B The analyte was found in the associated method blank at a level that is significant relative to the sample result as defined by the DOD or NELAC standards.
- E The result is an estimate amount because the value exceeded the instrument calibration range.
- J The result is an estimated value that was detected outside the quantitation range.
- U The analyte was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL.
DOD-QSM 4.1 definition: Analyte was not detected and is reported as less than the LOD or as defined by the project. The detection limit is adjusted for dilution.
- i The MRL/MDL or LOQ/LOD is elevated due to a matrix interference.
- X See case narrative.
- Q See case narrative. One or more quality control criteria was outside the limits.

Metals Data Qualifiers

- # The control limit criteria is not applicable. See case narrative.
- J The result is an estimated value that was detected outside the quantitation range.
- E The percent difference for the serial dilution was greater than 10%, indicating a possible matrix interference in the sample.
- M The duplicate injection precision was not met.
- N The Matrix Spike sample recovery is not within control limits. See case narrative.
- S The reported value was determined by the Method of Standard Additions (MSA).
- U The analyte was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL.
DOD-QSM 4.1 definition: Analyte was not detected and is reported as less than the LOD or as defined by the project. The detection limit is adjusted for dilution.
- W The post-digestion spike for furnace AA analysis is out of control limits, while sample absorbance is less than 50% of spike absorbance.
- i The MRL/MDL or LOQ/LOD is elevated due to a matrix interference.
- X See case narrative.
- + The correlation coefficient for the MSA is less than 0.995.
- Q See case narrative. One or more quality control criteria was outside the limits.

Organic Data Qualifiers

- * The result is an outlier. See case narrative.
- # The control limit criteria is not applicable. See case narrative.
- A A tentatively identified compound, a suspected aldol-condensation product.
- B The analyte was found in the associated method blank at a level that is significant relative to the sample result as defined by the DOD or NELAC standards.
- C The analyte was qualitatively confirmed using GC/MS techniques, pattern recognition, or by comparing to historical data.
- D The reported result is from a dilution.
- E The result is an estimate amount because the value exceeded the instrument calibration range.
- J The result is an estimated value that was detected outside the quantitation range.
- N The result is presumptive. The analyte was tentatively identified, but a confirmation analysis was not performed.
- P The GC or HPLC confirmation criteria was exceeded. The relative percent difference is greater than 40% between the two analytical results.
- U The analyte was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL.
DOD-QSM 4.1 definition: Analyte was not detected and is reported as less than the LOD or as defined by the project. The detection limit is adjusted for dilution.
- i The MRL/MDL or LOQ/LOD is elevated due to a chromatographic interference.
- X See case narrative.
- Q See case narrative. One or more quality control criteria was outside the limits.

Additional Petroleum Hydrocarbon Specific Qualifiers

- F The chromatographic fingerprint of the sample matches the elution pattern of the calibration standard.
- L The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of lighter molecular weight constituents than the calibration standard.
- H The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of heavier molecular weight constituents than the calibration standard.
- O The chromatographic fingerprint of the sample resembles an oil, but does not match the calibration standard.
- Y The chromatographic fingerprint of the sample resembles a petroleum product eluting in approximately the correct carbon range, but the elution pattern does not match the calibration standard.
- Z The chromatographic fingerprint does not resemble a petroleum product.

Columbia Analytical Services, Inc.
Kelso, WA
State Certifications, Accreditations, and Licenses

Program	Number
Alaska DEC UST	UST-040
Arizona DHS	AZ0339
Arkansas - DEQ	88-0637
California DHS	2286
Colorado DPHE	-
Florida DOH	E87412
Hawaii DOH	-
Idaho DHW	-
Indiana DOH	C-WA-01
Louisiana DEQ	3016
Louisiana DHH	LA050010
Maine DHS	WA0035
Michigan DEQ	9949
Minnesota DOH	053-999-368
Montana DPHHS	CERT0047
Nevada DEP	WA35
New Jersey DEP	WA005
New Mexico ED	-
North Carolina DWQ	605
Oklahoma DEQ	9801
Oregon - DHS	WA200001
South Carolina DHEC	61002
Utah DOH	COLU
Washington DOE	C1203
Wisconsin DNR	998386840
Wyoming (EPA Region 8)	-

Case Narrative

COLUMBIA ANALYTICAL SERVICES, INC.

Client: Pacific EcoRisk Laboratories
Project: USACE San Rafael Channel
Date Received: 06/18/10 to 06/23/10
Sample Matrix: Sediment

Service Request No.: K1006356

CASE NARRATIVE

All analyses were performed consistent with the quality assurance program of Columbia Analytical Services, Inc. (CAS). This report contains analytical results for samples designated for Tier II data deliverables. When appropriate to the method, method blank results have been reported with each analytical test. Surrogate recoveries have been reported for all applicable organic analyses. Additional quality control analyses reported herein include: Laboratory Duplicate (DUP), Matrix Spike (MS), Matrix/Duplicate Matrix Spike (MS/DMS), Laboratory Control Sample (LCS), and Laboratory/Duplicate Laboratory Control Sample (LCS/DLCS).

Sample Receipt

Twenty one sediment samples were received for analysis at Columbia Analytical Services between 06/18/10 and 06/23/10. The samples were received in good condition and consistent with the accompanying chain of custody form. The samples were stored in a refrigerator at 4°C upon receipt at the laboratory.

General Chemistry Parameters

No anomalies associated with the analysis of these samples were observed.

Total Metals

Matrix Spike Recovery Exceptions:

The control criteria for matrix spike recovery of Manganese for sample SRC-2010-1-Comp were not applicable. The analyte concentration in the sample was significantly higher than the added spike concentration, preventing accurate evaluation of the spike recovery.

Relative Percent Difference Exceptions:

The Relative Percent Difference (RPD) for the replicate analysis of Cadmium in sample SRC-2010-1-Comp was outside the normal CAS control limits (26% RPD versus a control limit of 20%). The variability in the results was attributed to the heterogeneous character of the sample. Standard mixing techniques were used, but were not sufficient for complete homogenization of this sample.

No other anomalies associated with the analysis of these samples were observed.

Diesel Range Organics by EPA Method 8015B

Sample Notes and Discussion:

The control criteria for matrix spike recovery of Residual Range Organics (RRO) for Batch QC were not applicable. The analyte concentration in the sample was significantly higher than the added spike concentration, preventing accurate evaluation of the spike recovery.

No other anomalies associated with the analysis of these samples were observed.

Approved by _____



Date _____

7/22/10

Gasoline Range Organics by EPA Method 8015B

No anomalies associated with the analysis of these samples were observed.

Organochlorine Pesticides by EPA Method 8081A

Sample Confirmation Notes:

The confirmation comparison criteria of 40% difference for at least one analyte was exceeded in some samples. The higher of the two values was reported when no evidence of a matrix interference was observed, or the lower of the two values was reported when there was an apparent interference on the alternate column that produced the higher value.

Elevated Detection Limits:

The detection limit was elevated for at least a few analytes in most samples. The chromatogram indicated the presence of non-target background components. The matrix interference prevented adequate resolution of the target compounds at the normal limit. The results were flagged to indicate the matrix interference.

Sample SRC-2010-7-5 required dilution due to the presence of elevated levels of target analyte. The reporting limits were adjusted to reflect the dilution.

No other anomalies associated with the analysis of these samples were observed.

PCB Aroclors by EPA Method 8082

Elevated Detection Limits:

The detection limit was elevated for Aroclors 1242, 1254 and 1260 in a few samples. The chromatogram indicated the presence of non-target background components. The matrix interference prevented adequate resolution of the target compounds at the normal limit. The results were flagged to indicate the matrix interference.

The detection limit was elevated for Aroclors 1016, 1221, 1232, 1242, 1248, 1254 in sample SRC-2010-8-Z-Comp. The chromatogram indicated the presence of non-target background components. The matrix interference prevented adequate resolution of the target compounds at the normal limit. The results were flagged to indicate the matrix interference.

Sample Notes and Discussion:

Two Aroclors were identified in a few samples: Aroclor 1254 and Aroclor 1260. When mixtures of PCB Aroclors are present in a sample, correct identification and quantitative analysis of the individual Aroclors can be subjective.

Sample Confirmation Notes:

The confirmation comparison criteria of 40% difference for Aroclor 1254 was exceeded in a few samples. The lower of the two values was reported due to an apparent interference on the alternate column that produced the higher value.

No other anomalies associated with the analysis of these samples were observed.

Herbicides by EPA Method 8151

Calibration Verification (CCV) Exceptions:

The upper control criterion was exceeded for MCPP and MCPA in CCV 0629F003, 0629F015, 0629F027, and 0629F036. The field samples analyzed in this sequence did not contain the analytes in question. Since the apparent problem indicated a potential high bias, the data quality was not affected. No further corrective action was required.

The primary evaluation criterion was exceeded for 2,4-Dichlorophenylacetic Acid in CCV 0629F003, 0629F015, 0629F027, and 0629F036. In accordance with CAS standard operating procedures, the alternative evaluation specified in the EPA method was performed using the average percent recovery of all analytes in the verification standard. The standard met the alternative evaluation criteria.

Approved by  Date 

Chain of Custody



Pacific EcoRisk

ENVIRONMENTAL CONSULTING & TESTING

2250 Cordelia Rd., Fairfield, CA 94534

(707)207-7760

CAS CHAIN-OF-CUSTODY RECORD

001

Client Name: Pacific EcoRisk		REQUESTED ANALYSIS										
Client Address: 2250 Cordelia Rd. Fairfield, CA 94534		* See Scope of Work	Grain Size Analysis									
Sampled By: Mike McElroy												
Phone: (707) 207-7760												
FAX: (707) 207-7916												
Project Manager: Jeff Cotsifas												
Project Name: ACOE (San Rafael Channel)												
PO Number: 16087												
Client Sample ID	Sample Date	Sample Time	Sample Matrix*	Container								
				Number	Type							
1	SRC-2010-1-Comp	6/8/10	9:20	Sed	2	8oz glass	x					
2	SRC-2010-2-Comp	6/9/10	8:00	Sed	2	8oz glass	x					
3	SRC-2010-3-Comp	6/9/10	11:05	Sed	2	8oz glass	x					
4	SRC-2010-4-Comp	6/11/10	8:40	Sed	2	8oz glass	x					
5	SRC-2010-5-Comp	6/8/10	13:35	Sed	2	8oz glass	x					
6	SRC-2010-6-Comp	6/9/10	15:30	Sed	2	8oz glass	x					
7	SRC-2010-7-Comp	6/10/10	9:00	Sed	2	8oz glass	x					
8	SRC-2010-8-Z-Comp	6/10/10	11:55	Sed	2	8oz glass	x					
9	SRC-2010-1-Comp	6/8/10	9:20	Sed	1	1 poly bag		x				
10	SRC-2010-2-Comp	6/9/10	8:00	Sed	1	1 poly bag		x				
11	SRC-2010-3-Comp	6/9/10	11:05	Sed	1	1 poly bag		x				
12	SRC-2010-4-Comp	6/11/10	8:40	Sed	1	1 poly bag		x				
13	SRC-2010-5-Comp	6/8/10	13:35	Sed	1	1 poly bag		x				
14	SRC-2010-6-Comp	6/9/10	15:30	Sed	1	1 poly bag		x				
15	SRC-2010-7-Comp	6/10/10	9:00	Sed	1	1 poly bag		x				
16	SRC-2010-8-Z-Comp	6/10/10	11:55	Sed	1	1 poly bag		x				
Correct Containers:		Yes	No	RELIQUISHED BY								
Sample Temperature:		Ambient	Cold	Warm	Signature: <i>Mike McElroy</i>		Signature:					
Sample Preservative:		Yes	No		Print: <i>Mike McElroy</i>		Print:					
Turnaround Time:		STD	Specify:		Organization: <i>PER</i>		Organization:					
Comments: * Analyze for all of the constituents in Table 1 of the ACOE Master SAP and the constituents identified in Section L of the USFWS Biological Opinion for placement at the HWRP. The HWRP specific constituents that are not in Table 1 of the Master SAP or have lower reporting limits than the Master SAP are identified in Table 6 of the San Rafael Channel SOW. Analyte list to follow via email.				DATE: <i>6/17/10</i>		TIME: <i>1800</i>		DATE:				TIME:
				RECEIVED BY								
				Signature: <i>John Flori</i>		Signature:						
				Print: <i>John Flori</i>		Print:						
				Organization: <i>CAS</i>		Organization:						
				DATE: <i>6-18-10</i>		TIME: <i>900</i>		DATE:				TIME:

*MATRIX CODES: (SED = Sediment); (FW = Freshwater); (WW = Wastewater); (STRMW = Stormwater)



Pacific EcoRisk

ENVIRONMENTAL CONSULTING & TESTING

2250 Cordelia Rd., Fairfield, CA 94534

(707)207-7760

CAS CHAIN-OF-CUSTODY RECORD

002

K100636

Client Name:		Pacific EcoRisk					REQUESTED ANALYSIS												
Client Address:		2250 Cordelia Rd. Fairfield, CA 94534					* See Scope of Work	Grain Size Analysis											
Sampled By:		Mike McElroy																	
Phone:		(707) 207-7760																	
FAX:		(707) 207-7916																	
Project Manager:		Jeff Cotsifas																	
Project Name:		ACOE (San Rafael Channel)																	
PO Number:		16087																	
Client Sample ID	Sample Date	Sample Time	Sample Matrix*	Container															
				Number	Type														
1	SRC-2010-1-B-Comp	6/8/10	9:20	Sed	1	8oz glass	x												
2	SRC-2010-2-B-Comp	6/9/10	8:00	Sed	1	8oz glass	x												
3	SRC-2010-3-B-Comp	6/9/10	11:05	Sed	1	8oz glass	x												
4	SRC-2010-4-B-Comp	6/11/10	8:40	Sed	1	8oz glass	x												
5	SRC-2010-5-B-Comp	6/8/10	13:35	Sed	1	8oz glass	x												
6	SRC-2010-6-B-Comp	6/9/10	15:30	Sed	1	8oz glass	x												
7	SRC-2010-7-B-Comp	6/10/10	9:00	Sed	1	8oz glass	x												
8	SRC-2010-8-B-Comp	6/10/10	11:55	Sed	1	8oz glass	x												
9	SRC-2010-1-B-Comp	6/8/10	9:20	Sed	1	1 poly bag		x											
10	SRC-2010-2-B-Comp	6/9/10	8:00	Sed	1	1 poly bag		x											
11	SRC-2010-3-B-Comp	6/9/10	11:05	Sed	1	1 poly bag		x											
12	SRC-2010-4-B-Comp	6/11/10	8:40	Sed	1	1 poly bag		x											
13	SRC-2010-5-B-Comp	6/8/10	13:35	Sed	1	1 poly bag		x											
14	SRC-2010-6-B-Comp	6/9/10	15:30	Sed	1	1 poly bag		x											
15	SRC-2010-7-B-Comp	6/10/10	9:00	Sed	1	1 poly bag		x											
16	SRC-2010-8-B-Comp	6/10/10	11:55	Sed	1	1 poly bag		x											
Correct Containers:		Yes	No						RELIQUINSHED BY										
Sample Temperature:		Ambient	Cold	Warm	Signature: <i>[Signature]</i>					Signature:									
Sample Preservative:		Yes	No	Print: <i>Mike McElroy</i>					Print:										
Turnaround Time:		STD	Specify:					Organization: <i>PER</i>					Organization:						
Comments: * Analyze for all of the constituents in Table 1 of the ACOE Master SAP. Analyte list to follow via email.							DATE: <i>6/17/10</i> TIME: <i>1800</i>					DATE: TIME:							
							RECEIVED BY												
							Signature: <i>[Signature]</i>					Signature:							
							Print: <i>John Flori</i>					Print:							
							Organization: <i>CAS</i>					Organization:							
							DATE: <i>6-18-10</i> TIME: <i>900</i>					DATE: TIME:							

*MATRIX CODES: (SED = Sediment); (FW = Freshwater); (WW = Wastewater); (STRMW = Stormwater)



Pacific EcoRisk

ENVIRONMENTAL CONSULTING & TESTING

2250 Cordelia Rd., Fairfield, CA 94534

(707)207-7760

CAS CHAIN-OF-CUSTODY RECORD

K1006356

003

Client Name:		Pacific EcoRisk					REQUESTED ANALYSIS														
Client Address:		2250 Cordelia Rd. Fairfield, CA 94534					* See Scope of Work	Grain Size Analysis	*	*											
Sampled By:		Mike McElroy																			
Phone:		(707) 207-7760																			
FAX:		(707) 207-7916																			
Project Manager:		Jeff Cotsifas																			
Project Name:		ACOE (San Rafael Channel)																			
PO Number:		16087																			
Client Sample ID	Sample Date	Sample Time	Sample Matrix*	Container																	
				Number	Type																
1	SRC-2010-7-1	6/10/10	9:00	Sed	1	8oz glass	x														
2	SRC-2010-7-2	6/10/10	9:40	Sed	1	8oz glass	x														
3	SRC-2010-7-3	6/10/10	10:10	Sed	1	8oz glass	x														
4	SRC-2010-7-4	6/10/10	10:35	Sed	1	8oz glass	x														
5	SRC-2010-7-5	6/10/10	11:00	Sed	1	8oz glass	x														
6	SRC-2010-7-1	6/10/10	9:00	Sed	1	1 poly bag		x													
7	SRC-2010-7-2	6/10/10	9:40	Sed	1	1 poly bag		x													
8	SRC-2010-7-3	6/10/10	10:10	Sed	1	1 poly bag		x													
9	SRC-2010-7-4	6/10/10	10:35	Sed	1	1 poly bag		x													
10	SRC-2010-7-5	6/10/10	11:00	Sed	1	1 poly bag		x													
Correct Containers:		Yes	No																		
Sample Temperature:		Ambient	Cold	Warm																	
Sample Preservative:		Yes	No																		
Turnaround Time:		STD	Specify:																		
Comments: ** Analyze for all of the constituents in Table 1 of the ACOE Master SAP and the constituents identified in Section L of the USFWS Biological Opinion for placement at the HWRP. The HWRP specific constituents that are not in Table 1 of the Master SAP or have lower reporting limits than the Master SAP are identified in Table 6 of the San Rafael Channel SOW. Analyte list to follow via email. NO DIOXINS FOR THESE INDIVIDUAL CORES! ** please take grain size from jar. We were volume limited.				RELIQUISHED BY																	
				Signature: <i>Mike McElroy</i>										Signature:							
				Print: <i>Mike McElroy</i>										Print:							
				Organization: <i>PER</i>										Organization:							
				DATE: <i>6/17/10</i> TIME: <i>1800</i>										DATE: TIME							
				RECEIVED BY																	
				Signature: <i>John Flori</i>										Signature:							
				Print: <i>John Flori</i>										Print:							
				Organization: <i>CAS</i>										Organization:							
				DATE: <i>6-18-10</i> TIME: <i>900</i>										DATE: TIME							

*MATRIX CODES: (SED = Sediment); (FW = Freshwater); (WW = Wastewater); (STRMW = Stormwater)

Columbia Analytical Services, Inc.
Cooler Receipt and Preservation Form

PC 113

Client / Project: PAC. FERRIS Service Request K10

Received: 6/23/10 Opened: 6/23/10 By: af

1. Samples were received via? *Mail* *Fed Ex* *UPS* *DHL* *PBX* *Courier* *Hand Delivered*
2. Samples were received in: (circle) *Cooler* *Box* *Envelope* *Other* NA
3. Were custody seals on coolers? NA Y N If yes, how many and where? _____
- If present, were custody seals intact? Y N If present, were they signed and dated? Y N

Cooler Temp °C	Temp Blank °C	Thermometer ID	Cooler/COC ID	NA	Tracking Number	NA	Filed
<u>0.3</u>	<u>2.0</u>	<u>2109</u>			<u>748784387489</u>		<u>X</u>
<u>1.0</u>	<u>5.4</u>	<u>223</u>			<u>743661755787</u>		

7. Packing material used. *Inserts* *Baggies* *Bubble Wrap* *Gel Packs* *Wet Ice* *Sleeves* *Other* _____
8. Were custody papers properly filled out (ink, signed, etc.)? NA Y N
9. Did all bottles arrive in good condition (unbroken)? *Indicate in the table below.* NA Y N
10. Were all sample labels complete (i.e analysis, preservation, etc.)? NA Y N
11. Did all sample labels and tags agree with custody papers? *Indicate major discrepancies in the table on page 2.* NA Y N
12. Were appropriate bottles/containers and volumes received for the tests indicated? NA Y N
13. Were the pH-preserved bottles (*see SMO GEN SOP*) received at the appropriate pH? *Indicate in the table below* NA Y N
14. Were VOA vials received without headspace? *Indicate in the table below.* NA Y N
15. Was C12/Res negative? NA Y N

Sample ID on Bottle	Sample ID on COC	Identified by:

Sample ID	Bottle Count	Bottle Type	Out of Temp	Head-space	Broke	pH	Reagent	Volume added	Reagent Lot Number	Initials	Time

Notes, Discrepancies, & Resolutions: NO COC Rec'd.

Rec'd sample: SRC-2010-8-Z

Columbia Analytical Services, Inc.
Cooler Receipt and Preservation Form

PC 111

Client / Project: Pacific EcoRisk/ACOE Service Request K10 06356
Received: 6-18-10 Opened: 6-18-10 By: JS

1. Samples were received via? *Mail* Fed Ex *UPS* *DHL* *PDX* *Courier* *Hand Delivered*
2. Samples were received in: (circle) Cooler *Box* *Envelope* *Other* NA
3. Were custody seals on coolers? *NA* *Y* N If yes, how many and where? _____
If present, were custody seals intact? *Y* *N* If present, were they signed and dated? *Y* *N*

Cooler Temp °C	Temp Blank °C	Thermometer ID	Cooler/COC ID	Tracking Number	NA	Filed
0.0	NA	275	NA	7987 7208 5521		
0.5	NA	266		7936 4944 0189		
0.2	NA	287		7987 7208 5646		

7. Packing material used. *Inserts* *Baggies* Bubble Wrap *Gel Packs* Wet Ice *Sleeves* *Other* _____
8. Were custody papers properly filled out (ink, signed, etc.)? *NA* Y *N*
9. Did all bottles arrive in good condition (unbroken)? *Indicate in the table below.* *NA* Y *N*
10. Were all sample labels complete (i.e analysis, preservation, etc.)? *NA* *Y* N
11. Did all sample labels and tags agree with custody papers? *Indicate major discrepancies in the table on page 2.* *NA* *Y* N *
12. Were appropriate bottles/containers and volumes received for the tests indicated? *NA* Y *N*
13. Were the pH-preserved bottles (see SMO GEN SOP) received at the appropriate pH? *Indicate in the table below* NA *Y* *N*
14. Were VOA vials received without headspace? *Indicate in the table below.* NA *Y* *N*
15. Was C12/Res negative? NA *Y* *N*

Sample ID on Bottle	Sample ID on COC	Identified by:
SRC-2010-7-Z	SRC-2010-8-Z	elimination / Date (time don't match)

Sample ID	Bottle Count Bottle Type	Out of Temp	Head- space	Broke	pH	Reagent	Volume added	Reagent Lot Number	Initials	Time

Notes, Discrepancies, & Resolutions:

● Missing SRC-2010-8-B-Comp Jar & Bag

Total Solids

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Pacific EcoRisk Laboratories
 Project: USACE San Rafael Cha/16087
 Sample Matrix: Sediment

Service Request: K1006356

Total Solids

Prep Method: NONE
 Analysis Method: 160.3M
 Test Notes:

Units: PERCENT
 Basis: Wet

Sample Name	Lab Code	Date Collected	Date Received	Date Analyzed	Result	Result Notes
SRC-2010-1-Comp	K1006356-001	06/08/2010	06/18/2010	06/23/2010	44.6	
SRC-2010-2-Comp	K1006356-002	06/09/2010	06/18/2010	06/23/2010	46.7	
SRC-2010-3-Comp	K1006356-003	06/09/2010	06/18/2010	06/23/2010	48.3	
SRC-2010-4-Comp	K1006356-004	06/11/2010	06/18/2010	06/23/2010	47.2	
SRC-2010-5-Comp	K1006356-005	06/08/2010	06/18/2010	06/23/2010	44.2	
SRC-2010-6-Comp	K1006356-006	06/09/2010	06/18/2010	06/23/2010	40.9	
SRC-2010-7-Comp	K1006356-007	06/10/2010	06/18/2010	06/23/2010	42.0	
SRC-2010-8-Z-Comp	K1006356-008	06/10/2010	06/18/2010	06/23/2010	47.5	
SRC-2010-1-B-Comp	K1006356-009	06/08/2010	06/18/2010	06/23/2010	50.4	
SRC-2010-2-B-Comp	K1006356-010	06/09/2010	06/18/2010	06/23/2010	50.9	
SRC-2010-3-B-Comp	K1006356-011	06/09/2010	06/18/2010	06/23/2010	49.2	
SRC-2010-4-B-Comp	K1006356-012	06/11/2010	06/18/2010	06/23/2010	51.4	
SRC-2010-5-B-Comp	K1006356-013	06/08/2010	06/18/2010	06/23/2010	49.1	
SRC-2010-6-B-Comp	K1006356-014	06/09/2010	06/18/2010	06/23/2010	45.6	
SRC-2010-7-B-Comp	K1006356-015	06/10/2010	06/18/2010	06/23/2010	53.0	
SRC-2010-7-1	K1006356-016	06/10/2010	06/18/2010	06/23/2010	39.0	
SRC-2010-7-2	K1006356-017	06/10/2010	06/18/2010	06/23/2010	41.7	
SRC-2010-7-3	K1006356-018	06/10/2010	06/18/2010	06/23/2010	41.3	
SRC-2010-7-4	K1006356-019	06/10/2010	06/18/2010	06/23/2010	39.8	
SRC-2010-7-5	K1006356-020	06/10/2010	06/18/2010	06/23/2010	43.8	

QA/QC Report

Client: Pacific EcoRisk Laboratories
Project: USACE San Rafael Cha/16087
Sample Matrix: Sediment

Service Request: K1006356
Date Collected: 06/08/2010
Date Received: 06/18/2010
Date Analyzed: 06/23/2010

Duplicate Sample Summary
Total Solids

Prep Method: NONE
Analysis Method: 160.3M
Test Notes:

Units: PERCENT
Basis: Wet

Sample Name	Lab Code	Sample Result	Duplicate Sample Result	Average	Relative Percent Difference	Result Notes
SRC-2010-1-Comp	K1006356-001	44.6	44.0	44.3	1	

QA/QC Report

Client: Pacific EcoRisk Laboratories
Project: USACE San Rafael Cha/16087
Sample Matrix: Sediment

Service Request: K1006356
Date Collected: 06/09/2010
Date Received: 06/18/2010
Date Analyzed: 06/23/2010

Duplicate Sample Summary
Total Solids

Prep Method: NONE
Analysis Method: 160.3M
Test Notes:

Units: PERCENT
Basis: Wet

Sample Name	Lab Code	Sample Result	Duplicate Sample Result	Average	Relative Percent Difference	Result Notes
SRC-2010-3-B-Comp	K1006356-011	49.2	47.7	48.5	3	

Analytical Results

Client: Pacific EcoRisk Laboratories
Project: USACE San Rafael Cha/16087
Sample Matrix: Sediment

Service Request: K1006356

Total Solids

Prep Method: NONE
Analysis Method: 160.3M
Test Notes:

Units: PERCENT
Basis: Wet

Sample Name	Lab Code	Date Collected	Date Received	Date Analyzed	Result	Result Notes
SRC-2010-8-Z-Comp	K1006356-021	06/10/2010	06/23/2010	06/26/2010	44.0	

QA/QC Report

Client: Pacific EcoRisk Laboratories
Project: USACE San Rafael Cha/16087
Sample Matrix: Sediment

Service Request: K1006356
Date Collected: 06/10/2010
Date Received: 06/23/2010
Date Analyzed: 06/26/2010

Duplicate Sample Summary
Total Solids

Prep Method: NONE
Analysis Method: 160.3M
Test Notes:

Units: PERCENT
Basis: Wet

Sample Name	Lab Code	Sample Result	Duplicate Sample Result	Average	Relative Percent Difference	Result Notes
SRC-2010-8-Z-Comp	K1006356-021	44.0	46.7	45.4	6	

General Chemistry Parameters

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client : Pacific EcoRisk Laboratories
Project Name : USACE San Rafael Channel
Project Number : 16087
Sample Matrix : SEDIMENT

Service Request : K1006356
Date Collected : 06/08-11/10
Date Received : 06/18-23/10

Carbon, Total Organic

Prep Method : CAS SOP
Analysis Method : 9060M
Test Notes :

Units : Percent
Basis : Dry

Sample Name	Lab Code	MRL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Result	Result Notes
SRC-2010-1-Comp	K1006356-001	0.050	0.020	1	6/22/2010	06/25/10	1.38	
SRC-2010-2-Comp	K1006356-002	0.050	0.020	1	6/22/2010	06/25/10	1.28	
SRC-2010-3-Comp	K1006356-003	0.050	0.020	1	6/22/2010	06/25/10	1.15	
SRC-2010-4-Comp	K1006356-004	0.050	0.020	1	6/22/2010	06/25/10	1.29	
SRC-2010-5-Comp	K1006356-005	0.050	0.020	1	6/22/2010	06/25/10	1.45	
SRC-2010-6-Comp	K1006356-006	0.050	0.020	1	6/22/2010	06/25/10	1.56	
SRC-2010-7-Comp	K1006356-007	0.050	0.020	1	6/22/2010	06/25/10	2.84	
SRC-2010-7-Z-Comp	K1006356-008	0.050	0.020	1	6/22/2010	06/25/10	0.558	
SRC-2010-1-B-Comp	K1006356-009	0.050	0.020	1	6/22/2010	06/28/10	1.33	
SRC-2010-2-B-Comp	K1006356-010	0.050	0.020	1	6/22/2010	06/28/10	1.36	
SRC-2010-3-B-Comp	K1006356-011	0.050	0.020	1	6/22/2010	06/28/10	1.27	
SRC-2010-4-B-Comp	K1006356-012	0.050	0.020	1	6/22/2010	06/28/10	1.299	
SRC-2010-5-B-Comp	K1006356-013	0.050	0.020	1	6/22/2010	06/28/10	1.497	
SRC-2010-6-B-Comp	K1006356-014	0.050	0.020	1	6/22/2010	06/28/10	1.56	
SRC-2010-7-B-Comp	K1006356-015	0.050	0.020	1	6/22/2010	06/28/10	1.64	
SRC-2010-7-1	K1006356-016	0.050	0.020	1	6/22/2010	06/28/10	1.77	
SRC-2010-7-2	K1006356-017	0.050	0.020	1	6/22/2010	06/28/10	1.61	
SRC-2010-7-3	K1006356-018	0.050	0.020	1	6/22/2010	06/28/10	1.96	
SRC-2010-7-4	K1006356-019	0.050	0.020	1	6/22/2010	06/28/10	3.83	
SRC-2010-7-5	K1006356-020	0.050	0.020	1	6/22/2010	06/28/10	4.91	
SRC-2010-8-Z-Comp	K1006356-021	0.050	0.020	1	6/24/2010	06/28/10	4.75	
Method Blank	K1006356-MB	0.050	0.020	1	NA	06/25/10	ND	
Method Blank	K1006356-MB	0.050	0.020	1	NA	06/28/10	ND	

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client : Pacific EcoRisk Laboratories
Project Name : USACE San Rafael Channel
Project Number : 16087
Sample Matrix : SEDIMENT

Service Request : K1006356
Date Collected : 6/9/2010
Date Received : 6/18/2010
Date Prepared : 06/22/10
Date Analyzed : 06/28/10

Duplicate Summary Inorganic Parameters

Sample Name : SRC-2010-3-B-Comp
Lab Code : K1006356-011DUP
Test Notes :

Units : Percent
Basis : Dry

Analyte	Prep Method	Analysis Method	MRL	Sample Result	Duplicate Sample Result	Average	Relative Percent Difference	Result Notes
Carbon, Total Organic	CAS SOP	9060M	0.050	1.27	1.25	1.26	2	

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client : Pacific EcoRisk Laboratories
Project Name : USACE San Rafael Channel
Project Number : 16087
Sample Matrix : SEDIMENT

Service Request : K1006356
Date Collected : NA
Date Received : NA
Date Prepared : NA
Date Analyzed : 06/28/10

**Duplicate Summary
Inorganic Parameters**

Sample Name : Batch QC
Lab Code : K1006377-001DUP
Test Notes :

Units : Percent
Basis : Dry

Analyte	Prep Method	Analysis Method	MRL	Sample Result	Duplicate Sample Result	Average	Relative Percent Difference	Result Notes
Carbon, Total Organic	CAS SOP	9060M	0.050	0.473	0.454	0.464	4	

COLUMBIA ANALYTICAL SERVICES, INC.**QA/QC Report**

Client : Pacific EcoRisk Laboratories
Project Name : USACE San Rafael Channel
Project Number : 16087
Sample Matrix : SEDIMENT

Service Request : K1006356
Date Collected : 6/9/2010
Date Received : 6/18/2010
Date Prepared : 06/22/10
Date Analyzed : 06/28/10

Matrix Spike/Duplicate Matrix Spike Summary

Sample Name : SRC-2010-3-B-Comp
Lab Code : K1006356-011MS
Test Notes :

K1006356-011DMS

Units : Percent
Basis : Dry

Analyte	Prep Method	Analysis Method	MRL	Spike Level		Sample Result	Spike Result		Spike Recovery		CAS Acceptance Limits	Relative Percent Difference	Result Notes
				MS	DMS		MS	DMS	MS	DMS			
Carbon, Total Organic	CAS SOP	9060M	0.050	4.14	10.2	1.27	5.94	11.6	113	101	77-155	11	

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client : Pacific EcoRisk Laboratories
Project Name : USACE San Rafael Channel
Project Number : 16087
Sample Matrix : SEDIMENT

Service Request : K1006356
Date Collected : NA
Date Received : NA
Date Prepared : NA
Date Analyzed : 06/28/10

Matrix Spike/Duplicate Matrix Spike Summary

Sample Name : Batch QC
Lab Code : K1006377-001MS
Test Notes :

K1006377-001DMS

Units : Percent
Basis : Dry

Analyte	Prep Method	Analysis Method	MRL	Spike Level		Sample Result	Spike Result		Spike Recovery		CAS Acceptance Limits	Relative Percent Difference	Result Notes
				MS	DMS		MS	DMS	MS	DMS			
Carbon, Total Organic	CAS SOP	9060M	0.050	9.20	4.40	0.473	9.45	4.98	98	102	77-155	4	

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client : Pacific EcoRisk Laboratories
Project Name : USACE San Rafael Channel
Project Number : 16087
Sample Matrix : SEDIMENT

Service Request : K1006356
Date Collected : NA
Date Received : NA
Date Prepared : NA
Date Analyzed : 06/25/10

Laboratory Control Sample Summary Inorganic Parameters

Sample Name : Lab Control Sample
Lab Code : K1006356-LCS
Test Notes :

Units : Percent
Basis : Dry

Analyte	Prep Method	Analysis Method	True Value	Result	Percent Recovery	CAS Percent Recovery	Result Notes
						Acceptance Limits	
Carbon, Total Organic	CAS SOP	9060M	0.550	0.517	94	82-119	

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client : Pacific EcoRisk Laboratories
Project Name : USACE San Rafael Channel
Project Number : 16087
Sample Matrix : SEDIMENT

Service Request : K1006356
Date Collected : NA
Date Received : NA
Date Prepared : NA
Date Analyzed : 06/28/10

Laboratory Control Sample Summary Inorganic Parameters

Sample Name : Laboratory Control Sample
Lab Code : K1006356-LCS
Test Notes :

Units : Percent
Basis : Dry

Analyte	Prep Method	Analysis Method	True Value	Result	Percent Recovery	CAS Percent Recovery	Result Notes
						Acceptance Limits	
Carbon, Total Organic	CAS SOP	9060M	0.550	0.484	88	82-119	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: Pacific EcoRisk Laboratories
Project: USACE San Rafael Channel/16087
Sample Matrix: Sediment

Service Request: K1006356
Date Collected: 6/8/2010
Date Received: 6/18/2010
Date Analyzed: 6/21/2010

Particle Size Determination
 Puget Sound Estuary Program Protocol

Sample Name: SRC-2010-1-Comp
Lab Code: K1006356-001

Sand Fraction: Dry Weight (Grams) 5.5531
 Sand Fraction: Weight Recovered (Grams) 5.4398
 Sand Fraction: Percent Recovery 98.0

Description	Phi Size	Dry Weight (Grams)	Percent of Total Weight Recovered
Gravel (>2.00 mm)	<-1 Ø	2.3556	18.6
Sand, Very Coarse (1.00 mm to 2.00 mm)	-1 to 0 Ø	0.5789	4.58
Sand, Coarse (0.50	0 to 1 Ø	0.6425	5.09
Sand, Medium (0.250 mm to 0.500 mm)	1 to 2 Ø	0.4470	3.54
Sand, Fine (0.125 mm to 0.250 mm)	2 to 3 Ø	0.1462	1.16
Sand, Very Fine (0.0625 mm to 0.125 mm)	3 to 4 Ø	0.3595	2.85
Silt (0.0039 mm to 0.0625 mm)	4 to 8 Ø	3.9800	31.5
Clay (< 0.0039 mm)	> 8 Ø	4.5550	36.1
Total		13.0647	103

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: Pacific EcoRisk Laboratories
Project: USACE San Rafael Channel/16087
Sample Matrix: Sediment

Service Request: K1006356
Date Collected: 6/8/2010
Date Received: 6/18/2010
Date Analyzed: 6/21/2010

Particle Size Determination
 Puget Sound Estuary Program Protocol

Sample Name: SRC-2010-1-Comp
Lab Code: K1006356-001DUP

Sand Fraction: Dry Weight (Grams) 6.2286
 Sand Fraction: Weight Recovered (Grams) 6.1502
 Sand Fraction: Percent Recovery 98.7

Description	Phi Size	Dry Weight (Grams)	Percent of Total Weight Recovered
Gravel (>2.00 mm)	<-1 Ø	2.6797	15.7
Sand, Very Coarse (1.00 mm to 2.00 mm)	-1 to 0 Ø	0.5007	2.93
Sand, Coarse (0.50	0 to 1 Ø	0.5724	3.34
Sand, Medium (0.250 mm to 0.500 mm)	1 to 2 Ø	0.1275	0.74
Sand, Fine (0.125 mm to 0.250 mm)	2 to 3 Ø	1.2747	7.45
Sand, Very Fine (0.0625 mm to 0.125 mm)	3 to 4 Ø	0.3402	1.99
Silt (0.0039 mm to 0.0625 mm)	4 to 8 Ø	6.3500	37.1
Clay (< 0.0039 mm)	> 8 Ø	4.0750	23.8
Total		15.9202	93.0

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: Pacific EcoRisk Laboratories
Project: USACE San Rafael Channel/16087
Sample Matrix: Sediment

Service Request: K1006356
Date Collected: 6/8/2010
Date Received: 6/18/2010
Date Analyzed: 6/21/2010

Particle Size Determination
 Puget Sound Estuary Program Protocol

Sample Name: SRC-2010-1-Comp
Lab Code: K1006356-001TRP

Sand Fraction: Dry Weight (Grams) 5.0219
 Sand Fraction: Weight Recovered (Grams) 5.2082
 Sand Fraction: Percent Recovery 104

Description	Phi Size	Dry Weight (Grams)	Percent of Total Weight Recovered
Gravel (>2.00 mm)	<-1 Ø	0.3205	2.90
Sand, Very Coarse (1.00 mm to 2.00 mm)	-1 to 0 Ø	1.6211	14.7
Sand, Coarse (0.50	0 to 1 Ø	0.9489	8.58
Sand, Medium (0.250 mm to 0.500 mm)	1 to 2 Ø	0.3149	2.85
Sand, Fine (0.125 mm to 0.250 mm)	2 to 3 Ø	0.5479	4.95
Sand, Very Fine (0.0625 mm to 0.125 mm)	3 to 4 Ø	0.6972	6.30
Silt (0.0039 mm to 0.0625 mm)	4 to 8 Ø	3.1800	28.8
Clay (< 0.0039 mm)	> 8 Ø	4.1650	37.7
Total		11.7955	107

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: Pacific EcoRisk Laboratories
Project: USACE San Rafael Channel/16087
Sample Matrix: Sediment

Service Request: K1006356
Date Collected: 6/9/2010
Date Received: 6/18/2010
Date Analyzed: 6/21/2010

Particle Size Determination
 Puget Sound Estuary Program Protocol

Sample Name: SRC-2010-2-Comp
Lab Code: K1006356-002

Sand Fraction: Dry Weight (Grams) 10.5713
 Sand Fraction: Weight Recovered (Grams) 10.4627
 Sand Fraction: Percent Recovery 99.0

Description	Phi Size	Dry Weight (Grams)	Percent of Total Weight Recovered
Gravel (>2.00 mm)	<-1 Ø	3.2902	16.8
Sand, Very Coarse (1.00 mm to 2.00 mm)	-1 to 0 Ø	3.4451	17.6
Sand, Coarse (0.50	0 to 1 Ø	1.5358	7.85
Sand, Medium (0.250 mm to 0.500 mm)	1 to 2 Ø	0.6764	3.46
Sand, Fine (0.125 mm to 0.250 mm)	2 to 3 Ø	0.6098	3.12
Sand, Very Fine (0.0625 mm to 0.125 mm)	3 to 4 Ø	0.8639	4.41
Silt (0.0039 mm to 0.0625 mm)	4 to 8 Ø	3.8250	19.5
Clay (< 0.0039 mm)	> 8 Ø	3.6300	18.5
Total		17.8762	91.3

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: Pacific EcoRisk Laboratories
Project: USACE San Rafael Channel/16087
Sample Matrix: Sediment

Service Request: K1006356
Date Collected: 6/9/2010
Date Received: 6/18/2010
Date Analyzed: 6/21/2010

Particle Size Determination Puget Sound Estuary Program Protocol

Sample Name: SRC-2010-3-Comp
Lab Code: K1006356-003

Sand Fraction: Dry Weight (Grams) 9.4867
 Sand Fraction: Weight Recovered (Grams) 9.2965
 Sand Fraction: Percent Recovery 98.0

Description	Phi Size	Dry Weight (Grams)	Percent of Total Weight Recovered
Gravel (>2.00 mm)	<-1 Ø	0.1392	0.64
Sand, Very Coarse (1.00 mm to 2.00 mm)	-1 to 0 Ø	3.6254	16.6
Sand, Coarse (0.50	0 to 1 Ø	1.7032	7.78
Sand, Medium (0.250 mm to 0.500 mm)	1 to 2 Ø	0.2318	1.06
Sand, Fine (0.125 mm to 0.250 mm)	2 to 3 Ø	0.4622	2.11
Sand, Very Fine (0.0625 mm to 0.125 mm)	3 to 4 Ø	1.7310	7.91
Silt (0.0039 mm to 0.0625 mm)	4 to 8 Ø	6.7500	30.8
Clay (< 0.0039 mm)	> 8 Ø	6.5700	30.0
Total		21.2128	96.9

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: Pacific EcoRisk Laboratories
Project: USACE San Rafael Channel/16087
Sample Matrix: Sediment

Service Request: K1006356
Date Collected: 6/11/2010
Date Received: 6/18/2010
Date Analyzed: 6/21/2010

Particle Size Determination Puget Sound Estuary Program Protocol

Sample Name: SRC-2010-4-Comp
Lab Code: K1006356-004

Sand Fraction: Dry Weight (Grams) 19.0694
 Sand Fraction: Weight Recovered (Grams) 18.7951
 Sand Fraction: Percent Recovery 98.6

Description	Phi Size	Dry Weight (Grams)	Percent of Total Weight Recovered
Gravel (>2.00 mm)	<-1 Ø	7.3346	23.2
Sand, Very Coarse (1.00 mm to 2.00 mm)	-1 to 0 Ø	4.7095	14.9
Sand, Coarse (0.50	0 to 1 Ø	2.1579	6.82
Sand, Medium (0.250 mm to 0.500 mm)	1 to 2 Ø	2.0217	6.39
Sand, Fine (0.125 mm to 0.250 mm)	2 to 3 Ø	0.8062	2.55
Sand, Very Fine (0.0625 mm to 0.125 mm)	3 to 4 Ø	0.3923	1.24
Silt (0.0039 mm to 0.0625 mm)	4 to 8 Ø	6.1200	19.3
Clay (< 0.0039 mm)	> 8 Ø	6.9050	21.8
Total		30.4472	96.2

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: Pacific EcoRisk Laboratories
Project: USACE San Rafael Channel/16087
Sample Matrix: Sediment

Service Request: K1006356
Date Collected: 6/8/2010
Date Received: 6/18/2010
Date Analyzed: 6/21/2010

Particle Size Determination Puget Sound Estuary Program Protocol

Sample Name: SRC-2010-5-Comp
Lab Code: K1006356-005

Sand Fraction: Dry Weight (Grams) 9.6607
 Sand Fraction: Weight Recovered (Grams) 9.4601
 Sand Fraction: Percent Recovery 97.9

Description	Phi Size	Dry Weight (Grams)	Percent of Total Weight Recovered
Gravel (>2.00 mm)	<-1 Ø	1.8407	10.5
Sand, Very Coarse (1.00 mm to 2.00 mm)	-1 to 0 Ø	2.6610	15.2
Sand, Coarse (0.50	0 to 1 Ø	1.5345	8.76
Sand, Medium (0.250 mm to 0.500 mm)	1 to 2 Ø	0.5012	2.86
Sand, Fine (0.125 mm to 0.250 mm)	2 to 3 Ø	0.9661	5.51
Sand, Very Fine (0.0625 mm to 0.125 mm)	3 to 4 Ø	0.6078	3.47
Silt (0.0039 mm to 0.0625 mm)	4 to 8 Ø	4.4800	25.6
Clay (< 0.0039 mm)	> 8 Ø	4.7100	26.9
Total		17.3013	98.7

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: Pacific EcoRisk Laboratories
Project: USACE San Rafael Channel/16087
Sample Matrix: Sediment

Service Request: K1006356
Date Collected: 6/9/2010
Date Received: 6/18/2010
Date Analyzed: 6/21/2010

Particle Size Determination
 Puget Sound Estuary Program Protocol

Sample Name: SRC-2010-6-Comp
Lab Code: K1006356-006

Sand Fraction: Dry Weight (Grams) 10.0891
 Sand Fraction: Weight Recovered (Grams) 9.8831
 Sand Fraction: Percent Recovery 98.0

Description	Phi Size	Dry Weight (Grams)	Percent of Total Weight Recovered
Gravel (>2.00 mm)	<-1 Ø	1.0152	4.04
Sand, Very Coarse (1.00 mm to 2.00 mm)	-1 to 0 Ø	3.1592	12.6
Sand, Coarse (0.50	0 to 1 Ø	2.2057	8.77
Sand, Medium (0.250 mm to 0.500 mm)	1 to 2 Ø	0.5279	2.10
Sand, Fine (0.125 mm to 0.250 mm)	2 to 3 Ø	0.6169	2.45
Sand, Very Fine (0.0625 mm to 0.125 mm)	3 to 4 Ø	1.3242	5.27
Silt (0.0039 mm to 0.0625 mm)	4 to 8 Ø	6.1500	24.5
Clay (< 0.0039 mm)	> 8 Ø	10.5050	41.8
Total		25.5041	101

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: Pacific EcoRisk Laboratories
Project: USACE San Rafael Channel/16087
Sample Matrix: Sediment

Service Request: K1006356
Date Collected: 6/10/2010
Date Received: 6/18/2010
Date Analyzed: 6/21/2010

Particle Size Determination
 Puget Sound Estuary Program Protocol

Sample Name: SRC-2010-7-Comp
Lab Code: K1006356-007

Sand Fraction: Dry Weight (Grams) 9.8913
 Sand Fraction: Weight Recovered (Grams) 9.5265
 Sand Fraction: Percent Recovery 96.3

Description	Phi Size	Dry Weight (Grams)	Percent of Total Weight Recovered
Gravel (>2.00 mm)	<-1 Ø	1.9993	9.18
Sand, Very Coarse (1.00 mm to 2.00 mm)	-1 to 0 Ø	1.8333	8.42
Sand, Coarse (0.50	0 to 1 Ø	1.1347	5.21
Sand, Medium (0.250 mm to 0.500 mm)	1 to 2 Ø	0.9289	4.27
Sand, Fine (0.125 mm to 0.250 mm)	2 to 3 Ø	0.9378	4.31
Sand, Very Fine (0.0625 mm to 0.125 mm)	3 to 4 Ø	1.4191	6.52
Silt (0.0039 mm to 0.0625 mm)	4 to 8 Ø	2.2600	10.4
Clay (< 0.0039 mm)	> 8 Ø	9.1250	41.9
Total		19.6381	90.2

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: Pacific EcoRisk Laboratories
Project: USACE San Rafael Channel/16087
Sample Matrix: Sediment

Service Request: K1006356
Date Collected: 6/10/2010
Date Received: 6/18/2010
Date Analyzed: 6/21/2010

Particle Size Determination Puget Sound Estuary Program Protocol

Sample Name: SRC-2010-7-Z-Comp
Lab Code: K1006356-008

Sand Fraction: Dry Weight (Grams) 13.1565
 Sand Fraction: Weight Recovered (Grams) 12.9076
 Sand Fraction: Percent Recovery 98.1

Description	Phi Size	Dry Weight (Grams)	Percent of Total Weight Recovered
Gravel (>2.00 mm)	<-1 Ø	1.7388	7.71
Sand, Very Coarse (1.00 mm to 2.00 mm)	-1 to 0 Ø	2.5944	11.5
Sand, Coarse (0.50	0 to 1 Ø	2.3567	10.4
Sand, Medium (0.250 mm to 0.500 mm)	1 to 2 Ø	0.4620	2.05
Sand, Fine (0.125 mm to 0.250 mm)	2 to 3 Ø	1.5924	7.06
Sand, Very Fine (0.0625 mm to 0.125 mm)	3 to 4 Ø	2.7144	12.0
Silt (0.0039 mm to 0.0625 mm)	4 to 8 Ø	4.8350	21.4
Clay (< 0.0039 mm)	> 8 Ø	5.8700	26.0
Total		22.1637	98.3

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: Pacific EcoRisk Laboratories
Project: USACE San Rafael Channel/16087
Sample Matrix: Sediment

Service Request: K1006356
Date Collected: 6/8/2010
Date Received: 6/18/2010
Date Analyzed: 6/21/2010

Particle Size Determination
 Puget Sound Estuary Program Protocol

Sample Name: SRC-2010-1-B-Comp
Lab Code: K1006356-009

Sand Fraction: Dry Weight (Grams) 24.8280
 Sand Fraction: Weight Recovered (Grams) 24.6927
 Sand Fraction: Percent Recovery 99.5

Description	Phi Size	Dry Weight (Grams)	Percent of Total Weight Recovered
Gravel (>2.00 mm)	<-1 Ø	5.4264	15.8
Sand, Very Coarse (1.00 mm to 2.00 mm)	-1 to 0 Ø	5.3338	15.5
Sand, Coarse (0.50	0 to 1 Ø	4.0456	11.8
Sand, Medium (0.250 mm to 0.500 mm)	1 to 2 Ø	1.3109	3.82
Sand, Fine (0.125 mm to 0.250 mm)	2 to 3 Ø	2.9003	8.44
Sand, Very Fine (0.0625 mm to 0.125 mm)	3 to 4 Ø	4.1787	12.2
Silt (0.0039 mm to 0.0625 mm)	4 to 8 Ø	5.5650	16.2
Clay (< 0.0039 mm)	> 8 Ø	6.1250	17.8
Total		34.8857	102

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: Pacific EcoRisk Laboratories
Project: USACE San Rafael Channel/16087
Sample Matrix: Sediment

Service Request: K1006356
Date Collected: 6/9/2010
Date Received: 6/18/2010
Date Analyzed: 6/21/2010

Particle Size Determination
 Puget Sound Estuary Program Protocol

Sample Name: SRC-2010-2-B-Comp
Lab Code: K1006356-010

Sand Fraction: Dry Weight (Grams) 7.9484
 Sand Fraction: Weight Recovered (Grams) 7.7995
 Sand Fraction: Percent Recovery 98.1

Description	Phi Size	Dry Weight (Grams)	Percent of Total Weight Recovered
Gravel (>2.00 mm)	<-1 Ø	3.9896	15.4
Sand, Very Coarse (1.00 mm to 2.00 mm)	-1 to 0 Ø	0.9344	3.61
Sand, Coarse (0.50	0 to 1 Ø	0.7433	2.87
Sand, Medium (0.250 mm to 0.500 mm)	1 to 2 Ø	0.4988	1.93
Sand, Fine (0.125 mm to 0.250 mm)	2 to 3 Ø	0.4094	1.58
Sand, Very Fine (0.0625 mm to 0.125 mm)	3 to 4 Ø	0.6040	2.33
Silt (0.0039 mm to 0.0625 mm)	4 to 8 Ø	6.5000	25.1
Clay (< 0.0039 mm)	> 8 Ø	10.3450	40.0
Total		24.0245	92.8

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: Pacific EcoRisk Laboratories
Project: USACE San Rafael Channel/16087
Sample Matrix: Sediment

Service Request: K1006356
Date Collected: 6/9/2010
Date Received: 6/18/2010
Date Analyzed: 6/21/2010

Particle Size Determination
 Puget Sound Estuary Program Protocol

Sample Name: SRC-2010-3-B-Comp
Lab Code: K1006356-011

Sand Fraction: Dry Weight (Grams) 18.1075
 Sand Fraction: Weight Recovered (Grams) 17.8190
 Sand Fraction: Percent Recovery 98.4

Description	Phi Size	Dry Weight (Grams)	Percent of Total Weight Recovered
Gravel (>2.00 mm)	<-1 Ø	9.7410	33.5
Sand, Very Coarse (1.00 mm to 2.00 mm)	-1 to 0 Ø	2.4118	8.30
Sand, Coarse (0.50	0 to 1 Ø	1.6252	5.60
Sand, Medium (0.250 mm to 0.500 mm)	1 to 2 Ø	0.9794	3.37
Sand, Fine (0.125 mm to 0.250 mm)	2 to 3 Ø	0.6938	2.39
Sand, Very Fine (0.0625 mm to 0.125 mm)	3 to 4 Ø	1.1772	4.05
Silt (0.0039 mm to 0.0625 mm)	4 to 8 Ø	5.7300	19.7
Clay (< 0.0039 mm)	> 8 Ø	6.4900	22.3
Total		28.8484	99.3

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: Pacific EcoRisk Laboratories
Project: USACE San Rafael Channel/16087
Sample Matrix: Sediment

Service Request: K1006356
Date Collected: 6/11/2010
Date Received: 6/18/2010
Date Analyzed: 6/21/2010

Particle Size Determination
 Puget Sound Estuary Program Protocol

Sample Name: SRC-2010-4-B-Comp
Lab Code: K1006356-012

Sand Fraction: Dry Weight (Grams) 17.0500
 Sand Fraction: Weight Recovered (Grams) 17.1041
 Sand Fraction: Percent Recovery 100

Description	Phi Size	Dry Weight (Grams)	Percent of Total Weight Recovered
Gravel (>2.00 mm)	<-1 Ø	10.1442	35.3
Sand, Very Coarse (1.00 mm to 2.00 mm)	-1 to 0 Ø	2.6932	9.37
Sand, Coarse (0.50	0 to 1 Ø	1.4715	5.12
Sand, Medium (0.250 mm to 0.500 mm)	1 to 2 Ø	0.8531	2.97
Sand, Fine (0.125 mm to 0.250 mm)	2 to 3 Ø	0.5435	1.89
Sand, Very Fine (0.0625 mm to 0.125 mm)	3 to 4 Ø	0.6592	2.29
Silt (0.0039 mm to 0.0625 mm)	4 to 8 Ø	5.3500	18.6
Clay (< 0.0039 mm)	> 8 Ø	6.6950	23.3
Total		28.4097	98.9

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: Pacific EcoRisk Laboratories
Project: USACE San Rafael Channel/16087
Sample Matrix: Sediment

Service Request: K1006356
Date Collected: 6/8/2010
Date Received: 6/18/2010
Date Analyzed: 6/21/2010

Particle Size Determination
 Puget Sound Estuary Program Protocol

Sample Name: SRC-2010-5-B-Comp
Lab Code: K1006356-013

Sand Fraction: Dry Weight (Grams) 11.5646
 Sand Fraction: Weight Recovered (Grams) 11.4069
 Sand Fraction: Percent Recovery 98.6

Description	Phi Size	Dry Weight (Grams)	Percent of Total Weight Recovered
Gravel (>2.00 mm)	<-1 Ø	4.3524	15.6
Sand, Very Coarse (1.00 mm to 2.00 mm)	-1 to 0 Ø	1.5413	5.54
Sand, Coarse (0.50	0 to 1 Ø	1.5238	5.48
Sand, Medium (0.250 mm to 0.500 mm)	1 to 2 Ø	1.1507	4.14
Sand, Fine (0.125 mm to 0.250 mm)	2 to 3 Ø	0.7811	2.81
Sand, Very Fine (0.0625 mm to 0.125 mm)	3 to 4 Ø	0.9556	3.43
Silt (0.0039 mm to 0.0625 mm)	4 to 8 Ø	7.3350	26.4
Clay (< 0.0039 mm)	> 8 Ø	10.0600	36.2
Total		27.6999	100

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: Pacific EcoRisk Laboratories
Project: USACE San Rafael Channel/16087
Sample Matrix: Sediment

Service Request: K1006356
Date Collected: 6/9/2010
Date Received: 6/18/2010
Date Analyzed: 6/21/2010

Particle Size Determination
 Puget Sound Estuary Program Protocol

Sample Name: SRC-2010-6-B-Comp
Lab Code: K1006356-014

Sand Fraction: Dry Weight (Grams) 10.9887
 Sand Fraction: Weight Recovered (Grams) 10.9157
 Sand Fraction: Percent Recovery 99.3

Description	Phi Size	Dry Weight (Grams)	Percent of Total Weight Recovered
Gravel (>2.00 mm)	<-1 Ø	3.8552	14.1
Sand, Very Coarse (1.00 mm to 2.00 mm)	-1 to 0 Ø	1.3432	4.90
Sand, Coarse (0.50	0 to 1 Ø	1.5037	5.49
Sand, Medium (0.250 mm to 0.500 mm)	1 to 2 Ø	1.3384	4.88
Sand, Fine (0.125 mm to 0.250 mm)	2 to 3 Ø	1.0049	3.67
Sand, Very Fine (0.0625 mm to 0.125 mm)	3 to 4 Ø	0.7081	2.58
Silt (0.0039 mm to 0.0625 mm)	4 to 8 Ø	6.4500	23.5
Clay (< 0.0039 mm)	> 8 Ø	10.4500	38.1
Total		26.6535	97.2

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: Pacific EcoRisk Laboratories
Project: USACE San Rafael Channel/16087
Sample Matrix: Sediment

Service Request: K1006356
Date Collected: 6/10/2010
Date Received: 6/18/2010
Date Analyzed: 6/21/2010

Particle Size Determination
 Puget Sound Estuary Program Protocol

Sample Name: SRC-2010-7-B-Comp
Lab Code: K1006356-015

Sand Fraction: Dry Weight (Grams) 6.7172
 Sand Fraction: Weight Recovered (Grams) 6.6306
 Sand Fraction: Percent Recovery 98.7

Description	Phi Size	Dry Weight (Grams)	Percent of Total Weight Recovered
Gravel (>2.00 mm)	<-1 Ø	1.2429	4.64
Sand, Very Coarse (1.00 mm to 2.00 mm)	-1 to 0 Ø	1.5060	5.63
Sand, Coarse (0.50	0 to 1 Ø	1.2842	4.80
Sand, Medium (0.250 mm to 0.500 mm)	1 to 2 Ø	0.7962	2.97
Sand, Fine (0.125 mm to 0.250 mm)	2 to 3 Ø	0.5679	2.12
Sand, Very Fine (0.0625 mm to 0.125 mm)	3 to 4 Ø	0.7160	2.67
Silt (0.0039 mm to 0.0625 mm)	4 to 8 Ø	10.8550	40.6
Clay (< 0.0039 mm)	> 8 Ø	10.4450	39.0
Total		27.4132	102

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: Pacific EcoRisk Laboratories
Project: USACE San Rafael Channel/16087
Sample Matrix: Sediment

Service Request: K1006356
Date Collected: 6/10/2010
Date Received: 6/18/2010
Date Analyzed: 6/21/2010

Particle Size Determination
 Puget Sound Estuary Program Protocol

Sample Name: SRC-2010-7-1
Lab Code: K1006356-016

Sand Fraction: Dry Weight (Grams) 6.3634
 Sand Fraction: Weight Recovered (Grams) 6.1497
 Sand Fraction: Percent Recovery 96.6

Description	Phi Size	Dry Weight (Grams)	Percent of Total Weight Recovered
Gravel (>2.00 mm)	<-1 Ø	1.3073	5.68
Sand, Very Coarse (1.00 mm to 2.00 mm)	-1 to 0 Ø	1.6549	7.19
Sand, Coarse (0.50	0 to 1 Ø	0.9617	4.18
Sand, Medium (0.250 mm to 0.500 mm)	1 to 2 Ø	0.9784	4.25
Sand, Fine (0.125 mm to 0.250 mm)	2 to 3 Ø	0.3678	1.60
Sand, Very Fine (0.0625 mm to 0.125 mm)	3 to 4 Ø	0.4042	1.76
Silt (0.0039 mm to 0.0625 mm)	4 to 8 Ø	7.8500	34.1
Clay (< 0.0039 mm)	> 8 Ø	10.3100	44.8
Total		23.8343	104

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: Pacific EcoRisk Laboratories
Project: USACE San Rafael Channel/16087
Sample Matrix: Sediment

Service Request: K1006356
Date Collected: 6/10/2010
Date Received: 6/18/2010
Date Analyzed: 6/21/2010

Particle Size Determination
 Puget Sound Estuary Program Protocol

Sample Name: SRC-2010-7-2
Lab Code: K1006356-017

Sand Fraction: Dry Weight (Grams) 16.6760
 Sand Fraction: Weight Recovered (Grams) 16.4674
 Sand Fraction: Percent Recovery 98.7

Description	Phi Size	Dry Weight (Grams)	Percent of Total Weight Recovered
Gravel (>2.00 mm)	<-1 Ø	12.6734	42.1
Sand, Very Coarse (1.00 mm to 2.00 mm)	-1 to 0 Ø	0.8854	2.94
Sand, Coarse (0.50	0 to 1 Ø	1.1098	3.69
Sand, Medium (0.250 mm to 0.500 mm)	1 to 2 Ø	0.4272	1.42
Sand, Fine (0.125 mm to 0.250 mm)	2 to 3 Ø	0.5311	1.77
Sand, Very Fine (0.0625 mm to 0.125 mm)	3 to 4 Ø	0.3684	1.22
Silt (0.0039 mm to 0.0625 mm)	4 to 8 Ø	6.6400	22.1
Clay (< 0.0039 mm)	> 8 Ø	7.9900	26.6
Total		30.6253	102

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: Pacific EcoRisk Laboratories
Project: USACE San Rafael Channel/16087
Sample Matrix: Sediment

Service Request: K1006356
Date Collected: 6/10/2010
Date Received: 6/18/2010
Date Analyzed: 6/21/2010

Particle Size Determination
 Puget Sound Estuary Program Protocol

Sample Name: SRC-2010-7-3
Lab Code: K1006356-018

Sand Fraction: Dry Weight (Grams) 10.1095
 Sand Fraction: Weight Recovered (Grams) 9.9482
 Sand Fraction: Percent Recovery 98.4

Description	Phi Size	Dry Weight (Grams)	Percent of Total Weight Recovered
Gravel (>2.00 mm)	<-1 Ø	5.3428	23.6
Sand, Very Coarse (1.00 mm to 2.00 mm)	-1 to 0 Ø	0.5447	2.41
Sand, Coarse (0.50	0 to 1 Ø	0.6584	2.91
Sand, Medium (0.250 mm to 0.500 mm)	1 to 2 Ø	0.8211	3.63
Sand, Fine (0.125 mm to 0.250 mm)	2 to 3 Ø	0.8576	3.79
Sand, Very Fine (0.0625 mm to 0.125 mm)	3 to 4 Ø	0.9145	4.04
Silt (0.0039 mm to 0.0625 mm)	4 to 8 Ø	6.7700	29.9
Clay (< 0.0039 mm)	> 8 Ø	6.9400	30.7
Total		22.8491	101

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: Pacific EcoRisk Laboratories
Project: USACE San Rafael Channel/16087
Sample Matrix: Sediment

Service Request: K1006356
Date Collected: 6/10/2010
Date Received: 6/18/2010
Date Analyzed: 6/21/2010

Particle Size Determination
 Puget Sound Estuary Program Protocol

Sample Name: SRC-2010-7-4
Lab Code: K1006356-019

Sand Fraction: Dry Weight (Grams) 7.8757
 Sand Fraction: Weight Recovered (Grams) 7.7674
 Sand Fraction: Percent Recovery 98.6

Description	Phi Size	Dry Weight (Grams)	Percent of Total Weight Recovered
Gravel (>2.00 mm)	<-1 Ø	1.1364	5.36
Sand, Very Coarse (1.00 mm to 2.00 mm)	-1 to 0 Ø	1.4045	6.63
Sand, Coarse (0.50	0 to 1 Ø	1.0709	5.05
Sand, Medium (0.250 mm to 0.500 mm)	1 to 2 Ø	1.2167	5.74
Sand, Fine (0.125 mm to 0.250 mm)	2 to 3 Ø	1.1387	5.37
Sand, Very Fine (0.0625 mm to 0.125 mm)	3 to 4 Ø	1.2285	5.80
Silt (0.0039 mm to 0.0625 mm)	4 to 8 Ø	7.6150	35.9
Clay (< 0.0039 mm)	> 8 Ø	6.2000	29.3
Total		21.0107	99.1

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: Pacific EcoRisk Laboratories
Project: USACE San Rafael Channel/16087
Sample Matrix: Sediment

Service Request: K1006356
Date Collected: 6/10/2010
Date Received: 6/18/2010
Date Analyzed: 6/21/2010

Particle Size Determination
 Puget Sound Estuary Program Protocol

Sample Name: SRC-2010-7-5
Lab Code: K1006356-020

Sand Fraction: Dry Weight (Grams) 13.1517
 Sand Fraction: Weight Recovered (Grams) 12.9482
 Sand Fraction: Percent Recovery 98.5

Description	Phi Size	Dry Weight (Grams)	Percent of Total Weight Recovered
Gravel (>2.00 mm)	<-1 Ø	2.4309	10.0
Sand, Very Coarse (1.00 mm to 2.00 mm)	-1 to 0 Ø	1.8551	7.65
Sand, Coarse (0.50	0 to 1 Ø	1.3794	5.69
Sand, Medium (0.250 mm to 0.500 mm)	1 to 2 Ø	0.9736	4.01
Sand, Fine (0.125 mm to 0.250 mm)	2 to 3 Ø	1.7721	7.30
Sand, Very Fine (0.0625 mm to 0.125 mm)	3 to 4 Ø	3.6317	15.0
Silt (0.0039 mm to 0.0625 mm)	4 to 8 Ø	6.7300	27.7
Clay (< 0.0039 mm)	> 8 Ø	5.3800	22.2
Total		24.1528	99.5

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: Pacific EcoRisk Laboratories
Project: USACE San Rafael Channel/16087
Sample Matrix: Sediment

Service Request: K1006356
Date Collected: 6/10/2010
Date Received: 6/23/2010
Date Analyzed: 6/29/2010

Particle Size Determination
Puget Sound Estuary Program Protocol

Sample Name: SRC-2010-8-Z-Comp
Lab Code: K1006356-021

Sand Fraction: Dry Weight (Grams) 20.2363
Sand Fraction: Weight Recovered (Grams) 20.3156
Sand Fraction: Percent Recovery 100

Description	Phi Size	Dry Weight (Grams)	Percent of Total Weight Recovered
Gravel (>2.00 mm)	<-1 Ø	2.0746	7.25
Sand, Very Coarse (1.00 mm to 2.00 mm)	-1 to 0 Ø	1.5715	5.49
Sand, Coarse (0.50	0 to 1 Ø	1.4317	5.01
Sand, Medium (0.250 mm to 0.500 mm)	1 to 2 Ø	4.0949	14.3
Sand, Fine (0.125 mm to 0.250 mm)	2 to 3 Ø	7.4645	26.1
Sand, Very Fine (0.0625 mm to 0.125 mm)	3 to 4 Ø	3.0525	10.7
Silt (0.0039 mm to 0.0625 mm)	4 to 8 Ø	5.1900	18.1
Clay (< 0.0039 mm)	> 8 Ø	4.4650	15.6
Total		29.3447	103

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: Pacific EcoRisk Laboratories
Project: USACE San Rafael Channel/16087
Sample Matrix: Sediment

Service Request: K1006356
Date Collected: 6/10/2010
Date Received: 6/23/2010
Date Analyzed: 6/29/2010

Particle Size Determination
 Puget Sound Estuary Program Protocol

Sample Name: SRC-2010-8-Z-Comp
Lab Code: K1006356-021DUP

Sand Fraction: Dry Weight (Grams) 20.4739
 Sand Fraction: Weight Recovered (Grams) 20.5302
 Sand Fraction: Percent Recovery 100

Description	Phi Size	Dry Weight (Grams)	Percent of Total Weight Recovered
Gravel (>2.00 mm)	<-1 Ø	2.0003	6.96
Sand, Very Coarse (1.00 mm to 2.00 mm)	-1 to 0 Ø	1.2778	4.45
Sand, Coarse (0.50	0 to 1 Ø	1.3671	4.76
Sand, Medium (0.250 mm to 0.500 mm)	1 to 2 Ø	4.1210	14.3
Sand, Fine (0.125 mm to 0.250 mm)	2 to 3 Ø	7.8876	27.4
Sand, Very Fine (0.0625 mm to 0.125 mm)	3 to 4 Ø	3.3297	11.6
Silt (0.0039 mm to 0.0625 mm)	4 to 8 Ø	5.4750	19.1
Clay (< 0.0039 mm)	> 8 Ø	3.3350	11.6
Total		28.7935	100

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: Pacific EcoRisk Laboratories
Project: USACE San Rafael Channel/16087
Sample Matrix: Sediment

Service Request: K1006356
Date Collected: 6/10/2010
Date Received: 6/23/2010
Date Analyzed: 6/29/2010

Particle Size Determination
 Puget Sound Estuary Program Protocol

Sample Name: SRC-2010-8-Z-Comp
Lab Code: K1006356-021TRP

Sand Fraction: Dry Weight (Grams) 23.9934
 Sand Fraction: Weight Recovered (Grams) 23.7720
 Sand Fraction: Percent Recovery 99.1

Description	Phi Size	Dry Weight (Grams)	Percent of Total Weight Recovered
Gravel (>2.00 mm)	<-1 Ø	2.0026	6.44
Sand, Very Coarse (1.00 mm to 2.00 mm)	-1 to 0 Ø	1.6671	5.36
Sand, Coarse (0.50	0 to 1 Ø	1.6751	5.39
Sand, Medium (0.250 mm to 0.500 mm)	1 to 2 Ø	4.9359	15.9
Sand, Fine (0.125 mm to 0.250 mm)	2 to 3 Ø	8.7863	28.3
Sand, Very Fine (0.0625 mm to 0.125 mm)	3 to 4 Ø	3.8555	12.4
Silt (0.0039 mm to 0.0625 mm)	4 to 8 Ø	4.5050	14.5
Clay (< 0.0039 mm)	> 8 Ø	3.6300	11.7
Total		31.0575	99.9

Metals

Columbia Analytical Services

- Cover Page - INORGANIC ANALYSIS DATA PACKAGE

Client: Pacific EcoRisk Laboratories
Project Name: USACE San Rafael Channel
Project No.: 16087

Service Request: K1006356

<u>Sample Name:</u>	<u>Lab Code:</u>
SRC-2010-1-Comp	K1006356-001
SRC-2010-1-CompD	K1006356-001D
SRC-2010-1-CompS	K1006356-001S
SRC-2010-2-Comp	K1006356-002
SRC-2010-1-CompD	K1006356-002D
SRC-2010-1-CompS	K1006356-002S
SRC-2010-3-Comp	K1006356-003
SRC-2010-4-Comp	K1006356-004
SRC-2010-5-Comp	K1006356-005
SRC-2010-6-Comp	K1006356-006
SRC-2010-7-Comp	K1006356-007
SRC-2010-7-Z-Comp	K1006356-008
SRC-2010-1-B-Comp	K1006356-009
SRC-2010-2-B-Comp	K1006356-010
SRC-2010-3-B-Comp	K1006356-011
SRC-2010-4-B-Comp	K1006356-012
SRC-2010-5-B-Comp	K1006356-013
SRC-2010-6-B-Comp	K1006356-014
SRC-2010-7-B-Comp	K1006356-015
SRC-2010-7-1	K1006356-016
SRC-2010-7-2	K1006356-017
SRC-2010-7-3	K1006356-018
SRC-2010-7-4	K1006356-019
SRC-2010-7-5	K1006356-020
SRC-2010-8-Z-Comp	K1006356-021
SRC-2010-8-Z-CompD	K1006356-021D
SRC-2010-8-Z-CompS	K1006356-021S
Method Blank	K1006356-MB1
Method Blank	K1006356-MB2
Batch QCD	K1006518-001D
Batch QCS	K1006518-001S

Comments:

Approved By: _____

Date: _____

METALS

- 1 -

INORGANIC ANALYSIS DATA PACKAGE

Client: Pacific EcoRisk Laboratories

Service Request: K1006356

Project No.: 16087

Date Collected: 6/8/2010

Project Name: USACE San Rafael Channel

Date Received: 6/18/2010

Matrix: SEDIMENT

Units: mg/Kg

Basis: DRY

Sample Name: SRC-2010-1-Comp

Lab Code: K1006356-001

Analyte	Analysis Method	MRL	MDL	Dil. Factor	Date Extracted	Date Analyzed	Result	C	Q
Arsenic	6020	0.62	0.06	5.0	06/24/10	06/28/10	10.4		
Barium	6010B	2.5	0.4	2.0	06/24/10	07/02/10	52.2		
Beryllium	6020	0.025	0.004	5.0	06/24/10	06/28/10	0.566		
Boron	6010B	12	0.4	2.0	06/24/10	07/02/10	24		
Cadmium	6020	0.025	0.005	5.0	06/24/10	06/28/10	0.221		
Chromium	6020	0.25	0.02	5.0	06/24/10	06/28/10	76.6		
Cobalt	6020	0.025	0.001	5.0	06/24/10	06/28/10	17.9		
Copper	6020	0.13	0.10	5.0	06/24/10	06/28/10	53.0		
Lead	6020	0.062	0.007	5.0	06/24/10	06/28/10	23.1		
Manganese	6010B	2.46	0.05	2.0	06/24/10	07/02/10	733		
Mercury	7471A	0.019	0.002	1.0	06/30/10	07/02/10	0.311		
Nickel	6020	0.25	0.03	5.0	06/24/10	06/28/10	87.3		
Selenium	7742	0.12	0.04	2.0	06/24/10	06/28/10	0.27		
Silver	6020	0.025	0.010	5.0	06/24/10	06/25/10	0.243		
Vanadium	6010B	2.5	0.5	2.0	06/24/10	07/02/10	69.9		
Zinc	6010B	2.5	0.4	2.0	06/24/10	07/02/10	123		

% Solids: 44.6

Comments:

METALS

- 1 -

INORGANIC ANALYSIS DATA PACKAGE

Client: Pacific EcoRisk Laboratories Service Request: K1006356
Project No.: 16087 Date Collected: 6/9/2010
Project Name: USACE San Rafael Channel Date Received: 6/18/2010
Matrix: SEDIMENT Units: mg/Kg
Basis: DRY

Sample Name: SRC-2010-2-Comp Lab Code: K1006356-002

Analyte	Analysis Method	MRL	MDL	Dil. Factor	Date Extracted	Date Analyzed	Result	C	Q
Arsenic	6020	0.59	0.06	5.0	06/24/10	06/28/10	9.95		
Barium	6010B	2.4	0.4	2.0	06/24/10	07/02/10	46.6		
Beryllium	6020	0.024	0.004	5.0	06/24/10	06/28/10	0.535		
Boron	6010B	12	0.4	2.0	06/24/10	07/02/10	22		
Cadmium	6020	0.024	0.005	5.0	06/24/10	06/28/10	0.189		
Chromium	6020	0.24	0.02	5.0	06/24/10	06/28/10	74.7		
Cobalt	6020	0.024	0.001	5.0	06/24/10	06/28/10	17.0		
Copper	6020	0.12	0.10	5.0	06/24/10	06/28/10	49.7		
Lead	6020	0.059	0.007	5.0	06/24/10	06/28/10	22.1		
Manganese	6010B	2.35	0.05	2.0	06/24/10	07/02/10	654		
Mercury	7471A	0.019	0.002	1.0	06/30/10	07/02/10	0.287		
Nickel	6020	0.24	0.02	5.0	06/24/10	06/28/10	85.1		
Selenium	7742	0.12	0.04	2.0	06/24/10	06/28/10	0.35		
Silver	6020	0.024	0.009	5.0	06/24/10	06/25/10	0.246		
Vanadium	6010B	2.4	0.5	2.0	06/24/10	07/02/10	64.1		
Zinc	6010B	2.4	0.4	2.0	06/24/10	07/02/10	112		

% Solids: 46.7

Comments:

METALS

- 1 -

INORGANIC ANALYSIS DATA PACKAGE

Client: Pacific EcoRisk Laboratories

Service Request: K1006356

Project No.: 16087

Date Collected: 6/9/2010

Project Name: USACE San Rafael Channel

Date Received: 6/18/2010

Matrix: SEDIMENT

Units: mg/Kg

Basis: DRY

Sample Name: SRC-2010-3-Comp

Lab Code: K1006356-003

Analyte	Analysis Method	MRL	MDL	Dil. Factor	Date Extracted	Date Analyzed	Result	C	Q
Arsenic	6020	0.58	0.06	5.0	06/24/10	06/28/10	9.73		
Barium	6010B	2.3	0.3	2.0	06/24/10	07/02/10	47.3		
Beryllium	6020	0.023	0.003	5.0	06/24/10	06/28/10	0.503		
Boron	6010B	11	0.3	2.0	06/24/10	07/02/10	24		
Cadmium	6020	0.023	0.005	5.0	06/24/10	06/28/10	0.184		
Chromium	6020	0.23	0.02	5.0	06/24/10	06/28/10	71.9		
Cobalt	6020	0.023	0.001	5.0	06/24/10	06/28/10	16.1		
Copper	6020	0.12	0.09	5.0	06/24/10	06/28/10	46.6		
Lead	6020	0.058	0.007	5.0	06/24/10	06/28/10	21.8		
Manganese	6010B	2.29	0.05	2.0	06/24/10	07/02/10	619		
Mercury	7471A	0.020	0.002	1.0	06/30/10	07/02/10	0.306		
Nickel	6020	0.23	0.02	5.0	06/24/10	06/28/10	79.7		
Selenium	7742	0.11	0.03	2.0	06/24/10	06/28/10	0.27		
Silver	6020	0.023	0.009	5.0	06/24/10	06/25/10	0.246		
Vanadium	6010B	2.3	0.5	2.0	06/24/10	07/02/10	66.7		
Zinc	6010B	2.3	0.3	2.0	06/24/10	07/02/10	122		

% Solids: 48.3

Comments:

METALS

- 1 -

INORGANIC ANALYSIS DATA PACKAGE

Client: Pacific EcoRisk Laboratories

Service Request: K1006356

Project No.: 16087

Date Collected: 6/11/2010

Project Name: USACE San Rafael Channel

Date Received: 6/18/2010

Matrix: SEDIMENT

Units: mg/Kg

Basis: DRY

Sample Name: SRC-2010-4-Comp

Lab Code: K1006356-004

Analyte	Analysis Method	MRL	MDL	Dil. Factor	Date Extracted	Date Analyzed	Result	C	Q
Arsenic	6020	0.59	0.06	5.0	06/24/10	06/28/10	9.97		
Barium	6010B	2.3	0.4	2.0	06/24/10	07/02/10	49.6		
Beryllium	6020	0.024	0.004	5.0	06/24/10	06/28/10	0.543		
Boron	6010B	12	0.4	2.0	06/24/10	07/02/10	25		
Cadmium	6020	0.024	0.005	5.0	06/24/10	06/28/10	0.182		
Chromium	6020	0.24	0.02	5.0	06/24/10	06/28/10	75.0		
Cobalt	6020	0.024	0.001	5.0	06/24/10	06/28/10	16.3		
Copper	6020	0.12	0.09	5.0	06/24/10	06/28/10	51.3		
Lead	6020	0.059	0.007	5.0	06/24/10	06/28/10	24.7		
Manganese	6010B	2.34	0.05	2.0	06/24/10	07/02/10	659		
Mercury	7471A	0.020	0.002	1.0	06/30/10	07/02/10	0.309		
Nickel	6020	0.24	0.02	5.0	06/24/10	06/28/10	83.9		
Selenium	7742	0.12	0.04	2.0	06/24/10	06/28/10	0.36		
Silver	6020	0.023	0.009	5.0	06/24/10	06/25/10	0.263		
Vanadium	6010B	2.3	0.5	2.0	06/24/10	07/02/10	71.0		
Zinc	6010B	2.3	0.4	2.0	06/24/10	07/02/10	142		

% Solids: 47.2

Comments:

METALS

- 1 -

INORGANIC ANALYSIS DATA PACKAGE

Client: Pacific EcoRisk Laboratories Service Request: K1006356
 Project No.: 16087 Date Collected: 6/8/2010
 Project Name: USACE San Rafael Channel Date Received: 6/18/2010
 Matrix: SEDIMENT Units: mg/Kg
 Basis: DRY

Sample Name: SRC-2010-5-Comp Lab Code: K1006356-005

Analyte	Analysis Method	MRL	MDL	Dil. Factor	Date Extracted	Date Analyzed	Result	C	Q
Arsenic	6020	0.63	0.06	5.0	06/24/10	06/28/10	10.5		
Barium	6010B	2.5	0.4	2.0	06/24/10	07/02/10	48.1		
Beryllium	6020	0.025	0.004	5.0	06/24/10	06/28/10	0.626		
Boron	6010B	12	0.4	2.0	06/24/10	07/02/10	25		
Cadmium	6020	0.025	0.005	5.0	06/24/10	06/28/10	0.203		
Chromium	6020	0.25	0.02	5.0	06/24/10	06/28/10	81.1		
Cobalt	6020	0.025	0.001	5.0	06/24/10	06/28/10	17.8		
Copper	6020	0.13	0.10	5.0	06/24/10	06/28/10	60.0		
Lead	6020	0.062	0.007	5.0	06/24/10	06/28/10	27.9		
Manganese	6010B	2.49	0.05	2.0	06/24/10	07/02/10	598		
Mercury	7471A	0.019	0.002	1.0	06/30/10	07/02/10	0.395		
Nickel	6020	0.25	0.03	5.0	06/24/10	06/28/10	89.9		
Selenium	7742	0.13	0.04	2.0	06/24/10	06/28/10	0.39		
Silver	6020	0.025	0.010	5.0	06/24/10	06/25/10	0.285		
Vanadium	6010B	2.5	0.5	2.0	06/24/10	07/02/10	68.8		
Zinc	6010B	2.5	0.4	2.0	06/24/10	07/02/10	158		

% Solids: 44.2

Comments:

METALS

- 1 -

INORGANIC ANALYSIS DATA PACKAGE

Client: Pacific EcoRisk Laboratories Service Request: K1006356
Project No.: 16087 Date Collected: 6/9/2010
Project Name: USACE San Rafael Channel Date Received: 6/18/2010
Matrix: SEDIMENT Units: mg/Kg
Basis: DRY

Sample Name: SRC-2010-6-Comp Lab Code: K1006356-006

Analyte	Analysis Method	MRL	MDL	Dil. Factor	Date Extracted	Date Analyzed	Result	C	Q
Arsenic	6020	0.68	0.07	5.0	06/24/10	06/28/10	11.0		
Barium	6010B	2.7	0.4	2.0	06/24/10	07/02/10	51.5		
Beryllium	6020	0.027	0.004	5.0	06/24/10	06/28/10	0.643		
Boron	6010B	13	0.4	2.0	06/24/10	07/02/10	28		
Cadmium	6020	0.027	0.005	5.0	06/24/10	06/28/10	0.236		
Chromium	6020	0.27	0.02	5.0	06/24/10	06/28/10	84.8		
Cobalt	6020	0.027	0.001	5.0	06/24/10	06/28/10	17.6		
Copper	6020	0.14	0.11	5.0	06/24/10	06/28/10	76.4		
Lead	6020	0.068	0.008	5.0	06/24/10	06/28/10	39.1		
Manganese	6010B	2.69	0.05	2.0	06/24/10	07/02/10	506		
Mercury	7471A	0.019	0.002	1.0	06/30/10	07/02/10	0.356		
Nickel	6020	0.27	0.03	5.0	06/24/10	06/28/10	93.5		
Selenium	7742	0.14	0.04	2.0	06/24/10	06/28/10	0.30		
Silver	6020	0.027	0.011	5.0	06/24/10	06/25/10	0.338		
Vanadium	6010B	2.7	0.5	2.0	06/24/10	07/02/10	73.2		
Zinc	6010B	2.7	0.4	2.0	06/24/10	07/02/10	185		

% Solids: 40.9

Comments:

METALS

- 1 -

INORGANIC ANALYSIS DATA PACKAGE

Client: Pacific EcoRisk Laboratories

Service Request: K1006356

Project No.: 16087

Date Collected: 6/10/2010

Project Name: USACE San Rafael Channel

Date Received: 6/18/2010

Matrix: SEDIMENT

Units: mg/Kg

Basis: DRY

Sample Name: SRC-2010-7-Comp

Lab Code: K1006356-007

Analyte	Analysis Method	MRL	MDL	Dil. Factor	Date Extracted	Date Analyzed	Result	C	Q
Arsenic	6020	0.66	0.07	5.0	06/24/10	06/28/10	10.9		
Barium	6010B	2.7	0.4	2.0	06/24/10	07/02/10	65.4		
Beryllium	6020	0.026	0.004	5.0	06/24/10	06/28/10	0.653		
Boron	6010B	13	0.4	2.0	06/24/10	07/02/10	33		
Cadmium	6020	0.026	0.005	5.0	06/24/10	06/28/10	0.441		
Chromium	6020	0.27	0.02	5.0	06/24/10	06/28/10	91.1		
Cobalt	6020	0.026	0.001	5.0	06/24/10	06/28/10	17.0		
Copper	6020	0.13	0.11	5.0	06/24/10	06/28/10	104.0		
Lead	6020	0.066	0.008	5.0	06/24/10	06/28/10	78.3		
Manganese	6010B	2.65	0.05	2.0	06/24/10	07/02/10	392		
Mercury	7471A	0.020	0.002	1.0	06/30/10	07/02/10	0.461		
Nickel	6020	0.27	0.03	5.0	06/24/10	06/28/10	101		
Selenium	7742	0.13	0.04	2.0	06/24/10	06/28/10	0.45		
Silver	6020	0.026	0.011	5.0	06/24/10	06/25/10	0.358		
Vanadium	6010B	2.7	0.5	2.0	06/24/10	07/02/10	64.0		
Zinc	6010B	2.7	0.4	2.0	06/24/10	07/02/10	248		

% Solids: 42.0

Comments:

METALS

- 1 -

INORGANIC ANALYSIS DATA PACKAGE

Client: Pacific EcoRisk Laboratories Service Request: K1006356
 Project No.: 16087 Date Collected: 6/10/2010
 Project Name: USACE San Rafael Channel Date Received: 6/18/2010
 Matrix: SEDIMENT Units: mg/Kg
 Basis: DRY

Sample Name: SRC-2010-7-Z-Comp Lab Code: K1006356-008

Analyte	Analysis Method	MRL	MDL	Dil. Factor	Date Extracted	Date Analyzed	Result	C	Q
Arsenic	6020	0.58	0.06	5.0	06/24/10	06/28/10	11.9		
Barium	6010B	2.3	0.3	2.0	06/24/10	07/02/10	64.7		
Beryllium	6020	0.023	0.003	5.0	06/24/10	06/28/10	0.704		
Boron	6010B	12	0.3	2.0	06/24/10	07/02/10	27		
Cadmium	6020	0.023	0.005	5.0	06/24/10	06/28/10	0.505		
Chromium	6020	0.23	0.02	5.0	06/24/10	06/28/10	101		
Cobalt	6020	0.023	0.001	5.0	06/24/10	06/28/10	17.7		
Copper	6020	0.12	0.09	5.0	06/24/10	06/28/10	109.0		
Lead	6020	0.058	0.007	5.0	06/24/10	06/28/10	138		
Manganese	6010B	2.31	0.05	2.0	06/24/10	07/02/10	382		
Mercury	7471A	0.019	0.002	1.0	06/30/10	07/02/10	0.728		
Nickel	6020	0.23	0.02	5.0	06/24/10	06/28/10	110		
Selenium	7742	0.12	0.04	2.0	06/24/10	06/28/10	0.22		
Silver	6020	0.023	0.009	5.0	06/24/10	06/25/10	0.490		
Vanadium	6010B	2.3	0.5	2.0	06/24/10	07/02/10	66.2		
Zinc	6010B	2.3	0.3	2.0	06/24/10	07/02/10	227		

% Solids: 47.5

Comments:

METALS

- 1 -

INORGANIC ANALYSIS DATA PACKAGE

Client: Pacific EcoRisk Laboratories

Service Request: K1006356

Project No.: 16087

Date Collected: 6/8/2010

Project Name: USACE San Rafael Channel

Date Received: 6/18/2010

Matrix: SEDIMENT

Units: mg/Kg

Basis: DRY

Sample Name: SRC-2010-1-B-Comp

Lab Code: K1006356-009

Analyte	Analysis Method	MRL	MDL	Dil. Factor	Date Extracted	Date Analyzed	Result	C	Q
Arsenic	6020	0.55	0.06	5.0	06/24/10	06/28/10	11.1		
Barium	6010B	2.2	0.3	2.0	06/24/10	07/02/10	58.0		
Boron	6010B	11	0.3	2.0	06/24/10	07/02/10	25		
Cadmium	6020	0.022	0.004	5.0	06/24/10	06/28/10	0.270		
Chromium	6020	0.22	0.02	5.0	06/24/10	06/28/10	78.1		
Copper	6020	0.11	0.09	5.0	06/24/10	06/28/10	54.3		
Lead	6020	0.055	0.007	5.0	06/24/10	06/28/10	26.3		
Manganese	6010B	2.18	0.04	2.0	06/24/10	07/02/10	831		
Mercury	7471A	0.019	0.002	1.0	06/30/10	07/02/10	0.362		
Nickel	6020	0.22	0.02	5.0	06/24/10	06/28/10	90.2		
Selenium	7742	0.11	0.03	2.0	06/24/10	06/28/10	0.23		
Silver	6020	0.022	0.009	5.0	06/24/10	06/25/10	0.308		
Vanadium	6010B	2.2	0.4	2.0	06/24/10	07/02/10	71.0		
Zinc	6010B	2.2	0.3	2.0	06/24/10	07/02/10	126		

% Solids: 50.4

Comments:

METALS**- 1 -****INORGANIC ANALYSIS DATA PACKAGE**

Client: Pacific EcoRisk Laboratories Service Request: K1006356
Project No.: 16087 Date Collected: 6/9/2010
Project Name: USACE San Rafael Channel Date Received: 6/18/2010
Matrix: SEDIMENT Units: mg/Kg
Basis: DRY

Sample Name: SRC-2010-2-B-Comp Lab Code: K1006356-010

Analyte	Analysis Method	MRL	MDL	Dil. Factor	Date Extracted	Date Analyzed	Result	C	Q
Arsenic	6020	0.54	0.05	5.0	06/24/10	06/28/10	12.0		
Barium	6010B	2.2	0.3	2.0	06/24/10	07/02/10	50.4		
Boron	6010B	11	0.3	2.0	06/24/10	07/02/10	24		
Cadmium	6020	0.022	0.004	5.0	06/24/10	06/28/10	0.270		
Chromium	6020	0.22	0.02	5.0	06/24/10	06/28/10	80.0		
Copper	6020	0.11	0.09	5.0	06/24/10	06/28/10	57.5		
Lead	6020	0.054	0.007	5.0	06/24/10	06/28/10	29.1		
Manganese	6010B	2.16	0.04	2.0	06/24/10	07/02/10	773		
Mercury	7471A	0.019	0.002	1.0	06/30/10	07/02/10	0.393		
Nickel	6020	0.22	0.02	5.0	06/24/10	06/28/10	89.8		
Selenium	7742	0.11	0.03	2.0	06/24/10	06/28/10	0.38		
Silver	6020	0.022	0.009	5.0	06/24/10	06/25/10	0.329		
Vanadium	6010B	2.2	0.4	2.0	06/24/10	07/02/10	70.9		
Zinc	6010B	2.2	0.3	2.0	06/24/10	07/02/10	129		

% Solids: 50.9

Comments:

METALS**- 1 -****INORGANIC ANALYSIS DATA PACKAGE**

Client: Pacific EcoRisk Laboratories **Service Request:** K1006356
Project No.: 16087 **Date Collected:** 6/9/2010
Project Name: USACE San Rafael Channel **Date Received:** 6/18/2010
Matrix: SEDIMENT **Units:** mg/Kg
Basis: DRY

Sample Name: SRC-2010-3-B-Comp **Lab Code:** K1006356-011

Analyte	Analysis Method	MRL	MDL	Dil. Factor	Date Extracted	Date Analyzed	Result	C	Q
Arsenic	6020	0.56	0.06	5.0	06/24/10	06/28/10	11.3		
Barium	6010B	2.3	0.3	2.0	06/24/10	07/02/10	54.4		
Boron	6010B	11	0.3	2.0	06/24/10	07/02/10	26		
Cadmium	6020	0.022	0.004	5.0	06/24/10	06/28/10	0.253		
Chromium	6020	0.23	0.02	5.0	06/24/10	06/28/10	76.2		
Copper	6020	0.11	0.09	5.0	06/24/10	06/28/10	53.4		
Lead	6020	0.056	0.007	5.0	06/24/10	06/28/10	27.5		
Manganese	6010B	2.26	0.05	2.0	06/24/10	07/02/10	763		
Mercury	7471A	0.018	0.002	1.0	06/30/10	07/02/10	0.359		
Nickel	6020	0.23	0.02	5.0	06/24/10	06/28/10	86.6		
Selenium	7742	0.11	0.03	2.0	06/24/10	06/28/10	0.38		
Silver	6020	0.023	0.009	5.0	06/24/10	06/25/10	0.332		
Vanadium	6010B	2.3	0.5	2.0	06/24/10	07/02/10	76.3		
Zinc	6010B	2.3	0.3	2.0	06/24/10	07/02/10	140		

% Solids: 49.2

Comments:

METALS

- 1 -

INORGANIC ANALYSIS DATA PACKAGE

Client: Pacific EcoRisk Laboratories

Service Request: K1006356

Project No.: 16087

Date Collected: 06/11/10

Project Name: USACE San Rafael Channel

Date Received: 06/18/10

Matrix: SEDIMENT

Units: mg/Kg

Basis: DRY

Sample Name: SRC-2010-4-B-Comp

Lab Code: K1006356-012

Analyte	Analysis Method	MRL	MDL	Dil. Factor	Date Extracted	Date Analyzed	Result	C	Q
Arsenic	6020	0.53	0.05	5.0	06/24/10	06/28/10	11.0		
Barium	6010B	2.1	0.3	2.0	06/24/10	07/02/10	45.6		
Boron	6010B	11	0.3	2.0	06/24/10	07/02/10	26		
Cadmium	6020	0.021	0.004	5.0	06/24/10	06/28/10	0.212		
Chromium	6020	0.21	0.02	5.0	06/24/10	06/28/10	75.4		
Copper	6020	0.11	0.09	5.0	06/24/10	06/28/10	54.7		
Lead	6020	0.053	0.006	5.0	06/24/10	06/28/10	29.1		
Manganese	6010B	2.14	0.04	2.0	06/24/10	07/02/10	653		
Mercury	7471A	0.018	0.002	1.0	06/30/10	07/02/10	0.366		
Nickel	6020	0.21	0.02	5.0	06/24/10	06/28/10	84.0		
Selenium	7742	0.11	0.03	2.0	06/24/10	06/28/10	0.31		
Silver	6020	0.021	0.009	5.0	06/24/10	06/25/10	0.335		
Vanadium	6010B	2.1	0.4	2.0	06/24/10	07/02/10	68.1		
Zinc	6010B	2.1	0.3	2.0	06/24/10	07/02/10	134		

% Solids: 51.4

Comments:

METALS

- 1 -

INORGANIC ANALYSIS DATA PACKAGE

Client: Pacific EcoRisk Laboratories

Service Request: K1006356

Project No.: 16087

Date Collected: 6/8/2010

Project Name: USACE San Rafael Channel

Date Received: 6/18/2010

Matrix: SEDIMENT

Units: mg/Kg

Basis: DRY

Sample Name: SRC-2010-5-B-Comp

Lab Code: K1006356-013

Analyte	Analysis Method	MRL	MDL	Dil. Factor	Date Extracted	Date Analyzed	Result	C	Q
Arsenic	6020	0.57	0.06	5.0	06/24/10	06/28/10	12.3		
Barium	6010B	2.2	0.3	2.0	06/24/10	07/02/10	48.1		
Boron	6010B	11	0.3	2.0	06/24/10	07/02/10	26		
Cadmium	6020	0.023	0.005	5.0	06/24/10	06/28/10	0.272		
Chromium	6020	0.23	0.02	5.0	06/24/10	06/28/10	84.9		
Copper	6020	0.11	0.09	5.0	06/24/10	06/28/10	62.4		
Lead	6020	0.057	0.007	5.0	06/24/10	06/28/10	42.1		
Manganese	6010B	2.24	0.05	2.0	06/24/10	07/02/10	510		
Mercury	7471A	0.019	0.002	1.0	06/30/10	07/02/10	0.424		
Nickel	6020	0.23	0.02	5.0	06/24/10	06/28/10	90.8		
Selenium	7742	0.11	0.03	2.0	06/24/10	06/28/10	0.23		
Silver	6020	0.022	0.009	5.0	06/24/10	06/25/10	0.423		
Vanadium	6010B	2.2	0.4	2.0	06/24/10	07/02/10	71.0		
Zinc	6010B	2.2	0.3	2.0	06/24/10	07/02/10	154		

% Solids: 49.1

Comments:

METALS

- 1 -

INORGANIC ANALYSIS DATA PACKAGE

Client: Pacific EcoRisk Laboratories Service Request: K1006356
 Project No.: 16087 Date Collected: 6/9/2010
 Project Name: USACE San Rafael Channel Date Received: 6/18/2010
 Matrix: SEDIMENT Units: mg/Kg
 Basis: DRY

Sample Name: SRC-2010-6-B-Comp Lab Code: K1006356-014

Analyte	Analysis Method	MRL	MDL	Dil. Factor	Date Extracted	Date Analyzed	Result	C	Q
Arsenic	6020	0.60	0.06	5.0	06/24/10	06/28/10	12.6		
Barium	6010B	2.4	0.4	2.0	06/24/10	07/02/10	51.1		
Boron	6010B	12	0.4	2.0	06/24/10	07/02/10	27		
Cadmium	6020	0.024	0.005	5.0	06/24/10	06/28/10	0.310		
Chromium	6020	0.24	0.02	5.0	06/24/10	06/28/10	86.2		
Copper	6020	0.12	0.10	5.0	06/24/10	06/28/10	72.5		
Lead	6020	0.060	0.007	5.0	06/24/10	06/28/10	55.6		
Manganese	6010B	2.41	0.05	2.0	06/24/10	07/02/10	489		
Mercury	7471A	0.019	0.002	1.0	06/30/10	07/02/10	0.525		
Nickel	6020	0.24	0.02	5.0	06/24/10	06/28/10	92.8		
Selenium	7742	0.12	0.04	2.0	06/24/10	06/28/10	0.20		
Silver	6020	0.024	0.010	5.0	06/24/10	06/25/10	0.518		
Vanadium	6010B	2.4	0.5	2.0	06/24/10	07/02/10	71.2		
Zinc	6010B	2.4	0.4	2.0	06/24/10	07/02/10	169		

% Solids: 45.6

Comments:

METALS

- 1 -

INORGANIC ANALYSIS DATA PACKAGE

Client: Pacific EcoRisk Laboratories Service Request: K1006356
Project No.: 16087 Date Collected: 6/10/2010
Project Name: USACE San Rafael Channel Date Received: 6/18/2010
Matrix: SEDIMENT Units: mg/Kg
Basis: DRY

Sample Name: SRC-2010-7-B-Comp Lab Code: K1006356-015

Analyte	Analysis Method	MRL	MDL	Dil. Factor	Date Extracted	Date Analyzed	Result	C	Q
Arsenic	6020	0.52	0.05	5.0	06/24/10	06/28/10	12.4		
Barium	6010B	2.1	0.3	2.0	06/24/10	07/02/10	81.7		
Boron	6010B	11	0.3	2.0	06/24/10	07/02/10	21		
Cadmium	6020	0.021	0.004	5.0	06/24/10	06/28/10	0.438		
Chromium	6020	0.21	0.02	5.0	06/24/10	06/28/10	202		
Copper	6020	0.10	0.08	5.0	06/24/10	06/28/10	65.3		
Lead	6020	0.052	0.006	5.0	06/24/10	06/28/10	71.5		
Manganese	6010B	2.10	0.04	2.0	06/24/10	07/02/10	501		
Mercury	7471A	0.020	0.002	1.0	06/30/10	07/02/10	0.652		
Nickel	6020	0.21	0.02	5.0	06/24/10	06/28/10	214		
Selenium	7742	0.11	0.03	2.0	06/24/10	06/28/10	0.23		
Silver	6020	0.021	0.008	5.0	06/24/10	06/25/10	0.358		
Vanadium	6010B	2.1	0.4	2.0	06/24/10	07/02/10	69.7		
Zinc	6010B	2.1	0.3	2.0	06/24/10	07/02/10	155		

% Solids: 53.0

Comments:

METALS

- 1 -

INORGANIC ANALYSIS DATA PACKAGE

Client: Pacific EcoRisk Laboratories

Service Request: K1006356

Project No.: 16087

Date Collected: 6/10/2010

Project Name: USACE San Rafael Channel

Date Received: 6/18/2010

Matrix: SEDIMENT

Units: mg/Kg

Basis: DRY

Sample Name: SRC-2010-7-1

Lab Code: K1006356-016

Analyte	Analysis Method	MRL	MDL	Dil. Factor	Date Extracted	Date Analyzed	Result	C	Q
Arsenic	6020	0.71	0.07	5.0	06/24/10	06/28/10	9.14		
Barium	6010B	2.9	0.4	2.0	06/24/10	07/02/10	48.8		
Beryllium	6020	0.028	0.004	5.0	06/24/10	06/28/10	0.638		
Boron	6010B	14	0.4	2.0	06/24/10	07/02/10	33		
Cadmium	6020	0.028	0.006	5.0	06/24/10	06/28/10	0.191		
Chromium	6020	0.29	0.02	5.0	06/24/10	06/28/10	80.6		
Cobalt	6020	0.028	0.001	5.0	06/24/10	06/28/10	16.5		
Copper	6020	0.14	0.11	5.0	06/24/10	06/28/10	88.2		
Lead	6020	0.071	0.009	5.0	06/24/10	06/28/10	33.3		
Manganese	6010B	2.85	0.06	2.0	06/24/10	07/02/10	444		
Mercury	7471A	0.020	0.002	1.0	06/30/10	07/02/10	0.359		
Nickel	6020	0.29	0.03	5.0	06/24/10	06/28/10	88.6		
Selenium	7742	0.14	0.04	2.0	06/24/10	06/28/10	0.40		
Silver	6020	0.028	0.011	5.0	06/24/10	06/25/10	0.268		
Vanadium	6010B	2.9	0.6	2.0	06/24/10	07/02/10	70.7		
Zinc	6010B	2.9	0.4	2.0	06/24/10	07/02/10	207		

% Solids: 39.0

Comments:

METALS

- 1 -

INORGANIC ANALYSIS DATA PACKAGE

Client: Pacific EcoRisk Laboratories

Service Request: K1006356

Project No.: 16087

Date Collected: 6/10/2010

Project Name: USACE San Rafael Channel

Date Received: 6/18/2010

Matrix: SEDIMENT

Units: mg/Kg

Basis: DRY

Sample Name: SRC-2010-7-2

Lab Code: K1006356-017

Analyte	Analysis Method	MRL	MDL	Dil. Factor	Date Extracted	Date Analyzed	Result	C	Q
Arsenic	6020	0.67	0.07	5.0	06/24/10	06/28/10	11.5		
Barium	6010B	2.6	0.4	2.0	06/24/10	07/02/10	54.1		
Beryllium	6020	0.027	0.004	5.0	06/24/10	06/28/10	0.739		
Boron	6010B	13	0.4	2.0	06/24/10	07/02/10	28		
Cadmium	6020	0.027	0.005	5.0	06/24/10	06/28/10	0.278		
Chromium	6020	0.27	0.02	5.0	06/24/10	06/28/10	89.9		
Cobalt	6020	0.027	0.001	5.0	06/24/10	06/28/10	17.7		
Copper	6020	0.13	0.11	5.0	06/24/10	06/28/10	88.3		
Lead	6020	0.067	0.008	5.0	06/24/10	06/28/10	57.7		
Manganese	6010B	2.64	0.05	2.0	06/24/10	07/02/10	496		
Mercury	7471A	0.019	0.002	1.0	06/30/10	07/02/10	0.534		
Nickel	6020	0.27	0.03	5.0	06/24/10	06/28/10	98.7		
Selenium	7742	0.13	0.04	2.0	06/24/10	06/28/10	0.33		
Silver	6020	0.026	0.011	5.0	06/24/10	06/25/10	0.392		
Vanadium	6010B	2.6	0.5	2.0	06/24/10	07/02/10	74.5		
Zinc	6010B	2.6	0.4	2.0	06/24/10	07/02/10	210		

% Solids: 41.7

Comments:

METALS

- 1 -

INORGANIC ANALYSIS DATA PACKAGE

Client: Pacific EcoRisk Laboratories

Service Request: K1006356

Project No.: 16087

Date Collected: 6/10/2010

Project Name: USACE San Rafael Channel

Date Received: 6/18/2010

Matrix: SEDIMENT

Units: mg/Kg

Basis: DRY

Sample Name: SRC-2010-7-3

Lab Code: K1006356-018

Analyte	Analysis Method	MRL	MDL	Dil. Factor	Date Extracted	Date Analyzed	Result	C	Q
Arsenic	6020	0.67	0.07	5.0	06/24/10	06/28/10	10.5		
Barium	6010B	2.7	0.4	2.0	06/24/10	07/02/10	56.3		
Beryllium	6020	0.027	0.004	5.0	06/24/10	06/28/10	0.651		
Boron	6010B	13	0.4	2.0	06/24/10	07/02/10	30		
Cadmium	6020	0.027	0.005	5.0	06/24/10	06/28/10	0.295		
Chromium	6020	0.27	0.02	5.0	06/24/10	06/28/10	86.3		
Cobalt	6020	0.027	0.001	5.0	06/24/10	06/28/10	16.6		
Copper	6020	0.13	0.11	5.0	06/24/10	06/28/10	101.0		
Lead	6020	0.067	0.008	5.0	06/24/10	06/28/10	49.6		
Manganese	6010B	2.66	0.05	2.0	06/24/10	07/02/10	463		
Mercury	7471A	0.019	0.002	1.0	06/30/10	07/02/10	0.412		
Nickel	6020	0.27	0.03	5.0	06/24/10	06/28/10	95.8		
Selenium	7742	0.14	0.04	2.0	06/24/10	06/28/10	0.24		
Silver	6020	0.027	0.011	5.0	06/24/10	06/25/10	0.346		
Vanadium	6010B	2.7	0.5	2.0	06/24/10	07/02/10	71.5		
Zinc	6010B	2.7	0.4	2.0	06/24/10	07/02/10	227		

% Solids: 41.3

Comments:

METALS

- 1 -

INORGANIC ANALYSIS DATA PACKAGE

Client: Pacific EcoRisk Laboratories

Service Request: K1006356

Project No.: 16087

Date Collected: 6/10/2010

Project Name: USACE San Rafael Channel

Date Received: 6/18/2010

Matrix: SEDIMENT

Units: mg/Kg

Basis: DRY

Sample Name: SRC-2010-7-4

Lab Code: K1006356-019

Analyte	Analysis Method	MRL	MDL	Dil. Factor	Date Extracted	Date Analyzed	Result	C	Q
Arsenic	6020	0.69	0.07	5.0	06/24/10	06/28/10	11.6		
Barium	6010B	2.8	0.4	2.0	06/24/10	07/02/10	62.5		
Beryllium	6020	0.028	0.004	5.0	06/24/10	06/28/10	0.767		
Boron	6010B	14	0.4	2.0	06/24/10	07/02/10	38		
Cadmium	6020	0.028	0.006	5.0	06/24/10	06/28/10	0.517		
Chromium	6020	0.28	0.02	5.0	06/24/10	06/28/10	97.0		
Cobalt	6020	0.028	0.001	5.0	06/24/10	06/28/10	17.8		
Copper	6020	0.14	0.11	5.0	06/24/10	06/28/10	129.0		
Lead	6020	0.069	0.008	5.0	06/24/10	06/28/10	91.3		
Manganese	6010B	2.76	0.06	2.0	06/24/10	07/02/10	364		
Mercury	7471A	0.019	0.002	1.0	06/30/10	07/02/10	0.438		
Nickel	6020	0.28	0.03	5.0	06/24/10	06/28/10	109		
Selenium	7742	0.14	0.04	2.0	06/24/10	06/28/10	0.18		
Silver	6020	0.028	0.011	5.0	06/24/10	06/25/10	0.332		
Vanadium	6010B	2.8	0.6	2.0	06/24/10	07/02/10	64.4		
Zinc	6010B	2.8	0.4	2.0	06/24/10	07/02/10	272		

% Solids: 39.8

Comments:

METALS

- 1 -

INORGANIC ANALYSIS DATA PACKAGE

Client: Pacific EcoRisk Laboratories

Service Request: K1006356

Project No.: 16087

Date Collected: 6/10/2010

Project Name: USACE San Rafael Channel

Date Received: 6/18/2010

Matrix: SEDIMENT

Units: mg/Kg

Basis: DRY

Sample Name: SRC-2010-7-5

Lab Code: K1006356-020

Analyte	Analysis Method	MRL	MDL	Dil. Factor	Date Extracted	Date Analyzed	Result	C	Q
Arsenic	6020	0.63	0.06	5.0	06/24/10	06/28/10	11.5		
Barium	6010B	2.5	0.4	2.0	06/24/10	07/02/10	80.4		
Beryllium	6020	0.025	0.004	5.0	06/24/10	06/28/10	0.741		
Boron	6010B	13	0.4	2.0	06/24/10	07/02/10	47		
Cadmium	6020	0.025	0.005	5.0	06/24/10	06/28/10	0.726		
Chromium	6020	0.25	0.02	5.0	06/24/10	06/28/10	101		
Cobalt	6020	0.025	0.001	5.0	06/24/10	06/28/10	17.2		
Copper	6020	0.13	0.10	5.0	06/24/10	06/28/10	95.7		
Lead	6020	0.063	0.008	5.0	06/24/10	06/28/10	162		
Manganese	6010B	2.51	0.05	2.0	06/24/10	07/02/10	347		
Mercury	7471A	0.019	0.002	1.0	06/30/10	07/02/10	0.541		
Nickel	6020	0.25	0.03	5.0	06/24/10	06/28/10	119		
Selenium	7742	0.13	0.04	2.0	06/24/10	06/28/10	0.31		
Silver	6020	0.025	0.010	5.0	06/24/10	06/25/10	0.419		
Vanadium	6010B	2.5	0.5	2.0	06/24/10	07/02/10	58.1		
Zinc	6010B	2.5	0.4	2.0	06/24/10	07/02/10	298		

% Solids: 43.8

Comments:

METALS

- 1 -

INORGANIC ANALYSIS DATA PACKAGE

Client: Pacific EcoRisk Laboratories

Service Request: K1006356

Project No.: 16087

Date Collected: 6/10/2010

Project Name: USACE San Rafael Channel

Date Received: 6/23/2010

Matrix: SEDIMENT

Units: mg/Kg

Basis: DRY

Sample Name: SRC-2010-8-Z-Comp

Lab Code: K1006356-021

Analyte	Analysis Method	MRL	MDL	Dil. Factor	Date Extracted	Date Analyzed	Result	C	Q
Arsenic	6020	0.63	0.06	5.0	06/25/10	06/28/10	12.1		
Barium	6010B	2.5	0.4	2.0	06/25/10	07/02/10	98.9		
Beryllium	6020	0.025	0.004	5.0	06/25/10	06/28/10	0.721		
Boron	6010B	13	0.4	2.0	06/25/10	07/02/10	40		
Cadmium	6020	0.025	0.005	5.0	06/25/10	06/28/10	0.845		*
Chromium	6020	0.25	0.02	5.0	06/25/10	06/28/10	106		
Cobalt	6020	0.025	0.001	5.0	06/25/10	06/28/10	17.6		
Copper	6020	0.13	0.10	5.0	06/25/10	06/28/10	107.0		
Lead	6020	0.063	0.008	5.0	06/25/10	06/28/10	200		
Manganese	6010B	2.51	0.05	2.0	06/25/10	07/02/10	372		
Mercury	7471A	0.019	0.002	1.0	06/30/10	07/02/10	0.503		
Nickel	6020	0.25	0.03	5.0	06/25/10	06/28/10	127		
Selenium	7742	0.13	0.04	2.0	06/25/10	06/28/10	0.29		
Silver	6020	0.025	0.010	5.0	06/25/10	06/25/10	0.425		
Vanadium	6010B	2.5	0.5	2.0	06/25/10	07/02/10	63.6		
Zinc	6010B	2.5	0.4	2.0	06/25/10	07/02/10	323		

% Solids: 44.0

Comments:

METALS

- 1 -

INORGANIC ANALYSIS DATA PACKAGE

Client: Pacific EcoRisk Laboratories

Service Request: K1006356

Project No.: 16087

Date Collected:

Project Name: USACE San Rafael Channel

Date Received:

Matrix: SEDIMENT

Units: mg/Kg

Basis: DRY

Sample Name: Method Blank1

Lab Code: K1006356-MB1

Analyte	Analysis Method	MRL	MDL	Dil. Factor	Date Extracted	Date Analyzed	Result	C	Q
Arsenic	6020	0.50	0.05	5.0	06/24/10	06/28/10	0.05	U	
Barium	6010B	2.0	0.3	2.0	06/24/10	07/02/10	0.3	U	
Beryllium	6020	0.020	0.003	5.0	06/24/10	06/28/10	0.003	U	
Boron	6010B	10	0.3	2.0	06/24/10	07/02/10	0.3	U	
Cadmium	6020	0.020	0.004	5.0	06/24/10	06/28/10	0.004	U	
Chromium	6020	0.20	0.02	5.0	06/24/10	06/28/10	0.08	J	
Cobalt	6020	0.020	0.001	5.0	06/24/10	06/28/10	0.002	J	
Copper	6020	0.10	0.08	5.0	06/24/10	06/28/10	0.08	U	
Lead	6020	0.050	0.006	5.0	06/24/10	06/28/10	0.006	U	
Manganese	6010B	2.00	0.04	2.0	06/24/10	07/02/10	0.19	J	
Mercury	7471A	0.020	0.002	1.0	06/30/10	07/02/10	0.002	U	
Nickel	6020	0.20	0.02	5.0	06/24/10	06/28/10	0.03	J	
Selenium	7742	0.10	0.03	2.0	06/24/10	06/28/10	0.03	U	
Silver	6020	0.020	0.008	5.0	06/24/10	06/25/10	0.008	U	
Vanadium	6010B	2.0	0.4	2.0	06/24/10	07/02/10	0.4	U	
Zinc	6010B	2.0	0.3	2.0	06/24/10	07/02/10	0.3	U	

% Solids: 100.0

Comments:

METALS

- 1 -

INORGANIC ANALYSIS DATA PACKAGE

Client: Pacific EcoRisk Laboratories

Service Request: K1006356

Project No.: 16087

Date Collected:

Project Name: USACE San Rafael Channel

Date Received:

Matrix: SEDIMENT

Units: mg/Kg

Basis: DRY

Sample Name: Method Blank2

Lab Code: K1006356-MB2

Analyte	Analysis Method	MRL	MDL	Dil. Factor	Date Extracted	Date Analyzed	Result	C	Q
Arsenic	6020	0.50	0.05	5.0	06/25/10	06/28/10	0.05	U	
Barium	6010B	2.0	0.3	2.0	06/25/10	07/02/10	0.3	U	
Beryllium	6020	0.020	0.003	5.0	06/25/10	06/28/10	0.003	U	
Boron	6010B	10	0.3	2.0	06/25/10	07/02/10	0.3	U	
Cadmium	6020	0.020	0.004	5.0	06/25/10	06/28/10	0.004	U	*
Chromium	6020	0.20	0.02	5.0	06/25/10	06/28/10	0.07	J	
Cobalt	6020	0.020	0.001	5.0	06/25/10	06/28/10	0.001	J	
Copper	6020	0.10	0.08	5.0	06/25/10	06/28/10	0.08	U	
Lead	6020	0.050	0.006	5.0	06/25/10	06/28/10	0.006	U	
Manganese	6010B	2.00	0.04	2.0	06/25/10	07/02/10	0.04	U	
Mercury	7471A	0.020	0.002	1.0	06/30/10	07/02/10	0.002	U	
Nickel	6020	0.20	0.02	5.0	06/25/10	06/28/10	0.03	J	
Selenium	7742	0.10	0.03	2.0	06/25/10	06/28/10	0.03	U	
Silver	6020	0.020	0.008	5.0	06/25/10	06/25/10	0.008	U	
Vanadium	6010B	2.0	0.4	2.0	06/25/10	07/02/10	0.4	U	
Zinc	6010B	2.0	0.3	2.0	06/25/10	07/02/10	0.3	U	

% Solids: 100.0

Comments:

METALS

- 5A -

SPIKE SAMPLE RECOVERY

Client: Pacific EcoRisk Laboratories

Service Request: K1006356

Project No.: 16087

Units: MG/KG

Project Name: USACE San Rafael Channel

Basis: DRY

Matrix: SEDIMENT

% Solids: 44.6

Sample Name: SRC-2010-1-CompS

Lab Code: K1006356-001S

Analyte	Control Limit %R	Spike Result	C	Sample Result	C	Spike Added	%R	Q	Method
Arsenic	57 - 133	140		10.4		123.20	105.2		6020
Barium	60 - 139	562		52.2		495.50	102.9		6010B
Beryllium	64 - 133	13.5		0.566		12.32	105.0		6020
Boron	53 - 135	138		24		123.88	92.0		6010B
Cadmium	68 - 137	13.3		0.221		12.32	106.2		6020
Chromium	34 - 175	130		76.6		49.28	108.4		6020
Cobalt	74 - 118	146		17.9		123.20	104.0		6020
Copper	22 - 181	119.0		53.0		61.60	107.1		6020
Lead	27 - 178	150		23.1		123.20	103.0		6020
Manganese		885		733		123.88	122.7		6010B
Nickel	59 - 132	220		87.3		123.20	107.7		6020
Selenium	57 - 134	2.69		0.27		2.46	98.4		7742
Silver	62 - 131	13.2		0.243		12.39	104.6		6020
Vanadium	64 - 132	195		69.9		123.88	101.0		6010B
Zinc	13 - 172	255		123		123.88	106.6		6010B

An empty field in the Control Limit column indicates the control limit is not applicable

METALS

- 5A -

SPIKE SAMPLE RECOVERY

Client: Pacific EcoRisk Laboratories

Service Request: K1006356

Project No.: 16087

Units: MG/KG

Project Name: USACE San Rafael Channel

Basis: DRY

Matrix: SEDIMENT

% Solids: 46.7

Sample Name: SRC-2010-1-Comps

Lab Code: K1006356-002S

Analyte	Control Limit %R	Spike Result	C	Sample Result	C	Spike Added	%R	Q	Method
Mercury	60 - 135	0.760		0.287		0.47	100.6		7471A

An empty field in the Control Limit column indicates the control limit is not applicable

METALS

- 5A -

SPIKE SAMPLE RECOVERY

Client: Pacific EcoRisk Laboratories

Service Request: K1006356

Project No.: 16087

Units: MG/KG

Project Name: USACE San Rafael Channel

Basis: DRY

Matrix: SEDIMENT

% Solids: 44.0

Sample Name: SRC-2010-8-Z-CompS

Lab Code: K1006356-021S

Analyte	Control Limit %R	Spike Result	C	Sample Result	C	Spike Added	%R	Q	Method
Arsenic	57 - 133	150		12.1		125.57	109.8		6020
Barium	60 - 139	594		98.9		505.05	98.0		6010B
Beryllium	64 - 133	15.5		0.721		12.56	117.7		6020
Boron	53 - 135	151		40		126.26	87.9		6010B
Cadmium	68 - 137	14.5		0.845		12.56	108.7		6020
Chromium	34 - 175	154		106		50.23	95.6		6020
Cobalt	74 - 118	150		17.6		125.57	105.4		6020
Copper	22 - 181	174.0		107.0		62.78	106.7		6020
Lead	27 - 178	330		200		125.57	103.5		6020
Manganese	28 - 181	497		372		126.26	99.0		6010B
Nickel	59 - 132	259		127		125.57	105.1		6020
Selenium	57 - 134	2.24		0.29		2.51	77.7		7742
Silver	62 - 131	13.8		0.425		12.63	105.9		6020
Vanadium	64 - 132	186		63.6		126.26	96.9		6010B
Zinc	13 - 172	408		323		126.26	67.3		6010B

An empty field in the Control Limit column indicates the control limit is not applicable

METALS

- 5A -

SPIKE SAMPLE RECOVERY

Client: Pacific EcoRisk Laboratories Service Request: K1006356
Project No.: 16087 Units: MG/KG
Project Name: USACE San Rafael Channel Basis: DRY
Matrix: SEDIMENT % Solids: 56.6

Sample Name: Batch QCS

Lab Code: K1006518-001S

Analyte	Control Limit %R	Spike Result	C	Sample Result	C	Spike Added	%R	Q	Method
Mercury	60 - 135	0.474		0.046		0.49	87.3		7471A

An empty field in the Control Limit column indicates the control limit is not applicable

METALS

- 6 -

DUPLICATES

Client: Pacific EcoRisk Laboratories

Service Request: K1006356

Project No.: 16087

Units: MG/KG

Project Name: USACE San Rafael Channel

Basis: DRY

Matrix: SEDIMENT

% Solids: 44.6

Sample Name: SRC-2010-1-CompD

Lab Code: K1006356-001D

Analyte	Control Limit	Sample (S)	C	Duplicate (D)	C	RPD	Q	Method
Arsenic	20	10.4		9.44		9.7		6020
Barium	30	52.2		53.7		2.8		6010B
Beryllium	20	0.566		0.506		11.2		6020
Boron		24		26		8.0		6010B
Cadmium	20	0.221		0.197		11.5		6020
Chromium	20	76.6		68.4		11.3		6020
Cobalt	20	17.9		16.1		10.6		6020
Copper	20	53.0		48.0		9.9		6020
Lead	20	23.1		21.2		8.6		6020
Manganese	30	733		755		3.0		6010B
Nickel	20	87.3		79.0		10.0		6020
Selenium		0.27		0.28		3.6		7742
Silver	20	0.243		0.253		4		6020
Vanadium	30	69.9		70.8		1.3		6010B
Zinc	30	123		127		3.2		6010B

An empty field in the Control Limit column indicates the control limit is not applicable.

METALS

- 6 -

DUPLICATES

Client: Pacific EcoRisk Laboratories Service Request: K1006356
Project No.: 16087 Units: MG/KG
Project Name: USACE San Rafael Channel Basis: DRY
Matrix: SEDIMENT % Solids: 46.7

Sample Name: SRC-2010-1-CompD

Lab Code: K1006356-002D

Analyte	Control Limit	Sample (S)	C	Duplicate (D)	C	RPD	Q	Method
Mercury	30	0.287		0.303		5.4		7471A

An empty field in the Control Limit column indicates the control limit is not applicable.

METALS

- 6 -

DUPLICATES

Client: Pacific EcoRisk Laboratories

Service Request: K1006356

Project No.: 16087

Units: MG/KG

Project Name: USACE San Rafael Channel

Basis: DRY

Matrix: SEDIMENT

% Solids: 44.0

Sample Name: SRC-2010-8-Z-CompD

Lab Code: K1006356-021D

Analyte	Control Limit	Sample (S)	C	Duplicate (D)	C	RPD	Q	Method
Arsenic	20	12.1		10.5		14.2		6020
Barium	30	98.9		84.1		16.2		6010B
Beryllium	20	0.721		0.646		11.0		6020
Boron		40		42		4.9		6010B
Cadmium	20	0.845		0.647		26.5	*	6020
Chromium	20	106		88.9		17.5		6020
Cobalt	20	17.6		15.0		16.0		6020
Copper	20	107.0		91.5		15.6		6020
Lead	20	200		168		17.4		6020
Manganese	30	372		370		0.5		6010B
Nickel	20	127		107		17.1		6020
Selenium		0.29		0.18		46.8		7742
Silver	20	0.425		0.430		1		6020
Vanadium	30	63.6		62.1		2.4		6010B
Zinc	30	323		259		22.0		6010B

An empty field in the Control Limit column indicates the control limit is not applicable.

METALS

- 6 -

DUPLICATES

Client: Pacific EcoRisk Laboratories

Service Request: K1006356

Project No.: 16087

Units: MG/KG

Project Name: USACE San Rafael Channel

Basis: DRY

Matrix: SEDIMENT

% Solids: 56.6

Sample Name: Batch QCD

Lab Code: K1006518-001D

Analyte	Control Limit	Sample (S)	C	Duplicate (D)	C	RPD	Q	Method
Mercury		0.046		0.046		0.0		7471A

An empty field in the Control Limit column indicates the control limit is not applicable.

METALS

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LABORATORY CONTROL SAMPLE

Client: Pacific EcoRisk Laboratories

Service Request: K1006356

Project No.: 16087

Project Name: USACE San Rafael Channel

Aqueous LCS Source:

Solid LCS Source: ERA D065540

Analyte	Aqueous: ug/L			Solid: mg/kg					
	True	Found	%R	True	Found	C	Limits	%R	
Arsenic				88.3	90.1		78 122	102.0	
Barium				432	481		81 119	111.3	
Beryllium				58.2	57.5		83 117	98.8	
Boron				101	112		67 133	110.9	
Cadmium				91	90.8		81 119	99.8	
Chromium				144	151		80 119	104.9	
Cobalt				190	204		82 118	107.4	
Copper				237	240.0		83 116	101.3	
Lead				104	105		79 121	101.0	
Manganese				497	560		81 119	112.7	
Mercury				6.8	7.580		71 128	111.5	
Nickel				200	214		81 118	107.0	
Selenium				192	197		80 120	102.6	
Silver				76.4	82.7		66 134	108.2	
Vanadium				180	191		79 121	106.1	
Zinc				292	330		73 121	113.0	

METALS

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LABORATORY CONTROL SAMPLE

Client: Pacific EcoRisk Laboratories

Service Request: K1006356

Project No.: 16087

Project Name: USACE San Rafael Channel

Aqueous LCS Source:

Solid LCS Source: ERA D065540

Analyte	Aqueous: ug/L			Solid: mg/kg					
	True	Found	%R	True	Found	C	Limits	%R	
Arsenic				88.3	90.6		78 122	102.6	
Barium				432	449		81 119	103.9	
Beryllium				58.2	60.6		83 117	104.1	
Boron				101	115		67 133	113.9	
Cadmium				91	93.5		81 119	102.7	
Chromium				144	146		80 119	101.4	
Cobalt				190	206		82 118	108.4	
Copper				237	237.0		83 116	100.0	
Lead				104	105		79 121	101.0	
Manganese				497	547		81 119	110.1	
Mercury				6.8	6.580		71 128	96.8	
Nickel				200	216		81 118	108.0	
Selenium				192	189		80 120	98.4	
Silver				76.4	76.8		66 134	100.5	
Vanadium				180	191		79 121	106.1	
Zinc				292	319		73 121	109.2	

Butyltins

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Pacific EcoRisk Laboratories
Project: USACE San Rafael Channel/16087
Sample Matrix: Sediment

Service Request: K1006356
Date Collected: 06/08/2010
Date Received: 06/18/2010

Butyltins (as cation)

Sample Name: SRC-2010-1-Comp
Lab Code: K1006356-001
Extraction Method: SOC-OSWT
Analysis Method: Krone

Units: ug/Kg
Basis: Dry
Level: Low

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Tetra-n-butyltin	ND	U	2.3	0.98	1	06/22/10	07/07/10	KWG1006633	
Tri-n-butyltin Cation	ND	U	2.3	0.96	1	06/22/10	07/07/10	KWG1006633	
Di-n-butyltin Cation	2.1	J	2.3	0.43	1	06/22/10	07/07/10	KWG1006633	
n-Butyltin Cation	2.5		2.3	0.58	1	06/22/10	07/07/10	KWG1006633	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Tri-n-propyltin	57	18-95	07/07/10	Acceptable

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Pacific EcoRisk Laboratories
Project: USACE San Rafael Channel/16087
Sample Matrix: Sediment

Service Request: K1006356
Date Collected: 06/09/2010
Date Received: 06/18/2010

Butyltins (as cation)

Sample Name: SRC-2010-2-Comp
Lab Code: K1006356-002
Extraction Method: SOC-OSWT
Analysis Method: Krone

Units: ug/Kg
Basis: Dry
Level: Low

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Tetra-n-butyltin	ND	U	2.2	0.94	1	06/22/10	07/07/10	KWG1006633	
Tri-n-butyltin Cation	ND	U	2.2	0.92	1	06/22/10	07/07/10	KWG1006633	
Di-n-butyltin Cation	1.5	J	2.2	0.41	1	06/22/10	07/07/10	KWG1006633	
n-Butyltin Cation	2.0	J	2.2	0.56	1	06/22/10	07/07/10	KWG1006633	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Tri-n-propyltin	50	18-95	07/07/10	Acceptable

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Pacific EcoRisk Laboratories
Project: USACE San Rafael Channel/16087
Sample Matrix: Sediment

Service Request: K1006356
Date Collected: 06/09/2010
Date Received: 06/18/2010

Butyltins (as cation)

Sample Name: SRC-2010-3-Comp
Lab Code: K1006356-003
Extraction Method: SOC-OSWT
Analysis Method: Krone

Units: ug/Kg
Basis: Dry
Level: Low

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Tetra-n-butyltin	ND	U	2.1	0.89	1	06/22/10	07/07/10	KWG1006633	
Tri-n-butyltin Cation	1.3	J	2.1	0.87	1	06/22/10	07/07/10	KWG1006633	
Di-n-butyltin Cation	2.3		2.1	0.39	1	06/22/10	07/07/10	KWG1006633	
n-Butyltin Cation	2.5		2.1	0.53	1	06/22/10	07/07/10	KWG1006633	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Tri-n-propyltin	66	18-95	07/07/10	Acceptable

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Pacific EcoRisk Laboratories
Project: USACE San Rafael Channel/16087
Sample Matrix: Sediment

Service Request: K1006356
Date Collected: 06/11/2010
Date Received: 06/18/2010

Butyltins (as cation)

Sample Name: SRC-2010-4-Comp
Lab Code: K1006356-004
Extraction Method: SOC-OSWT
Analysis Method: Krone

Units: ug/Kg
Basis: Dry
Level: Low

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Tetra-n-butyltin	ND	U	2.1	0.92	1	06/22/10	07/07/10	KWG1006633	
Tri-n-butyltin Cation	ND	U	2.1	0.90	1	06/22/10	07/07/10	KWG1006633	
Di-n-butyltin Cation	1.6	J	2.1	0.40	1	06/22/10	07/07/10	KWG1006633	
n-Butyltin Cation	2.5		2.1	0.55	1	06/22/10	07/07/10	KWG1006633	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Tri-n-propyltin	64	18-95	07/07/10	Acceptable

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Pacific EcoRisk Laboratories
Project: USACE San Rafael Channel/16087
Sample Matrix: Sediment

Service Request: K1006356
Date Collected: 06/08/2010
Date Received: 06/18/2010

Butyltins (as cation)

Sample Name: SRC-2010-5-Comp
Lab Code: K1006356-005
Extraction Method: SOC-OSWT
Analysis Method: Krone

Units: ug/Kg
Basis: Dry
Level: Low

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Tetra-n-butyltin	ND	U	2.3	1.0	1	06/22/10	07/07/10	KWG1006633	
Tri-n-butyltin Cation	1.7	J	2.3	0.98	1	06/22/10	07/07/10	KWG1006633	
Di-n-butyltin Cation	5.0		2.3	0.43	1	06/22/10	07/07/10	KWG1006633	
n-Butyltin Cation	5.6		2.3	0.59	1	06/22/10	07/07/10	KWG1006633	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Tri-n-propyltin	71	18-95	07/07/10	Acceptable

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Pacific EcoRisk Laboratories
Project: USACE San Rafael Channel/16087
Sample Matrix: Sediment

Service Request: K1006356
Date Collected: 06/09/2010
Date Received: 06/18/2010

Butyltins (as cation)

Sample Name: SRC-2010-6-Comp
Lab Code: K1006356-006
Extraction Method: SOC-OSWT
Analysis Method: Krone

Units: ug/Kg
Basis: Dry
Level: Low

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Tetra-n-butyltin	ND	U	2.4	1.1	1	06/22/10	07/07/10	KWG1006633	
Tri-n-butyltin Cation	3.8		2.4	1.1	1	06/22/10	07/07/10	KWG1006633	
Di-n-butyltin Cation	14		2.4	0.46	1	06/22/10	07/07/10	KWG1006633	
n-Butyltin Cation	12		2.4	0.63	1	06/22/10	07/07/10	KWG1006633	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Tri-n-propyltin	77	18-95	07/07/10	Acceptable

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Pacific EcoRisk Laboratories
Project: USACE San Rafael Channel/16087
Sample Matrix: Sediment

Service Request: K1006356
Date Collected: 06/10/2010
Date Received: 06/18/2010

Butyltins (as cation)

Sample Name: SRC-2010-7-Comp
Lab Code: K1006356-007
Extraction Method: SOC-OSWT
Analysis Method: Krone

Units: ug/Kg
Basis: Dry
Level: Low

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Tetra-n-butyltin	ND	U	2.4	1.1	1	06/22/10	07/07/10	KWG1006633	
Tri-n-butyltin Cation	9.6		2.4	1.1	1	06/22/10	07/07/10	KWG1006633	
Di-n-butyltin Cation	33		2.4	0.45	1	06/22/10	07/07/10	KWG1006633	
n-Butyltin Cation	20		2.4	0.62	1	06/22/10	07/07/10	KWG1006633	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Tri-n-propyltin	69	18-95	07/07/10	Acceptable

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Pacific EcoRisk Laboratories
Project: USACE San Rafael Channel/16087
Sample Matrix: Sediment

Service Request: K1006356
Date Collected: 06/10/2010
Date Received: 06/18/2010

Butyltins (as cation)

Sample Name: SRC-2010-7-Z-Comp
Lab Code: K1006356-008
Extraction Method: SOC-OSWT
Analysis Method: Krone

Units: ug/Kg
Basis: Dry
Level: Low

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Tetra-n-butyltin	ND	U	2.1	0.90	1	06/22/10	07/07/10	KWG1006633	
Tri-n-butyltin Cation	21		2.1	0.88	1	06/22/10	07/07/10	KWG1006633	
Di-n-butyltin Cation	50		2.1	0.39	1	06/22/10	07/07/10	KWG1006633	
n-Butyltin Cation	21		2.1	0.53	1	06/22/10	07/07/10	KWG1006633	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Tri-n-propyltin	63	18-95	07/07/10	Acceptable

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Pacific EcoRisk Laboratories
Project: USACE San Rafael Channel/16087
Sample Matrix: Sediment

Service Request: K1006356
Date Collected: 06/08/2010
Date Received: 06/18/2010

Butyltins (as cation)

Sample Name: SRC-2010-1-B-Comp
Lab Code: K1006356-009
Extraction Method: SOC-OSWT
Analysis Method: Krone

Units: ug/Kg
Basis: Dry
Level: Low

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Tetra-n-butyltin	ND	U	2.0	0.86	1	06/22/10	07/07/10	KWG1006633	
Tri-n-butyltin Cation	ND	U	2.0	0.84	1	06/22/10	07/07/10	KWG1006633	
Di-n-butyltin Cation	1.9	J	2.0	0.38	1	06/22/10	07/07/10	KWG1006633	
n-Butyltin Cation	2.5		2.0	0.51	1	06/22/10	07/07/10	KWG1006633	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Tri-n-propyltin	73	18-95	07/07/10	Acceptable

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Pacific EcoRisk Laboratories
Project: USACE San Rafael Channel/16087
Sample Matrix: Sediment

Service Request: K1006356
Date Collected: 06/09/2010
Date Received: 06/18/2010

Butyltins (as cation)

Sample Name: SRC-2010-2-B-Comp
Lab Code: K1006356-010
Extraction Method: SOC-OSWT
Analysis Method: Krone

Units: ug/Kg
Basis: Dry
Level: Low

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Tetra-n-butyltin	ND	U	2.0	0.85	1	06/22/10	07/07/10	KWG1006633	
Tri-n-butyltin Cation	1.3	J	2.0	0.83	1	06/22/10	07/07/10	KWG1006633	
Di-n-butyltin Cation	1.8	J	2.0	0.37	1	06/22/10	07/07/10	KWG1006633	
n-Butyltin Cation	2.2		2.0	0.51	1	06/22/10	07/07/10	KWG1006633	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Tri-n-propyltin	66	18-95	07/07/10	Acceptable

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Pacific EcoRisk Laboratories
Project: USACE San Rafael Channel/16087
Sample Matrix: Sediment

Service Request: K1006356
Date Collected: 06/09/2010
Date Received: 06/18/2010

Butyltins (as cation)

Sample Name: SRC-2010-3-B-Comp
Lab Code: K1006356-011
Extraction Method: SOC-OSWT
Analysis Method: Krone

Units: ug/Kg
Basis: Dry
Level: Low

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Tetra-n-butyltin	ND	U	2.1	0.89	1	06/22/10	07/08/10	KWG1006633	
Tri-n-butyltin Cation	1.3	J	2.1	0.87	1	06/22/10	07/08/10	KWG1006633	
Di-n-butyltin Cation	2.9		2.1	0.39	1	06/22/10	07/08/10	KWG1006633	
n-Butyltin Cation	2.4		2.1	0.53	1	06/22/10	07/08/10	KWG1006633	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Tri-n-propyltin	69	18-95	07/08/10	Acceptable

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Pacific EcoRisk Laboratories
Project: USACE San Rafael Channel/16087
Sample Matrix: Sediment

Service Request: K1006356
Date Collected: 06/11/2010
Date Received: 06/18/2010

Butyltins (as cation)

Sample Name: SRC-2010-4-B-Comp
Lab Code: K1006356-012
Extraction Method: SOC-OSWT
Analysis Method: Krone

Units: ug/Kg
Basis: Dry
Level: Low

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Tetra-n-butyltin	ND	U	2.0	0.85	1	06/22/10	07/08/10	KWG1006633	
Tri-n-butyltin Cation	1.6	J	2.0	0.83	1	06/22/10	07/08/10	KWG1006633	
Di-n-butyltin Cation	3.7		2.0	0.37	1	06/22/10	07/08/10	KWG1006633	
n-Butyltin Cation	3.5		2.0	0.51	1	06/22/10	07/08/10	KWG1006633	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Tri-n-propyltin	63	18-95	07/08/10	Acceptable

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Pacific EcoRisk Laboratories
Project: USACE San Rafael Channel/16087
Sample Matrix: Sediment

Service Request: K1006356
Date Collected: 06/08/2010
Date Received: 06/18/2010

Butyltins (as cation)

Sample Name: SRC-2010-5-B-Comp
Lab Code: K1006356-013
Extraction Method: SOC-OSWT
Analysis Method: Krone

Units: ug/Kg
Basis: Dry
Level: Low

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Tetra-n-butyltin	ND	U	2.0	0.88	1	06/22/10	07/08/10	KWG1006633	
Tri-n-butyltin Cation	8.4		2.0	0.86	1	06/22/10	07/08/10	KWG1006633	
Di-n-butyltin Cation	24		2.0	0.38	1	06/22/10	07/08/10	KWG1006633	
n-Butyltin Cation	13		2.0	0.52	1	06/22/10	07/08/10	KWG1006633	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Tri-n-propyltin	72	18-95	07/08/10	Acceptable

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Pacific EcoRisk Laboratories
Project: USACE San Rafael Channel/16087
Sample Matrix: Sediment

Service Request: K1006356
Date Collected: 06/09/2010
Date Received: 06/18/2010

Butyltins (as cation)

Sample Name: SRC-2010-6-B-Comp
Lab Code: K1006356-014
Extraction Method: SOC-OSWT
Analysis Method: Krone

Units: ug/Kg
Basis: Dry
Level: Low

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Tetra-n-butyltin	ND	U	2.2	0.95	1	06/22/10	07/08/10	KWG1006633	
Tri-n-butyltin Cation	3.9		2.2	0.93	1	06/22/10	07/08/10	KWG1006633	
Di-n-butyltin Cation	21		2.2	0.41	1	06/22/10	07/08/10	KWG1006633	
n-Butyltin Cation	13		2.2	0.56	1	06/22/10	07/08/10	KWG1006633	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Tri-n-propyltin	70	18-95	07/08/10	Acceptable

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Pacific EcoRisk Laboratories
Project: USACE San Rafael Channel/16087
Sample Matrix: Sediment

Service Request: K1006356
Date Collected: 06/10/2010
Date Received: 06/18/2010

Butyltins (as cation)

Sample Name: SRC-2010-7-B-Comp
Lab Code: K1006356-015
Extraction Method: SOC-OSWT
Analysis Method: Krone

Units: ug/Kg
Basis: Dry
Level: Low

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Tetra-n-butyltin	ND	U	1.9	0.82	1	06/22/10	07/08/10	KWG1006633	
Tri-n-butyltin Cation	4.0		1.9	0.81	1	06/22/10	07/08/10	KWG1006633	
Di-n-butyltin Cation	18		1.9	0.36	1	06/22/10	07/08/10	KWG1006633	
n-Butyltin Cation	8.1		1.9	0.49	1	06/22/10	07/08/10	KWG1006633	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Tri-n-propyltin	79	18-95	07/08/10	Acceptable

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Pacific EcoRisk Laboratories
Project: USACE San Rafael Channel/16087
Sample Matrix: Sediment

Service Request: K1006356
Date Collected: 06/10/2010
Date Received: 06/18/2010

Butyltins (as cation)

Sample Name: SRC-2010-7-1
Lab Code: K1006356-016
Extraction Method: SOC-OSWT
Analysis Method: Krone

Units: ug/Kg
Basis: Dry
Level: Low

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Tetra-n-butyltin	ND	U	2.6	1.2	1	06/22/10	07/08/10	KWG1006633	
Tri-n-butyltin Cation	3.9		2.6	1.1	1	06/22/10	07/08/10	KWG1006633	
Di-n-butyltin Cation	15		2.6	0.49	1	06/22/10	07/08/10	KWG1006633	
n-Butyltin Cation	10		2.6	0.66	1	06/22/10	07/08/10	KWG1006633	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Tri-n-propyltin	76	18-95	07/08/10	Acceptable

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Pacific EcoRisk Laboratories
Project: USACE San Rafael Channel/16087
Sample Matrix: Sediment

Service Request: K1006356
Date Collected: 06/10/2010
Date Received: 06/18/2010

Butyltins (as cation)

Sample Name: SRC-2010-7-2
Lab Code: K1006356-017
Extraction Method: SOC-OSWT
Analysis Method: Krone

Units: ug/Kg
Basis: Dry
Level: Low

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Tetra-n-butyltin	ND	U	2.4	1.1	1	06/22/10	07/08/10	KWG1006633	
Tri-n-butyltin Cation	12		2.4	1.1	1	06/22/10	07/08/10	KWG1006633	
Di-n-butyltin Cation	68		2.4	0.46	1	06/22/10	07/08/10	KWG1006633	
n-Butyltin Cation	29		2.4	0.63	1	06/22/10	07/08/10	KWG1006633	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Tri-n-propyltin	84	18-95	07/08/10	Acceptable

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Pacific EcoRisk Laboratories
Project: USACE San Rafael Channel/16087
Sample Matrix: Sediment

Service Request: K1006356
Date Collected: 06/10/2010
Date Received: 06/18/2010

Butyltins (as cation)

Sample Name: SRC-2010-7-3
Lab Code: K1006356-018
Extraction Method: SOC-OSWT
Analysis Method: Krone

Units: ug/Kg
Basis: Dry
Level: Low

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Tetra-n-butyltin	ND	U	2.4	1.1	1	06/22/10	07/08/10	KWG1006633	
Tri-n-butyltin Cation	6.7		2.4	1.1	1	06/22/10	07/08/10	KWG1006633	
Di-n-butyltin Cation	30		2.4	0.46	1	06/22/10	07/08/10	KWG1006633	
n-Butyltin Cation	20		2.4	0.62	1	06/22/10	07/08/10	KWG1006633	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Tri-n-propyltin	74	18-95	07/08/10	Acceptable

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Pacific EcoRisk Laboratories
Project: USACE San Rafael Channel/16087
Sample Matrix: Sediment

Service Request: K1006356
Date Collected: 06/10/2010
Date Received: 06/18/2010

Butyltins (as cation)

Sample Name: SRC-2010-7-4
Lab Code: K1006356-019
Extraction Method: SOC-OSWT
Analysis Method: Krone

Units: ug/Kg
Basis: Dry
Level: Low

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Tetra-n-butyltin	ND	U	2.5	1.1	1	06/22/10	07/08/10	KWG1006633	
Tri-n-butyltin Cation	14		2.5	1.1	1	06/22/10	07/08/10	KWG1006633	
Di-n-butyltin Cation	51		2.5	0.48	1	06/22/10	07/08/10	KWG1006633	
n-Butyltin Cation	29		2.5	0.65	1	06/22/10	07/08/10	KWG1006633	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Tri-n-propyltin	80	18-95	07/08/10	Acceptable

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Pacific EcoRisk Laboratories
Project: USACE San Rafael Channel/16087
Sample Matrix: Sediment

Service Request: K1006356
Date Collected: 06/10/2010
Date Received: 06/18/2010

Butyltins (as cation)

Sample Name: SRC-2010-7-5
Lab Code: K1006356-020
Extraction Method: SOC-OSWT
Analysis Method: Krone

Units: ug/Kg
Basis: Dry
Level: Low

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Tetra-n-butyltin	ND	U	2.3	1.1	1	06/22/10	07/08/10	KWG1006633	
Tri-n-butyltin Cation	17		2.3	0.98	1	06/22/10	07/08/10	KWG1006633	
Di-n-butyltin Cation	63		2.3	0.44	1	06/22/10	07/08/10	KWG1006633	
n-Butyltin Cation	27		2.3	0.60	1	06/22/10	07/08/10	KWG1006633	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Tri-n-propyltin	86	18-95	07/08/10	Acceptable

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Pacific EcoRisk Laboratories
Project: USACE San Rafael Channel/16087
Sample Matrix: Sediment

Service Request: K1006356
Date Collected: 06/10/2010
Date Received: 06/23/2010

Butyltins (as cation)

Sample Name: SRC-2010-8-Z-Comp
Lab Code: K1006356-021
Extraction Method: SOC-OSWT
Analysis Method: Krone

Units: ug/Kg
Basis: Dry
Level: Low

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Tetra-n-butyltin	1.3	J	2.3	0.99	1	06/24/10	07/14/10	KWG1006888	
Tri-n-butyltin Cation	11		2.3	0.97	1	06/24/10	07/14/10	KWG1006888	
Di-n-butyltin Cation	25		2.3	0.43	1	06/24/10	07/14/10	KWG1006888	
n-Butyltin Cation	27		2.3	0.59	1	06/24/10	07/14/10	KWG1006888	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Tri-n-propyltin	83	18-95	07/14/10	Acceptable

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Pacific EcoRisk Laboratories
Project: USACE San Rafael Channel/16087
Sample Matrix: Sediment

Service Request: K1006356
Date Collected: NA
Date Received: NA

Butyltins (as cation)

Sample Name: Method Blank
Lab Code: KWG1006633-4
Extraction Method: SOC-OSWT
Analysis Method: Krone

Units: ug/Kg
Basis: Dry
Level: Low

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Tetra-n-butyltin	ND	U	0.97	0.44	1	06/22/10	07/07/10	KWG1006633	
Tri-n-butyltin Cation	ND	U	0.97	0.43	1	06/22/10	07/07/10	KWG1006633	
Di-n-butyltin Cation	ND	U	0.97	0.19	1	06/22/10	07/07/10	KWG1006633	
n-Butyltin Cation	ND	U	0.97	0.26	1	06/22/10	07/07/10	KWG1006633	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Tri-n-propyltin	67	18-95	07/07/10	Acceptable

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Pacific EcoRisk Laboratories
Project: USACE San Rafael Channel/16087
Sample Matrix: Sediment

Service Request: K1006356
Date Collected: NA
Date Received: NA

Butyltins (as cation)

Sample Name: Method Blank
Lab Code: KWG1006888-4
Extraction Method: SOC-OSWT
Analysis Method: Krone

Units: ug/Kg
Basis: Dry
Level: Low

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Tetra-n-butyltin	ND	U	0.97	0.44	1	06/24/10	07/14/10	KWG1006888	
Tri-n-butyltin Cation	ND	U	0.97	0.43	1	06/24/10	07/14/10	KWG1006888	
Di-n-butyltin Cation	ND	U	0.97	0.19	1	06/24/10	07/14/10	KWG1006888	
n-Butyltin Cation	ND	U	0.97	0.26	1	06/24/10	07/14/10	KWG1006888	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Tri-n-propyltin	89	18-95	07/14/10	Acceptable

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Pacific EcoRisk Laboratories
Project: USACE San Rafael Channel/16087
Sample Matrix: Sediment

Service Request: K1006356

Surrogate Recovery Summary
Butyltins (as cation)

Extraction Method: SOC-OSWT
Analysis Method: Krone

Units: PERCENT
Level: Low

<u>Sample Name</u>	<u>Lab Code</u>	<u>Sur1</u>
SRC-2010-8-Z-Comp	K1006356-021	83
Method Blank	KWG1006633-4	67
Method Blank	KWG1006888-4	89
Batch QC	K1006486-001	60
SRC-2010-2-B-CompMS	KWG1006633-1	71
SRC-2010-2-B-CompDMS	KWG1006633-2	73
Batch QCMS	KWG1006888-1	95
Batch QCDMS	KWG1006888-2	70
Lab Control Sample	KWG1006633-3	62
Lab Control Sample	KWG1006888-3	76
SRC-2010-1-Comp	K1006356-001	57
SRC-2010-2-Comp	K1006356-002	50
SRC-2010-3-Comp	K1006356-003	66
SRC-2010-4-Comp	K1006356-004	64
SRC-2010-5-Comp	K1006356-005	71
SRC-2010-6-Comp	K1006356-006	77
SRC-2010-7-Comp	K1006356-007	69
SRC-2010-7-Z-Comp	K1006356-008	63
SRC-2010-1-B-Comp	K1006356-009	73
SRC-2010-2-B-Comp	K1006356-010	66
SRC-2010-3-B-Comp	K1006356-011	69
SRC-2010-4-B-Comp	K1006356-012	63
SRC-2010-5-B-Comp	K1006356-013	72
SRC-2010-6-B-Comp	K1006356-014	70
SRC-2010-7-B-Comp	K1006356-015	79
SRC-2010-7-1	K1006356-016	76
SRC-2010-7-2	K1006356-017	84
SRC-2010-7-3	K1006356-018	74
SRC-2010-7-4	K1006356-019	80
SRC-2010-7-5	K1006356-020	86

Surrogate Recovery Control Limits (%)

Sur1 = Tri-n-propyltin 18-95

Results flagged with an asterisk (*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Pacific EcoRisk Laboratories
Project: USACE San Rafael Channel/16087
Sample Matrix: Sediment

Service Request: K1006356
Date Extracted: 06/22/2010
Date Analyzed: 07/07/2010 -
07/08/2010

Matrix Spike/Duplicate Matrix Spike Summary
Butyltins (as cation)

Sample Name: SRC-2010-2-B-Comp
Lab Code: K1006356-010
Extraction Method: SOC-OSWT
Analysis Method: Krone

Units: ug/Kg
Basis: Dry
Level: Low
Extraction Lot: KWG1006633

Analyte Name	Sample Result	SRC-2010-2-B-CompMS KWG1006633-1 Matrix Spike			SRC-2010-2-B-CompDMS KWG1006633-2 Duplicate Matrix Spike			%Rec Limits	RPD	RPD Limit
		Result	Expected	%Rec	Result	Expected	%Rec			
Tetra-n-butyltin	ND	36.9	48.0	77	33.9	48.0	71	10-120	8	40
Tri-n-butyltin Cation	1.3	26.4	42.6	59	25.6	42.6	57	10-118	3	40
Di-n-butyltin Cation	1.8	33.9	36.9	87	34.7	36.9	89	10-145	2	40
n-Butyltin Cation	2.2	26.9	30.0	83	22.3	29.9	67	10-126	19	40

Results flagged with an asterisk (*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Pacific EcoRisk Laboratories
Project: USACE San Rafael Channel/16087
Sample Matrix: Sediment

Service Request: K1006356
Date Extracted: 06/24/2010
Date Analyzed: 07/14/2010

Matrix Spike/Duplicate Matrix Spike Summary
Butyltins (as cation)

Sample Name: Batch QC
Lab Code: K1006486-001
Extraction Method: SOC-OSWT
Analysis Method: Krone

Units: ug/Kg
Basis: Dry
Level: Low
Extraction Lot: KWG1006888

Analyte Name	Sample Result	Batch QCMS KWG1006888-1 Matrix Spike			Batch QCDMS KWG1006888-2 Duplicate Matrix Spike			%Rec Limits	RPD	RPD Limit
		Result	Expected	%Rec	Result	Expected	%Rec			
Tetra-n-butyltin	ND	57.0	56.7	101	44.6	56.4	79	10-120	24	40
Tri-n-butyltin Cation	3.3	44.9	50.3	83	34.3	50.1	62	10-118	27	40
Di-n-butyltin Cation	3.6	40.6	43.5	85	29.4	43.3	60	10-145	32	40
n-Butyltin Cation	9.4	52.8	35.4	123	47.6	35.2	109	10-126	10	40

Results flagged with an asterisk (*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Pacific EcoRisk Laboratories
Project: USACE San Rafael Channel/16087
Sample Matrix: Sediment

Service Request: K1006356
Date Extracted: 06/22/2010
Date Analyzed: 07/07/2010

Lab Control Spike Summary
Butyltins (as cation)

Extraction Method: SOC-OSWT
Analysis Method: Krone

Units: ug/Kg
Basis: Dry
Level: Low
Extraction Lot: KWG1006633

Lab Control Sample
KWG1006633-3
Lab Control Spike

Analyte Name	Result	Expected	%Rec	%Rec Limits
Tetra-n-butyltin	17.7	25.0	71	30-110
Tri-n-butyltin Cation	15.9	22.2	72	25-101
Di-n-butyltin Cation	18.1	19.2	95	35-108
n-Butyltin Cation	12.0	15.6	77	20-123

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Pacific EcoRisk Laboratories
Project: USACE San Rafael Channel/16087
Sample Matrix: Sediment

Service Request: K1006356
Date Extracted: 06/24/2010
Date Analyzed: 07/14/2010

Lab Control Spike Summary
Butyltins (as cation)

Extraction Method: SOC-OSWT
Analysis Method: Krone

Units: ug/Kg
Basis: Dry
Level: Low
Extraction Lot: KWG1006888

Lab Control Sample
KWG1006888-3
Lab Control Spike

Analyte Name	Result	Expected	%Rec	%Rec Limits
Tetra-n-butyltin	19.1	25.0	76	30-110
Tri-n-butyltin Cation	20.1	22.2	91	25-101
Di-n-butyltin Cation	12.6	19.2	66	35-108
n-Butyltin Cation	18.5	15.6	119	20-123

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

Gasoline Range Organics

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Pacific EcoRisk Laboratories
Project: USACE San Rafael Channel/16087
Sample Matrix: Sediment

Service Request: K1006356
Date Collected: 06/08/2010
Date Received: 06/18/2010

Gasoline Range Organics

Sample Name: SRC-2010-1-Comp
Lab Code: K1006356-001
Extraction Method: EPA 5035A/5030B
Analysis Method: 8015B

Units: mg/Kg
Basis: Dry
Level: Med

Analyte Name	Result Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Gasoline Range Organics (GRO)	ND U	15	3.8	1	06/21/10	06/21/10	KWG1006065	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
4-Bromofluorobenzene	106	83-119	06/21/10	Acceptable

Comments: _____

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Pacific EcoRisk Laboratories
Project: USACE San Rafael Channel/16087
Sample Matrix: Sediment

Service Request: K1006356
Date Collected: 06/09/2010
Date Received: 06/18/2010

Gasoline Range Organics

Sample Name: SRC-2010-2-Comp
Lab Code: K1006356-002
Extraction Method: EPA 5035A/5030B
Analysis Method: 8015B

Units: mg/Kg
Basis: Dry
Level: Med

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Gasoline Range Organics (GRO)	ND	U	14	3.6	1	06/21/10	06/21/10	KWG1006065	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
4-Bromofluorobenzene	114	83-119	06/21/10	Acceptable

Comments: _____

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Pacific EcoRisk Laboratories
Project: USACE San Rafael Channel/16087
Sample Matrix: Sediment

Service Request: K1006356
Date Collected: 06/09/2010
Date Received: 06/18/2010

Gasoline Range Organics

Sample Name: SRC-2010-3-Comp
Lab Code: K1006356-003
Extraction Method: EPA 5035A/5030B
Analysis Method: 8015B

Units: mg/Kg
Basis: Dry
Level: Med

Analyte Name	Result Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Gasoline Range Organics (GRO)	ND U	13	3.4	1	06/21/10	06/21/10	KWG1006065	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
4-Bromofluorobenzene	112	83-119	06/21/10	Acceptable

Comments: _____

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Pacific EcoRisk Laboratories
Project: USACE San Rafael Channel/16087
Sample Matrix: Sediment

Service Request: K1006356
Date Collected: 06/11/2010
Date Received: 06/18/2010

Gasoline Range Organics

Sample Name: SRC-2010-4-Comp
Lab Code: K1006356-004
Extraction Method: EPA 5035A/5030B
Analysis Method: 8015B

Units: mg/Kg
Basis: Dry
Level: Med

Analyte Name	Result Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Gasoline Range Organics (GRO)	ND U	14	3.5	1	06/21/10	06/21/10	KWG1006065	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
4-Bromofluorobenzene	118	83-119	06/21/10	Acceptable

Comments: _____

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Pacific EcoRisk Laboratories
Project: USACE San Rafael Channel/16087
Sample Matrix: Sediment

Service Request: K1006356
Date Collected: 06/08/2010
Date Received: 06/18/2010

Gasoline Range Organics

Sample Name: SRC-2010-5-Comp
Lab Code: K1006356-005
Extraction Method: EPA 5035A/5030B
Analysis Method: 8015B

Units: mg/Kg
Basis: Dry
Level: Med

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Gasoline Range Organics (GRO)	ND	U	15	3.7	1	06/21/10	06/21/10	KWG1006065	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
4-Bromofluorobenzene	109	83-119	06/21/10	Acceptable

Comments: _____

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Pacific EcoRisk Laboratories
Project: USACE San Rafael Channel/16087
Sample Matrix: Sediment

Service Request: K1006356
Date Collected: 06/09/2010
Date Received: 06/18/2010

Gasoline Range Organics

Sample Name: SRC-2010-6-Comp
Lab Code: K1006356-006
Extraction Method: EPA 5035A/5030B
Analysis Method: 8015B

Units: mg/Kg
Basis: Dry
Level: Med

Analyte Name	Result Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Gasoline Range Organics (GRO)	ND U	16	4.1	1	06/21/10	06/21/10	KWG1006065	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
4-Bromofluorobenzene	107	83-119	06/21/10	Acceptable

Comments: _____

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Pacific EcoRisk Laboratories
Project: USACE San Rafael Channel/16087
Sample Matrix: Sediment

Service Request: K1006356
Date Collected: 06/10/2010
Date Received: 06/18/2010

Gasoline Range Organics

Sample Name: SRC-2010-7-Comp
Lab Code: K1006356-007
Extraction Method: EPA 5035A/5030B
Analysis Method: 8015B

Units: mg/Kg
Basis: Dry
Level: Med

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Gasoline Range Organics (GRO)	5.0	J	16	4.0	1	06/21/10	06/21/10	KWG1006065	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
4-Bromofluorobenzene	108	83-119	06/21/10	Acceptable

Comments: _____

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Pacific EcoRisk Laboratories
Project: USACE San Rafael Channel/16087
Sample Matrix: Sediment

Service Request: K1006356
Date Collected: 06/10/2010
Date Received: 06/18/2010

Gasoline Range Organics

Sample Name: SRC-2010-7-Z-Comp
Lab Code: K1006356-008
Extraction Method: EPA 5035A/5030B
Analysis Method: 8015B

Units: mg/Kg
Basis: Dry
Level: Med

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Gasoline Range Organics (GRO)	7.1	J	13	3.4	1	06/21/10	06/21/10	KWG1006065	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
4-Bromofluorobenzene	111	83-119	06/21/10	Acceptable

Comments: _____

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Pacific EcoRisk Laboratories
Project: USACE San Rafael Channel/16087
Sample Matrix: Sediment

Service Request: K1006356
Date Collected: 06/10/2010
Date Received: 06/18/2010

Gasoline Range Organics

Sample Name: SRC-2010-7-1
Lab Code: K1006356-016

Units: mg/Kg
Basis: Dry

Extraction Method: EPA 5035A/5030B
Analysis Method: 8015B

Level: Med

Analyte Name	Result Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Gasoline Range Organics (GRO)	ND U	17	4.3	1	06/21/10	06/22/10	KWG1006065	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
4-Bromofluorobenzene	101	83-119	06/22/10	Acceptable

Comments: _____

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Pacific EcoRisk Laboratories
Project: USACE San Rafael Channel/16087
Sample Matrix: Sediment

Service Request: K1006356
Date Collected: 06/10/2010
Date Received: 06/18/2010

Gasoline Range Organics

Sample Name: SRC-2010-7-2
Lab Code: K1006356-017
Extraction Method: EPA 5035A/5030B
Analysis Method: 8015B

Units: mg/Kg
Basis: Dry
Level: Med

Analyte Name	Result Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Gasoline Range Organics (GRO)	ND U	15	3.9	1	06/21/10	06/22/10	KWG1006065	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
4-Bromofluorobenzene	114	83-119	06/22/10	Acceptable

Comments: _____

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Pacific EcoRisk Laboratories
Project: USACE San Rafael Channel/16087
Sample Matrix: Sediment

Service Request: K1006356
Date Collected: 06/10/2010
Date Received: 06/18/2010

Gasoline Range Organics

Sample Name: SRC-2010-7-3
Lab Code: K1006356-018
Extraction Method: EPA 5035A/5030B
Analysis Method: 8015B

Units: mg/Kg
Basis: Dry
Level: Med

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Gasoline Range Organics (GRO)	ND	U	16	4.1	1	06/21/10	06/22/10	KWG1006065	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
4-Bromofluorobenzene	110	83-119	06/22/10	Acceptable

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Pacific EcoRisk Laboratories
Project: USACE San Rafael Channel/16087
Sample Matrix: Sediment

Service Request: K1006356
Date Collected: 06/10/2010
Date Received: 06/18/2010

Gasoline Range Organics

Sample Name: SRC-2010-7-4
Lab Code: K1006356-019
Extraction Method: EPA 5035A/5030B
Analysis Method: 8015B

Units: mg/Kg
Basis: Dry
Level: Med

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Gasoline Range Organics (GRO)	ND	U	17	4.3	1	06/21/10	06/22/10	KWG1006065	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
4-Bromofluorobenzene	99	83-119	06/22/10	Acceptable

Comments: _____

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Pacific EcoRisk Laboratories
Project: USACE San Rafael Channel/16087
Sample Matrix: Sediment

Service Request: K1006356
Date Collected: 06/10/2010
Date Received: 06/18/2010

Gasoline Range Organics

Sample Name: SRC-2010-7-5
Lab Code: K1006356-020

Units: mg/Kg

Basis: Dry

Extraction Method: EPA 5035A/5030B

Level: Med

Analysis Method: 8015B

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Gasoline Range Organics (GRO)	6.4	J	15	3.8	1	06/21/10	06/22/10	KWG1006065	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
4-Bromofluorobenzene	109	83-119	06/22/10	Acceptable

Comments: _____

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Pacific EcoRisk Laboratories
Project: USACE San Rafael Channel/16087
Sample Matrix: Sediment

Service Request: K1006356
Date Collected: 06/10/2010
Date Received: 06/23/2010

Gasoline Range Organics

Sample Name: SRC-2010-8-Z-Comp
Lab Code: K1006356-021
Extraction Method: EPA 5035A/5030B
Analysis Method: 8015B

Units: mg/Kg
Basis: Dry
Level: Med

Analyte Name	Result Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Gasoline Range Organics (GRO)	4.9 J	15	3.8	1	06/23/10	06/23/10	KWG1006137	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
4-Bromofluorobenzene	103	83-119	06/23/10	Acceptable

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Pacific EcoRisk Laboratories
Project: USACE San Rafael Channel/16087
Sample Matrix: Sediment

Service Request: K1006356
Date Collected: NA
Date Received: NA

Gasoline Range Organics

Sample Name: Method Blank
Lab Code: KWG1006065-4
Extraction Method: EPA 5035A/5030B
Analysis Method: 8015B

Units: mg/Kg
Basis: Dry
Level: Med

Analyte Name	Result Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Gasoline Range Organics (GRO)	1.5 J	5.0	1.3	1	06/21/10	06/21/10	KWG1006065	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
4-Bromofluorobenzene	99	83-119	06/21/10	Acceptable

Comments: _____

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Pacific EcoRisk Laboratories
Project: USACE San Rafael Channel/16087
Sample Matrix: Sediment

Service Request: K1006356
Date Collected: NA
Date Received: NA

Gasoline Range Organics

Sample Name: Method Blank
Lab Code: KWG1006137-4
Extraction Method: EPA 5035A/5030B
Analysis Method: 8015B

Units: mg/Kg
Basis: Dry
Level: Med

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Gasoline Range Organics (GRO)	1.5	J	5.0	1.3	1	06/23/10	06/23/10	KWG1006137	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
4-Bromofluorobenzene	92	83-119	06/23/10	Acceptable

Comments: _____

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Pacific EcoRisk Laboratories
Project: USACE San Rafael Channel/16087
Sample Matrix: Sediment

Service Request: K1006356

Surrogate Recovery Summary
Gasoline Range Organics

Extraction Method: EPA 5035A/5030B
Analysis Method: 8015B

Units: PERCENT
Level: Med

<u>Sample Name</u>	<u>Lab Code</u>	<u>Sur1</u>
Batch QCDMS	KWG1006137-2	96
Lab Control Sample	KWG1006065-3	99
Lab Control Sample	KWG1006137-3	94
SRC-2010-1-Comp	K1006356-001	106
SRC-2010-2-Comp	K1006356-002	114
SRC-2010-3-Comp	K1006356-003	112
SRC-2010-4-Comp	K1006356-004	118
SRC-2010-5-Comp	K1006356-005	109
SRC-2010-6-Comp	K1006356-006	107
SRC-2010-7-Comp	K1006356-007	108
SRC-2010-7-Z-Comp	K1006356-008	111
SRC-2010-7-1	K1006356-016	101
SRC-2010-7-2	K1006356-017	114
SRC-2010-7-3	K1006356-018	110
SRC-2010-7-4	K1006356-019	99
SRC-2010-7-5	K1006356-020	109
SRC-2010-8-Z-Comp	K1006356-021	103
Method Blank	KWG1006065-4	99
Method Blank	KWG1006137-4	92
Batch QC	K1006482-001	95
SRC-2010-7-5MS	KWG1006065-1	107
SRC-2010-7-5DMS	KWG1006065-2	107
Batch QCMS	KWG1006137-1	94

Surrogate Recovery Control Limits (%)

Sur1 = 4-Bromofluorobenzene 83-119

Results flagged with an asterisk (*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Pacific EcoRisk Laboratories
Project: USACE San Rafael Channel/16087
Sample Matrix: Sediment

Service Request: K1006356
Date Extracted: 06/21/2010
Date Analyzed: 06/22/2010

Matrix Spike/Duplicate Matrix Spike Summary
Gasoline Range Organics

Sample Name: SRC-2010-7-5
Lab Code: K1006356-020
Extraction Method: EPA 5035A/5030B
Analysis Method: 8015B

Units: mg/Kg
Basis: Dry
Level: Med
Extraction Lot: KWG1006065

Analyte Name	Sample Result	SRC-2010-7-5MS KWG1006065-1 Matrix Spike			SRC-2010-7-5DMS KWG1006065-2 Duplicate Matrix Spike			%Rec Limits	RPD	RPD Limit
		Result	Expected	%Rec	Result	Expected	%Rec			
Gasoline Range Organics (GRO)	6.4	135	145	89	136	144	90	68-112	1	40

Results flagged with an asterisk (*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Pacific EcoRisk Laboratories
Project: USACE San Rafael Channel/16087
Sample Matrix: Sediment

Service Request: K1006356
Date Extracted: 06/23/2010
Date Analyzed: 06/23/2010

Matrix Spike/Duplicate Matrix Spike Summary
Gasoline Range Organics

Sample Name: Batch QC
Lab Code: K1006482-001
Extraction Method: EPA 5035A/5030B
Analysis Method: 8015B

Units: mg/Kg
Basis: Dry
Level: Med
Extraction Lot: KWG1006137

Analyte Name	Sample Result	Batch QCMS KWG1006137-1 Matrix Spike			Batch QCDMS KWG1006137-2 Duplicate Matrix Spike			%Rec Limits	RPD	RPD Limit
		Result	Expected	%Rec	Result	Expected	%Rec			
Gasoline Range Organics (GRO)	ND	111	146	76	114	144	79	68-112	3	40

Results flagged with an asterisk (*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Pacific EcoRisk Laboratories
Project: USACE San Rafael Channel/16087
Sample Matrix: Sediment

Service Request: K1006356
Date Extracted: 06/21/2010
Date Analyzed: 06/21/2010

Lab Control Spike Summary
Gasoline Range Organics

Extraction Method: EPA 5035A/5030B
Analysis Method: 8015B

Units: mg/Kg
Basis: Dry
Level: Med
Extraction Lot: KWG1006065

Lab Control Sample KWG1006065-3 Lab Control Spike				
Analyte Name	Result	Expected	%Rec	%Rec Limits
Gasoline Range Organics (GRO)	46.0	50.0	92	76-123

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Pacific EcoRisk Laboratories
Project: USACE San Rafael Channel/16087
Sample Matrix: Sediment

Service Request: K1006356
Date Extracted: 06/23/2010
Date Analyzed: 06/23/2010

Lab Control Spike Summary
Gasoline Range Organics

Extraction Method: EPA 5035A/5030B
Analysis Method: 8015B

Units: mg/Kg
Basis: Dry
Level: Med
Extraction Lot: KWG1006137

Lab Control Sample KWG1006137-3 Lab Control Spike				
Analyte Name	Result	Expected	%Rec	%Rec Limits
Gasoline Range Organics (GRO)	48.1	50.0	96	76-123

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

Diesel & Residual Range Organics

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Pacific EcoRisk Laboratories
Project: USACE San Rafael Channel/16087
Sample Matrix: Sediment

Service Request: K1006356
Date Collected: 06/08/2010
Date Received: 06/18/2010

Diesel and Residual Range Organics

Sample Name: SRC-2010-1-Comp
Lab Code: K1006356-001
Extraction Method: EPA 3550B
Analysis Method: 8015B

Units: mg/Kg
Basis: Dry
Level: Low

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Diesel Range Organics (DRO)	35	J	56	3.6	1	06/22/10	06/26/10	KWG1006155	
Residual Range Organics (RRO)	110	O	56	6.5	1	06/22/10	06/26/10	KWG1006155	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
o-Terphenyl	82	51-126	06/26/10	Acceptable
n-Triacontane	81	50-150	06/26/10	Acceptable

Comments: _____

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Pacific EcoRisk Laboratories
Project: USACE San Rafael Channel/16087
Sample Matrix: Sediment

Service Request: K1006356
Date Collected: 06/09/2010
Date Received: 06/18/2010

Diesel and Residual Range Organics

Sample Name: SRC-2010-2-Comp
Lab Code: K1006356-002
Extraction Method: EPA 3550B
Analysis Method: 8015B

Units: mg/Kg
Basis: Dry
Level: Low

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Diesel Range Organics (DRO)	36	J	54	3.5	1	06/22/10	06/26/10	KWG1006155	
Residual Range Organics (RRO)	120	O	54	6.2	1	06/22/10	06/26/10	KWG1006155	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
o-Terphenyl	96	51-126	06/26/10	Acceptable
n-Triacontane	99	50-150	06/26/10	Acceptable

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Pacific EcoRisk Laboratories
Project: USACE San Rafael Channel/16087
Sample Matrix: Sediment

Service Request: K1006356
Date Collected: 06/09/2010
Date Received: 06/18/2010

Diesel and Residual Range Organics

Sample Name: SRC-2010-3-Comp
Lab Code: K1006356-003
Extraction Method: EPA 3550B
Analysis Method: 8015B

Units: mg/Kg
Basis: Dry
Level: Low

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Diesel Range Organics (DRO)	41	J	52	3.3	1	06/22/10	06/26/10	KWG1006155	
Residual Range Organics (RRO)	120	O	52	6.0	1	06/22/10	06/26/10	KWG1006155	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
o-Terphenyl	81	51-126	06/26/10	Acceptable
n-Triacontane	85	50-150	06/26/10	Acceptable

Comments: _____

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Pacific EcoRisk Laboratories
Project: USACE San Rafael Channel/16087
Sample Matrix: Sediment

Service Request: K1006356
Date Collected: 06/11/2010
Date Received: 06/18/2010

Diesel and Residual Range Organics

Sample Name: SRC-2010-4-Comp
Lab Code: K1006356-004
Extraction Method: EPA 3550B
Analysis Method: 8015B

Units: mg/Kg
Basis: Dry
Level: Low

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Diesel Range Organics (DRO)	53	H	53	3.4	1	06/22/10	06/26/10	KWG1006155	
Residual Range Organics (RRO)	170	O	53	6.2	1	06/22/10	06/26/10	KWG1006155	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
o-Terphenyl	98	51-126	06/26/10	Acceptable
n-Triacontane	106	50-150	06/26/10	Acceptable

Comments: _____

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Pacific EcoRisk Laboratories
Project: USACE San Rafael Channel/16087
Sample Matrix: Sediment

Service Request: K1006356
Date Collected: 06/08/2010
Date Received: 06/18/2010

Diesel and Residual Range Organics

Sample Name: SRC-2010-5-Comp
Lab Code: K1006356-005
Extraction Method: EPA 3550B
Analysis Method: 8015B

Units: mg/Kg
Basis: Dry
Level: Low

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Diesel Range Organics (DRO)	38	J	57	3.7	1	06/22/10	06/26/10	KWG1006155	
Residual Range Organics (RRO)	150	O	57	6.6	1	06/22/10	06/26/10	KWG1006155	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
o-Terphenyl	75	51-126	06/26/10	Acceptable
n-Triacontane	78	50-150	06/26/10	Acceptable

Comments: _____

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Pacific EcoRisk Laboratories
Project: USACE San Rafael Channel/16087
Sample Matrix: Sediment

Service Request: K1006356
Date Collected: 06/09/2010
Date Received: 06/18/2010

Diesel and Residual Range Organics

Sample Name: SRC-2010-6-Comp
Lab Code: K1006356-006
Extraction Method: EPA 3550B
Analysis Method: 8015B

Units: mg/Kg
Basis: Dry
Level: Low

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Diesel Range Organics (DRO)	75	H	61	4.0	1	06/22/10	06/28/10	KWG1006155	
Residual Range Organics (RRO)	280	O	61	7.1	1	06/22/10	06/28/10	KWG1006155	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
o-Terphenyl	96	51-126	06/28/10	Acceptable
n-Triacontane	94	50-150	06/28/10	Acceptable

Comments: _____

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Pacific EcoRisk Laboratories
Project: USACE San Rafael Channel/16087
Sample Matrix: Sediment

Service Request: K1006356
Date Collected: 06/10/2010
Date Received: 06/18/2010

Diesel and Residual Range Organics

Sample Name: SRC-2010-7-Comp
Lab Code: K1006356-007
Extraction Method: EPA 3550B
Analysis Method: 8015B

Units: mg/Kg
Basis: Dry
Level: Low

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Diesel Range Organics (DRO)	240	H	60	3.9	1	06/22/10	06/28/10	KWG1006155	
Residual Range Organics (RRO)	1000	O	60	6.9	1	06/22/10	06/28/10	KWG1006155	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
o-Terphenyl	104	51-126	06/28/10	Acceptable
n-Triacontane	104	50-150	06/28/10	Acceptable

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Pacific EcoRisk Laboratories
Project: USACE San Rafael Channel/16087
Sample Matrix: Sediment

Service Request: K1006356
Date Collected: 06/10/2010
Date Received: 06/18/2010

Diesel and Residual Range Organics

Sample Name: SRC-2010-7-Z-Comp
Lab Code: K1006356-008
Extraction Method: EPA 3550B
Analysis Method: 8015B

Units: mg/Kg
Basis: Dry
Level: Low

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Diesel Range Organics (DRO)	180	H	53	3.4	1	06/22/10	06/28/10	KWG1006155	
Residual Range Organics (RRO)	700	O	53	6.1	1	06/22/10	06/28/10	KWG1006155	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
o-Terphenyl	88	51-126	06/28/10	Acceptable
n-Triacontane	92	50-150	06/28/10	Acceptable

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Pacific EcoRisk Laboratories
Project: USACE San Rafael Channel/16087
Sample Matrix: Sediment

Service Request: K1006356
Date Collected: 06/10/2010
Date Received: 06/18/2010

Diesel and Residual Range Organics

Sample Name: SRC-2010-7-1
Lab Code: K1006356-016
Extraction Method: EPA 3550B
Analysis Method: 8015B

Units: mg/Kg
Basis: Dry
Level: Low

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Diesel Range Organics (DRO)	76	H	64	4.1	1	06/22/10	06/28/10	KWG1006155	
Residual Range Organics (RRO)	300	O	64	7.5	1	06/22/10	06/28/10	KWG1006155	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
o-Terphenyl	105	51-126	06/28/10	Acceptable
n-Triacontane	103	50-150	06/28/10	Acceptable

Comments: _____

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Pacific EcoRisk Laboratories
Project: USACE San Rafael Channel/16087
Sample Matrix: Sediment

Service Request: K1006356
Date Collected: 06/10/2010
Date Received: 06/18/2010

Diesel and Residual Range Organics

Sample Name: SRC-2010-7-2
Lab Code: K1006356-017
Extraction Method: EPA 3550B
Analysis Method: 8015B

Units: mg/Kg
Basis: Dry
Level: Low

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Diesel Range Organics (DRO)	130	H	60	3.9	1	06/22/10	06/28/10	KWG1006155	
Residual Range Organics (RRO)	400	O	60	7.0	1	06/22/10	06/28/10	KWG1006155	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
o-Terphenyl	102	51-126	06/28/10	Acceptable
n-Triacontane	101	50-150	06/28/10	Acceptable

Comments: _____

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Pacific EcoRisk Laboratories
Project: USACE San Rafael Channel/16087
Sample Matrix: Sediment

Service Request: K1006356
Date Collected: 06/10/2010
Date Received: 06/18/2010

Diesel and Residual Range Organics

Sample Name: SRC-2010-7-3
Lab Code: K1006356-018
Extraction Method: EPA 3550B
Analysis Method: 8015B

Units: mg/Kg
Basis: Dry
Level: Low

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Diesel Range Organics (DRO)	110	H	60	3.9	1	06/22/10	06/28/10	KWG1006155	
Residual Range Organics (RRO)	510	O	60	7.0	1	06/22/10	06/28/10	KWG1006155	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
o-Terphenyl	87	51-126	06/28/10	Acceptable
n-Triacontane	84	50-150	06/28/10	Acceptable

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Pacific EcoRisk Laboratories
Project: USACE San Rafael Channel/16087
Sample Matrix: Sediment

Service Request: K1006356
Date Collected: 06/10/2010
Date Received: 06/18/2010

Diesel and Residual Range Organics

Sample Name: SRC-2010-7-4
Lab Code: K1006356-019
Extraction Method: EPA 3550B
Analysis Method: 8015B

Units: mg/Kg
Basis: Dry
Level: Low

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Diesel Range Organics (DRO)	290	H	63	4.0	1	06/22/10	06/28/10	KWG1006155	
Residual Range Organics (RRO)	1300	O	63	7.3	1	06/22/10	06/28/10	KWG1006155	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
o-Terphenyl	105	51-126	06/28/10	Acceptable
n-Triacontane	111	50-150	06/28/10	Acceptable

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Pacific EcoRisk Laboratories
Project: USACE San Rafael Channel/16087
Sample Matrix: Sediment

Service Request: K1006356
Date Collected: 06/10/2010
Date Received: 06/18/2010

Diesel and Residual Range Organics

Sample Name: SRC-2010-7-5
Lab Code: K1006356-020
Extraction Method: EPA 3550B
Analysis Method: 8015B

Units: mg/Kg
Basis: Dry
Level: Low

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Diesel Range Organics (DRO)	550	H	58	3.7	1	06/22/10	06/28/10	KWG1006155	
Residual Range Organics (RRO)	2400	O	58	6.7	1	06/22/10	06/28/10	KWG1006155	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
o-Terphenyl	95	51-126	06/28/10	Acceptable
n-Triacontane	108	50-150	06/28/10	Acceptable

Comments: _____

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Pacific EcoRisk Laboratories
Project: USACE San Rafael Channel/16087
Sample Matrix: Sediment

Service Request: K1006356
Date Collected: 06/10/2010
Date Received: 06/23/2010

Diesel and Residual Range Organics

Sample Name: SRC-2010-8-Z-Comp
Lab Code: K1006356-021
Extraction Method: EPA 3550B
Analysis Method: 8015B

Units: mg/Kg
Basis: Dry
Level: Low

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Diesel Range Organics (DRO)	520	H	57	3.7	1	06/24/10	06/28/10	KWG1006188	
Residual Range Organics (RRO)	2100	O	57	6.6	1	06/24/10	06/28/10	KWG1006188	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
o-Terphenyl	102	51-126	06/28/10	Acceptable
n-Triacontane	114	50-150	06/28/10	Acceptable

Comments: _____

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Pacific EcoRisk Laboratories
Project: USACE San Rafael Channel/16087
Sample Matrix: Sediment

Service Request: K1006356
Date Collected: NA
Date Received: NA

Diesel and Residual Range Organics

Sample Name: Method Blank
Lab Code: KWG1006155-2
Extraction Method: EPA 3550B
Analysis Method: 8015B

Units: mg/Kg
Basis: Dry
Level: Low

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Diesel Range Organics (DRO)	ND	U	25	1.6	1	06/22/10	06/26/10	KWG1006155	
Residual Range Organics (RRO)	3.0	J	25	2.9	1	06/22/10	06/26/10	KWG1006155	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
o-Terphenyl	100	51-126	06/26/10	Acceptable
n-Triacontane	110	50-150	06/26/10	Acceptable

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Pacific EcoRisk Laboratories
Project: USACE San Rafael Channel/16087
Sample Matrix: Sediment

Service Request: K1006356
Date Collected: NA
Date Received: NA

Diesel and Residual Range Organics

Sample Name: Method Blank
Lab Code: KWG1006188-4
Extraction Method: EPA 3550B
Analysis Method: 8015B

Units: mg/Kg
Basis: Dry
Level: Low

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Diesel Range Organics (DRO)	ND	U	25	1.6	1	06/24/10	06/28/10	KWG1006188	
Residual Range Organics (RRO)	ND	U	25	2.9	1	06/24/10	06/28/10	KWG1006188	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
o-Terphenyl	93	51-126	06/28/10	Acceptable
n-Triacontane	86	50-150	06/28/10	Acceptable

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Pacific EcoRisk Laboratories
Project: USACE San Rafael Channel/16087
Sample Matrix: Sediment

Service Request: K1006356

Surrogate Recovery Summary
Diesel and Residual Range Organics

Extraction Method: EPA 3550B
Analysis Method: 8015B

Units: PERCENT
Level: Low

<u>Sample Name</u>	<u>Lab Code</u>	<u>Sur1</u>	<u>Sur2</u>
SRC-2010-2-CompDMS	KWG1006155-4	99	92
Batch QCMS	KWG1006188-1	99	101
Batch QCDMS	KWG1006188-2	97	95
Lab Control Sample	KWG1006155-1	106	104
Lab Control Sample	KWG1006188-3	102	94
SRC-2010-1-Comp	K1006356-001	82	81
SRC-2010-2-Comp	K1006356-002	96	99
SRC-2010-3-Comp	K1006356-003	81	85
SRC-2010-4-Comp	K1006356-004	98	106
SRC-2010-5-Comp	K1006356-005	75	78
SRC-2010-6-Comp	K1006356-006	96	94
SRC-2010-7-Comp	K1006356-007	104	104
SRC-2010-7-Z-Comp	K1006356-008	88	92
SRC-2010-7-1	K1006356-016	105	103
SRC-2010-7-2	K1006356-017	102	101
SRC-2010-7-3	K1006356-018	87	84
SRC-2010-7-4	K1006356-019	105	111
SRC-2010-7-5	K1006356-020	95	108
SRC-2010-8-Z-Comp	K1006356-021	102	114
Method Blank	KWG1006155-2	100	110
Method Blank	KWG1006188-4	93	86
Batch QC	K1006482-001	104	107
SRC-2010-2-CompMS	KWG1006155-3	81	78

Surrogate Recovery Control Limits (%)

Sur1 = o-Terphenyl	51-126
Sur2 = n-Triacontane	50-150

Results flagged with an asterisk (*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Pacific EcoRisk Laboratories
Project: USACE San Rafael Channel/16087
Sample Matrix: Sediment

Service Request: K1006356
Date Extracted: 06/22/2010
Date Analyzed: 06/26/2010

Matrix Spike/Duplicate Matrix Spike Summary
Diesel and Residual Range Organics

Sample Name: SRC-2010-2-Comp
Lab Code: K1006356-002
Extraction Method: EPA 3550B
Analysis Method: 8015B

Units: mg/Kg
Basis: Dry
Level: Low
Extraction Lot: KWG1006155

Analyte Name	Sample Result	SRC-2010-2-CompMS KWG1006155-3 Matrix Spike			SRC-2010-2-CompDMS KWG1006155-4 Duplicate Matrix Spike			%Rec Limits	RPD	RPD Limit
		Result	Expected	%Rec	Result	Expected	%Rec			
Diesel Range Organics (DRO)	36	522	566	86	640	567	107	43-146	20	40
Residual Range Organics (RRO)	120	312	283	69	375	284	91	29-167	18	40

Results flagged with an asterisk (*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Pacific EcoRisk Laboratories
Project: USACE San Rafael Channel/16087
Sample Matrix: Sediment

Service Request: K1006356
Date Extracted: 06/24/2010
Date Analyzed: 06/28/2010

Matrix Spike/Duplicate Matrix Spike Summary
Diesel and Residual Range Organics

Sample Name: Batch QC
Lab Code: K1006482-001
Extraction Method: EPA 3550B
Analysis Method: 8015B

Units: mg/Kg
Basis: Dry
Level: Low
Extraction Lot: KWG1006188

Analyte Name	Sample Result	Batch QCMS KWG1006188-1 Matrix Spike			Batch QCDMS KWG1006188-2 Duplicate Matrix Spike			%Rec Limits	RPD	RPD Limit
		Result	Expected	%Rec	Result	Expected	%Rec			
Diesel Range Organics (DRO)	360	1000	621	103	995	623	102	43-146	1	40
Residual Range Organics (RRO)	1700	2040	311	117 #	2080	312	128 #	29-167	2	40

Results flagged with an asterisk (*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Pacific EcoRisk Laboratories
Project: USACE San Rafael Channel/16087
Sample Matrix: Sediment

Service Request: K1006356
Date Extracted: 06/22/2010
Date Analyzed: 06/26/2010

Lab Control Spike Summary
Diesel and Residual Range Organics

Extraction Method: EPA 3550B
Analysis Method: 8015B

Units: mg/Kg
Basis: Dry
Level: Low
Extraction Lot: KWG1006155

Analyte Name	Lab Control Sample KWG1006155-1 Lab Control Spike			%Rec Limits
	Result	Expected	%Rec	
Diesel Range Organics (DRO)	279	267	105	63-121
Residual Range Organics (RRO)	129	133	97	57-136

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Pacific EcoRisk Laboratories
Project: USACE San Rafael Channel/16087
Sample Matrix: Sediment

Service Request: K1006356
Date Extracted: 06/24/2010
Date Analyzed: 06/28/2010

Lab Control Spike Summary
Diesel and Residual Range Organics

Extraction Method: EPA 3550B
Analysis Method: 8015B

Units: mg/Kg
Basis: Dry
Level: Low
Extraction Lot: KWG1006188

Analyte Name	Lab Control Sample KWG1006188-3 Lab Control Spike			%Rec Limits
	Result	Expected	%Rec	
Diesel Range Organics (DRO)	284	267	107	63-121
Residual Range Organics (RRO)	121	133	91	57-136

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

Organochlorine Pesticides

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Pacific EcoRisk Laboratories
Project: USACE San Rafael Channel/16087
Sample Matrix: Sediment

Service Request: K1006356
Date Collected: 06/08/2010
Date Received: 06/18/2010

Organochlorine Pesticides

Sample Name: SRC-2010-1-Comp
Lab Code: K1006356-001
Extraction Method: EPA 3541
Analysis Method: 8081A

Units: ug/Kg
Basis: Dry
Level: Low

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
alpha-BHC	ND	U	1.2	0.13	1	06/22/10	06/29/10	KWG1006235	
alpha-Chlordane	ND	U	1.2	0.12	1	06/22/10	06/29/10	KWG1006235	
beta-BHC	ND	U	1.2	0.21	1	06/22/10	06/29/10	KWG1006235	
gamma-BHC (Lindane)	ND	U	1.2	0.090	1	06/22/10	06/29/10	KWG1006235	
delta-BHC	0.10	J	1.2	0.083	1	06/22/10	06/29/10	KWG1006235	
Heptachlor	ND	U	1.2	0.14	1	06/22/10	06/29/10	KWG1006235	
Aldrin	ND	U	1.2	0.18	1	06/22/10	06/29/10	KWG1006235	
gamma-Chlordane†	0.29	J	1.2	0.11	1	06/22/10	06/29/10	KWG1006235	
Heptachlor Epoxide	ND	U	1.2	0.095	1	06/22/10	06/29/10	KWG1006235	
Endosulfan I	ND	U	1.2	0.071	1	06/22/10	06/29/10	KWG1006235	
Dieldrin	ND	U	1.2	0.16	1	06/22/10	06/29/10	KWG1006235	
4,4'-DDE	2.0		1.2	0.13	1	06/22/10	06/29/10	KWG1006235	
Endrin	ND	U	1.2	0.11	1	06/22/10	06/29/10	KWG1006235	
Endosulfan II	ND	U	1.2	0.16	1	06/22/10	06/29/10	KWG1006235	
4,4'-DDD	1.1	J	1.2	0.13	1	06/22/10	06/29/10	KWG1006235	
Endrin Aldehyde	ND	U	1.2	0.14	1	06/22/10	06/29/10	KWG1006235	
Endosulfan Sulfate	ND	U	1.2	0.13	1	06/22/10	06/29/10	KWG1006235	
4,4'-DDT	ND	Ui	1.2	0.65	1	06/22/10	06/29/10	KWG1006235	
Toxaphene	ND	Ui	56	13	1	06/22/10	06/29/10	KWG1006235	
Chlordane	ND	Ui	12	3.4	1	06/22/10	06/29/10	KWG1006235	
2,4'-DDE	ND	U	1.2	0.18	1	06/22/10	06/29/10	KWG1006235	
2,4'-DDD	0.51	JP	1.2	0.15	1	06/22/10	06/29/10	KWG1006235	
2,4'-DDT	0.44	JP	1.2	0.065	1	06/22/10	06/29/10	KWG1006235	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Tetrachloro-m-xylene	66	21-112	06/29/10	Acceptable
Decachlorobiphenyl	83	15-130	06/29/10	Acceptable

Comments: _____

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Pacific EcoRisk Laboratories
Project: USACE San Rafael Channel/16087
Sample Matrix: Sediment

Service Request: K1006356
Date Collected: 06/08/2010
Date Received: 06/18/2010

Organochlorine Pesticides

Sample Name: SRC-2010-1-Comp
Lab Code: K1006356-001

Units: ug/Kg
Basis: Dry

† Analyte Comments

gamma-Chlordane

For this analyte (CAS Registry No. 5103-74-2), USEPA has corrected the name to be beta-Chlordane, also known as trans-Chlordane.

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Pacific EcoRisk Laboratories
Project: USACE San Rafael Channel/16087
Sample Matrix: Sediment

Service Request: K1006356
Date Collected: 06/09/2010
Date Received: 06/18/2010

Organochlorine Pesticides

Sample Name: SRC-2010-2-Comp
Lab Code: K1006356-002
Extraction Method: EPA 3541
Analysis Method: 8081A

Units: ug/Kg
Basis: Dry
Level: Low

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
alpha-BHC	ND	U	1.1	0.12	1	06/22/10	06/29/10	KWG1006235	
alpha-Chlordane	ND	U	1.1	0.11	1	06/22/10	06/29/10	KWG1006235	
beta-BHC	ND	U	1.1	0.20	1	06/22/10	06/29/10	KWG1006235	
gamma-BHC (Lindane)	ND	U	1.1	0.086	1	06/22/10	06/29/10	KWG1006235	
delta-BHC	ND	U	1.1	0.080	1	06/22/10	06/29/10	KWG1006235	
Heptachlor	ND	U	1.1	0.13	1	06/22/10	06/29/10	KWG1006235	
Aldrin	ND	U	1.1	0.18	1	06/22/10	06/29/10	KWG1006235	
gamma-Chlordane†	0.12	JP	1.1	0.097	1	06/22/10	06/29/10	KWG1006235	
Heptachlor Epoxide	ND	Ui	1.1	0.097	1	06/22/10	06/29/10	KWG1006235	
Endosulfan I	ND	U	1.1	0.068	1	06/22/10	06/29/10	KWG1006235	
Dieldrin	ND	U	1.1	0.15	1	06/22/10	06/29/10	KWG1006235	
4,4'-DDE	1.4		1.1	0.12	1	06/22/10	06/29/10	KWG1006235	
Endrin	ND	U	1.1	0.11	1	06/22/10	06/29/10	KWG1006235	
Endosulfan II	ND	U	1.1	0.15	1	06/22/10	06/29/10	KWG1006235	
4,4'-DDD	0.90	J	1.1	0.12	1	06/22/10	06/29/10	KWG1006235	
Endrin Aldehyde	ND	U	1.1	0.13	1	06/22/10	06/29/10	KWG1006235	
Endosulfan Sulfate	ND	U	1.1	0.12	1	06/22/10	06/29/10	KWG1006235	
4,4'-DDT	ND	Ui	1.1	0.46	1	06/22/10	06/29/10	KWG1006235	
Toxaphene	ND	Ui	54	7.3	1	06/22/10	06/29/10	KWG1006235	
Chlordane	ND	Ui	11	2.7	1	06/22/10	06/29/10	KWG1006235	
2,4'-DDE	ND	U	1.1	0.18	1	06/22/10	06/29/10	KWG1006235	
2,4'-DDD	0.55	J	1.1	0.14	1	06/22/10	06/29/10	KWG1006235	
2,4'-DDT	0.24	JP	1.1	0.063	1	06/22/10	06/29/10	KWG1006235	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Tetrachloro-m-xylene	64	21-112	06/29/10	Acceptable
Decachlorobiphenyl	73	15-130	06/29/10	Acceptable

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Pacific EcoRisk Laboratories
Project: USACE San Rafael Channel/16087
Sample Matrix: Sediment

Service Request: K1006356
Date Collected: 06/09/2010
Date Received: 06/18/2010

Organochlorine Pesticides

Sample Name: SRC-2010-2-Comp
Lab Code: K1006356-002

Units: ug/Kg
Basis: Dry

† Analyte Comments

gamma-Chlordane

For this analyte (CAS Registry No. 5103-74-2), USEPA has corrected the name to be beta-Chlordane, also known as trans-Chlordane.

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Pacific EcoRisk Laboratories
Project: USACE San Rafael Channel/16087
Sample Matrix: Sediment

Service Request: K1006356
Date Collected: 06/09/2010
Date Received: 06/18/2010

Organochlorine Pesticides

Sample Name: SRC-2010-3-Comp
Lab Code: K1006356-003
Extraction Method: EPA 3541
Analysis Method: 8081A

Units: ug/Kg
Basis: Dry
Level: Low

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
alpha-BHC	ND	U	1.1	0.12	1	06/22/10	06/29/10	KWG1006235	
alpha-Chlordane	ND	U	1.1	0.11	1	06/22/10	06/29/10	KWG1006235	
beta-BHC	ND	U	1.1	0.19	1	06/22/10	06/29/10	KWG1006235	
gamma-BHC (Lindane)	ND	U	1.1	0.083	1	06/22/10	06/29/10	KWG1006235	
delta-BHC	ND	U	1.1	0.077	1	06/22/10	06/29/10	KWG1006235	
Heptachlor	ND	Ui	1.1	0.15	1	06/22/10	06/29/10	KWG1006235	
Aldrin	ND	U	1.1	0.17	1	06/22/10	06/29/10	KWG1006235	
gamma-Chlordane†	ND	U	1.1	0.094	1	06/22/10	06/29/10	KWG1006235	
Heptachlor Epoxide	ND	U	1.1	0.087	1	06/22/10	06/29/10	KWG1006235	
Endosulfan I	ND	U	1.1	0.066	1	06/22/10	06/29/10	KWG1006235	
Dieldrin	ND	U	1.1	0.15	1	06/22/10	06/29/10	KWG1006235	
4,4'-DDE	1.0	J	1.1	0.12	1	06/22/10	06/29/10	KWG1006235	
Endrin	ND	U	1.1	0.098	1	06/22/10	06/29/10	KWG1006235	
Endosulfan II	ND	U	1.1	0.15	1	06/22/10	06/29/10	KWG1006235	
4,4'-DDD	0.51	J	1.1	0.12	1	06/22/10	06/29/10	KWG1006235	
Endrin Aldehyde	ND	U	1.1	0.13	1	06/22/10	06/29/10	KWG1006235	
Endosulfan Sulfate	ND	U	1.1	0.12	1	06/22/10	06/29/10	KWG1006235	
4,4'-DDT	ND	Ui	1.1	0.25	1	06/22/10	06/29/10	KWG1006235	
Toxaphene	ND	Ui	52	9.9	1	06/22/10	06/29/10	KWG1006235	
Chlordane	ND	Ui	11	2.5	1	06/22/10	06/29/10	KWG1006235	
2,4'-DDE	ND	U	1.1	0.17	1	06/22/10	06/29/10	KWG1006235	
2,4'-DDD	0.35	J	1.1	0.14	1	06/22/10	06/29/10	KWG1006235	
2,4'-DDT	0.21	JP	1.1	0.060	1	06/22/10	06/29/10	KWG1006235	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Tetrachloro-m-xylene	56	21-112	06/29/10	Acceptable
Decachlorobiphenyl	67	15-130	06/29/10	Acceptable

Comments: _____

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Pacific EcoRisk Laboratories
Project: USACE San Rafael Channel/16087
Sample Matrix: Sediment

Service Request: K1006356
Date Collected: 06/09/2010
Date Received: 06/18/2010

Organochlorine Pesticides

Sample Name: SRC-2010-3-Comp
Lab Code: K1006356-003

Units: ug/Kg
Basis: Dry

† Analyte Comments

gamma-Chlordane

For this analyte (CAS Registry No. 5103-74-2), USEPA has corrected the name to be beta-Chlordane, also known as trans-Chlordane.

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Pacific EcoRisk Laboratories
Project: USACE San Rafael Channel/16087
Sample Matrix: Sediment

Service Request: K1006356
Date Collected: 06/11/2010
Date Received: 06/18/2010

Organochlorine Pesticides

Sample Name: SRC-2010-4-Comp
Lab Code: K1006356-004
Extraction Method: EPA 3541
Analysis Method: 8081A

Units: ug/Kg
Basis: Dry
Level: Low

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
alpha-BHC	ND	U	1.1	0.12	1	06/22/10	06/29/10	KWG1006235	
alpha-Chlordane	ND	U	1.1	0.11	1	06/22/10	06/29/10	KWG1006235	
beta-BHC	ND	U	1.1	0.20	1	06/22/10	06/29/10	KWG1006235	
gamma-BHC (Lindane)	ND	U	1.1	0.085	1	06/22/10	06/29/10	KWG1006235	
delta-BHC	ND	U	1.1	0.079	1	06/22/10	06/29/10	KWG1006235	
Heptachlor	ND	U	1.1	0.13	1	06/22/10	06/29/10	KWG1006235	
Aldrin	ND	U	1.1	0.17	1	06/22/10	06/29/10	KWG1006235	
gamma-Chlordane†	0.24	JP	1.1	0.096	1	06/22/10	06/29/10	KWG1006235	
Heptachlor Epoxide	ND	U	1.1	0.089	1	06/22/10	06/29/10	KWG1006235	
Endosulfan I	ND	Ui	1.1	0.070	1	06/22/10	06/29/10	KWG1006235	
Dieldrin	ND	Ui	1.1	0.18	1	06/22/10	06/29/10	KWG1006235	
4,4'-DDE	0.96	J	1.1	0.12	1	06/22/10	06/29/10	KWG1006235	
Endrin	ND	U	1.1	0.10	1	06/22/10	06/29/10	KWG1006235	
Endosulfan II	ND	U	1.1	0.15	1	06/22/10	06/29/10	KWG1006235	
4,4'-DDD	0.60	J	1.1	0.12	1	06/22/10	06/29/10	KWG1006235	
Endrin Aldehyde	ND	U	1.1	0.13	1	06/22/10	06/29/10	KWG1006235	
Endosulfan Sulfate	ND	U	1.1	0.12	1	06/22/10	06/29/10	KWG1006235	
4,4'-DDT	ND	Ui	1.1	0.20	1	06/22/10	06/29/10	KWG1006235	
Toxaphene	ND	Ui	53	9.4	1	06/22/10	06/29/10	KWG1006235	
Chlordane	ND	U	11	2.1	1	06/22/10	06/29/10	KWG1006235	
2,4'-DDE	ND	U	1.1	0.17	1	06/22/10	06/29/10	KWG1006235	
2,4'-DDD	0.17	JP	1.1	0.14	1	06/22/10	06/29/10	KWG1006235	
2,4'-DDT	0.22	JP	1.1	0.062	1	06/22/10	06/29/10	KWG1006235	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Tetrachloro-m-xylene	63	21-112	06/29/10	Acceptable
Decachlorobiphenyl	77	15-130	06/29/10	Acceptable

Comments: _____

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Pacific EcoRisk Laboratories
Project: USACE San Rafael Channel/16087
Sample Matrix: Sediment

Service Request: K1006356
Date Collected: 06/11/2010
Date Received: 06/18/2010

Organochlorine Pesticides

Sample Name: SRC-2010-4-Comp
Lab Code: K1006356-004

Units: ug/Kg
Basis: Dry

† Analyte Comments

gamma-Chlordane

For this analyte (CAS Registry No. 5103-74-2), USEPA has corrected the name to be beta-Chlordane, also known as trans-Chlordane.

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Pacific EcoRisk Laboratories
Project: USACE San Rafael Channel/16087
Sample Matrix: Sediment

Service Request: K1006356
Date Collected: 06/08/2010
Date Received: 06/18/2010

Organochlorine Pesticides

Sample Name: SRC-2010-5-Comp
Lab Code: K1006356-005
Extraction Method: EPA 3541
Analysis Method: 8081A

Units: ug/Kg
Basis: Dry
Level: Low

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
alpha-BHC	ND	U	1.2	0.13	1	06/22/10	06/29/10	KWG1006235	
alpha-Chlordane	0.26	JP	1.2	0.12	1	06/22/10	06/29/10	KWG1006235	
beta-BHC	ND	U	1.2	0.21	1	06/22/10	06/29/10	KWG1006235	
gamma-BHC (Lindane)	ND	Ui	1.2	1.2	1	06/22/10	06/29/10	KWG1006235	
delta-BHC	ND	U	1.2	0.084	1	06/22/10	06/29/10	KWG1006235	
Heptachlor	ND	U	1.2	0.14	1	06/22/10	06/29/10	KWG1006235	
Aldrin	ND	U	1.2	0.19	1	06/22/10	06/29/10	KWG1006235	
gamma-Chlordane†	0.43	J	1.2	0.11	1	06/22/10	06/29/10	KWG1006235	
Heptachlor Epoxide	ND	U	1.2	0.095	1	06/22/10	06/29/10	KWG1006235	
Endosulfan I	ND	U	1.2	0.072	1	06/22/10	06/29/10	KWG1006235	
Dieldrin	ND	U	1.2	0.16	1	06/22/10	06/29/10	KWG1006235	
4,4'-DDE	1.3		1.2	0.13	1	06/22/10	06/29/10	KWG1006235	
Endrin	ND	U	1.2	0.11	1	06/22/10	06/29/10	KWG1006235	
Endosulfan II	ND	U	1.2	0.16	1	06/22/10	06/29/10	KWG1006235	
4,4'-DDD	0.86	J	1.2	0.13	1	06/22/10	06/29/10	KWG1006235	
Endrin Aldehyde	ND	U	1.2	0.14	1	06/22/10	06/29/10	KWG1006235	
Endosulfan Sulfate	ND	U	1.2	0.13	1	06/22/10	06/29/10	KWG1006235	
4,4'-DDT	ND	Ui	1.2	1.2	1	06/22/10	06/29/10	KWG1006235	
Toxaphene	ND	Ui	57	18	1	06/22/10	06/29/10	KWG1006235	
Chlordane	3.5	JP	12	2.2	1	06/22/10	06/29/10	KWG1006235	
2,4'-DDE	ND	U	1.2	0.19	1	06/22/10	06/29/10	KWG1006235	
2,4'-DDD	0.25	JP	1.2	0.15	1	06/22/10	06/29/10	KWG1006235	
2,4'-DDT	0.40	JP	1.2	0.066	1	06/22/10	06/29/10	KWG1006235	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Tetrachloro-m-xylene	60	21-112	06/29/10	Acceptable
Decachlorobiphenyl	77	15-130	06/29/10	Acceptable

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Pacific EcoRisk Laboratories
Project: USACE San Rafael Channel/16087
Sample Matrix: Sediment

Service Request: K1006356
Date Collected: 06/08/2010
Date Received: 06/18/2010

Organochlorine Pesticides

Sample Name: SRC-2010-5-Comp
Lab Code: K1006356-005

Units: ug/Kg
Basis: Dry

† Analyte Comments

gamma-Chlordane

For this analyte (CAS Registry No. 5103-74-2), USEPA has corrected the name to be beta-Chlordane, also known as trans-Chlordane.

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Pacific EcoRisk Laboratories
Project: USACE San Rafael Channel/16087
Sample Matrix: Sediment

Service Request: K1006356
Date Collected: 06/09/2010
Date Received: 06/18/2010

Organochlorine Pesticides

Sample Name: SRC-2010-6-Comp
Lab Code: K1006356-006
Extraction Method: EPA 3541
Analysis Method: 8081A

Units: ug/Kg
Basis: Dry
Level: Low

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
alpha-BHC	ND	U	1.3	0.14	1	06/22/10	06/29/10	KWG1006235	
alpha-Chlordane	0.53	JP	1.3	0.13	1	06/22/10	06/29/10	KWG1006235	
beta-BHC	ND	U	1.3	0.22	1	06/22/10	06/29/10	KWG1006235	
gamma-BHC (Lindane)	ND	U	1.3	0.098	1	06/22/10	06/29/10	KWG1006235	
delta-BHC	ND	U	1.3	0.091	1	06/22/10	06/29/10	KWG1006235	
Heptachlor	ND	U	1.3	0.15	1	06/22/10	06/29/10	KWG1006235	
Aldrin	ND	U	1.3	0.20	1	06/22/10	06/29/10	KWG1006235	
gamma-Chlordane†	1.1	J	1.3	0.11	1	06/22/10	06/29/10	KWG1006235	
Heptachlor Epoxide	ND	Ui	1.3	0.24	1	06/22/10	06/29/10	KWG1006235	
Endosulfan I	ND	Ui	1.3	0.080	1	06/22/10	06/29/10	KWG1006235	
Dieldrin	ND	U	1.3	0.18	1	06/22/10	06/29/10	KWG1006235	
4,4'-DDE	2.0		1.3	0.14	1	06/22/10	06/29/10	KWG1006235	
Endrin	ND	U	1.3	0.12	1	06/22/10	06/29/10	KWG1006235	
Endosulfan II	ND	U	1.3	0.18	1	06/22/10	06/29/10	KWG1006235	
4,4'-DDD	1.2	J	1.3	0.14	1	06/22/10	06/29/10	KWG1006235	
Endrin Aldehyde	ND	U	1.3	0.15	1	06/22/10	06/29/10	KWG1006235	
Endosulfan Sulfate	ND	U	1.3	0.14	1	06/22/10	06/29/10	KWG1006235	
4,4'-DDT	ND	Ui	1.3	1.3	1	06/22/10	06/29/10	KWG1006235	
Toxaphene	ND	Ui	62	15	1	06/22/10	06/29/10	KWG1006235	
Chlordane	9.1	J	13	2.4	1	06/22/10	06/29/10	KWG1006235	
2,4'-DDE	ND	Ui	1.3	1.3	1	06/22/10	06/29/10	KWG1006235	
2,4'-DDD	0.51	JP	1.3	0.16	1	06/22/10	06/29/10	KWG1006235	
2,4'-DDT	0.70	JP	1.3	0.071	1	06/22/10	06/29/10	KWG1006235	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Tetrachloro-m-xylene	61	21-112	06/29/10	Acceptable
Decachlorobiphenyl	72	15-130	06/29/10	Acceptable

Comments: _____

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Pacific EcoRisk Laboratories
Project: USACE San Rafael Channel/16087
Sample Matrix: Sediment

Service Request: K1006356
Date Collected: 06/09/2010
Date Received: 06/18/2010

Organochlorine Pesticides

Sample Name: SRC-2010-6-Comp
Lab Code: K1006356-006

Units: ug/Kg
Basis: Dry

† Analyte Comments

gamma-Chlordane

For this analyte (CAS Registry No. 5103-74-2), USEPA has corrected the name to be beta-Chlordane, also known as trans-Chlordane.

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Pacific EcoRisk Laboratories
Project: USACE San Rafael Channel/16087
Sample Matrix: Sediment

Service Request: K1006356
Date Collected: 06/10/2010
Date Received: 06/18/2010

Organochlorine Pesticides

Sample Name: SRC-2010-7-Comp
Lab Code: K1006356-007
Extraction Method: EPA 3541
Analysis Method: 8081A

Units: ug/Kg
Basis: Dry
Level: Low

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
alpha-BHC	ND	Ui	1.2	0.45	1	06/22/10	06/29/10	KWG1006235	
alpha-Chlordane	5.2		1.2	0.12	1	06/22/10	06/29/10	KWG1006235	
beta-BHC	ND	Ui	1.2	0.50	1	06/22/10	06/29/10	KWG1006235	
gamma-BHC (Lindane)	ND	U	1.2	0.096	1	06/22/10	06/29/10	KWG1006235	
delta-BHC	ND	U	1.2	0.089	1	06/22/10	06/29/10	KWG1006235	
Heptachlor	ND	U	1.2	0.15	1	06/22/10	06/29/10	KWG1006235	
Aldrin	ND	Ui	1.2	0.24	1	06/22/10	06/29/10	KWG1006235	
gamma-Chlordane†	ND	Ui	7.3	7.3	1	06/22/10	06/29/10	KWG1006235	
Heptachlor Epoxide	ND	Ui	1.2	0.74	1	06/22/10	06/29/10	KWG1006235	
Endosulfan I	ND	Ui	1.2	1.2	1	06/22/10	06/29/10	KWG1006235	
Dieldrin	0.46	J	1.2	0.17	1	06/22/10	06/29/10	KWG1006235	
4,4'-DDE	6.8		1.2	0.14	1	06/22/10	06/29/10	KWG1006235	
Endrin	ND	U	1.2	0.12	1	06/22/10	06/29/10	KWG1006235	
Endosulfan II	ND	Ui	1.2	0.70	1	06/22/10	06/29/10	KWG1006235	
4,4'-DDD	7.5		1.2	0.14	1	06/22/10	06/29/10	KWG1006235	
Endrin Aldehyde	0.31	JP	1.2	0.15	1	06/22/10	06/29/10	KWG1006235	
Endosulfan Sulfate	ND	Ui	1.2	0.69	1	06/22/10	06/29/10	KWG1006235	
4,4'-DDT	ND	Ui	1.2	1.2	1	06/22/10	06/29/10	KWG1006235	
Toxaphene	ND	Ui	60	44	1	06/22/10	06/29/10	KWG1006235	
Chlordane	64	P	12	2.3	1	06/22/10	06/29/10	KWG1006235	
2,4'-DDE	ND	Ui	1.2	1.2	1	06/22/10	06/29/10	KWG1006235	
2,4'-DDD	2.7	P	1.2	0.16	1	06/22/10	06/29/10	KWG1006235	
2,4'-DDT	1.9		1.2	0.070	1	06/22/10	06/29/10	KWG1006235	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Tetrachloro-m-xylene	45	21-112	06/29/10	Acceptable
Decachlorobiphenyl	51	15-130	06/29/10	Acceptable

Comments: _____

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Pacific EcoRisk Laboratories
Project: USACE San Rafael Channel/16087
Sample Matrix: Sediment

Service Request: K1006356
Date Collected: 06/10/2010
Date Received: 06/18/2010

Organochlorine Pesticides

Sample Name: SRC-2010-7-Comp
Lab Code: K1006356-007

Units: ug/Kg
Basis: Dry

† Analyte Comments

gamma-Chlordane

For this analyte (CAS Registry No. 5103-74-2), USEPA has corrected the name to be beta-Chlordane, also known as trans-Chlordane.

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Pacific EcoRisk Laboratories
Project: USACE San Rafael Channel/16087
Sample Matrix: Sediment

Service Request: K1006356
Date Collected: 06/10/2010
Date Received: 06/18/2010

Organochlorine Pesticides

Sample Name: SRC-2010-7-Z-Comp
Lab Code: K1006356-008
Extraction Method: EPA 3541
Analysis Method: 8081A

Units: ug/Kg
Basis: Dry
Level: Low

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
alpha-BHC	ND	U	1.1	0.12	1	06/22/10	06/29/10	KWG1006235	
alpha-Chlordane	3.6		1.1	0.11	1	06/22/10	06/29/10	KWG1006235	
beta-BHC	ND	U	1.1	0.19	1	06/22/10	06/29/10	KWG1006235	
gamma-BHC (Lindane)	ND	Ui	1.1	1.1	1	06/22/10	06/29/10	KWG1006235	
delta-BHC	ND	Ui	1.1	0.083	1	06/22/10	06/29/10	KWG1006235	
Heptachlor	ND	U	1.1	0.13	1	06/22/10	06/29/10	KWG1006235	
Aldrin	ND	U	1.1	0.17	1	06/22/10	06/29/10	KWG1006235	
gamma-Chlordane†	6.7		1.1	0.095	1	06/22/10	06/29/10	KWG1006235	
Heptachlor Epoxide	ND	Ui	1.1	1.1	1	06/22/10	06/29/10	KWG1006235	
Endosulfan I	1.1	JP	1.1	0.067	1	06/22/10	06/29/10	KWG1006235	
Dieldrin	ND	Ui	1.1	1.1	1	06/22/10	06/29/10	KWG1006235	
4,4'-DDE	11		1.1	0.12	1	06/22/10	06/29/10	KWG1006235	
Endrin	ND	U	1.1	0.099	1	06/22/10	06/29/10	KWG1006235	
Endosulfan II	ND	U	1.1	0.15	1	06/22/10	06/29/10	KWG1006235	
4,4'-DDD	13		1.1	0.12	1	06/22/10	06/29/10	KWG1006235	
Endrin Aldehyde	ND	Ui	1.1	1.1	1	06/22/10	06/29/10	KWG1006235	
Endosulfan Sulfate	ND	U	1.1	0.12	1	06/22/10	06/29/10	KWG1006235	
4,4'-DDT	4.5		1.1	0.18	1	06/22/10	06/29/10	KWG1006235	
Toxaphene	ND	Ui	53	39	1	06/22/10	06/29/10	KWG1006235	
Chlordane	48		11	2.0	1	06/22/10	06/29/10	KWG1006235	
2,4'-DDE	ND	Ui	2.1	2.1	1	06/22/10	06/29/10	KWG1006235	
2,4'-DDD	4.2	P	1.1	0.14	1	06/22/10	06/29/10	KWG1006235	
2,4'-DDT	3.5		1.1	0.061	1	06/22/10	06/29/10	KWG1006235	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Tetrachloro-m-xylene	63	21-112	06/29/10	Acceptable
Decachlorobiphenyl	71	15-130	06/29/10	Acceptable

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Pacific EcoRisk Laboratories
Project: USACE San Rafael Channel/16087
Sample Matrix: Sediment

Service Request: K1006356
Date Collected: 06/10/2010
Date Received: 06/18/2010

Organochlorine Pesticides

Sample Name: SRC-2010-7-Z-Comp
Lab Code: K1006356-008

Units: ug/Kg
Basis: Dry

† Analyte Comments

gamma-Chlordane

For this analyte (CAS Registry No. 5103-74-2), USEPA has corrected the name to be beta-Chlordane, also known as trans-Chlordane.

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Pacific EcoRisk Laboratories
Project: USACE San Rafael Channel/16087
Sample Matrix: Sediment

Service Request: K1006356
Date Collected: 06/08/2010
Date Received: 06/18/2010

Organochlorine Pesticides

Sample Name: SRC-2010-1-B-Comp
Lab Code: K1006356-009
Extraction Method: EPA 3541
Analysis Method: 8081A

Units: ug/Kg
Basis: Dry
Level: Low

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
alpha-BHC	ND	U	1.0	0.11	1	06/22/10	06/29/10	KWG1006235	
alpha-Chlordane	ND	U	1.0	0.10	1	06/22/10	06/29/10	KWG1006235	
beta-BHC	ND	U	1.0	0.18	1	06/22/10	06/29/10	KWG1006235	
gamma-BHC (Lindane)	ND	U	1.0	0.080	1	06/22/10	06/29/10	KWG1006235	
delta-BHC	ND	U	1.0	0.074	1	06/22/10	06/29/10	KWG1006235	
Heptachlor	ND	U	1.0	0.12	1	06/22/10	06/29/10	KWG1006235	
Aldrin	ND	U	1.0	0.16	1	06/22/10	06/29/10	KWG1006235	
gamma-Chlordane†	0.17	JP	1.0	0.090	1	06/22/10	06/29/10	KWG1006235	
Heptachlor Epoxide	ND	U	1.0	0.084	1	06/22/10	06/29/10	KWG1006235	
Endosulfan I	ND	U	1.0	0.063	1	06/22/10	06/29/10	KWG1006235	
Dieldrin	ND	U	1.0	0.14	1	06/22/10	06/29/10	KWG1006235	
4,4'-DDE	1.3		1.0	0.11	1	06/22/10	06/29/10	KWG1006235	
Endrin	ND	U	1.0	0.094	1	06/22/10	06/29/10	KWG1006235	
Endosulfan II	ND	U	1.0	0.14	1	06/22/10	06/29/10	KWG1006235	
4,4'-DDD	0.87	J	1.0	0.11	1	06/22/10	06/29/10	KWG1006235	
Endrin Aldehyde	ND	U	1.0	0.12	1	06/22/10	06/29/10	KWG1006235	
Endosulfan Sulfate	ND	U	1.0	0.11	1	06/22/10	06/29/10	KWG1006235	
4,4'-DDT	0.51	J	1.0	0.17	1	06/22/10	06/29/10	KWG1006235	
Toxaphene	ND	Ui	50	11	1	06/22/10	06/29/10	KWG1006235	
Chlordane	ND	Ui	10	3.6	1	06/22/10	06/29/10	KWG1006235	
2,4'-DDE	ND	Ui	1.0	0.51	1	06/22/10	06/29/10	KWG1006235	
2,4'-DDD	ND	Ui	1.0	0.33	1	06/22/10	06/29/10	KWG1006235	
2,4'-DDT	0.66	J	1.0	0.058	1	06/22/10	06/29/10	KWG1006235	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Tetrachloro-m-xylene	53	21-112	06/29/10	Acceptable
Decachlorobiphenyl	64	15-130	06/29/10	Acceptable

Comments: _____

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Pacific EcoRisk Laboratories
Project: USACE San Rafael Channel/16087
Sample Matrix: Sediment

Service Request: K1006356
Date Collected: 06/08/2010
Date Received: 06/18/2010

Organochlorine Pesticides

Sample Name: SRC-2010-1-B-Comp
Lab Code: K1006356-009

Units: ug/Kg
Basis: Dry

† Analyte Comments

gamma-Chlordane

For this analyte (CAS Registry No. 5103-74-2), USEPA has corrected the name to be beta-Chlordane, also known as trans-Chlordane.

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Pacific EcoRisk Laboratories
Project: USACE San Rafael Channel/16087
Sample Matrix: Sediment

Service Request: K1006356
Date Collected: 06/09/2010
Date Received: 06/18/2010

Organochlorine Pesticides

Sample Name: SRC-2010-2-B-Comp
Lab Code: K1006356-010
Extraction Method: EPA 3541
Analysis Method: 8081A

Units: ug/Kg
Basis: Dry
Level: Low

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
alpha-BHC	ND	U	0.99	0.11	1	06/22/10	06/29/10	KWG1006235	
alpha-Chlordane	ND	Ui	0.99	0.99	1	06/22/10	06/29/10	KWG1006235	
beta-BHC	ND	U	0.99	0.18	1	06/22/10	06/29/10	KWG1006235	
gamma-BHC (Lindane)	ND	U	0.99	0.080	1	06/22/10	06/29/10	KWG1006235	
delta-BHC	ND	U	0.99	0.074	1	06/22/10	06/29/10	KWG1006235	
Heptachlor	ND	U	0.99	0.12	1	06/22/10	06/29/10	KWG1006235	
Aldrin	ND	U	0.99	0.16	1	06/22/10	06/29/10	KWG1006235	
gamma-Chlordane†	0.37	J	0.99	0.090	1	06/22/10	06/29/10	KWG1006235	
Heptachlor Epoxide	ND	U	0.99	0.084	1	06/22/10	06/29/10	KWG1006235	
Endosulfan I	ND	U	0.99	0.063	1	06/22/10	06/29/10	KWG1006235	
Dieldrin	ND	U	0.99	0.14	1	06/22/10	06/29/10	KWG1006235	
4,4'-DDE	2.0		0.99	0.11	1	06/22/10	06/29/10	KWG1006235	
Endrin	ND	U	0.99	0.094	1	06/22/10	06/29/10	KWG1006235	
Endosulfan II	ND	U	0.99	0.14	1	06/22/10	06/29/10	KWG1006235	
4,4'-DDD	1.3	P	0.99	0.11	1	06/22/10	06/29/10	KWG1006235	
Endrin Aldehyde	ND	U	0.99	0.12	1	06/22/10	06/29/10	KWG1006235	
Endosulfan Sulfate	ND	U	0.99	0.11	1	06/22/10	06/29/10	KWG1006235	
4,4'-DDT	ND	Ui	0.99	0.59	1	06/22/10	06/29/10	KWG1006235	
Toxaphene	ND	Ui	50	11	1	06/22/10	06/29/10	KWG1006235	
Chlordane	ND	Ui	9.9	2.0	1	06/22/10	06/29/10	KWG1006235	
2,4'-DDE	ND	Ui	0.99	0.99	1	06/22/10	06/29/10	KWG1006235	
2,4'-DDD	ND	Ui	0.99	0.37	1	06/22/10	06/29/10	KWG1006235	
2,4'-DDT	0.52	JP	0.99	0.058	1	06/22/10	06/29/10	KWG1006235	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Tetrachloro-m-xylene	53	21-112	06/29/10	Acceptable
Decachlorobiphenyl	66	15-130	06/29/10	Acceptable

Comments: _____

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Pacific EcoRisk Laboratories
Project: USACE San Rafael Channel/16087
Sample Matrix: Sediment

Service Request: K1006356
Date Collected: 06/09/2010
Date Received: 06/18/2010

Organochlorine Pesticides

Sample Name: SRC-2010-2-B-Comp
Lab Code: K1006356-010

Units: ug/Kg
Basis: Dry

† Analyte Comments

gamma-Chlordane

For this analyte (CAS Registry No. 5103-74-2), USEPA has corrected the name to be beta-Chlordane, also known as trans-Chlordane.

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Pacific EcoRisk Laboratories
Project: USACE San Rafael Channel/16087
Sample Matrix: Sediment

Service Request: K1006356
Date Collected: 06/09/2010
Date Received: 06/18/2010

Organochlorine Pesticides

Sample Name: SRC-2010-3-B-Comp
Lab Code: K1006356-011
Extraction Method: EPA 3541
Analysis Method: 8081A

Units: ug/Kg
Basis: Dry
Level: Low

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
alpha-BHC	ND	U	1.1	0.12	1	06/22/10	06/29/10	KWG1006235	
alpha-Chlordane	ND	Ui	1.1	1.1	1	06/22/10	06/29/10	KWG1006235	
beta-BHC	ND	U	1.1	0.19	1	06/22/10	06/29/10	KWG1006235	
gamma-BHC (Lindane)	ND	U	1.1	0.082	1	06/22/10	06/29/10	KWG1006235	
delta-BHC	ND	U	1.1	0.076	1	06/22/10	06/29/10	KWG1006235	
Heptachlor	ND	U	1.1	0.13	1	06/22/10	06/29/10	KWG1006235	
Aldrin	ND	U	1.1	0.17	1	06/22/10	06/29/10	KWG1006235	
gamma-Chlordane†	0.13	JP	1.1	0.092	1	06/22/10	06/29/10	KWG1006235	
Heptachlor Epoxide	ND	U	1.1	0.086	1	06/22/10	06/29/10	KWG1006235	
Endosulfan I	ND	U	1.1	0.064	1	06/22/10	06/29/10	KWG1006235	
Dieldrin	ND	U	1.1	0.15	1	06/22/10	06/29/10	KWG1006235	
4,4'-DDE	2.1		1.1	0.12	1	06/22/10	06/29/10	KWG1006235	
Endrin	ND	U	1.1	0.096	1	06/22/10	06/29/10	KWG1006235	
Endosulfan II	ND	U	1.1	0.15	1	06/22/10	06/29/10	KWG1006235	
4,4'-DDD	1.4	P	1.1	0.12	1	06/22/10	06/29/10	KWG1006235	
Endrin Aldehyde	ND	U	1.1	0.13	1	06/22/10	06/29/10	KWG1006235	
Endosulfan Sulfate	ND	U	1.1	0.12	1	06/22/10	06/29/10	KWG1006235	
4,4'-DDT	ND	Ui	1.1	0.53	1	06/22/10	06/29/10	KWG1006235	
Toxaphene	ND	Ui	51	13	1	06/22/10	06/29/10	KWG1006235	
Chlordane	ND	Ui	11	3.1	1	06/22/10	06/29/10	KWG1006235	
2,4'-DDE	ND	Ui	1.2	1.2	1	06/22/10	06/29/10	KWG1006235	
2,4'-DDD	ND	Ui	1.1	0.26	1	06/22/10	06/29/10	KWG1006235	
2,4'-DDT	0.42	JP	1.1	0.059	1	06/22/10	06/29/10	KWG1006235	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Tetrachloro-m-xylene	58	21-112	06/29/10	Acceptable
Decachlorobiphenyl	67	15-130	06/29/10	Acceptable

Comments: _____

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Pacific EcoRisk Laboratories
Project: USACE San Rafael Channel/16087
Sample Matrix: Sediment

Service Request: K1006356
Date Collected: 06/09/2010
Date Received: 06/18/2010

Organochlorine Pesticides

Sample Name: SRC-2010-3-B-Comp
Lab Code: K1006356-011

Units: ug/Kg
Basis: Dry

† Analyte Comments

gamma-Chlordane

For this analyte (CAS Registry No. 5103-74-2), USEPA has corrected the name to be beta-Chlordane, also known as trans-Chlordane.

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Pacific EcoRisk Laboratories
Project: USACE San Rafael Channel/16087
Sample Matrix: Sediment

Service Request: K1006356
Date Collected: 06/11/2010
Date Received: 06/18/2010

Organochlorine Pesticides

Sample Name: SRC-2010-4-B-Comp
Lab Code: K1006356-012
Extraction Method: EPA 3541
Analysis Method: 8081A

Units: ug/Kg
Basis: Dry
Level: Low

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
alpha-BHC	ND	U	0.98	0.11	1	06/22/10	06/29/10	KWG1006235	
alpha-Chlordane	ND	U	0.98	0.10	1	06/22/10	06/29/10	KWG1006235	
beta-BHC	ND	U	0.98	0.18	1	06/22/10	06/29/10	KWG1006235	
gamma-BHC (Lindane)	ND	U	0.98	0.080	1	06/22/10	06/29/10	KWG1006235	
delta-BHC	ND	Ui	0.98	0.079	1	06/22/10	06/29/10	KWG1006235	
Heptachlor	ND	U	0.98	0.12	1	06/22/10	06/29/10	KWG1006235	
Aldrin	ND	U	0.98	0.16	1	06/22/10	06/29/10	KWG1006235	
gamma-Chlordane†	0.33	J	0.98	0.090	1	06/22/10	06/29/10	KWG1006235	
Heptachlor Epoxide	ND	U	0.98	0.084	1	06/22/10	06/29/10	KWG1006235	
Endosulfan I	ND	U	0.98	0.063	1	06/22/10	06/29/10	KWG1006235	
Dieldrin	ND	U	0.98	0.14	1	06/22/10	06/29/10	KWG1006235	
4,4'-DDE	1.6		0.98	0.11	1	06/22/10	06/29/10	KWG1006235	
Endrin	ND	U	0.98	0.094	1	06/22/10	06/29/10	KWG1006235	
Endosulfan II	ND	U	0.98	0.14	1	06/22/10	06/29/10	KWG1006235	
4,4'-DDD	0.92	J	0.98	0.11	1	06/22/10	06/29/10	KWG1006235	
Endrin Aldehyde	ND	U	0.98	0.12	1	06/22/10	06/29/10	KWG1006235	
Endosulfan Sulfate	ND	U	0.98	0.11	1	06/22/10	06/29/10	KWG1006235	
4,4'-DDT	ND	Ui	0.98	0.55	1	06/22/10	06/29/10	KWG1006235	
Toxaphene	ND	Ui	49	15	1	06/22/10	06/29/10	KWG1006235	
Chlordane	ND	Ui	9.8	3.7	1	06/22/10	06/29/10	KWG1006235	
2,4'-DDE	ND	Ui	0.98	0.61	1	06/22/10	06/29/10	KWG1006235	
2,4'-DDD	0.72	JP	0.98	0.13	1	06/22/10	06/29/10	KWG1006235	
2,4'-DDT	0.43	JP	0.98	0.058	1	06/22/10	06/29/10	KWG1006235	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Tetrachloro-m-xylene	53	21-112	06/29/10	Acceptable
Decachlorobiphenyl	66	15-130	06/29/10	Acceptable

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Pacific EcoRisk Laboratories
Project: USACE San Rafael Channel/16087
Sample Matrix: Sediment

Service Request: K1006356
Date Collected: 06/11/2010
Date Received: 06/18/2010

Organochlorine Pesticides

Sample Name: SRC-2010-4-B-Comp
Lab Code: K1006356-012

Units: ug/Kg
Basis: Dry

† Analyte Comments

gamma-Chlordane

For this analyte (CAS Registry No. 5103-74-2), USEPA has corrected the name to be beta-Chlordane, also known as trans-Chlordane.

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Pacific EcoRisk Laboratories
Project: USACE San Rafael Channel/16087
Sample Matrix: Sediment

Service Request: K1006356
Date Collected: 06/08/2010
Date Received: 06/18/2010

Organochlorine Pesticides

Sample Name: SRC-2010-5-B-Comp
Lab Code: K1006356-013
Extraction Method: EPA 3541
Analysis Method: 8081A

Units: ug/Kg
Basis: Dry
Level: Low

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
alpha-BHC	ND	U	1.1	0.12	1	06/22/10	06/29/10	KWG1006235	
alpha-Chlordane	ND	Ui	1.1	1.1	1	06/22/10	06/29/10	KWG1006235	
beta-BHC	ND	U	1.1	0.19	1	06/22/10	06/29/10	KWG1006235	
gamma-BHC (Lindane)	ND	U	1.1	0.082	1	06/22/10	06/29/10	KWG1006235	
delta-BHC	ND	U	1.1	0.076	1	06/22/10	06/29/10	KWG1006235	
Heptachlor	ND	U	1.1	0.13	1	06/22/10	06/29/10	KWG1006235	
Aldrin	ND	U	1.1	0.17	1	06/22/10	06/29/10	KWG1006235	
gamma-Chlordane†	0.32	JP	1.1	0.092	1	06/22/10	06/29/10	KWG1006235	
Heptachlor Epoxide	0.31	J	1.1	0.086	1	06/22/10	06/29/10	KWG1006235	
Endosulfan I	ND	Ui	1.1	0.071	1	06/22/10	06/29/10	KWG1006235	
Dieldrin	ND	U	1.1	0.15	1	06/22/10	06/29/10	KWG1006235	
4,4'-DDE	2.0		1.1	0.12	1	06/22/10	06/29/10	KWG1006235	
Endrin	ND	U	1.1	0.096	1	06/22/10	06/29/10	KWG1006235	
Endosulfan II	ND	U	1.1	0.15	1	06/22/10	06/29/10	KWG1006235	
4,4'-DDD	1.3		1.1	0.12	1	06/22/10	06/29/10	KWG1006235	
Endrin Aldehyde	ND	U	1.1	0.13	1	06/22/10	06/29/10	KWG1006235	
Endosulfan Sulfate	ND	U	1.1	0.12	1	06/22/10	06/29/10	KWG1006235	
4,4'-DDT	ND	Ui	1.1	1.1	1	06/22/10	06/29/10	KWG1006235	
Toxaphene	ND	Ui	51	26	1	06/22/10	06/29/10	KWG1006235	
Chlordane	ND	Ui	11	5.8	1	06/22/10	06/29/10	KWG1006235	
2,4'-DDE	ND	Ui	1.1	1.1	1	06/22/10	06/29/10	KWG1006235	
2,4'-DDD	ND	Ui	1.1	0.46	1	06/22/10	06/29/10	KWG1006235	
2,4'-DDT	0.75	JP	1.1	0.059	1	06/22/10	06/29/10	KWG1006235	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Tetrachloro-m-xylene	64	21-112	06/29/10	Acceptable
Decachlorobiphenyl	71	15-130	06/29/10	Acceptable

Comments: _____

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Pacific EcoRisk Laboratories
Project: USACE San Rafael Channel/16087
Sample Matrix: Sediment

Service Request: K1006356
Date Collected: 06/08/2010
Date Received: 06/18/2010

Organochlorine Pesticides

Sample Name: SRC-2010-5-B-Comp
Lab Code: K1006356-013

Units: ug/Kg
Basis: Dry

† Analyte Comments

gamma-Chlordane

For this analyte (CAS Registry No. 5103-74-2), USEPA has corrected the name to be beta-Chlordane, also known as trans-Chlordane.

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Pacific EcoRisk Laboratories
Project: USACE San Rafael Channel/16087
Sample Matrix: Sediment

Service Request: K1006356
Date Collected: 06/09/2010
Date Received: 06/18/2010

Organochlorine Pesticides

Sample Name: SRC-2010-6-B-Comp
Lab Code: K1006356-014
Extraction Method: EPA 3541
Analysis Method: 8081A

Units: ug/Kg
Basis: Dry
Level: Low

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
alpha-BHC	ND	U	1.1	0.13	1	06/22/10	06/30/10	KWG1006235	
alpha-Chlordane	ND	U	1.1	0.11	1	06/22/10	06/30/10	KWG1006235	
beta-BHC	ND	U	1.1	0.20	1	06/22/10	06/30/10	KWG1006235	
gamma-BHC (Lindane)	0.12	J	1.1	0.088	1	06/22/10	06/30/10	KWG1006235	
delta-BHC	ND	U	1.1	0.082	1	06/22/10	06/30/10	KWG1006235	
Heptachlor	ND	U	1.1	0.14	1	06/22/10	06/30/10	KWG1006235	
Aldrin	ND	U	1.1	0.18	1	06/22/10	06/30/10	KWG1006235	
gamma-Chlordane†	0.82	JP	1.1	0.099	1	06/22/10	06/30/10	KWG1006235	
Heptachlor Epoxide	ND	Ui	1.1	0.55	1	06/22/10	06/30/10	KWG1006235	
Endosulfan I	0.15	J	1.1	0.070	1	06/22/10	06/30/10	KWG1006235	
Dieldrin	ND	Ui	1.4	1.4	1	06/22/10	06/30/10	KWG1006235	
4,4'-DDE	3.4		1.1	0.13	1	06/22/10	06/30/10	KWG1006235	
Endrin	ND	U	1.1	0.11	1	06/22/10	06/30/10	KWG1006235	
Endosulfan II	ND	U	1.1	0.16	1	06/22/10	06/30/10	KWG1006235	
4,4'-DDD	2.4		1.1	0.13	1	06/22/10	06/30/10	KWG1006235	
Endrin Aldehyde	ND	U	1.1	0.14	1	06/22/10	06/29/10	KWG1006235	
Endosulfan Sulfate	ND	U	1.1	0.13	1	06/22/10	06/30/10	KWG1006235	
4,4'-DDT	ND	Ui	1.7	1.7	1	06/22/10	06/30/10	KWG1006235	
Toxaphene	ND	Ui	55	28	1	06/22/10	06/30/10	KWG1006235	
Chlordane	7.6	JP	11	2.1	1	06/22/10	06/30/10	KWG1006235	
2,4'-DDE	ND	Ui	1.1	1.1	1	06/22/10	06/30/10	KWG1006235	
2,4'-DDD	2.4	P	1.1	0.15	1	06/22/10	06/30/10	KWG1006235	
2,4'-DDT	2.6		1.1	0.064	1	06/22/10	06/30/10	KWG1006235	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Tetrachloro-m-xylene	80	21-112	06/30/10	Acceptable
Decachlorobiphenyl	94	15-130	06/30/10	Acceptable

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Pacific EcoRisk Laboratories
Project: USACE San Rafael Channel/16087
Sample Matrix: Sediment

Service Request: K1006356
Date Collected: 06/09/2010
Date Received: 06/18/2010

Organochlorine Pesticides

Sample Name: SRC-2010-6-B-Comp
Lab Code: K1006356-014

Units: ug/Kg
Basis: Dry

† Analyte Comments

gamma-Chlordane

For this analyte (CAS Registry No. 5103-74-2), USEPA has corrected the name to be beta-Chlordane, also known as trans-Chlordane.

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Pacific EcoRisk Laboratories
Project: USACE San Rafael Channel/16087
Sample Matrix: Sediment

Service Request: K1006356
Date Collected: 06/10/2010
Date Received: 06/18/2010

Organochlorine Pesticides

Sample Name: SRC-2010-7-B-Comp
Lab Code: K1006356-015
Extraction Method: EPA 3541
Analysis Method: 8081A

Units: ug/Kg
Basis: Dry
Level: Low

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
alpha-BHC	ND	U	0.95	0.11	1	06/22/10	06/30/10	KWG1006235	
alpha-Chlordane	1.3		0.95	0.10	1	06/22/10	06/30/10	KWG1006235	
beta-BHC	ND	U	0.95	0.18	1	06/22/10	06/30/10	KWG1006235	
gamma-BHC (Lindane)	0.13	J	0.95	0.080	1	06/22/10	06/30/10	KWG1006235	
delta-BHC	ND	U	0.95	0.074	1	06/22/10	06/30/10	KWG1006235	
Heptachlor	ND	U	0.95	0.12	1	06/22/10	06/30/10	KWG1006235	
Aldrin	ND	U	0.95	0.16	1	06/22/10	06/30/10	KWG1006235	
gamma-Chlordane†	3.4		0.95	0.090	1	06/22/10	06/30/10	KWG1006235	
Heptachlor Epoxide	ND	Ui	0.95	0.67	1	06/22/10	06/30/10	KWG1006235	
Endosulfan I	ND	Ui	0.95	0.95	1	06/22/10	06/30/10	KWG1006235	
Dieldrin	ND	Ui	0.95	0.95	1	06/22/10	06/30/10	KWG1006235	
4,4'-DDE	7.1		0.95	0.11	1	06/22/10	06/30/10	KWG1006235	
Endrin	ND	Ui	0.95	0.29	1	06/22/10	06/30/10	KWG1006235	
Endosulfan II	ND	Ui	0.95	0.17	1	06/22/10	06/30/10	KWG1006235	
4,4'-DDD	16		0.95	0.11	1	06/22/10	06/30/10	KWG1006235	
Endrin Aldehyde	ND	U	0.95	0.12	1	06/22/10	06/29/10	KWG1006235	
Endosulfan Sulfate	ND	U	0.95	0.11	1	06/22/10	06/30/10	KWG1006235	
4,4'-DDT	1.8	P	0.95	0.17	1	06/22/10	06/30/10	KWG1006235	
Toxaphene	ND	Ui	48	32	1	06/22/10	06/30/10	KWG1006235	
Chlordane	24		9.5	1.9	1	06/22/10	06/30/10	KWG1006235	
2,4'-DDE	ND	Ui	0.95	0.95	1	06/22/10	06/30/10	KWG1006235	
2,4'-DDD	2.0	P	0.95	0.13	1	06/22/10	06/30/10	KWG1006235	
2,4'-DDT	ND	Ui	2.1	2.1	1	06/22/10	06/30/10	KWG1006235	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Tetrachloro-m-xylene	66	21-112	06/30/10	Acceptable
Decachlorobiphenyl	77	15-130	06/30/10	Acceptable

Comments: _____

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Pacific EcoRisk Laboratories
Project: USACE San Rafael Channel/16087
Sample Matrix: Sediment

Service Request: K1006356
Date Collected: 06/10/2010
Date Received: 06/18/2010

Organochlorine Pesticides

Sample Name: SRC-2010-7-B-Comp
Lab Code: K1006356-015

Units: ug/Kg
Basis: Dry

† Analyte Comments

gamma-Chlordane

For this analyte (CAS Registry No. 5103-74-2), USEPA has corrected the name to be beta-Chlordane, also known as trans-Chlordane.

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Pacific EcoRisk Laboratories
Project: USACE San Rafael Channel/16087
Sample Matrix: Sediment

Service Request: K1006356
Date Collected: 06/10/2010
Date Received: 06/18/2010

Organochlorine Pesticides

Sample Name: SRC-2010-7-1
Lab Code: K1006356-016
Extraction Method: EPA 3541
Analysis Method: 8081A

Units: ug/Kg
Basis: Dry
Level: Low

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
alpha-BHC	ND	U	1.3	0.15	1	06/22/10	06/30/10	KWG1006235	
alpha-Chlordane	1.1	J	1.3	0.13	1	06/22/10	06/30/10	KWG1006235	
beta-BHC	ND	U	1.3	0.24	1	06/22/10	06/30/10	KWG1006235	
gamma-BHC (Lindane)	ND	Ui	1.3	0.12	1	06/22/10	06/30/10	KWG1006235	
delta-BHC	ND	U	1.3	0.095	1	06/22/10	06/30/10	KWG1006235	
Heptachlor	ND	U	1.3	0.16	1	06/22/10	06/30/10	KWG1006235	
Aldrin	ND	U	1.3	0.21	1	06/22/10	06/30/10	KWG1006235	
gamma-Chlordane†	1.3		1.3	0.12	1	06/22/10	06/30/10	KWG1006235	
Heptachlor Epoxide	ND	Ui	1.3	0.18	1	06/22/10	06/30/10	KWG1006235	
Endosulfan I	ND	Ui	1.3	0.14	1	06/22/10	06/30/10	KWG1006235	
Dieldrin	ND	U	1.3	0.18	1	06/22/10	06/30/10	KWG1006235	
4,4'-DDE	2.4	P	1.3	0.15	1	06/22/10	06/30/10	KWG1006235	
Endrin	ND	U	1.3	0.13	1	06/22/10	06/30/10	KWG1006235	
Endosulfan II	ND	U	1.3	0.18	1	06/22/10	06/30/10	KWG1006235	
4,4'-DDD	1.5		1.3	0.15	1	06/22/10	06/30/10	KWG1006235	
Endrin Aldehyde	ND	U	1.3	0.16	1	06/22/10	06/29/10	KWG1006235	
Endosulfan Sulfate	ND	U	1.3	0.15	1	06/22/10	06/30/10	KWG1006235	
4,4'-DDT	1.6	P	1.3	0.22	1	06/22/10	06/30/10	KWG1006235	
Toxaphene	ND	Ui	64	21	1	06/22/10	06/30/10	KWG1006235	
Chlordane	12	J	13	2.5	1	06/22/10	06/30/10	KWG1006235	
2,4'-DDE	ND	Ui	1.3	1.3	1	06/22/10	06/30/10	KWG1006235	
2,4'-DDD	0.69	JP	1.3	0.17	1	06/22/10	06/30/10	KWG1006235	
2,4'-DDT	ND	Ui	1.3	1.3	1	06/22/10	06/30/10	KWG1006235	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Tetrachloro-m-xylene	75	21-112	06/30/10	Acceptable
Decachlorobiphenyl	88	15-130	06/30/10	Acceptable

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Pacific EcoRisk Laboratories
Project: USACE San Rafael Channel/16087
Sample Matrix: Sediment

Service Request: K1006356
Date Collected: 06/10/2010
Date Received: 06/18/2010

Organochlorine Pesticides

Sample Name: SRC-2010-7-1
Lab Code: K1006356-016

Units: ug/Kg
Basis: Dry

† Analyte Comments

gamma-Chlordane

For this analyte (CAS Registry No. 5103-74-2), USEPA has corrected the name to be beta-Chlordane, also known as trans-Chlordane.

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Pacific EcoRisk Laboratories
Project: USACE San Rafael Channel/16087
Sample Matrix: Sediment

Service Request: K1006356
Date Collected: 06/10/2010
Date Received: 06/18/2010

Organochlorine Pesticides

Sample Name: SRC-2010-7-2
Lab Code: K1006356-017

Units: ug/Kg

Basis: Dry

Extraction Method: EPA 3541

Level: Low

Analysis Method: 8081A

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
alpha-BHC	ND	U	1.2	0.14	1	06/22/10	06/30/10	KWG1006235	
alpha-Chlordane	0.95	J	1.2	0.12	1	06/22/10	06/30/10	KWG1006235	
beta-BHC	ND	U	1.2	0.22	1	06/22/10	06/30/10	KWG1006235	
gamma-BHC (Lindane)	ND	U	1.2	0.096	1	06/22/10	06/30/10	KWG1006235	
delta-BHC	ND	U	1.2	0.089	1	06/22/10	06/30/10	KWG1006235	
Heptachlor	ND	U	1.2	0.15	1	06/22/10	06/30/10	KWG1006235	
Aldrin	ND	U	1.2	0.20	1	06/22/10	06/30/10	KWG1006235	
gamma-Chlordane†	2.3		1.2	0.11	1	06/22/10	06/30/10	KWG1006235	
Heptachlor Epoxide	ND	Ui	1.2	0.53	1	06/22/10	06/30/10	KWG1006235	
Endosulfan I	0.34	JP	1.2	0.076	1	06/22/10	06/30/10	KWG1006235	
Dieldrin	ND	Ui	1.2	1.2	1	06/22/10	06/30/10	KWG1006235	
4,4'-DDE	3.6		1.2	0.14	1	06/22/10	06/30/10	KWG1006235	
Endrin	ND	Ui	1.2	0.20	1	06/22/10	06/30/10	KWG1006235	
Endosulfan II	ND	U	1.2	0.17	1	06/22/10	06/30/10	KWG1006235	
4,4'-DDD	2.4		1.2	0.14	1	06/22/10	06/30/10	KWG1006235	
Endrin Aldehyde	ND	U	1.2	0.15	1	06/22/10	06/29/10	KWG1006235	
Endosulfan Sulfate	ND	U	1.2	0.14	1	06/22/10	06/30/10	KWG1006235	
4,4'-DDT	ND	Ui	2.0	2.0	1	06/22/10	06/30/10	KWG1006235	
Toxaphene	ND	Ui	60	49	1	06/22/10	06/30/10	KWG1006235	
Chlordane	18		12	2.3	1	06/22/10	06/30/10	KWG1006235	
2,4'-DDE	ND	Ui	1.2	1.2	1	06/22/10	06/30/10	KWG1006235	
2,4'-DDD	1.0	JP	1.2	0.16	1	06/22/10	06/30/10	KWG1006235	
2,4'-DDT	1.7	P	1.2	0.070	1	06/22/10	06/30/10	KWG1006235	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Tetrachloro-m-xylene	67	21-112	06/30/10	Acceptable
Decachlorobiphenyl	78	15-130	06/30/10	Acceptable

Comments:

Client: Pacific EcoRisk Laboratories
Project: USACE San Rafael Channel/16087
Sample Matrix: Sediment

Service Request: K1006356
Date Collected: 06/10/2010
Date Received: 06/18/2010

Organochlorine Pesticides

Sample Name: SRC-2010-7-2
Lab Code: K1006356-017

Units: ug/Kg
Basis: Dry

† Analyte Comments

gamma-Chlordane

For this analyte (CAS Registry No. 5103-74-2), USEPA has corrected the name to be beta-Chlordane, also known as trans-Chlordane.

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Pacific EcoRisk Laboratories
Project: USACE San Rafael Channel/16087
Sample Matrix: Sediment

Service Request: K1006356
Date Collected: 06/10/2010
Date Received: 06/18/2010

Organochlorine Pesticides

Sample Name: SRC-2010-7-3
Lab Code: K1006356-018
Extraction Method: EPA 3541
Analysis Method: 8081A

Units: ug/Kg
Basis: Dry
Level: Low

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
alpha-BHC	ND	U	1.3	0.14	1	06/22/10	06/30/10	KWG1006235	
alpha-Chlordane	2.4		1.3	0.13	1	06/22/10	06/30/10	KWG1006235	
beta-BHC	ND	U	1.3	0.22	1	06/22/10	06/30/10	KWG1006235	
gamma-BHC (Lindane)	ND	U	1.3	0.097	1	06/22/10	06/30/10	KWG1006235	
delta-BHC	ND	U	1.3	0.090	1	06/22/10	06/30/10	KWG1006235	
Heptachlor	ND	U	1.3	0.15	1	06/22/10	06/30/10	KWG1006235	
Aldrin	ND	U	1.3	0.20	1	06/22/10	06/30/10	KWG1006235	
gamma-Chlordane†	3.7		1.3	0.11	1	06/22/10	06/30/10	KWG1006235	
Heptachlor Epoxide	ND	Ui	1.3	0.54	1	06/22/10	06/30/10	KWG1006235	
Endosulfan I	ND	Ui	1.3	1.3	1	06/22/10	06/30/10	KWG1006235	
Dieldrin	ND	Ui	1.3	0.33	1	06/22/10	06/30/10	KWG1006235	
4,4'-DDE	4.4		1.3	0.14	1	06/22/10	06/30/10	KWG1006235	
Endrin	ND	Ui	1.3	0.17	1	06/22/10	06/30/10	KWG1006235	
Endosulfan II	ND	Ui	1.3	0.21	1	06/22/10	06/30/10	KWG1006235	
4,4'-DDD	2.8		1.3	0.14	1	06/22/10	06/30/10	KWG1006235	
Endrin Aldehyde	0.19	JP	1.3	0.15	1	06/22/10	06/29/10	KWG1006235	
Endosulfan Sulfate	ND	U	1.3	0.14	1	06/22/10	06/30/10	KWG1006235	
4,4'-DDT	ND	Ui	2.2	2.2	1	06/22/10	06/30/10	KWG1006235	
Toxaphene	ND	Ui	61	42	1	06/22/10	06/30/10	KWG1006235	
Chlordane	32		13	2.3	1	06/22/10	06/30/10	KWG1006235	
2,4'-DDE	ND	Ui	1.3	1.3	1	06/22/10	06/30/10	KWG1006235	
2,4'-DDD	ND	Ui	1.3	1.1	1	06/22/10	06/30/10	KWG1006235	
2,4'-DDT	1.8	P	1.3	0.071	1	06/22/10	06/30/10	KWG1006235	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Tetrachloro-m-xylene	63	21-112	06/30/10	Acceptable
Decachlorobiphenyl	73	15-130	06/30/10	Acceptable

Comments: _____

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Pacific EcoRisk Laboratories
Project: USACE San Rafael Channel/16087
Sample Matrix: Sediment

Service Request: K1006356
Date Collected: 06/10/2010
Date Received: 06/18/2010

Organochlorine Pesticides

Sample Name: SRC-2010-7-3
Lab Code: K1006356-018

Units: ug/Kg
Basis: Dry

† Analyte Comments

gamma-Chlordane

For this analyte (CAS Registry No. 5103-74-2), USEPA has corrected the name to be beta-Chlordane, also known as trans-Chlordane.

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Pacific EcoRisk Laboratories
Project: USACE San Rafael Channel/16087
Sample Matrix: Sediment

Service Request: K1006356
Date Collected: 06/10/2010
Date Received: 06/18/2010

Organochlorine Pesticides

Sample Name: SRC-2010-7-4
Lab Code: K1006356-019
Extraction Method: EPA 3541
Analysis Method: 8081A

Units: ug/Kg
Basis: Dry
Level: Low

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
alpha-BHC	ND	U	1.3	0.14	1	06/22/10	06/30/10	KWG1006235	
alpha-Chlordane	8.7		1.3	0.13	1	06/22/10	06/30/10	KWG1006235	
beta-BHC	ND	U	1.3	0.23	1	06/22/10	06/30/10	KWG1006235	
gamma-BHC (Lindane)	ND	Ui	1.3	0.26	1	06/22/10	06/30/10	KWG1006235	
delta-BHC	ND	Ui	1.3	0.13	1	06/22/10	06/30/10	KWG1006235	
Heptachlor	ND	U	1.3	0.16	1	06/22/10	06/30/10	KWG1006235	
Aldrin	ND	Ui	1.3	0.67	1	06/22/10	06/30/10	KWG1006235	
gamma-Chlordane†	11		1.3	0.12	1	06/22/10	06/30/10	KWG1006235	
Heptachlor Epoxide	ND	U	1.3	0.11	1	06/22/10	06/30/10	KWG1006235	
Endosulfan I	ND	Ui	1.3	1.3	1	06/22/10	06/30/10	KWG1006235	
Dieldrin	1.2	J	1.3	0.18	1	06/22/10	06/30/10	KWG1006235	
4,4'-DDE	13		1.3	0.14	1	06/22/10	06/30/10	KWG1006235	
Endrin	ND	Ui	1.3	0.53	1	06/22/10	06/30/10	KWG1006235	
Endosulfan II	ND	Ui	1.3	1.1	1	06/22/10	06/30/10	KWG1006235	
4,4'-DDD	16		1.3	0.14	1	06/22/10	06/30/10	KWG1006235	
Endrin Aldehyde	ND	Ui	1.3	0.27	1	06/22/10	06/29/10	KWG1006235	
Endosulfan Sulfate	ND	Ui	1.3	1.3	1	06/22/10	06/30/10	KWG1006235	
4,4'-DDT	ND	Ui	1.9	1.9	1	06/22/10	06/30/10	KWG1006235	
Toxaphene	ND	Ui	89	89	1	06/22/10	06/30/10	KWG1006235	
Chlordane	96		13	2.4	1	06/22/10	06/30/10	KWG1006235	
2,4'-DDE	ND	Ui	1.3	1.3	1	06/22/10	06/30/10	KWG1006235	
2,4'-DDD	4.5	P	1.3	0.17	1	06/22/10	06/30/10	KWG1006235	
2,4'-DDT	3.6		1.3	0.073	1	06/22/10	06/30/10	KWG1006235	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Tetrachloro-m-xylene	67	21-112	06/30/10	Acceptable
Decachlorobiphenyl	77	15-130	06/30/10	Acceptable

Comments: _____

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Pacific EcoRisk Laboratories
Project: USACE San Rafael Channel/16087
Sample Matrix: Sediment

Service Request: K1006356
Date Collected: 06/10/2010
Date Received: 06/18/2010

Organochlorine Pesticides

Sample Name: SRC-2010-7-4
Lab Code: K1006356-019

Units: ug/Kg
Basis: Dry

† Analyte Comments

gamma-Chlordane For this analyte (CAS Registry No. 5103-74-2), USEPA has corrected the name to be beta-Chlordane, also known as trans-Chlordane.

Comments: _____

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Pacific EcoRisk Laboratories
Project: USACE San Rafael Channel/16087
Sample Matrix: Sediment

Service Request: K1006356
Date Collected: 06/10/2010
Date Received: 06/18/2010

Organochlorine Pesticides

Sample Name: SRC-2010-7-5
Lab Code: K1006356-020
Extraction Method: EPA 3541
Analysis Method: 8081A

Units: ug/Kg
Basis: Dry
Level: Low

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
alpha-BHC	ND	U	1.2	0.13	1	06/22/10	06/30/10	KWG1006235	
alpha-Chlordane	30		1.2	0.12	1	06/22/10	06/30/10	KWG1006235	
beta-BHC	ND	U	1.2	0.21	1	06/22/10	06/30/10	KWG1006235	
gamma-BHC (Lindane)	0.82	JP	1.2	0.092	1	06/22/10	06/30/10	KWG1006235	
delta-BHC	ND	Ui	1.2	0.55	1	06/22/10	06/30/10	KWG1006235	
Heptachlor	ND	Ui	1.2	1.2	1	06/22/10	06/30/10	KWG1006235	
Aldrin	ND	Ui	1.7	1.7	1	06/22/10	06/30/10	KWG1006235	
gamma-Chlordane†	43		1.2	0.11	1	06/22/10	06/30/10	KWG1006235	
Heptachlor Epoxide	ND	U	1.2	0.096	1	06/22/10	06/30/10	KWG1006235	
Endosulfan I	ND	Ui	3.8	3.8	1	06/22/10	06/30/10	KWG1006235	
Dieldrin	2.8		1.2	0.16	1	06/22/10	06/30/10	KWG1006235	
4,4'-DDE	33		1.2	0.13	1	06/22/10	06/30/10	KWG1006235	
Endrin	ND	Ui	1.2	1.2	1	06/22/10	06/30/10	KWG1006235	
Endosulfan II	ND	Ui	1.2	1.2	1	06/22/10	06/30/10	KWG1006235	
4,4'-DDD	66	D	5.8	0.63	5	06/22/10	07/01/10	KWG1006235	
Endrin Aldehyde	ND	Ui	1.2	1.2	1	06/22/10	06/29/10	KWG1006235	
Endosulfan Sulfate	ND	Ui	1.2	1.2	1	06/22/10	06/30/10	KWG1006235	
4,4'-DDT	ND	Ui	9.7	9.7	1	06/22/10	06/30/10	KWG1006235	
Toxaphene	ND	Ui	210	210	1	06/22/10	06/30/10	KWG1006235	
Chlordane	380	D	58	11	5	06/22/10	07/01/10	KWG1006235	
2,4'-DDE	ND	Ui	5.2	5.2	1	06/22/10	06/30/10	KWG1006235	
2,4'-DDD	18		1.2	0.15	1	06/22/10	06/30/10	KWG1006235	
2,4'-DDT	7.3	P	1.2	0.067	1	06/22/10	06/30/10	KWG1006235	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Tetrachloro-m-xylene	72	21-112	06/30/10	Acceptable
Decachlorobiphenyl	83	15-130	06/30/10	Acceptable

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Pacific EcoRisk Laboratories
Project: USACE San Rafael Channel/16087
Sample Matrix: Sediment

Service Request: K1006356
Date Collected: 06/10/2010
Date Received: 06/18/2010

Organochlorine Pesticides

Sample Name: SRC-2010-7-5
Lab Code: K1006356-020

Units: ug/Kg
Basis: Dry

† Analyte Comments

gamma-Chlordane

For this analyte (CAS Registry No. 5103-74-2), USEPA has corrected the name to be beta-Chlordane, also known as trans-Chlordane.

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Pacific EcoRisk Laboratories
Project: USACE San Rafael Channel/16087
Sample Matrix: Sediment

Service Request: K1006356
Date Collected: 06/10/2010
Date Received: 06/23/2010

Organochlorine Pesticides

Sample Name: SRC-2010-8-Z-Comp
Lab Code: K1006356-021
Extraction Method: EPA 3541
Analysis Method: 8081A

Units: ug/Kg
Basis: Dry
Level: Low

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
alpha-BHC	ND	Ui	1.2	0.64	1	06/24/10	07/16/10	KWG1006549	
alpha-Chlordane	15		1.2	0.12	1	06/24/10	07/16/10	KWG1006549	
beta-BHC	ND	U	1.2	0.21	1	06/24/10	07/16/10	KWG1006549	
gamma-BHC (Lindane)	ND	Ui	1.3	1.3	1	06/24/10	07/16/10	KWG1006549	
delta-BHC	ND	Ui	1.2	0.38	1	06/24/10	07/16/10	KWG1006549	
Heptachlor	ND	U	1.2	0.14	1	06/24/10	07/16/10	KWG1006549	
Aldrin	0.83	JP	1.2	0.19	1	06/24/10	07/16/10	KWG1006549	
gamma-Chlordane†	23		1.2	0.11	1	06/24/10	07/16/10	KWG1006549	
Heptachlor Epoxide	ND	Ui	1.2	1.2	1	06/24/10	07/16/10	KWG1006549	
Endosulfan I	5.3	P	1.2	0.072	1	06/24/10	07/16/10	KWG1006549	
Dieldrin	4.0		1.2	0.16	1	06/24/10	07/16/10	KWG1006549	
4,4'-DDE	18	P	1.2	0.13	1	06/24/10	07/16/10	KWG1006549	
Endrin	0.18	JP	1.2	0.11	1	06/24/10	07/16/10	KWG1006549	
Endosulfan II	ND	U	1.2	0.16	1	06/24/10	07/16/10	KWG1006549	
4,4'-DDD	43		1.2	0.13	1	06/24/10	07/16/10	KWG1006549	
Endrin Aldehyde	ND	U	1.2	0.14	1	06/24/10	07/16/10	KWG1006549	
Endosulfan Sulfate	ND	Ui	1.2	1.2	1	06/24/10	07/16/10	KWG1006549	
4,4'-DDT	ND	Ui	2.7	2.7	1	06/24/10	07/16/10	KWG1006549	
Toxaphene	ND	Ui	130	130	1	06/24/10	07/16/10	KWG1006549	
Chlordane	170		12	2.2	1	06/24/10	07/16/10	KWG1006549	
2,4'-DDE	ND	Ui	2.0	2.0	1	06/24/10	07/16/10	KWG1006549	
2,4'-DDD	7.1	P	1.2	0.15	1	06/24/10	07/16/10	KWG1006549	
2,4'-DDT	4.2	P	1.2	0.066	1	06/24/10	07/16/10	KWG1006549	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Tetrachloro-m-xylene	61	21-112	07/16/10	Acceptable
Decachlorobiphenyl	72	15-130	07/16/10	Acceptable

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Pacific EcoRisk Laboratories
Project: USACE San Rafael Channel/16087
Sample Matrix: Sediment

Service Request: K1006356
Date Collected: 06/10/2010
Date Received: 06/23/2010

Organochlorine Pesticides

Sample Name: SRC-2010-8-Z-Comp
Lab Code: K1006356-021

Units: ug/Kg
Basis: Dry

† Analyte Comments

gamma-Chlordane

For this analyte (CAS Registry No. 5103-74-2), USEPA has corrected the name to be beta-Chlordane, also known as trans-Chlordane.

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Pacific EcoRisk Laboratories
Project: USACE San Rafael Channel/16087
Sample Matrix: Sediment

Service Request: K1006356
Date Collected: NA
Date Received: NA

Organochlorine Pesticides

Sample Name: Method Blank
Lab Code: KWG1006235-13

Units: ug/Kg

Basis: Dry

Extraction Method: EPA 3541

Level: Low

Analysis Method: 8081A

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
alpha-BHC	ND	U	0.50	0.11	1	06/22/10	06/28/10	KWG1006235	
alpha-Chlordane	ND	U	0.50	0.10	1	06/22/10	06/28/10	KWG1006235	
beta-BHC	ND	U	0.50	0.18	1	06/22/10	06/28/10	KWG1006235	
gamma-BHC (Lindane)	ND	U	0.50	0.080	1	06/22/10	06/28/10	KWG1006235	
delta-BHC	ND	U	0.50	0.074	1	06/22/10	06/28/10	KWG1006235	
Heptachlor	ND	U	0.50	0.12	1	06/22/10	06/28/10	KWG1006235	
Aldrin	ND	U	0.50	0.16	1	06/22/10	06/28/10	KWG1006235	
gamma-Chlordane†	ND	U	0.50	0.090	1	06/22/10	06/28/10	KWG1006235	
Heptachlor Epoxide	ND	U	0.50	0.084	1	06/22/10	06/28/10	KWG1006235	
Endosulfan I	ND	U	0.50	0.063	1	06/22/10	06/28/10	KWG1006235	
Dieldrin	ND	U	0.50	0.14	1	06/22/10	06/28/10	KWG1006235	
4,4'-DDE	ND	U	0.50	0.11	1	06/22/10	06/28/10	KWG1006235	
Endrin	ND	U	0.50	0.094	1	06/22/10	06/28/10	KWG1006235	
Endosulfan II	ND	U	0.50	0.14	1	06/22/10	06/28/10	KWG1006235	
4,4'-DDD	ND	U	0.50	0.11	1	06/22/10	06/28/10	KWG1006235	
Endrin Aldehyde	ND	U	0.50	0.12	1	06/22/10	06/28/10	KWG1006235	
Endosulfan Sulfate	ND	U	0.50	0.11	1	06/22/10	06/28/10	KWG1006235	
4,4'-DDT	ND	U	0.50	0.17	1	06/22/10	06/28/10	KWG1006235	
Toxaphene	ND	U	25	4.8	1	06/22/10	06/28/10	KWG1006235	
Chlordane	ND	U	5.0	1.9	1	06/22/10	06/28/10	KWG1006235	
2,4'-DDE	ND	U	0.50	0.16	1	06/22/10	06/28/10	KWG1006235	
2,4'-DDD	ND	U	0.50	0.13	1	06/22/10	06/28/10	KWG1006235	
2,4'-DDT	ND	U	0.50	0.058	1	06/22/10	06/28/10	KWG1006235	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Tetrachloro-m-xylene	61	21-112	06/28/10	Acceptable
Decachlorobiphenyl	79	15-130	06/28/10	Acceptable

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Pacific EcoRisk Laboratories
Project: USACE San Rafael Channel/16087
Sample Matrix: Sediment

Service Request: K1006356
Date Collected: NA
Date Received: NA

Organochlorine Pesticides

Sample Name: Method Blank
Lab Code: KWG1006235-13

Units: ug/Kg
Basis: Dry

† Analyte Comments

gamma-Chlordane

For this analyte (CAS Registry No. 5103-74-2), USEPA has corrected the name to be beta-Chlordane, also known as trans-Chlordane.

Comments: _____

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Pacific EcoRisk Laboratories
Project: USACE San Rafael Channel/16087
Sample Matrix: Sediment

Service Request: K1006356
Date Collected: NA
Date Received: NA

Organochlorine Pesticides

Sample Name: Method Blank
Lab Code: KWG1006549-10

Units: ug/Kg

Basis: Dry

Extraction Method: EPA 3541

Level: Low

Analysis Method: 8081A

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
alpha-BHC	ND	U	0.50	0.11	1	06/24/10	07/16/10	KWG1006549	
alpha-Chlordane	ND	U	0.50	0.10	1	06/24/10	07/16/10	KWG1006549	
beta-BHC	ND	U	0.50	0.18	1	06/24/10	07/16/10	KWG1006549	
gamma-BHC (Lindane)	ND	U	0.50	0.080	1	06/24/10	07/16/10	KWG1006549	
delta-BHC	ND	U	0.50	0.074	1	06/24/10	07/16/10	KWG1006549	
Heptachlor	ND	U	0.50	0.12	1	06/24/10	07/16/10	KWG1006549	
Aldrin	ND	U	0.50	0.16	1	06/24/10	07/16/10	KWG1006549	
gamma-Chlordane†	ND	U	0.50	0.090	1	06/24/10	07/16/10	KWG1006549	
Heptachlor Epoxide	ND	U	0.50	0.084	1	06/24/10	07/16/10	KWG1006549	
Endosulfan I	ND	U	0.50	0.063	1	06/24/10	07/16/10	KWG1006549	
Dieldrin	ND	U	0.50	0.14	1	06/24/10	07/16/10	KWG1006549	
4,4'-DDE	ND	U	0.50	0.11	1	06/24/10	07/16/10	KWG1006549	
Endrin	ND	U	0.50	0.094	1	06/24/10	07/16/10	KWG1006549	
Endosulfan II	ND	U	0.50	0.14	1	06/24/10	07/16/10	KWG1006549	
4,4'-DDD	ND	U	0.50	0.11	1	06/24/10	07/16/10	KWG1006549	
Endrin Aldehyde	ND	U	0.50	0.12	1	06/24/10	07/16/10	KWG1006549	
Endosulfan Sulfate	ND	U	0.50	0.11	1	06/24/10	07/16/10	KWG1006549	
4,4'-DDT	ND	U	0.50	0.17	1	06/24/10	07/16/10	KWG1006549	
Toxaphene	ND	U	25	4.8	1	06/24/10	07/16/10	KWG1006549	
Chlordane	ND	U	5.0	1.9	1	06/24/10	07/16/10	KWG1006549	
2,4'-DDE	ND	U	0.50	0.16	1	06/24/10	07/16/10	KWG1006549	
2,4'-DDD	ND	U	0.50	0.13	1	06/24/10	07/16/10	KWG1006549	
2,4'-DDT	ND	U	0.50	0.058	1	06/24/10	07/16/10	KWG1006549	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Tetrachloro-m-xylene	59	21-112	07/16/10	Acceptable
Decachlorobiphenyl	64	15-130	07/16/10	Acceptable

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Pacific EcoRisk Laboratories
Project: USACE San Rafael Channel/16087
Sample Matrix: Sediment

Service Request: K1006356
Date Collected: NA
Date Received: NA

Organochlorine Pesticides

Sample Name: Method Blank
Lab Code: KWG1006549-10

Units: ug/Kg
Basis: Dry

† **Analyte Comments**

gamma-Chlordane

For this analyte (CAS Registry No. 5103-74-2), USEPA has corrected the name to be beta-Chlordane, also known as trans-Chlordane.

Comments:

Client: Pacific EcoRisk Laboratories
Project: USACE San Rafael Channel/16087
Sample Matrix: Sediment

Service Request: K1006356

**Surrogate Recovery Summary
Organochlorine Pesticides**

Extraction Method: EPA 3541
Analysis Method: 8081A

Units: PERCENT
Level: Low

<u>Sample Name</u>	<u>Lab Code</u>	<u>Sur1</u>	<u>Sur2</u>
SRC-2010-1-CompMS	KWG1006235-10	73	80
SRC-2010-1-CompDMS	KWG1006235-11	72	83
SRC-2010-1-CompDMS	KWG1006235-2	68	73
SRC-2010-1-CompMS	KWG1006235-7	72	85
SRC-2010-1-CompDMS	KWG1006235-8	74	85
SRC-2010-1-Comp	K1006356-001	66	83
SRC-2010-2-Comp	K1006356-002	64	73
SRC-2010-3-Comp	K1006356-003	56	67
SRC-2010-4-Comp	K1006356-004	63	77
SRC-2010-5-Comp	K1006356-005	60	77
SRC-2010-6-Comp	K1006356-006	61	72
SRC-2010-7-Comp	K1006356-007	45	51
SRC-2010-7-Z-Comp	K1006356-008	63	71
SRC-2010-1-B-Comp	K1006356-009	53	64
SRC-2010-2-B-Comp	K1006356-010	53	66
SRC-2010-3-B-Comp	K1006356-011	58	67
SRC-2010-4-B-Comp	K1006356-012	53	66
SRC-2010-5-B-Comp	K1006356-013	64	71
SRC-2010-6-B-Comp	K1006356-014	80	94
SRC-2010-7-B-Comp	K1006356-015	66	77
SRC-2010-7-1	K1006356-016	75	88
SRC-2010-7-2	K1006356-017	67	78
SRC-2010-7-3	K1006356-018	63	73
SRC-2010-7-4	K1006356-019	67	77
SRC-2010-7-5	K1006356-020	72	83
SRC-2010-8-Z-Comp	K1006356-021	61	72
Method Blank	KWG1006235-13	61	79
Method Blank	KWG1006549-10	59	64
Batch QC	K1006486-001	49	57
SRC-2010-1-CompMS	KWG1006235-1	65	71
Batch QCMS	KWG1006549-1	51	57
Batch QCDMS	KWG1006549-2	45	54
Batch QCMS	KWG1006549-4	58	59
Batch QCDMS	KWG1006549-5	53	55

Surrogate Recovery Control Limits (%)

Sur1 = Tetrachloro-m-xylene	21-112
Sur2 = Decachlorobiphenyl	15-130

Results flagged with an asterisk (*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Pacific EcoRisk Laboratories
Project: USACE San Rafael Channel/16087
Sample Matrix: Sediment

Service Request: K1006356**Surrogate Recovery Summary
Organochlorine Pesticides**

Extraction Method: EPA 3541
Analysis Method: 8081A

Units: PERCENT
Level: Low

<u>Sample Name</u>	<u>Lab Code</u>	<u>Sur1</u>	<u>Sur2</u>
Batch QCMS	KWG1006549-7	50	57
Batch QCDMS	KWG1006549-8	51	59
Lab Control Sample	KWG1006235-3	65	77
Lab Control Sample	KWG1006549-3	61	71

Surrogate Recovery Control Limits (%)

Sur1 = Tetrachloro-m-xylene	21-112
Sur2 = Decachlorobiphenyl	15-130

Results flagged with an asterisk (*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Pacific EcoRisk Laboratories
Project: USACE San Rafael Channel/16087
Sample Matrix: Sediment

Service Request: K1006356
Date Extracted: 06/22/2010
Date Analyzed: 06/29/2010

Matrix Spike/Duplicate Matrix Spike Summary
Organochlorine Pesticides

Sample Name: SRC-2010-1-Comp
Lab Code: K1006356-001
Extraction Method: EPA 3541
Analysis Method: 8081A

Units: ug/Kg
Basis: Dry
Level: Low
Extraction Lot: KWG1006235

Analyte Name	Sample Result	SRC-2010-1-CompMS KWG1006235-1 Matrix Spike			SRC-2010-1-CompDMS KWG1006235-2 Duplicate Matrix Spike			%Rec Limits	RPD	RPD Limit
		Result	Expected	%Rec	Result	Expected	%Rec			
alpha-BHC	ND	15.9	22.4	71	16.9	22.4	75	23-133	6	40
alpha-Chlordane	ND	15.0	22.4	67	16.2	22.4	72	24-132	7	40
beta-BHC	ND	15.3	22.4	68	16.1	22.4	72	22-142	5	40
gamma-BHC (Lindane)	ND	15.8	22.4	71	16.8	22.4	75	26-135	6	40
delta-BHC	0.10	15.4	22.4	68	17.5	22.4	78	25-148	13	40
Heptachlor	ND	15.4	22.4	69	16.6	22.4	74	21-136	7	40
Aldrin	ND	13.5	22.4	60	14.7	22.4	65	22-135	8	40
gamma-Chlordane	0.29	15.1	22.4	66	16.4	22.4	72	24-133	8	40
Heptachlor Epoxide	ND	15.2	22.4	68	16.1	22.4	72	25-129	6	40
Endosulfan I	ND	15.2	22.4	68	16.1	22.4	72	15-119	6	40
Dieldrin	ND	15.0	22.4	67	17.0	22.4	76	26-133	12	40
4,4'-DDE	2.0	17.1	22.4	68	16.5	22.4	65	22-142	4	40
Endrin	ND	14.7	22.4	66	16.6	22.4	74	22-145	12	40
Endosulfan II	ND	13.8	22.4	62	15.8	22.4	70	13-129	13	40
4,4'-DDD	1.1	14.9	22.4	61	16.9	22.4	70	19-143	13	40
Endrin Aldehyde	ND	14.4	22.4	64	14.8	22.4	66	10-129	2	40
Endosulfan Sulfate	ND	12.0	22.4	53	15.3	22.4	68	20-134	25	40
4,4'-DDT	ND	14.9	22.4	67	16.4	22.4	73	19-154	9	40

Results flagged with an asterisk (*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Pacific EcoRisk Laboratories
Project: USACE San Rafael Channel/16087
Sample Matrix: Sediment

Service Request: K1006356
Date Extracted: 06/22/2010
Date Analyzed: 06/29/2010

Matrix Spike/Duplicate Matrix Spike Summary
Organochlorine Pesticides

Sample Name: SRC-2010-1-Comp
Lab Code: K1006356-001
Extraction Method: EPA 3541
Analysis Method: 8081A

Units: ug/Kg
Basis: Dry
Level: Low
Extraction Lot: KWG1006235

Analyte Name	Sample Result	SRC-2010-1-CompMS KWG1006235-10 Matrix Spike			SRC-2010-1-CompDMS KWG1006235-11 Duplicate Matrix Spike			%Rec Limits	RPD	RPD Limit
		Result	Expected	%Rec	Result	Expected	%Rec			
Toxaphene	ND	173	224	77	174	224	78	20-155	1	40
Chlordane	ND	225	224	101	226	224	101	46-139	0	40

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COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Pacific EcoRisk Laboratories
Project: USACE San Rafael Channel/16087
Sample Matrix: Sediment

Service Request: K1006356
Date Extracted: 06/22/2010
Date Analyzed: 06/29/2010

Matrix Spike/Duplicate Matrix Spike Summary
Organochlorine Pesticides

Sample Name: SRC-2010-1-Comp
Lab Code: K1006356-001
Extraction Method: EPA 3541
Analysis Method: 8081A

Units: ug/Kg
Basis: Dry
Level: Low
Extraction Lot: KWG1006235

Analyte Name	Sample Result	SRC-2010-1-CompMS KWG1006235-7 Matrix Spike			SRC-2010-1-CompDMS KWG1006235-8 Duplicate Matrix Spike			%Rec Limits	RPD	RPD Limit
		Result	Expected	%Rec	Result	Expected	%Rec			
2,4'-DDE	ND	21.2	22.4	94	22.0	22.4	98	24-141	4	40
2,4'-DDD	0.51	20.1	22.4	88	21.1	22.4	92	12-147	5	40
2,4'-DDT	0.44	20.1	22.4	88	21.1	22.4	92	15-141	5	40

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COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Pacific EcoRisk Laboratories
 Project: USACE San Rafael Channel/16087
 Sample Matrix: Sediment

Service Request: K1006356
 Date Extracted: 06/24/2010
 Date Analyzed: 07/17/2010

Matrix Spike/Duplicate Matrix Spike Summary
 Organochlorine Pesticides

Sample Name: Batch QC
 Lab Code: K1006486-001
 Extraction Method: EPA 3541
 Analysis Method: 8081A

Units: ug/Kg
 Basis: Dry
 Level: Low
 Extraction Lot: KWG1006549

Analyte Name	Sample Result	Batch QCMS KWG1006549-1 Matrix Spike			Batch QCMS KWG1006549-2 Duplicate Matrix Spike			%Rec Limits	RPD	RPD Limit
		Result	Expected	%Rec	Result	Expected	%Rec			
alpha-BHC	ND	14.3	22.7	63	12.6	22.7	55	23-133	13	40
alpha-Chlordane	ND	13.0	22.7	57	12.3	22.7	54	24-132	6	40
beta-BHC	ND	12.9	22.7	57	11.6	22.7	51	22-142	11	40
gamma-BHC (Lindane)	ND	14.3	22.7	63	12.8	22.7	56	26-135	11	40
delta-BHC	ND	16.1	22.7	71	14.4	22.7	64	25-148	11	40
Heptachlor	ND	16.0	22.7	70	14.3	22.7	63	21-136	11	40
Aldrin	ND	14.2	22.7	63	12.6	22.7	55	22-135	12	40
gamma-Chlordane	ND	14.6	22.7	64	13.2	22.7	58	24-133	10	40
Heptachlor Epoxide	ND	14.5	22.7	64	13.1	22.7	58	25-129	10	40
Endosulfan I	ND	12.8	22.7	56	11.5	22.7	51	15-119	10	40
Dieldrin	ND	14.5	22.7	64	13.2	22.7	58	26-133	10	40
4,4'-DDE	ND	24.5	22.7	108	24.8	22.7	109	22-142	1	40
Endrin	ND	14.5	22.7	64	13.2	22.7	58	22-145	10	40
Endosulfan II	ND	13.0	22.7	57	11.9	22.7	52	13-129	9	40
4,4'-DDD	ND	24.4	22.7	107	23.4	22.7	103	19-143	4	40
Endrin Aldehyde	ND	13.6	22.7	60	12.4	22.7	55	10-129	9	40
Endosulfan Sulfate	ND	14.4	22.7	63	13.2	22.7	58	20-134	9	40
4,4'-DDT	0.26	18.8	22.7	82	18.2	22.7	79	19-154	4	40

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Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

Client: Pacific EcoRisk Laboratories
Project: USACE San Rafael Channel/16087
Sample Matrix: Sediment

Service Request: K1006356
Date Extracted: 06/24/2010
Date Analyzed: 07/17/2010

Matrix Spike/Duplicate Matrix Spike Summary
Organochlorine Pesticides

Sample Name: Batch QC
Lab Code: K1006486-001
Extraction Method: EPA 3541
Analysis Method: 8081A

Units: ug/Kg
Basis: Dry
Level: Low
Extraction Lot: KWG1006549

Analyte Name	Sample Result	Batch QCMS KWG1006549-4 Matrix Spike			Batch QCDMS KWG1006549-5 Duplicate Matrix Spike			%Rec Limits	RPD	RPD Limit
		Result	Expected	%Rec	Result	Expected	%Rec			
Toxaphene	ND	218	227	96	216	227	95	20-155	1	40
Chlordane	ND	182	227	80	167	227	74	46-139	8	40

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Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Pacific EcoRisk Laboratories
Project: USACE San Rafael Channel/16087
Sample Matrix: Sediment

Service Request: K1006356
Date Extracted: 06/24/2010
Date Analyzed: 07/17/2010

Matrix Spike/Duplicate Matrix Spike Summary
Organochlorine Pesticides

Sample Name: Batch QC
Lab Code: K1006486-001

Units: ug/Kg
Basis: Dry

Extraction Method: EPA 3541
Analysis Method: 8081A.

Level: Low
Extraction Lot: KWG1006549

Analyte Name	Sample Result	Batch QCMS KWG1006549-7 Matrix Spike			Batch QCDMS KWG1006549-8 Duplicate Matrix Spike			%Rec Limits	RPD	RPD Limit
		Result	Expected	%Rec	Result	Expected	%Rec			
2,4'-DDE	ND	14.3	22.7	63	15.3	22.7	68	24-141	7	40
2,4'-DDD	0.19	12.8	22.7	55	14.0	22.7	61	12-147	10	40
2,4'-DDT	0.42	15.4	22.7	66	17.0	22.7	73	15-141	10	40

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COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Pacific EcoRisk Laboratories
Project: USACE San Rafael Channel/16087
Sample Matrix: Sediment

Service Request: K1006356
Date Extracted: 06/22/2010
Date Analyzed: 06/28/2010 -
06/29/2010

**Lab Control Spike Summary
Organochlorine Pesticides**

Extraction Method: EPA 3541
Analysis Method: 8081A

Units: ug/Kg
Basis: Dry
Level: Low
Extraction Lot: KWG1006235

Analyte Name	Lab Control Sample KWG1006235-3 Lab Control Spike			%Rec Limits
	Result	Expected	%Rec	
alpha-BHC	15.5	20.0	77	36-139
alpha-Chlordane	14.8	20.0	74	41-134
beta-BHC	15.2	20.0	76	38-142
gamma-BHC (Lindane)	15.7	20.0	78	40-142
delta-BHC	16.3	20.0	81	48-145
Heptachlor	15.0	20.0	75	39-135
Aldrin	14.5	20.0	73	37-134
gamma-Chlordane	14.7	20.0	74	41-135
Heptachlor Epoxide	14.8	20.0	74	45-118
Endosulfan I	14.6	20.0	73	35-121
Dieldrin	15.4	20.0	77	46-136
4,4'-DDE	15.4	20.0	77	46-141
Endrin	14.4	20.0	72	40-152
Endosulfan II	14.6	20.0	73	39-128
4,4'-DDD	15.0	20.0	75	46-146
Endrin Aldehyde	13.8	20.0	69	32-132
Endosulfan Sulfate	15.1	20.0	75	43-138
4,4'-DDT	15.2	20.0	76	46-151
Toxaphene	146	200	73	53-133
Chlordane	189	200	94	52-140
2,4'-DDE	16.9	20.0	85	49-112
2,4'-DDD	16.7	20.0	84	53-115
2,4'-DDT	16.7	20.0	83	44-120

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Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Pacific EcoRisk Laboratories
Project: USACE San Rafael Channel/16087
Sample Matrix: Sediment

Service Request: K1006356
Date Extracted: 06/24/2010
Date Analyzed: 07/16/2010

**Lab Control Spike Summary
Organochlorine Pesticides**

Extraction Method: EPA 3541
Analysis Method: 8081A

Units: ug/Kg
Basis: Dry
Level: Low
Extraction Lot: KWG1006549

Analyte Name	Lab Control Sample KWG1006549-3 Lab Control Spike			%Rec Limits
	Result	Expected	%Rec	
alpha-BHC	13.8	20.0	69	36-139
alpha-Chlordane	12.4	20.0	62	41-134
beta-BHC	13.2	20.0	66	38-142
gamma-BHC (Lindane)	13.9	20.0	69	40-142
delta-BHC	15.0	20.0	75	48-145
Heptachlor	12.0	20.0	60	39-135
Aldrin	13.3	20.0	66	37-134
gamma-Chlordane	13.6	20.0	68	41-135
Heptachlor Epoxide	13.9	20.0	69	45-118
Endosulfan I	12.6	20.0	63	35-121
Dieldrin	14.3	20.0	72	46-136
4,4'-DDE	17.6	20.0	88	46-141
Endrin	13.6	20.0	68	40-152
Endosulfan II	13.2	20.0	66	39-128
4,4'-DDD	18.6	20.0	93	46-146
Endrin Aldehyde	12.3	20.0	62	32-132
Endosulfan Sulfate	14.1	20.0	71	43-138
4,4'-DDT	17.0	20.0	85	46-151
Toxaphene	190	200	95	53-133
Chlordane	159	200	80	52-140
2,4'-DDE	15.1	20.0	75	49-112
2,4'-DDD	15.0	20.0	75	53-115
2,4'-DDT	16.0	20.0	80	44-120

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COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Pacific EcoRisk Laboratories
Project: USACE San Rafael Channel/16087
Sample Matrix: Sediment

Service Request: K1006356
Date Collected: 06/08/2010
Date Received: 06/18/2010

Organochlorine Pesticides

Sample Name: SRC-2010-1-Comp
Lab Code: K1006356-001
Extraction Method: EPA 3541
Analysis Method: 8081A

Units: ug/Kg
Basis: Dry
Level: Low

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Methoxychlor	ND	U	1.2	0.22	1	06/22/10	06/29/10	KWG1006235	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Tetrachloro-m-xylene	66	21-112	06/29/10	Acceptable
Decachlorobiphenyl	83	15-130	06/29/10	Acceptable

Comments: _____

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Pacific EcoRisk Laboratories
Project: USACE San Rafael Channel/16087
Sample Matrix: Sediment

Service Request: K1006356
Date Collected: 06/09/2010
Date Received: 06/18/2010

Organochlorine Pesticides

Sample Name: SRC-2010-2-Comp
Lab Code: K1006356-002
Extraction Method: EPA 3541
Analysis Method: 8081A

Units: ug/Kg
Basis: Dry
Level: Low

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Methoxychlor	ND	U	1.1	0.21	1	06/22/10	06/29/10	KWG1006235	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Tetrachloro-m-xylene	64	21-112	06/29/10	Acceptable
Decachlorobiphenyl	73	15-130	06/29/10	Acceptable

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Pacific EcoRisk Laboratories
Project: USACE San Rafael Channel/16087
Sample Matrix: Sediment

Service Request: K1006356
Date Collected: 06/09/2010
Date Received: 06/18/2010

Organochlorine Pesticides

Sample Name: SRC-2010-3-Comp
Lab Code: K1006356-003
Extraction Method: EPA 3541
Analysis Method: 8081A

Units: ug/Kg
Basis: Dry
Level: Low

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Methoxychlor	ND	U	1.1	0.20	1	06/22/10	06/29/10	KWG1006235	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Tetrachloro-m-xylene	56	21-112	06/29/10	Acceptable
Decachlorobiphenyl	67	15-130	06/29/10	Acceptable

Comments:

Analytical Results

Client: Pacific EcoRisk Laboratories
Project: USACE San Rafael Channel/16087
Sample Matrix: Sediment

Service Request: K1006356
Date Collected: 06/11/2010
Date Received: 06/18/2010

Organochlorine Pesticides

Sample Name: SRC-2010-4-Comp
Lab Code: K1006356-004
Extraction Method: EPA 3541
Analysis Method: 8081A

Units: ug/Kg
Basis: Dry
Level: Low

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Methoxychlor	ND	U	1.1	0.21	1	06/22/10	06/29/10	KWG1006235	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Tetrachloro-m-xylene	63	21-112	06/29/10	Acceptable
Decachlorobiphenyl	77	15-130	06/29/10	Acceptable

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Pacific EcoRisk Laboratories
Project: USACE San Rafael Channel/16087
Sample Matrix: Sediment

Service Request: K1006356
Date Collected: 06/08/2010
Date Received: 06/18/2010

Organochlorine Pesticides

Sample Name: SRC-2010-5-Comp
Lab Code: K1006356-005
Extraction Method: EPA 3541
Analysis Method: 8081A

Units: ug/Kg
Basis: Dry
Level: Low

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Methoxychlor	ND	U	1.2	0.22	1	06/22/10	06/29/10	KWG1006235	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Tetrachloro-m-xylene	60	21-112	06/29/10	Acceptable
Decachlorobiphenyl	77	15-130	06/29/10	Acceptable

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Pacific EcoRisk Laboratories
Project: USACE San Rafael Channel/16087
Sample Matrix: Sediment

Service Request: K1006356
Date Collected: 06/09/2010
Date Received: 06/18/2010

Organochlorine Pesticides

Sample Name: SRC-2010-6-Comp
Lab Code: K1006356-006
Extraction Method: EPA 3541
Analysis Method: 8081A

Units: ug/Kg
Basis: Dry
Level: Low

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Methoxychlor	ND	U	1.3	0.24	1	06/22/10	06/29/10	KWG1006235	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Tetrachloro-m-xylene	61	21-112	06/29/10	Acceptable
Decachlorobiphenyl	72	15-130	06/29/10	Acceptable

Comments: _____

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Pacific EcoRisk Laboratories
Project: USACE San Rafael Channel/16087
Sample Matrix: Sediment

Service Request: K1006356
Date Collected: 06/10/2010
Date Received: 06/18/2010

Organochlorine Pesticides

Sample Name: SRC-2010-7-Comp
Lab Code: K1006356-007
Extraction Method: EPA 3541
Analysis Method: 8081A

Units: ug/Kg
Basis: Dry
Level: Low

Analyte Name	Result Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Methoxychlor	ND Ui	1.2	1.2	1	06/22/10	06/29/10	KWG1006235	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Tetrachloro-m-xylene	45	21-112	06/29/10	Acceptable
Decachlorobiphenyl	51	15-130	06/29/10	Acceptable

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Pacific EcoRisk Laboratories
Project: USACE San Rafael Channel/16087
Sample Matrix: Sediment

Service Request: K1006356
Date Collected: 06/10/2010
Date Received: 06/18/2010

Organochlorine Pesticides

Sample Name: SRC-2010-7-Z-Comp
Lab Code: K1006356-008
Extraction Method: EPA 3541
Analysis Method: 8081A

Units: ug/Kg
Basis: Dry
Level: Low

Analyte Name	Result Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Methoxychlor	ND U	1.1	0.20	1	06/22/10	06/29/10	KWG1006235	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Tetrachloro-m-xylene	63	21-112	06/29/10	Acceptable
Decachlorobiphenyl	71	15-130	06/29/10	Acceptable

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Pacific EcoRisk Laboratories
Project: USACE San Rafael Channel/16087
Sample Matrix: Sediment

Service Request: K1006356
Date Collected: 06/10/2010
Date Received: 06/18/2010

Organochlorine Pesticides

Sample Name: SRC-2010-7-1
Lab Code: K1006356-016
Extraction Method: EPA 3541
Analysis Method: 8081A

Units: ug/Kg
Basis: Dry
Level: Low

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Methoxychlor	ND	Ui	1.3	0.29	1	06/22/10	06/30/10	KWG1006235	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Tetrachloro-m-xylene	75	21-112	06/30/10	Acceptable
Decachlorobiphenyl	88	15-130	06/30/10	Acceptable

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Pacific EcoRisk Laboratories
Project: USACE San Rafael Channel/16087
Sample Matrix: Sediment

Service Request: K1006356
Date Collected: 06/10/2010
Date Received: 06/18/2010

Organochlorine Pesticides

Sample Name: SRC-2010-7-2
Lab Code: K1006356-017
Extraction Method: EPA 3541
Analysis Method: 8081A

Units: ug/Kg
Basis: Dry
Level: Low

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Methoxychlor	ND	U	1.2	0.23	1	06/22/10	06/30/10	KWG1006235	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Tetrachloro-m-xylene	67	21-112	06/30/10	Acceptable
Decachlorobiphenyl	78	15-130	06/30/10	Acceptable

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Pacific EcoRisk Laboratories
Project: USACE San Rafael Channel/16087
Sample Matrix: Sediment

Service Request: K1006356
Date Collected: 06/10/2010
Date Received: 06/18/2010

Organochlorine Pesticides

Sample Name: SRC-2010-7-3
Lab Code: K1006356-018
Extraction Method: EPA 3541
Analysis Method: 8081A

Units: ug/Kg
Basis: Dry
Level: Low

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Methoxychlor	ND	Ui	1.3	0.64	1	06/22/10	06/30/10	KWG1006235	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Tetrachloro-m-xylene	63	21-112	06/30/10	Acceptable
Decachlorobiphenyl	73	15-130	06/30/10	Acceptable

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Pacific EcoRisk Laboratories
Project: USACE San Rafael Channel/16087
Sample Matrix: Sediment

Service Request: K1006356
Date Collected: 06/10/2010
Date Received: 06/18/2010

Organochlorine Pesticides

Sample Name: SRC-2010-7-4
Lab Code: K1006356-019
Extraction Method: EPA 3541
Analysis Method: 8081A

Units: ug/Kg
Basis: Dry
Level: Low

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Methoxychlor	ND	Ui	1.3	1.3	1	06/22/10	06/30/10	KWG1006235	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Tetrachloro-m-xylene	67	21-112	06/30/10	Acceptable
Decachlorobiphenyl	77	15-130	06/30/10	Acceptable

Comments: _____

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Pacific EcoRisk Laboratories
Project: USACE San Rafael Channel/16087
Sample Matrix: Sediment

Service Request: K1006356
Date Collected: 06/10/2010
Date Received: 06/18/2010

Organochlorine Pesticides

Sample Name: SRC-2010-7-5
Lab Code: K1006356-020
Extraction Method: EPA 3541
Analysis Method: 8081A

Units: ug/Kg
Basis: Dry
Level: Low

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Methoxychlor	1.7	P	1.2	0.22	1	06/22/10	06/30/10	KWG1006235	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Tetrachloro-m-xylene	72	21-112	06/30/10	Acceptable
Decachlorobiphenyl	83	15-130	06/30/10	Acceptable

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Pacific EcoRisk Laboratories
Project: USACE San Rafael Channel/16087
Sample Matrix: Sediment

Service Request: K1006356
Date Collected: 06/10/2010
Date Received: 06/23/2010

Organochlorine Pesticides

Sample Name: SRC-2010-8-Z-Comp
Lab Code: K1006356-021
Extraction Method: EPA 3541
Analysis Method: 8081A

Units: ug/Kg
Basis: Dry
Level: Low

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Methoxychlor	ND	Ui	2.8	2.8	1	06/24/10	07/16/10	KWG1006549	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Tetrachloro-m-xylene	61	21-112	07/16/10	Acceptable
Decachlorobiphenyl	72	15-130	07/16/10	Acceptable

Comments: _____

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Pacific EcoRisk Laboratories
Project: USACE San Rafael Channel/16087
Sample Matrix: Sediment

Service Request: K1006356
Date Collected: NA
Date Received: NA

Organochlorine Pesticides

Sample Name: Method Blank
Lab Code: KWG1006235-13
Extraction Method: EPA 3541
Analysis Method: 8081A

Units: ug/Kg
Basis: Dry
Level: Low

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Methoxychlor	ND	U	0.50	0.19	1	06/22/10	06/28/10	KWG1006235	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Tetrachloro-m-xylene	61	21-112	06/28/10	Acceptable
Decachlorobiphenyl	79	15-130	06/28/10	Acceptable

Comments: _____

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Pacific EcoRisk Laboratories
Project: USACE San Rafael Channel/16087
Sample Matrix: Sediment

Service Request: K1006356
Date Collected: NA
Date Received: NA

Organochlorine Pesticides

Sample Name: Method Blank
Lab Code: KWG1006549-10
Extraction Method: EPA 3541
Analysis Method: 8081A

Units: ug/Kg
Basis: Dry
Level: Low

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Methoxychlor	ND	U	0.50	0.19	1	06/24/10	07/16/10	KWG1006549	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Tetrachloro-m-xylene	59	21-112	07/16/10	Acceptable
Decachlorobiphenyl	64	15-130	07/16/10	Acceptable

Comments:

Client: Pacific EcoRisk Laboratories
Project: USACE San Rafael Channel/16087
Sample Matrix: Sediment

Service Request: K1006356

Surrogate Recovery Summary
Organochlorine Pesticides

Extraction Method: EPA 3541
Analysis Method: 8081A

Units: PERCENT
Level: Low

<u>Sample Name</u>	<u>Lab Code</u>	<u>Sur1</u>	<u>Sur2</u>
SRC-2010-1-Comp	K1006356-001	66	83
SRC-2010-2-Comp	K1006356-002	64	73
SRC-2010-3-Comp	K1006356-003	56	67
SRC-2010-4-Comp	K1006356-004	63	77
SRC-2010-5-Comp	K1006356-005	60	77
SRC-2010-6-Comp	K1006356-006	61	72
SRC-2010-7-Comp	K1006356-007	45	51
SRC-2010-7-Z-Comp	K1006356-008	63	71
SRC-2010-7-1	K1006356-016	75	88
SRC-2010-7-2	K1006356-017	67	78
SRC-2010-7-3	K1006356-018	63	73
SRC-2010-7-4	K1006356-019	67	77
SRC-2010-7-5	K1006356-020	72	83
SRC-2010-8-Z-Comp	K1006356-021	61	72
Method Blank	KWG1006235-13	61	79
Method Blank	KWG1006549-10	59	64
Batch QC	K1006486-001	49	57
SRC-2010-1-CompMS	KWG1006235-1	65	71
SRC-2010-1-CompDMS	KWG1006235-2	68	73
Batch QCMS	KWG1006549-1	51	57
Batch QCDMS	KWG1006549-2	45	54
Lab Control Sample	KWG1006235-3	65	77
Lab Control Sample	KWG1006549-3	61	71

Surrogate Recovery Control Limits (%)

Sur1 = Tetrachloro-m-xylene	21-112
Sur2 = Decachlorobiphenyl	15-130

Results flagged with an asterisk (*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Pacific EcoRisk Laboratories
Project: USACE San Rafael Channel/16087
Sample Matrix: Sediment

Service Request: K1006356
Date Extracted: 06/22/2010
Date Analyzed: 06/29/2010

Matrix Spike/Duplicate Matrix Spike Summary
Organochlorine Pesticides

Sample Name: SRC-2010-1-Comp
Lab Code: K1006356-001
Extraction Method: EPA 3541
Analysis Method: 8081A

Units: ug/Kg
Basis: Dry
Level: Low
Extraction Lot: KWG1006235

Analyte Name	Sample Result	SRC-2010-1-CompMS KWG1006235-1 Matrix Spike			SRC-2010-1-CompDMS KWG1006235-2 Duplicate Matrix Spike			%Rec Limits	RPD	RPD Limit
		Result	Expected	%Rec	Result	Expected	%Rec			
Methoxychlor	ND	14.0	22.4	62	15.2	22.4	68	24-151	9	40

Results flagged with an asterisk (*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Pacific EcoRisk Laboratories
Project: USACE San Rafael Channel/16087
Sample Matrix: Sediment

Service Request: K1006356
Date Extracted: 06/24/2010
Date Analyzed: 07/17/2010

Matrix Spike/Duplicate Matrix Spike Summary
Organochlorine Pesticides

Sample Name: Batch QC
Lab Code: K1006486-001
Extraction Method: EPA 3541
Analysis Method: 8081A

Units: ug/Kg
Basis: Dry
Level: Low
Extraction Lot: KWG1006549

Analyte Name	Sample Result	Batch QCMS KWG1006549-1 Matrix Spike			Batch QCDMS KWG1006549-2 Duplicate Matrix Spike			%Rec Limits	RPD	RPD Limit
		Result	Expected	%Rec	Result	Expected	%Rec			
Methoxychlor	ND	17.7	22.7	78	16.5	22.7	73	24-151	7	40

Results flagged with an asterisk (*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Pacific EcoRisk Laboratories
Project: USACE San Rafael Channel/16087
Sample Matrix: Sediment

Service Request: K1006356
Date Extracted: 06/22/2010
Date Analyzed: 06/28/2010

Lab Control Spike Summary
Organochlorine Pesticides

Extraction Method: EPA 3541
Analysis Method: 8081A

Units: ug/Kg
Basis: Dry
Level: Low
Extraction Lot: KWG1006235

Analyte Name	Lab Control Sample KWG1006235-3 Lab Control Spike			%Rec Limits
	Result	Expected	%Rec	
Methoxychlor	14.9	20.0	75	42-147

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Pacific EcoRisk Laboratories
Project: USACE San Rafael Channel/16087
Sample Matrix: Sediment

Service Request: K1006356
Date Extracted: 06/24/2010
Date Analyzed: 07/16/2010

Lab Control Spike Summary
Organochlorine Pesticides

Extraction Method: EPA 3541
Analysis Method: 8081A

Units: ug/Kg
Basis: Dry
Level: Low
Extraction Lot: KWG1006549

Lab Control Sample
KWG1006549-3
Lab Control Spike

Analyte Name	Result	Expected	%Rec	%Rec Limits
Methoxychlor	15.6	20.0	78	42-147

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

Polychlorinated Biphenyls

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Pacific EcoRisk Laboratories
Project: USACE San Rafael Channel/16087
Sample Matrix: Sediment

Service Request: K1006356
Date Collected: 06/08/2010
Date Received: 06/18/2010

Polychlorinated Biphenyls (PCBs)

Sample Name: SRC-2010-1-Comp
Lab Code: K1006356-001
Extraction Method: EPA 3541
Analysis Method: 8082

Units: ug/Kg
Basis: Dry
Level: Low

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Aroclor 1016	ND	U	12	2.4	1	06/22/10	07/03/10	KWG1006234	
Aroclor 1221	ND	U	23	2.4	1	06/22/10	07/03/10	KWG1006234	
Aroclor 1232	ND	U	12	2.4	1	06/22/10	07/03/10	KWG1006234	
Aroclor 1242	ND	U	12	2.4	1	06/22/10	07/03/10	KWG1006234	
Aroclor 1248	ND	U	12	2.4	1	06/22/10	07/03/10	KWG1006234	
Aroclor 1254	10	J	12	2.4	1	06/22/10	07/03/10	KWG1006234	
Aroclor 1260	9.6	J	12	2.4	1	06/22/10	07/03/10	KWG1006234	
Aroclor 1262	ND	U	12	2.4	1	06/22/10	07/03/10	KWG1006234	
Aroclor 1268	ND	U	12	2.4	1	06/22/10	07/03/10	KWG1006234	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Decachlorobiphenyl	96	35-133	07/03/10	Acceptable

Comments: _____

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Pacific EcoRisk Laboratories
Project: USACE San Rafael Channel/16087
Sample Matrix: Sediment

Service Request: K1006356
Date Collected: 06/09/2010
Date Received: 06/18/2010

Polychlorinated Biphenyls (PCBs)

Sample Name: SRC-2010-2-Comp
Lab Code: K1006356-002
Extraction Method: EPA 3541
Analysis Method: 8082

Units: ug/Kg
Basis: Dry
Level: Low

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Aroclor 1016	ND	U	11	2.3	1	06/22/10	07/03/10	KWG1006234	
Aroclor 1221	ND	U	22	2.3	1	06/22/10	07/03/10	KWG1006234	
Aroclor 1232	ND	U	11	2.3	1	06/22/10	07/03/10	KWG1006234	
Aroclor 1242	ND	U	11	2.3	1	06/22/10	07/03/10	KWG1006234	
Aroclor 1248	ND	U	11	2.3	1	06/22/10	07/03/10	KWG1006234	
Aroclor 1254	ND	Ui	11	4.2	1	06/22/10	07/03/10	KWG1006234	
Aroclor 1260	ND	Ui	11	5.5	1	06/22/10	07/03/10	KWG1006234	
Aroclor 1262	ND	U	11	2.3	1	06/22/10	07/03/10	KWG1006234	
Aroclor 1268	ND	U	11	2.3	1	06/22/10	07/03/10	KWG1006234	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Decachlorobiphenyl	96	35-133	07/03/10	Acceptable

Comments: _____

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Pacific EcoRisk Laboratories
Project: USACE San Rafael Channel/16087
Sample Matrix: Sediment

Service Request: K1006356
Date Collected: 06/09/2010
Date Received: 06/18/2010

Polychlorinated Biphenyls (PCBs)

Sample Name: SRC-2010-3-Comp
Lab Code: K1006356-003
Extraction Method: EPA 3541
Analysis Method: 8082

Units: ug/Kg
Basis: Dry
Level: Low

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Aroclor 1016	ND	U	11	2.2	1	06/22/10	07/03/10	KWG1006234	
Aroclor 1221	ND	U	21	2.2	1	06/22/10	07/03/10	KWG1006234	
Aroclor 1232	ND	U	11	2.2	1	06/22/10	07/03/10	KWG1006234	
Aroclor 1242	ND	U	11	2.2	1	06/22/10	07/03/10	KWG1006234	
Aroclor 1248	ND	U	11	2.2	1	06/22/10	07/03/10	KWG1006234	
Aroclor 1254	3.8	JP	11	2.2	1	06/22/10	07/03/10	KWG1006234	
Aroclor 1260	5.5	J	11	2.2	1	06/22/10	07/03/10	KWG1006234	
Aroclor 1262	ND	U	11	2.2	1	06/22/10	07/03/10	KWG1006234	
Aroclor 1268	ND	U	11	2.2	1	06/22/10	07/03/10	KWG1006234	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Decachlorobiphenyl	97	35-133	07/03/10	Acceptable

Comments: _____

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Pacific EcoRisk Laboratories
Project: USACE San Rafael Channel/16087
Sample Matrix: Sediment

Service Request: K1006356
Date Collected: 06/11/2010
Date Received: 06/18/2010

Polychlorinated Biphenyls (PCBs)

Sample Name: SRC-2010-4-Comp
Lab Code: K1006356-004
Extraction Method: EPA 3541
Analysis Method: 8082

Units: ug/Kg
Basis: Dry
Level: Low

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Aroclor 1016	ND	U	11	2.3	1	06/22/10	07/03/10	KWG1006234	
Aroclor 1221	ND	U	22	2.3	1	06/22/10	07/03/10	KWG1006234	
Aroclor 1232	ND	U	11	2.3	1	06/22/10	07/03/10	KWG1006234	
Aroclor 1242	ND	U	11	2.3	1	06/22/10	07/03/10	KWG1006234	
Aroclor 1248	ND	U	11	2.3	1	06/22/10	07/03/10	KWG1006234	
Aroclor 1254	ND	U	11	4.4	1	06/22/10	07/03/10	KWG1006234	
Aroclor 1260	ND	U	11	2.3	1	06/22/10	07/03/10	KWG1006234	
Aroclor 1262	ND	U	11	2.3	1	06/22/10	07/03/10	KWG1006234	
Aroclor 1268	ND	U	11	2.3	1	06/22/10	07/03/10	KWG1006234	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Decachlorobiphenyl	108	35-133	07/03/10	Acceptable

Comments: _____

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Pacific EcoRisk Laboratories
Project: USACE San Rafael Channel/16087
Sample Matrix: Sediment

Service Request: K1006356
Date Collected: 06/08/2010
Date Received: 06/18/2010

Polychlorinated Biphenyls (PCBs)

Sample Name: SRC-2010-5-Comp
Lab Code: K1006356-005
Extraction Method: EPA 3541
Analysis Method: 8082

Units: ug/Kg
Basis: Dry
Level: Low

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Aroclor 1016	ND	U	12	2.4	1	06/22/10	07/03/10	KWG1006234	
Aroclor 1221	ND	U	23	2.4	1	06/22/10	07/03/10	KWG1006234	
Aroclor 1232	ND	U	12	2.4	1	06/22/10	07/03/10	KWG1006234	
Aroclor 1242	ND	U	12	2.4	1	06/22/10	07/03/10	KWG1006234	
Aroclor 1248	ND	U	12	2.4	1	06/22/10	07/03/10	KWG1006234	
Aroclor 1254	8.8	J	12	2.4	1	06/22/10	07/03/10	KWG1006234	
Aroclor 1260	8.7	J	12	2.4	1	06/22/10	07/03/10	KWG1006234	
Aroclor 1262	ND	U	12	2.4	1	06/22/10	07/03/10	KWG1006234	
Aroclor 1268	ND	U	12	2.4	1	06/22/10	07/03/10	KWG1006234	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Decachlorobiphenyl	98	35-133	07/03/10	Acceptable

Comments: _____

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Pacific EcoRisk Laboratories
Project: USACE San Rafael Channel/16087
Sample Matrix: Sediment

Service Request: K1006356
Date Collected: 06/09/2010
Date Received: 06/18/2010

Polychlorinated Biphenyls (PCBs)

Sample Name: SRC-2010-6-Comp
Lab Code: K1006356-006
Extraction Method: EPA 3541
Analysis Method: 8082

Units: ug/Kg
Basis: Dry
Level: Low

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Aroclor 1016	ND	U	13	2.6	1	06/22/10	07/12/10	KWG1006234	
Aroclor 1221	ND	U	25	2.6	1	06/22/10	07/12/10	KWG1006234	
Aroclor 1232	ND	U	13	2.6	1	06/22/10	07/12/10	KWG1006234	
Aroclor 1242	ND	Ui	13	8.9	1	06/22/10	07/12/10	KWG1006234	
Aroclor 1248	ND	U	13	2.6	1	06/22/10	07/12/10	KWG1006234	
Aroclor 1254	13	J	13	2.6	1	06/22/10	07/12/10	KWG1006234	
Aroclor 1260	5.0	J	13	2.6	1	06/22/10	07/12/10	KWG1006234	
Aroclor 1262	ND	U	13	2.6	1	06/22/10	07/12/10	KWG1006234	
Aroclor 1268	ND	U	13	2.6	1	06/22/10	07/12/10	KWG1006234	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Decachlorobiphenyl	72	35-133	07/12/10	Acceptable

Comments: _____

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Pacific EcoRisk Laboratories
Project: USACE San Rafael Channel/16087
Sample Matrix: Sediment

Service Request: K1006356
Date Collected: 06/10/2010
Date Received: 06/18/2010

Polychlorinated Biphenyls (PCBs)

Sample Name: SRC-2010-7-Comp
Lab Code: K1006356-007
Extraction Method: EPA 3541
Analysis Method: 8082

Units: ug/Kg
Basis: Dry
Level: Low

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Aroclor 1016	ND	U	12	2.5	1	06/22/10	07/03/10	KWG1006234	
Aroclor 1221	ND	U	24	2.5	1	06/22/10	07/03/10	KWG1006234	
Aroclor 1232	ND	U	12	2.5	1	06/22/10	07/03/10	KWG1006234	
Aroclor 1242	34		12	2.5	1	06/22/10	07/03/10	KWG1006234	
Aroclor 1248	ND	U	12	2.5	1	06/22/10	07/03/10	KWG1006234	
Aroclor 1254	47		12	2.5	1	06/22/10	07/03/10	KWG1006234	
Aroclor 1260	45		12	2.5	1	06/22/10	07/03/10	KWG1006234	
Aroclor 1262	ND	U	12	2.5	1	06/22/10	07/03/10	KWG1006234	
Aroclor 1268	ND	U	12	2.5	1	06/22/10	07/03/10	KWG1006234	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Decachlorobiphenyl	76	35-133	07/03/10	Acceptable

Comments: _____

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Pacific EcoRisk Laboratories
Project: USACE San Rafael Channel/16087
Sample Matrix: Sediment

Service Request: K1006356
Date Collected: 06/10/2010
Date Received: 06/18/2010

Polychlorinated Biphenyls (PCBs)

Sample Name: SRC-2010-7-Z-Comp
Lab Code: K1006356-008
Extraction Method: EPA 3541
Analysis Method: 8082

Units: ug/Kg
Basis: Dry
Level: Low

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Aroclor 1016	ND	U	11	2.3	1	06/22/10	07/03/10	KWG1006234	
Aroclor 1221	ND	U	22	2.3	1	06/22/10	07/03/10	KWG1006234	
Aroclor 1232	ND	U	11	2.3	1	06/22/10	07/03/10	KWG1006234	
Aroclor 1242	91		11	2.3	1	06/22/10	07/03/10	KWG1006234	
Aroclor 1248	ND	U	11	2.3	1	06/22/10	07/03/10	KWG1006234	
Aroclor 1254	100		11	2.3	1	06/22/10	07/03/10	KWG1006234	
Aroclor 1260	64		11	2.3	1	06/22/10	07/03/10	KWG1006234	
Aroclor 1262	ND	U	11	2.3	1	06/22/10	07/03/10	KWG1006234	
Aroclor 1268	ND	U	11	2.3	1	06/22/10	07/03/10	KWG1006234	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Decachlorobiphenyl	108	35-133	07/03/10	Acceptable

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Pacific EcoRisk Laboratories
Project: USACE San Rafael Channel/16087
Sample Matrix: Sediment

Service Request: K1006356
Date Collected: 06/08/2010
Date Received: 06/18/2010

Polychlorinated Biphenyls (PCBs)

Sample Name: SRC-2010-1-B-Comp
Lab Code: K1006356-009
Extraction Method: EPA 3541
Analysis Method: 8082

Units: ug/Kg
Basis: Dry
Level: Low

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Aroclor 1016	ND	U	10	2.1	1	06/22/10	07/03/10	KWG1006234	
Aroclor 1221	ND	U	20	2.1	1	06/22/10	07/03/10	KWG1006234	
Aroclor 1232	ND	U	10	2.1	1	06/22/10	07/03/10	KWG1006234	
Aroclor 1242	ND	U	10	2.1	1	06/22/10	07/03/10	KWG1006234	
Aroclor 1248	ND	U	10	2.1	1	06/22/10	07/03/10	KWG1006234	
Aroclor 1254	ND	Ui	10	5.2	1	06/22/10	07/03/10	KWG1006234	
Aroclor 1260	ND	Ui	10	6.7	1	06/22/10	07/03/10	KWG1006234	
Aroclor 1262	ND	U	10	2.1	1	06/22/10	07/03/10	KWG1006234	
Aroclor 1268	ND	U	10	2.1	1	06/22/10	07/03/10	KWG1006234	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Decachlorobiphenyl	88	35-133	07/03/10	Acceptable

Comments: _____

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Pacific EcoRisk Laboratories
Project: USACE San Rafael Channel/16087
Sample Matrix: Sediment

Service Request: K1006356
Date Collected: 06/09/2010
Date Received: 06/18/2010

Polychlorinated Biphenyls (PCBs)

Sample Name: SRC-2010-2-B-Comp
Lab Code: K1006356-010
Extraction Method: EPA 3541
Analysis Method: 8082

Units: ug/Kg
Basis: Dry
Level: Low

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Aroclor 1016	ND	U	9.9	2.1	1	06/22/10	07/03/10	KWG1006234	
Aroclor 1221	ND	U	20	2.1	1	06/22/10	07/03/10	KWG1006234	
Aroclor 1232	ND	U	9.9	2.1	1	06/22/10	07/03/10	KWG1006234	
Aroclor 1242	ND	U	9.9	2.1	1	06/22/10	07/03/10	KWG1006234	
Aroclor 1248	ND	U	9.9	2.1	1	06/22/10	07/03/10	KWG1006234	
Aroclor 1254	ND	Ui	9.9	8.9	1	06/22/10	07/03/10	KWG1006234	
Aroclor 1260	ND	Ui	11	11	1	06/22/10	07/03/10	KWG1006234	
Aroclor 1262	ND	U	9.9	2.1	1	06/22/10	07/03/10	KWG1006234	
Aroclor 1268	ND	U	9.9	2.1	1	06/22/10	07/03/10	KWG1006234	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Decachlorobiphenyl	91	35-133	07/03/10	Acceptable

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Pacific EcoRisk Laboratories
Project: USACE San Rafael Channel/16087
Sample Matrix: Sediment

Service Request: K1006356
Date Collected: 06/09/2010
Date Received: 06/18/2010

Polychlorinated Biphenyls (PCBs)

Sample Name: SRC-2010-3-B-Comp
Lab Code: K1006356-011
Extraction Method: EPA 3541
Analysis Method: 8082

Units: ug/Kg
Basis: Dry
Level: Low

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Aroclor 1016	ND	U	11	2.2	1	06/22/10	07/07/10	KWG1006234	
Aroclor 1221	ND	U	21	2.2	1	06/22/10	07/07/10	KWG1006234	
Aroclor 1232	ND	U	11	2.2	1	06/22/10	07/07/10	KWG1006234	
Aroclor 1242	ND	Ui	11	7.6	1	06/22/10	07/07/10	KWG1006234	
Aroclor 1248	ND	U	11	2.2	1	06/22/10	07/07/10	KWG1006234	
Aroclor 1254	ND	Ui	14	14	1	06/22/10	07/07/10	KWG1006234	
Aroclor 1260	18		11	2.2	1	06/22/10	07/07/10	KWG1006234	
Aroclor 1262	ND	U	11	2.2	1	06/22/10	07/07/10	KWG1006234	
Aroclor 1268	ND	U	11	2.2	1	06/22/10	07/07/10	KWG1006234	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Decachlorobiphenyl	124	35-133	07/07/10	Acceptable

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Pacific EcoRisk Laboratories
Project: USACE San Rafael Channel/16087
Sample Matrix: Sediment

Service Request: K1006356
Date Collected: 06/11/2010
Date Received: 06/18/2010

Polychlorinated Biphenyls (PCBs)

Sample Name: SRC-2010-4-B-Comp
Lab Code: K1006356-012
Extraction Method: EPA 3541
Analysis Method: 8082

Units: ug/Kg
Basis: Dry
Level: Low

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Aroclor 1016	ND	U	9.8	2.1	1	06/22/10	07/08/10	KWG1006234	
Aroclor 1221	ND	U	20	2.1	1	06/22/10	07/08/10	KWG1006234	
Aroclor 1232	ND	U	9.8	2.1	1	06/22/10	07/08/10	KWG1006234	
Aroclor 1242	ND	U	9.8	2.1	1	06/22/10	07/08/10	KWG1006234	
Aroclor 1248	ND	U	9.8	2.1	1	06/22/10	07/08/10	KWG1006234	
Aroclor 1254	ND	Ui	12	12	1	06/22/10	07/08/10	KWG1006234	
Aroclor 1260	15		9.8	2.1	1	06/22/10	07/08/10	KWG1006234	
Aroclor 1262	ND	U	9.8	2.1	1	06/22/10	07/08/10	KWG1006234	
Aroclor 1268	ND	U	9.8	2.1	1	06/22/10	07/08/10	KWG1006234	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Decachlorobiphenyl	130	35-133	07/08/10	Acceptable

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Pacific EcoRisk Laboratories
Project: USACE San Rafael Channel/16087
Sample Matrix: Sediment

Service Request: K1006356
Date Collected: 06/08/2010
Date Received: 06/18/2010

Polychlorinated Biphenyls (PCBs)

Sample Name: SRC-2010-5-B-Comp
Lab Code: K1006356-013
Extraction Method: EPA 3541
Analysis Method: 8082

Units: ug/Kg
Basis: Dry
Level: Low

Analyte Name	Result Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Aroclor 1016	ND U	11	2.2	1	06/22/10	07/08/10	KWG1006234	
Aroclor 1221	ND U	21	2.2	1	06/22/10	07/08/10	KWG1006234	
Aroclor 1232	ND U	11	2.2	1	06/22/10	07/08/10	KWG1006234	
Aroclor 1242	ND U	11	2.2	1	06/22/10	07/08/10	KWG1006234	
Aroclor 1248	ND U	11	2.2	1	06/22/10	07/08/10	KWG1006234	
Aroclor 1254	ND U	19	19	1	06/22/10	07/08/10	KWG1006234	
Aroclor 1260	20	11	2.2	1	06/22/10	07/08/10	KWG1006234	
Aroclor 1262	ND U	11	2.2	1	06/22/10	07/08/10	KWG1006234	
Aroclor 1268	ND U	11	2.2	1	06/22/10	07/08/10	KWG1006234	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Decachlorobiphenyl	127	35-133	07/08/10	Acceptable

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Pacific EcoRisk Laboratories
Project: USACE San Rafael Channel/16087
Sample Matrix: Sediment

Service Request: K1006356
Date Collected: 06/09/2010
Date Received: 06/18/2010

Polychlorinated Biphenyls (PCBs)

Sample Name: SRC-2010-6-B-Comp
Lab Code: K1006356-014
Extraction Method: EPA 3541
Analysis Method: 8082

Units: ug/Kg
Basis: Dry
Level: Low

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Aroclor 1016	ND	U	11	2.4	1	06/22/10	07/03/10	KWG1006234	
Aroclor 1221	ND	U	22	2.4	1	06/22/10	07/03/10	KWG1006234	
Aroclor 1232	ND	U	11	2.4	1	06/22/10	07/03/10	KWG1006234	
Aroclor 1242	24	P	11	2.4	1	06/22/10	07/03/10	KWG1006234	
Aroclor 1248	ND	U	11	2.4	1	06/22/10	07/03/10	KWG1006234	
Aroclor 1254	37		11	2.4	1	06/22/10	07/03/10	KWG1006234	
Aroclor 1260	29		11	2.4	1	06/22/10	07/03/10	KWG1006234	
Aroclor 1262	ND	U	11	2.4	1	06/22/10	07/03/10	KWG1006234	
Aroclor 1268	ND	U	11	2.4	1	06/22/10	07/03/10	KWG1006234	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Decachlorobiphenyl	107	35-133	07/03/10	Acceptable

Comments: _____

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Pacific EcoRisk Laboratories
Project: USACE San Rafael Channel/16087
Sample Matrix: Sediment

Service Request: K1006356
Date Collected: 06/10/2010
Date Received: 06/18/2010

Polychlorinated Biphenyls (PCBs)

Sample Name: SRC-2010-7-B-Comp
Lab Code: K1006356-015
Extraction Method: EPA 3541
Analysis Method: 8082

Units: ug/Kg
Basis: Dry
Level: Low

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Aroclor 1016	ND	U	9.5	2.1	1	06/22/10	07/03/10	KWG1006234	
Aroclor 1221	ND	U	19	2.1	1	06/22/10	07/03/10	KWG1006234	
Aroclor 1232	ND	U	9.5	2.1	1	06/22/10	07/03/10	KWG1006234	
Aroclor 1242	49		9.5	2.1	1	06/22/10	07/03/10	KWG1006234	
Aroclor 1248	ND	U	9.5	2.1	1	06/22/10	07/03/10	KWG1006234	
Aroclor 1254	51		9.5	2.1	1	06/22/10	07/03/10	KWG1006234	
Aroclor 1260	46		9.5	2.1	1	06/22/10	07/03/10	KWG1006234	
Aroclor 1262	ND	U	9.5	2.1	1	06/22/10	07/03/10	KWG1006234	
Aroclor 1268	ND	U	9.5	2.1	1	06/22/10	07/03/10	KWG1006234	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Decachlorobiphenyl	101	35-133	07/03/10	Acceptable

Comments: _____

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Pacific EcoRisk Laboratories
Project: USACE San Rafael Channel/16087
Sample Matrix: Sediment

Service Request: K1006356
Date Collected: 06/10/2010
Date Received: 06/18/2010

Polychlorinated Biphenyls (PCBs)

Sample Name: SRC-2010-7-1
Lab Code: K1006356-016
Extraction Method: EPA 3541
Analysis Method: 8082

Units: ug/Kg
Basis: Dry
Level: Low

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Aroclor 1016	ND	U	13	2.7	1	06/22/10	07/07/10	KWG1006234	
Aroclor 1221	ND	U	26	2.7	1	06/22/10	07/07/10	KWG1006234	
Aroclor 1232	ND	U	13	2.7	1	06/22/10	07/07/10	KWG1006234	
Aroclor 1242	9.2	J	13	2.7	1	06/22/10	07/07/10	KWG1006234	
Aroclor 1248	ND	U	13	2.7	1	06/22/10	07/07/10	KWG1006234	
Aroclor 1254	ND	U	13	2.7	1	06/22/10	07/07/10	KWG1006234	
Aroclor 1260	14		13	2.7	1	06/22/10	07/07/10	KWG1006234	
Aroclor 1262	ND	U	13	2.7	1	06/22/10	07/07/10	KWG1006234	
Aroclor 1268	ND	U	13	2.7	1	06/22/10	07/07/10	KWG1006234	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Decachlorobiphenyl	112	35-133	07/07/10	Acceptable

Comments: _____

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Pacific EcoRisk Laboratories
Project: USACE San Rafael Channel/16087
Sample Matrix: Sediment

Service Request: K1006356
Date Collected: 06/10/2010
Date Received: 06/18/2010

Polychlorinated Biphenyls (PCBs)

Sample Name: SRC-2010-7-2
Lab Code: K1006356-017
Extraction Method: EPA 3541
Analysis Method: 8082

Units: ug/Kg
Basis: Dry
Level: Low

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Aroclor 1016	ND	U	12	2.6	1	06/22/10	07/08/10	KWG1006234	
Aroclor 1221	ND	U	24	2.6	1	06/22/10	07/08/10	KWG1006234	
Aroclor 1232	ND	U	12	2.6	1	06/22/10	07/08/10	KWG1006234	
Aroclor 1242	ND	U	12	2.6	1	06/22/10	07/08/10	KWG1006234	
Aroclor 1248	ND	U	12	2.6	1	06/22/10	07/08/10	KWG1006234	
Aroclor 1254	42		12	2.6	1	06/22/10	07/08/10	KWG1006234	
Aroclor 1260	33		12	2.6	1	06/22/10	07/08/10	KWG1006234	
Aroclor 1262	ND	U	12	2.6	1	06/22/10	07/08/10	KWG1006234	
Aroclor 1268	ND	U	12	2.6	1	06/22/10	07/08/10	KWG1006234	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Decachlorobiphenyl	112	35-133	07/08/10	Acceptable

Comments: _____

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Pacific EcoRisk Laboratories
Project: USACE San Rafael Channel/16087
Sample Matrix: Sediment

Service Request: K1006356
Date Collected: 06/10/2010
Date Received: 06/18/2010

Polychlorinated Biphenyls (PCBs)

Sample Name: SRC-2010-7-3
Lab Code: K1006356-018
Extraction Method: EPA 3541
Analysis Method: 8082

Units: ug/Kg
Basis: Dry
Level: Low

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Aroclor 1016	ND	U	13	2.6	1	06/22/10	07/07/10	KWG1006234	
Aroclor 1221	ND	U	25	2.6	1	06/22/10	07/07/10	KWG1006234	
Aroclor 1232	ND	U	13	2.6	1	06/22/10	07/07/10	KWG1006234	
Aroclor 1242	27		13	2.6	1	06/22/10	07/07/10	KWG1006234	
Aroclor 1248	ND	U	13	2.6	1	06/22/10	07/07/10	KWG1006234	
Aroclor 1254	42		13	2.6	1	06/22/10	07/07/10	KWG1006234	
Aroclor 1260	37		13	2.6	1	06/22/10	07/07/10	KWG1006234	
Aroclor 1262	ND	U	13	2.6	1	06/22/10	07/07/10	KWG1006234	
Aroclor 1268	ND	U	13	2.6	1	06/22/10	07/07/10	KWG1006234	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Decachlorobiphenyl	104	35-133	07/07/10	Acceptable

Comments: _____

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Pacific EcoRisk Laboratories
Project: USACE San Rafael Channel/16087
Sample Matrix: Sediment

Service Request: K1006356
Date Collected: 06/10/2010
Date Received: 06/18/2010

Polychlorinated Biphenyls (PCBs)

Sample Name: SRC-2010-7-4
Lab Code: K1006356-019
Extraction Method: EPA 3541
Analysis Method: 8082

Units: ug/Kg
Basis: Dry
Level: Low

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Aroclor 1016	ND	U	13	2.7	1	06/22/10	07/07/10	KWG1006234	
Aroclor 1221	ND	U	26	2.7	1	06/22/10	07/07/10	KWG1006234	
Aroclor 1232	ND	U	13	2.7	1	06/22/10	07/07/10	KWG1006234	
Aroclor 1242	55		13	2.7	1	06/22/10	07/07/10	KWG1006234	
Aroclor 1248	ND	U	13	2.7	1	06/22/10	07/07/10	KWG1006234	
Aroclor 1254	97		13	2.7	1	06/22/10	07/07/10	KWG1006234	
Aroclor 1260	66		13	2.7	1	06/22/10	07/07/10	KWG1006234	
Aroclor 1262	ND	U	13	2.7	1	06/22/10	07/07/10	KWG1006234	
Aroclor 1268	ND	U	13	2.7	1	06/22/10	07/07/10	KWG1006234	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Decachlorobiphenyl	106	35-133	07/07/10	Acceptable

Comments: _____

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Pacific EcoRisk Laboratories
Project: USACE San Rafael Channel/16087
Sample Matrix: Sediment

Service Request: K1006356
Date Collected: 06/10/2010
Date Received: 06/18/2010

Polychlorinated Biphenyls (PCBs)

Sample Name: SRC-2010-7-5
Lab Code: K1006356-020
Extraction Method: EPA 3541
Analysis Method: 8082

Units: ug/Kg
Basis: Dry
Level: Low

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Aroclor 1016	ND	U	12	2.4	1	06/22/10	07/08/10	KWG1006234	
Aroclor 1221	ND	U	23	2.4	1	06/22/10	07/08/10	KWG1006234	
Aroclor 1232	ND	U	12	2.4	1	06/22/10	07/08/10	KWG1006234	
Aroclor 1242	ND	U	12	2.4	1	06/22/10	07/08/10	KWG1006234	
Aroclor 1248	180		12	2.4	1	06/22/10	07/08/10	KWG1006234	
Aroclor 1254	230		12	2.4	1	06/22/10	07/08/10	KWG1006234	
Aroclor 1260	170		12	2.4	1	06/22/10	07/08/10	KWG1006234	
Aroclor 1262	ND	U	12	2.4	1	06/22/10	07/08/10	KWG1006234	
Aroclor 1268	ND	U	12	2.4	1	06/22/10	07/08/10	KWG1006234	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Decachlorobiphenyl	106	35-133	07/08/10	Acceptable

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Pacific EcoRisk Laboratories
Project: USACE San Rafael Channel/16087
Sample Matrix: Sediment

Service Request: K1006356
Date Collected: 06/10/2010
Date Received: 06/23/2010

Polychlorinated Biphenyls (PCBs)

Sample Name: SRC-2010-8-Z-Comp
Lab Code: K1006356-021
Extraction Method: EPA 3541
Analysis Method: 8082

Units: ug/Kg
Basis: Dry
Level: Low

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Aroclor 1016	ND	Ui	50	50	1	06/24/10	07/07/10	KWG1006548	
Aroclor 1221	ND	Ui	23	23	1	06/24/10	07/07/10	KWG1006548	
Aroclor 1232	ND	Ui	110	110	1	06/24/10	07/07/10	KWG1006548	
Aroclor 1242	ND	Ui	29	29	1	06/24/10	07/07/10	KWG1006548	
Aroclor 1248	ND	Ui	61	61	1	06/24/10	07/07/10	KWG1006548	
Aroclor 1254	ND	Ui	58	58	1	06/24/10	07/07/10	KWG1006548	
Aroclor 1260	76		12	2.4	1	06/24/10	07/07/10	KWG1006548	
Aroclor 1262	ND	U	12	2.4	1	06/24/10	07/07/10	KWG1006548	
Aroclor 1268	ND	U	12	2.4	1	06/24/10	07/07/10	KWG1006548	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Decachlorobiphenyl	97	35-133	07/07/10	Acceptable

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Pacific EcoRisk Laboratories
Project: USACE San Rafael Channel/16087
Sample Matrix: Sediment

Service Request: K1006356
Date Collected: NA
Date Received: NA

Polychlorinated Biphenyls (PCBs)

Sample Name: Method Blank
Lab Code: KWG1006234-4
Extraction Method: EPA 3541
Analysis Method: 8082

Units: ug/Kg
Basis: Dry
Level: Low

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Aroclor 1016	ND	U	5.0	2.1	1	06/22/10	07/03/10	KWG1006234	
Aroclor 1221	ND	U	10	2.1	1	06/22/10	07/03/10	KWG1006234	
Aroclor 1232	ND	U	5.0	2.1	1	06/22/10	07/03/10	KWG1006234	
Aroclor 1242	ND	U	5.0	2.1	1	06/22/10	07/03/10	KWG1006234	
Aroclor 1248	ND	U	5.0	2.1	1	06/22/10	07/03/10	KWG1006234	
Aroclor 1254	ND	U	5.0	2.1	1	06/22/10	07/03/10	KWG1006234	
Aroclor 1260	ND	U	5.0	2.1	1	06/22/10	07/03/10	KWG1006234	
Aroclor 1262	ND	U	5.0	2.1	1	06/22/10	07/03/10	KWG1006234	
Aroclor 1268	ND	U	5.0	2.1	1	06/22/10	07/03/10	KWG1006234	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Decachlorobiphenyl	102	35-133	07/03/10	Acceptable

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Pacific EcoRisk Laboratories
Project: USACE San Rafael Channel/16087
Sample Matrix: Sediment

Service Request: K1006356
Date Collected: NA
Date Received: NA

Polychlorinated Biphenyls (PCBs)

Sample Name: Method Blank
Lab Code: KWG1006548-4
Extraction Method: EPA 3541
Analysis Method: 8082

Units: ug/Kg
Basis: Dry
Level: Low

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Aroclor 1016	ND	U	5.0	2.1	1	06/24/10	07/07/10	KWG1006548	
Aroclor 1221	ND	U	10	2.1	1	06/24/10	07/07/10	KWG1006548	
Aroclor 1232	ND	U	5.0	2.1	1	06/24/10	07/07/10	KWG1006548	
Aroclor 1242	ND	U	5.0	2.1	1	06/24/10	07/07/10	KWG1006548	
Aroclor 1248	ND	U	5.0	2.1	1	06/24/10	07/07/10	KWG1006548	
Aroclor 1254	ND	U	5.0	2.1	1	06/24/10	07/07/10	KWG1006548	
Aroclor 1260	ND	U	5.0	2.1	1	06/24/10	07/07/10	KWG1006548	
Aroclor 1262	ND	U	5.0	2.1	1	06/24/10	07/07/10	KWG1006548	
Aroclor 1268	ND	U	5.0	2.1	1	06/24/10	07/07/10	KWG1006548	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Decachlorobiphenyl	87	35-133	07/07/10	Acceptable

Comments: _____

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Pacific EcoRisk Laboratories
Project: USACE San Rafael Channel/16087
Sample Matrix: Sediment

Service Request: K1006356

**Surrogate Recovery Summary
 Polychlorinated Biphenyls (PCBs)**

Extraction Method: EPA 3541
Analysis Method: 8082

Units: PERCENT
Level: Low

<u>Sample Name</u>	<u>Lab Code</u>	<u>Sur1</u>
SRC-2010-1-Comp	K1006356-001	96
SRC-2010-2-Comp	K1006356-002	96
SRC-2010-3-Comp	K1006356-003	97
SRC-2010-4-Comp	K1006356-004	108
SRC-2010-5-Comp	K1006356-005	98
SRC-2010-6-Comp	K1006356-006	72
SRC-2010-7-Comp	K1006356-007	76
SRC-2010-7-Z-Comp	K1006356-008	108
SRC-2010-1-B-Comp	K1006356-009	88
SRC-2010-2-B-Comp	K1006356-010	91
SRC-2010-3-B-Comp	K1006356-011	124
SRC-2010-4-B-Comp	K1006356-012	130
SRC-2010-5-B-Comp	K1006356-013	127
SRC-2010-6-B-Comp	K1006356-014	107
SRC-2010-7-B-Comp	K1006356-015	101
SRC-2010-7-1	K1006356-016	112
SRC-2010-7-2	K1006356-017	112
SRC-2010-7-3	K1006356-018	104
SRC-2010-7-4	K1006356-019	106
SRC-2010-7-5	K1006356-020	106
SRC-2010-8-Z-Comp	K1006356-021	97
Method Blank	KWG1006234-4	102
Method Blank	KWG1006548-4	87
Batch QC	K1006486-001	78
SRC-2010-1-CompMS	KWG1006234-1	99
SRC-2010-1-CompDMS	KWG1006234-2	92
Batch QCMS	KWG1006548-1	74
Batch QCDMS	KWG1006548-2	68
Lab Control Sample	KWG1006234-3	99
Lab Control Sample	KWG1006548-3	88

Surrogate Recovery Control Limits (%)

Sur1 = Decachlorobiphenyl 35-133

Results flagged with an asterisk (*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Pacific EcoRisk Laboratories
Project: USACE San Rafael Channel/16087
Sample Matrix: Sediment

Service Request: K1006356
Date Extracted: 06/22/2010
Date Analyzed: 07/03/2010

Matrix Spike/Duplicate Matrix Spike Summary
Polychlorinated Biphenyls (PCBs)

Sample Name: SRC-2010-1-Comp
Lab Code: K1006356-001
Extraction Method: EPA 3541
Analysis Method: 8082

Units: ug/Kg
Basis: Dry
Level: Low
Extraction Lot: KWG1006234

Analyte Name	Sample Result	SRC-2010-1-CompMS KWG1006234-1 Matrix Spike			SRC-2010-1-CompDMS KWG1006234-2 Duplicate Matrix Spike			%Rec Limits	RPD	RPD Limit
		Result	Expected	%Rec	Result	Expected	%Rec			
Aroclor 1016	ND	198	224	88	196	224	88	27-174	1	40
Aroclor 1260	9.6	221	224	94	228	224	98	20-185	3	40

Results flagged with an asterisk (*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

Client: Pacific EcoRisk Laboratories
Project: USACE San Rafael Channel/16087
Sample Matrix: Sediment

Service Request: K1006356
Date Extracted: 06/24/2010
Date Analyzed: 07/08/2010

Matrix Spike/Duplicate Matrix Spike Summary
Polychlorinated Biphenyls (PCBs)

Sample Name: Batch QC
Lab Code: K1006486-001
Extraction Method: EPA 3541
Analysis Method: 8082

Units: ug/Kg
Basis: Dry
Level: Low
Extraction Lot: KWG1006548

Analyte Name	Sample Result	Batch QCMS KWG1006548-1 Matrix Spike			Batch QCDMS KWG1006548-2 Duplicate Matrix Spike			%Rec Limits	RPD	RPD Limit
		Result	Expected	%Rec	Result	Expected	%Rec			
Aroclor 1016	ND	162	227	71	144	227	63	27-174	12	40
Aroclor 1260	3.7	179	227	77	157	227	67	20-185	13	40

Results flagged with an asterisk (*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

Client: Pacific EcoRisk Laboratories
Project: USACE San Rafael Channel/16087
Sample Matrix: Sediment

Service Request: K1006356
Date Extracted: 06/22/2010
Date Analyzed: 07/03/2010

Lab Control Spike Summary
Polychlorinated Biphenyls (PCBs)

Extraction Method: EPA 3541
Analysis Method: 8082

Units: ug/Kg
Basis: Dry
Level: Low
Extraction Lot: KWG1006234

Analyte Name	Lab Control Sample KWG1006234-3 Lab Control Spike			%Rec Limits
	Result	Expected	%Rec	
Aroclor 1016	169	200	85	48-121
Aroclor 1260	195	200	97	53-129

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Pacific EcoRisk Laboratories
Project: USACE San Rafael Channel/16087
Sample Matrix: Sediment

Service Request: K1006356
Date Extracted: 06/24/2010
Date Analyzed: 07/07/2010

Lab Control Spike Summary
Polychlorinated Biphenyls (PCBs)

Extraction Method: EPA 3541
Analysis Method: 8082

Units: ug/Kg
Basis: Dry
Level: Low
Extraction Lot: KWG1006548

Lab Control Sample KWG1006548-3 Lab Control Spike				
Analyte Name	Result	Expected	%Rec	%Rec Limits
Aroclor 1016	169	200	84	48-121
Aroclor 1260	177	200	88	53-129

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

Chlorinated Herbicides

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Pacific EcoRisk Laboratories
Project: USACE San Rafael Channel/16087
Sample Matrix: Sediment

Service Request: K1006356
Date Collected: 06/08/2010
Date Received: 06/18/2010

Chlorinated Herbicides

Sample Name: SRC-2010-1-Comp
Lab Code: K1006356-001
Extraction Method: Method
Analysis Method: 8151A

Units: ug/Kg
Basis: Dry
Level: Low

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
MCPP	ND	U	12000	2900	1	06/22/10	06/29/10	KWG1006196	
MCPA	ND	U	12000	2900	1	06/22/10	06/29/10	KWG1006196	
Dichlorprop	ND	U	56	11	1	06/22/10	06/29/10	KWG1006196	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
2,4-Dichlorophenylacetic Acid	60	27-166	06/29/10	Acceptable

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Pacific EcoRisk Laboratories
Project: USACE San Rafael Channel/16087
Sample Matrix: Sediment

Service Request: K1006356
Date Collected: 06/09/2010
Date Received: 06/18/2010

Chlorinated Herbicides

Sample Name: SRC-2010-2-Comp
Lab Code: K1006356-002
Extraction Method: Method
Analysis Method: 8151A

Units: ug/Kg
Basis: Dry
Level: Low

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
MCPP	ND	U	11000	9700	1	06/22/10	06/29/10	KWG1006196	
MCPA	ND	U	11000	2800	1	06/22/10	06/29/10	KWG1006196	
Dichlorprop	ND	U	54	9.7	1	06/22/10	06/29/10	KWG1006196	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
2,4-Dichlorophenylacetic Acid	63	27-166	06/29/10	Acceptable

Comments: _____

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Pacific EcoRisk Laboratories
Project: USACE San Rafael Channel/16087
Sample Matrix: Sediment

Service Request: K1006356
Date Collected: 06/09/2010
Date Received: 06/18/2010

Chlorinated Herbicides

Sample Name: SRC-2010-3-Comp
Lab Code: K1006356-003
Extraction Method: Method
Analysis Method: 8151A

Units: ug/Kg
Basis: Dry
Level: Low

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
MCP	ND	U	11000	9300	1	06/22/10	06/29/10	KWG1006196	
MCPA	ND	U	11000	2700	1	06/22/10	06/29/10	KWG1006196	
Dichlorprop	ND	U	52	9.5	1	06/22/10	06/29/10	KWG1006196	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
2,4-Dichlorophenylacetic Acid	63	27-166	06/29/10	Acceptable

Comments: _____

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Pacific EcoRisk Laboratories
Project: USACE San Rafael Channel/16087
Sample Matrix: Sediment

Service Request: K1006356
Date Collected: 06/11/2010
Date Received: 06/18/2010

Chlorinated Herbicides

Sample Name: SRC-2010-4-Comp
Lab Code: K1006356-004
Extraction Method: Method
Analysis Method: 8151A

Units: ug/Kg
Basis: Dry
Level: Low

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
MCPP	ND	Ui	11000	11000	1	06/22/10	06/29/10	KWG1006196	
MCPA	ND	U	11000	2800	1	06/22/10	06/29/10	KWG1006196	
Dichlorprop	ND	U	53	9.6	1	06/22/10	06/29/10	KWG1006196	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
2,4-Dichlorophenylacetic Acid	62	27-166	06/29/10	Acceptable

Comments: _____

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Pacific EcoRisk Laboratories
Project: USACE San Rafael Channel/16087
Sample Matrix: Sediment

Service Request: K1006356
Date Collected: 06/08/2010
Date Received: 06/18/2010

Chlorinated Herbicides

Sample Name: SRC-2010-5-Comp
Lab Code: K1006356-005
Extraction Method: Method
Analysis Method: 8151A

Units: ug/Kg
Basis: Dry
Level: Low

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
MCPP	ND	U	12000	12000	1	06/22/10	06/30/10	KWG1006196	
MCPA	ND	U	12000	3000	1	06/22/10	06/30/10	KWG1006196	
Dichlorprop	ND	U	57	11	1	06/22/10	06/30/10	KWG1006196	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
2,4-Dichlorophenylacetic Acid	61	27-166	06/30/10	Acceptable

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Pacific EcoRisk Laboratories
Project: USACE San Rafael Channel/16087
Sample Matrix: Sediment

Service Request: K1006356
Date Collected: 06/09/2010
Date Received: 06/18/2010

Chlorinated Herbicides

Sample Name: SRC-2010-6-Comp
Lab Code: K1006356-006
Extraction Method: Method
Analysis Method: 8151A

Units: ug/Kg
Basis: Dry
Level: Low

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
MCPP	ND	U	13000	13000	1	06/22/10	06/30/10	KWG1006196	
MCPA	ND	U	13000	3200	1	06/22/10	06/30/10	KWG1006196	
Dichlorprop	ND	U	61	12	1	06/22/10	06/30/10	KWG1006196	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
2,4-Dichlorophenylacetic Acid	67	27-166	06/30/10	Acceptable

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Pacific EcoRisk Laboratories
Project: USACE San Rafael Channel/16087
Sample Matrix: Sediment

Service Request: K1006356
Date Collected: 06/10/2010
Date Received: 06/18/2010

Chlorinated Herbicides

Sample Name: SRC-2010-7-Comp
Lab Code: K1006356-007
Extraction Method: Method
Analysis Method: 8151A

Units: ug/Kg
Basis: Dry
Level: Low

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
MCPP	ND	U	60000	16000	5	06/22/10	06/30/10	KWG1006196	
MCPA	ND	U	60000	16000	5	06/22/10	06/30/10	KWG1006196	
Dichlorprop	ND	U	300	54	5	06/22/10	06/30/10	KWG1006196	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
2,4-Dichlorophenylacetic Acid	77	27-166	06/30/10	Acceptable

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Pacific EcoRisk Laboratories
Project: USACE San Rafael Channel/16087
Sample Matrix: Sediment

Service Request: K1006356
Date Collected: 06/10/2010
Date Received: 06/18/2010

Chlorinated Herbicides

Sample Name: SRC-2010-7-Z-Comp
Lab Code: K1006356-008
Extraction Method: Method
Analysis Method: 8151A

Units: ug/Kg
Basis: Dry
Level: Low

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
MCP	ND	U	53000	14000	5	06/22/10	06/30/10	KWG1006196	
MCPA	ND	U	53000	14000	5	06/22/10	06/30/10	KWG1006196	
Dichlorprop	ND	U	270	48	5	06/22/10	06/30/10	KWG1006196	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
2,4-Dichlorophenylacetic Acid	84	27-166	06/30/10	Acceptable

Comments: _____

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Pacific EcoRisk Laboratories
Project: USACE San Rafael Channel/16087
Sample Matrix: Sediment

Service Request: K1006356
Date Collected: 06/10/2010
Date Received: 06/18/2010

Chlorinated Herbicides

Sample Name: SRC-2010-7-1
Lab Code: K1006356-016
Extraction Method: Method
Analysis Method: 8151A

Units: ug/Kg
Basis: Dry
Level: Low

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
MCP	ND	U	13000	3400	1	06/22/10	06/30/10	KWG1006196	
MCPA	ND	U	13000	3400	1	06/22/10	06/30/10	KWG1006196	
Dichlorprop	ND	U	64	12	1	06/22/10	06/30/10	KWG1006196	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
2,4-Dichlorophenylacetic Acid	61	27-166	06/30/10	Acceptable

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Pacific EcoRisk Laboratories
Project: USACE San Rafael Channel/16087
Sample Matrix: Sediment

Service Request: K1006356
Date Collected: 06/10/2010
Date Received: 06/18/2010

Chlorinated Herbicides

Sample Name: SRC-2010-7-2
Lab Code: K1006356-017

Units: ug/Kg

Basis: Dry

Extraction Method: Method
Analysis Method: 8151A

Level: Low

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
MCPP	ND	U	60000	16000	5	06/22/10	06/30/10	KWG1006196	
MCPA	ND	U	60000	16000	5	06/22/10	06/30/10	KWG1006196	
Dichlorprop	ND	U	300	55	5	06/22/10	06/30/10	KWG1006196	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
2,4-Dichlorophenylacetic Acid	76	27-166	06/30/10	Acceptable

Comments: _____

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Pacific EcoRisk Laboratories
Project: USACE San Rafael Channel/16087
Sample Matrix: Sediment

Service Request: K1006356
Date Collected: 06/10/2010
Date Received: 06/18/2010

Chlorinated Herbicides

Sample Name: SRC-2010-7-3
Lab Code: K1006356-018
Extraction Method: Method
Analysis Method: 8151A

Units: ug/Kg
Basis: Dry
Level: Low

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
MCPP	ND	U	60000	16000	5	06/22/10	06/30/10	KWG1006196	
MCPA	ND	U	60000	16000	5	06/22/10	06/30/10	KWG1006196	
Dichlorprop	ND	U	300	55	5	06/22/10	06/30/10	KWG1006196	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
2,4-Dichlorophenylacetic Acid	75	27-166	06/30/10	Acceptable

Comments: _____

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Pacific EcoRisk Laboratories
Project: USACE San Rafael Channel/16087
Sample Matrix: Sediment

Service Request: K1006356
Date Collected: 06/10/2010
Date Received: 06/18/2010

Chlorinated Herbicides

Sample Name: SRC-2010-7-4
Lab Code: K1006356-019
Extraction Method: Method
Analysis Method: 8151A

Units: ug/Kg
Basis: Dry
Level: Low

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
MCPP	ND	U	63000	17000	5	06/22/10	06/30/10	KWG1006196	
MCPA	ND	U	63000	17000	5	06/22/10	06/30/10	KWG1006196	
Dichlorprop	ND	U	320	57	5	06/22/10	06/30/10	KWG1006196	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
2,4-Dichlorophenylacetic Acid	81	27-166	06/30/10	Acceptable

Comments: _____

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Pacific EcoRisk Laboratories
Project: USACE San Rafael Channel/16087
Sample Matrix: Sediment

Service Request: K1006356
Date Collected: 06/10/2010
Date Received: 06/18/2010

Chlorinated Herbicides

Sample Name: SRC-2010-7-5
Lab Code: K1006356-020
Extraction Method: Method
Analysis Method: 8151A

Units: ug/Kg
Basis: Dry
Level: Low

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
MCPP	ND	U	58000	15000	5	06/22/10	06/30/10	KWG1006196	
MCPA	ND	U	58000	15000	5	06/22/10	06/30/10	KWG1006196	
Dichlorprop	ND	U	290	52	5	06/22/10	06/30/10	KWG1006196	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
2,4-Dichlorophenylacetic Acid	80	27-166	06/30/10	Acceptable

Comments: _____

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Pacific EcoRisk Laboratories
Project: USACE San Rafael Channel/16087
Sample Matrix: Sediment

Service Request: K1006356
Date Collected: 06/10/2010
Date Received: 06/23/2010

Chlorinated Herbicides

Sample Name: SRC-2010-8-Z-Comp
Lab Code: K1006356-021
Extraction Method: Method
Analysis Method: 8151A

Units: ug/Kg
Basis: Dry
Level: Low

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
MCPP	ND	U	57000	15000	5	06/24/10	06/29/10	KWG1006203	
MCPA	ND	U	57000	15000	5	06/24/10	06/29/10	KWG1006203	
Dichlorprop	ND	U	290	52	5	06/24/10	06/29/10	KWG1006203	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
2,4-Dichlorophenylacetic Acid	68	27-166	06/29/10	Acceptable

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Pacific EcoRisk Laboratories
Project: USACE San Rafael Channel/16087
Sample Matrix: Sediment

Service Request: K1006356
Date Collected: NA
Date Received: NA

Chlorinated Herbicides

Sample Name: Method Blank
Lab Code: KWG1006196-4
Extraction Method: Method
Analysis Method: 8151A

Units: ug/Kg
Basis: Dry
Level: Low

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
MCP	ND	U	5000	2600	1	06/22/10	06/29/10	KWG1006196	
MCPA	ND	U	5000	2600	1	06/22/10	06/29/10	KWG1006196	
Dichlorprop	ND	U	25	9.1	1	06/22/10	06/29/10	KWG1006196	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
2,4-Dichlorophenylacetic Acid	65	27-166	06/29/10	Acceptable

Comments: _____

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Pacific EcoRisk Laboratories
Project: USACE San Rafael Channel/16087
Sample Matrix: Sediment

Service Request: K1006356
Date Collected: NA
Date Received: NA

Chlorinated Herbicides

Sample Name: Method Blank
Lab Code: KWG1006203-4
Extraction Method: Method
Analysis Method: 8151A

Units: ug/Kg
Basis: Dry
Level: Low

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
MCPP	ND	U	4900	2600	1	06/24/10	06/28/10	KWG1006203	
MCPA	ND	U	4900	2600	1	06/24/10	06/28/10	KWG1006203	
Dichlorprop	ND	U	25	9.1	1	06/24/10	06/28/10	KWG1006203	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
2,4-Dichlorophenylacetic Acid	76	27-166	06/28/10	Acceptable

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Pacific EcoRisk Laboratories
Project: USACE San Rafael Channel/16087
Sample Matrix: Sediment

Service Request: K1006356

Surrogate Recovery Summary
Chlorinated Herbicides

Extraction Method: Method
Analysis Method: 8151A

Units: PERCENT
Level: Low

<u>Sample Name</u>	<u>Lab Code</u>	<u>Sur1</u>
SRC-2010-1-Comp	K1006356-001	60
SRC-2010-2-Comp	K1006356-002	63
SRC-2010-3-Comp	K1006356-003	63
SRC-2010-4-Comp	K1006356-004	62
SRC-2010-5-Comp	K1006356-005	61
SRC-2010-6-Comp	K1006356-006	67
SRC-2010-7-Comp	K1006356-007	77 D
SRC-2010-7-Z-Comp	K1006356-008	84 D
SRC-2010-7-1	K1006356-016	61
SRC-2010-7-2	K1006356-017	76 D
SRC-2010-7-3	K1006356-018	75 D
SRC-2010-7-4	K1006356-019	81 D
SRC-2010-7-5	K1006356-020	80 D
SRC-2010-8-Z-Comp	K1006356-021	68 D
Method Blank	KWG1006196-4	65
Method Blank	KWG1006203-4	76
Batch QC	K1006482-001	71 D
SRC-2010-4-CompMS	KWG1006196-1	61
SRC-2010-4-CompDMS	KWG1006196-2	64
Batch QCMS	KWG1006203-1	70 D
Batch QCDMS	KWG1006203-2	67 D
Lab Control Sample	KWG1006196-3	64
Lab Control Sample	KWG1006203-3	72

Surrogate Recovery Control Limits (%)

Sur1 = 2,4-Dichlorophenylacetic Acid 27-166

Results flagged with an asterisk (*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Pacific EcoRisk Laboratories
Project: USACE San Rafael Channel/16087
Sample Matrix: Sediment

Service Request: K1006356
Date Extracted: 06/22/2010
Date Analyzed: 06/29/2010

Matrix Spike/Duplicate Matrix Spike Summary
Chlorinated Herbicides

Sample Name: SRC-2010-4-Comp
Lab Code: K1006356-004
Extraction Method: Method
Analysis Method: 8151A

Units: ug/Kg
Basis: Dry
Level: Low
Extraction Lot: KWG1006196

Analyte Name	Sample Result	SRC-2010-4-CompMS KWG1006196-1 Matrix Spike			SRC-2010-4-CompDMS KWG1006196-2 Duplicate Matrix Spike			%Rec Limits	RPD	RPD Limit
		Result	Expected	%Rec	Result	Expected	%Rec			
MCP	ND	12800	17600	73	12200	17500	70	10-192	5	40
MCPA	ND	6640	17600	38	6490	17500	37	10-165	2	40
Dichlorprop	ND	159	176	90	167	175	95	29-149	5	40

Results flagged with an asterisk (*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Pacific EcoRisk Laboratories
Project: USACE San Rafael Channel/16087
Sample Matrix: Sediment

Service Request: K1006356
Date Extracted: 06/24/2010
Date Analyzed: 06/29/2010

Matrix Spike/Duplicate Matrix Spike Summary
Chlorinated Herbicides

Sample Name: Batch QC
Lab Code: K1006482-001
Extraction Method: Method
Analysis Method: 8151A

Units: ug/Kg
Basis: Dry
Level: Low
Extraction Lot: KWG1006203

Analyte Name	Sample Result	Batch QCMS KWG1006203-1 Matrix Spike			Batch QCDMS KWG1006203-2 Duplicate Matrix Spike			%Rec Limits	RPD	RPD Limit
		Result	Expected	%Rec	Result	Expected	%Rec			
MCP	ND	31500	19400	162	64000	19400	330 *	10-192	68 *	40
MCPA	ND	9440	19400	49	6020	19400	31	10-165	44 *	40
Dichlorprop	ND	198	194	102	208	194	107	29-149	5	40

Results flagged with an asterisk (*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Pacific EcoRisk Laboratories
Project: USACE San Rafael Channel/16087
Sample Matrix: Sediment

Service Request: K1006356
Date Extracted: 06/22/2010
Date Analyzed: 06/29/2010

Lab Control Spike Summary
Chlorinated Herbicides

Extraction Method: Method
Analysis Method: 8151A

Units: ug/Kg
Basis: Dry
Level: Low
Extraction Lot: KWG1006196

Lab Control Sample KWG1006196-3 Lab Control Spike				
Analyte Name	Result	Expected	%Rec	%Rec Limits
MCPP	7820	8330	94	49-116
MCPA	6090	8330	73	52-111
Dichlorprop	59.0	83.3	71	58-112

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Pacific EcoRisk Laboratories
Project: USACE San Rafael Channel/16087
Sample Matrix: Sediment

Service Request: K1006356
Date Extracted: 06/24/2010
Date Analyzed: 06/28/2010

Lab Control Spike Summary
Chlorinated Herbicides

Extraction Method: Method
Analysis Method: 8151A

Units: ug/Kg
Basis: Dry
Level: Low
Extraction Lot: KWG1006203

Lab Control Sample KWG1006203-3 Lab Control Spike				
Analyte Name	Result	Expected	%Rec	%Rec Limits
MCPP	7970	8330	96	49-116
MCPA	6620	8330	79	52-111
Dichlorprop	59.5	83.3	71	58-112

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

Polynuclear Aromatic Hydrocarbons

COLUMBIA ANALYTICAL SERVICES, INC.

Client: Pacific EcoRisk Laboratories
Project: USACE San Rafael Channel/16087

Service Request: K1006356

**Cover Page - Organic Analysis Data Package
 Polynuclear Aromatic Hydrocarbons**

Sample Name	Lab Code	Date Collected	Date Received
SRC-2010-1-Comp	K1006356-001	06/08/2010	06/18/2010
SRC-2010-2-Comp	K1006356-002	06/09/2010	06/18/2010
SRC-2010-3-Comp	K1006356-003	06/09/2010	06/18/2010
SRC-2010-4-Comp	K1006356-004	06/11/2010	06/18/2010
SRC-2010-5-Comp	K1006356-005	06/08/2010	06/18/2010
SRC-2010-6-Comp	K1006356-006	06/09/2010	06/18/2010
SRC-2010-7-Comp	K1006356-007	06/10/2010	06/18/2010
SRC-2010-7-Z-Comp	K1006356-008	06/10/2010	06/18/2010
SRC-2010-1-B-Comp	K1006356-009	06/08/2010	06/18/2010
SRC-2010-2-B-Comp	K1006356-010	06/09/2010	06/18/2010
SRC-2010-3-B-Comp	K1006356-011	06/09/2010	06/18/2010
SRC-2010-4-B-Comp	K1006356-012	06/11/2010	06/18/2010
SRC-2010-5-B-Comp	K1006356-013	06/08/2010	06/18/2010
SRC-2010-6-B-Comp	K1006356-014	06/09/2010	06/18/2010
SRC-2010-7-B-Comp	K1006356-015	06/10/2010	06/18/2010
SRC-2010-7-1	K1006356-016	06/10/2010	06/18/2010
SRC-2010-7-2	K1006356-017	06/10/2010	06/18/2010
SRC-2010-7-3	K1006356-018	06/10/2010	06/18/2010
SRC-2010-7-4	K1006356-019	06/10/2010	06/18/2010
SRC-2010-7-5	K1006356-020	06/10/2010	06/18/2010
SRC-2010-8-Z-Comp	K1006356-021	06/10/2010	06/23/2010
SRC-2010-1-CompMS	KWG1006224-1	06/08/2010	06/18/2010
SRC-2010-1-CompDMS	KWG1006224-2	06/08/2010	06/18/2010

I certify that this data package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions detailed in the case narrative. Release of the data contained in this hardcopy data package and in the computer-readable data submitted on floppy diskette has been authorized by the Laboratory Manager or the Manager's designee, as verified by the following signature.

Signature: M. Hendrickson

Name: M. Hendrickson

Date: 7/12/10

Title: Analyst

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Pacific EcoRisk Laboratories
Project: USACE San Rafael Channel/16087
Sample Matrix: Sediment

Service Request: K1006356
Date Collected: 06/08/2010
Date Received: 06/18/2010

Polynuclear Aromatic Hydrocarbons

Sample Name: SRC-2010-1-Comp
Lab Code: K1006356-001
Extraction Method: EPA 3541
Analysis Method: 8270C SIM

Units: ug/Kg
Basis: Dry
Level: Low

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Naphthalene	12		5.6	0.68	1	06/21/10	07/02/10	KWG1006224	
Acenaphthylene	4.2	J	5.6	0.66	1	06/21/10	07/02/10	KWG1006224	
Acenaphthene	3.1	J	5.6	0.85	1	06/21/10	07/02/10	KWG1006224	
Fluorene	5.1	J	5.6	0.69	1	06/21/10	07/02/10	KWG1006224	
Phenanthrene	38		5.6	1.6	1	06/21/10	07/02/10	KWG1006224	
Anthracene	10		5.6	0.65	1	06/21/10	07/02/10	KWG1006224	
Fluoranthene	91		5.6	1.1	1	06/21/10	07/02/10	KWG1006224	
Pyrene	150		5.6	0.85	1	06/21/10	07/02/10	KWG1006224	
Benzo(b)fluoranthene	86		5.6	1.1	1	06/21/10	07/02/10	KWG1006224	
Benzo(k)fluoranthene	27		5.6	0.98	1	06/21/10	07/02/10	KWG1006224	
Benz(a)anthracene	46		5.6	0.81	1	06/21/10	07/02/10	KWG1006224	
Chrysene	54		5.6	0.90	1	06/21/10	07/02/10	KWG1006224	
Benzo(a)pyrene	90		5.6	0.85	1	06/21/10	07/02/10	KWG1006224	
Indeno(1,2,3-cd)pyrene	81		5.6	0.98	1	06/21/10	07/02/10	KWG1006224	
Dibenz(a,h)anthracene	9.2		5.6	0.90	1	06/21/10	07/02/10	KWG1006224	
Benzo(g,h,i)perylene	99		5.6	0.96	1	06/21/10	07/02/10	KWG1006224	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Fluorene-d10	49	17-104	07/02/10	Acceptable
Fluoranthene-d10	49	27-106	07/02/10	Acceptable
Terphenyl-d14	64	35-109	07/02/10	Acceptable

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Pacific EcoRisk Laboratories
Project: USACE San Rafael Channel/16087
Sample Matrix: Sediment

Service Request: K1006356
Date Collected: 06/09/2010
Date Received: 06/18/2010

Polynuclear Aromatic Hydrocarbons

Sample Name: SRC-2010-2-Comp
Lab Code: K1006356-002
Extraction Method: EPA 3541
Analysis Method: 8270C SIM

Units: ug/Kg
Basis: Dry
Level: Low

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Naphthalene	11		5.3	0.63	1	06/21/10	07/02/10	KWG1006224	
Acenaphthylene	4.9	J	5.3	0.62	1	06/21/10	07/02/10	KWG1006224	
Acenaphthene	3.8	J	5.3	0.80	1	06/21/10	07/02/10	KWG1006224	
Fluorene	4.8	J	5.3	0.64	1	06/21/10	07/02/10	KWG1006224	
Phenanthrene	40		5.3	1.5	1	06/21/10	07/02/10	KWG1006224	
Anthracene	13		5.3	0.61	1	06/21/10	07/02/10	KWG1006224	
Fluoranthene	110		5.3	1.1	1	06/21/10	07/02/10	KWG1006224	
Pyrene	190		5.3	0.80	1	06/21/10	07/02/10	KWG1006224	
Benzo(b)fluoranthene	110		5.3	0.96	1	06/21/10	07/02/10	KWG1006224	
Benzo(k)fluoranthene	32		5.3	0.91	1	06/21/10	07/02/10	KWG1006224	
Benz(a)anthracene	56		5.3	0.75	1	06/21/10	07/02/10	KWG1006224	
Chrysene	79		5.3	0.84	1	06/21/10	07/02/10	KWG1006224	
Benzo(a)pyrene	110		5.3	0.80	1	06/21/10	07/02/10	KWG1006224	
Indeno(1,2,3-cd)pyrene	90		5.3	0.91	1	06/21/10	07/02/10	KWG1006224	
Dibenz(a,h)anthracene	10		5.3	0.84	1	06/21/10	07/02/10	KWG1006224	
Benzo(g,h,i)perylene	110		5.3	0.89	1	06/21/10	07/02/10	KWG1006224	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Fluorene-d10	50	17-104	07/02/10	Acceptable
Fluoranthene-d10	51	27-106	07/02/10	Acceptable
Terphenyl-d14	62	35-109	07/02/10	Acceptable

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Pacific EcoRisk Laboratories
Project: USACE San Rafael Channel/16087
Sample Matrix: Sediment

Service Request: K1006356
Date Collected: 06/09/2010
Date Received: 06/18/2010

Polynuclear Aromatic Hydrocarbons

Sample Name: SRC-2010-3-Comp
Lab Code: K1006356-003
Extraction Method: EPA 3541
Analysis Method: 8270C SIM

Units: ug/Kg
Basis: Dry
Level: Low

Analyte Name	Result Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Naphthalene	15	5.1	0.61	1	06/21/10	07/02/10	KWG1006224	
Acenaphthylene	9.1	5.1	0.60	1	06/21/10	07/02/10	KWG1006224	
Acenaphthene	6.1	5.1	0.77	1	06/21/10	07/02/10	KWG1006224	
Fluorene	7.9	5.1	0.62	1	06/21/10	07/02/10	KWG1006224	
Phenanthrene	80	5.1	1.5	1	06/21/10	07/02/10	KWG1006224	
Anthracene	30	5.1	0.59	1	06/21/10	07/02/10	KWG1006224	
Fluoranthene	190	5.1	0.99	1	06/21/10	07/02/10	KWG1006224	
Pyrene	300	5.1	0.77	1	06/21/10	07/02/10	KWG1006224	
Benzo(b)fluoranthene	160	5.1	0.93	1	06/21/10	07/02/10	KWG1006224	
Benzo(k)fluoranthene	51	5.1	0.88	1	06/21/10	07/02/10	KWG1006224	
Benz(a)anthracene	100	5.1	0.73	1	06/21/10	07/02/10	KWG1006224	
Chrysene	120	5.1	0.81	1	06/21/10	07/02/10	KWG1006224	
Benzo(a)pyrene	180	5.1	0.77	1	06/21/10	07/02/10	KWG1006224	
Indeno(1,2,3-cd)pyrene	150	5.1	0.88	1	06/21/10	07/02/10	KWG1006224	
Dibenz(a,h)anthracene	16	5.1	0.81	1	06/21/10	07/02/10	KWG1006224	
Benzo(g,h,i)perylene	170	5.1	0.86	1	06/21/10	07/02/10	KWG1006224	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Fluorene-d10	62	17-104	07/02/10	Acceptable
Fluoranthene-d10	64	27-106	07/02/10	Acceptable
Terphenyl-d14	78	35-109	07/02/10	Acceptable

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Pacific EcoRisk Laboratories
Project: USACE San Rafael Channel/16087
Sample Matrix: Sediment

Service Request: K1006356
Date Collected: 06/11/2010
Date Received: 06/18/2010

Polynuclear Aromatic Hydrocarbons

Sample Name: SRC-2010-4-Comp
Lab Code: K1006356-004
Extraction Method: EPA 3541
Analysis Method: 8270C SIM

Units: ug/Kg
Basis: Dry
Level: Low

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Naphthalene	11		5.3	0.64	1	06/21/10	07/02/10	KWG1006224	
Acenaphthylene	4.2	J	5.3	0.63	1	06/21/10	07/02/10	KWG1006224	
Acenaphthene	2.7	J	5.3	0.81	1	06/21/10	07/02/10	KWG1006224	
Fluorene	4.0	J	5.3	0.65	1	06/21/10	07/02/10	KWG1006224	
Phenanthrene	32		5.3	1.5	1	06/21/10	07/02/10	KWG1006224	
Anthracene	9.9		5.3	0.62	1	06/21/10	07/02/10	KWG1006224	
Fluoranthene	88		5.3	1.1	1	06/21/10	07/02/10	KWG1006224	
Pyrene	150		5.3	0.81	1	06/21/10	07/02/10	KWG1006224	
Benzo(b)fluoranthene	93		5.3	0.98	1	06/21/10	07/02/10	KWG1006224	
Benzo(k)fluoranthene	31		5.3	0.93	1	06/21/10	07/02/10	KWG1006224	
Benz(a)anthracene	48		5.3	0.77	1	06/21/10	07/02/10	KWG1006224	
Chrysene	62		5.3	0.85	1	06/21/10	07/02/10	KWG1006224	
Benzo(a)pyrene	92		5.3	0.81	1	06/21/10	07/02/10	KWG1006224	
Indeno(1,2,3-cd)pyrene	84		5.3	0.93	1	06/21/10	07/02/10	KWG1006224	
Dibenz(a,h)anthracene	8.9		5.3	0.85	1	06/21/10	07/02/10	KWG1006224	
Benzo(g,h,i)perylene	100		5.3	0.90	1	06/21/10	07/02/10	KWG1006224	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Fluorene-d10	59	17-104	07/02/10	Acceptable
Fluoranthene-d10	61	27-106	07/02/10	Acceptable
Terphenyl-d14	77	35-109	07/02/10	Acceptable

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Pacific EcoRisk Laboratories
Project: USACE San Rafael Channel/16087
Sample Matrix: Sediment

Service Request: K1006356
Date Collected: 06/08/2010
Date Received: 06/18/2010

Polynuclear Aromatic Hydrocarbons

Sample Name: SRC-2010-5-Comp
Lab Code: K1006356-005
Extraction Method: EPA 3541
Analysis Method: 8270C SIM

Units: ug/Kg
Basis: Dry
Level: Low

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Naphthalene	12		5.6	0.67	1	06/21/10	07/02/10	KWG1006224	
Acenaphthylene	7.5		5.6	0.66	1	06/21/10	07/02/10	KWG1006224	
Acenaphthene	3.6	J	5.6	0.85	1	06/21/10	07/02/10	KWG1006224	
Fluorene	6.8		5.6	0.68	1	06/21/10	07/02/10	KWG1006224	
Phenanthrene	72		5.6	1.6	1	06/21/10	07/02/10	KWG1006224	
Anthracene	23		5.6	0.65	1	06/21/10	07/02/10	KWG1006224	
Fluoranthene	260		5.6	1.1	1	06/21/10	07/02/10	KWG1006224	
Pyrene	360		5.6	0.85	1	06/21/10	07/02/10	KWG1006224	
Benzo(b)fluoranthene	240		5.6	1.1	1	06/21/10	07/02/10	KWG1006224	
Benzo(k)fluoranthene	74		5.6	0.97	1	06/21/10	07/02/10	KWG1006224	
Benz(a)anthracene	140		5.6	0.80	1	06/21/10	07/02/10	KWG1006224	
Chrysene	180		5.6	0.89	1	06/21/10	07/02/10	KWG1006224	
Benzo(a)pyrene	210		5.6	0.85	1	06/21/10	07/02/10	KWG1006224	
Indeno(1,2,3-cd)pyrene	200		5.6	0.97	1	06/21/10	07/02/10	KWG1006224	
Dibenz(a,h)anthracene	24		5.6	0.89	1	06/21/10	07/02/10	KWG1006224	
Benzo(g,h,i)perylene	210		5.6	0.95	1	06/21/10	07/02/10	KWG1006224	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Fluorene-d10	60	17-104	07/02/10	Acceptable
Fluoranthene-d10	62	27-106	07/02/10	Acceptable
Terphenyl-d14	77	35-109	07/02/10	Acceptable

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Pacific EcoRisk Laboratories
Project: USACE San Rafael Channel/16087
Sample Matrix: Sediment

Service Request: K1006356
Date Collected: 06/09/2010
Date Received: 06/18/2010

Polynuclear Aromatic Hydrocarbons

Sample Name: SRC-2010-6-Comp
Lab Code: K1006356-006
Extraction Method: EPA 3541
Analysis Method: 8270C SIM

Units: ug/Kg
Basis: Dry
Level: Low

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Naphthalene	14		6.1	0.73	1	06/21/10	07/02/10	KWG1006224	
Acenaphthylene	4.0	J	6.1	0.72	1	06/21/10	07/02/10	KWG1006224	
Acenaphthene	3.2	J	6.1	0.93	1	06/21/10	07/02/10	KWG1006224	
Fluorene	5.0	J	6.1	0.74	1	06/21/10	07/02/10	KWG1006224	
Phenanthrene	31		6.1	1.7	1	06/21/10	07/02/10	KWG1006224	
Anthracene	9.3		6.1	0.71	1	06/21/10	07/02/10	KWG1006224	
Fluoranthene	100		6.1	1.2	1	06/21/10	07/02/10	KWG1006224	
Pyrene	200		6.1	0.93	1	06/21/10	07/02/10	KWG1006224	
Benzo(b)fluoranthene	120		6.1	1.2	1	06/21/10	07/02/10	KWG1006224	
Benzo(k)fluoranthene	37		6.1	1.1	1	06/21/10	07/02/10	KWG1006224	
Benz(a)anthracene	54		6.1	0.88	1	06/21/10	07/02/10	KWG1006224	
Chrysene	78		6.1	0.97	1	06/21/10	07/02/10	KWG1006224	
Benzo(a)pyrene	100		6.1	0.93	1	06/21/10	07/02/10	KWG1006224	
Indeno(1,2,3-cd)pyrene	110		6.1	1.1	1	06/21/10	07/02/10	KWG1006224	
Dibenz(a,h)anthracene	13		6.1	0.97	1	06/21/10	07/02/10	KWG1006224	
Benzo(g,h,i)perylene	140		6.1	1.1	1	06/21/10	07/02/10	KWG1006224	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Fluorene-d10	53	17-104	07/02/10	Acceptable
Fluoranthene-d10	48	27-106	07/02/10	Acceptable
Terphenyl-d14	63	35-109	07/02/10	Acceptable

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Pacific EcoRisk Laboratories
Project: USACE San Rafael Channel/16087
Sample Matrix: Sediment

Service Request: K1006356
Date Collected: 06/10/2010
Date Received: 06/18/2010

Polynuclear Aromatic Hydrocarbons

Sample Name: SRC-2010-7-Comp
Lab Code: K1006356-007
Extraction Method: EPA 3541
Analysis Method: 8270C SIM

Units: ug/Kg
Basis: Dry
Level: Low

Analyte Name	Result Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Naphthalene	16	5.8	0.69	1	06/21/10	07/02/10	KWG1006224	
Acenaphthylene	9.4	5.8	0.68	1	06/21/10	07/02/10	KWG1006224	
Acenaphthene	12	5.8	0.88	1	06/21/10	07/02/10	KWG1006224	
Fluorene	16	5.8	0.70	1	06/21/10	07/02/10	KWG1006224	
Phenanthrene	170	5.8	1.7	1	06/21/10	07/02/10	KWG1006224	
Anthracene	47	5.8	0.67	1	06/21/10	07/02/10	KWG1006224	
Fluoranthene	490	5.8	1.2	1	06/21/10	07/02/10	KWG1006224	
Pyrene	780	5.8	0.88	1	06/21/10	07/02/10	KWG1006224	
Benzo(b)fluoranthene	510	5.8	1.1	1	06/21/10	07/02/10	KWG1006224	
Benzo(k)fluoranthene	170	5.8	1.0	1	06/21/10	07/02/10	KWG1006224	
Benz(a)anthracene	270	5.8	0.83	1	06/21/10	07/02/10	KWG1006224	
Chrysene	380	5.8	0.92	1	06/21/10	07/02/10	KWG1006224	
Benzo(a)pyrene	450	5.8	0.88	1	06/21/10	07/02/10	KWG1006224	
Indeno(1,2,3-cd)pyrene	420	5.8	1.0	1	06/21/10	07/02/10	KWG1006224	
Dibenz(a,h)anthracene	56	5.8	0.92	1	06/21/10	07/02/10	KWG1006224	
Benzo(g,h,i)perylene	460	5.8	0.98	1	06/21/10	07/02/10	KWG1006224	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Fluorene-d10	59	17-104	07/02/10	Acceptable
Fluoranthene-d10	55	27-106	07/02/10	Acceptable
Terphenyl-d14	67	35-109	07/02/10	Acceptable

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Pacific EcoRisk Laboratories
Project: USACE San Rafael Channel/16087
Sample Matrix: Sediment

Service Request: K1006356
Date Collected: 06/10/2010
Date Received: 06/18/2010

Polynuclear Aromatic Hydrocarbons

Sample Name: SRC-2010-7-Z-Comp
Lab Code: K1006356-008
Extraction Method: EPA 3541
Analysis Method: 8270C SIM

Units: ug/Kg
Basis: Dry
Level: Low

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Naphthalene	11		5.2	0.62	1	06/21/10	07/02/10	KWG1006224	
Acenaphthylene	3.4	J	5.2	0.61	1	06/21/10	07/02/10	KWG1006224	
Acenaphthene	4.6	J	5.2	0.79	1	06/21/10	07/02/10	KWG1006224	
Fluorene	5.4		5.2	0.63	1	06/21/10	07/02/10	KWG1006224	
Phenanthrene	28		5.2	1.5	1	06/21/10	07/02/10	KWG1006224	
Anthracene	8.5		5.2	0.60	1	06/21/10	07/02/10	KWG1006224	
Fluoranthene	100		5.2	1.1	1	06/21/10	07/02/10	KWG1006224	
Pyrene	200		5.2	0.79	1	06/21/10	07/02/10	KWG1006224	
Benzo(b)fluoranthene	110		5.2	0.95	1	06/21/10	07/02/10	KWG1006224	
Benzo(k)fluoranthene	35		5.2	0.90	1	06/21/10	07/02/10	KWG1006224	
Benz(a)anthracene	48		5.2	0.75	1	06/21/10	07/02/10	KWG1006224	
Chrysene	73		5.2	0.83	1	06/21/10	07/02/10	KWG1006224	
Benzo(a)pyrene	100		5.2	0.79	1	06/21/10	07/02/10	KWG1006224	
Indeno(1,2,3-cd)pyrene	100		5.2	0.90	1	06/21/10	07/02/10	KWG1006224	
Dibenz(a,h)anthracene	9.9		5.2	0.83	1	06/21/10	07/02/10	KWG1006224	
Benzo(g,h,i)perylene	130		5.2	0.88	1	06/21/10	07/02/10	KWG1006224	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Fluorene-d10	56	17-104	07/02/10	Acceptable
Fluoranthene-d10	60	27-106	07/02/10	Acceptable
Terphenyl-d14	72	35-109	07/02/10	Acceptable

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Pacific EcoRisk Laboratories
Project: USACE San Rafael Channel/16087
Sample Matrix: Sediment

Service Request: K1006356
Date Collected: 06/08/2010
Date Received: 06/18/2010

Polynuclear Aromatic Hydrocarbons

Sample Name: SRC-2010-1-B-Comp
Lab Code: K1006356-009
Extraction Method: EPA 3541
Analysis Method: 8270C SIM

Units: ug/Kg
Basis: Dry
Level: Low

Analyte Name	Result Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Naphthalene	13	5.0	0.60	1	06/21/10	07/02/10	KWG1006224	
Acenaphthylene	8.7	5.0	0.59	1	06/21/10	07/02/10	KWG1006224	
Acenaphthene	6.7	5.0	0.76	1	06/21/10	07/02/10	KWG1006224	
Fluorene	8.2	5.0	0.61	1	06/21/10	07/02/10	KWG1006224	
Phenanthrene	83	5.0	1.4	1	06/21/10	07/02/10	KWG1006224	
Anthracene	27	5.0	0.58	1	06/21/10	07/02/10	KWG1006224	
Fluoranthene	150	5.0	0.98	1	06/21/10	07/02/10	KWG1006224	
Pyrene	240	5.0	0.76	1	06/21/10	07/02/10	KWG1006224	
Benzo(b)fluoranthene	110	5.0	0.92	1	06/21/10	07/02/10	KWG1006224	
Benzo(k)fluoranthene	34	5.0	0.87	1	06/21/10	07/02/10	KWG1006224	
Benz(a)anthracene	83	5.0	0.72	1	06/21/10	07/02/10	KWG1006224	
Chrysene	94	5.0	0.80	1	06/21/10	07/02/10	KWG1006224	
Benzo(a)pyrene	120	5.0	0.76	1	06/21/10	07/02/10	KWG1006224	
Indeno(1,2,3-cd)pyrene	100	5.0	0.87	1	06/21/10	07/02/10	KWG1006224	
Dibenz(a,h)anthracene	14	5.0	0.80	1	06/21/10	07/02/10	KWG1006224	
Benzo(g,h,i)perylene	110	5.0	0.85	1	06/21/10	07/02/10	KWG1006224	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Fluorene-d10	52	17-104	07/02/10	Acceptable
Fluoranthene-d10	53	27-106	07/02/10	Acceptable
Terphenyl-d14	65	35-109	07/02/10	Acceptable

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Pacific EcoRisk Laboratories
Project: USACE San Rafael Channel/16087
Sample Matrix: Sediment

Service Request: K1006356
Date Collected: 06/09/2010
Date Received: 06/18/2010

Polynuclear Aromatic Hydrocarbons

Sample Name: SRC-2010-2-B-Comp
Lab Code: K1006356-010
Extraction Method: EPA 3541
Analysis Method: 8270C SIM

Units: ug/Kg
Basis: Dry
Level: Low

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Naphthalene	12		5.0	0.60	1	06/21/10	07/02/10	KWG1006224	
Acenaphthylene	6.4		5.0	0.59	1	06/21/10	07/02/10	KWG1006224	
Acenaphthene	3.7	J	5.0	0.76	1	06/21/10	07/02/10	KWG1006224	
Fluorene	6.4		5.0	0.61	1	06/21/10	07/02/10	KWG1006224	
Phenanthrene	50		5.0	1.4	1	06/21/10	07/02/10	KWG1006224	
Anthracene	16		5.0	0.58	1	06/21/10	07/02/10	KWG1006224	
Fluoranthene	120		5.0	0.98	1	06/21/10	07/02/10	KWG1006224	
Pyrene	210		5.0	0.76	1	06/21/10	07/02/10	KWG1006224	
Benzo(b)fluoranthene	110		5.0	0.92	1	06/21/10	07/02/10	KWG1006224	
Benzo(k)fluoranthene	33		5.0	0.87	1	06/21/10	07/02/10	KWG1006224	
Benz(a)anthracene	64		5.0	0.72	1	06/21/10	07/02/10	KWG1006224	
Chrysene	73		5.0	0.80	1	06/21/10	07/02/10	KWG1006224	
Benzo(a)pyrene	120		5.0	0.76	1	06/21/10	07/02/10	KWG1006224	
Indeno(1,2,3-cd)pyrene	110		5.0	0.87	1	06/21/10	07/02/10	KWG1006224	
Dibenz(a,h)anthracene	12		5.0	0.80	1	06/21/10	07/02/10	KWG1006224	
Benzo(g,h,i)perylene	130		5.0	0.85	1	06/21/10	07/02/10	KWG1006224	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Fluorene-d10	41	17-104	07/02/10	Acceptable
Fluoranthene-d10	40	27-106	07/02/10	Acceptable
Terphenyl-d14	49	35-109	07/02/10	Acceptable

Comments: _____

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Pacific EcoRisk Laboratories
Project: USACE San Rafael Channel/16087
Sample Matrix: Sediment

Service Request: K1006356
Date Collected: 06/09/2010
Date Received: 06/18/2010

Polynuclear Aromatic Hydrocarbons

Sample Name: SRC-2010-3-B-Comp
Lab Code: K1006356-011
Extraction Method: EPA 3541
Analysis Method: 8270C SIM

Units: ug/Kg
Basis: Dry
Level: Low

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Naphthalene	14		5.0	0.60	1	06/21/10	07/02/10	KWG1006224	
Acenaphthylene	5.7		5.0	0.59	1	06/21/10	07/02/10	KWG1006224	
Acenaphthene	3.9	J	5.0	0.76	1	06/21/10	07/02/10	KWG1006224	
Fluorene	6.0		5.0	0.61	1	06/21/10	07/02/10	KWG1006224	
Phenanthrene	46		5.0	1.4	1	06/21/10	07/02/10	KWG1006224	
Anthracene	13		5.0	0.58	1	06/21/10	07/02/10	KWG1006224	
Fluoranthene	130		5.0	0.98	1	06/21/10	07/02/10	KWG1006224	
Pyrene	220		5.0	0.76	1	06/21/10	07/02/10	KWG1006224	
Benzo(b)fluoranthene	130		5.0	0.92	1	06/21/10	07/02/10	KWG1006224	
Benzo(k)fluoranthene	38		5.0	0.87	1	06/21/10	07/02/10	KWG1006224	
Benz(a)anthracene	68		5.0	0.72	1	06/21/10	07/02/10	KWG1006224	
Chrysene	79		5.0	0.80	1	06/21/10	07/02/10	KWG1006224	
Benzo(a)pyrene	140		5.0	0.76	1	06/21/10	07/02/10	KWG1006224	
Indeno(1,2,3-cd)pyrene	120		5.0	0.87	1	06/21/10	07/02/10	KWG1006224	
Dibenz(a,h)anthracene	12		5.0	0.80	1	06/21/10	07/02/10	KWG1006224	
Benzo(g,h,i)perylene	150		5.0	0.85	1	06/21/10	07/02/10	KWG1006224	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Fluorene-d10	62	17-104	07/02/10	Acceptable
Fluoranthene-d10	64	27-106	07/02/10	Acceptable
Terphenyl-d14	78	35-109	07/02/10	Acceptable

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Pacific EcoRisk Laboratories
Project: USACE San Rafael Channel/16087
Sample Matrix: Sediment

Service Request: K1006356
Date Collected: 06/11/2010
Date Received: 06/18/2010

Polynuclear Aromatic Hydrocarbons

Sample Name: SRC-2010-4-B-Comp
Lab Code: K1006356-012
Extraction Method: EPA 3541
Analysis Method: 8270C SIM

Units: ug/Kg
Basis: Dry
Level: Low

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Naphthalene	11		4.9	0.60	1	06/21/10	07/02/10	KWG1006224	
Acenaphthylene	4.8	J	4.9	0.59	1	06/21/10	07/02/10	KWG1006224	
Acenaphthene	4.1	J	4.9	0.76	1	06/21/10	07/02/10	KWG1006224	
Fluorene	5.1		4.9	0.61	1	06/21/10	07/02/10	KWG1006224	
Phenanthrene	38		4.9	1.4	1	06/21/10	07/02/10	KWG1006224	
Anthracene	11		4.9	0.58	1	06/21/10	07/02/10	KWG1006224	
Fluoranthene	100		4.9	0.98	1	06/21/10	07/02/10	KWG1006224	
Pyrene	180		4.9	0.76	1	06/21/10	07/02/10	KWG1006224	
Benzo(b)fluoranthene	110		4.9	0.92	1	06/21/10	07/02/10	KWG1006224	
Benzo(k)fluoranthene	31		4.9	0.87	1	06/21/10	07/02/10	KWG1006224	
Benz(a)anthracene	55		4.9	0.72	1	06/21/10	07/02/10	KWG1006224	
Chrysene	63		4.9	0.80	1	06/21/10	07/02/10	KWG1006224	
Benzo(a)pyrene	110		4.9	0.76	1	06/21/10	07/02/10	KWG1006224	
Indeno(1,2,3-cd)pyrene	100		4.9	0.87	1	06/21/10	07/02/10	KWG1006224	
Dibenz(a,h)anthracene	12		4.9	0.80	1	06/21/10	07/02/10	KWG1006224	
Benzo(g,h,i)perylene	120		4.9	0.85	1	06/21/10	07/02/10	KWG1006224	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Fluorene-d10	53	17-104	07/02/10	Acceptable
Fluoranthene-d10	51	27-106	07/02/10	Acceptable
Terphenyl-d14	66	35-109	07/02/10	Acceptable

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Pacific EcoRisk Laboratories
Project: USACE San Rafael Channel/16087
Sample Matrix: Sediment

Service Request: K1006356
Date Collected: 06/08/2010
Date Received: 06/18/2010

Polynuclear Aromatic Hydrocarbons

Sample Name: SRC-2010-5-B-Comp
Lab Code: K1006356-013
Extraction Method: EPA 3541
Analysis Method: 8270C SIM

Units: ug/Kg
Basis: Dry
Level: Low

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Naphthalene	15		5.1	0.62	1	06/21/10	07/02/10	KWG1006224	
Acenaphthylene	6.4		5.1	0.60	1	06/21/10	07/02/10	KWG1006224	
Acenaphthene	4.4	J	5.1	0.78	1	06/21/10	07/02/10	KWG1006224	
Fluorene	6.6		5.1	0.63	1	06/21/10	07/02/10	KWG1006224	
Phenanthrene	70		5.1	1.5	1	06/21/10	07/02/10	KWG1006224	
Anthracene	19		5.1	0.59	1	06/21/10	07/02/10	KWG1006224	
Fluoranthene	180		5.1	1.0	1	06/21/10	07/02/10	KWG1006224	
Pyrene	280		5.1	0.78	1	06/21/10	07/02/10	KWG1006224	
Benzo(b)fluoranthene	180		5.1	0.94	1	06/21/10	07/02/10	KWG1006224	
Benzo(k)fluoranthene	55		5.1	0.89	1	06/21/10	07/02/10	KWG1006224	
Benz(a)anthracene	91		5.1	0.74	1	06/21/10	07/02/10	KWG1006224	
Chrysene	120		5.1	0.82	1	06/21/10	07/02/10	KWG1006224	
Benzo(a)pyrene	170		5.1	0.78	1	06/21/10	07/02/10	KWG1006224	
Indeno(1,2,3-cd)pyrene	160		5.1	0.89	1	06/21/10	07/02/10	KWG1006224	
Dibenz(a,h)anthracene	22		5.1	0.82	1	06/21/10	07/02/10	KWG1006224	
Benzo(g,h,i)perylene	190		5.1	0.87	1	06/21/10	07/02/10	KWG1006224	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Fluorene-d10	56	17-104	07/02/10	Acceptable
Fluoranthene-d10	66	27-106	07/02/10	Acceptable
Terphenyl-d14	73	35-109	07/02/10	Acceptable

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Pacific EcoRisk Laboratories
Project: USACE San Rafael Channel/16087
Sample Matrix: Sediment

Service Request: K1006356
Date Collected: 06/09/2010
Date Received: 06/18/2010

Polynuclear Aromatic Hydrocarbons

Sample Name: SRC-2010-6-B-Comp
Lab Code: K1006356-014
Extraction Method: EPA 3541
Analysis Method: 8270C SIM

Units: ug/Kg
Basis: Dry
Level: Low

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Naphthalene	16		5.3	0.63	1	06/21/10	07/02/10	KWG1006224	
Acenaphthylene	6.0		5.3	0.62	1	06/21/10	07/02/10	KWG1006224	
Acenaphthene	4.0	J	5.3	0.80	1	06/21/10	07/02/10	KWG1006224	
Fluorene	5.5		5.3	0.65	1	06/21/10	07/02/10	KWG1006224	
Phenanthrene	42		5.3	1.5	1	06/21/10	07/02/10	KWG1006224	
Anthracene	12		5.3	0.61	1	06/21/10	07/02/10	KWG1006224	
Fluoranthene	140		5.3	1.1	1	06/21/10	07/02/10	KWG1006224	
Pyrene	300		5.3	0.80	1	06/21/10	07/02/10	KWG1006224	
Benzo(b)fluoranthene	170		5.3	0.97	1	06/21/10	07/02/10	KWG1006224	
Benzo(k)fluoranthene	45		5.3	0.92	1	06/21/10	07/02/10	KWG1006224	
Benz(a)anthracene	69		5.3	0.76	1	06/21/10	07/02/10	KWG1006224	
Chrysene	56		5.3	0.84	1	06/21/10	07/02/10	KWG1006224	
Benzo(a)pyrene	160		5.3	0.80	1	06/21/10	07/02/10	KWG1006224	
Indeno(1,2,3-cd)pyrene	170		5.3	0.92	1	06/21/10	07/02/10	KWG1006224	
Dibenz(a,h)anthracene	16		5.3	0.84	1	06/21/10	07/02/10	KWG1006224	
Benzo(g,h,i)perylene	210		5.3	0.90	1	06/21/10	07/02/10	KWG1006224	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Fluorene-d10	59	17-104	07/02/10	Acceptable
Fluoranthene-d10	58	27-106	07/02/10	Acceptable
Terphenyl-d14	74	35-109	07/02/10	Acceptable

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Pacific EcoRisk Laboratories
Project: USACE San Rafael Channel/16087
Sample Matrix: Sediment

Service Request: K1006356
Date Collected: 06/10/2010
Date Received: 06/18/2010

Polynuclear Aromatic Hydrocarbons

Sample Name: SRC-2010-7-B-Comp
Lab Code: K1006356-015
Extraction Method: EPA 3541
Analysis Method: 8270C SIM

Units: ug/Kg
Basis: Dry
Level: Low

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Naphthalene	13		4.7	0.60	1	06/21/10	07/02/10	KWG1006224	
Acenaphthylene	6.9		4.7	0.59	1	06/21/10	07/02/10	KWG1006224	
Acenaphthene	3.6	J	4.7	0.76	1	06/21/10	07/02/10	KWG1006224	
Fluorene	2.9	J	4.7	0.61	1	06/21/10	07/02/10	KWG1006224	
Phenanthrene	30		4.7	1.4	1	06/21/10	07/02/10	KWG1006224	
Anthracene	8.7		4.7	0.58	1	06/21/10	07/02/10	KWG1006224	
Fluoranthene	170		4.7	0.98	1	06/21/10	07/02/10	KWG1006224	
Pyrene	510		4.7	0.76	1	06/21/10	07/02/10	KWG1006224	
Benzo(b)fluoranthene	210		4.7	0.92	1	06/21/10	07/02/10	KWG1006224	
Benzo(k)fluoranthene	53		4.7	0.87	1	06/21/10	07/02/10	KWG1006224	
Benz(a)anthracene	65		4.7	0.72	1	06/21/10	07/02/10	KWG1006224	
Chrysene	56		4.7	0.80	1	06/21/10	07/02/10	KWG1006224	
Benzo(a)pyrene	230		4.7	0.76	1	06/21/10	07/02/10	KWG1006224	
Indeno(1,2,3-cd)pyrene	260		4.7	0.87	1	06/21/10	07/02/10	KWG1006224	
Dibenz(a,h)anthracene	17		4.7	0.80	1	06/21/10	07/02/10	KWG1006224	
Benzo(g,h,i)perylene	340		4.7	0.85	1	06/21/10	07/02/10	KWG1006224	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Fluorene-d10	43	17-104	07/02/10	Acceptable
Fluoranthene-d10	48	27-106	07/02/10	Acceptable
Terphenyl-d14	52	35-109	07/02/10	Acceptable

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Pacific EcoRisk Laboratories
Project: USACE San Rafael Channel/16087
Sample Matrix: Sediment

Service Request: K1006356
Date Collected: 06/10/2010
Date Received: 06/18/2010

Polynuclear Aromatic Hydrocarbons

Sample Name: SRC-2010-7-1
Lab Code: K1006356-016
Extraction Method: EPA 3541
Analysis Method: 8270C SIM

Units: ug/Kg
Basis: Dry
Level: Low

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Naphthalene	11		6.3	0.75	1	06/21/10	07/02/10	KWG1006224	
Acenaphthylene	5.5	J	6.3	0.74	1	06/21/10	07/02/10	KWG1006224	
Acenaphthene	2.7	J	6.3	0.95	1	06/21/10	07/02/10	KWG1006224	
Fluorene	4.3	J	6.3	0.77	1	06/21/10	07/02/10	KWG1006224	
Phenanthrene	44		6.3	1.8	1	06/21/10	07/02/10	KWG1006224	
Anthracene	15		6.3	0.73	1	06/21/10	07/02/10	KWG1006224	
Fluoranthene	130		6.3	1.3	1	06/21/10	07/02/10	KWG1006224	
Pyrene	180		6.3	0.95	1	06/21/10	07/02/10	KWG1006224	
Benzo(b)fluoranthene	130		6.3	1.2	1	06/21/10	07/02/10	KWG1006224	
Benzo(k)fluoranthene	38		6.3	1.1	1	06/21/10	07/02/10	KWG1006224	
Benz(a)anthracene	59		6.3	0.90	1	06/21/10	07/02/10	KWG1006224	
Chrysene	92		6.3	1.0	1	06/21/10	07/02/10	KWG1006224	
Benzo(a)pyrene	110		6.3	0.95	1	06/21/10	07/02/10	KWG1006224	
Indeno(1,2,3-cd)pyrene	130		6.3	1.1	1	06/21/10	07/02/10	KWG1006224	
Dibenz(a,h)anthracene	20		6.3	1.0	1	06/21/10	07/02/10	KWG1006224	
Benzo(g,h,i)perylene	130		6.3	1.1	1	06/21/10	07/02/10	KWG1006224	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Fluorene-d10	60	17-104	07/02/10	Acceptable
Fluoranthene-d10	75	27-106	07/02/10	Acceptable
Terphenyl-d14	79	35-109	07/02/10	Acceptable

Comments: _____

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Pacific EcoRisk Laboratories
Project: USACE San Rafael Channel/16087
Sample Matrix: Sediment

Service Request: K1006356
Date Collected: 06/10/2010
Date Received: 06/18/2010

Polynuclear Aromatic Hydrocarbons

Sample Name: SRC-2010-7-2
Lab Code: K1006356-017
Extraction Method: EPA 3541
Analysis Method: 8270C SIM

Units: ug/Kg
Basis: Dry
Level: Low

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Naphthalene	13		6.0	0.72	1	06/21/10	07/02/10	KWG1006224	
Acenaphthylene	5.8	J	6.0	0.70	1	06/21/10	07/02/10	KWG1006224	
Acenaphthene	2.6	J	6.0	0.91	1	06/21/10	07/02/10	KWG1006224	
Fluorene	4.3	J	6.0	0.73	1	06/21/10	07/02/10	KWG1006224	
Phenanthrene	44		6.0	1.7	1	06/21/10	07/02/10	KWG1006224	
Anthracene	11		6.0	0.69	1	06/21/10	07/02/10	KWG1006224	
Fluoranthene	140		6.0	1.2	1	06/21/10	07/02/10	KWG1006224	
Pyrene	230		6.0	0.91	1	06/21/10	07/02/10	KWG1006224	
Benzo(b)fluoranthene	150		6.0	1.1	1	06/21/10	07/02/10	KWG1006224	
Benzo(k)fluoranthene	46		6.0	1.1	1	06/21/10	07/02/10	KWG1006224	
Benz(a)anthracene	56		6.0	0.86	1	06/21/10	07/02/10	KWG1006224	
Chrysene	86		6.0	0.95	1	06/21/10	07/02/10	KWG1006224	
Benzo(a)pyrene	140		6.0	0.91	1	06/21/10	07/02/10	KWG1006224	
Indeno(1,2,3-cd)pyrene	170		6.0	1.1	1	06/21/10	07/02/10	KWG1006224	
Dibenz(a,h)anthracene	23		6.0	0.95	1	06/21/10	07/02/10	KWG1006224	
Benzo(g,h,i)perylene	180		6.0	1.1	1	06/21/10	07/02/10	KWG1006224	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Fluorene-d10	61	17-104	07/02/10	Acceptable
Fluoranthene-d10	75	27-106	07/02/10	Acceptable
Terphenyl-d14	75	35-109	07/02/10	Acceptable

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Pacific EcoRisk Laboratories
Project: USACE San Rafael Channel/16087
Sample Matrix: Sediment

Service Request: K1006356
Date Collected: 06/10/2010
Date Received: 06/18/2010

Polynuclear Aromatic Hydrocarbons

Sample Name: SRC-2010-7-3
Lab Code: K1006356-018
Extraction Method: EPA 3541
Analysis Method: 8270C SIM

Units: ug/Kg
Basis: Dry
Level: Low

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Naphthalene	12		5.9	0.71	1	06/21/10	07/02/10	KWG1006224	
Acenaphthylene	7.5		5.9	0.70	1	06/21/10	07/02/10	KWG1006224	
Acenaphthene	3.5	J	5.9	0.90	1	06/21/10	07/02/10	KWG1006224	
Fluorene	5.2	J	5.9	0.72	1	06/21/10	07/02/10	KWG1006224	
Phenanthrene	65		5.9	1.7	1	06/21/10	07/02/10	KWG1006224	
Anthracene	18		5.9	0.68	1	06/21/10	07/02/10	KWG1006224	
Fluoranthene	200		5.9	1.2	1	06/21/10	07/02/10	KWG1006224	
Pyrene	340		5.9	0.90	1	06/21/10	07/02/10	KWG1006224	
Benzo(b)fluoranthene	220		5.9	1.1	1	06/21/10	07/02/10	KWG1006224	
Benzo(k)fluoranthene	64		5.9	1.1	1	06/21/10	07/02/10	KWG1006224	
Benz(a)anthracene	91		5.9	0.85	1	06/21/10	07/02/10	KWG1006224	
Chrysene	140		5.9	0.94	1	06/21/10	07/02/10	KWG1006224	
Benzo(a)pyrene	180		5.9	0.90	1	06/21/10	07/02/10	KWG1006224	
Indeno(1,2,3-cd)pyrene	200		5.9	1.1	1	06/21/10	07/02/10	KWG1006224	
Dibenz(a,h)anthracene	24		5.9	0.94	1	06/21/10	07/02/10	KWG1006224	
Benzo(g,h,i)perylene	220		5.9	1.0	1	06/21/10	07/02/10	KWG1006224	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Fluorene-d10	57	17-104	07/02/10	Acceptable
Fluoranthene-d10	63	27-106	07/02/10	Acceptable
Terphenyl-d14	73	35-109	07/02/10	Acceptable

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Pacific EcoRisk Laboratories
Project: USACE San Rafael Channel/16087
Sample Matrix: Sediment

Service Request: K1006356
Date Collected: 06/10/2010
Date Received: 06/18/2010

Polynuclear Aromatic Hydrocarbons

Sample Name: SRC-2010-7-4
Lab Code: K1006356-019
Extraction Method: EPA 3541
Analysis Method: 8270C SIM

Units: ug/Kg
Basis: Dry
Level: Low

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Naphthalene	13		6.3	0.76	1	06/21/10	07/02/10	KWG1006224	
Acenaphthylene	6.6		6.3	0.74	1	06/21/10	07/02/10	KWG1006224	
Acenaphthene	4.5	J	6.3	0.96	1	06/21/10	07/02/10	KWG1006224	
Fluorene	5.5	J	6.3	0.77	1	06/21/10	07/02/10	KWG1006224	
Phenanthrene	69		6.3	1.8	1	06/21/10	07/02/10	KWG1006224	
Anthracene	20		6.3	0.73	1	06/21/10	07/02/10	KWG1006224	
Fluoranthene	250		6.3	1.3	1	06/21/10	07/02/10	KWG1006224	
Pyrene	450		6.3	0.96	1	06/21/10	07/02/10	KWG1006224	
Benzo(b)fluoranthene	260		6.3	1.2	1	06/21/10	07/02/10	KWG1006224	
Benzo(k)fluoranthene	72		6.3	1.1	1	06/21/10	07/02/10	KWG1006224	
Benz(a)anthracene	110		6.3	0.91	1	06/21/10	07/02/10	KWG1006224	
Chrysene	110		6.3	1.1	1	06/21/10	07/02/10	KWG1006224	
Benzo(a)pyrene	210		6.3	0.96	1	06/21/10	07/02/10	KWG1006224	
Indeno(1,2,3-cd)pyrene	220		6.3	1.1	1	06/21/10	07/02/10	KWG1006224	
Dibenz(a,h)anthracene	27		6.3	1.1	1	06/21/10	07/02/10	KWG1006224	
Benzo(g,h,i)perylene	250		6.3	1.1	1	06/21/10	07/02/10	KWG1006224	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Fluorene-d10	42	17-104	07/02/10	Acceptable
Fluoranthene-d10	48	27-106	07/02/10	Acceptable
Terphenyl-d14	53	35-109	07/02/10	Acceptable

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Pacific EcoRisk Laboratories
Project: USACE San Rafael Channel/16087
Sample Matrix: Sediment

Service Request: K1006356
Date Collected: 06/10/2010
Date Received: 06/18/2010

Polynuclear Aromatic Hydrocarbons

Sample Name: SRC-2010-7-5
Lab Code: K1006356-020
Extraction Method: EPA 3541
Analysis Method: 8270C SIM

Units: ug/Kg
Basis: Dry
Level: Low

Analyte Name	Result Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Naphthalene	25	5.7	0.68	1	06/21/10	07/02/10	KWG1006224	
Acenaphthylene	11	5.7	0.67	1	06/21/10	07/02/10	KWG1006224	
Acenaphthene	33	5.7	0.86	1	06/21/10	07/02/10	KWG1006224	
Fluorene	42	5.7	0.70	1	06/21/10	07/02/10	KWG1006224	
Phenanthrene	230	5.7	1.6	1	06/21/10	07/02/10	KWG1006224	
Anthracene	59	5.7	0.66	1	06/21/10	07/02/10	KWG1006224	
Fluoranthene	750	5.7	1.2	1	06/21/10	07/02/10	KWG1006224	
Pyrene	1000	5.7	0.86	1	06/21/10	07/02/10	KWG1006224	
Benzo(b)fluoranthene	500	5.7	1.1	1	06/21/10	07/02/10	KWG1006224	
Benzo(k)fluoranthene	150	5.7	0.99	1	06/21/10	07/02/10	KWG1006224	
Benz(a)anthracene	310	5.7	0.82	1	06/21/10	07/02/10	KWG1006224	
Chrysene	360	5.7	0.91	1	06/21/10	07/02/10	KWG1006224	
Benzo(a)pyrene	430	5.7	0.86	1	06/21/10	07/02/10	KWG1006224	
Indeno(1,2,3-cd)pyrene	430	5.7	0.99	1	06/21/10	07/02/10	KWG1006224	
Dibenz(a,h)anthracene	53	5.7	0.91	1	06/21/10	07/02/10	KWG1006224	
Benzo(g,h,i)perylene	490	5.7	0.97	1	06/21/10	07/02/10	KWG1006224	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Fluorene-d10	58	17-104	07/02/10	Acceptable
Fluoranthene-d10	69	27-106	07/02/10	Acceptable
Terphenyl-d14	70	35-109	07/02/10	Acceptable

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Pacific EcoRisk Laboratories
Project: USACE San Rafael Channel/16087
Sample Matrix: Sediment

Service Request: K1006356
Date Collected: 06/10/2010
Date Received: 06/23/2010

Polynuclear Aromatic Hydrocarbons

Sample Name: SRC-2010-8-Z-Comp
Lab Code: K1006356-021
Extraction Method: EPA 3541
Analysis Method: 8270C SIM

Units: ug/Kg
Basis: Dry
Level: Low

Analyte Name	Result Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Naphthalene	37	5.6	0.67	1	06/24/10	07/01/10	KWG1006323	
Acenaphthylene	21	5.6	0.66	1	06/24/10	07/01/10	KWG1006323	
Acenaphthene	21	5.6	0.85	1	06/24/10	07/01/10	KWG1006323	
Fluorene	20	5.6	0.68	1	06/24/10	07/01/10	KWG1006323	
Phenanthrene	230	5.6	1.6	1	06/24/10	07/01/10	KWG1006323	
Anthracene	54	5.6	0.65	1	06/24/10	07/01/10	KWG1006323	
Fluoranthene	990	5.6	1.1	1	06/24/10	07/01/10	KWG1006323	
Pyrene	1600	5.6	0.85	1	06/24/10	07/01/10	KWG1006323	
Benzo(b)fluoranthene	670	5.6	1.1	1	06/24/10	07/01/10	KWG1006323	
Benzo(k)fluoranthene	170	5.6	0.97	1	06/24/10	07/01/10	KWG1006323	
Benz(a)anthracene	300	5.6	0.81	1	06/24/10	07/01/10	KWG1006323	
Chrysene	400	5.6	0.89	1	06/24/10	07/01/10	KWG1006323	
Benzo(a)pyrene	710	5.6	0.85	1	06/24/10	07/01/10	KWG1006323	
Indeno(1,2,3-cd)pyrene	850	5.6	0.97	1	06/24/10	07/01/10	KWG1006323	
Dibenz(a,h)anthracene	61	5.6	0.89	1	06/24/10	07/01/10	KWG1006323	
Benzo(g,h,i)perylene	970	5.6	0.95	1	06/24/10	07/01/10	KWG1006323	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Fluorene-d10	61	17-104	07/01/10	Acceptable
Fluoranthene-d10	73	27-106	07/01/10	Acceptable
Terphenyl-d14	72	35-109	07/01/10	Acceptable

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Pacific EcoRisk Laboratories
Project: USACE San Rafael Channel/16087
Sample Matrix: Sediment

Service Request: K1006356
Date Collected: NA
Date Received: NA

Polynuclear Aromatic Hydrocarbons

Sample Name: Method Blank
Lab Code: KWG1006224-5
Extraction Method: EPA 3541
Analysis Method: 8270C SIM

Units: ug/Kg
Basis: Dry
Level: Low

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Naphthalene	1.8	J	2.4	0.60	1	06/21/10	07/03/10	KWG1006224	
Acenaphthylene	ND	U	2.4	0.59	1	06/21/10	07/03/10	KWG1006224	
Acenaphthene	ND	U	2.4	0.76	1	06/21/10	07/03/10	KWG1006224	
Fluorene	ND	U	2.4	0.61	1	06/21/10	07/03/10	KWG1006224	
Phenanthrene	ND	U	2.4	1.4	1	06/21/10	07/03/10	KWG1006224	
Anthracene	ND	U	2.4	0.58	1	06/21/10	07/03/10	KWG1006224	
Fluoranthene	ND	U	2.4	0.98	1	06/21/10	07/03/10	KWG1006224	
Pyrene	ND	U	2.4	0.76	1	06/21/10	07/03/10	KWG1006224	
Benzo(b)fluoranthene	ND	U	2.4	0.92	1	06/21/10	07/03/10	KWG1006224	
Benzo(k)fluoranthene	ND	U	2.4	0.87	1	06/21/10	07/03/10	KWG1006224	
Benz(a)anthracene	ND	U	2.4	0.72	1	06/21/10	07/03/10	KWG1006224	
Chrysene	ND	U	2.4	0.80	1	06/21/10	07/03/10	KWG1006224	
Benzo(a)pyrene	ND	U	2.4	0.76	1	06/21/10	07/03/10	KWG1006224	
Indeno(1,2,3-cd)pyrene	ND	U	2.4	0.87	1	06/21/10	07/03/10	KWG1006224	
Dibenz(a,h)anthracene	ND	U	2.4	0.80	1	06/21/10	07/03/10	KWG1006224	
Benzo(g,h,i)perylene	ND	U	2.4	0.85	1	06/21/10	07/03/10	KWG1006224	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Fluorene-d10	71	17-104	07/03/10	Acceptable
Fluoranthene-d10	65	27-106	07/03/10	Acceptable
Terphenyl-d14	92	35-109	07/03/10	Acceptable

Comments: _____

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Pacific EcoRisk Laboratories
Project: USACE San Rafael Channel/16087
Sample Matrix: Sediment

Service Request: K1006356
Date Collected: NA
Date Received: NA

Polynuclear Aromatic Hydrocarbons

Sample Name: Method Blank
Lab Code: KWG1006323-5
Extraction Method: EPA 3541
Analysis Method: 8270C SIM

Units: ug/Kg
Basis: Dry
Level: Low

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Naphthalene	2.3	J	2.4	0.60	1	06/24/10	07/01/10	KWG1006323	
Acenaphthylene	ND	U	2.4	0.59	1	06/24/10	07/01/10	KWG1006323	
Acenaphthene	ND	U	2.4	0.76	1	06/24/10	07/01/10	KWG1006323	
Fluorene	ND	U	2.4	0.61	1	06/24/10	07/01/10	KWG1006323	
Phenanthrene	ND	U	2.4	1.4	1	06/24/10	07/01/10	KWG1006323	
Anthracene	ND	U	2.4	0.58	1	06/24/10	07/01/10	KWG1006323	
Fluoranthene	ND	U	2.4	0.98	1	06/24/10	07/01/10	KWG1006323	
Pyrene	ND	U	2.4	0.76	1	06/24/10	07/01/10	KWG1006323	
Benzo(b)fluoranthene	ND	U	2.4	0.92	1	06/24/10	07/01/10	KWG1006323	
Benzo(k)fluoranthene	ND	U	2.4	0.87	1	06/24/10	07/01/10	KWG1006323	
Benz(a)anthracene	ND	U	2.4	0.72	1	06/24/10	07/01/10	KWG1006323	
Chrysene	ND	U	2.4	0.80	1	06/24/10	07/01/10	KWG1006323	
Benzo(a)pyrene	ND	U	2.4	0.76	1	06/24/10	07/01/10	KWG1006323	
Indeno(1,2,3-cd)pyrene	ND	U	2.4	0.87	1	06/24/10	07/01/10	KWG1006323	
Dibenz(a,h)anthracene	ND	U	2.4	0.80	1	06/24/10	07/01/10	KWG1006323	
Benzo(g,h,i)perylene	ND	U	2.4	0.85	1	06/24/10	07/01/10	KWG1006323	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Fluorene-d10	68	17-104	07/01/10	Acceptable
Fluoranthene-d10	67	27-106	07/01/10	Acceptable
Terphenyl-d14	83	35-109	07/01/10	Acceptable

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Pacific EcoRisk Laboratories
Project: USACE San Rafael Channel/16087
Sample Matrix: Sediment

Service Request: K1006356

Surrogate Recovery Summary
Polynuclear Aromatic Hydrocarbons

Extraction Method: EPA 3541
Analysis Method: 8270C SIM

Units: PERCENT
Level: Low

<u>Sample Name</u>	<u>Lab Code</u>	<u>Sur1</u>	<u>Sur2</u>	<u>Sur3</u>
SRC-2010-1-B-Comp	K1006356-009	52	53	65
SRC-2010-2-B-Comp	K1006356-010	41	40	49
SRC-2010-3-B-Comp	K1006356-011	62	64	78
SRC-2010-4-B-Comp	K1006356-012	53	51	66
SRC-2010-5-B-Comp	K1006356-013	56	66	73
SRC-2010-6-B-Comp	K1006356-014	59	58	74
SRC-2010-7-B-Comp	K1006356-015	43	48	52
SRC-2010-7-1	K1006356-016	60	75	79
SRC-2010-7-2	K1006356-017	61	75	75
SRC-2010-7-3	K1006356-018	57	63	73
SRC-2010-7-4	K1006356-019	42	48	53
SRC-2010-7-5	K1006356-020	58	69	70
SRC-2010-8-Z-Comp	K1006356-021	61	73	72
Method Blank	KWG1006224-5	71	65	92
Method Blank	KWG1006323-5	68	67	83
Batch QC	K1006486-001	56	63	67
SRC-2010-1-CompMS	KWG1006224-1	56	63	67
SRC-2010-1-CompDMS	KWG1006224-2	69	85	83
Batch QCMS	KWG1006323-1	52	63	60
Batch QCDMS	KWG1006323-2	57	65	67
Lab Control Sample	KWG1006224-3	69	67	79
Duplicate Lab Control Sample	KWG1006224-4	69	77	76
Lab Control Sample	KWG1006323-3	58	59	64
Duplicate Lab Control Sample	KWG1006323-4	72	70	80
SRC-2010-1-Comp	K1006356-001	49	49	64
SRC-2010-2-Comp	K1006356-002	50	51	62
SRC-2010-3-Comp	K1006356-003	62	64	78
SRC-2010-4-Comp	K1006356-004	59	61	77
SRC-2010-5-Comp	K1006356-005	60	62	77
SRC-2010-6-Comp	K1006356-006	53	48	63
SRC-2010-7-Comp	K1006356-007	59	55	67
SRC-2010-7-Z-Comp	K1006356-008	56	60	72

Surrogate Recovery Control Limits (%)

Sur1 = Fluorene-d10	17-104
Sur2 = Fluoranthene-d10	27-106
Sur3 = Terphenyl-d14	35-109

Results flagged with an asterisk (*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Pacific EcoRisk Laboratories
Project: USACE San Rafael Channel/16087

Service Request: K1006356
Date Analyzed: 07/01/2010
Time Analyzed: 13:43

Internal Standard Area and RT Summary
Polynuclear Aromatic Hydrocarbons

File ID: J:\MS11\DATA\070110\0701F004.D
Instrument ID: MS11
Analysis Method: 8270C SIM

Lab Code: KWG1006532-2
Analysis Lot: KWG1006532

	Naphthalene-d8		Acenaphthene-d10		Phenanthrene-d10	
	<u>Area</u>	<u>RT</u>	<u>Area</u>	<u>RT</u>	<u>Area</u>	<u>RT</u>
Results ==>	93,530	4.91	50,761	6.32	102,373	7.55
Upper Limit ==>	187,060	5.41	101,522	6.82	204,746	8.05
Lower Limit ==>	46,765	4.41	25,381	5.82	51,187	7.05
ICAL Result ==>	96,897	4.94	52,741	6.36	94,220	7.59

Associated Analyses

Method Blank	KWG1006323-5	82,749	4.90	48,100	6.32	90,604	7.55
Lab Control Sample	KWG1006323-3	72,469	4.90	42,434	6.32	81,405	7.55
Duplicate Lab Control Sample	KWG1006323-4	65,667	4.90	40,141	6.32	76,848	7.56
Batch QCMS	KWG1006323-1	70,991	4.90	41,211	6.32	73,344	7.54
Batch QCDMS	KWG1006323-2	67,179	4.90	40,542	6.32	80,090	7.55
Batch QC	K1006486-001	66,803	4.90	40,127	6.32	76,235	7.56
SRC-2010-8-Z-Comp	K1006356-021	76,100	4.90	47,138	6.32	86,278	7.55

Results flagged with an asterisk (*) indicate values outside control criteria.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Pacific EcoRisk Laboratories
Project: USACE San Rafael Channel/16087

Service Request: K1006356
Date Analyzed: 07/01/2010
Time Analyzed: 13:43

Internal Standard Area and RT Summary
Polynuclear Aromatic Hydrocarbons

File ID: J:\MS11\DATA\070110\0701F004.D
Instrument ID: MS11
Analysis Method: 8270C SIM

Lab Code: KWG1006532-2
Analysis Lot: KWG1006532

	Chrysene-d12		Perylene-d12		<u>Area</u>	<u>RT</u>
	<u>Area</u>	<u>RT</u>	<u>Area</u>	<u>RT</u>		
Results ==>	111,977	10.30	104,238	13.94		
Upper Limit ==>	223,954	10.80	208,476	14.44		
Lower Limit ==>	55,989	9.80	52,119	13.44		
ICAL Result ==>	131,231	10.35	113,534	14.00		

Associated Analyses

Method Blank	KWG1006323-5	96,608	10.29	88,235	13.93
Lab Control Sample	KWG1006323-3	87,950	10.29	79,312	13.92
Duplicate Lab Control Sample	KWG1006323-4	84,461	10.29	78,171	13.93
Batch QCMS	KWG1006323-1	92,841	10.29	87,335	13.93
Batch QCDMS	KWG1006323-2	95,557	10.29	92,023	13.93
Batch QC	K1006486-001	89,657	10.29	86,073	13.92
SRC-2010-8-Z-Comp	K1006356-021	108,341	10.29	108,881	13.95

Results flagged with an asterisk (*) indicate values outside control criteria.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Pacific EcoRisk Laboratories
Project: USACE San Rafael Channel/16087

Service Request: K1006356
Date Analyzed: 07/02/2010
Time Analyzed: 10:48

Internal Standard Area and RT Summary
Polynuclear Aromatic Hydrocarbons

File ID: J:\MS11\DATA\070210\0702F004.D
Instrument ID: MS11
Analysis Method: 8270C SIM

Lab Code: KWG1006570-2
Analysis Lot: KWG1006570

	Naphthalene-d8		Acenaphthene-d10		Phenanthrene-d10	
	<u>Area</u>	<u>RT</u>	<u>Area</u>	<u>RT</u>	<u>Area</u>	<u>RT</u>
Results ==>	93,038	4.90	56,217	6.32	109,878	7.54
Upper Limit ==>	186,076	5.40	112,434	6.82	219,756	8.04
Lower Limit ==>	46,519	4.40	28,109	5.82	54,939	7.04
ICAL Result ==>	96,897	4.94	52,741	6.36	94,220	7.59

Associated Analyses

SRC-2010-1-Comp	K1006356-001	85,584	4.90	49,834	6.31	97,039	7.54
SRC-2010-2-Comp	K1006356-002	59,066	4.89	34,882	6.32	73,174	7.54
SRC-2010-3-Comp	K1006356-003	80,519	4.89	47,492	6.32	95,139	7.54
SRC-2010-4-Comp	K1006356-004	59,470	4.89	33,573	6.32	66,355	7.54
SRC-2010-5-Comp	K1006356-005	80,488	4.90	47,267	6.32	97,436	7.54
SRC-2010-6-Comp	K1006356-006	79,582	4.89	48,262	6.32	100,929	7.54
SRC-2010-7-Comp	K1006356-007	82,391	4.90	49,657	6.31	107,261	7.54
SRC-2010-7-Z-Comp	K1006356-008	84,852	4.89	49,580	6.31	98,895	7.54
SRC-2010-1-B-Comp	K1006356-009	72,941	4.89	43,252	6.32	87,287	7.54
SRC-2010-2-B-Comp	K1006356-010	80,925	4.89	45,973	6.32	96,054	7.54
SRC-2010-3-B-Comp	K1006356-011	67,515	4.89	40,270	6.32	78,967	7.54
SRC-2010-4-B-Comp	K1006356-012	62,627	4.89	36,833	6.32	77,611	7.54
SRC-2010-5-B-Comp	K1006356-013	61,795	4.88	34,528	6.32	65,557	7.54
SRC-2010-6-B-Comp	K1006356-014	76,341	4.89	44,920	6.31	93,697	7.54
SRC-2010-7-B-Comp	K1006356-015	64,891	4.89	38,960	6.31	77,435	7.54
SRC-2010-7-1	K1006356-016	77,979	4.90	44,647	6.32	77,020	7.55
SRC-2010-7-2	K1006356-017	85,256	4.89	46,981	6.32	71,092	7.55
SRC-2010-7-3	K1006356-018	78,047	4.89	43,356	6.32	70,024	7.54
SRC-2010-7-4	K1006356-019	74,345	4.89	41,755	6.32	68,880	7.54
SRC-2010-7-5	K1006356-020	74,386	4.89	41,179	6.32	66,023	7.54

Results flagged with an asterisk (*) indicate values outside control criteria.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Pacific EcoRisk Laboratories
Project: USACE San Rafael Channel/16087

Service Request: K1006356
Date Analyzed: 07/02/2010
Time Analyzed: 10:48

Internal Standard Area and RT Summary
Polynuclear Aromatic Hydrocarbons

File ID: J:\MS11\DATA\070210\0702F004.D
Instrument ID: MS11
Analysis Method: 8270C SIM

Lab Code: KWG1006570-2
Analysis Lot: KWG1006570

	Chrysene-d12		Perylene-d12			
	<u>Area</u>	<u>RT</u>	<u>Area</u>	<u>RT</u>	<u>Area</u>	<u>RT</u>
Results ==>	118,461	10.28	110,591	13.90		
Upper Limit ==>	236,922	10.78	221,182	14.40		
Lower Limit ==>	59,231	9.78	55,296	13.40		
ICAL Result ==>	131,231	10.35	113,534	14.00		

Associated Analyses

SRC-2010-1-Comp	K1006356-001	95,965	10.28	92,300	13.89
SRC-2010-2-Comp	K1006356-002	70,432	10.27	66,049	13.89
SRC-2010-3-Comp	K1006356-003	95,013	10.27	92,128	13.89
SRC-2010-4-Comp	K1006356-004	65,494	10.28	62,960	13.89
SRC-2010-5-Comp	K1006356-005	95,494	10.28	92,332	13.89
SRC-2010-6-Comp	K1006356-006	99,398	10.28	101,094	13.89
SRC-2010-7-Comp	K1006356-007	112,801	10.28	115,426	13.90
SRC-2010-7-Z-Comp	K1006356-008	100,500	10.28	102,542	13.90
SRC-2010-1-B-Comp	K1006356-009	87,283	10.27	86,505	13.89
SRC-2010-2-B-Comp	K1006356-010	91,788	10.27	89,013	13.89
SRC-2010-3-B-Comp	K1006356-011	79,975	10.27	80,523	13.89
SRC-2010-4-B-Comp	K1006356-012	75,422	10.27	73,406	13.88
SRC-2010-5-B-Comp	K1006356-013	68,246	10.27	67,498	13.89
SRC-2010-6-B-Comp	K1006356-014	91,751	10.27	91,353	13.89
SRC-2010-7-B-Comp	K1006356-015	83,281	10.27	85,027	13.89
SRC-2010-7-1	K1006356-016	92,528	10.30	92,142	13.95
SRC-2010-7-2	K1006356-017	89,807	10.29	90,740	13.94
SRC-2010-7-3	K1006356-018	85,507	10.29	84,391	13.93
SRC-2010-7-4	K1006356-019	79,204	10.29	78,411	13.93
SRC-2010-7-5	K1006356-020	79,580	10.29	76,966	13.95

Results flagged with an asterisk (*) indicate values outside control criteria.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Pacific EcoRisk Laboratories
Project: USACE San Rafael Channel/16087

Service Request: K1006356
Date Analyzed: 07/03/2010
Time Analyzed: 08:29

Internal Standard Area and RT Summary
Polynuclear Aromatic Hydrocarbons

File ID: J:\MS11\DATA\070310\0703F002.D
Instrument ID: MS11
Analysis Method: 8270C SIM

Lab Code: KWG1006565-2
Analysis Lot: KWG1006565

		Naphthalene-d8		Acenaphthene-d10		Phenanthrene-d10	
		<u>Area</u>	<u>RT</u>	<u>Area</u>	<u>RT</u>	<u>Area</u>	<u>RT</u>
Results ==>		104,822	4.89	61,409	6.31	114,193	7.54
Upper Limit ==>		209,644	5.39	122,818	6.81	228,386	8.04
Lower Limit ==>		52,411	4.39	30,705	5.81	57,097	7.04
ICAL Result ==>		96,897	4.94	52,741	6.36	94,220	7.59
Associated Analyses							
Method Blank	KWG1006224-5	90,612	4.89	49,588	6.31	94,926	7.54
Lab Control Sample	KWG1006224-3	77,592	4.88	44,597	6.31	88,653	7.54
Duplicate Lab Control Sample	KWG1006224-4	79,537	4.88	44,227	6.31	78,527	7.54
SRC-2010-1-CompMS	KWG1006224-1	80,437	4.88	46,039	6.31	87,903	7.54
SRC-2010-1-CompDMS	KWG1006224-2	78,931	4.89	45,560	6.31	78,659	7.54

Results flagged with an asterisk (*) indicate values outside control criteria.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Pacific EcoRisk Laboratories
Project: USACE San Rafael Channel/16087

Service Request: K1006356
Date Analyzed: 07/03/2010
Time Analyzed: 08:29

Internal Standard Area and RT Summary
Polynuclear Aromatic Hydrocarbons

File ID: J:\MS11\DATA\070310\0703F002.D
Instrument ID: MS11
Analysis Method: 8270C SIM

Lab Code: KWG1006565-2
Analysis Lot: KWG1006565

		Chrysene-d12		Perylene-d12		<u>Area</u>	<u>RT</u>
		<u>Area</u>	<u>RT</u>	<u>Area</u>	<u>RT</u>		
Results ==>		133,701	10.28	124,506	13.90		
Upper Limit ==>		267,402	10.78	249,012	14.40		
Lower Limit ==>		66,851	9.78	62,253	13.40		
ICAL Result ==>		131,231	10.35	113,534	14.00		
Associated Analyses							
Method Blank	KWG1006224-5	87,427	10.28	82,121	13.91		
Lab Control Sample	KWG1006224-3	95,648	10.28	89,795	13.90		
Duplicate Lab Control Sample	KWG1006224-4	97,962	10.28	89,110	13.90		
SRC-2010-1-CompMS	KWG1006224-1	102,716	10.28	95,120	13.90		
SRC-2010-1-CompDMS	KWG1006224-2	99,878	10.27	93,366	13.90		

Results flagged with an asterisk (*) indicate values outside control criteria.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Pacific EcoRisk Laboratories
Project: USACE San Rafael Channel/16087
Sample Matrix: Sediment

Service Request: K1006356
Date Extracted: 06/21/2010
Date Analyzed: 07/03/2010

Matrix Spike/Duplicate Matrix Spike Summary
Polynuclear Aromatic Hydrocarbons

Sample Name: SRC-2010-1-Comp
Lab Code: K1006356-001
Extraction Method: EPA 3541
Analysis Method: 8270C SIM

Units: ug/Kg
Basis: Dry
Level: Low
Extraction Lot: KWG1006224

Analyte Name	Sample Result	SRC-2010-1-CompMS KWG1006224-1 Matrix Spike			SRC-2010-1-CompDMS KWG1006224-2 Duplicate Matrix Spike			%Rec Limits	RPD	RPD Limit
		Result	Expected	%Rec	Result	Expected	%Rec			
Naphthalene	12	291	560	50	425	559	74	11-119	38	40
Acenaphthylene	4.2	318	560	56	464	559	82	32-106	37	40
Acenaphthene	3.1	327	560	58	445	559	79	29-110	30	40
Fluorene	5.1	355	560	62	471	559	83	29-117	28	40
Phenanthrene	38	435	560	71	557	559	93	19-128	25	40
Anthracene	10	352	560	61	491	559	86	31-115	33	40
Fluoranthene	91	463	560	66	617	559	94	22-138	28	40
Pyrene	150	524	560	66	666	559	92	11-148	24	40
Benzo(b)fluoranthene	86	473	560	69	609	559	93	15-136	25	40
Benzo(k)fluoranthene	27	407	560	68	532	559	90	29-126	27	40
Benz(a)anthracene	46	423	560	67	548	559	90	25-128	26	40
Chrysene	54	422	560	66	562	559	91	25-132	28	40
Benzo(a)pyrene	90	479	560	70	643	559	99	24-131	29	40
Indeno(1,2,3-cd)pyrene	81	530	560	80	687	559	108	20-136	26	40
Dibenz(a,h)anthracene	9.2	381	560	66	521	559	91	29-124	31	40
Benzo(g,h,i)perylene	99	529	560	77	698	559	107	24-127	28	40

Results flagged with an asterisk (*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Pacific EcoRisk Laboratories
Project: USACE San Rafael Channel/16087
Sample Matrix: Sediment

Service Request: K1006356
Date Extracted: 06/24/2010
Date Analyzed: 07/01/2010

Matrix Spike/Duplicate Matrix Spike Summary
Polynuclear Aromatic Hydrocarbons

Sample Name: Batch QC
Lab Code: K1006486-001
Extraction Method: EPA 3541
Analysis Method: 8270C SIM

Units: ug/Kg
Basis: Dry
Level: Low
Extraction Lot: KWG1006323

Analyte Name	Sample Result	Batch QCMS KWG1006323-1 Matrix Spike			Batch QCDS KWG1006323-2 Duplicate Matrix Spike			%Rec Limits	RPD	RPD Limit
		Result	Expected	%Rec	Result	Expected	%Rec			
Naphthalene	4.1	366	546	66	330	545	60	11-119	10	40
Acenaphthylene	1.3	395	546	72	356	545	65	32-106	11	40
Acenaphthene	1.1	392	546	72	361	545	66	29-110	8	40
Fluorene	3.1	413	546	75	395	545	72	29-117	4	40
Phenanthrene	13	495	546	88	448	545	80	19-128	10	40
Anthracene	2.1	414	546	75	401	545	73	31-115	3	40
Fluoranthene	38	497	546	84	454	545	76	22-138	9	40
Pyrene	50	478	546	78	477	545	78	11-148	0	40
Benzo(b)fluoranthene	30	447	546	76	432	545	74	15-136	3	40
Benzo(k)fluoranthene	10	434	546	78	420	545	75	29-126	3	40
Benz(a)anthracene	14	424	546	75	417	545	74	25-128	2	40
Chrysene	19	445	546	78	429	545	75	25-132	4	40
Benzo(a)pyrene	25	446	546	77	425	545	73	24-131	5	40
Indeno(1,2,3-cd)pyrene	32	475	546	81	464	545	79	20-136	2	40
Dibenz(a,h)anthracene	4.1	423	546	77	415	545	75	29-124	2	40
Benzo(g,h,i)perylene	41	508	546	86	500	545	84	24-127	2	40

Results flagged with an asterisk (*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Pacific EcoRisk Laboratories
Project: USACE San Rafael Channel/16087
Sample Matrix: Sediment

Service Request: K1006356
Date Extracted: 06/21/2010
Date Analyzed: 07/03/2010

Lab Control Spike/Duplicate Lab Control Spike Summary
Polynuclear Aromatic Hydrocarbons

Extraction Method: EPA 3541
Analysis Method: 8270C SIM

Units: ug/Kg
Basis: Dry
Level: Low
Extraction Lot: KWG1006224

Analyte Name	Lab Control Sample KWG1006224-3 Lab Control Spike			Duplicate Lab Control Sample KWG1006224-4 Duplicate Lab Control Spike			%Rec Limits	RPD	RPD Limit
	Result	Expected	%Rec	Result	Expected	%Rec			
Naphthalene	404	500	81	416	500	83	43-99	3	40
Acenaphthylene	450	500	90	470	500	94	41-110	4	40
Acenaphthene	434	500	87	453	500	91	44-104	4	40
Fluorene	449	500	90	472	500	94	49-105	5	40
Phenanthrene	393	500	79	487	500	97	47-104	21	40
Anthracene	467	500	93	470	500	94	47-112	1	40
Fluoranthene	417	500	83	450	500	90	51-111	8	40
Pyrene	459	500	92	448	500	90	48-113	3	40
Benzo(b)fluoranthene	476	500	95	494	500	99	51-113	4	40
Benzo(k)fluoranthene	462	500	92	482	500	96	56-114	4	40
Benz(a)anthracene	457	500	91	474	500	95	51-111	4	40
Chrysene	458	500	92	468	500	94	54-111	2	40
Benzo(a)pyrene	479	500	96	504	500	101	52-118	5	40
Indeno(1,2,3-cd)pyrene	499	500	100	508	500	102	42-123	2	40
Dibenz(a,h)anthracene	478	500	96	489	500	98	44-119	2	40
Benzo(g,h,i)perylene	489	500	98	504	500	101	46-114	3	40

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Pacific EcoRisk Laboratories
Project: USACE San Rafael Channel/16087
Sample Matrix: Sediment

Service Request: K1006356
Date Extracted: 06/24/2010
Date Analyzed: 07/01/2010

Lab Control Spike/Duplicate Lab Control Spike Summary
Polynuclear Aromatic Hydrocarbons

Extraction Method: EPA 3541
Analysis Method: 8270C SIM

Units: ug/Kg
Basis: Dry
Level: Low
Extraction Lot: KWG1006323

Analyte Name	Lab Control Sample KWG1006323-3 Lab Control Spike			Duplicate Lab Control Sample KWG1006323-4 Duplicate Lab Control Spike			%Rec Limits	RPD	RPD Limit
	Result	Expected	%Rec	Result	Expected	%Rec			
Naphthalene	386	500	77	402	500	80	43-99	4	40
Acenaphthylene	417	500	83	439	500	88	41-110	5	40
Acenaphthene	406	500	81	428	500	86	44-104	5	40
Fluorene	424	500	85	459	500	92	49-105	8	40
Phenanthrene	406	500	81	470	500	94	47-104	15	40
Anthracene	427	500	85	454	500	91	47-112	6	40
Fluoranthene	395	500	79	435	500	87	51-111	10	40
Pyrene	441	500	88	456	500	91	48-113	4	40
Benzo(b)fluoranthene	431	500	86	437	500	87	51-113	1	40
Benzo(k)fluoranthene	444	500	89	467	500	93	56-114	5	40
Benz(a)anthracene	416	500	83	427	500	85	51-111	2	40
Chrysene	430	500	86	449	500	90	54-111	4	40
Benzo(a)pyrene	447	500	89	461	500	92	52-118	3	40
Indeno(1,2,3-cd)pyrene	444	500	89	460	500	92	42-123	3	40
Dibenz(a,h)anthracene	444	500	89	459	500	92	44-119	3	40
Benzo(g,h,i)perylene	474	500	95	493	500	99	46-114	4	40

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

Semi-Volatile Organic Compounds

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Pacific EcoRisk Laboratories
Project: USACE San Rafael Channel/16087
Sample Matrix: Sediment

Service Request: K1006356
Date Collected: 06/08/2010
Date Received: 06/18/2010

Semi-Volatile Organic Compounds by GC/MS

Sample Name: SRC-2010-1-Comp
Lab Code: K1006356-001
Extraction Method: EPA 3541
Analysis Method: 8270C

Units: ug/Kg
Basis: Dry
Level: Low

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Phenol	5.4	J	34	2.3	1	06/24/10	07/09/10	KWG1006611	
Pentachlorophenol	ND	U	120	23	1	06/24/10	07/09/10	KWG1006611	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Phenol-d6	58	20-86	07/09/10	Acceptable
2,4,6-Tribromophenol	49	10-119	07/09/10	Acceptable

Comments: _____

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Pacific EcoRisk Laboratories
Project: USACE San Rafael Channel/16087
Sample Matrix: Sediment

Service Request: K1006356
Date Collected: 06/09/2010
Date Received: 06/18/2010

Semi-Volatile Organic Compounds by GC/MS

Sample Name: SRC-2010-2-Comp
Lab Code: K1006356-002
Extraction Method: EPA 3541
Analysis Method: 8270C

Units: ug/Kg
Basis: Dry
Level: Low

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Phenol	4.0	J	32	2.2	1	06/24/10	07/09/10	KWG1006611	
Pentachlorophenol	ND	U	110	22	1	06/24/10	07/09/10	KWG1006611	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Phenol-d6	54	20-86	07/09/10	Acceptable
2,4,6-Tribromophenol	39	10-119	07/09/10	Acceptable

Comments: _____

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Pacific EcoRisk Laboratories
Project: USACE San Rafael Channel/16087
Sample Matrix: Sediment

Service Request: K1006356
Date Collected: 06/09/2010
Date Received: 06/18/2010

Semi-Volatile Organic Compounds by GC/MS

Sample Name: SRC-2010-3-Comp
Lab Code: K1006356-003
Extraction Method: EPA 3541
Analysis Method: 8270C

Units: ug/Kg
Basis: Dry
Level: Low

Analyte Name	Result Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Phenol	3.7 J	31	2.1	1	06/24/10	07/09/10	KWG1006611	
Pentachlorophenol	ND U	110	21	1	06/24/10	07/09/10	KWG1006611	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Phenol-d6	53	20-86	07/09/10	Acceptable
2,4,6-Tribromophenol	42	10-119	07/09/10	Acceptable

Comments: _____

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Pacific EcoRisk Laboratories
Project: USACE San Rafael Channel/16087
Sample Matrix: Sediment

Service Request: K1006356
Date Collected: 06/11/2010
Date Received: 06/18/2010

Semi-Volatile Organic Compounds by GC/MS

Sample Name: SRC-2010-4-Comp
Lab Code: K1006356-004
Extraction Method: EPA 3541
Analysis Method: 8270C

Units: ug/Kg
Basis: Dry
Level: Low

Analyte Name	Result Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Phenol	19 J	32	2.2	1	06/24/10	07/09/10	KWG1006611	
Pentachlorophenol	ND U	110	22	1	06/24/10	07/09/10	KWG1006611	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Phenol-d6	58	20-86	07/09/10	Acceptable
2,4,6-Tribromophenol	51	10-119	07/09/10	Acceptable

Comments: _____

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Pacific EcoRisk Laboratories
Project: USACE San Rafael Channel/16087
Sample Matrix: Sediment

Service Request: K1006356
Date Collected: 06/08/2010
Date Received: 06/18/2010

Semi-Volatile Organic Compounds by GC/MS

Sample Name: SRC-2010-5-Comp
Lab Code: K1006356-005
Extraction Method: EPA 3541
Analysis Method: 8270C

Units: ug/Kg
Basis: Dry
Level: Low

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Phenol	4.6	J	34	2.3	1	06/24/10	07/09/10	KWG1006611	
Pentachlorophenol	ND	U	120	23	1	06/24/10	07/09/10	KWG1006611	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Phenol-d6	57	20-86	07/09/10	Acceptable
2,4,6-Tribromophenol	53	10-119	07/09/10	Acceptable

Comments: _____

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Pacific EcoRisk Laboratories
Project: USACE San Rafael Channel/16087
Sample Matrix: Sediment

Service Request: K1006356
Date Collected: 06/09/2010
Date Received: 06/18/2010

Semi-Volatile Organic Compounds by GC/MS

Sample Name: SRC-2010-6-Comp
Lab Code: K1006356-006
Extraction Method: EPA 3541
Analysis Method: 8270C

Units: ug/Kg
Basis: Dry
Level: Low

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Phenol	3.7	J	36	2.4	1	06/24/10	07/09/10	KWG1006611	
Pentachlorophenol	ND	U	120	24	1	06/24/10	07/09/10	KWG1006611	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Phenol-d6	59	20-86	07/09/10	Acceptable
2,4,6-Tribromophenol	57	10-119	07/09/10	Acceptable

Comments: _____

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Pacific EcoRisk Laboratories
Project: USACE San Rafael Channel/16087
Sample Matrix: Sediment

Service Request: K1006356
Date Collected: 06/10/2010
Date Received: 06/18/2010

Semi-Volatile Organic Compounds by GC/MS

Sample Name: SRC-2010-7-Comp
Lab Code: K1006356-007
Extraction Method: EPA 3541
Analysis Method: 8270C

Units: ug/Kg
Basis: Dry
Level: Low

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Phenol	150	JD	360	24	10	06/24/10	07/09/10	KWG1006611	
Pentachlorophenol	ND	U	1200	240	10	06/24/10	07/09/10	KWG1006611	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Phenol-d6	70	20-86	07/09/10	Acceptable
2,4,6-Tribromophenol	73	10-119	07/09/10	Acceptable

Comments: _____

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Pacific EcoRisk Laboratories
Project: USACE San Rafael Channel/16087
Sample Matrix: Sediment

Service Request: K1006356
Date Collected: 06/10/2010
Date Received: 06/18/2010

Semi-Volatile Organic Compounds by GC/MS

Sample Name: SRC-2010-7-Z-Comp
Lab Code: K1006356-008
Extraction Method: EPA 3541
Analysis Method: 8270C

Units: ug/Kg
Basis: Dry
Level: Low

Analyte Name	Result Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Phenol	ND U	160	11	5	06/24/10	07/09/10	KWG1006611	
Pentachlorophenol	ND U	530	110	5	06/24/10	07/09/10	KWG1006611	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Phenol-d6	62	20-86	07/09/10	Acceptable
2,4,6-Tribromophenol	65	10-119	07/09/10	Acceptable

Comments: _____

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Pacific EcoRisk Laboratories
Project: USACE San Rafael Channel/16087
Sample Matrix: Sediment

Service Request: K1006356
Date Collected: 06/10/2010
Date Received: 06/18/2010

Semi-Volatile Organic Compounds by GC/MS

Sample Name: SRC-2010-7-1
Lab Code: K1006356-016
Extraction Method: EPA 3541
Analysis Method: 8270C

Units: ug/Kg
Basis: Dry
Level: Low

Analyte Name	Result Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Phenol	4.4 J	39	2.6	1	06/24/10	07/12/10	KWG1006611	
Pentachlorophenol	ND U	130	26	1	06/24/10	07/12/10	KWG1006611	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Phenol-d6	62	20-86	07/12/10	Acceptable
2,4,6-Tribromophenol	71	10-119	07/12/10	Acceptable

Comments: _____

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Pacific EcoRisk Laboratories
Project: USACE San Rafael Channel/16087
Sample Matrix: Sediment

Service Request: K1006356
Date Collected: 06/10/2010
Date Received: 06/18/2010

Semi-Volatile Organic Compounds by GC/MS

Sample Name: SRC-2010-7-2
Lab Code: K1006356-017
Extraction Method: EPA 3541
Analysis Method: 8270C

Units: ug/Kg
Basis: Dry
Level: Low

Analyte Name	Result Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Phenol	4.2 J	36	2.4	1	06/24/10	07/12/10	KWG1006611	
Pentachlorophenol	ND U	120	24	1	06/24/10	07/12/10	KWG1006611	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Phenol-d6	54	20-86	07/12/10	Acceptable
2,4,6-Tribromophenol	70	10-119	07/12/10	Acceptable

Comments: _____

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Pacific EcoRisk Laboratories
Project: USACE San Rafael Channel/16087
Sample Matrix: Sediment

Service Request: K1006356
Date Collected: 06/10/2010
Date Received: 06/18/2010

Semi-Volatile Organic Compounds by GC/MS

Sample Name: SRC-2010-7-3
Lab Code: K1006356-018
Extraction Method: EPA 3541
Analysis Method: 8270C

Units: ug/Kg
Basis: Dry
Level: Low

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Phenol	5.0	J	36	2.4	1	06/24/10	07/12/10	KWG1006611	
Pentachlorophenol	ND	U	120	24	1	06/24/10	07/12/10	KWG1006611	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Phenol-d6	61	20-86	07/12/10	Acceptable
2,4,6-Tribromophenol	72	10-119	07/12/10	Acceptable

Comments: _____

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Pacific EcoRisk Laboratories
Project: USACE San Rafael Channel/16087
Sample Matrix: Sediment

Service Request: K1006356
Date Collected: 06/10/2010
Date Received: 06/18/2010

Semi-Volatile Organic Compounds by GC/MS

Sample Name: SRC-2010-7-4
Lab Code: K1006356-019
Extraction Method: EPA 3541
Analysis Method: 8270C

Units: ug/Kg
Basis: Dry
Level: Low

Analyte Name	Result Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Phenol	7.4 J	38	2.6	1	06/24/10	07/12/10	KWG1006611	
Pentachlorophenol	ND U	130	26	1	06/24/10	07/12/10	KWG1006611	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Phenol-d6	62	20-86	07/12/10	Acceptable
2,4,6-Tribromophenol	78	10-119	07/12/10	Acceptable

Comments: _____

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Pacific EcoRisk Laboratories
Project: USACE San Rafael Channel/16087
Sample Matrix: Sediment

Service Request: K1006356
Date Collected: 06/10/2010
Date Received: 06/18/2010

Semi-Volatile Organic Compounds by GC/MS

Sample Name: SRC-2010-7-5
Lab Code: K1006356-020
Extraction Method: EPA 3541
Analysis Method: 8270C

Units: ug/Kg
Basis: Dry
Level: Low

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Phenol	6.7	J	34	2.3	1	06/24/10	07/12/10	KWG1006611	
Pentachlorophenol	ND	U	120	23	1	06/24/10	07/12/10	KWG1006611	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Phenol-d6	44	20-86	07/12/10	Acceptable
2,4,6-Tribromophenol	54	10-119	07/12/10	Acceptable

Comments: _____

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Pacific EcoRisk Laboratories
Project: USACE San Rafael Channel/16087
Sample Matrix: Sediment

Service Request: K1006356
Date Collected: 06/10/2010
Date Received: 06/23/2010

Semi-Volatile Organic Compounds by GC/MS

Sample Name: SRC-2010-8-Z-Comp
Lab Code: K1006356-021
Extraction Method: EPA 3541
Analysis Method: 8270C

Units: ug/Kg
Basis: Dry
Level: Low

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Phenol	ND	U	350	23	10	06/24/10	07/12/10	KWG1006611	
Pentachlorophenol	ND	U	1200	230	10	06/24/10	07/12/10	KWG1006611	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Phenol-d6	63	20-86	07/12/10	Acceptable
2,4,6-Tribromophenol	81	10-119	07/12/10	Acceptable

Comments: _____

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Pacific EcoRisk Laboratories
Project: USACE San Rafael Channel/16087
Sample Matrix: Sediment

Service Request: K1006356
Date Collected: NA
Date Received: NA

Semi-Volatile Organic Compounds by GC/MS

Sample Name: Method Blank
Lab Code: KWG1006611-5
Extraction Method: EPA 3541
Analysis Method: 8270C

Units: ug/Kg
Basis: Dry
Level: Low

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Phenol	ND	U	15	2.0	1	06/24/10	07/09/10	KWG1006611	
Pentachlorophenol	ND	U	49	20	1	06/24/10	07/09/10	KWG1006611	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Phenol-d6	60	20-86	07/09/10	Acceptable
2,4,6-Tribromophenol	58	10-119	07/09/10	Acceptable

Comments: _____

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Pacific EcoRisk Laboratories
Project: USACE San Rafael Channel/16087
Sample Matrix: Sediment

Service Request: K1006356

Surrogate Recovery Summary
Semi-Volatile Organic Compounds by GC/MS

Extraction Method: EPA 3541
Analysis Method: 8270C

Units: PERCENT
Level: Low

<u>Sample Name</u>	<u>Lab Code</u>	<u>Sur1</u>	<u>Sur2</u>
SRC-2010-1-Comp	K1006356-001	58	49
SRC-2010-2-Comp	K1006356-002	54	39
SRC-2010-3-Comp	K1006356-003	53	42
SRC-2010-4-Comp	K1006356-004	58	51
SRC-2010-5-Comp	K1006356-005	57	53
SRC-2010-6-Comp	K1006356-006	59	57
SRC-2010-7-Comp	K1006356-007	70 D	73 D
SRC-2010-7-Z-Comp	K1006356-008	62 D	65 D
SRC-2010-7-1	K1006356-016	62	71
SRC-2010-7-2	K1006356-017	54	70
SRC-2010-7-3	K1006356-018	61	72
SRC-2010-7-4	K1006356-019	62	78
SRC-2010-7-5	K1006356-020	44	54
SRC-2010-8-Z-Comp	K1006356-021	63 D	81 D
Method Blank	KWG1006611-5	60	58
SRC-2010-7-Z-CompMS	KWG1006611-1	59 D	71 D
SRC-2010-7-Z-CompDMS	KWG1006611-2	74 D	83 D
Lab Control Sample	KWG1006611-3	70	75
Duplicate Lab Control Sample	KWG1006611-4	58	59

Surrogate Recovery Control Limits (%)

Sur1 = Phenol-d6	20-86
Sur2 = 2,4,6-Tribromophenol	10-119

Results flagged with an asterisk (*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Pacific EcoRisk Laboratories
Project: USACE San Rafael Channel/16087
Sample Matrix: Sediment

Service Request: K1006356
Date Extracted: 06/24/2010
Date Analyzed: 07/09/2010

Matrix Spike/Duplicate Matrix Spike Summary
Semi-Volatile Organic Compounds by GC/MS

Sample Name: SRC-2010-7-Z-Comp
Lab Code: K1006356-008
Extraction Method: EPA 3541
Analysis Method: 8270C

Units: ug/Kg
Basis: Dry
Level: Low
Extraction Lot: KWG1006611

Analyte Name	Sample Result	SRC-2010-7-Z-CompMS KWG1006611-1 Matrix Spike			SRC-2010-7-Z-CompDMS KWG1006611-2 Duplicate Matrix Spike			%Rec Limits	RPD	RPD Limit
		Result	Expected	%Rec	Result	Expected	%Rec			
Phenol	ND	140	262	54	158	262	60	15-98	12	40
Pentachlorophenol	ND	77.6	262	30	149	262	57	10-123	63 *	40

Results flagged with an asterisk (*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Pacific EcoRisk Laboratories
Project: USACE San Rafael Channel/16087
Sample Matrix: Sediment

Service Request: K1006356
Date Extracted: 06/24/2010
Date Analyzed: 07/09/2010

Lab Control Spike/Duplicate Lab Control Spike Summary
Semi-Volatile Organic Compounds by GC/MS

Extraction Method: EPA 3541
Analysis Method: 8270C

Units: ug/Kg
Basis: Dry
Level: Low
Extraction Lot: KWG1006611

Analyte Name	Lab Control Sample KWG1006611-3 Lab Control Spike			Duplicate Lab Control Sample KWG1006611-4 Duplicate Lab Control Spike			%Rec Limits	RPD	RPD Limit
	Result	Expected	%Rec	Result	Expected	%Rec			
Phenol	158	250	63	130	250	52	28-91	19	40
Pentachlorophenol	149	250	60	103	250	41	21-97	37	40

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

Dioxins and Furans

July 21, 2010

Service Request No: K1006356

Pradeep Divvela

Columbia Analytical Services, Inc
1317 S. 13th Avenue
Kelso, WA 98626

Laboratory Results for: Pacific EcoRisk Laboratories/USACE San Rafael Channel/16087

Dear Pradeep Divvela:

Enclosed are the results of the sample(s) submitted to our laboratory on June 23rd and July 3rd, 2010. For your reference, these analyses have been assigned our service request number: **K1006356**. All analyses were performed according to our laboratory's quality assurance program. The test results meet requirements of the NELAP standards except as noted in the case narrative report. All results are intended to be considered in their entirety, and Columbia Analytical Services, Inc. (CAS) is not responsible for use of less than the complete report. Results apply only to the items submitted to the laboratory for analysis and individual items (samples) analyzed, as listed in the report. In accordance to the NELAC 2003 Standard, a statement on the estimated uncertainty of measurement of any quantitative analysis will be supplied upon request.

Please contact me if you have any questions. My direct number is 281-994-2954. You may also contact me via email at DBiles@caslab.com.

Respectfully submitted,

Columbia Analytical Services, Inc.

Darren Biles
Project Manager

Page 1 of _____

For a specific list of NELAP-accredited analytes, refer to the certifications section at www.caslab.com.





Certificate of Analysis

19408 Park Row, Suite 320, Houston, TX 77084

Phone (713)266-1599 Fax (713)266-0130

www.caslab.com

An Employee Owned Company

COLUMBIA ANALYTICAL SERVICES, INC

Client: Pacific EcoRisk Laboratories
Project: USACE San Rafael Channel/16087
Sample Matrix: Sediment

Service Request No.: K1006356
Date Received: 6/23/10-7/03/10

CASE NARRATIVE

All analyses were performed in adherence to the quality assurance program of Columbia Analytical Services, Inc. (CAS). This report contains analytical results for samples designated for Tier II. When appropriate to the method, method blank results have been reported with each analytical test.

Sample Receipt

Nine sediment samples were received for analysis at Columbia Analytical Services between 6/23/10 and 7/03/10.

The samples were received at 0°C in good condition and are consistent with the accompanying chain of custody form. The samples were stored in a refrigerator at 4°C upon receipt at the laboratory.

Please note the reporting forms are currently referencing the date CAS- Kelso received the samples (6/18/10-6/23/10) and not the date CAS-Houston received the samples (6/23/10-7/3/10.)

Data Validation Notes and Discussion

B flags – Method Blanks

The Method Blank EQ1000320-01 contained low levels of 1234678-HpCDD, OCDD, and OCDF at or below the Method Reporting Limit (MRL).

The Method Blank EQ1000323-01 contained low levels of OCDD at or below the Method Reporting Limit (MRL).

The Method Blank EQ1000340-01 contained low levels of 1234678-HpCDD and OCDD at or below the Method Reporting Limit (MRL).

The associated compounds in the samples are flagged with 'B' flags.

Y flags – Labeled Standards

Samples that had recoveries of labeled standards outside the acceptance limits are flagged with 'Y' flags. In all cases, the signal-to-noise ratios are greater than 10:1, making these data acceptable.

Approved by:

Date: 07/21/10

Xiangqiu Liang, Laboratory Director

MS/DMS

EQ1000320: Laboratory Control Spike/Duplicate Laboratory Control Spike (LCS/DLCS) samples were analyzed and reported in lieu of an MS/DMS for this extraction batch. The batch quality control criteria were met.

EQ1000323: Laboratory Control Spike/Duplicate Laboratory Control Spike (LCS/DLCS) samples were analyzed and reported in lieu of an MS/DMS for this extraction batch. The batch quality control criteria were met.

EQ1000340: Laboratory Control Spike/Duplicate Laboratory Control Spike (LCS/DLCS) samples were analyzed and reported in lieu of an MS/DMS for this extraction batch. The batch quality control criteria were met.

C flags – 2378-TCDF Confirmation

Confirmation of the TCDF compound: When 2378-TCDF is detected on the DB-5 column, confirmation analyses are performed on a second column (DB-225.) The results from both the DB-5 column and the DB-225 column are included in this data package.

The valid result for the 2378-TCDF compound is reported from the confirmation column.

The confirmation results have been included on the TEQ summary pages.

K flags

EMPC - When the ion abundance ratios associated with a particular compound are outside the QC limits, samples are flagged with a 'K' flag. A 'K' flag indicates an estimated maximum possible concentration for the associated compound.

Detection Limits

Detection limits are calculated for each congener in each sample by measuring the height of the noise level for each quantitation ion for the associated labeled standard. The concentration equivalent to 2.5 times the height of the noise is then calculated using the appropriate response factor and the weight of the sample. The calculated concentration equals the detection limit.

The TEQ results for each sample have been calculated by CAS/Houston to include:

- WHO-2005 TEFs ("The 2005 World Health Organization Reevaluation of Human and Mammalian Toxic Equivalency Factors for Dioxins and Dioxin-Like Compounds", M. Van den Berg et al., Toxicological Sciences 93(2):223-241, 2006)
- 2378-TCDF from the DB-225 column, when confirmation required
- Non-detected compounds are not included in the 'Total'

Approved by:

Date: 07/21/10

Xiangqiu Liang, Laboratory Director

Client: Pacific EcoRisk Laboratories
Project: USACE San Rafael Channel/16087

Service Request: K1006356

SAMPLE CROSS-REFERENCE

<u>SAMPLE #</u>	<u>CLIENT SAMPLE ID</u>	<u>DATE</u>	<u>TIME</u>
K1006356-001	SRC-2010-1-Comp	6/8/10	09:20
K1006356-002	SRC-2010-2-Comp	6/9/10	08:00
K1006356-003	SRC-2010-3-Comp	6/9/10	11:05
K1006356-004	SRC-2010-4-Comp	6/11/10	08:40
K1006356-005	SRC-2010-5-Comp	6/8/10	13:35
K1006356-006	SRC-2010-6-Comp	6/9/10	15:30
K1006356-007	SRC-2010-7-Comp	6/10/10	09:00
K1006356-008	SRC-2010-7-Z-Comp	6/10/10	11:55
K1006356-009	SRC-2010-1-B-Comp	6/8/10	09:20
K1006356-010	SRC-2010-2-B-Comp	6/9/10	08:00
K1006356-011	SRC-2010-3-B-Comp	6/9/10	11:05
K1006356-012	SRC-2010-4-B-Comp	6/11/10	08:40
K1006356-013	SRC-2010-5-B-Comp	6/8/10	13:35
K1006356-014	SRC-2010-6-B-Comp	6/9/10	15:30
K1006356-015	SRC-2010-7-B-Comp	6/10/10	09:00
K1006356-016	SRC-2010-7-1	6/10/10	09:00
K1006356-017	SRC-2010-7-2	6/10/10	09:40
K1006356-018	SRC-2010-7-3	6/10/10	10:10
K1006356-019	SRC-2010-7-4	6/10/10	10:35
K1006356-020	SRC-2010-7-5	6/10/10	11:00
K1006356-021	SRC-2010-8-Z-Comp	6/10/10	11:55

Laboratory Certifications 2010-2011

STATE/PROGRAM	AGENCY	CERTIFICATION ID	EXP DATE
ARIZONA	AZ-DHS	AZ0725	05/27/11
ARKANSAS	ADEQ	10-035-0	06/16/11
CALIFORNIA	CA-ELAP	2452	02/28/11
DoD ELAP	A2LA	2897.01	11/30/11
FLORIDA/NELAP	FL-DOHS	E87611	06/30/11
HAWAII	HI-DOH	N/A	06/30/11
ILLINOIS/NELAP	IL-EPA	002380	10/06/10
ISO 17025	A2LA	2897.01	11/30/11
LOUISIANA/NELAP	LELAP	03048	06/30/10
LOUISIANA/NELAP	LDHH	LA100032	12/31/10
MAINE	ME-DOHS	2010041	06/05/12
MICHIGAN	MIDEQ	9971	06/30/10
MINNESOTA	MDH	048-999-427	12/31/10
NEVADA	NDEP	TX014112010A	07/31/10
NEW JERSEY	NJDEP	TX008	06/30/11
NEW MEXICO	NMED-DWB	N/A	06/30/11
NEW YORK/NELAP	NY-DOH	11707	04/01/11
OKLAHOMA	OKDEQ	2009-25	08/31/10
OREGON/NELAP	ORELAP	TX200002-006	03/24/10
PENNSYLVANIA/NELAP	PLAP	002	06/30/11
TENNESSEE	TNDEC	04016	06/30/11
TEXAS/NELAP	TCEQ	T104704216-10-1	06/30/11
UTAH/NELAP	UTELCP	COLU2	06/30/10
SOIL IMPORT PERMIT	USDA	P330-09-00067	03/27/12
WASHINGTON/NELAP	WA-Ecology	C1855	11/14/10
WEST VIRGINIA	WVDEP	347	06/30/11

Abbreviations, Acronyms & Definitions

Cal	Calibration
Conc	CONCentration
Dioxin(s)	Polychlorinated dibenzo-p-dioxin(s)
EDL	Estimated Detection Limit
EMPC	Estimated Maximum Possible Concentration
Flags	Data qualifiers
Furan(s)	Polychlorinated dibenzofuran(s)
g	Grams
ICAL	Initial CALibration
ID	IDentifier
Ions	Masses monitored for the analyte during data acquisition
L	Liter (s)
LCS	Laboratory Control Sample
DLCS	Duplicate Laboratory Control Sample
MB	Method Blank
MCL	Method Calibration Limit
MDL	Method Detection Limit
MRL	Method Reporting Limit
mL	Milliliters
MS	Matrix Spiked sample
DMS	Duplicate Matrix Spiked sample
NO	Number of peaks meeting all identification criteria
PCDD(s)	Polychlorinated dibenzo-p-dioxin(s)
PCDF(s)	Polychlorinated dibenzofuran(s)
ppb	Parts per billion
ppm	Parts per million
ppq	Parts per quadrillion
ppt	Parts per trillion
QA	Quality Assurance
QC	Quality Control
Ratio	Ratio of areas from monitored ions for an analyte
% Rec.	Percent Recovery
RPD	Relative Percent Difference
RRF	Relative Response Factor
RT	Retention Time
RRT	Relative Retention Time
SDG	Sample Delivery Group
S/N	Signal-to-Noise ratio
TEF	Toxicity Equivalence Factor
TEQ	Toxicity Equivalence Quotient

Data Qualifier Flags – Dioxin/Furans

- **B** Indicates the associated analyte is found in the method blank, as well as in the sample.
- **C** Confirmation of the TCDF compound: When 2378-TCDF is detected on the DB-5 column, confirmation analyses are performed on a second column (DB-225). The results from both the DB-5 column and the DB-225 column are included in this data package. The results from the DB-225 analyses should be used to evaluate the 2378-TCDF in the samples. The confirmed result should be used in determining the TEQ value for TCDF.
- **E** Indicates an estimated value – used when the analyte concentration exceeds the upper end of the linear calibration range.
- **J** Indicates an estimated value – used when the analyte concentration is below the method reporting limit (MRL) and above the estimated detection limit (EDL).
- **K** EMPC - When the ion abundance ratios associated with a particular compound are outside the QC limits, samples are flagged with a 'K' flag. A 'K' flag indicates an estimated maximum possible concentration for the associated compound.
- **U** Indicates the compound was analyzed and not detected.
- **Y** Samples that had recoveries of labeled standards outside the acceptance limits are flagged with 'Y'. In all cases, the signal-to-noise ratios are greater than 10:1, making these data acceptable.
- **ND** Indicates concentration is reported as 'Not Detected.'
- **S** Peak is saturated; data not reportable.
- **P** Indicates chlorodiphenyl ether interference present at the retention time of the target compound.
- **Q** Lock-mass interference by chlorodiphenyl ether compounds.

COLUMBIA ANALYTICAL SERVICES, INC. – Houston
Data Processing/Form Production and Peer Review Signatures

SR# Unique ID

K1006356

DB-5

DB-225

SPB-Octyl

First Level - Data Processing - to be filled by person generating the forms

Date:

07/19/10

Analyst:

MC

Samples:

021

Second Level - Data Review – to be filled by person doing peer review

Date:

7/21/10

Analyst:

gc

Samples:

021

COLUMBIA ANALYTICAL SERVICES, INC. – Houston
Data Processing/Form Production and Peer Review Signatures

SR# Unique ID

K.1006356

DB-5

DB-225

SPB-Octyl

First Level - Data Processing - to be filled by person generating the forms

Date:	Analyst:	Samples:
07/20/10	LZ	(-021)

Second Level - Data Review – to be filled by person doing peer review

Date:	Analyst:	Samples:
07/20/10	PA	021

COLUMBIA ANALYTICAL SERVICES, INC. – Houston
Data Processing/Form Production and Peer Review Signatures

SR# Unique ID

K1006356

DB-5

DB-225

SPB-Octyl

First Level - Data Processing - to be filled by person generating the forms

Date:	Analyst:	Samples:
07/14/10	XX	(-003, -004)

Second Level - Data Review — to be filled by person doing peer review

Date: 07/14/10	Analyst: [Signature]	Samples: (003-004)

COLUMBIA ANALYTICAL SERVICES, INC. – Houston
Data Processing/Form Production and Peer Review Signatures

SR# Unique ID

K1006356

DB-5

DB-225

SPB-Octyl

First Level - Data Processing - to be filled by person generating the forms

Date:

Analyst:

Samples:

07/13/10

LL

(-001)

Second Level - Data Review – to be filled by person doing peer review

Date:

07/13/10

Analyst:

PA

Samples:

001

COLUMBIA ANALYTICAL SERVICES, INC. – Houston
Data Processing/Form Production and Peer Review Signatures

SR# Unique ID

K1006356

DB-5

DB-225

SPB-Octyl

First Level - Data Processing - to be filled by person generating the forms

Date: 7/13/10

Analyst:

cel

Samples:

3,4

Second Level - Data Review – to be filled by person doing peer review

Date:

07/13/10

Analyst:

A

Samples:

003,004

COLUMBIA ANALYTICAL SERVICES, INC. – Houston
Data Processing/Form Production and Peer Review Signatures

SR# Unique ID

K1006356

DB-5

DB-225

SPB-Octyl

First Level - Data Processing - to be filled by person generating the forms

Date: 07/13/10

Analyst:

84

Samples: 001-002

Second Level - Data Review – to be filled by person doing peer review

Date:

07/13/10

Analyst:

MC

Samples:

001-002

COLUMBIA ANALYTICAL SERVICES, INC. – Houston
Data Processing/Form Production and Peer Review Signatures

SR# Unique ID

K1006356

DB-5

DB-225

SPB-Octyl

First Level - Data Processing - to be filled by person generating the forms

Date: 07/07/10

Analyst: MC

Samples: 005-008

Second Level - Data Review – to be filled by person doing peer review

Date: 07/08/10

Analyst: PJ

Samples: 005-008

COLUMBIA ANALYTICAL SERVICES, INC. – Houston
Data Processing/Form Production and Peer Review Signatures

SR# Unique ID

K1006356

DB-5

DB-225

SPB-Octyl

First Level - Data Processing - to be filled by person generating the forms

Date:	Analyst:	Samples:
07/07/10	LL	(-005, -006, -007, -008)

Second Level - Data Review – to be filled by person doing peer review

Date:	Analyst:	Samples:
07/07/10	MC	005 008, 007
		mc 7/07/10

No 2378-TCDF on DB-5
for 005, 006

Analytical Results

19408 Park Row, Suite 320, Houston, TX 77084

Phone (713)266-1599 Fax (713)266-0130

www.caslab.com

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COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: Pacific EcoRisk Laboratories
Project: USACE San Rafael Channel/16087
Sample Matrix: Sediment
Sample Name: SRC-2010-1-Comp
Lab Code: K1006356-001

Service Request: K1006356
Date Collected: 6/ 8/10 0920
Date Received: 6/18/10
Units: ng/Kg
Basis: Dry
Percent Solids: 44.6

Polychlorinated Dibenzodioxins and Polychlorinated Dibenzofurans by HRGC/HRMS

Analytical Method: 8290
Prep Method: Method
Sample Amount: 11.341g
Data File Name: P109694
ICAL Date: 09/11/09

Date Analyzed: 7/12/10 1411
Date Extracted: 6/25/10
Instrument Name: E-HRMS-03
GC Column: DB-5
Blank File Name: P208554
Cal Ver. File Name: P109689

Analyte Name	Result	Q	EDL	MRL	Ion Ratio	RRT	Dilution Factor
2,3,7,8-TCDD	ND	U	0.250	1.98			1
1,2,3,7,8-PeCDD	ND	U	0.170	4.94			1
1,2,3,4,7,8-HxCDD	ND	U	0.122	4.94			1
1,2,3,6,7,8-HxCDD	0.926	J	0.109	4.94	1.29	1.000	1
1,2,3,7,8,9-HxCDD	0.625	J	0.116	4.94	1.33	1.008	1
1,2,3,4,6,7,8-HpCDD	14.3	B	0.154	4.94	1.11	1.000	1
OCDD	107	B	0.195	9.89	0.88	1.000	1
2,3,7,8-TCDF	0.952	CJ	0.389	1.98	0.70	1.001	1
1,2,3,7,8-PeCDF	ND	U	0.161	4.94			1
2,3,4,7,8-PeCDF	ND	U	0.160	4.94			1
1,2,3,4,7,8-HxCDF	0.416	J	0.139	4.94	1.33	1.000	1
1,2,3,6,7,8-HxCDF	ND	U	0.131	4.94			1
1,2,3,7,8,9-HxCDF	ND	U	0.177	4.94			1
2,3,4,6,7,8-HxCDF	ND	U	0.151	4.94			1
1,2,3,4,6,7,8-HpCDF	2.72	J	0.136	4.94	1.02	1.000	1
1,2,3,4,7,8,9-HpCDF	ND	U	0.189	4.94			1
OCDF	7.08	BJ	0.203	9.89	0.87	1.004	1
Total Tetra-Dioxins	0.883	J	0.250	1.98	0.83		1
Total Penta-Dioxins	0.496	J	0.170	4.94	1.56		1
Total Hexa-Dioxins	7.58		0.109	4.94	1.27		1
Total Hepta-Dioxins	34.0		0.154	4.94	1.08		1
Total Tetra-Furans	0.952	J	0.389	1.98	0.70		1
Total Penta-Furans	2.38	J	0.160	4.94	1.59		1
Total Hexa-Furans	2.48	J	0.131	4.94	1.37		1
Total Hepta-Furans	7.31		0.136	4.94	1.02		1

Comments: _____

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: Pacific EcoRisk Laboratories
Project: USACE San Rafael Channel/16087
Sample Matrix: Sediment
Sample Name: SRC-2010-1-Comp
Lab Code: K1006356-001

Service Request: K1006356
Date Collected: 6/ 8/10 0920
Date Received: 6/18/10
Units: Percent
Basis: Dry
Percent Solids: 44.6

Polychlorinated Dibenzodioxins and Polychlorinated Dibenzofurans by HRGC/HRMS

Analytical Method: 8290
Prep Method: Method
Sample Amount: 11.341g
Data File Name: P109694
ICAL Date: 09/11/09

Date Analyzed: 7/12/10 1411
Date Extracted: 6/25/10
Instrument Name: E-HRMS-03
GC Column: DB-5
Blank File Name: P208554
Cal Ver. File Name: P109689

Labeled Compounds	Spike Conc.(pg)	Conc. Found (pg)	%Rec	Q	Control Limits	Ion Ratio	RRT
13C-2,3,7,8-TCDD	1000	749.290	75		40-135	0.80	1.009
13C-1,2,3,7,8-PeCDD	1000	974.095	97		40-135	1.59	1.181
13C-1,2,3,6,7,8-HxCDD	2500	1443.984	58		40-135	1.26	0.992
13C-1,2,3,4,6,7,8-HpCDD	2500	1497.977	60		40-135	1.07	1.068
13C-OCDD	5000	2395.543	48		40-135	0.91	1.146
13C-2,3,7,8-TCDF	1000	689.236	69		40-135	0.79	0.978
13C-1,2,3,7,8-PeCDF	1000	978.866	98		40-135	1.60	1.140
13C-1,2,3,4,7,8-HxCDF	2500	1244.820	50		40-135	0.53	0.970
13C-1,2,3,4,6,7,8-HpCDF	2500	1340.879	54		40-135	0.45	1.045
37Cl-2,3,7,8-TCDD	800	806.737	101		40-135	NA	1.009

Comments: _____

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: Pacific EcoRisk Laboratories
Project: USACE San Rafael Channel/16087
Sample Matrix: Sediment
Sample Name: SRC-2010-1-Comp
Lab Code: K1006356-001

Service Request: K1006356
Date Collected: 6/ 8/10 0920
Date Received: 6/18/10
Units: ng/Kg
Basis: Dry

Polychlorinated Dibenzodioxins and Polychlorinated Dibenzofurans by HRGC/HRMS

Analytical Method: 8290
Prep Method: Method

Analyte Name	Result	DL	Dilution Factor	TEF	TEF - Adjusted Concentration
2,3,7,8-TCDD	ND	0.250	1	1	
1,2,3,7,8-PeCDD	ND	0.170	1	1	
1,2,3,4,7,8-HxCDD	ND	0.122	1	0.1	
1,2,3,6,7,8-HxCDD	0.926	0.109	1	0.1	0.0926
1,2,3,7,8,9-HxCDD	0.625	0.116	1	0.1	0.0625
1,2,3,4,6,7,8-HpCDD	14.3	0.154	1	0.01	0.143
OCDD	107	0.195	1	0.0003	0.0321
2,3,7,8-TCDF	0.781	0.133	1	0.1	0.0781
1,2,3,7,8-PeCDF	ND	0.161	1	0.03	
2,3,4,7,8-PeCDF	ND	0.160	1	0.3	
1,2,3,4,7,8-HxCDF	0.416	0.139	1	0.1	0.0416
1,2,3,6,7,8-HxCDF	ND	0.131	1	0.1	
1,2,3,7,8,9-HxCDF	ND	0.177	1	0.1	
2,3,4,6,7,8-HxCDF	ND	0.151	1	0.1	
1,2,3,4,6,7,8-HpCDF	2.72	0.136	1	0.01	0.0272
1,2,3,4,7,8,9-HpCDF	ND	0.189	1	0.01	
OCDF	7.08	0.203	1	0.0003	0.00212
Total TEQ					0.479

2005 WHO TEFs, ND = 0

Comments: _____

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: Pacific EcoRisk Laboratories
Project: USACE San Rafael Channel/16087
Sample Matrix: Sediment

Sample Name: SRC-2010-1-Comp
Lab Code: K1006356-001
Run Type: Reanalysis

Service Request: K1006356
Date Collected: 6/ 8/10 0920
Date Received: 6/18/10

Units: ng/Kg
Basis: Dry
Percent Solids: 44.6

Polychlorinated Dibenzodioxins and Polychlorinated Dibenzofurans by HRGC/HRMS

Analytical Method: 8290
Prep Method: Method
Sample Amount: 11.341g

Data File Name: U137034
ICAL Date: 12/17/07

Date Analyzed: 7/12/10 1813
Date Extracted: 6/25/10
Instrument Name: E-HRMS-01
GC Column: DB-225
Blank File Name: U137025
Cal Ver. File Name: U137024

Analyte Name	Result	Q	EDL	MRL	Ion Ratio	RRT	Dilution Factor
2,3,7,8-TCDF	0.781	J	0.133	1.98	0.76	1.001	1

Labeled Compounds	Spike Conc.(pg)	Conc. Found (pg)	%Rec	Q	Control Limits	Ion Ratio	RRT
13C-2,3,7,8-TCDF	1000	637.599	64		40-135	0.78	1.061
37Cl-2,3,7,8-TCDD	800	719.378	90		40-135	NA	0.989

Comments: _____

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: Pacific EcoRisk Laboratories
Project: USACE San Rafael Channel/16087
Sample Matrix: Sediment
Sample Name: SRC-2010-2-Comp
Lab Code: K1006356-002

Service Request: K1006356
Date Collected: 6/ 9/10 0800
Date Received: 6/18/10
Units: ng/Kg
Basis: Dry
Percent Solids: 46.7

Polychlorinated Dibenzodioxins and Polychlorinated Dibenzofurans by HRGC/HRMS

Analytical Method: 8290
Prep Method: Method
Sample Amount: 12.223g
Data File Name: P109695
ICAL Date: 09/11/09

Date Analyzed: 7/12/10 1459
Date Extracted: 6/25/10
Instrument Name: E-HRMS-03
GC Column: DB-5
Blank File Name: P208554
Cal Ver. File Name: P109689

Analyte Name	Result	Q	EDL	MRL	Ion Ratio	RRT	Dilution Factor
2,3,7,8-TCDD	ND	U	0.215	1.75			1
1,2,3,7,8-PeCDD	ND	U	0.129	4.38			1
1,2,3,4,7,8-HxCDD	ND	U	0.0785	4.38			1
1,2,3,6,7,8-HxCDD	0.295	J	0.0705	4.38	1.23	1.000	1
1,2,3,7,8,9-HxCDD	0.181	JK	0.0745	4.38	1.45	1.008	1
1,2,3,4,6,7,8-HpCDD	5.59	B	0.132	4.38	1.01	1.000	1
OCDD	42.0	B	0.203	8.76	0.89	1.000	1
2,3,7,8-TCDF	ND	U	0.292	1.75			1
1,2,3,7,8-PeCDF	ND	U	0.107	4.38			1
2,3,4,7,8-PeCDF	ND	U	0.106	4.38			1
1,2,3,4,7,8-HxCDF	ND	U	0.0899	4.38			1
1,2,3,6,7,8-HxCDF	ND	U	0.0850	4.38			1
1,2,3,7,8,9-HxCDF	ND	U	0.115	4.38			1
2,3,4,6,7,8-HxCDF	ND	U	0.0976	4.38			1
1,2,3,4,6,7,8-HpCDF	1.12	J	0.0840	4.38	0.96	1.000	1
1,2,3,4,7,8,9-HpCDF	ND	U	0.117	4.38			1
OCDF	3.06	BJ	0.138	8.76	0.88	1.004	1
Total Tetra-Dioxins	0.398	J	0.215	1.75	0.79		1
Total Penta-Dioxins	ND	U	0.129	4.38			1
Total Hexa-Dioxins	2.68	J	0.0705	4.38	1.22		1
Total Hepta-Dioxins	14.6		0.132	4.38	1.01		1
Total Tetra-Furans	ND	U	0.292	1.75			1
Total Penta-Furans	ND	U	0.106	4.38			1
Total Hexa-Furans	1.25	J	0.0850	4.38	1.36		1
Total Hepta-Furans	2.90	J	0.0840	4.38	0.96		1

Comments: _____

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: Pacific EcoRisk Laboratories
Project: USACE San Rafael Channel/16087
Sample Matrix: Sediment
Sample Name: SRC-2010-2-Comp
Lab Code: K1006356-002

Service Request: K1006356
Date Collected: 6/ 9/10 0800
Date Received: 6/18/10
Units: Percent
Basis: Dry
Percent Solids: 46.7

Polychlorinated Dibenzodioxins and Polychlorinated Dibenzofurans by HRGC/HRMS

Analytical Method: 8290
Prep Method: Method
Sample Amount: 12.223g
Data File Name: P109695
ICAL Date: 09/11/09

Date Analyzed: 7/12/10 1459
Date Extracted: 6/25/10
Instrument Name: E-HRMS-03
GC Column: DB-5
Blank File Name: P208554
Cal Ver. File Name: P109689

Labeled Compounds	Spike Conc.(pg)	Conc. Found (pg)	%Rec	Q	Control Limits	Ion Ratio	RRT
13C-2,3,7,8-TCDD	1000	738.462	74		40-135	0.79	1.009
13C-1,2,3,7,8-PeCDD	1000	970.054	97		40-135	1.59	1.181
13C-1,2,3,6,7,8-HxCDD	2500	1494.499	60		40-135	1.27	0.992
13C-1,2,3,4,6,7,8-HpCDD	2500	1528.746	61		40-135	1.07	1.068
13C-OCDD	5000	2358.270	47		40-135	0.91	1.146
13C-2,3,7,8-TCDF	1000	643.378	64		40-135	0.76	0.979
13C-1,2,3,7,8-PeCDF	1000	962.320	96		40-135	1.60	1.141
13C-1,2,3,4,7,8-HxCDF	2500	1210.406	48		40-135	0.53	0.970
13C-1,2,3,4,6,7,8-HpCDF	2500	1429.311	57		40-135	0.45	1.044
37Cl-2,3,7,8-TCDD	800	812.202	102		40-135	NA	1.010

Comments: _____

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: Pacific EcoRisk Laboratories
Project: USACE San Rafael Channel/16087
Sample Matrix: Sediment
Sample Name: SRC-2010-2-Comp
Lab Code: K1006356-002

Service Request: K1006356
Date Collected: 6/ 9/10 0800
Date Received: 6/18/10
Units: ng/Kg
Basis: Dry

Polychlorinated Dibenzodioxins and Polychlorinated Dibenzofurans by HRGC/HRMS

Analytical Method: 8290
Prep Method: Method

Analyte Name	Result	DL	Dilution Factor	TEF	TEF - Adjusted Concentration
2,3,7,8-TCDD	ND	0.215	1	1	
1,2,3,7,8-PeCDD	ND	0.129	1	1	
1,2,3,4,7,8-HxCDD	ND	0.0785	1	0.1	
1,2,3,6,7,8-HxCDD	0.295	0.0705	1	0.1	0.0295
1,2,3,7,8,9-HxCDD	0.181	0.0745	1	0.1	0.0181
1,2,3,4,6,7,8-HpCDD	5.59	0.132	1	0.01	0.0559
OCDD	42.0	0.203	1	0.0003	0.0126
2,3,7,8-TCDF	ND	0.292	1	0.1	
1,2,3,7,8-PeCDF	ND	0.107	1	0.03	
2,3,4,7,8-PeCDF	ND	0.106	1	0.3	
1,2,3,4,7,8-HxCDF	ND	0.0899	1	0.1	
1,2,3,6,7,8-HxCDF	ND	0.0850	1	0.1	
1,2,3,7,8,9-HxCDF	ND	0.115	1	0.1	
2,3,4,6,7,8-HxCDF	ND	0.0976	1	0.1	
1,2,3,4,6,7,8-HpCDF	1.12	0.0840	1	0.01	0.0112
1,2,3,4,7,8,9-HpCDF	ND	0.117	1	0.01	
OCDF	3.06	0.138	1	0.0003	0.000918
Total TEQ					0.128

2005 WHO TEFs, ND = 0

Comments: _____

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: Pacific EcoRisk Laboratories
Project: USACE San Rafael Channel/16087
Sample Matrix: Sediment
Sample Name: SRC-2010-3-Comp
Lab Code: K1006356-003

Service Request: K1006356
Date Collected: 6/ 9/10 1105
Date Received: 6/18/10
Units: ng/Kg
Basis: Dry
Percent Solids: 48.3

Polychlorinated Dibenzodioxins and Polychlorinated Dibenzofurans by HRGC/HRMS

Analytical Method: 8290
Prep Method: Method
Sample Amount: 13.215g
Data File Name: P208555
ICAL Date: 08/01/08

Date Analyzed: 7/12/10 1909
Date Extracted: 6/25/10
Instrument Name: E-HRMS-04
GC Column: DB-5
Blank File Name: P208554
Cal Ver. File Name: P208552

Analyte Name	Result	Q	EDL	MRL	Ion Ratio	RRT	Dilution Factor
2,3,7,8-TCDD	ND	U	0.0735	1.57			1
1,2,3,7,8-PeCDD	ND	U	0.0746	3.92			1
1,2,3,4,7,8-HxCDD	ND	U	0.0742	3.92			1
1,2,3,6,7,8-HxCDD	0.0844	JK	0.0527	3.92	1.48	1.000	1
1,2,3,7,8,9-HxCDD	ND	U	0.0597	3.92			1
1,2,3,4,6,7,8-HpCDD	1.43	BJ	0.0353	3.92	1.09	1.000	1
OCDD	9.87	B	0.0864	7.83	0.88	1.000	1
2,3,7,8-TCDF	0.212	CJ	0.0729	1.57	0.82	1.001	1
1,2,3,7,8-PeCDF	ND	U	0.0632	3.92			1
2,3,4,7,8-PeCDF	ND	U	0.0612	3.92			1
1,2,3,4,7,8-HxCDF	ND	U	0.0698	3.92			1
1,2,3,6,7,8-HxCDF	ND	U	0.0597	3.92			1
1,2,3,7,8,9-HxCDF	ND	U	0.0804	3.92			1
2,3,4,6,7,8-HxCDF	ND	U	0.0669	3.92			1
1,2,3,4,6,7,8-HpCDF	0.291	JK	0.0652	3.92	1.23	1.000	1
1,2,3,4,7,8,9-HpCDF	ND	U	0.0829	3.92			1
OCDF	0.785	BJ	0.0552	7.83	0.95	1.004	1
Total Tetra-Dioxins	ND	U	0.0735	1.57			1
Total Penta-Dioxins	ND	U	0.0746	3.92			1
Total Hexa-Dioxins	0.624	J	0.0527	3.92	1.21		1
Total Hepta-Dioxins	4.06		0.0353	3.92	0.99		1
Total Tetra-Furans	0.212	J	0.0729	1.57	0.82		1
Total Penta-Furans	0.174	J	0.0612	3.92	1.67		1
Total Hexa-Furans	0.131	J	0.0597	3.92	1.15		1
Total Hepta-Furans	0.488	J	0.0652	3.92	0.90		1

Comments: _____

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: Pacific EcoRisk Laboratories
Project: USACE San Rafael Channel/16087
Sample Matrix: Sediment
Sample Name: SRC-2010-3-Comp
Lab Code: K1006356-003

Service Request: K1006356
Date Collected: 6/ 9/10 1105
Date Received: 6/18/10
Units: Percent
Basis: Dry
Percent Solids: 48.3

Polychlorinated Dibenzodioxins and Polychlorinated Dibenzofurans by HRGC/HRMS

Analytical Method: 8290
Prep Method: Method
Sample Amount: 13.215g
Data File Name: P208555
ICAL Date: 08/01/08

Date Analyzed: 7/12/10 1909
Date Extracted: 6/25/10
Instrument Name: E-HRMS-04
GC Column: DB-5
Blank File Name: P208554
Cal Ver. File Name: P208552

Labeled Compounds	Spike Conc.(pg)	Conc. Found (pg)	%Rec	Q	Control Limits	Ion Ratio	RRT
13C-2,3,7,8-TCDD	1000	673.466	67		40-135	0.78	1.009
13C-1,2,3,7,8-PeCDD	1000	653.510	65		40-135	1.59	1.168
13C-1,2,3,6,7,8-HxCDD	2500	1795.303	72		40-135	1.25	0.992
13C-1,2,3,4,6,7,8-HpCDD	2500	1583.374	63		40-135	1.05	1.068
13C-OCDD	5000	2462.669	49		40-135	0.90	1.149
13C-2,3,7,8-TCDF	1000	655.224	66		40-135	0.78	0.982
13C-1,2,3,7,8-PeCDF	1000	736.508	74		40-135	1.59	1.131
13C-1,2,3,4,7,8-HxCDF	2500	1679.023	67		40-135	0.53	0.971
13C-1,2,3,4,6,7,8-HpCDF	2500	1516.631	61		40-135	0.45	1.044
37Cl-2,3,7,8-TCDD	800	725.768	91		40-135	NA	1.010

Comments: _____

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: Pacific EcoRisk Laboratories
Project: USACE San Rafael Channel/16087
Sample Matrix: Sediment
Sample Name: SRC-2010-3-Comp
Lab Code: K1006356-003

Service Request: K1006356
Date Collected: 6/ 9/10 1105
Date Received: 6/18/10
Units: ng/Kg
Basis: Dry

Polychlorinated Dibenzodioxins and Polychlorinated Dibenzofurans by HRGC/HRMS

Analytical Method: 8290
Prep Method: Method

Analyte Name	Result	DL	Dilution Factor	TEF	TEF - Adjusted Concentration
2,3,7,8-TCDD	ND	0.0735	1	1	
1,2,3,7,8-PeCDD	ND	0.0746	1	1	
1,2,3,4,7,8-HxCDD	ND	0.0742	1	0.1	
1,2,3,6,7,8-HxCDD	0.0844	0.0527	1	0.1	0.00844
1,2,3,7,8,9-HxCDD	ND	0.0597	1	0.1	
1,2,3,4,6,7,8-HpCDD	1.43	0.0353	1	0.01	0.0143
OCDD	9.87	0.0864	1	0.0003	0.00296
2,3,7,8-TCDF	ND	0.0848	1	0.1	
1,2,3,7,8-PeCDF	ND	0.0632	1	0.03	
2,3,4,7,8-PeCDF	ND	0.0612	1	0.3	
1,2,3,4,7,8-HxCDF	ND	0.0698	1	0.1	
1,2,3,6,7,8-HxCDF	ND	0.0597	1	0.1	
1,2,3,7,8,9-HxCDF	ND	0.0804	1	0.1	
2,3,4,6,7,8-HxCDF	ND	0.0669	1	0.1	
1,2,3,4,6,7,8-HpCDF	0.291	0.0652	1	0.01	0.00291
1,2,3,4,7,8,9-HpCDF	ND	0.0829	1	0.01	
OCDF	0.785	0.0552	1	0.0003	0.000236
Total TEQ					0.0288

2005 WHO TEFs, ND = 0

Comments: _____

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: Pacific EcoRisk Laboratories
Project: USACE San Rafael Channel/16087
Sample Matrix: Sediment
Sample Name: SRC-2010-3-Comp
Lab Code: K1006356-003
Run Type: Reanalysis

Service Request: K1006356
Date Collected: 6/ 9/10 1105
Date Received: 6/18/10
Units: ng/Kg
Basis: Dry
Percent Solids: 48.3

Polychlorinated Dibenzodioxins and Polychlorinated Dibenzofurans by HRGC/HRMS

Analytical Method: 8290
Prep Method: Method
Sample Amount: 13.215g
Data File Name: U137046
ICAL Date: 12/17/07

Date Analyzed: 7/13/10 1545
Date Extracted: 6/25/10
Instrument Name: E-HRMS-01
GC Column: DB-225
Blank File Name: U137039
Cal Ver. File Name: U137038

Analyte Name	Result	Q	EDL	MRL	Ion Ratio	RRT	Dilution Factor
2,3,7,8-TCDF	ND	U	0.0848	1.57			1

Labeled Compounds	Spike Conc.(pg)	Conc. Found (pg)	%Rec	Q	Control Limits	Ion Ratio	RRT
13C-2,3,7,8-TCDF	1000	684.749	68		40-135	0.79	1.060
37Cl-2,3,7,8-TCDD	800	732.829	92		40-135	NA	0.988

Comments: _____

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: Pacific EcoRisk Laboratories
Project: USACE San Rafael Channel/16087
Sample Matrix: Sediment
Sample Name: SRC-2010-4-Comp
Lab Code: K1006356-004

Service Request: K1006356
Date Collected: 6/11/10 0840
Date Received: 6/18/10
Units: ng/Kg
Basis: Dry
Percent Solids: 47.2

Polychlorinated Dibenzodioxins and Polychlorinated Dibenzofurans by HRGC/HRMS

Analytical Method: 8290
Prep Method: Method
Sample Amount: 10.784g
Data File Name: P208556
ICAL Date: 08/01/08

Date Analyzed: 7/12/10 1957
Date Extracted: 6/25/10
Instrument Name: E-HRMS-04
GC Column: DB-5
Blank File Name: P208554
Cal Ver. File Name: P208552

Analyte Name	Result	Q	EDL	MRL	Ion Ratio	RRT	Dilution Factor
2,3,7,8-TCDD	ND	U	0.115	1.96			1
1,2,3,7,8-PeCDD	ND	U	0.114	4.91			1
1,2,3,4,7,8-HxCDD	0.104	JK	0.0967	4.91	0.66	0.999	1
1,2,3,6,7,8-HxCDD	0.450	J	0.0686	4.91	1.23	1.000	1
1,2,3,7,8,9-HxCDD	0.363	J	0.0780	4.91	1.10	1.009	1
1,2,3,4,6,7,8-HpCDD	7.72	B	0.0798	4.91	1.06	1.000	1
OCDD	52.1	B	0.102	9.82	0.90	1.000	1
2,3,7,8-TCDF	0.398	CJK	0.151	1.96	0.57	1.001	1
1,2,3,7,8-PeCDF	ND	U	0.121	4.91			1
2,3,4,7,8-PeCDF	ND	U	0.117	4.91			1
1,2,3,4,7,8-HxCDF	0.258	JK	0.109	4.91	1.69	1.001	1
1,2,3,6,7,8-HxCDF	ND	U	0.0930	4.91			1
1,2,3,7,8,9-HxCDF	ND	U	0.126	4.91			1
2,3,4,6,7,8-HxCDF	ND	U	0.105	4.91			1
1,2,3,4,6,7,8-HpCDF	1.75	J	0.106	4.91	0.90	1.000	1
1,2,3,4,7,8,9-HpCDF	ND	U	0.135	4.91			1
OCDF	3.96	BJ	0.0896	9.82	0.81	1.004	1
Total Tetra-Dioxins	ND	U	0.115	1.96			1
Total Penta-Dioxins	0.318	J	0.114	4.91	1.46		1
Total Hexa-Dioxins	2.48	J	0.0686	4.91	1.40		1
Total Hepta-Dioxins	18.9		0.0798	4.91	1.00		1
Total Tetra-Furans	ND	U	0.151	1.96			1
Total Penta-Furans	1.37	J	0.117	4.91	1.76		1
Total Hexa-Furans	1.98	J	0.0930	4.91	1.24		1
Total Hepta-Furans	4.82	J	0.106	4.91	0.90		1

Comments: _____

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: Pacific EcoRisk Laboratories
Project: USACE San Rafael Channel/16087
Sample Matrix: Sediment
Sample Name: SRC-2010-4-Comp
Lab Code: K1006356-004

Service Request: K1006356
Date Collected: 6/11/10 0840
Date Received: 6/18/10
Units: Percent
Basis: Dry
Percent Solids: 47.2

Polychlorinated Dibenzodioxins and Polychlorinated Dibenzofurans by HRGC/HRMS

Analytical Method: 8290
Prep Method: Method
Sample Amount: 10.784g
Data File Name: P208556
ICAL Date: 08/01/08

Date Analyzed: 7/12/10 1957
Date Extracted: 6/25/10
Instrument Name: E-HRMS-04
GC Column: DB-5
Blank File Name: P208554
Cal Ver. File Name: P208552

Labeled Compounds	Spike Conc.(pg)	Conc. Found (pg)	%Rec	Q	Control Limits	Ion Ratio	RRT
13C-2,3,7,8-TCDD	1000	599.958	60		40-135	0.77	1.009
13C-1,2,3,7,8-PeCDD	1000	627.663	63		40-135	1.61	1.168
13C-1,2,3,6,7,8-HxCDD	2500	1765.519	71		40-135	1.28	0.992
13C-1,2,3,4,6,7,8-HpCDD	2500	1630.026	65		40-135	1.06	1.068
13C-OCDD	5000	2556.393	51		40-135	0.91	1.149
13C-2,3,7,8-TCDF	1000	529.219	53		40-135	0.78	0.982
13C-1,2,3,7,8-PeCDF	1000	704.419	70		40-135	1.56	1.131
13C-1,2,3,4,7,8-HxCDF	2500	1659.234	66		40-135	0.52	0.971
13C-1,2,3,4,6,7,8-HpCDF	2500	1558.486	62		40-135	0.44	1.044
37Cl-2,3,7,8-TCDD	800	621.241	78		40-135	NA	1.010

Comments: _____

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: Pacific EcoRisk Laboratories
Project: USACE San Rafael Channel/16087
Sample Matrix: Sediment
Sample Name: SRC-2010-4-Comp
Lab Code: K1006356-004

Service Request: K1006356
Date Collected: 6/11/10 0840
Date Received: 6/18/10
Units: ng/Kg
Basis: Dry

Polychlorinated Dibenzodioxins and Polychlorinated Dibenzofurans by HRGC/HRMS

Analytical Method: 8290
Prep Method: Method

Analyte Name	Result	DL	Dilution Factor	TEF	TEF - Adjusted Concentration
2,3,7,8-TCDD	ND	0.115	1	1	
1,2,3,7,8-PeCDD	ND	0.114	1	1	
1,2,3,4,7,8-HxCDD	0.104	0.0967	1	0.1	0.0104
1,2,3,6,7,8-HxCDD	0.450	0.0686	1	0.1	0.0450
1,2,3,7,8,9-HxCDD	0.363	0.0780	1	0.1	0.0363
1,2,3,4,6,7,8-HpCDD	7.72	0.0798	1	0.01	0.0772
OCDD	52.1	0.102	1	0.0003	0.0156
2,3,7,8-TCDF	0.522	0.126	1	0.1	0.0522
1,2,3,7,8-PeCDF	ND	0.121	1	0.03	
2,3,4,7,8-PeCDF	ND	0.117	1	0.3	
1,2,3,4,7,8-HxCDF	0.258	0.109	1	0.1	0.0258
1,2,3,6,7,8-HxCDF	ND	0.0930	1	0.1	
1,2,3,7,8,9-HxCDF	ND	0.126	1	0.1	
2,3,4,6,7,8-HxCDF	ND	0.105	1	0.1	
1,2,3,4,6,7,8-HpCDF	1.75	0.106	1	0.01	0.0175
1,2,3,4,7,8,9-HpCDF	ND	0.135	1	0.01	
OCDF	3.96	0.0896	1	0.0003	0.00119
Total TEQ					0.281

2005 WHO TEFs, ND = 0

Comments: _____

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: Pacific EcoRisk Laboratories
Project: USACE San Rafael Channel/16087
Sample Matrix: Sediment

Sample Name: SRC-2010-4-Comp
Lab Code: K1006356-004
Run Type: Reanalysis

Service Request: K1006356
Date Collected: 6/11/10 0840
Date Received: 6/18/10

Units: ng/Kg
Basis: Dry
Percent Solids: 47.2

Polychlorinated Dibenzodioxins and Polychlorinated Dibenzofurans by HRGC/HRMS

Analytical Method: 8290
Prep Method: Method
Sample Amount: 10.784g

Data File Name: U137047
ICAL Date: 12/17/07

Date Analyzed: 7/13/10 1611
Date Extracted: 6/25/10
Instrument Name: E-HRMS-01
GC Column: DB-225
Blank File Name: U137039
Cal Ver. File Name: U137038

Analyte Name	Result	Q	EDL	MRL	Ion Ratio	RRT	Dilution Factor
2,3,7,8-TCDF	0.522	J	0.126	1.96	0.68	1.001	1

Labeled Compounds	Spike Conc.(pg)	Conc. Found (pg)	%Rec	Q	Control Limits	Ion Ratio	RRT
13C-2,3,7,8-TCDF	1000	573.327	57		40-135	0.79	1.060
37Cl-2,3,7,8-TCDD	800	630.480	79		40-135	NA	0.989

Comments: _____

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: Pacific EcoRisk Laboratories
Project: USACE San Rafael Channel/16087
Sample Matrix: Sediment
Sample Name: SRC-2010-5-Comp
Lab Code: K1006356-005

Service Request: K1006356
Date Collected: 6/ 8/10 1335
Date Received: 6/18/10
Units: ng/Kg
Basis: Dry
Percent Solids: 44.2

Polychlorinated Dibenzodioxins and Polychlorinated Dibenzofurans by HRGC/HRMS

Analytical Method: 8290
Prep Method: Method
Sample Amount: 11.657g
Data File Name: P109593
ICAL Date: 09/11/09

Date Analyzed: 7/6/10 1301
Date Extracted: 6/28/10
Instrument Name: E-HRMS-03
GC Column: DB-5
Blank File Name: P109648
Cal Ver. File Name: P109590

Analyte Name	Result	Q	EDL	MRL	Ion Ratio	RRT	Dilution Factor
2,3,7,8-TCDD	ND	U	0.315	1.94			1
1,2,3,7,8-PeCDD	ND	U	0.227	4.85			1
1,2,3,4,7,8-HxCDD	0.240	JK	0.184	4.85	0.96	0.999	1
1,2,3,6,7,8-HxCDD	0.731	J	0.165	4.85	1.13	1.000	1
1,2,3,7,8,9-HxCDD	0.606	J	0.174	4.85	1.16	1.009	1
1,2,3,4,6,7,8-HpCDD	11.7		0.257	4.85	1.02	1.000	1
OCDD	85.8	B	0.250	9.70	0.90	1.000	1
2,3,7,8-TCDF	ND	U	0.528	1.94			1
1,2,3,7,8-PeCDF	ND	U	0.251	4.85			1
2,3,4,7,8-PeCDF	ND	U	0.249	4.85			1
1,2,3,4,7,8-HxCDF	ND	U	0.257	4.85			1
1,2,3,6,7,8-HxCDF	ND	U	0.243	4.85			1
1,2,3,7,8,9-HxCDF	ND	U	0.326	4.85			1
2,3,4,6,7,8-HxCDF	ND	U	0.279	4.85			1
1,2,3,4,6,7,8-HpCDF	2.77	J	0.137	4.85	0.93	1.000	1
1,2,3,4,7,8,9-HpCDF	ND	U	0.191	4.85			1
OCDF	7.47	J	0.359	9.70	0.81	1.004	1
Total Tetra-Dioxins	ND	U	0.315	1.94			1
Total Penta-Dioxins	ND	U	0.227	4.85			1
Total Hexa-Dioxins	6.25		0.165	4.85	1.30		1
Total Hepta-Dioxins	28.6		0.257	4.85	1.10		1
Total Tetra-Furans	ND	U	0.528	1.94			1
Total Penta-Furans	ND	U	0.249	4.85			1
Total Hexa-Furans	2.98	J	0.243	4.85	1.29		1
Total Hepta-Furans	2.77	J	0.137	4.85	0.93		1

Comments: _____

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: Pacific EcoRisk Laboratories
Project: USACE San Rafael Channel/16087
Sample Matrix: Sediment
Sample Name: SRC-2010-5-Comp
Lab Code: K1006356-005

Service Request: K1006356
Date Collected: 6/ 8/10 1335
Date Received: 6/18/10
Units: Percent
Basis: Dry
Percent Solids: 44.2

Polychlorinated Dibenzodioxins and Polychlorinated Dibenzofurans by HRGC/HRMS

Analytical Method: 8290
Prep Method: Method
Sample Amount: 11.657g
Data File Name: P109593
ICAL Date: 09/11/09

Date Analyzed: 7/6/10 1301
Date Extracted: 6/28/10
Instrument Name: E-HRMS-03
GC Column: DB-5
Blank File Name: P109648
Cal Ver. File Name: P109590

Labeled Compounds	Spike Conc.(pg)	Conc. Found (pg)	%Rec	Q	Control Limits	Ion Ratio	RRT
13C-2,3,7,8-TCDD	1000	737.013	74		40-135	0.79	1.009
13C-1,2,3,7,8-PeCDD	1000	882.099	88		40-135	1.63	1.182
13C-1,2,3,6,7,8-HxCDD	2500	1555.926	62		40-135	1.29	0.991
13C-1,2,3,4,6,7,8-HpCDD	2500	1498.224	60		40-135	1.05	1.068
13C-OCDD	5000	2132.518	43		40-135	0.91	1.146
13C-2,3,7,8-TCDF	1000	633.351	63		40-135	0.80	0.979
13C-1,2,3,7,8-PeCDF	1000	884.704	88		40-135	1.60	1.142
13C-1,2,3,4,7,8-HxCDF	2500	1433.996	57		40-135	0.53	0.970
13C-1,2,3,4,6,7,8-HpCDF	2500	1421.512	57		40-135	0.45	1.045
37Cl-2,3,7,8-TCDD	800	788.626	99		40-135	NA	1.010

Comments: _____

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: Pacific EcoRisk Laboratories
Project: USACE San Rafael Channel/16087
Sample Matrix: Sediment
Sample Name: SRC-2010-5-Comp
Lab Code: K1006356-005

Service Request: K1006356
Date Collected: 6/ 8/10 1335
Date Received: 6/18/10
Units: ng/Kg
Basis: Dry

Polychlorinated Dibenzodioxins and Polychlorinated Dibenzofurans by HRGC/HRMS

Analytical Method: 8290
Prep Method: Method

Analyte Name	Result	DL	Dilution Factor	TEF	TEF - Adjusted Concentration
2,3,7,8-TCDD	ND	0.315	1	1	
1,2,3,7,8-PeCDD	ND	0.227	1	1	
1,2,3,4,7,8-HxCDD	0.240	0.184	1	0.1	0.0240
1,2,3,6,7,8-HxCDD	0.731	0.165	1	0.1	0.0731
1,2,3,7,8,9-HxCDD	0.606	0.174	1	0.1	0.0606
1,2,3,4,6,7,8-HpCDD	11.7	0.257	1	0.01	0.117
OCDD	85.8	0.250	1	0.0003	0.0257
2,3,7,8-TCDF	ND	0.528	1	0.1	
1,2,3,7,8-PeCDF	ND	0.251	1	0.03	
2,3,4,7,8-PeCDF	ND	0.249	1	0.3	
1,2,3,4,7,8-HxCDF	ND	0.257	1	0.1	
1,2,3,6,7,8-HxCDF	ND	0.243	1	0.1	
1,2,3,7,8,9-HxCDF	ND	0.326	1	0.1	
2,3,4,6,7,8-HxCDF	ND	0.279	1	0.1	
1,2,3,4,6,7,8-HpCDF	2.77	0.137	1	0.01	0.0277
1,2,3,4,7,8,9-HpCDF	ND	0.191	1	0.01	
OCDF	7.47	0.359	1	0.0003	0.00224
Total TEQ					0.330

2005 WHO TEFs, ND = 0

Comments: _____

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: Pacific EcoRisk Laboratories
Project: USACE San Rafael Channel/16087
Sample Matrix: Sediment
Sample Name: SRC-2010-6-Comp
Lab Code: K1006356-006

Service Request: K1006356
Date Collected: 6/ 9/10 1530
Date Received: 6/18/10
Units: ng/Kg
Basis: Dry
Percent Solids: 40.9

Polychlorinated Dibenzodioxins and Polychlorinated Dibenzofurans by HRGC/HRMS

Analytical Method: 8290
Prep Method: Method
Sample Amount: 11.638g
Data File Name: P109594
ICAL Date: 09/11/09

Date Analyzed: 7/6/10 1348
Date Extracted: 6/28/10
Instrument Name: E-HRMS-03
GC Column: DB-5
Blank File Name: P109648
Cal Ver. File Name: P109590

Analyte Name	Result	Q	EDL	MRL	Ion Ratio	RRT	Dilution Factor
2,3,7,8-TCDD	ND	U	0.404	2.10			1
1,2,3,7,8-PeCDD	0.682	JK	0.209	5.25	1.12	1.001	1
1,2,3,4,7,8-HxCDD	1.15	J	0.210	5.25	1.26	0.999	1
1,2,3,6,7,8-HxCDD	2.98	J	0.189	5.25	1.10	1.000	1
1,2,3,7,8,9-HxCDD	2.73	J	0.199	5.25	1.27	1.009	1
1,2,3,4,6,7,8-HpCDD	50.2		0.374	5.25	1.05	1.000	1
OCDD	829	B	0.392	10.5	0.89	1.000	1
2,3,7,8-TCDF	ND	U	0.500	2.10			1
1,2,3,7,8-PeCDF	ND	U	0.290	5.25			1
2,3,4,7,8-PeCDF	ND	U	0.287	5.25			1
1,2,3,4,7,8-HxCDF	0.697	JK	0.190	5.25	1.04	1.000	1
1,2,3,6,7,8-HxCDF	0.431	JK	0.180	5.25	1.66	1.003	1
1,2,3,7,8,9-HxCDF	ND	U	0.241	5.25			1
2,3,4,6,7,8-HxCDF	0.347	J	0.206	5.25	1.14	1.018	1
1,2,3,4,6,7,8-HpCDF	11.6		0.178	5.25	1.03	1.000	1
1,2,3,4,7,8,9-HpCDF	0.756	J	0.247	5.25	1.02	1.034	1
OCDF	41.5		0.460	10.5	0.89	1.004	1
Total Tetra-Dioxins	ND	U	0.404	2.10			1
Total Penta-Dioxins	1.16	J	0.209	5.25	1.47		1
Total Hexa-Dioxins	22.6		0.189	5.25	1.32		1
Total Hepta-Dioxins	111		0.374	5.25	1.04		1
Total Tetra-Furans	ND	U	0.500	2.10			1
Total Penta-Furans	5.58		0.287	5.25	1.51		1
Total Hexa-Furans	14.9		0.180	5.25	1.25		1
Total Hepta-Furans	39.3		0.178	5.25	1.03		1

Comments: _____

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: Pacific EcoRisk Laboratories
Project: USACE San Rafael Channel/16087
Sample Matrix: Sediment
Sample Name: SRC-2010-6-Comp
Lab Code: K1006356-006

Service Request: K1006356
Date Collected: 6/ 9/10 1530
Date Received: 6/18/10
Units: Percent
Basis: Dry
Percent Solids: 40.9

Polychlorinated Dibenzodioxins and Polychlorinated Dibenzofurans by HRGC/HRMS

Analytical Method: 8290
Prep Method: Method
Sample Amount: 11.638g
Data File Name: P109594
ICAL Date: 09/11/09

Date Analyzed: 7/6/10 1348
Date Extracted: 6/28/10
Instrument Name: E-HRMS-03
GC Column: DB-5
Blank File Name: P109648
Cal Ver. File Name: P109590

Labeled Compounds	Spike Conc.(pg)	Conc. Found (pg)	%Rec	Q	Control Limits	Ion Ratio	RRT
13C-2,3,7,8-TCDD	1000	791.012	79		40-135	0.78	1.009
13C-1,2,3,7,8-PeCDD	1000	919.917	92		40-135	1.58	1.182
13C-1,2,3,6,7,8-HxCDD	2500	1622.559	65		40-135	1.27	0.991
13C-1,2,3,4,6,7,8-HpCDD	2500	1510.815	60		40-135	1.06	1.068
13C-OCDD	5000	2073.164	41		40-135	0.91	1.146
13C-2,3,7,8-TCDF	1000	685.959	69		40-135	0.78	0.979
13C-1,2,3,7,8-PeCDF	1000	915.368	92		40-135	1.61	1.142
13C-1,2,3,4,7,8-HxCDF	2500	1517.508	61		40-135	0.52	0.970
13C-1,2,3,4,6,7,8-HpCDF	2500	1424.694	57		40-135	0.44	1.045
37Cl-2,3,7,8-TCDD	800	815.966	102		40-135	NA	1.010

Comments: _____

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: Pacific EcoRisk Laboratories
Project: USACE San Rafael Channel/16087
Sample Matrix: Sediment
Sample Name: SRC-2010-6-Comp
Lab Code: K1006356-006

Service Request: K1006356
Date Collected: 6/ 9/10 1530
Date Received: 6/18/10
Units: ng/Kg
Basis: Dry

Polychlorinated Dibenzodioxins and Polychlorinated Dibenzofurans by HRGC/HRMS

Analytical Method: 8290
Prep Method: Method

Analyte Name	Result	DL	Dilution Factor	TEF	TEF - Adjusted Concentration
2,3,7,8-TCDD	ND	0.404	1	1	
1,2,3,7,8-PeCDD	0.682	0.209	1	1	0.682
1,2,3,4,7,8-HxCDD	1.15	0.210	1	0.1	0.115
1,2,3,6,7,8-HxCDD	2.98	0.189	1	0.1	0.298
1,2,3,7,8,9-HxCDD	2.73	0.199	1	0.1	0.273
1,2,3,4,6,7,8-HpCDD	50.2	0.374	1	0.01	0.502
OCDD	829	0.392	1	0.0003	0.249
2,3,7,8-TCDF	ND	0.500	1	0.1	
1,2,3,7,8-PeCDF	ND	0.290	1	0.03	
2,3,4,7,8-PeCDF	ND	0.287	1	0.3	
1,2,3,4,7,8-HxCDF	0.697	0.190	1	0.1	0.0697
1,2,3,6,7,8-HxCDF	0.431	0.180	1	0.1	0.0431
1,2,3,7,8,9-HxCDF	ND	0.241	1	0.1	
2,3,4,6,7,8-HxCDF	0.347	0.206	1	0.1	0.0347
1,2,3,4,6,7,8-HpCDF	11.6	0.178	1	0.01	0.116
1,2,3,4,7,8,9-HpCDF	0.756	0.247	1	0.01	0.00756
OCDF	41.5	0.460	1	0.0003	0.0125
Total TEQ					2.40

2005 WHO TEFs, ND = 0

Comments: _____

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: Pacific EcoRisk Laboratories
Project: USACE San Rafael Channel/16087
Sample Matrix: Sediment
Sample Name: SRC-2010-7-Comp
Lab Code: K1006356-007

Service Request: K1006356
Date Collected: 6/10/10 0900
Date Received: 6/18/10
Units: ng/Kg
Basis: Dry
Percent Solids: 42.0

Polychlorinated Dibenzodioxins and Polychlorinated Dibenzofurans by HRGC/HRMS

Analytical Method: 8290
Prep Method: Method
Sample Amount: 10.387g
Data File Name: P109595
ICAL Date: 09/11/09

Date Analyzed: 7/6/10 1436
Date Extracted: 6/28/10
Instrument Name: E-HRMS-03
GC Column: DB-5
Blank File Name: P109648
Cal Ver. File Name: P109590

Analyte Name	Result	Q	EDL	MRL	Ion Ratio	RRT	Dilution Factor
2,3,7,8-TCDD	ND	U	0.263	2.29			1
1,2,3,7,8-PeCDD	1.59	J	0.184	5.73	1.41	1.000	1
1,2,3,4,7,8-HxCDD	1.86	J	0.204	5.73	1.42	0.999	1
1,2,3,6,7,8-HxCDD	5.48	J	0.183	5.73	1.28	1.000	1
1,2,3,7,8,9-HxCDD	5.03	J	0.194	5.73	1.14	1.009	1
1,2,3,4,6,7,8-HpCDD	103		0.273	5.73	1.07	1.000	1
OCDD	903	B	0.273	11.5	0.89	1.000	1
2,3,7,8-TCDF	1.08	CJ	0.419	2.29	0.76	1.000	1
1,2,3,7,8-PeCDF	ND	U	0.329	5.73			1
2,3,4,7,8-PeCDF	0.534	J	0.326	5.73	1.65	1.026	1
1,2,3,4,7,8-HxCDF	1.47	JK	0.223	5.73	1.02	1.000	1
1,2,3,6,7,8-HxCDF	1.04	JK	0.211	5.73	1.00	1.004	1
1,2,3,7,8,9-HxCDF	ND	U	0.284	5.73			1
2,3,4,6,7,8-HxCDF	1.34	J	0.243	5.73	1.29	1.017	1
1,2,3,4,6,7,8-HpCDF	19.8		0.121	5.73	1.04	1.000	1
1,2,3,4,7,8,9-HpCDF	1.45	J	0.168	5.73	1.15	1.034	1
OCDF	66.2		0.366	11.5	0.89	1.004	1
Total Tetra-Dioxins	ND	U	0.263	2.29			1
Total Penta-Dioxins	3.91	J	0.184	5.73	1.52		1
Total Hexa-Dioxins	37.1		0.183	5.73	1.30		1
Total Hepta-Dioxins	226		0.273	5.73	1.02		1
Total Tetra-Furans	6.80		0.419	2.29	0.77		1
Total Penta-Furans	24.7		0.326	5.73	1.55		1
Total Hexa-Furans	34.8		0.211	5.73	1.23		1
Total Hepta-Furans	64.0		0.121	5.73	1.04		1

Comments: _____

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: Pacific EcoRisk Laboratories
Project: USACE San Rafael Channel/16087
Sample Matrix: Sediment
Sample Name: SRC-2010-7-Comp
Lab Code: K1006356-007

Service Request: K1006356
Date Collected: 6/10/10 0900
Date Received: 6/18/10
Units: Percent
Basis: Dry
Percent Solids: 42.0

Polychlorinated Dibenzodioxins and Polychlorinated Dibenzofurans by HRGC/HRMS

Analytical Method: 8290
Prep Method: Method
Sample Amount: 10.387g
Data File Name: P109595
ICAL Date: 09/11/09

Date Analyzed: 7/6/10 1436
Date Extracted: 6/28/10
Instrument Name: E-HRMS-03
GC Column: DB-5
Blank File Name: P109648
Cal Ver. File Name: P109590

Labeled Compounds	Spike Conc.(pg)	Conc. Found (pg)	%Rec	Q	Control Limits	Ion Ratio	RRT
13C-2,3,7,8-TCDD	1000	747.162	75		40-135	0.79	1.009
13C-1,2,3,7,8-PeCDD	1000	849.674	85		40-135	1.58	1.182
13C-1,2,3,6,7,8-HxCDD	2500	1412.841	57		40-135	1.28	0.991
13C-1,2,3,4,6,7,8-HpCDD	2500	1279.349	51		40-135	1.06	1.068
13C-OCDD	5000	1757.199	35	Y	40-135	0.91	1.146
13C-2,3,7,8-TCDF	1000	625.471	63		40-135	0.80	0.979
13C-1,2,3,7,8-PeCDF	1000	852.858	85		40-135	1.63	1.142
13C-1,2,3,4,7,8-HxCDF	2500	1334.134	53		40-135	0.52	0.970
13C-1,2,3,4,6,7,8-HpCDF	2500	1258.329	50		40-135	0.45	1.045
37Cl-2,3,7,8-TCDD	800	800.378	100		40-135	NA	1.010

Comments: _____

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: Pacific EcoRisk Laboratories
Project: USACE San Rafael Channel/16087
Sample Matrix: Sediment
Sample Name: SRC-2010-7-Comp
Lab Code: K1006356-007

Service Request: K1006356
Date Collected: 6/10/10 0900
Date Received: 6/18/10
Units: ng/Kg
Basis: Dry

Polychlorinated Dibenzodioxins and Polychlorinated Dibenzofurans by HRGC/HRMS

Analytical Method: 8290
Prep Method: Method

Analyte Name	Result	DL	Dilution Factor	TEF	TEF - Adjusted Concentration
2,3,7,8-TCDD	ND	0.263	1	1	
1,2,3,7,8-PeCDD	1.59	0.184	1	1	1.59
1,2,3,4,7,8-HxCDD	1.86	0.204	1	0.1	0.186
1,2,3,6,7,8-HxCDD	5.48	0.183	1	0.1	0.548
1,2,3,7,8,9-HxCDD	5.03	0.194	1	0.1	0.503
1,2,3,4,6,7,8-HpCDD	103	0.273	1	0.01	1.03
OCDD	903	0.273	1	0.0003	0.271
2,3,7,8-TCDF	0.922	0.230	1	0.1	0.0922
1,2,3,7,8-PeCDF	ND	0.329	1	0.03	
2,3,4,7,8-PeCDF	0.534	0.326	1	0.3	0.160
1,2,3,4,7,8-HxCDF	1.47	0.223	1	0.1	0.147
1,2,3,6,7,8-HxCDF	1.04	0.211	1	0.1	0.104
1,2,3,7,8,9-HxCDF	ND	0.284	1	0.1	
2,3,4,6,7,8-HxCDF	1.34	0.243	1	0.1	0.134
1,2,3,4,6,7,8-HpCDF	19.8	0.121	1	0.01	0.198
1,2,3,4,7,8,9-HpCDF	1.45	0.168	1	0.01	0.0145
OCDF	66.2	0.366	1	0.0003	0.0199
Total TEQ					5.00

2005 WHO TEFs, ND = 0

Comments: _____

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: Pacific EcoRisk Laboratories
Project: USACE San Rafael Channel/16087
Sample Matrix: Sediment

Sample Name: SRC-2010-7-Comp
Lab Code: K1006356-007
Run Type: Reanalysis

Service Request: K1006356
Date Collected: 6/10/10 0900
Date Received: 6/18/10

Units: ng/Kg
Basis: Dry
Percent Solids: 42.0

Polychlorinated Dibenzodioxins and Polychlorinated Dibenzofurans by HRGC/HRMS

Analytical Method: 8290
Prep Method: Method
Sample Amount: 10.387g

Data File Name: U137000
ICAL Date: 12/17/07

Date Analyzed: 7/6/10 1635
Date Extracted: 6/28/10
Instrument Name: E-HRMS-01
GC Column: DB-225
Blank File Name: U136992
Cal Ver. File Name: U136991

Analyte Name	Result	Q	EDL	MRL	Ion Ratio	RRT	Dilution Factor
2,3,7,8-TCDF	0.922	J	0.230	2.29	0.80	1.001	1

Labeled Compounds	Spike Conc.(pg)	Conc. Found (pg)	%Rec	Q	Control Limits	Ion Ratio	RRT
13C-2,3,7,8-TCDF	1000	667.096	67		40-135	0.79	1.060
37Cl-2,3,7,8-TCDD	800	734.359	92		40-135	NA	0.988

Comments: _____

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: Pacific EcoRisk Laboratories
Project: USACE San Rafael Channel/16087
Sample Matrix: Sediment
Sample Name: SRC-2010-7-Z-Comp
Lab Code: K1006356-008

Service Request: K1006356
Date Collected: 6/10/10 1155
Date Received: 6/18/10
Units: ng/Kg
Basis: Dry
Percent Solids: 47.5

Polychlorinated Dibenzodioxins and Polychlorinated Dibenzofurans by HRGC/HRMS

Analytical Method: 8290
Prep Method: Method
Sample Amount: 10.475g
Data File Name: P109596
ICAL Date: 09/11/09

Date Analyzed: 7/6/10 1524
Date Extracted: 6/28/10
Instrument Name: E-HRMS-03
GC Column: DB-5
Blank File Name: P109648
Cal Ver. File Name: P109590

Analyte Name	Result	Q	EDL	MRL	Ion Ratio	RRT	Dilution Factor
2,3,7,8-TCDD	ND	U	0.298	2.01			1
1,2,3,7,8-PeCDD	1.24	J	0.298	5.02	1.65	1.000	1
1,2,3,4,7,8-HxCDD	1.60	J	0.258	5.02	1.31	0.999	1
1,2,3,6,7,8-HxCDD	6.02		0.232	5.02	1.38	1.000	1
1,2,3,7,8,9-HxCDD	4.61	J	0.245	5.02	1.36	1.009	1
1,2,3,4,6,7,8-HpCDD	109		0.401	5.02	1.04	1.000	1
OCDD	839	B	0.352	10.0	0.90	1.000	1
2,3,7,8-TCDF	1.39	CJK	0.437	2.01	1.05	1.002	1
1,2,3,7,8-PeCDF	ND	U	0.810	5.02			1
2,3,4,7,8-PeCDF	0.972	JK	0.804	5.02	1.79	1.025	1
1,2,3,4,7,8-HxCDF	2.16	JK	0.483	5.02	1.47	1.000	1
1,2,3,6,7,8-HxCDF	1.78	J	0.457	5.02	1.16	1.004	1
1,2,3,7,8,9-HxCDF	ND	U	0.614	5.02			1
2,3,4,6,7,8-HxCDF	2.03	J	0.525	5.02	1.28	1.018	1
1,2,3,4,6,7,8-HpCDF	24.8		0.343	5.02	1.00	1.000	1
1,2,3,4,7,8,9-HpCDF	1.16	JK	0.476	5.02	0.72	1.034	1
OCDF	82.2		0.339	10.0	0.88	1.004	1
Total Tetra-Dioxins	ND	U	0.298	2.01			1
Total Penta-Dioxins	2.44	J	0.298	5.02	1.36		1
Total Hexa-Dioxins	41.1		0.232	5.02	1.23		1
Total Hepta-Dioxins	244		0.401	5.02	1.04		1
Total Tetra-Furans	19.2		0.437	2.01	0.87		1
Total Penta-Furans	52.2		0.804	5.02	1.55		1
Total Hexa-Furans	55.9		0.457	5.02	1.25		1
Total Hepta-Furans	88.4		0.343	5.02	1.00		1

Comments: _____

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: Pacific EcoRisk Laboratories
Project: USACE San Rafael Channel/16087
Sample Matrix: Sediment
Sample Name: SRC-2010-7-Z-Comp
Lab Code: K1006356-008

Service Request: K1006356
Date Collected: 6/10/10 1155
Date Received: 6/18/10
Units: Percent
Basis: Dry
Percent Solids: 47.5

Polychlorinated Dibenzodioxins and Polychlorinated Dibenzofurans by HRGC/HRMS

Analytical Method: 8290
Prep Method: Method
Sample Amount: 10.475g
Data File Name: P109596
ICAL Date: 09/11/09

Date Analyzed: 7/6/10 1524
Date Extracted: 6/28/10
Instrument Name: E-HRMS-03
GC Column: DB-5
Blank File Name: P109648
Cal Ver. File Name: P109590

Labeled Compounds	Spike Conc.(pg)	Conc. Found (pg)	%Rec	Q	Control Limits	Ion Ratio	RRT
13C-2,3,7,8-TCDD	1000	732.311	73		40-135	0.79	1.010
13C-1,2,3,7,8-PeCDD	1000	869.515	87		40-135	1.59	1.183
13C-1,2,3,6,7,8-HxCDD	2500	1461.255	58		40-135	1.28	0.991
13C-1,2,3,4,6,7,8-HpCDD	2500	1421.937	57		40-135	1.07	1.068
13C-OCDD	5000	2072.453	41		40-135	0.91	1.146
13C-2,3,7,8-TCDF	1000	608.847	61		40-135	0.80	0.979
13C-1,2,3,7,8-PeCDF	1000	878.825	88		40-135	1.63	1.142
13C-1,2,3,4,7,8-HxCDF	2500	1373.681	55		40-135	0.53	0.970
13C-1,2,3,4,6,7,8-HpCDF	2500	1358.049	54		40-135	0.45	1.044
37Cl-2,3,7,8-TCDD	800	750.959	94		40-135	NA	1.011

Comments: _____

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: Pacific EcoRisk Laboratories
Project: USACE San Rafael Channel/16087
Sample Matrix: Sediment
Sample Name: SRC-2010-7-Z-Comp
Lab Code: K1006356-008

Service Request: K1006356
Date Collected: 6/10/10 1155
Date Received: 6/18/10
Units: ng/Kg
Basis: Dry

Polychlorinated Dibenzodioxins and Polychlorinated Dibenzofurans by HRGC/HRMS

Analytical Method: 8290
Prep Method: Method

Analyte Name	Result	DL	Dilution Factor	TEF	TEF - Adjusted Concentration
2,3,7,8-TCDD	ND	0.298	1	1	
1,2,3,7,8-PeCDD	1.24	0.298	1	1	1.24
1,2,3,4,7,8-HxCDD	1.60	0.258	1	0.1	0.160
1,2,3,6,7,8-HxCDD	6.02	0.232	1	0.1	0.602
1,2,3,7,8,9-HxCDD	4.61	0.245	1	0.1	0.461
1,2,3,4,6,7,8-HpCDD	109	0.401	1	0.01	1.09
OCDD	839	0.352	1	0.0003	0.252
2,3,7,8-TCDF	1.41	0.225	1	0.1	0.141
1,2,3,7,8-PeCDF	ND	0.810	1	0.03	
2,3,4,7,8-PeCDF	0.972	0.804	1	0.3	0.292
1,2,3,4,7,8-HxCDF	2.16	0.483	1	0.1	0.216
1,2,3,6,7,8-HxCDF	1.78	0.457	1	0.1	0.178
1,2,3,7,8,9-HxCDF	ND	0.614	1	0.1	
2,3,4,6,7,8-HxCDF	2.03	0.525	1	0.1	0.203
1,2,3,4,6,7,8-HpCDF	24.8	0.343	1	0.01	0.248
1,2,3,4,7,8,9-HpCDF	1.16	0.476	1	0.01	0.0116
OCDF	82.2	0.339	1	0.0003	0.0247
Total TEQ					5.12

2005 WHO TEFs, ND = 0

Comments: _____

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: Pacific EcoRisk Laboratories
Project: USACE San Rafael Channel/16087
Sample Matrix: Sediment

Sample Name: SRC-2010-7-Z-Comp
Lab Code: K1006356-008
Run Type: Reanalysis

Service Request: K1006356
Date Collected: 6/10/10 1155
Date Received: 6/18/10

Units: ng/Kg
Basis: Dry
Percent Solids: 47.5

Polychlorinated Dibenzodioxins and Polychlorinated Dibenzofurans by HRGC/HRMS

Analytical Method: 8290
Prep Method: Method
Sample Amount: 10.475g

Data File Name: U137001
ICAL Date: 12/17/07

Date Analyzed: 7/6/10 1700
Date Extracted: 6/28/10
Instrument Name: E-HRMS-01
GC Column: DB-225
Blank File Name: U136992
Cal Ver. File Name: U136991

Analyte Name	Result	Q	EDL	MRL	Ion Ratio	RRT	Dilution Factor
2,3,7,8-TCDF	1.41	J	0.225	2.01	0.79	1.000	1

Labeled Compounds	Spike Conc.(pg)	Conc. Found (pg)	%Rec	Q	Control Limits	Ion Ratio	RRT
13C-2,3,7,8-TCDF	1000	654.774	65		40-135	0.80	1.061
37Cl-2,3,7,8-TCDD	800	694.682	87		40-135	NA	0.989

Comments: _____

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: Pacific EcoRisk Laboratories
Project: USACE San Rafael Channel/16087
Sample Matrix: Sediment
Sample Name: SRC-2010-8-Z-Comp
Lab Code: K1006356-021

Service Request: K1006356
Date Collected: 6/10/10 1155
Date Received: 6/23/10
Units: ng/Kg
Basis: Dry
Percent Solids: 44.0

Polychlorinated Dibenzodioxins and Polychlorinated Dibenzofurans by HRGC/HRMS

Analytical Method: 8290
Prep Method: Method
Sample Amount: 13.336g
Data File Name: P208659
ICAL Date: 08/01/08

Date Analyzed: 7/16/10 1851
Date Extracted: 7/8/10
Instrument Name: E-HRMS-04
GC Column: DB-5
Blank File Name: P208658
Cal Ver. File Name: P208656

Analyte Name	Result	Q	EDL	MRL	Ion Ratio	RRT	Dilution Factor
2,3,7,8-TCDD	0.558	JK	0.0812	1.70	0.52	1.001	1
1,2,3,7,8-PeCDD	2.90	J	0.112	4.26	1.41	1.000	1
1,2,3,4,7,8-HxCDD	2.66	JK	0.130	4.26	1.48	0.998	1
1,2,3,6,7,8-HxCDD	11.0		0.123	4.26	1.21	1.000	1
1,2,3,7,8,9-HxCDD	7.56		0.129	4.26	1.25	1.008	1
1,2,3,4,6,7,8-HpCDD	185	B	0.291	4.26	1.02	1.000	1
OCDD	1260	B	0.115	8.52	0.90	1.000	1
2,3,7,8-TCDF	1.56	CJ	0.0875	1.70	0.66	1.001	1
1,2,3,7,8-PeCDF	0.882	J	0.335	4.26	1.44	1.001	1
2,3,4,7,8-PeCDF	1.61	J	0.322	4.26	1.46	1.024	1
1,2,3,4,7,8-HxCDF	4.45		0.198	4.26	1.12	1.000	1
1,2,3,6,7,8-HxCDF	3.72	J	0.190	4.26	1.16	1.003	1
1,2,3,7,8,9-HxCDF	ND	U	0.241	4.26			1
2,3,4,6,7,8-HxCDF	4.13	J	0.204	4.26	1.14	1.016	1
1,2,3,4,6,7,8-HpCDF	45.3		0.224	4.26	1.01	1.000	1
1,2,3,4,7,8,9-HpCDF	2.93	J	0.295	4.26	0.88	1.034	1
OCDF	137		0.0968	8.52	0.84	1.004	1
Total Tetra-Dioxins	1.37	J	0.0812	1.70	0.77		1
Total Penta-Dioxins	11.3		0.112	4.26	1.48		1
Total Hexa-Dioxins	56.3		0.123	4.26	1.21		1
Total Hepta-Dioxins	354		0.291	4.26	1.02		1
Total Tetra-Furans	33.7		0.0875	1.70	0.67		1
Total Penta-Furans	142		0.322	4.26	1.48		1
Total Hexa-Furans	76.0		0.190	4.26	1.16		1
Total Hepta-Furans	159		0.224	4.26	1.01		1

Comments: _____

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: Pacific EcoRisk Laboratories
Project: USACE San Rafael Channel/16087
Sample Matrix: Sediment
Sample Name: SRC-2010-8-Z-Comp
Lab Code: K1006356-021

Service Request: K1006356
Date Collected: 6/10/10 1155
Date Received: 6/23/10
Units: Percent
Basis: Dry
Percent Solids: 44.0

Polychlorinated Dibenzodioxins and Polychlorinated Dibenzofurans by HRGC/HRMS

Analytical Method: 8290
Prep Method: Method
Sample Amount: 13.336g
Data File Name: P208659
ICAL Date: 08/01/08

Date Analyzed: 7/16/10 1851
Date Extracted: 7/8/10
Instrument Name: E-HRMS-04
GC Column: DB-5
Blank File Name: P208658
Cal Ver. File Name: P208656

Labeled Compounds	Spike Conc.(pg)	Conc. Found (pg)	%Rec	Q	Control Limits	Ion Ratio	RRT
13C-2,3,7,8-TCDD	1000	678.485	68		40-135	0.76	1.008
13C-1,2,3,7,8-PeCDD	1000	557.005	56		40-135	1.57	1.167
13C-1,2,3,6,7,8-HxCDD	2500	1307.612	52		40-135	1.25	0.992
13C-1,2,3,4,6,7,8-HpCDD	2500	1206.370	48		40-135	1.05	1.068
13C-OCDD	5000	1704.957	34	Y	40-135	0.91	1.148
13C-2,3,7,8-TCDF	1000	546.751	55		40-135	0.78	0.980
13C-1,2,3,7,8-PeCDF	1000	641.748	64		40-135	1.56	1.129
13C-1,2,3,4,7,8-HxCDF	2500	1287.482	51		40-135	0.52	0.971
13C-1,2,3,4,6,7,8-HpCDF	2500	1146.931	46		40-135	0.43	1.044
37Cl-2,3,7,8-TCDD	800	663.036	83		40-135	NA	1.009

Comments: _____

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: Pacific EcoRisk Laboratories
Project: USACE San Rafael Channel/16087
Sample Matrix: Sediment
Sample Name: SRC-2010-8-Z-Comp
Lab Code: K1006356-021

Service Request: K1006356
Date Collected: 6/10/10 1155
Date Received: 6/23/10
Units: ng/Kg
Basis: Dry

Polychlorinated Dibenzodioxins and Polychlorinated Dibenzofurans by HRGC/HRMS

Analytical Method: 8290
Prep Method: Method

Analyte Name	Result	DL	Dilution Factor	TEF	TEF - Adjusted Concentration
2,3,7,8-TCDD	0.558	0.0812	1	1	0.558
1,2,3,7,8-PeCDD	2.90	0.112	1	1	2.90
1,2,3,4,7,8-HxCDD	2.66	0.130	1	0.1	0.266
1,2,3,6,7,8-HxCDD	11.0	0.123	1	0.1	1.10
1,2,3,7,8,9-HxCDD	7.56	0.129	1	0.1	0.756
1,2,3,4,6,7,8-HpCDD	185	0.291	1	0.01	1.85
OCDD	1260	0.115	1	0.0003	0.378
2,3,7,8-TCDF	1.31	0.136	1	0.1	0.131
1,2,3,7,8-PeCDF	0.882	0.335	1	0.03	0.0265
2,3,4,7,8-PeCDF	1.61	0.322	1	0.3	0.483
1,2,3,4,7,8-HxCDF	4.45	0.198	1	0.1	0.445
1,2,3,6,7,8-HxCDF	3.72	0.190	1	0.1	0.372
1,2,3,7,8,9-HxCDF	ND	0.241	1	0.1	
2,3,4,6,7,8-HxCDF	4.13	0.204	1	0.1	0.413
1,2,3,4,6,7,8-HpCDF	45.3	0.224	1	0.01	0.453
1,2,3,4,7,8,9-HpCDF	2.93	0.295	1	0.01	0.0293
OCDF	137	0.0968	1	0.0003	0.0411
Total TEQ					10.2

2005 WHO TEFs, ND = 0

Comments: _____

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: Pacific EcoRisk Laboratories
Project: USACE San Rafael Channel/16087
Sample Matrix: Sediment
Sample Name: SRC-2010-8-Z-Comp
Lab Code: K1006356-021
Run Type: Reanalysis

Service Request: K1006356
Date Collected: 6/10/10 1155
Date Received: 6/23/10
Units: ng/Kg
Basis: Dry
Percent Solids: 44.0

Polychlorinated Dibenzodioxins and Polychlorinated Dibenzofurans by HRGC/HRMS

Analytical Method: 8290
Prep Method: Method
Sample Amount: 13.336g
Data File Name: U137165
ICAL Date: 12/17/07

Date Analyzed: 7/17/10 1646
Date Extracted: 7/8/10
Instrument Name: E-HRMS-01
GC Column: DB-225
Blank File Name: U137156
Cal Ver. File Name: U137155

Analyte Name	Result	Q	EDL	MRL	Ion Ratio	RRT	Dilution Factor
2,3,7,8-TCDF	1.31	J	0.136	1.70	0.75	1.001	1

Labeled Compounds	Spike Conc.(pg)	Conc. Found (pg)	%Rec	Q	Control Limits	Ion Ratio	RRT
13C-2,3,7,8-TCDF	1000	607.158	61		40-135	0.80	1.059
37Cl-2,3,7,8-TCDD	800	707.817	88		40-135	NA	0.989

Comments: _____

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: Pacific EcoRisk Laboratories
Project: USACE San Rafael Channel/16087
Sample Matrix: Sediment
Sample Name: Method Blank
Lab Code: EQ1000320-01

Service Request: K1006356
Date Collected: NA
Date Received: NA
Units: ng/Kg
Basis: Dry

Polychlorinated Dibenzodioxins and Polychlorinated Dibenzofurans by HRGC/HRMS

Analytical Method: 8290
Prep Method: Method
Sample Amount: 10.000g
Data File Name: P208554
ICAL Date: 08/01/08

Date Analyzed: 7/12/10 1822
Date Extracted: 6/25/10
Instrument Name: E-HRMS-04
GC Column: DB-5
Blank File Name: P208554
Cal Ver. File Name: P208552

Analyte Name	Result	Q	EDL	MRL	Ion Ratio	RRT	Dilution Factor
2,3,7,8-TCDD	ND	U	0.0312	1.00			1
1,2,3,7,8-PeCDD	ND	U	0.0441	2.50			1
1,2,3,4,7,8-HxCDD	ND	U	0.0369	2.50			1
1,2,3,6,7,8-HxCDD	ND	U	0.0263	2.50			1
1,2,3,7,8,9-HxCDD	ND	U	0.0297	2.50			1
1,2,3,4,6,7,8-HpCDD	0.180	J	0.0263	2.50	1.05	1.000	1
OCDD	0.713	J	0.0462	5.00	0.84	1.000	1
2,3,7,8-TCDF	ND	U	0.0318	1.00			1
1,2,3,7,8-PeCDF	ND	U	0.0216	2.50			1
2,3,4,7,8-PeCDF	ND	U	0.0209	2.50			1
1,2,3,4,7,8-HxCDF	ND	U	0.0296	2.50			1
1,2,3,6,7,8-HxCDF	ND	U	0.0254	2.50			1
1,2,3,7,8,9-HxCDF	ND	U	0.0342	2.50			1
2,3,4,6,7,8-HxCDF	ND	U	0.0283	2.50			1
1,2,3,4,6,7,8-HpCDF	ND	U	0.0327	2.50			1
1,2,3,4,7,8,9-HpCDF	ND	U	0.0417	2.50			1
OCDF	0.153	J	0.0453	5.00	1.00	1.004	1
Total Tetra-Dioxins	ND	U	0.0312	1.00			1
Total Penta-Dioxins	ND	U	0.0441	2.50			1
Total Hexa-Dioxins	ND	U	0.0263	2.50			1
Total Hepta-Dioxins	0.378	J	0.0263	2.50	1.03		1
Total Tetra-Furans	0.0789	J	0.0318	1.00	0.81		1
Total Penta-Furans	ND	U	0.0209	2.50			1
Total Hexa-Furans	ND	U	0.0254	2.50			1
Total Hepta-Furans	ND	U	0.0327	2.50			1

Comments: _____

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: Pacific EcoRisk Laboratories
Project: USACE San Rafael Channel/16087
Sample Matrix: Sediment
Sample Name: Method Blank
Lab Code: EQ1000320-01

Service Request: K1006356
Date Collected: NA
Date Received: NA
Units: Percent
Basis: Dry

Polychlorinated Dibenzodioxins and Polychlorinated Dibenzofurans by HRGC/HRMS

Analytical Method: 8290
Prep Method: Method
Sample Amount: 10.000g
Data File Name: P208554
ICAL Date: 08/01/08

Date Analyzed: 7/12/10 1822
Date Extracted: 6/25/10
Instrument Name: E-HRMS-04
GC Column: DB-5
Blank File Name: P208554
Cal Ver. File Name: P208552

Labeled Compounds	Spike Conc.(pg)	Conc. Found (pg)	%Rec	Q	Control Limits	Ion Ratio	RRT
13C-2,3,7,8-TCDD	1000	698.513	70		40-135	0.79	1.009
13C-1,2,3,7,8-PeCDD	1000	701.371	70		40-135	1.60	1.167
13C-1,2,3,6,7,8-HxCDD	2500	1824.690	73		40-135	1.26	0.992
13C-1,2,3,4,6,7,8-HpCDD	2500	1626.315	65		40-135	1.05	1.068
13C-OCDD	5000	2440.681	49		40-135	0.91	1.148
13C-2,3,7,8-TCDF	1000	706.482	71		40-135	0.78	0.980
13C-1,2,3,7,8-PeCDF	1000	772.353	77		40-135	1.61	1.130
13C-1,2,3,4,7,8-HxCDF	2500	1773.867	71		40-135	0.52	0.971
13C-1,2,3,4,6,7,8-HpCDF	2500	1573.747	63		40-135	0.44	1.044
37Cl-2,3,7,8-TCDD	800	739.712	92		40-135	NA	1.009

Comments: _____

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: Pacific EcoRisk Laboratories
Project: USACE San Rafael Channel/16087
Sample Matrix: Sediment
Sample Name: Method Blank
Lab Code: EQ1000323-01

Service Request: K1006356
Date Collected: NA
Date Received: NA
Units: ng/Kg
Basis: Dry

Polychlorinated Dibenzodioxins and Polychlorinated Dibenzofurans by HRGC/HRMS

Analytical Method: 8290
Prep Method: Method
Sample Amount: 10.000g
Data File Name: P109648
ICAL Date: 09/11/09

Date Analyzed: 7/9/10 1122
Date Extracted: 6/28/10
Instrument Name: E-HRMS-03
GC Column: DB-5
Blank File Name: P109648
Cal Ver. File Name: P109647

Analyte Name	Result	Q	EDL	MRL	Ion Ratio	RRT	Dilution Factor
2,3,7,8-TCDD	ND	U	0.115	1.00			1
1,2,3,7,8-PeCDD	ND	U	0.108	2.50			1
1,2,3,4,7,8-HxCDD	ND	U	0.0886	2.50			1
1,2,3,6,7,8-HxCDD	ND	U	0.0646	2.50			1
1,2,3,7,8,9-HxCDD	ND	U	0.0729	2.50			1
1,2,3,4,6,7,8-HpCDD	ND	U	0.150	2.50			1
OCDD	0.578	JK	0.289	5.00	1.27	1.000	1
2,3,7,8-TCDF	ND	U	0.156	1.00			1
1,2,3,7,8-PeCDF	ND	U	0.0673	2.50			1
2,3,4,7,8-PeCDF	ND	U	0.0655	2.50			1
1,2,3,4,7,8-HxCDF	ND	U	0.0727	2.50			1
1,2,3,6,7,8-HxCDF	ND	U	0.0649	2.50			1
1,2,3,7,8,9-HxCDF	ND	U	0.0755	2.50			1
2,3,4,6,7,8-HxCDF	ND	U	0.0688	2.50			1
1,2,3,4,6,7,8-HpCDF	ND	U	0.0738	2.50			1
1,2,3,4,7,8,9-HpCDF	ND	U	0.0959	2.50			1
OCDF	ND	U	0.194	5.00			1
Total Tetra-Dioxins	ND	U	0.115	1.00			1
Total Penta-Dioxins	ND	U	0.108	2.50			1
Total Hexa-Dioxins	ND	U	0.0646	2.50			1
Total Hepta-Dioxins	ND	U	0.150	2.50			1
Total Tetra-Furans	ND	U	0.156	1.00			1
Total Penta-Furans	ND	U	0.0655	2.50			1
Total Hexa-Furans	ND	U	0.0649	2.50			1
Total Hepta-Furans	ND	U	0.0738	2.50			1

Comments: _____

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: Pacific EcoRisk Laboratories
Project: USACE San Rafael Channel/16087
Sample Matrix: Sediment
Sample Name: Method Blank
Lab Code: EQ1000323-01

Service Request: K1006356
Date Collected: NA
Date Received: NA
Units: Percent
Basis: Dry

Polychlorinated Dibenzodioxins and Polychlorinated Dibenzofurans by HRGC/HRMS

Analytical Method: 8290
Prep Method: Method
Sample Amount: 10.000g
Data File Name: P109648
ICAL Date: 09/11/09

Date Analyzed: 7/9/10 1122
Date Extracted: 6/28/10
Instrument Name: E-HRMS-03
GC Column: DB-5
Blank File Name: P109648
Cal Ver. File Name: P109647

Labeled Compounds	Spike Conc.(pg)	Conc. Found (pg)	%Rec	Q	Control Limits	Ion Ratio	RRT
13C-2,3,7,8-TCDD	1000	781.989	78		40-135	0.77	1.009
13C-1,2,3,7,8-PeCDD	1000	769.122	77		40-135	1.64	1.183
13C-1,2,3,6,7,8-HxCDD	2500	1960.155	78		40-135	1.28	0.991
13C-1,2,3,4,6,7,8-HpCDD	2500	1607.613	64		40-135	1.06	1.068
13C-OCDD	5000	2363.506	47		40-135	0.91	1.146
13C-2,3,7,8-TCDF	1000	716.740	72		40-135	0.80	0.979
13C-1,2,3,7,8-PeCDF	1000	795.002	80		40-135	1.61	1.142
13C-1,2,3,4,7,8-HxCDF	2500	1740.121	70		40-135	0.52	0.970
13C-1,2,3,4,6,7,8-HpCDF	2500	1495.805	60		40-135	0.45	1.045
37Cl-2,3,7,8-TCDD	800	814.462	102		40-135	NA	1.010

Comments: _____

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: Pacific EcoRisk Laboratories
Project: USACE San Rafael Channel/16087
Sample Matrix: Sediment
Sample Name: Method Blank
Lab Code: EQ1000340-01

Service Request: K1006356
Date Collected: NA
Date Received: NA
Units: ng/Kg
Basis: Dry

Polychlorinated Dibenzodioxins and Polychlorinated Dibenzofurans by HRGC/HRMS

Analytical Method: 8290
Prep Method: Method
Sample Amount: 10.000g
Data File Name: P208658
ICAL Date: 08/01/08

Date Analyzed: 7/16/10 1803
Date Extracted: 7/8/10
Instrument Name: E-HRMS-04
GC Column: DB-5
Blank File Name: P208658
Cal Ver. File Name: P208656

Analyte Name	Result	Q	EDL	MRL	Ion Ratio	RRT	Dilution Factor
2,3,7,8-TCDD	ND	U	0.0535	1.00			1
1,2,3,7,8-PeCDD	ND	U	0.0504	2.50			1
1,2,3,4,7,8-HxCDD	ND	U	0.0256	2.50			1
1,2,3,6,7,8-HxCDD	ND	U	0.0242	2.50			1
1,2,3,7,8,9-HxCDD	ND	U	0.0255	2.50			1
1,2,3,4,6,7,8-HpCDD	0.0926	JK	0.0302	2.50	1.57	1.001	1
OCDD	0.375	J	0.0597	5.00	0.77	1.000	1
2,3,7,8-TCDF	ND	U	0.0388	1.00			1
1,2,3,7,8-PeCDF	ND	U	0.0312	2.50			1
2,3,4,7,8-PeCDF	ND	U	0.0300	2.50			1
1,2,3,4,7,8-HxCDF	ND	U	0.0229	2.50			1
1,2,3,6,7,8-HxCDF	ND	U	0.0220	2.50			1
1,2,3,7,8,9-HxCDF	ND	U	0.0279	2.50			1
2,3,4,6,7,8-HxCDF	ND	U	0.0237	2.50			1
1,2,3,4,6,7,8-HpCDF	ND	U	0.0238	2.50			1
1,2,3,4,7,8,9-HpCDF	ND	U	0.0313	2.50			1
OCDF	ND	U	0.0474	5.00			1
Total Tetra-Dioxins	ND	U	0.0535	1.00			1
Total Penta-Dioxins	ND	U	0.0504	2.50			1
Total Hexa-Dioxins	ND	U	0.0242	2.50			1
Total Hepta-Dioxins	ND	U	0.0302	2.50			1
Total Tetra-Furans	ND	U	0.0388	1.00			1
Total Penta-Furans	ND	U	0.0300	2.50			1
Total Hexa-Furans	ND	U	0.0220	2.50			1
Total Hepta-Furans	ND	U	0.0238	2.50			1

Comments: _____

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: Pacific EcoRisk Laboratories
Project: USACE San Rafael Channel/16087
Sample Matrix: Sediment
Sample Name: Method Blank
Lab Code: EQ1000340-01

Service Request: K1006356
Date Collected: NA
Date Received: NA
Units: Percent
Basis: Dry

Polychlorinated Dibenzodioxins and Polychlorinated Dibenzofurans by HRGC/HRMS

Analytical Method: 8290
Prep Method: Method
Sample Amount: 10.000g
Data File Name: P208658
ICAL Date: 08/01/08

Date Analyzed: 7/16/10 1803
Date Extracted: 7/8/10
Instrument Name: E-HRMS-04
GC Column: DB-5
Blank File Name: P208658
Cal Ver. File Name: P208656

Labeled Compounds	Spike Conc.(pg)	Conc. Found (pg)	%Rec	Q	Control Limits	Ion Ratio	RRT
13C-2,3,7,8-TCDD	1000	672.048	67		40-135	0.77	1.009
13C-1,2,3,7,8-PeCDD	1000	686.581	69		40-135	1.56	1.168
13C-1,2,3,6,7,8-HxCDD	2500	1647.296	66		40-135	1.26	0.992
13C-1,2,3,4,6,7,8-HpCDD	2500	1396.904	56		40-135	1.05	1.068
13C-OCDD	5000	1744.035	35	Y	40-135	0.91	1.148
13C-2,3,7,8-TCDF	1000	608.785	61		40-135	0.77	0.980
13C-1,2,3,7,8-PeCDF	1000	739.405	74		40-135	1.58	1.130
13C-1,2,3,4,7,8-HxCDF	2500	1616.719	65		40-135	0.53	0.971
13C-1,2,3,4,6,7,8-HpCDF	2500	1382.723	55		40-135	0.44	1.044
37Cl-2,3,7,8-TCDD	800	636.934	80		40-135	NA	1.009

Comments: _____

Accuracy and Precision

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COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Pacific EcoRisk Laboratories
Project: USACE San Rafael Channel/16087
Sample Matrix: Sediment

Service Request: K1006356
Date Analyzed: 7/13/10

Lab Control Sample Summary
Polychlorinated Dibenzodioxins and Polychlorinated Dibenzofurans by HRGC/HRMS

Analytical Method: 8290
Prep Method: Method

Units: ng/Kg

Basis: Dry

Extraction Lot: 113950

Analyte Name	Lab Control Sample EQ1000320-02			Duplicate Lab Control Sample EQ1000320-03			% Rec Limits	RPD	RPD Limit
	Result	Expected	% Rec	Result	Expected	% Rec			
2,3,7,8-TCDD	19.9	20.0	99	19.1	20.0	96	74 - 127	3	18
1,2,3,7,8-PeCDD	52.2	50.0	104	51.8	50.0	104	73 - 122	0	14
1,2,3,4,7,8-HxCDD	39.2	50.0	78	42.3	50.0	85	60 - 153	9	26
1,2,3,6,7,8-HxCDD	51.3	50.0	103	48.6	50.0	97	72 - 126	6	16
1,2,3,7,8,9-HxCDD	46.1	50.0	92	44.6	50.0	89	59 - 140	3	32
1,2,3,4,6,7,8-HpCDD	49.1	50.0	98	49.0	50.0	98	66 - 132	0	19
OCDD	94.8	100	95	95.0	100	95	73 - 140	0	28
2,3,7,8-TCDF	20.8	20.0	104	21.0	20.0	105	66 - 129	1	18
1,2,3,7,8-PeCDF	47.4	50.0	95	46.1	50.0	92	70 - 123	3	14
2,3,4,7,8-PeCDF	45.7	50.0	91	44.8	50.0	90	69 - 122	1	17
1,2,3,4,7,8-HxCDF	43.8	50.0	88	43.2	50.0	86	71 - 121	2	15
1,2,3,6,7,8-HxCDF	50.0	50.0	100	51.3	50.0	103	70 - 130	3	14
1,2,3,7,8,9-HxCDF	44.7	50.0	89	44.8	50.0	90	53 - 130	1	28
2,3,4,6,7,8-HxCDF	45.8	50.0	92	46.4	50.0	93	66 - 126	1	22
1,2,3,4,6,7,8-HpCDF	47.1	50.0	94	46.8	50.0	94	66 - 122	0	17
1,2,3,4,7,8,9-HpCDF	52.5	50.0	105	52.9	50.0	106	69 - 136	1	21
OCDF	104	100	104	105	100	105	66 - 146	1	24

Comments: _____

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Pacific EcoRisk Laboratories
Project: USACE San Rafael Channel/16087
Sample Matrix: Sediment

Service Request: K1006356
Date Analyzed: 7/12/10

Lab Control Sample Summary
Polychlorinated Dibenzodioxins and Polychlorinated Dibenzofurans by HRGC/HRMS

Analytical Method: 8290
Prep Method: Method

Units: ng/Kg

Basis: Dry

Extraction Lot: 114258

Analyte Name	Lab Control Sample EQ1000323-02			Duplicate Lab Control Sample EQ1000323-03			% Rec Limits	RPD	RPD Limit
	Result	Expected	% Rec	Result	Expected	% Rec			
2,3,7,8-TCDD	19.5	20.0	98	19.8	20.0	99	74 - 127	1	18
1,2,3,7,8-PeCDD	52.4	50.0	105	52.6	50.0	105	73 - 122	0	14
1,2,3,4,7,8-HxCDD	44.9	50.0	90	44.6	50.0	89	60 - 153	1	26
1,2,3,6,7,8-HxCDD	45.4	50.0	91	46.8	50.0	94	72 - 126	3	16
1,2,3,7,8,9-HxCDD	43.6	50.0	87	42.9	50.0	86	59 - 140	1	32
1,2,3,4,6,7,8-HpCDD	49.2	50.0	98	48.7	50.0	97	66 - 132	1	19
OCDD	94.7	100	95	94.7	100	95	73 - 140	0	28
2,3,7,8-TCDF	20.9	20.0	105	21.0	20.0	105	66 - 129	0	18
1,2,3,7,8-PeCDF	47.3	50.0	95	47.8	50.0	96	70 - 123	1	14
2,3,4,7,8-PeCDF	49.1	50.0	98	49.7	50.0	99	69 - 122	1	17
1,2,3,4,7,8-HxCDF	48.0	50.0	96	47.5	50.0	95	71 - 121	1	15
1,2,3,6,7,8-HxCDF	50.2	50.0	100	51.5	50.0	103	70 - 130	3	14
1,2,3,7,8,9-HxCDF	49.5	50.0	99	47.2	50.0	94	53 - 130	5	28
2,3,4,6,7,8-HxCDF	49.5	50.0	99	49.1	50.0	98	66 - 126	1	22
1,2,3,4,6,7,8-HpCDF	48.7	50.0	97	48.4	50.0	97	66 - 122	0	17
1,2,3,4,7,8,9-HpCDF	51.3	50.0	103	50.5	50.0	101	69 - 136	2	21
OCDF	97.7	100	98	93.0	100	93	66 - 146	5	24

Comments: _____

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Pacific EcoRisk Laboratories
Project: USACE San Rafael Channel/16087
Sample Matrix: Sediment

Service Request: K1006356
Date Analyzed: 7/17/10

Lab Control Sample Summary
Polychlorinated Dibenzodioxins and Polychlorinated Dibenzofurans by HRGC/HRMS

Analytical Method: 8290
Prep Method: Method

Units: ng/Kg
Basis: Dry

Extraction Lot: 114850

Analyte Name	Lab Control Sample EQ1000340-02			Duplicate Lab Control Sample EQ1000340-03			% Rec Limits	RPD	RPD Limit
	Result	Expected	% Rec	Result	Expected	% Rec			
2,3,7,8-TCDD	19.6	20.0	98	18.5	20.0	93	74 - 127	5	18
1,2,3,7,8-PeCDD	52.3	50.0	105	51.1	50.0	102	73 - 122	3	14
1,2,3,4,7,8-HxCDD	47.1	50.0	94	42.1	50.0	84	60 - 153	11	26
1,2,3,6,7,8-HxCDD	49.5	50.0	99	49.2	50.0	98	72 - 126	1	16
1,2,3,7,8,9-HxCDD	44.9	50.0	90	41.7	50.0	83	59 - 140	8	32
1,2,3,4,6,7,8-HpCDD	50.0	50.0	100	48.9	50.0	98	66 - 132	2	19
OCDD	95.7	100	96	92.6	100	93	73 - 140	3	28
2,3,7,8-TCDF	20.2	20.0	101	19.9	20.0	100	66 - 129	1	18
1,2,3,7,8-PeCDF	46.7	50.0	93	45.5	50.0	91	70 - 123	2	14
2,3,4,7,8-PeCDF	45.5	50.0	91	44.9	50.0	90	69 - 122	1	17
1,2,3,4,7,8-HxCDF	47.9	50.0	96	46.4	50.0	93	71 - 121	3	15
1,2,3,6,7,8-HxCDF	52.7	50.0	105	50.4	50.0	101	70 - 130	4	14
1,2,3,7,8,9-HxCDF	51.7	50.0	103	53.1	50.0	106	53 - 130	3	28
2,3,4,6,7,8-HxCDF	50.3	50.0	101	51.1	50.0	102	66 - 126	1	22
1,2,3,4,6,7,8-HpCDF	47.7	50.0	95	46.6	50.0	93	66 - 122	2	17
1,2,3,4,7,8,9-HpCDF	52.6	50.0	105	53.2	50.0	106	69 - 136	1	21
OCDF	110	100	110	111	100	111	66 - 146	1	24

Comments: _____

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: Pacific EcoRisk Laboratories
Project: USACE San Rafael Channel/16087
Sample Matrix: Sediment
Sample Name: Lab Control Sample
Lab Code: EQ1000320-02

Service Request: K1006356
Date Collected: NA
Date Received: NA
Units: ng/Kg
Basis: Dry

Polychlorinated Dibenzodioxins and Polychlorinated Dibenzofurans by HRGC/HRMS

Analytical Method: 8290
Prep Method: Method
Sample Amount: 10.000g
Data File Name: P208563
ICAL Date: 08/01/08

Date Analyzed: 7/13/10 0136
Date Extracted: 6/25/10
Instrument Name: E-HRMS-04
GC Column: DB-5
Blank File Name: P208554
Cal Ver. File Name: P208552

Analyte Name	Result	Q	EDL	MRL	Ion Ratio	RRT	Dilution Factor
2,3,7,8-TCDD	19.9		0.0444	1.00	0.76	1.000	1
1,2,3,7,8-PeCDD	52.2		0.0575	2.50	1.60	1.000	1
1,2,3,4,7,8-HxCDD	39.2		0.0423	2.50	1.26	0.999	1
1,2,3,6,7,8-HxCDD	51.3		0.0300	2.50	1.27	1.000	1
1,2,3,7,8,9-HxCDD	46.1		0.0342	2.50	1.18	1.009	1
1,2,3,4,6,7,8-HpCDD	49.1		0.0370	2.50	1.04	1.000	1
OCDD	94.8		0.0395	5.00	0.87	1.000	1
2,3,7,8-TCDF	20.8		0.0579	1.00	0.74	1.000	1
1,2,3,7,8-PeCDF	47.4		0.0421	2.50	1.51	1.001	1
2,3,4,7,8-PeCDF	45.7		0.0408	2.50	1.52	1.024	1
1,2,3,4,7,8-HxCDF	43.8		0.0191	2.50	1.15	1.000	1
1,2,3,6,7,8-HxCDF	50.0		0.0164	2.50	1.17	1.004	1
1,2,3,7,8,9-HxCDF	44.7		0.0221	2.50	1.15	1.038	1
2,3,4,6,7,8-HxCDF	45.8		0.0183	2.50	1.15	1.017	1
1,2,3,4,6,7,8-HpCDF	47.1		0.0661	2.50	0.97	1.000	1
1,2,3,4,7,8,9-HpCDF	52.5		0.0842	2.50	0.96	1.036	1
OCDF	104		0.0384	5.00	0.87	1.004	1
Total Tetra-Dioxins	19.9		0.0444	1.00	0.76		1
Total Penta-Dioxins	52.2		0.0575	2.50	1.60		1
Total Hexa-Dioxins	137		0.0300	2.50	1.26		1
Total Hepta-Dioxins	49.5		0.0370	2.50	1.02		1
Total Tetra-Furans	20.8		0.0579	1.00	0.74		1
Total Penta-Furans	93.0		0.0408	2.50	1.51		1
Total Hexa-Furans	184		0.0164	2.50	1.15		1
Total Hepta-Furans	99.6		0.0661	2.50	0.97		1

Comments: _____

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: Pacific EcoRisk Laboratories
Project: USACE San Rafael Channel/16087
Sample Matrix: Sediment

Sample Name: Lab Control Sample
Lab Code: EQ1000320-02

Service Request: K1006356
Date Collected: NA
Date Received: NA

Units: Percent
Basis: Dry

Polychlorinated Dibenzodioxins and Polychlorinated Dibenzofurans by HRGC/HRMS

Analytical Method: 8290
Prep Method: Method
Sample Amount: 10.000g

Data File Name: P208563
ICAL Date: 08/01/08

Date Analyzed: 7/13/10 0136
Date Extracted: 6/25/10
Instrument Name: E-HRMS-04
GC Column: DB-5
Blank File Name: P208554
Cal Ver. File Name: P208552

Labeled Compounds	Spike Conc.(pg)	Conc. Found (pg)	%Rec	Q	Control Limits	Ion Ratio	RRT
13C-2,3,7,8-TCDD	1000	667.498	67		40-135	0.75	1.009
13C-1,2,3,7,8-PeCDD	1000	628.897	63		40-135	1.61	1.168
13C-1,2,3,6,7,8-HxCDD	2500	1647.546	66		40-135	1.26	0.992
13C-1,2,3,4,6,7,8-HpCDD	2500	1596.181	64		40-135	1.06	1.068
13C-OCDD	5000	2612.044	52		40-135	0.91	1.148
13C-2,3,7,8-TCDF	1000	612.520	61		40-135	0.78	0.983
13C-1,2,3,7,8-PeCDF	1000	719.136	72		40-135	1.59	1.130
13C-1,2,3,4,7,8-HxCDF	2500	1603.537	64		40-135	0.51	0.971
13C-1,2,3,4,6,7,8-HpCDF	2500	1501.240	60		40-135	0.43	1.044
37Cl-2,3,7,8-TCDD	800	704.465	88		40-135	NA	1.009

Comments: _____

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: Pacific EcoRisk Laboratories
Project: USACE San Rafael Channel/16087
Sample Matrix: Sediment
Sample Name: Lab Control Sample
Lab Code: EQ1000323-02

Service Request: K1006356
Date Collected: NA
Date Received: NA
Units: ng/Kg
Basis: Dry

Polychlorinated Dibenzodioxins and Polychlorinated Dibenzofurans by HRGC/HRMS

Analytical Method: 8290
Prep Method: Method
Sample Amount: 10.000g
Data File Name: P109683
ICAL Date: 09/11/09

Date Analyzed: 7/12/10 0350
Date Extracted: 6/28/10
Instrument Name: E-HRMS-03
GC Column: DB-5
Blank File Name: P109648
Cal Ver. File Name: P109672

Analyte Name	Result	Q	EDL	MRL	Ion Ratio	RRT	Dilution Factor
2,3,7,8-TCDD	19.5		0.124	1.00	0.77	1.001	1
1,2,3,7,8-PeCDD	52.4		0.0975	2.50	1.57	1.000	1
1,2,3,4,7,8-HxCDD	44.9		0.0684	2.50	1.24	0.999	1
1,2,3,6,7,8-HxCDD	45.4		0.0531	2.50	1.26	1.000	1
1,2,3,7,8,9-HxCDD	43.6		0.0588	2.50	1.30	1.009	1
1,2,3,4,6,7,8-HpCDD	49.2		0.0991	2.50	1.06	1.000	1
OCDD	94.7		0.128	5.00	0.89	1.000	1
2,3,7,8-TCDF	20.9		0.145	1.00	0.79	1.001	1
1,2,3,7,8-PeCDF	47.3		0.0818	2.50	1.56	1.000	1
2,3,4,7,8-PeCDF	49.1		0.0790	2.50	1.55	1.025	1
1,2,3,4,7,8-HxCDF	48.0		0.0633	2.50	1.23	1.000	1
1,2,3,6,7,8-HxCDF	50.2		0.0574	2.50	1.25	1.004	1
1,2,3,7,8,9-HxCDF	49.5		0.0701	2.50	1.23	1.038	1
2,3,4,6,7,8-HxCDF	49.5		0.0626	2.50	1.22	1.018	1
1,2,3,4,6,7,8-HpCDF	48.7		0.0833	2.50	1.03	1.000	1
1,2,3,4,7,8,9-HpCDF	51.3		0.103	2.50	1.04	1.034	1
OCDF	97.7		0.135	5.00	0.90	1.004	1
Total Tetra-Dioxins	19.5		0.124	1.00	0.77		1
Total Penta-Dioxins	52.4		0.0975	2.50	1.57		1
Total Hexa-Dioxins	134		0.0531	2.50	1.24		1
Total Hepta-Dioxins	49.2		0.0991	2.50	1.06		1
Total Tetra-Furans	21.3		0.145	1.00	0.83		1
Total Penta-Furans	98.6		0.0790	2.50	1.37		1
Total Hexa-Furans	197		0.0574	2.50	1.23		1
Total Hepta-Furans	100		0.0833	2.50	1.03		1

Comments: _____

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: Pacific EcoRisk Laboratories
Project: USACE San Rafael Channel/16087
Sample Matrix: Sediment

Sample Name: Lab Control Sample
Lab Code: EQ1000323-02

Service Request: K1006356
Date Collected: NA
Date Received: NA

Units: Percent
Basis: Dry

Polychlorinated Dibenzodioxins and Polychlorinated Dibenzofurans by HRGC/HRMS

Analytical Method: 8290
Prep Method: Method
Sample Amount: 10.000g

Data File Name: P109683
ICAL Date: 09/11/09

Date Analyzed: 7/12/10 0350
Date Extracted: 6/28/10
Instrument Name: E-HRMS-03
GC Column: DB-5
Blank File Name: P109648
Cal Ver. File Name: P109672

Labeled Compounds	Spike Conc.(pg)	Conc. Found (pg)	%Rec	Q	Control Limits	Ion Ratio	RRT
13C-2,3,7,8-TCDD	1000	830.666	83		40-135	0.80	1.009
13C-1,2,3,7,8-PeCDD	1000	788.093	79		40-135	1.57	1.181
13C-1,2,3,6,7,8-HxCDD	2500	1821.713	73		40-135	1.26	0.992
13C-1,2,3,4,6,7,8-HpCDD	2500	1481.397	59		40-135	1.05	1.068
13C-OCDD	5000	2281.328	46		40-135	0.90	1.146
13C-2,3,7,8-TCDF	1000	712.560	71		40-135	0.79	0.979
13C-1,2,3,7,8-PeCDF	1000	792.777	79		40-135	1.59	1.141
13C-1,2,3,4,7,8-HxCDF	2500	1532.975	61		40-135	0.53	0.970
13C-1,2,3,4,6,7,8-HpCDF	2500	1362.127	54		40-135	0.45	1.045
37Cl-2,3,7,8-TCDD	800	816.249	102		40-135	NA	1.010

Comments: _____

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: Pacific EcoRisk Laboratories
Project: USACE San Rafael Channel/16087
Sample Matrix: Sediment
Sample Name: Lab Control Sample
Lab Code: EQ1000340-02

Service Request: K1006356
Date Collected: NA
Date Received: NA
Units: ng/Kg
Basis: Dry

Polychlorinated Dibenzodioxins and Polychlorinated Dibenzofurans by HRGC/HRMS

Analytical Method: 8290
Prep Method: Method
Sample Amount: 10.000g
Data File Name: P208667
ICAL Date: 08/01/08

Date Analyzed: 7/17/10 0120
Date Extracted: 7/8/10
Instrument Name: E-HRMS-04
GC Column: DB-5
Blank File Name: P208658
Cal Ver. File Name: P208656

Analyte Name	Result	Q	EDL	MRL	Ion Ratio	RRT	Dilution Factor
2,3,7,8-TCDD	19.6		0.0439	1.00	0.78	1.001	1
1,2,3,7,8-PeCDD	52.3		0.0477	2.50	1.54	1.000	1
1,2,3,4,7,8-HxCDD	47.1		0.0326	2.50	1.25	0.999	1
1,2,3,6,7,8-HxCDD	49.5		0.0312	2.50	1.26	1.000	1
1,2,3,7,8,9-HxCDD	44.9		0.0325	2.50	1.25	1.008	1
1,2,3,4,6,7,8-HpCDD	50.0		0.0310	2.50	1.04	1.000	1
OCDD	95.7		0.0517	5.00	0.90	1.000	1
2,3,7,8-TCDF	20.2		0.0402	1.00	0.80	1.001	1
1,2,3,7,8-PeCDF	46.7		0.0324	2.50	1.51	1.001	1
2,3,4,7,8-PeCDF	45.5		0.0312	2.50	1.52	1.024	1
1,2,3,4,7,8-HxCDF	47.9		0.0184	2.50	1.19	1.000	1
1,2,3,6,7,8-HxCDF	52.7		0.0177	2.50	1.20	1.003	1
1,2,3,7,8,9-HxCDF	51.7		0.0226	2.50	1.18	1.036	1
2,3,4,6,7,8-HxCDF	50.3		0.0191	2.50	1.17	1.017	1
1,2,3,4,6,7,8-HpCDF	47.7		0.0620	2.50	0.99	1.000	1
1,2,3,4,7,8,9-HpCDF	52.6		0.0816	2.50	0.99	1.034	1
OCDF	110		0.0664	5.00	0.87	1.004	1
Total Tetra-Dioxins	19.6		0.0439	1.00	0.80		1
Total Penta-Dioxins	52.3		0.0477	2.50	1.54		1
Total Hexa-Dioxins	141		0.0312	2.50	1.25		1
Total Hepta-Dioxins	50.5		0.0310	2.50	1.15		1
Total Tetra-Furans	20.2		0.0402	1.00	0.80		1
Total Penta-Furans	94.1		0.0312	2.50	1.69		1
Total Hexa-Furans	203		0.0177	2.50	1.19		1
Total Hepta-Furans	100		0.0620	2.50	0.99		1

Comments: _____

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: Pacific EcoRisk Laboratories
Project: USACE San Rafael Channel/16087
Sample Matrix: Sediment

Sample Name: Lab Control Sample
Lab Code: EQ1000340-02

Service Request: K1006356
Date Collected: NA
Date Received: NA

Units: Percent
Basis: Dry

Polychlorinated Dibenzodioxins and Polychlorinated Dibenzofurans by HRGC/HRMS

Analytical Method: 8290
Prep Method: Method
Sample Amount: 10.000g

Data File Name: P208667
ICAL Date: 08/01/08

Date Analyzed: 7/17/10 0120
Date Extracted: 7/8/10
Instrument Name: E-HRMS-04
GC Column: DB-5
Blank File Name: P208658
Cal Ver. File Name: P208656

Labeled Compounds	Spike Conc.(pg)	Conc. Found (pg)	%Rec	Q	Control Limits	Ion Ratio	RRT
13C-2,3,7,8-TCDD	1000	743.420	74		40-135	0.79	1.009
13C-1,2,3,7,8-PeCDD	1000	658.775	66		40-135	1.56	1.168
13C-1,2,3,6,7,8-HxCDD	2500	1764.231	71		40-135	1.28	0.992
13C-1,2,3,4,6,7,8-HpCDD	2500	1506.198	60		40-135	1.05	1.068
13C-OCDD	5000	1909.832	38	Y	40-135	0.91	1.148
13C-2,3,7,8-TCDF	1000	652.828	65		40-135	0.78	0.981
13C-1,2,3,7,8-PeCDF	1000	729.057	73		40-135	1.53	1.130
13C-1,2,3,4,7,8-HxCDF	2500	1643.241	66		40-135	0.53	0.971
13C-1,2,3,4,6,7,8-HpCDF	2500	1512.814	61		40-135	0.44	1.044
37Cl-2,3,7,8-TCDD	800	703.620	88		40-135	NA	1.009

Comments: _____

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: Pacific EcoRisk Laboratories
Project: USACE San Rafael Channel/16087
Sample Matrix: Sediment
Sample Name: Duplicate Lab Control Sample
Lab Code: EQ1000320-03

Service Request: K1006356
Date Collected: NA
Date Received: NA
Units: ng/Kg
Basis: Dry

Polychlorinated Dibenzodioxins and Polychlorinated Dibenzofurans by HRGC/HRMS

Analytical Method: 8290
Prep Method: Method
Sample Amount: 10.000g
Data File Name: P208564
ICAL Date: 08/01/08

Date Analyzed: 7/13/10 0225
Date Extracted: 6/25/10
Instrument Name: E-HRMS-04
GC Column: DB-5
Blank File Name: P208554
Cal Ver. File Name: P208552

Analyte Name	Result	Q	EDL	MRL	Ion Ratio	RRT	Dilution Factor
2,3,7,8-TCDD	19.1		0.0429	1.00	0.76	1.001	1
1,2,3,7,8-PeCDD	51.8		0.0474	2.50	1.56	1.000	1
1,2,3,4,7,8-HxCDD	42.3		0.0384	2.50	1.25	0.999	1
1,2,3,6,7,8-HxCDD	48.6		0.0273	2.50	1.28	1.000	1
1,2,3,7,8,9-HxCDD	44.6		0.0310	2.50	1.28	1.009	1
1,2,3,4,6,7,8-HpCDD	49.0		0.0310	2.50	1.04	1.000	1
OCDD	95.0		0.0395	5.00	0.89	1.000	1
2,3,7,8-TCDF	21.0		0.0540	1.00	0.71	1.001	1
1,2,3,7,8-PeCDF	46.1		0.0660	2.50	1.49	1.000	1
2,3,4,7,8-PeCDF	44.8		0.0640	2.50	1.51	1.024	1
1,2,3,4,7,8-HxCDF	43.2		0.0196	2.50	1.19	1.000	1
1,2,3,6,7,8-HxCDF	51.3		0.0168	2.50	1.16	1.004	1
1,2,3,7,8,9-HxCDF	44.8		0.0226	2.50	1.20	1.038	1
2,3,4,6,7,8-HxCDF	46.4		0.0187	2.50	1.18	1.017	1
1,2,3,4,6,7,8-HpCDF	46.8		0.140	2.50	0.97	1.000	1
1,2,3,4,7,8,9-HpCDF	52.9		0.179	2.50	0.97	1.036	1
OCDF	105		0.0463	5.00	0.87	1.004	1
Total Tetra-Dioxins	19.1		0.0429	1.00	0.76		1
Total Penta-Dioxins	51.8		0.0474	2.50	1.56		1
Total Hexa-Dioxins	135		0.0273	2.50	1.25		1
Total Hepta-Dioxins	49.0		0.0310	2.50	1.04		1
Total Tetra-Furans	21.0		0.0540	1.00	0.71		1
Total Penta-Furans	90.9		0.0640	2.50	1.49		1
Total Hexa-Furans	186		0.0168	2.50	1.19		1
Total Hepta-Furans	99.7		0.140	2.50	0.97		1

Comments: _____

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: Pacific EcoRisk Laboratories
Project: USACE San Rafael Channel/16087
Sample Matrix: Sediment
Sample Name: Duplicate Lab Control Sample
Lab Code: EQ1000320-03

Service Request: K1006356
Date Collected: NA
Date Received: NA
Units: Percent
Basis: Dry

Polychlorinated Dibenzodioxins and Polychlorinated Dibenzofurans by HRGC/HRMS

Analytical Method: 8290
Prep Method: Method
Sample Amount: 10.000g
Data File Name: P208564
ICAL Date: 08/01/08

Date Analyzed: 7/13/10 0225
Date Extracted: 6/25/10
Instrument Name: E-HRMS-04
GC Column: DB-5
Blank File Name: P208554
Cal Ver. File Name: P208552

Labeled Compounds	Spike Conc.(pg)	Conc. Found (pg)	%Rec	Q	Control Limits	Ion Ratio	RRT
13C-2,3,7,8-TCDD	1000	689.083	69		40-135	0.76	1.009
13C-1,2,3,7,8-PeCDD	1000	636.103	64		40-135	1.61	1.168
13C-1,2,3,6,7,8-HxCDD	2500	1749.978	70		40-135	1.25	0.991
13C-1,2,3,4,6,7,8-HpCDD	2500	1646.908	66		40-135	1.06	1.067
13C-OCDD	5000	2683.773	54		40-135	0.91	1.148
13C-2,3,7,8-TCDF	1000	622.839	62		40-135	0.76	0.983
13C-1,2,3,7,8-PeCDF	1000	736.914	74		40-135	1.56	1.131
13C-1,2,3,4,7,8-HxCDF	2500	1662.848	67		40-135	0.52	0.971
13C-1,2,3,4,6,7,8-HpCDF	2500	1557.765	62		40-135	0.44	1.043
37Cl-2,3,7,8-TCDD	800	739.094	92		40-135	NA	1.010

Comments: _____

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: Pacific EcoRisk Laboratories
Project: USACE San Rafael Channel/16087
Sample Matrix: Sediment
Sample Name: Duplicate Lab Control Sample
Lab Code: EQ1000323-03

Service Request: K1006356
Date Collected: NA
Date Received: NA
Units: ng/Kg
Basis: Dry

Polychlorinated Dibenzodioxins and Polychlorinated Dibenzofurans by HRGC/HRMS

Analytical Method: 8290
Prep Method: Method
Sample Amount: 10.000g
Data File Name: P109684
ICAL Date: 09/11/09

Date Analyzed: 7/12/10 0438
Date Extracted: 6/28/10
Instrument Name: E-HRMS-03
GC Column: DB-5
Blank File Name: P109648
Cal Ver. File Name: P109672

Analyte Name	Result	Q	EDL	MRL	Ion Ratio	RRT	Dilution Factor
2,3,7,8-TCDD	19.8		0.143	1.00	0.77	1.000	1
1,2,3,7,8-PeCDD	52.6		0.0901	2.50	1.56	1.000	1
1,2,3,4,7,8-HxCDD	44.6		0.0702	2.50	1.25	0.999	1
1,2,3,6,7,8-HxCDD	46.8		0.0546	2.50	1.27	1.000	1
1,2,3,7,8,9-HxCDD	42.9		0.0605	2.50	1.24	1.009	1
1,2,3,4,6,7,8-HpCDD	48.7		0.0535	2.50	1.05	1.000	1
OCDD	94.7		0.110	5.00	0.89	1.000	1
2,3,7,8-TCDF	21.0		0.156	1.00	0.73	1.001	1
1,2,3,7,8-PeCDF	47.8		0.0740	2.50	1.56	1.000	1
2,3,4,7,8-PeCDF	49.7		0.0714	2.50	1.55	1.025	1
1,2,3,4,7,8-HxCDF	47.5		0.0584	2.50	1.24	1.000	1
1,2,3,6,7,8-HxCDF	51.5		0.0529	2.50	1.22	1.004	1
1,2,3,7,8,9-HxCDF	47.2		0.0646	2.50	1.27	1.038	1
2,3,4,6,7,8-HxCDF	49.1		0.0577	2.50	1.21	1.018	1
1,2,3,4,6,7,8-HpCDF	48.4		0.0967	2.50	1.05	1.000	1
1,2,3,4,7,8,9-HpCDF	50.5		0.119	2.50	1.04	1.034	1
OCDF	93.0		0.0993	5.00	0.91	1.004	1
Total Tetra-Dioxins	19.8		0.143	1.00	0.77		1
Total Penta-Dioxins	52.6		0.0901	2.50	1.56		1
Total Hexa-Dioxins	134		0.0546	2.50	1.25		1
Total Hepta-Dioxins	48.7		0.0535	2.50	1.05		1
Total Tetra-Furans	21.2		0.156	1.00	0.73		1
Total Penta-Furans	99.8		0.0714	2.50	1.44		1
Total Hexa-Furans	195		0.0529	2.50	1.24		1
Total Hepta-Furans	98.9		0.0967	2.50	1.05		1

Comments: _____

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: Pacific EcoRisk Laboratories
Project: USACE San Rafael Channel/16087
Sample Matrix: Sediment

Sample Name: Duplicate Lab Control Sample
Lab Code: EQ1000323-03

Service Request: K1006356
Date Collected: NA
Date Received: NA

Units: Percent
Basis: Dry

Polychlorinated Dibenzodioxins and Polychlorinated Dibenzofurans by HRGC/HRMS

Analytical Method: 8290
Prep Method: Method
Sample Amount: 10.000g

Data File Name: P109684
ICAL Date: 09/11/09

Date Analyzed: 7/12/10 0438
Date Extracted: 6/28/10
Instrument Name: E-HRMS-03
GC Column: DB-5
Blank File Name: P109648
Cal Ver. File Name: P109672

Labeled Compounds	Spike Conc.(pg)	Conc. Found (pg)	%Rec	Q	Control Limits	Ion Ratio	RRT
13C-2,3,7,8-TCDD	1000	680.175	68		40-135	0.79	1.010
13C-1,2,3,7,8-PeCDD	1000	773.573	77		40-135	1.58	1.182
13C-1,2,3,6,7,8-HxCDD	2500	1724.141	69		40-135	1.25	0.991
13C-1,2,3,4,6,7,8-HpCDD	2500	1455.050	58		40-135	1.06	1.068
13C-OCDD	5000	2212.451	44		40-135	0.90	1.146
13C-2,3,7,8-TCDF	1000	587.220	59		40-135	0.77	0.979
13C-1,2,3,7,8-PeCDF	1000	746.946	75		40-135	1.55	1.141
13C-1,2,3,4,7,8-HxCDF	2500	1502.243	60		40-135	0.53	0.970
13C-1,2,3,4,6,7,8-HpCDF	2500	1308.275	52		40-135	0.45	1.044
37Cl-2,3,7,8-TCDD	800	677.372	85		40-135	NA	1.010

Comments: _____

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: Pacific EcoRisk Laboratories
Project: USACE San Rafael Channel/16087
Sample Matrix: Sediment
Sample Name: Duplicate Lab Control Sample
Lab Code: EQ1000340-03

Service Request: K1006356
Date Collected: NA
Date Received: NA
Units: ng/Kg
Basis: Dry

Polychlorinated Dibenzodioxins and Polychlorinated Dibenzofurans by HRGC/HRMS

Analytical Method: 8290
Prep Method: Method
Sample Amount: 10.000g
Data File Name: P208668
ICAL Date: 08/01/08

Date Analyzed: 7/17/10 0209
Date Extracted: 7/8/10
Instrument Name: E-HRMS-04
GC Column: DB-5
Blank File Name: P208658
Cal Ver. File Name: P208656

Analyte Name	Result	Q	EDL	MRL	Ion Ratio	RRT	Dilution Factor
2,3,7,8-TCDD	18.5		0.0398	1.00	0.77	1.001	1
1,2,3,7,8-PeCDD	51.1		0.0488	2.50	1.54	1.001	1
1,2,3,4,7,8-HxCDD	42.1		0.0224	2.50	1.40	0.998	1
1,2,3,6,7,8-HxCDD	49.2		0.0213	2.50	1.14	1.000	1
1,2,3,7,8,9-HxCDD	41.7		0.0223	2.50	1.21	1.008	1
1,2,3,4,6,7,8-HpCDD	48.9		0.0286	2.50	1.05	1.000	1
OCDD	92.6		0.0589	5.00	0.89	1.000	1
2,3,7,8-TCDF	19.9		0.0517	1.00	0.75	1.001	1
1,2,3,7,8-PeCDF	45.5		0.0266	2.50	1.49	1.000	1
2,3,4,7,8-PeCDF	44.9		0.0255	2.50	1.51	1.023	1
1,2,3,4,7,8-HxCDF	46.4		0.0244	2.50	1.21	1.000	1
1,2,3,6,7,8-HxCDF	50.4		0.0235	2.50	1.19	1.003	1
1,2,3,7,8,9-HxCDF	53.1		0.0297	2.50	1.18	1.036	1
2,3,4,6,7,8-HxCDF	51.1		0.0252	2.50	1.19	1.017	1
1,2,3,4,6,7,8-HpCDF	46.6		0.0476	2.50	0.99	1.000	1
1,2,3,4,7,8,9-HpCDF	53.2		0.0626	2.50	0.98	1.034	1
OCDF	111		0.0703	5.00	0.87	1.004	1
Total Tetra-Dioxins	18.6		0.0398	1.00	0.77		1
Total Penta-Dioxins	51.3		0.0488	2.50	1.54		1
Total Hexa-Dioxins	133		0.0213	2.50	1.40		1
Total Hepta-Dioxins	49.3		0.0286	2.50	1.06		1
Total Tetra-Furans	20.0		0.0517	1.00	0.88		1
Total Penta-Furans	92.1		0.0255	2.50	1.49		1
Total Hexa-Furans	201		0.0235	2.50	1.21		1
Total Hepta-Furans	99.8		0.0476	2.50	0.99		1

Comments: _____

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: Pacific EcoRisk Laboratories
Project: USACE San Rafael Channel/16087
Sample Matrix: Sediment
Sample Name: Duplicate Lab Control Sample
Lab Code: EQ1000340-03

Service Request: K1006356
Date Collected: NA
Date Received: NA
Units: Percent
Basis: Dry

Polychlorinated Dibenzodioxins and Polychlorinated Dibenzofurans by HRGC/HRMS

Analytical Method: 8290
Prep Method: Method
Sample Amount: 10.000g
Data File Name: P208668
ICAL Date: 08/01/08

Date Analyzed: 7/17/10 0209
Date Extracted: 7/8/10
Instrument Name: E-HRMS-04
GC Column: DB-5
Blank File Name: P208658
Cal Ver. File Name: P208656

Labeled Compounds	Spike Conc.(pg)	Conc. Found (pg)	%Rec	Q	Control Limits	Ion Ratio	RRT
13C-2,3,7,8-TCDD	1000	757.168	76		40-135	0.79	1.008
13C-1,2,3,7,8-PeCDD	1000	679.783	68		40-135	1.57	1.167
13C-1,2,3,6,7,8-HxCDD	2500	1822.545	73		40-135	1.25	0.992
13C-1,2,3,4,6,7,8-HpCDD	2500	1416.448	57		40-135	1.06	1.068
13C-OCDD	5000	1707.522	34	Y	40-135	0.90	1.148
13C-2,3,7,8-TCDF	1000	664.112	66		40-135	0.75	0.980
13C-1,2,3,7,8-PeCDF	1000	738.431	74		40-135	1.56	1.130
13C-1,2,3,4,7,8-HxCDF	2500	1618.962	65		40-135	0.52	0.972
13C-1,2,3,4,6,7,8-HpCDF	2500	1407.768	56		40-135	0.44	1.044
37Cl-2,3,7,8-TCDD	800	695.624	87		40-135	NA	1.009

Comments: _____



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CAS Contact: Pradeep Divvela

Project Name: USACE San Rafael Channel
Project Number: 16087
Project Manager: Jeffrey Cotsifas
Company: Pacific EcoRisk Laboratories

PCDD PCDF
8290

Lab Code	Client Sample ID	# of Cont.	Matrix	Sample Date	Sample Time	Date Received	Send To	
K1006356-021	SRC-2010-8-Z-Comp	1	Sediment	6/10/10	1155	6/23/10	HOUSTON	II

Test Comments

PCDD PCDF - 8290

K1006356-001,2,3,4,5,6,7,8,21

Analyte list attached

Folder Comments:

WATCH HOLD TIMES! Samples received Frozen

Special Instructions/Comments Please provide the electronic (PDF and EDD) report to the following e-mail address: kelso_data@caslab.com	Turnaround Requirements <input type="checkbox"/> RUSH (Surcharges Apply) PLEASE CIRCLE WORK DAYS 1 2 3 4 5 <input checked="" type="checkbox"/> STANDARD Requested FAX Date: _____ Requested Report Date: <u>07/06/10</u>	Report Requirements <input type="checkbox"/> I. Results Only <input checked="" type="checkbox"/> II. Results + QC Summaries <input type="checkbox"/> III. Results + QC and Calibration Summaries <input type="checkbox"/> IV. Data Validation Report with Raw Data PQL/MDL/J <input checked="" type="checkbox"/> Y EDD	Invoice Information PO# K1006356 Bill to

Relinquished By: John Jones 7/2/10 1130

Received By: [Signature]

420

Invoice Number: 1297365944467

00C

bubble wrap

2 seals front

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CAS Contact: Pradeep Divvela

Project Name: USACE San Rafael Channel
Project Number: 16087
Project Manager: Jeffrey Cotsifas
Company: Pacific EcoRisk Laboratories

PCDD PCDF
8290

Lab Code	Client Sample ID	# of Cont.	Matrix	Sample Date	Time	Date Received	Send To	
K1006356-001	SRC-2010-1-Comp		Sediment	6/8/10	0920	6/18/10	HOUSTON	V
K1006356-002	SRC-2010-2-Comp		Sediment	6/9/10	0800	6/18/10	HOUSTON	V
K1006356-003	SRC-2010-3-Comp		Sediment	6/9/10	1105	6/18/10	HOUSTON	V
K1006356-004	SRC-2010-4-Comp		Sediment	6/11/10	0840	6/18/10	HOUSTON	V
K1006356-005	SRC-2010-5-Comp		Sediment	6/8/10	1335	6/18/10	HOUSTON	V
K1006356-006	SRC-2010-6-Comp		Sediment	6/9/10	1530	6/18/10	HOUSTON	V
K1006356-007	SRC-2010-7-Comp		Sediment	6/10/10	0900	6/18/10	HOUSTON	V
K1006356-008	SRC-2010-8-Z-Comp		Sediment	6/10/10	1155	6/18/10	HOUSTON	V

Test Comments

PCDD PCDF - 8290

K1006356-001,2,3,4,5,6,7,8

Analyte list attached

Folder Comments:

WATCH HOLD TIMES!

Special Instructions/Comments Please provide the electronic (PDF and EDD) report to the following e-mail address: kelso_data@caslab.com	Turnaround Requirements _____ RUSH (Surcharges Apply) PLEASE CIRCLE WORK DAYS 1 2 3 4 5 ✓ STANDARD Requested FAX Date: _____ Requested Report Date: <u>07/05/10</u>	Report Requirements _____ I. Results Only ✓ _____ II. Results + QC Summaries _____ III. Results + QC and Calibration Summaries _____ IV. Data Validation Report with Raw Data PQL/MDL/J <u>Y</u> EDD	Invoice Information PO# K1006356 Bill to

Relinquished By:

Received By:

Airbill Number:

10-07AC00
10-29A(R)
6-23-10
421
2 FRONT CUSTODY SEALS 0°C
BLUE ICE/0, WRAP
TR# 1Z9736590148682656

Columbia Analytical Services, Inc.
Cooler Receipt Form

Client/Project: Pacific EcoRisk Laboratories/ USACE San Rafael Service Request: K1006356

Received: 6/23/10; 1007 Opened (Date/Time): 6/23/10; 1029 By: CD for EB

1. Samples were received via? ☐ *US Mail* ☐ *Fedex* ☒ *UPS* ☐ *DHL* ☐ *Courier* ☐ *Hand Delivered*
2. Samples were received in: (circle) ☒ *Cooler* ☐ *Box* ☐ *Other* _____ ☐ *NA*
3. Were custody seals present on coolers? ☒ *Y* ☐ *N* If yes, how many and where? 2-front
If present, were custody seals intact? ☒ *Y* ☐ *N* If present, were they signed and dated? ☒ *Y* ☐ *N*
4. Is shipper's air-bill filed? ☐ *NA* ☐ *Y* ☒ *N* If not, record air bill number: 1Z9736590148682656
5. Temperature of cooler(s) upon receipt (°C): 0
6. If applicable, list Chain of Custody numbers: _____
7. Were custody papers properly filled out (ink, signed, etc.)? ☐ *NA* ☒ *Y* ☐ *N*
8. Packing material used: ☐ *Inserts* ☒ *Bubble Wrap* ☒ *Blue Ice* ☐ *Wet Ice* ☐ *Sleeves* ☐ *Other* _____
9. Were the correct types of bottles used for the tests indicated? ☒ *Y* ☐ *N*
Did all bottles arrive in good condition (i.e. unbroken, out of temp.)? *Indicate in the table below.* ☒ *Y* ☐ *N*

Sample ID	Bottle Count	Bottle Type	Out of Temp	Broken	Initials
			<input type="checkbox"/>	<input type="checkbox"/>	
			<input type="checkbox"/>	<input type="checkbox"/>	
			<input type="checkbox"/>	<input type="checkbox"/>	
			<input type="checkbox"/>	<input type="checkbox"/>	
			<input type="checkbox"/>	<input type="checkbox"/>	
			<input type="checkbox"/>	<input type="checkbox"/>	
			<input type="checkbox"/>	<input type="checkbox"/>	

10. Were all bottle labels complete (i.e. analysis, ID, etc.)? ☒ *Y* ☐ *N*
Did all bottle labels and tags agree with custody papers? *Indicate in the table below.* ☒ *Y* ☐ *N*

Sample ID on Bottle	Sample ID on COC	Sample ID on Bottle	Sample ID on COC

11. Additional notes, discrepancies, and resolutions:

Sample Acceptance Policy

Custody Seals (desirable, mandatory if specified in SAP):

- ✓ On outside of cooler
- ✓ Seals intact, signed and dated

Chain-of-Custody documentation (mandatory):

- ✓ Properly filled out in ink & signed by the client
- ✓ Sign and date the coc for CAS/HOU upon cooler receipt
- ✓ Coc must list method number
- ✓ If no coc was submitted with the samples, complete a CAS/HOU coc for the client

Sample Integrity (mandatory):

- ✓ Sample containers must arrive in good condition (not broken or leaking)
- ✓ Sample IDs on the bottles must match the sample IDs on the coc
- ✓ The correct type of sample bottle must be used for the method requested
- ✓ The correct number of sample containers received must agree with the documentation on the coc
- ✓ The correct sample matrix must appear on the coc
- ✓ An appropriate sample volume or weight must be received

Temperature Preservatives (varies by sample matrix):

- ✓ Aqueous and Non-aqueous samples must be shipped and stored cold, at 0 to 6°C
- ✓ Tissue samples must be shipped and stored frozen, at -20 to -10°C
- ✓ Air samples can be shipped and stored at ambient temperature, ~23°C
- ✓ The sample temperature must be recorded on the coc
- ✓ Notify a Project Chemist if any samples are outside the acceptance temperature or have compromised sample integrity – the client must decide re: replacement sample submittal or continue with the analysis

Cooler Receipt Form, CRF (mandatory):

- ✓ Cooler receipt forms must be completed for each coc & SR#
- ✓ Sample integrity issues must be documented on the CRF
- ✓ A scan of the carrier and the airbill number must be recorded in CAS LIMS

Sample Integrity Issues/Resolutions (mandatory):

- ✓ Sample integrity issues are documented on the CRF and given to the Project Chemist for resolution with the client
- ✓ Client resolution is documented in writing (typically email or on the CRF) and filed in the project folder(s)

Service Request Summary

Folder #: K1006356
Client Name: Pacific EcoRisk Laboratories
Project Name: USACE San Rafael Channel
Project Number: 16087
Report To: Jeffrey Cotsifas
 Pacific EcoRisk Laboratories
 2250 Cordelia Road
 Fairfield, CA 94534
Phone Number: 707-207-7760
Cell Number:
Fax Number: 707-207-7916
E-mail: cotsifas@pacificecorisk.com

Project Chemist: Darren Biles
Originating Lab: KELSO
Logged By: FADAIR
Date Received: 6/18 - 6/23/10
Internal Due Date: 7/6/10
QAP: LAB QAP
Qualifier Set: CAS Standard
Formset: CAS Standard
Merged?: N,Y
Report to MDL?: Y
P.O. Number:
EDD: BASIC_WQC

37 _ 16 oz-Glass Jar WM CLEAR Teflon Liner Unpreserved
 16 _ 1 each-Plastic Bag Ziplock Unpreserved
 14 _ 2 oz-Glass Jar WM CLEAR Teflon Liner 4-deg C

Location: K-Delilah-51, K-PETUNIA-10,
 E-WIC02-Box106, E-WIC-02-Box168

RUSH

CAS Samp No	Client Samp No.	Matrix	Collected	KELSO			KELSO					KELSO		
				9060M/ TOC	PSEP PS/ PSEP PartSizeCB	Subsample/ Sub Sample	6010B/ Metals T	6020/ Metals T	6020/ Sb Ag T	7471A/ Hg	7742/ Se T	8015B/ DRO_RRO	8081A/ PEST_OC_LL	8082/ PCB_LL
K1006356-001	SRC-2010-1-Comp	Sediment	6/8/10 0920	V	V	V	V	V	V	V	V	V	V	V
K1006356-002	SRC-2010-2-Comp	Sediment	6/9/10 0800	V	V	V	V	V	V	V	V	V	V	V
K1006356-003	SRC-2010-3-Comp	Sediment	6/9/10 1105	V	V	V	V	V	V	V	V	V	V	V
K1006356-004	SRC-2010-4-Comp	Sediment	6/11/10 0840	V	V	V	V	V	V	V	V	V	V	V
K1006356-005	SRC-2010-5-Comp	Sediment	6/8/10 1335	V	V	V	V	V	V	V	V	V	V	V
K1006356-006	SRC-2010-6-Comp	Sediment	6/9/10 1530	V	V	V	V	V	V	V	V	V	V	V
K1006356-007	SRC-2010-7-Comp	Sediment	6/10/10 0900	V	V	V	V	V	V	V	V	V	V	V
K1006356-008	SRC-2010-7-Z-Comp	Sediment	6/10/10 1155	V	V	V	V	V	V	V	V	V	V	V
K1006356-009	SRC-2010-1-B-Comp	Sediment	6/8/10 0920	V	V			V	V	V	V		V	V
K1006356-010	SRC-2010-2-B-Comp	Sediment	6/9/10 0800	V	V			V	V	V	V		V	V
K1006356-011	SRC-2010-3-B-Comp	Sediment	6/9/10 1105	V	V			V	V	V	V		V	V
K1006356-012	SRC-2010-4-B-Comp	Sediment	6/11/10 0840	V	V			V	V	V	V		V	V
K1006356-013	SRC-2010-5-B-Comp	Sediment	6/8/10 1335	V	V			V	V	V	V		V	V
K1006356-014	SRC-2010-6-B-Comp	Sediment	6/9/10 1530	V	V			V	V	V	V		V	V
K1006356-015	SRC-2010-7-B-Comp	Sediment	6/10/10 0900	V	V			V	V	V	V		V	V
K1006356-016	SRC-2010-7-1	Sediment	6/10/10 0900	V	V		V	V	V	V	V	V	V	V
K1006356-017	SRC-2010-7-2	Sediment	6/10/10 0940	V	V		V	V	V	V	V	V	V	V
K1006356-018	SRC-2010-7-3	Sediment	6/10/10 1010	V	V		V	V	V	V	V	V	V	V
K1006356-019	SRC-2010-7-4	Sediment	6/10/10 1035	V	V		V	V	V	V	V	V	V	V
K1006356-020	SRC-2010-7-5	Sediment	6/10/10 1100	V	V		V	V	V	V	V	V	V	V
K1006356-021	SRC-2010-8-Z-Comp	Sediment	6/10/10 1155	V	V	V	V	V	V	V	V	V	V	V

CAS Samp No.	Client Samp No.	Matrix	Collected	KELSO		KELSO		KELSO		KELSO	KELSO	SVM
				8151A/ HERB	Butyltins/ BUTYL TINS	8270C SIM/ PAH_SIM	8270C/ SVO_LL	Archive/ Archive -20C	Archive/ Archive 4C	TS-MET/ Total Solids	8015B/ VOC_GRO	8290/ PCDD PCDF
K1006356-001	SRC-2010-1-Comp	Sediment	6/8/10 0920	V	V	V	V	V	V	V	V	II
K1006356-002	SRC-2010-2-Comp	Sediment	6/9/10 0800	V	V	V	V	V	V	V	V	II
K1006356-003	SRC-2010-3-Comp	Sediment	6/9/10 1105	V	V	V	V	V	V	V	V	II
K1006356-004	SRC-2010-4-Comp	Sediment	6/11/10 0840	V	V	V	V	V	V	V	V	II
K1006356-005	SRC-2010-5-Comp	Sediment	6/8/10 1335	V	V	V	V	V	V	V	V	II
K1006356-006	SRC-2010-6-Comp	Sediment	6/9/10 1530	V	V	V	V	V	V	V	V	II
K1006356-007	SRC-2010-7-Comp	Sediment	6/10/10 0900	V	V	V	V	V	V	V	V	II
K1006356-008	SRC-2010-7-Z-Comp	Sediment	6/10/10 1155	V	V	V	V	V	V	V	V	II
K1006356-009	SRC-2010-1-B-Comp	Sediment	6/8/10 0920		V	V		V	V	V		
K1006356-010	SRC-2010-2-B-Comp	Sediment	6/9/10 0800		V	V		V	V	V		
K1006356-011	SRC-2010-3-B-Comp	Sediment	6/9/10 1105		V	V		V	V	V		
K1006356-012	SRC-2010-4-B-Comp	Sediment	6/11/10 0840		V	V		V	V	V		
K1006356-013	SRC-2010-5-B-Comp	Sediment	6/8/10 1335		V	V		V	V	V		
K1006356-014	SRC-2010-6-B-Comp	Sediment	6/9/10 1530		V	V		V	V	V		
K1006356-015	SRC-2010-7-B-Comp	Sediment	6/10/10 0900		V	V		V	V	V		
K1006356-016	SRC-2010-7-1	Sediment	6/10/10 0900	V	V	V	V	V	V	V	V	
K1006356-017	SRC-2010-7-2	Sediment	6/10/10 0940	V	V	V	V	V	V	V	V	
K1006356-018	SRC-2010-7-3	Sediment	6/10/10 1010	V	V	V	V	V	V	V	V	
K1006356-019	SRC-2010-7-4	Sediment	6/10/10 1035	V	V	V	V	V	V	V	V	
K1006356-020	SRC-2010-7-5	Sediment	6/10/10 1100	V	V	V	V	V	V	V	V	
K1006356-021	SRC-2010-8-Z-Comp	Sediment	6/10/10 1155	V	V	V	V	V	V	V	V	II

Service Request Summary

Folder #: K1006356
Client Name: Pacific EcoRisk Laboratories
Project Name: USACE San Rafael Channel
Project Number: 16087

Report To: Jeffrey Cotsifas
Pacific EcoRisk Laboratories
2250 Cordelia Road
Fairfield, CA 94534

Phone Number: 707-207-7760
Cell Number:
Fax Number: 707-207-7916
E-mail: cotsifas@pacificecorisk.com

Project Chemist: Darren Biles
Originating Lab: KELSO
Logged By: FADAIR
Date Received: 6/18 - 6/23/10
Internal Due Date: 7/6/10
QAP: LAB QAP
Qualifier Set: CAS Standard
Formset: CAS Standard
Merged?: N,Y
Report to MDL?: Y
P.O. Number:
EDD: BASIC_WQC

37 - 16 oz-Glass Jar WM CLEAR Teflon Liner Unpreserved
16 - 1 each-Plastic Bag Ziplock Unpreserved
14 - 2 oz-Glass Jar WM CLEAR Teflon Liner 4-deg C

Location: K-Delilah-51, K-PETUNIA-10,
E-WIC02-Box106, E-WIC-02-Box168

RUSH

Folder Comments:

WATCH HOLD TIMES! Samples received Frozen

Test Comments:

Group	Test/Method	Samples	Comments
GenChem	PSEP PartSizeCB/PSEP PS	16-20	Grainsize comes out of the 16 oz jar for this sample
Metals	Metals T/6010B	1-8, 16-21	B
Metals	Metals T/6020	9-15	As,Cd,Cr,Cu,Pb,Ni,Zn
Metals	Metals T/6020	1-8, 16-21	As,Cd,Cr,Cu,Pb,Ni,Zn,Ba,Be,Co,Mn,V
Metals	Sb Ag T/6020	1-21	Ag
Semivola GC	HERB/8151A	1-8, 16-21	Dichlorprop, MCPA and MCPP
Semivola GCMS	PCDD PCDF/8290	1-8, 21	Analyte list attached
Semivola GCMS	SVO_LL/8270C	1-8, 16-21	Phenol and Pentachlorophenol only

Preparation Information Benchsheet

Prep Run#: 113950
Team: Semivoa GCMS/AKODUR

Prep WorkFlow: OrgExtDioxS(30)
Prep Method: Method

Status: Prepped
Prep Date/Time: 6/25/10 12:20 PM

#	Lab Code	Client ID	B#	Method /Test	pH	Matrix	Amt. Ext.	Sample Description
1	E1000707-001	1006300-01	.01	8290/PCDD PCDF		Soil	11.932g	brown, wet soil
2	E1000707-002	1006300-02	.01	8290/PCDD PCDF		Soil	12.990g	black wet soil
3	EQ1000320-01	MB		8290/PCDD PCDF		Solid	10.000g	
4	EQ1000320-02	LCS		8290/PCDD PCDF		Solid	10.000g	
5	EQ1000320-03	DLCS		8290/PCDD PCDF		Solid	10.000g	
6	K1006190-015	S04-20-05	.10	8290/PCDD PCDF		Soil	10.888g	brown sand
7	K1006190-016	S04-20-15	.01	8290/PCDD PCDF		Soil	11.646g	brown sand
8	K1006190-017	S04-21-00	.01	8290/PCDD PCDF		Soil	10.386g	brown sand
9	K1006190-018	S04-21-02	.01	8290/PCDD PCDF		Soil	10.966g	brown clay
10	K1006190-019	S04-21-05	.01	8290/PCDD PCDF		Soil	12.027g	brown sand
11	K1006190-020	S04-21-15	.01	8290/PCDD PCDF		Soil	12.861g	brown sand
12	K1006356-001	SRC-2010-1-Comp	.04	8290/PCDD PCDF		Sediment	11.341g	dark brown wet soil
13	K1006356-002	SRC-2010-2-Comp	.01	8290/PCDD PCDF		Sediment	12.223g	dark brown wet soil
14	K1006356-003	SRC-2010-3-Comp	.04	8290/PCDD PCDF		Sediment	13.215g	dark brown wet soil
15	K1006356-004	SRC-2010-4-Comp	.04	8290/PCDD PCDF		Sediment	10.784g	dark brown wet soil

Spiking Solutions

Name:	8290 Matrix Working Standard	Inventory ID	17186	Logbook Ref:	D11-21-5A	Expires On:	04/16/2011
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EQ1000320-02 100.00µL EQ1000320-03 100.00µL

Name:	8290 Internal Working Standard	Inventory ID	19025	Logbook Ref:	D11-41-1A	Expires On:	06/24/2011
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E1000707-001	100.00µL	E1000707-002	100.00µL	EQ1000320-01	100.00µL	EQ1000320-02	100.00µL	EQ1000320-03	100.00µL	K1006190-015	100.00µL
K1006190-016	100.00µL	K1006190-017	100.00µL	K1006190-018	100.00µL	K1006190-019	100.00µL	K1006190-020	100.00µL	K1006356-001	100.00µL
K1006356-002	100.00µL	K1006356-003	100.00µL	K1006356-004	100.00µL						

Name:	8290/1613B Cleanup Working Standard	Inventory ID	19026	Logbook Ref:	D11-41-2A/B	Expires On:	06/24/2011
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E1000707-001	100.00µL	E1000707-002	100.00µL	EQ1000320-01	100.00µL	EQ1000320-02	100.00µL	EQ1000320-03	100.00µL	K1006190-015	100.00µL
K1006190-016	100.00µL	K1006190-017	100.00µL	K1006190-018	100.00µL	K1006190-019	100.00µL	K1006190-020	100.00µL	K1006356-001	100.00µL
K1006356-002	100.00µL	K1006356-003	100.00µL	K1006356-004	100.00µL						

Preparation Information Benchsheet

Prep Run#: 113950
Team: Semivoa GCMS/AKODUR

Prep WorkFlow: OrgExtDioxS(30)
Prep Method: Method

Status: Prepped
Prep Date/Time: 6/25/10 12:20 PM

Preparation Materials

Carbon, High Purity	C2-32-005 (13986)	Ethyl Acetate 99.9% Minimum EtOAc	C2-33-2 (14437)	Extraction Thimbles 43 x123 mm	(1577)
Glass Wool	C2-13-005 (7198)	Sulfuric Acid Reagent Grade H2SO4	C2-34-6 (15542)	Dichloromethane (Methylene Chloride) 99.9% MeCl2	C2-34-1 (15540)
Sodium Chloride Reagent Grade NaCl	C1-104-2 (3306)	Sodium Hydroxide Reagent Grade NaOH	C2-24-002 (9463)	Sodium Sulfate Anhydrous Reagent Grade Na2SO4	C2-36-004 (16226)
Tridecane (n-Tridecane)	C2-34-3 (15537)	Hexane (n-Hexane) 98.5% Minimum	C2-36-002 (16224)	Nonane (n-Nonane) 99%	C2-33-001 (13944)
Silica Gel Reagent Grade	C2-31-005 (13988)	Toluene 99.9% Minimum	C2-36-003 (16225)		

Preparation Steps

Step:	Extraction	Step:	Acid Clean	Step:	Silica Gel Clean	Step:	Final Volume
Started:	6/25/10 12:20	Started:	6/29/10 09:00	Started:	6/29/10 12:15	Started:	6/30/10 06:45
Finished:	6/26/10 08:20	Finished:	6/29/10 10:15	Finished:	6/29/10 15:10	Finished:	6/30/10 10:15
By:	CDONOVAN	By:	CDONOVAN	By:	CDONOVAN	By:	CDONOVAN

Comments: _____

Reviewed By: CD Date: 6/30/2010

Chain of Custody

Relinquished By: _____	Date: _____	<u>Extracts Examined</u>
Received By: _____	Date: _____	Yes No

Preparation Information Benchsheet

Prep Run#: 114258
Team: Semivoa GCMS/AKODUR

Prep WorkFlow: OrgExtDioxS(30)
Prep Method: Method

Status: Prepped
Prep Date/Time: 6/28/10 10:55 AM

#	Lab Code	Client ID	B#	Method /Test	pH	Matrix	Amt. Ext.	Sample Description
1	E1000591-016	K6IW01-01	.01	8290/PCDD PCDF		Soil	10.014g	brown soil
2	E1000591-017	K6IW01- 02.5	.01	8290/PCDD PCDF		Soil	10.494g	grey soil
3	E1000591-018	K6IW01- 04.5	.01	8290/PCDD PCDF		Soil	10.714g	orange-brown soil
4	E1000622-001RE	Dx-1 (0-6)	.01	8290/PCDD PCDF		Soil	4.842g	dark brown soil with roots
5	E1000648-001	O8IW01-01	.01	8290/PCDD PCDF		Soil	11.075g	grey soil with rock and debris
6	E1000648-002	O8IW02-02.5	.01	8290/PCDD PCDF		Soil	10.506g	grey soil with rock and debris
7	E1000648-003	O8IW02-04.5	.01	8290/PCDD PCDF		Soil	10.130g	grey clay
8	E1000669-009	Q7IW01-0.5	.01	8290/PCDD PCDF		Soil	10.650g	orange-brown clay
9	E1000669-010	Q7IW01-02.5	.01	8290/PCDD PCDF		Soil	10.095g	grey clay
10	E1000669-011	Q7IW01-04.5	.01	8290/PCDD PCDF		Soil	10.087g	orange-brown clay
11	EQ1000323-01	MB		8290/PCDD PCDF		Solid	10.000g	
12	EQ1000323-02	LCS		8290/PCDD PCDF		Solid	10.000g	
13	EQ1000323-03	DLCS		8290/PCDD PCDF		Solid	10.000g	
14	K1005734-001	95302807-F010724	.06	8290/PCDD PCDF		Paperboard	4.793g	white/brown cardboard strips
15	K1006356-005	SRC-2010-5-Comp	.04	8290/PCDD PCDF		Sediment	11.657g	grey sludge
16	K1006356-006	SRC-2010-6-Comp	.04	8290/PCDD PCDF		Sediment	11.638g	grey sludge
17	K1006356-007	SRC-2010-7-Comp	.04	8290/PCDD PCDF		Sediment	10.387g	grey sludge
18	K1006356-008	SRC-2010-7-Z-Comp	.04	8290/PCDD PCDF		Sediment	10.475g	grey sludge

Spiking Solutions

Name:	8290 Matrix Working Standard	Inventory ID	17186	Logbook Ref:	D11-21-5A	Expires On:	04/16/2011
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EQ1000323-02 100.00µL EQ1000323-03 100.00µL

Name:	8290 Internal Working Standard	Inventory ID	19025	Logbook Ref:	D11-41-1A	Expires On:	06/24/2011
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E1000591-016	100.00µL	E1000591-017	100.00µL	E1000591-018	100.00µL	E1000622-001	100.00µL	E1000648-001	100.00µL	E1000648-002	100.00µL
E1000648-003	100.00µL	E1000669-009	100.00µL	E1000669-010	100.00µL	E1000669-011	100.00µL	EQ1000323-01	100.00µL	EQ1000323-02	100.00µL
EQ1000323-03	100.00µL	K1005734-001	100.00µL	K1006356-005	100.00µL	K1006356-006	100.00µL	K1006356-007	100.00µL	K1006356-008	100.00µL

Name:	8290/1613B Cleanup Working Standard	Inventory ID	19026	Logbook Ref:	D11-41-2A/B	Expires On:	06/24/2011
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E1000591-016	100.00µL	E1000591-017	100.00µL	E1000591-018	100.00µL	E1000622-001	100.00µL	E1000648-001	100.00µL	E1000648-002	100.00µL
E1000648-003	100.00µL	E1000669-009	100.00µL	E1000669-010	100.00µL	E1000669-011	100.00µL	EQ1000323-01	100.00µL	EQ1000323-02	100.00µL
EQ1000323-03	100.00µL	K1005734-001	100.00µL	K1006356-005	100.00µL	K1006356-006	100.00µL	K1006356-007	100.00µL	K1006356-008	100.00µL

Preparation Information Benchsheet

Prep Run#: 114258
Team: Semivoa GCMS/AKODUR

Prep Workflow: OrgExtDioxS(30)
Prep Method: Method

Status: Prepped
Prep Date/Time: 6/28/10 10:55 AM

Preparation Materials

Carbon, High Purity	C2-32-005 (13986)	Ethyl Acetate 99.9% Minimum EtOAc	C2-33-2 (14437)	Extraction Thimbles 43 x123 mm	(1577)
Glass Wool	C2-13-005 (7198)	Sulfuric Acid Reagent Grade H2SO4	C2-34-6 (15542)	Dichloromethane (Methylene Chloride) 99.9% MeCl2	C2-34-1 (15540)
Sodium Chloride Reagent Grade NaCl	C1-104-2 (3306)	Sodium Hydroxide Reagent Grade NaOH	C2-24-002 (9463)	Sodium Sulfate Anhydrous Reagent Grade Na2SO4	C2-36-004 (16226)
Tridecane (n-Tridecane)	C2-34-3 (15537)	Hexane (n-Hexane) 98.5% Minimum	C2-36-002 (16224)	Nonane (n-Nonane) 99%	C2-33-001 (13944)
Silica Gel Reagent Grade	C2-31-005 (13988)	Toluene 99.9% Minimum	C2-36-003 (16225)		

Preparation Steps

Step:	Extraction	Step:	Acid Clean	Step:	Silica Gel Clean	Step:	Final Volume
Started:	6/28/10 10:55	Started:	6/30/10 09:45	Started:	6/30/10 12:40	Started:	7/1/10 07:30
Finished:	6/29/10 07:50	Finished:	6/30/10 11:00	Finished:	6/30/10 15:00	Finished:	7/1/10 09:25
By:	CDONOVAN	By:	CDONOVAN	By:	CDONOVAN	By:	CDONOVAN

Comments: _____

Reviewed By: CD Date: 7/1/2010

Chain of Custody

Relinquished By: _____	Date: _____	<u>Extracts Examined</u>
Received By: _____	Date: _____	Yes No

Preparation Information Benchsheet

Prep Run#: 114850
Team: Semivoa GCMS/AKODUR

Prep WorkFlow: OrgExtDioxS(30)
Prep Method: Method

Status: Prepped
Prep Date/Time: 7/8/10 12:55 PM

#	Lab Code	Client ID	B#	Method /Test	pH	Matrix	Amt. Ext.	Sample Description
1	E1000731-001	10068313-1	.01	8290/PCDD PCDF		Paper	5.217g	white paper squares
2	E1000740-001	10068632-1	.01	8290/PCDD PCDF		Paper	5.142g	white cardboard
3	EQ1000340-01	MB		8290/PCDD PCDF		Solid	10.000g	
4	EQ1000340-02	LCS		8290/PCDD PCDF		Solid	10.000g	
5	EQ1000340-03	DLCS		8290/PCDD PCDF		Solid	10.000g	
6	K1006356-021	SRC-2010-8-Z-Comp	.04	8290/PCDD PCDF		Sediment	13.336g	dark brown wet soil
7	K1006559-001	SF 10	.04	8290/PCDD PCDF		Sediment	11.860g	dark brown wet soil
8	K1006559-002	SF 11	.04	8290/PCDD PCDF		Sediment	11.958g	dark brown wet soil
9	K1006816-001	OUTSIDE-CB2-062910	.03	8290/PCDD PCDF		Soil	10.990g	brown soil
10	K1006816-002	OUTSIDE-CB3-062910	.03	8290/PCDD PCDF		Soil	10.870g	brown soil
11	K1006816-003	OUTSIDE-CB5-062910	.03	8290/PCDD PCDF		Soil	10.318g	brown soil
12	K1006816-004	DALLAS AVE-062910	.03	8290/PCDD PCDF		Soil	13.406g	brown soil

Spiking Solutions

Name:	8290 Matrix Working Standard	Inventory ID	17186	Logbook Ref:	D11-21-5A	Expires On:	04/16/2011
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EQ1000340-02 100.00µL EQ1000340-03 100.00µL

Name:	8290 Internal Working Standard	Inventory ID	19025	Logbook Ref:	D11-41-1A	Expires On:	06/24/2011
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E1000731-001 100.00µL E1000740-001 100.00µL EQ1000340-01 100.00µL EQ1000340-02 100.00µL EQ1000340-03 100.00µL K1006356-021 100.00µL
K1006559-001 100.00µL K1006559-002 100.00µL K1006816-001 100.00µL K1006816-002 100.00µL K1006816-003 100.00µL K1006816-004 100.00µL

Name:	8290/1613B Cleanup Working Standard	Inventory ID	19198	Logbook Ref:	D11-42-2A/B	Expires On:	07/01/2011
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E1000731-001 100.00µL E1000740-001 100.00µL EQ1000340-01 100.00µL EQ1000340-02 100.00µL EQ1000340-03 100.00µL K1006356-021 100.00µL
K1006559-001 100.00µL K1006559-002 100.00µL K1006816-001 100.00µL K1006816-002 100.00µL K1006816-003 100.00µL K1006816-004 100.00µL

Preparation Materials

Carbon, High Purity	C2-40-1 (19119)	Ethyl Acetate 99.9% Minimum EtOAc	C2-41-3 (19127)	Extraction Thimbles 43 x123 mm	(1577)
Glass Wool	C2-37-2 (19132)	Sulfuric Acid Reagent Grade H2SO4	C2-40-2 (19147)	Dichloromethane (Methylene Chloride) 99.9% MeCl2	C2-41-2 (19145)
Sodium Chloride Reagent Grade NaCl	C2-38-1 (19137)	Sodium Hydroxide Reagent Grade NaOH	C2-40-5 (19149)	Sodium Sulfate Anhydrous Reagent Grade Na2SO4	C2-36-004 (16226)
Tridecane (n-Tridecane)	C2-40-3 (19135)	Hexane (n-Hexane) 98.5% Minimum	C2-40-6 (19125)	Nonane (n-Nonane) 99%	C2-33-001 (13944)
Silica Gel Reagent Grade	C2-38-6 (19140)	Toluene 99.9% Minimum	C2-41-1 (19142)		

Preparation Information Benchsheet

Prep Run#: 114850
Team: Semivoa GCMS/AKODUR

Prep WorkFlow: OrgExtDioxS(30)
Prep Method: Method

Status: Prepped
Prep Date/Time: 7/8/10 12:55 PM

Preparation Steps

Step:	Extraction	Step:	Acid Clean	Step:	Silica Gel Clean	Step:	Final Volume
Started:	7/8/10 12:55	Started:	7/12/10 09:58	Started:	7/12/10 12:00	Started:	7/13/10 06:30
Finished:	7/9/10 07:10	Finished:	7/12/10 11:21	Finished:	7/12/10 14:00	Finished:	7/13/10 10:00
By:	CDONOVAN	By:	CDONOVAN	By:	CDONOVAN	By:	CDONOVAN

Comments: _____

Reviewed By: CD Date: 7/14/2010

Chain of Custody

Relinquished By:	_____	Date:	_____	<u>Extracts Examined</u>
Received By:	_____	Date:	_____	Yes No

July 20, 2010

Analytical Report for Service Request No: K1006477

Jeffrey Cotsifas
Pacific EcoRisk Laboratories
2250 Cordelia Road
Fairfield, CA 94534

RE: ACOE San Rafael Channel/16087

Dear Jeffrey:

Enclosed is the revised report for the rush samples submitted to our laboratory on June 23, 2010. For your reference, these analyses have been assigned our service request number K1006477.

Report is resubmitted to include results for Pesticides by EPA Method 8081A.

Analyses were performed according to our laboratory's NELAP-approved quality assurance program. The test results meet requirements of the current NELAP standards, where applicable, and except as noted in the laboratory case narrative provided. For a specific list of NELAP-accredited analytes, refer to the certifications section at www.caslab.com. All results are intended to be considered in their entirety, and Columbia Analytical Services, Inc. (CAS) is not responsible for use of less than the complete report. Results apply only to the items submitted to the laboratory for analysis and individual items (samples) analyzed, as listed in the report.

Please call if you have any questions. My extension is 3281. You may also contact me via Email at PDivvela@caslab.com.

Respectfully submitted,

Columbia Analytical Services, Inc.

Pradeep Divvela
Project Chemist

PD/cb

Page 1 of 62**REVISED****5:36 pm, Jul 20, 2010**

Acronyms

ASTM	American Society for Testing and Materials
A2LA	American Association for Laboratory Accreditation
CARB	California Air Resources Board
CAS Number	Chemical Abstract Service registry Number
CFC	Chlorofluorocarbon
CFU	Colony-Forming Unit
DEC	Department of Environmental Conservation
DEQ	Department of Environmental Quality
DHS	Department of Health Services
DOE	Department of Ecology
DOH	Department of Health
EPA	U. S. Environmental Protection Agency
ELAP	Environmental Laboratory Accreditation Program
GC	Gas Chromatography
GC/MS	Gas Chromatography/Mass Spectrometry
LUFT	Leaking Underground Fuel Tank
M	Modified
MCL	Maximum Contaminant Level is the highest permissible concentration of a substance allowed in drinking water as established by the USEPA.
MDL	Method Detection Limit
MPN	Most Probable Number
MRL	Method Reporting Limit
NA	Not Applicable
NC	Not Calculated
NCASI	National Council of the Paper Industry for Air and Stream Improvement
ND	Not Detected
NIOSH	National Institute for Occupational Safety and Health
PQL	Practical Quantitation Limit
RCRA	Resource Conservation and Recovery Act
SIM	Selected Ion Monitoring
TPH	Total Petroleum Hydrocarbons
tr	Trace level is the concentration of an analyte that is less than the PQL but greater than or equal to the MDL.

Inorganic Data Qualifiers

- * The result is an outlier. See case narrative.
- # The control limit criteria is not applicable. See case narrative.
- B The analyte was found in the associated method blank at a level that is significant relative to the sample result as defined by the DOD or NELAC standards.
- E The result is an estimate amount because the value exceeded the instrument calibration range.
- J The result is an estimated value that was detected outside the quantitation range.
- U The analyte was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL.
DOD-QSM 4.1 definition: Analyte was not detected and is reported as less than the LOD or as defined by the project. The detection limit is adjusted for dilution.
- i The MRL/MDL or LOQ/LOD is elevated due to a matrix interference.
- X See case narrative.
- Q See case narrative. One or more quality control criteria was outside the limits.

Metals Data Qualifiers

- # The control limit criteria is not applicable. See case narrative.
- J The result is an estimated value that was detected outside the quantitation range.
- E The percent difference for the serial dilution was greater than 10%, indicating a possible matrix interference in the sample.
- M The duplicate injection precision was not met.
- N The Matrix Spike sample recovery is not within control limits. See case narrative.
- S The reported value was determined by the Method of Standard Additions (MSA).
- U The analyte was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL.
DOD-QSM 4.1 definition: Analyte was not detected and is reported as less than the LOD or as defined by the project. The detection limit is adjusted for dilution.
- W The post-digestion spike for furnace AA analysis is out of control limits, while sample absorbance is less than 50% of spike absorbance.
- i The MRL/MDL or LOQ/LOD is elevated due to a matrix interference.
- X See case narrative.
- + The correlation coefficient for the MSA is less than 0.995.
- Q See case narrative. One or more quality control criteria was outside the limits.

Organic Data Qualifiers

- * The result is an outlier. See case narrative.
- # The control limit criteria is not applicable. See case narrative.
- A A tentatively identified compound, a suspected aldol-condensation product.
- B The analyte was found in the associated method blank at a level that is significant relative to the sample result as defined by the DOD or NELAC standards.
- C The analyte was qualitatively confirmed using GC/MS techniques, pattern recognition, or by comparing to historical data.
- D The reported result is from a dilution.
- E The result is an estimate amount because the value exceeded the instrument calibration range.
- J The result is an estimated value that was detected outside the quantitation range.
- N The result is presumptive. The analyte was tentatively identified, but a confirmation analysis was not performed.
- P The GC or HPLC confirmation criteria was exceeded. The relative percent difference is greater than 40% between the two analytical results.
- U The analyte was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL.
DOD-QSM 4.1 definition: Analyte was not detected and is reported as less than the LOD or as defined by the project. The detection limit is adjusted for dilution.
- i The MRL/MDL or LOQ/LOD is elevated due to a chromatographic interference.
- X See case narrative.
- Q See case narrative. One or more quality control criteria was outside the limits.

Additional Petroleum Hydrocarbon Specific Qualifiers

- F The chromatographic fingerprint of the sample matches the elution pattern of the calibration standard.
- L The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of lighter molecular weight constituents than the calibration standard.
- H The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of heavier molecular weight constituents than the calibration standard.
- O The chromatographic fingerprint of the sample resembles an oil, but does not match the calibration standard.
- Y The chromatographic fingerprint of the sample resembles a petroleum product eluting in approximately the correct carbon range, but the elution pattern does not match the calibration standard.
- Z The chromatographic fingerprint does not resemble a petroleum product.

Columbia Analytical Services, Inc.
Kelso, WA
State Certifications, Accreditations, and Licenses

Program	Number
Alaska DEC UST	UST-040
Arizona DHS	AZ0339
Arkansas - DEQ	88-0637
California DHS	2286
Colorado DPHE	-
Florida DOH	E87412
Hawaii DOH	-
Idaho DHW	-
Indiana DOH	C-WA-01
Louisiana DEQ	3016
Louisiana DHH	LA050010
Maine DHS	WA0035
Michigan DEQ	9949
Minnesota DOH	053-999-368
Montana DPHHS	CERT0047
Nevada DEP	WA35
New Jersey DEP	WA005
New Mexico ED	-
North Carolina DWQ	605
Oklahoma DEQ	9801
Oregon - DHS	WA200001
South Carolina DHEC	61002
Utah DOH	COLU
Washington DOE	C1203
Wisconsin DNR	998386840
Wyoming (EPA Region 8)	-

Case Narrative

COLUMBIA ANALYTICAL SERVICES, INC.

Client: Pacific EcoRisk Laboratories
Project: ACOE San Rafael Channel
Sample Matrix: Sediment

Service Request No.: K1006477
Date Received: 06/23/10

CASE NARRATIVE

All analyses were performed consistent with the quality assurance program of Columbia Analytical Services, Inc. (CAS). This report contains analytical results for samples designated for Tier II data deliverables. When appropriate to the method, method blank results have been reported with each analytical test. Surrogate recoveries have been reported for all applicable organic analyses. Additional quality control analyses reported herein include: Laboratory Duplicate (DUP), Matrix Spike (MS), Matrix/Duplicate Matrix Spike (MS/DMS), Laboratory Control Sample (LCS), and Laboratory/Duplicate Laboratory Control Sample (LCS/DLCS).

Sample Receipt

One sediment sample was received for analysis at Columbia Analytical Services on 06/23/10. The sample was received in good condition and consistent with the accompanying chain of custody form. The sample was stored in a refrigerator at 4°C upon receipt at the laboratory.

General Chemistry Parameters

No anomalies associated with the analysis of these samples were observed.

Total Metals

Matrix Spike Recovery Exceptions:

The control criteria for matrix spike recovery of Lead for sample SRC-2010-8-B-Comp were not applicable. The analyte concentration in the sample was significantly higher than the added spike concentration, preventing accurate evaluation of the spike recovery.

No other anomalies associated with the analysis of these samples were observed.

Organotin Compounds

Calibration Verification Exceptions:

The analysis of Butyltins requires the use of dual column confirmation. When the Continuing Calibration Verification (CCV) criterion is met for both columns, the higher of the two sample results is generally reported. The primary evaluation criteria were not met on the confirmation column for Di-n-butyltin. The results were reported from the column with an acceptable CCV. The data quality was not affected. No further corrective action was necessary.

Elevated Detection Limits:

Sample SRC-2010-8-B-Comp required dilution due to the presence of elevated levels of target analyte. The reporting limits were adjusted to reflect the dilution.

Sample Confirmation Notes:

The confirmation comparison criteria of 40% difference for Tetra-n-butyltin was exceeded in sample SRC-2010-8-B-Comp. The higher of the two values was reported because no evidence of a matrix interference was observed.

Approved by _____

Date

07/20/10

REVISED

5:34 pm, Jul 20, 2010

No other anomalies associated with the analysis of these samples were observed.

Organochlorine Pesticides by EPA Method 8081A

Sample Confirmation Notes:

The confirmation comparison criteria of 40% difference for at least one analyte was exceeded in sample SRC-2010-8-B-Comp. The higher of the two values was reported when no evidence of a matrix interference was observed, or the lower of the two values was reported when there was an apparent interference on the alternate column that produced the higher value.

Elevated Detection Limits:

The detection limit was elevated for a few analytes in sample SRC-2010-8-B-Comp. The chromatogram indicated the presence of non-target background components. The matrix interference prevented adequate resolution of the target compounds at the normal limit. The results were flagged to indicate the matrix interference.

Sample SRC-2010-8-B-Comp required dilution due to the presence of elevated levels of target analyte. The reporting limits were adjusted to reflect the dilution.

PCB Aroclors by EPA Method 8082

Sample Notes and Discussion:

Three Aroclors were identified in sample SRC-2010-8-B-Comp: Aroclor 1248, Aroclor 1254, and Aroclor 1260. When mixtures of PCB Aroclors are present in a sample, correct identification and quantitative analysis of the individual Aroclors can be subjective. In particular, when mixtures are present, differentiating Aroclor 1242 from Aroclor 1248 can be difficult.

A review of the sample chromatograms indicated the presence of PCB patterns that spanned the entire elution range from Aroclor 1242 through the end of Aroclor 1260. Based on individual PCB peaks in the early portion of the chromatogram, Aroclor 1248 was identified and quantitated. Aroclor 1260 was identified based on the presence of late eluting PCB peaks in the chromatogram. The remainder of the PCB pattern was identified as Aroclor 1254 because PCB peak height in the middle of the chromatogram was larger than could be attributed to either Aroclor Aroclor 1248 or Aroclor 1260.

When Aroclor mixtures are present in a sample, care is taken to minimize the possibility of double-counting PCBs. Analytical peaks are selected based on the best resolution possible for that particular sample. However, when a mixture of Aroclors 1248, 1254, and 1260 are present in a sample, the potential exists for a high bias from contribution of one Aroclor to another due to common peaks or peaks that cannot be completely resolved.

No other anomalies associated with the analysis of these samples were observed.

Polynuclear Aromatic Hydrocarbons by EPA Method 8270C

No other anomalies associated with the analysis of these samples were observed.

Approved by _____ Date 07/20/10

REVISED

5:35 pm, Jul 20, 2010

Chain of Custody



Pacific EcoRisk

ENVIRONMENTAL CONSULTING & TESTING

2250 Cordelia Rd., Fairfield, CA 94534

(707)207-7760

CAS CHAIN-OF-CUSTODY RECORD

005

K1006477

Client Name:		Pacific EcoRisk				REQUESTED ANALYSIS													
Client Address:		2250 Cordelia Rd. Fairfield, CA 94534				* See Scope of Work	Grain Size Analysis												
Sampled By:		Mike McElroy																	
Phone:		(707) 207-7760																	
FAX:		(707) 207-7916																	
Project Manager:		Jeff Cotsifas																	
Project Name:		ACOE (San Rafael Channel)																	
PO Number:		16087																	
Client Sample ID	Sample Date	Sample Time	Sample Matrix*	Container															
				Number	Type														
1	SRC-2010-8-B-Comp	6/10/10	11:55	Sed	2	8oz glass	x												
2	SRC-2010-8-B-Comp	6/10/10	11:55	Sed	1	1 poly bag		x											
3																			
4																			
5																			
6																			
7																			
8																			
9																			
10																			
Correct Containers:		Yes	No			RELIQUISHED BY													
Sample Temperature:		Ambient	Cold	Warm		Signature:						Signature:							
Sample Preservative:		Yes	No			Print:		M. McElroy				Print:							
Turnaround Time:		STD	Specify:				Organization:		PER				Organization:						
Comments: * Analyze for all of the constituents in Table 1 of the ACOE Master SAP. Analyte list to follow via email.					DATE:		6/22/10		TIME:		1400		DATE:		TIME				
					RECEIVED BY														
					Signature:						Signature:								
					Print:		J. Cotsifas				Print:								
					Organization:		CAS				Organization:								
DATE:		6/23/10		TIME:		0850		DATE:		TIME:									

*MATRIX CODES: (SED = Sediment); (FW = Freshwater); (WW = Wastewater); (STRMW = Stormwater)

Columbia Analytical Services, Inc.
Cooler Receipt and Preservation Form

PC Pradeep

Client / Project: PAC - FEDRISK Service Request K10 06477

Received: 6/23/10 Opened: 6/23/10 By: AF

1. Samples were received via? *Mail* Fed Ex *UPS* *DHL* *PDX* *Courier* *Hand Delivered*
2. Samples were received in: (circle) Cooler *Box* *Envelope* *Other* NA
3. Were custody seals on coolers? *NA* *Y* N If yes, how many and where? _____
- If present, were custody seals intact? *Y* *N* If present, were they signed and dated? *Y* *N*

Cooler Temp °C	Temp Blank °C	Thermometer ID	Cooler/COC ID	NA	Tracking Number	NA	Filed
0.3	2.0	269			798784387489		X
1.0	5.4	223			793661755787		

7. Packing material used. *Inserts* Baggies Bubble Wrap Gel Packs *Wet Ice* *Sleeves* *Other* _____
8. Were custody papers properly filled out (ink, signed, etc.)? *NA* Y *N*
9. Did all bottles arrive in good condition (unbroken)? *Indicate in the table below.* *NA* Y *N*
10. Were all sample labels complete (i.e analysis, preservation, etc.)? *NA* Y *N*
11. Did all sample labels and tags agree with custody papers? *Indicate major discrepancies in the table on page 2.* *NA* Y *N*
12. Were appropriate bottles/containers and volumes received for the tests indicated? *NA* Y *N*
13. Were the pH-preserved bottles (see SMO GEN SOP) received at the appropriate pH? *Indicate in the table below* NA *Y* *N*
14. Were VOA vials received without headspace? *Indicate in the table below.* NA *Y* *N*
15. Was C12/Res negative? NA *Y* *N*

Sample ID on Bottle	Sample ID on COC	Identified by:

Sample ID	Bottle Count	Bottle Type	Out of Temp	Head-space	Broke	pH	Reagent	Volume added	Reagent Lot Number	Initials	Time

Notes, Discrepancies, & Resolutions: _____

Total Solids

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Pacific EcoRisk Laboratories
Project: ACOE San Rafael Chan/16087
Sample Matrix: Sediment

Service Request: K1006477

Total Solids

Prep Method: NONE
Analysis Method: 160.3M
Test Notes:

Units: PERCENT
Basis: Wet

Sample Name	Lab Code	Date Collected	Date Received	Date Analyzed	Result	Result Notes
SRC-2010-8-B-Comp	K1006477-001	06/10/2010	06/23/2010	06/26/2010	51.0	

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Pacific EcoRisk Laboratories
Project: ACOE San Rafael Chan/16087
Sample Matrix: Sediment

Service Request: K1006477
Date Collected: 06/10/2010
Date Received: 06/23/2010
Date Analyzed: 06/26/2010

Duplicate Sample Summary
Total Solids

Prep Method: NONE
Analysis Method: 160.3M
Test Notes:

Units: PERCENT
Basis: Wet

Sample Name	Lab Code	Sample Result	Duplicate Sample Result	Average	Relative Percent Difference	Result Notes
SRC-2010-8-B-Comp	K1006477-001	51.0	50.3	50.7	1	

General Chemistry Parameters

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client : Pacific EcoRisk Laboratories
Project Name : ACOE San Rafael Channel
Project Number : 16087
Sample Matrix : SEDIMENT

Service Request : K1006477
Date Collected : 06/10/10
Date Received : 06/23/10

Carbon, Total Organic (TOC)

Prep Method : Method
Analysis Method : ASTM D4129-82M
Test Notes :

Units : Percent
Basis : Dry

Sample Name	Lab Code	MRL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Result	Result Notes
SRC-2010-8-B-Comp	K1006477-001	0.050	0.020	1	6/24/2010	07/10/10	4.33	
Method Blank	K1006477-MB	0.050	0.020	1	NA	07/10/10	ND	

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client : Pacific EcoRisk Laboratories
Project Name : ACOE San Rafael Channel
Project Number : 16087
Sample Matrix : SEDIMENT

Service Request : K1006477
Date Collected : 6/10/2010
Date Received : 6/23/2010
Date Prepared : 06/24/10
Date Analyzed : 07/10/10

Duplicate Summary Inorganic Parameters

Sample Name : SRC-2010-8-B-Comp
Lab Code : K1006477-001DUP
Test Notes :

Units : Percent
Basis : Dry

Analyte	Prep Method	Analysis Method	MRL	Sample Result	Duplicate Sample Result	Average	Relative Percent Difference	Result Notes
Carbon, Total Organic (TOC)	Method	ASTM D4129-82M	0.050	4.33	3.56	3.95	19	

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client : Pacific EcoRisk Laboratories
Project Name : ACOE San Rafael Channel
Project Number : 16087
Sample Matrix : SEDIMENT

Service Request : K1006477
Date Collected : 6/10/2010
Date Received : 6/23/2010
Date Prepared : 06/24/10
Date Analyzed : 07/10/10

Matrix Spike/Duplicate Matrix Spike Summary

Sample Name : SRC-2010-8-B-Comp
Lab Code : K1006477-001MS K1006477-001DMS
Test Notes :

Units : Percent
Basis : Dry

Analyte	Prep Method	Analysis Method	MRL	Spike Level		Sample Result	Spike Result		Spike Recovery		CAS Acceptance Limits	Relative Percent Difference	Result Notes
				MS	DMS		MS	DMS	MS	DMS			
Carbon, Total Organic (TOC)	Method	ASTM D4129-82M	0.050	12.0	10.8	4.33	14.8	15.5	87	103	77-155	17	

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client : Pacific EcoRisk Laboratories
Project Name : ACOE San Rafael Channel
Project Number : 16087
Sample Matrix : SOIL

Service Request : K1006477
Date Collected : NA
Date Received : NA
Date Prepared : NA
Date Analyzed : 07/10/10

Laboratory Control Sample Summary Inorganic Parameters

Sample Name : Lab Control Sample
Lab Code : K1006477-LCS
Test Notes :

Units : Percent
Basis : Dry

Analyte	Prep Method	Analysis Method	True Value	Result	Percent Recovery	CAS Percent Recovery	Result Notes
						Acceptance Limits	
Carbon, Total Organic (TOC)	Method	ASTM D4129-82M	0.550	0.476	87	82-119	

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client : Pacific EcoRisk Laboratories

Project : ACOE San Rafael Channel

Service Request : K1006477

Date Collected : NA

Date Received : NA

Carbon, Total Organic (TOC)

ASTM D4129-82M

Units: Percent

CONTINUING CALIBRATION VERIFICATION (CCV)

	Date Analyzed	True Value	Measured Value	Percent Recovery
CCV1 Result	7/10/2010	20.0	19.1	96
CCV2 Result	7/10/2010	20.0	19.6	98
CCV3 Result	7/10/2010	20.0	19.7	99

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client : Pacific EcoRisk Laboratories

Project : ACOE San Rafael Channel

Service Request : K1006477

Date Collected : NA

Date Received : NA

Carbon, Total Organic (TOC)

ASTM D4129-82M

Units: Percent

CONTINUING CALIBRATION BLANK (CCB)

	Date Analyzed	MRL	Blank Value
CCB1 Result	7/10/2010	0.050	ND
CCB2 Result	7/10/2010	0.050	ND
CCB3 Result	7/10/2010	0.050	ND

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: Pacific EcoRisk Laboratories
Project: ACOE San Rafael Channel/16087
Sample Matrix: Sediment

Service Request: K1006477
Date Collected: 6/10/2010
Date Received: 6/23/2010
Date Analyzed: 7/1/2010

Particle Size Determination
 Puget Sound Estuary Program Protocol

Sample Name: SRC-2010-8-B-Comp
Lab Code: K1006477-001

Sand Fraction: Dry Weight (Grams) 18.9066
 Sand Fraction: Weight Recovered (Grams) 18.5533
 Sand Fraction: Percent Recovery 98.1

Description	Phi Size	Dry Weight (Grams)	Percent of Total Weight Recovered
Gravel (>2.00 mm)	<-1 Ø	4.2857	11.8
Sand, Very Coarse (1.00 mm to 2.00 mm)	-1 to 0 Ø	1.4921	4.12
Sand, Coarse (0.50 mm to 1.00 mm)	0 to 1 Ø	0.7409	2.05
Sand, Medium (0.250 mm to 0.500 mm)	1 to 2 Ø	2.2051	6.09
Sand, Fine (0.125 mm to 0.250 mm)	2 to 3 Ø	5.2460	14.5
Sand, Very Fine (0.0625 mm to 0.125 mm)	3 to 4 Ø	2.1797	6.02
Silt (0.0039 mm to 0.0625 mm)	4 to 8 Ø	10.3400	28.6
Clay (<0.0039 mm)	> 8 Ø	6.3050	17.4
Total		32.7945	90.6

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: Pacific EcoRisk Laboratories
Project: ACOE (San Rafael Channel)
Sample Matrix: Sediment

Service Request: K1006477
Date Collected: NA
Date Received: NA
Date Analyzed: 7/1/2010

Particle Size Determination
 Puget Sound Estuary Program Protocol

Sample Name: Batch QC
Lab Code: K1006639-001

Sand Fraction: Dry Weight (Grams) 15.3109
 Sand Fraction: Weight Recovered (Grams) 14.7400
 Sand Fraction: Percent Recovery 96.3

Description	Phi Size	Dry Weight (Grams)	Percent of Total Weight Recovered
Gravel (>2.00 mm)	<-1 Ø	1.0266	2.91
Sand, Very Coarse (1.00 mm to 2.00 mm)	-1 to 0 Ø	0.7347	2.08
Sand, Coarse (0.50	0 to 1 Ø	1.6235	4.60
Sand, Medium (0.250 mm to 0.500 mm)	1 to 2 Ø	1.9505	5.53
Sand, Fine (0.125 mm to 0.250 mm)	2 to 3 Ø	1.0719	3.04
Sand, Very Fine (0.0625 mm to 0.125 mm)	3 to 4 Ø	3.0650	8.68
Silt (0.0039 mm to 0.0625 mm)	4 to 8 Ø	17.4750	49.5
Clay (< 0.0039 mm)	> 8 Ø	7.4100	21.0
Total		34.3572	97.3

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: Pacific EcoRisk Laboratories
Project: ACOE (San Rafael Channel)
Sample Matrix: Sediment

Service Request: K1006477
Date Collected: NA
Date Received: NA
Date Analyzed: 7/1/2010

Particle Size Determination
 Puget Sound Estuary Program Protocol

Sample Name: Batch QC
Lab Code: K1006639-001DUP

Sand Fraction: Dry Weight (Grams) 13.1066
 Sand Fraction: Weight Recovered (Grams) 12.7392
 Sand Fraction: Percent Recovery 97.2

Description	Phi Size	Dry Weight (Grams)	Percent of Total Weight Recovered
Gravel (>2.00 mm)	<-1 Ø	2.1883	6.95
Sand, Very Coarse (1.00 mm to 2.00 mm)	-1 to 0 Ø	1.0291	3.27
Sand, Coarse (0.50	0 to 1 Ø	2.4145	7.67
Sand, Medium (0.250 mm to 0.500 mm)	1 to 2 Ø	1.6424	5.22
Sand, Fine (0.125 mm to 0.250 mm)	2 to 3 Ø	0.8600	2.73
Sand, Very Fine (0.0625 mm to 0.125 mm)	3 to 4 Ø	2.0133	6.40
Silt (0.0039 mm to 0.0625 mm)	4 to 8 Ø	13.6350	43.3
Clay (< 0.0039 mm)	> 8 Ø	7.6500	24.3
Total		31.4326	100

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: Pacific EcoRisk Laboratories
Project: ACOE (San Rafael Channel)
Sample Matrix: Sediment

Service Request: K1006477
Date Collected: NA
Date Received: NA
Date Analyzed: 7/1/2010

Particle Size Determination
 Puget Sound Estuary Program Protocol

Sample Name: Batch QC
 Lab Code: K1006639-001TRP

Sand Fraction: Dry Weight (Grams) 14.6145
 Sand Fraction: Weight Recovered (Grams) 14.2727
 Sand Fraction: Percent Recovery 97.7

Description	Phi Size	Dry Weight (Grams)	Percent of Total Weight Recovered
Gravel (>2.00 mm)	<-1 Ø	0.4513	1.27
Sand, Very Coarse (1.00 mm to 2.00 mm)	-1 to 0 Ø	1.3773	3.88
Sand, Coarse (0.50)	0 to 1 Ø	2.2650	6.38
Sand, Medium (0.250 mm to 0.500 mm)	1 to 2 Ø	2.4836	7.00
Sand, Fine (0.125 mm to 0.250 mm)	2 to 3 Ø	1.7124	4.82
Sand, Very Fine (0.0625 mm to 0.125 mm)	3 to 4 Ø	3.2969	9.29
Silt (0.0039 mm to 0.0625 mm)	4 to 8 Ø	16.6900	47.0
Clay (< 0.0039 mm)	> 8 Ø	8.3550	23.5
Total		36.6315	103

Metals

Columbia Analytical Services

- Cover Page - INORGANIC ANALYSIS DATA PACKAGE

Client: Pacific EcoRisk Laboratories
Project Name: ACOE San Rafael Channel
Project No.: 16087

Service Request: K1006477

Sample Name:

SRC-2010-8-B-Comp

SRC-2010-8-B-CompD

SRC-2010-8-B-CompS

Method Blank

Batch QC1D

Batch QC1S

Batch QC2D

Batch QC2S

Lab Code:

K1006477-001

K1006477-001D

K1006477-001S

K1006477-MB

K1006480-001D

K1006480-001S

K1006518-001D

K1006518-001S

Comments:

Approved By:



Date:

7/14/10

Metals**- 1 -****INORGANIC ANALYSIS DATA PACKAGE**

Client: Pacific EcoRisk Laboratories **Service Request:** K1006477
Project No.: 16087 **Date Collected:** 06/10/10
Project Name: ACOE San Rafael Channel **Date Received:** 06/23/10
Matrix: SEDIMENT **Units:** mg/Kg
Basis: DRY

Sample Name: SRC-2010-8-B-Comp **Lab Code:** K1006477-001

Analyte	Analysis Method	MRL	MDL	Dil. Factor	Date Extracted	Date Analyzed	Result	C	Q
Arsenic	6020	0.51	0.05	5.0	07/08/10	07/12/10	11.4		
Cadmium	6020	0.020	0.004	5.0	07/08/10	07/12/10	1.190		
Chromium	6020	0.20	0.02	5.0	07/08/10	07/12/10	93.6		
Copper	6010B	2.0	0.6	2.0	07/08/10	07/09/10	117		
Lead	6020	0.051	0.006	5.0	07/08/10	07/12/10	427		
Mercury	7471A	0.018	0.002	1.0	06/30/10	07/02/10	0.845		
Nickel	6020	0.20	0.02	5.0	07/08/10	07/12/10	103		
Selenium	7742	0.10	0.03	2.0	07/08/10	07/09/10	0.34		
Silver	6020	0.020	0.008	5.0	07/08/10	07/13/10	0.710		
Zinc	6020	0.5	0.2	5.0	07/08/10	07/12/10	306		

% Solids: 51.0

Comments:

Metals**- 1 -****INORGANIC ANALYSIS DATA PACKAGE**

Client: Pacific EcoRisk Laboratories **Service Request:** K1006477
Project No.: 16087 **Date Collected:**
Project Name: ACOE San Rafael Channel **Date Received:**
Matrix: SEDIMENT **Units:** mg/Kg
Basis: DRY

Sample Name: Method Blank **Lab Code:** K1006477-MB

Analyte	Analysis Method	MRL	MDL	Dil. Factor	Date Extracted	Date Analyzed	Result	C	Q
Arsenic	6020	0.50	0.05	5.0	07/08/10	07/12/10	0.05	U	
Cadmium	6020	0.020	0.004	5.0	07/08/10	07/12/10	0.004	U	
Chromium	6020	0.20	0.02	5.0	07/08/10	07/12/10	0.08	J	
Copper	6010B	2.0	0.6	2.0	07/08/10	07/09/10	0.6	U	
Lead	6020	0.050	0.006	5.0	07/08/10	07/12/10	0.030	J	
Mercury	7471A	0.020	0.002	1.0	06/30/10	07/02/10	0.002	U	
Nickel	6020	0.20	0.02	5.0	07/08/10	07/12/10	0.02	U	
Selenium	7742	0.10	0.03	2.0	07/08/10	07/09/10	0.03	U	
Silver	6020	0.020	0.008	5.0	07/08/10	07/13/10	0.008	U	
Zinc	6020	0.5	0.2	5.0	07/08/10	07/12/10	0.2	U	

% Solids: 100.0

Comments:

Metals

- 5A -

SPIKE SAMPLE RECOVERY

Client: Pacific EcoRisk Laboratories Service Request: K1006477
Project No.: 16087 Units: MG/KG
Project Name: ACOE San Rafael Channel Basis: DRY
Matrix: SEDIMENT % Solids: 51.0

Sample Name: SRC-2010-8-B-CompS

Lab Code: K1006477-001S

Analyte	Control Limit %R	Spike Result	C	Sample Result	C	Spike Added	%R	Q	Method
Arsenic	57 - 133	114		11.4		101.60	101.0		6020
Cadmium	68 - 137	12.3		1.190		10.16	109.4		6020
Chromium	34 - 175	136		93.6		40.64	104.3		6020
Lead		567		427		101.60	137.8		6020
Nickel	59 - 132	212		103		101.60	107.3		6020
Selenium	57 - 134	2.30		0.34		2.05	95.6		7742
Zinc	37 - 162	450		306		101.60	141.7		6020

An empty field in the Control Limit column indicates the control limit is not applicable

Metals
- 5A -

SPIKE SAMPLE RECOVERY

Client: Pacific EcoRisk Laboratories Service Request: K1006477
Project No.: 16087 Units: MG/KG
Project Name: ACOE San Rafael Channel Basis: DRY
Matrix: SEDIMENT % Solids: 54.4

Sample Name: Batch QC1S Lab Code: K1006480-001S

Analyte	Control Limit %R	Spike Result	C	Sample Result	C	Spike Added	%R	Q	Method
Copper	24 - 173	106		52.7		50.50	105.5		6010B
Silver	62 - 131	10.6		0.152		10.10	103.4		6020

An empty field in the Control Limit column indicates the control limit is not applicable

Metals
- 5A -

SPIKE SAMPLE RECOVERY

Client: Pacific EcoRisk Laboratories Service Request: K1006477
Project No.: 16087 Units: MG/KG
Project Name: ACOE San Rafael Channel Basis: DRY
Matrix: SEDIMENT % Solids: 56.6

Sample Name: Batch QC2S Lab Code: K1006518-001S

Analyte	Control Limit %R	Spike Result	C	Sample Result	C	Spike Added	%R	Q	Method
Mercury	60 - 135	0.474		0.046		0.49	87.3		7471A

An empty field in the Control Limit column indicates the control limit is not applicable

Metals

- 6 -

DUPLICATES

Client: Pacific EcoRisk Laboratories Service Request: K1006477
Project No.: 16087 Units: MG/KG
Project Name: ACOE San Rafael Channel Basis: DRY
Matrix: SEDIMENT % Solids: 51.0

Sample Name: SRC-2010-8-B-CompD

Lab Code: K1006477-001D

Analyte	Control Limit	Sample (S)	C	Duplicate (D)	C	RPD	Q	Method
Arsenic	20	11.4		11.3		0.9		6020
Cadmium	20	1.190		1.230		3.3		6020
Chromium	20	93.6		90.1		3.8		6020
Lead	20	427		427		0.0		6020
Nickel	20	103		98.1		4.9		6020
Selenium		0.34		0.33		3.0		7742
Zinc	20	306		309		1.0		6020

An empty field in the Control Limit column indicates the control limit is not applicable.

Metals

- 6 -

DUPLICATES

Client: Pacific EcoRisk Laboratories Service Request: K1006477

Project No.: 16087 Units: MG/KG

Project Name: ACOE San Rafael Channel Basis: DRY

Matrix: SEDIMENT % Solids: 54.4

Sample Name: Batch QC1D Lab Code: K1006480-001D

Analyte	Control Limit	Sample (S)	C	Duplicate (D)	C	RPD	Q	Method
Copper	30	52.7		63.0		17.8		6010B
Silver	20	0.152		0.152		0.0		6020

An empty field in the Control Limit column indicates the control limit is not applicable.

Metals
- 6 -
DUPLICATES

Client: Pacific EcoRisk Laboratories Service Request: K1006477
Project No.: 16087 Units: MG/KG
Project Name: ACOE San Rafael Channel Basis: DRY
Matrix: SEDIMENT % Solids: 56.6

Sample Name: Batch QC2D Lab Code: K1006518-001D

Analyte	Control Limit	Sample (S)	C	Duplicate (D)	C	RPD	Q	Method
Mercury		0.046		0.046		0.0		7471A

An empty field in the Control Limit column indicates the control limit is not applicable.

Metals

- 7 -

LABORATORY CONTROL SAMPLE

Client: Pacific EcoRisk Laboratories Service Request: K1006477

Project No.: 16087

Project Name: ACOE San Rafael Channel

Aqueous LCS Source: Solid LCS Source: ERA D065540

Analyte	Aqueous: ug/L			Solid: mg/kg					
	True	Found	%R	True	Found	C	Limits	%R	
Arsenic				88.3	92.3		78	122	104.5
Cadmium				91	100		81	119	109.9
Chromium				144	152		80	119	105.6
Copper				237	255		83	116	107.6
Lead				104	121		79	121	116.3
Mercury				6.8	6.580		71	128	96.8
Nickel				200	223		81	118	111.5
Selenium				192	191		80	120	99.5
Silver				76.4	83.5		66	134	109.3
Zinc				292	286		73	121	97.9

Butyltins

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Pacific EcoRisk Laboratories
Project: ACOE San Rafael Channel/16087
Sample Matrix: Sediment

Service Request: K1006477
Date Collected: 06/10/2010
Date Received: 06/23/2010

Butyltins (as cation)

Sample Name: SRC-2010-8-B-Comp
Lab Code: K1006477-001
Extraction Method: SOC-OSWT
Analysis Method: Krone

Units: ug/Kg
Basis: Dry
Level: Low

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Tetra-n-butyltin	5.9	P	2.0	0.84	1	06/24/10	07/14/10	KWG1006888	
Tri-n-butyltin Cation	140		2.0	0.82	1	06/24/10	07/14/10	KWG1006888	
Di-n-butyltin Cation	280	D	9.6	1.9	5	06/24/10	07/14/10	KWG1006888	
n-Butyltin Cation	86		2.0	0.50	1	06/24/10	07/14/10	KWG1006888	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Tri-n-propyltin	95	18-95	07/14/10	Acceptable

Comments: _____

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Pacific EcoRisk Laboratories
Project: ACOE San Rafael Channel/16087
Sample Matrix: Sediment

Service Request: K1006477
Date Collected: NA
Date Received: NA

Butyltins (as cation)

Sample Name: Method Blank
Lab Code: KWG1006888-4
Extraction Method: SOC-OSWT
Analysis Method: Krone

Units: ug/Kg
Basis: Dry
Level: Low

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Tetra-n-butyltin	ND	U	0.97	0.44	1	06/24/10	07/14/10	KWG1006888	
Tri-n-butyltin Cation	ND	U	0.97	0.43	1	06/24/10	07/14/10	KWG1006888	
Di-n-butyltin Cation	ND	U	0.97	0.19	1	06/24/10	07/14/10	KWG1006888	
n-Butyltin Cation	ND	U	0.97	0.26	1	06/24/10	07/14/10	KWG1006888	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Tri-n-propyltin	89	18-95	07/14/10	Acceptable

Comments: _____

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Pacific EcoRisk Laboratories
Project: ACOE San Rafael Channel/16087
Sample Matrix: Sediment

Service Request: K1006477

Surrogate Recovery Summary
Butyltins (as cation)

Extraction Method: SOC-OSWT
Analysis Method: Krone

Units: PERCENT
Level: Low

<u>Sample Name</u>	<u>Lab Code</u>	<u>Sur1</u>
SRC-2010-8-B-Comp	K1006477-001	95 D
Method Blank	KWG1006888-4	89
Batch QC	K1006486-001	60
Batch QCMS	KWG1006888-1	95
Batch QCDMS	KWG1006888-2	70
Lab Control Sample	KWG1006888-3	76

Surrogate Recovery Control Limits (%)

Sur1 = Tri-n-propyltin 18-95

Results flagged with an asterisk (*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Pacific EcoRisk Laboratories
Project: ACOE San Rafael Channel/16087
Sample Matrix: Sediment

Service Request: K1006477
Date Extracted: 06/24/2010
Date Analyzed: 07/14/2010

Matrix Spike/Duplicate Matrix Spike Summary
Butyltins (as cation)

Sample Name: Batch QC
Lab Code: K1006486-001
Extraction Method: SOC-OSWT
Analysis Method: Krone

Units: ug/Kg
Basis: Dry
Level: Low
Extraction Lot: KWG1006888

Analyte Name	Sample Result	Batch QCMS KWG1006888-1 Matrix Spike			Batch QCDMS KWG1006888-2 Duplicate Matrix Spike			%Rec Limits	RPD	RPD Limit
		Result	Expected	%Rec	Result	Expected	%Rec			
Tetra-n-butyltin	ND	57.0	56.7	101	44.6	56.4	79	10-120	24	40
Tri-n-butyltin Cation	3.3	44.9	50.3	83	34.3	50.1	62	10-118	27	40
Di-n-butyltin Cation	3.6	40.6	43.5	85	29.4	43.3	60	10-145	32	40
n-Butyltin Cation	9.4	52.8	35.4	123	47.6	35.2	109	10-126	10	40

Results flagged with an asterisk (*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Pacific EcoRisk Laboratories
Project: ACOE San Rafael Channel/16087
Sample Matrix: Sediment

Service Request: K1006477
Date Extracted: 06/24/2010
Date Analyzed: 07/14/2010

Lab Control Spike Summary
Butyltins (as cation)

Extraction Method: SOC-OSWT
Analysis Method: Krone

Units: ug/Kg
Basis: Dry
Level: Low
Extraction Lot: KWG1006888

Analyte Name	Lab Control Sample KWG1006888-3 Lab Control Spike			%Rec Limits
	Result	Expected	%Rec	
Tetra-n-butyltin	19.1	25.0	76	30-110
Tri-n-butyltin Cation	20.1	22.2	91	25-101
Di-n-butyltin Cation	12.6	19.2	66	35-108
n-Butyltin Cation	18.5	15.6	119	20-123

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

Polychlorinated Biphenyls

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Pacific EcoRisk Laboratories
Project: ACOE San Rafael Channel/16087
Sample Matrix: Sediment

Service Request: K1006477
Date Collected: 06/10/2010
Date Received: 06/23/2010

Polychlorinated Biphenyls (PCBs)

Sample Name: SRC-2010-8-B-Comp
Lab Code: K1006477-001
Extraction Method: EPA 3541
Analysis Method: 8082

Units: ug/Kg
Basis: Dry
Level: Low

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Aroclor 1016	ND	U	9.8	2.1	1	06/24/10	07/08/10	KWG1006548	
Aroclor 1221	ND	U	20	2.1	1	06/24/10	07/08/10	KWG1006548	
Aroclor 1232	ND	U	9.8	2.1	1	06/24/10	07/08/10	KWG1006548	
Aroclor 1242	ND	U	9.8	2.1	1	06/24/10	07/08/10	KWG1006548	
Aroclor 1248	160		9.8	2.1	1	06/24/10	07/08/10	KWG1006548	
Aroclor 1254	200		9.8	2.1	1	06/24/10	07/08/10	KWG1006548	
Aroclor 1260	210		9.8	2.1	1	06/24/10	07/08/10	KWG1006548	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Decachlorobiphenyl	83	35-133	07/08/10	Acceptable

Comments: _____

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Pacific EcoRisk Laboratories
Project: ACOE San Rafael Channel/16087
Sample Matrix: Sediment

Service Request: K1006477
Date Collected: NA
Date Received: NA

Polychlorinated Biphenyls (PCBs)

Sample Name: Method Blank
Lab Code: KWG1006548-4
Extraction Method: EPA 3541
Analysis Method: 8082

Units: ug/Kg
Basis: Dry
Level: Low

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Aroclor 1016	ND	U	5.0	2.1	1	06/24/10	07/07/10	KWG1006548	
Aroclor 1221	ND	U	10	2.1	1	06/24/10	07/07/10	KWG1006548	
Aroclor 1232	ND	U	5.0	2.1	1	06/24/10	07/07/10	KWG1006548	
Aroclor 1242	ND	U	5.0	2.1	1	06/24/10	07/07/10	KWG1006548	
Aroclor 1248	ND	U	5.0	2.1	1	06/24/10	07/07/10	KWG1006548	
Aroclor 1254	ND	U	5.0	2.1	1	06/24/10	07/07/10	KWG1006548	
Aroclor 1260	ND	U	5.0	2.1	1	06/24/10	07/07/10	KWG1006548	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Decachlorobiphenyl	87	35-133	07/07/10	Acceptable

Comments: _____

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Pacific EcoRisk Laboratories
Project: ACOE San Rafael Channel/16087
Sample Matrix: Sediment

Service Request: K1006477

Surrogate Recovery Summary
Polychlorinated Biphenyls (PCBs)

Extraction Method: EPA 3541
Analysis Method: 8082

Units: PERCENT
Level: Low

<u>Sample Name</u>	<u>Lab Code</u>	<u>Sur1</u>
Lab Control Sample	KWG1006548-3	88
SRC-2010-8-B-Comp	K1006477-001	83
Method Blank	KWG1006548-4	87
Batch QC	K1006486-001	78
Batch QCMS	KWG1006548-1	74
Batch QCDMS	KWG1006548-2	68

Surrogate Recovery Control Limits (%)

Sur1 = Decachlorobiphenyl 35-133

Results flagged with an asterisk (*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Pacific EcoRisk Laboratories
Project: ACOE San Rafael Channel/16087
Sample Matrix: Sediment

Service Request: K1006477
Date Extracted: 06/24/2010
Date Analyzed: 07/08/2010

Matrix Spike/Duplicate Matrix Spike Summary
Polychlorinated Biphenyls (PCBs)

Sample Name: Batch QC
Lab Code: K1006486-001
Extraction Method: EPA 3541
Analysis Method: 8082

Units: ug/Kg
Basis: Dry
Level: Low
Extraction Lot: KWG1006548

Analyte Name	Sample Result	Batch QCMS KWG1006548-1 Matrix Spike			Batch QCDMS KWG1006548-2 Duplicate Matrix Spike			%Rec Limits	RPD	RPD Limit
		Result	Expected	%Rec	Result	Expected	%Rec			
Aroclor 1016	ND	162	227	71	144	227	63	27-174	12	40
Aroclor 1260	3.7	179	227	77	157	227	67	20-185	13	40

Results flagged with an asterisk (*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Pacific EcoRisk Laboratories
Project: ACOE San Rafael Channel/16087
Sample Matrix: Sediment

Service Request: K1006477
Date Extracted: 06/24/2010
Date Analyzed: 07/07/2010

Lab Control Spike Summary
Polychlorinated Biphenyls (PCBs)

Extraction Method: EPA 3541
Analysis Method: 8082

Units: ug/Kg
Basis: Dry
Level: Low
Extraction Lot: KWG1006548

Lab Control Sample KWG1006548-3 Lab Control Spike				
Analyte Name	Result	Expected	%Rec	%Rec Limits
Aroclor 1016	169	200	84	48-121
Aroclor 1260	177	200	88	53-129

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

Polynuclear Aromatic Hydrocarbons

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Pacific EcoRisk Laboratories
Project: ACOE San Rafael Channel/16087
Sample Matrix: Sediment

Service Request: K1006477
Date Collected: 06/10/2010
Date Received: 06/23/2010

Polynuclear Aromatic Hydrocarbons

Sample Name: SRC-2010-8-B-Comp
Lab Code: K1006477-001
Extraction Method: EPA 3541
Analysis Method: 8270C SIM

Units: ug/Kg
Basis: Dry
Level: Low

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Naphthalene	31		4.8	0.60	1	06/24/10	07/01/10	KWG1006323	
Acenaphthylene	16		4.8	0.59	1	06/24/10	07/01/10	KWG1006323	
Acenaphthene	37		4.8	0.76	1	06/24/10	07/01/10	KWG1006323	
Fluorene	54		4.8	0.61	1	06/24/10	07/01/10	KWG1006323	
Phenanthrene	360		4.8	1.4	1	06/24/10	07/01/10	KWG1006323	
Anthracene	81		4.8	0.58	1	06/24/10	07/01/10	KWG1006323	
Fluoranthene	850		4.8	0.98	1	06/24/10	07/01/10	KWG1006323	
Pyrene	1300		4.8	0.76	1	06/24/10	07/01/10	KWG1006323	
Benzo(b)fluoranthene	590		4.8	0.92	1	06/24/10	07/01/10	KWG1006323	
Benzo(k)fluoranthene	190		4.8	0.87	1	06/24/10	07/01/10	KWG1006323	
Benz(a)anthracene	370		4.8	0.72	1	06/24/10	07/01/10	KWG1006323	
Chrysene	330		4.8	0.80	1	06/24/10	07/01/10	KWG1006323	
Benzo(a)pyrene	510		4.8	0.76	1	06/24/10	07/01/10	KWG1006323	
Indeno(1,2,3-cd)pyrene	550		4.8	0.87	1	06/24/10	07/01/10	KWG1006323	
Dibenz(a,h)anthracene	71		4.8	0.80	1	06/24/10	07/01/10	KWG1006323	
Benzo(g,h,i)perylene	710		4.8	0.85	1	06/24/10	07/01/10	KWG1006323	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Fluorene-d10	68	17-104	07/01/10	Acceptable
Fluoranthene-d10	79	27-106	07/01/10	Acceptable
Terphenyl-d14	79	35-109	07/01/10	Acceptable

Comments: _____

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Pacific EcoRisk Laboratories
Project: ACOE San Rafael Channel/16087
Sample Matrix: Sediment

Service Request: K1006477
Date Collected: NA
Date Received: NA

Polynuclear Aromatic Hydrocarbons

Sample Name: Method Blank
Lab Code: KWG1006323-5
Extraction Method: EPA 3541
Analysis Method: 8270C SIM

Units: ug/Kg
Basis: Dry
Level: Low

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Naphthalene	2.3	J	2.4	0.60	1	06/24/10	07/01/10	KWG1006323	
Acenaphthylene	ND	U	2.4	0.59	1	06/24/10	07/01/10	KWG1006323	
Acenaphthene	ND	U	2.4	0.76	1	06/24/10	07/01/10	KWG1006323	
Fluorene	ND	U	2.4	0.61	1	06/24/10	07/01/10	KWG1006323	
Phenanthrene	ND	U	2.4	1.4	1	06/24/10	07/01/10	KWG1006323	
Anthracene	ND	U	2.4	0.58	1	06/24/10	07/01/10	KWG1006323	
Fluoranthene	ND	U	2.4	0.98	1	06/24/10	07/01/10	KWG1006323	
Pyrene	ND	U	2.4	0.76	1	06/24/10	07/01/10	KWG1006323	
Benzo(b)fluoranthene	ND	U	2.4	0.92	1	06/24/10	07/01/10	KWG1006323	
Benzo(k)fluoranthene	ND	U	2.4	0.87	1	06/24/10	07/01/10	KWG1006323	
Benz(a)anthracene	ND	U	2.4	0.72	1	06/24/10	07/01/10	KWG1006323	
Chrysene	ND	U	2.4	0.80	1	06/24/10	07/01/10	KWG1006323	
Benzo(a)pyrene	ND	U	2.4	0.76	1	06/24/10	07/01/10	KWG1006323	
Indeno(1,2,3-cd)pyrene	ND	U	2.4	0.87	1	06/24/10	07/01/10	KWG1006323	
Dibenz(a,h)anthracene	ND	U	2.4	0.80	1	06/24/10	07/01/10	KWG1006323	
Benzo(g,h,i)perylene	ND	U	2.4	0.85	1	06/24/10	07/01/10	KWG1006323	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Fluorene-d10	68	17-104	07/01/10	Acceptable
Fluoranthene-d10	67	27-106	07/01/10	Acceptable
Terphenyl-d14	83	35-109	07/01/10	Acceptable

Comments: _____

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Pacific EcoRisk Laboratories
Project: ACOE San Rafael Channel/16087
Sample Matrix: Sediment

Service Request: K1006477

Surrogate Recovery Summary
Polynuclear Aromatic Hydrocarbons

Extraction Method: EPA 3541
Analysis Method: 8270C SIM

Units: PERCENT
Level: Low

<u>Sample Name</u>	<u>Lab Code</u>	<u>Sur1</u>	<u>Sur2</u>	<u>Sur3</u>
SRC-2010-8-B-Comp	K1006477-001	68	79	79
Method Blank	KWG1006323-5	68	67	83
Batch QC	K1006486-001	56	63	67
Batch QCMS	KWG1006323-1	52	63	60
Batch QCDMS	KWG1006323-2	57	65	67
Lab Control Sample	KWG1006323-3	58	59	64
Duplicate Lab Control Sample	KWG1006323-4	72	70	80

Surrogate Recovery Control Limits (%)

Sur1 = Fluorene-d10	17-104
Sur2 = Fluoranthene-d10	27-106
Sur3 = Terphenyl-d14	35-109

Results flagged with an asterisk (*) indicate values outside control criteria.

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COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Pacific EcoRisk Laboratories
Project: ACOE San Rafael Channel/16087
Sample Matrix: Sediment

Service Request: K1006477
Date Extracted: 06/24/2010
Date Analyzed: 07/01/2010

Matrix Spike/Duplicate Matrix Spike Summary
Polynuclear Aromatic Hydrocarbons

Sample Name: Batch QC
Lab Code: K1006486-001
Extraction Method: EPA 3541
Analysis Method: 8270C SIM

Units: ug/Kg
Basis: Dry
Level: Low
Extraction Lot: KWG1006323

Analyte Name	Sample Result	Batch QCMS KWG1006323-1 Matrix Spike			Batch QCDMS KWG1006323-2 Duplicate Matrix Spike			%Rec Limits	RPD	RPD Limit
		Result	Expected	%Rec	Result	Expected	%Rec			
Naphthalene	4.1	366	546	66	330	545	60	11-119	10	40
Acenaphthylene	1.3	395	546	72	356	545	65	32-106	11	40
Acenaphthene	1.1	392	546	72	361	545	66	29-110	8	40
Fluorene	3.1	413	546	75	395	545	72	29-117	4	40
Phenanthrene	13	495	546	88	448	545	80	19-128	10	40
Anthracene	2.1	414	546	75	401	545	73	31-115	3	40
Fluoranthene	38	497	546	84	454	545	76	22-138	9	40
Pyrene	50	478	546	78	477	545	78	11-148	0	40
Benzo(b)fluoranthene	30	447	546	76	432	545	74	15-136	3	40
Benzo(k)fluoranthene	10	434	546	78	420	545	75	29-126	3	40
Benzo(a)anthracene	14	424	546	75	417	545	74	25-128	2	40
Chrysene	19	445	546	78	429	545	75	25-132	4	40
Benzo(a)pyrene	25	446	546	77	425	545	73	24-131	5	40
Indeno(1,2,3-cd)pyrene	32	475	546	81	464	545	79	20-136	2	40
Dibenz(a,h)anthracene	4.1	423	546	77	415	545	75	29-124	2	40
Benzo(g,h,i)perylene	41	508	546	86	500	545	84	24-127	2	40

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Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Pacific EcoRisk Laboratories
Project: ACOE San Rafael Channel/16087
Sample Matrix: Sediment

Service Request: K1006477
Date Extracted: 06/24/2010
Date Analyzed: 07/01/2010

Lab Control Spike/Duplicate Lab Control Spike Summary
Polynuclear Aromatic Hydrocarbons

Extraction Method: EPA 3541
Analysis Method: 8270C SIM

Units: ug/Kg
Basis: Dry
Level: Low
Extraction Lot: KWG1006323

Analyte Name	Lab Control Sample KWG1006323-3 Lab Control Spike			Duplicate Lab Control Sample KWG1006323-4 Duplicate Lab Control Spike			%Rec Limits	RPD	RPD Limit
	Result	Expected	%Rec	Result	Expected	%Rec			
Naphthalene	386	500	77	402	500	80	43-99	4	40
Acenaphthylene	417	500	83	439	500	88	41-110	5	40
Acenaphthene	406	500	81	428	500	86	44-104	5	40
Fluorene	424	500	85	459	500	92	49-105	8	40
Phenanthrene	406	500	81	470	500	94	47-104	15	40
Anthracene	427	500	85	454	500	91	47-112	6	40
Fluoranthene	395	500	79	435	500	87	51-111	10	40
Pyrene	441	500	88	456	500	91	48-113	4	40
Benzo(b)fluoranthene	431	500	86	437	500	87	51-113	1	40
Benzo(k)fluoranthene	444	500	89	467	500	93	56-114	5	40
Benz(a)anthracene	416	500	83	427	500	85	51-111	2	40
Chrysene	430	500	86	449	500	90	54-111	4	40
Benzo(a)pyrene	447	500	89	461	500	92	52-118	3	40
Indeno(1,2,3-cd)pyrene	444	500	89	460	500	92	42-123	3	40
Dibenz(a,h)anthracene	444	500	89	459	500	92	44-119	3	40
Benzo(g,h,i)perylene	474	500	95	493	500	99	46-114	4	40

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Pacific EcoRisk Laboratories
Project: ACOE San Rafael Channel/16087
Sample Matrix: Sediment

Service Request: K1006477
Date Collected: 06/10/2010
Date Received: 06/23/2010

Organochlorine Pesticides

Sample Name: SRC-2010-8-B-Comp
Lab Code: K1006477-001
Extraction Method: EPA 3541
Analysis Method: 8081A

Units: ug/Kg
Basis: Dry
Level: Low

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
alpha-BHC	ND	U	0.98	0.11	1	06/24/10	07/16/10	KWG1006549	
alpha-Chlordane	20		0.98	0.10	1	06/24/10	07/16/10	KWG1006549	
beta-BHC	ND	U	0.98	0.18	1	06/24/10	07/16/10	KWG1006549	
gamma-BHC (Lindane)	0.27	JP	0.98	0.080	1	06/24/10	07/16/10	KWG1006549	
delta-BHC	ND	Ui	0.98	0.98	1	06/24/10	07/16/10	KWG1006549	
Heptachlor	ND	Ui	0.98	0.16	1	06/24/10	07/16/10	KWG1006549	
Aldrin	1.5	P	0.98	0.16	1	06/24/10	07/16/10	KWG1006549	
gamma-Chlordane†	39		0.98	0.090	1	06/24/10	07/16/10	KWG1006549	
Heptachlor Epoxide	ND	Ui	0.98	0.98	1	06/24/10	07/16/10	KWG1006549	
Endosulfan I	ND	Ui	3.5	3.5	1	06/24/10	07/16/10	KWG1006549	
Dieldrin	1.4	P	0.98	0.14	1	06/24/10	07/16/10	KWG1006549	
4,4'-DDE	24	P	0.98	0.11	1	06/24/10	07/16/10	KWG1006549	
Endrin	ND	Ui	2.0	2.0	1	06/24/10	07/16/10	KWG1006549	
Endosulfan II	ND	Ui	0.98	0.98	1	06/24/10	07/16/10	KWG1006549	
4,4'-DDD	100	D	4.9	0.55	5	06/24/10	07/16/10	KWG1006549	
Endrin Aldehyde	ND	Ui	0.98	0.98	1	06/24/10	07/16/10	KWG1006549	
Endosulfan Sulfate	1.2	P	0.98	0.11	1	06/24/10	07/16/10	KWG1006549	
4,4'-DDT	15		0.98	0.17	1	06/24/10	07/16/10	KWG1006549	
Toxaphene	ND	Ui	150	150	1	06/24/10	07/16/10	KWG1006549	
Chlordane	280	D	49	9.5	5	06/24/10	07/16/10	KWG1006549	
2,4'-DDE	ND	Ui	5.1	5.1	1	06/24/10	07/16/10	KWG1006549	
2,4'-DDD	12	P	0.98	0.13	1	06/24/10	07/16/10	KWG1006549	
2,4'-DDT	8.3	P	0.98	0.058	1	06/24/10	07/16/10	KWG1006549	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Tetrachloro-m-xylene	54	21-112	07/16/10	Acceptable
Decachlorobiphenyl	56	15-130	07/16/10	Acceptable

REVISED

5:35 pm, Jul 20, 2010

Comments: _____

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Pacific EcoRisk Laboratories
Project: ACOE San Rafael Channel/16087
Sample Matrix: Sediment

Service Request: K1006477
Date Collected: 06/10/2010
Date Received: 06/23/2010

Organochlorine Pesticides

Sample Name: SRC-2010-8-B-Comp
Lab Code: K1006477-001

Units: ug/Kg
Basis: Dry

† Analyte Comments

gamma-Chlordane For this analyte (CAS Registry No. 5103-74-2), USEPA has corrected the name to be beta-Chlordane, also known as trans-Chlordane.

REVISED

5:35 pm, Jul 20, 2010

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Pacific EcoRisk Laboratories
Project: ACOE San Rafael Channel/16087
Sample Matrix: Sediment

Service Request: K1006477
Date Collected: NA
Date Received: NA

Organochlorine Pesticides

Sample Name: Method Blank
Lab Code: KWG1006549-10

Units: ug/Kg
Basis: Dry

Extraction Method: EPA 3541
Analysis Method: 8081A

Level: Low

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
alpha-BHC	ND	U	0.50	0.11	1	06/24/10	07/16/10	KWG1006549	
alpha-Chlordane	ND	U	0.50	0.10	1	06/24/10	07/16/10	KWG1006549	
beta-BHC	ND	U	0.50	0.18	1	06/24/10	07/16/10	KWG1006549	
gamma-BHC (Lindane)	ND	U	0.50	0.080	1	06/24/10	07/16/10	KWG1006549	
delta-BHC	ND	U	0.50	0.074	1	06/24/10	07/16/10	KWG1006549	
Heptachlor	ND	U	0.50	0.12	1	06/24/10	07/16/10	KWG1006549	
Aldrin	ND	U	0.50	0.16	1	06/24/10	07/16/10	KWG1006549	
gamma-Chlordane†	ND	U	0.50	0.090	1	06/24/10	07/16/10	KWG1006549	
Heptachlor Epoxide	ND	U	0.50	0.084	1	06/24/10	07/16/10	KWG1006549	
Endosulfan I	ND	U	0.50	0.063	1	06/24/10	07/16/10	KWG1006549	
Dieldrin	ND	U	0.50	0.14	1	06/24/10	07/16/10	KWG1006549	
4,4'-DDE	ND	U	0.50	0.11	1	06/24/10	07/16/10	KWG1006549	
Endrin	ND	U	0.50	0.094	1	06/24/10	07/16/10	KWG1006549	
Endosulfan II	ND	U	0.50	0.14	1	06/24/10	07/16/10	KWG1006549	
4,4'-DDD	ND	U	0.50	0.11	1	06/24/10	07/16/10	KWG1006549	
Endrin Aldehyde	ND	U	0.50	0.12	1	06/24/10	07/16/10	KWG1006549	
Endosulfan Sulfate	ND	U	0.50	0.11	1	06/24/10	07/16/10	KWG1006549	
4,4'-DDT	ND	U	0.50	0.17	1	06/24/10	07/16/10	KWG1006549	
Toxaphene	ND	U	25	4.8	1	06/24/10	07/16/10	KWG1006549	
Chlordane	ND	U	5.0	1.9	1	06/24/10	07/16/10	KWG1006549	
2,4'-DDE	ND	U	0.50	0.16	1	06/24/10	07/16/10	KWG1006549	
2,4'-DDD	ND	U	0.50	0.13	1	06/24/10	07/16/10	KWG1006549	
2,4'-DDT	ND	U	0.50	0.058	1	06/24/10	07/16/10	KWG1006549	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Tetrachloro-m-xylene	59	21-112	07/16/10	Acceptable
Decachlorobiphenyl	64	15-130	07/16/10	Acceptable

REVISED

5:35 pm, Jul 20, 2010

Comments: _____

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Pacific EcoRisk Laboratories
Project: ACOE San Rafael Channel/16087
Sample Matrix: Sediment

Service Request: K1006477
Date Collected: NA
Date Received: NA

Organochlorine Pesticides

Sample Name: Method Blank
Lab Code: KWG1006549-10

Units: ug/Kg
Basis: Dry

† Analyte Comments

gamma-Chlordane For this analyte (CAS Registry No. 5103-74-2), USEPA has corrected the name to be beta-Chlordane, also known as trans-Chlordane.

REVISED

5:36 pm, Jul 20, 2010

Comments: _____

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Pacific EcoRisk Laboratories
Project: ACOE San Rafael Channel/16087
Sample Matrix: Sediment

Service Request: K1006477

Surrogate Recovery Summary
Organochlorine Pesticides

Extraction Method: EPA 3541
Analysis Method: 8081A

Units: PERCENT
Level: Low

<u>Sample Name</u>	<u>Lab Code</u>	<u>Sur1</u>	<u>Sur2</u>
SRC-2010-8-B-Comp	K1006477-001	54	56
Method Blank	KWG1006549-10	59	64
Batch QC	K1006486-001	49	57
Batch QCMS	KWG1006549-1	51	57
Batch QCDMS	KWG1006549-2	45	54
Batch QCMS	KWG1006549-4	58	59
Batch QCDMS	KWG1006549-5	53	55
Batch QCMS	KWG1006549-7	50	57
Batch QCDMS	KWG1006549-8	51	59
Lab Control Sample	KWG1006549-3	61	71

REVISED*5:36 pm, Jul 20, 2010***Surrogate Recovery Control Limits (%)**

Sur1 = Tetrachloro-m-xylene	21-112
Sur2 = Decachlorobiphenyl	15-130

Results flagged with an asterisk (*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Pacific EcoRisk Laboratories
Project: ACOE San Rafael Channel/16087
Sample Matrix: Sediment

Service Request: K1006477
Date Extracted: 06/24/2010
Date Analyzed: 07/17/2010

Matrix Spike/Duplicate Matrix Spike Summary
Organochlorine Pesticides

Sample Name: Batch QC
Lab Code: K1006486-001
Extraction Method: EPA 3541
Analysis Method: 8081A

Units: ug/Kg
Basis: Dry
Level: Low
Extraction Lot: KWG1006549

Analyte Name	Sample Result	Batch QCMS KWG1006549-1 Matrix Spike			Batch QCDS KWG1006549-2 Duplicate Matrix Spike			%Rec Limits	RPD	RPD Limit
		Result	Expected	%Rec	Result	Expected	%Rec			
alpha-BHC	ND	14.3	22.7	63	12.6	22.7	55	23-133	13	40
alpha-Chlordane	ND	13.0	22.7	57	12.3	22.7	54	24-132	6	40
beta-BHC	ND	12.9	22.7	57	11.6	22.7	51	22-142	11	40
gamma-BHC (Lindane)	ND	14.3	22.7	63	12.8	22.7	56	26-135	11	40
delta-BHC	ND	16.1	22.7	71	14.4	22.7	64	25-148	11	40
Heptachlor	ND	16.0	22.7	70	14.3	22.7	63	21-136	11	40
Aldrin	ND	14.2	22.7	63	12.6	22.7	55	22-135	12	40
gamma-Chlordane	ND	14.6	22.7	64	13.2	22.7	58	24-133	10	40
Heptachlor Epoxide	ND	14.5	22.7	64	13.1	22.7	58	25-129	10	40
Endosulfan I	ND	12.8	22.7	56	11.5	22.7	51	15-119	10	40
Dieldrin	ND	14.5	22.7	64	13.2	22.7	58	26-133	10	40
4,4'-DDE	ND	24.5	22.7	108	24.8	22.7	109	22-142	1	40
Endrin	ND	14.5	22.7	64	13.2	22.7	58	22-145	10	40
Endosulfan II	ND	13.0	22.7	57	11.9	22.7	52	13-129	9	40
4,4'-DDD	ND	24.4	22.7	107	23.4	22.7	103	19-143	4	40
Endrin Aldehyde	ND	13.6	22.7	60	12.4	22.7	55	10-129	9	40
Endosulfan Sulfate	ND	14.4	22.7	63	13.2	22.7	58	20-134	9	40
4,4'-DDT	0.26	18.8	22.7	82	18.2	22.7	79	19-154	4	40

REVISED

5:36 pm, Jul 20, 2010

Results flagged with an asterisk (*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Pacific EcoRisk Laboratories
Project: ACOE San Rafael Channel/16087
Sample Matrix: Sediment

Service Request: K1006477
Date Extracted: 06/24/2010
Date Analyzed: 07/17/2010

Matrix Spike/Duplicate Matrix Spike Summary
Organochlorine Pesticides

Sample Name: Batch QC
Lab Code: K1006486-001
Extraction Method: EPA 3541
Analysis Method: 8081A

Units: ug/Kg
Basis: Dry
Level: Low
Extraction Lot: KWG1006549

Analyte Name	Sample Result	Batch QCMS KWG1006549-4 Matrix Spike			Batch QCDMS KWG1006549-5 Duplicate Matrix Spike			%Rec Limits	RPD	RPD Limit
		Result	Expected	%Rec	Result	Expected	%Rec			
Toxaphene	ND	218	227	96	216	227	95	20-155	1	40
Chlordane	ND	182	227	80	167	227	74	46-139	8	40

REVISED

5:36 pm, Jul 20, 2010

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COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Pacific EcoRisk Laboratories
Project: ACOE San Rafael Channel/16087
Sample Matrix: Sediment

Service Request: K1006477
Date Extracted: 06/24/2010
Date Analyzed: 07/17/2010

**Matrix Spike/Duplicate Matrix Spike Summary
 Organochlorine Pesticides**

Sample Name: Batch QC
Lab Code: K1006486-001
Extraction Method: EPA 3541
Analysis Method: 8081A

Units: ug/Kg
Basis: Dry
Level: Low
Extraction Lot: KWG1006549

Analyte Name	Sample Result	Batch QCMS KWG1006549-7 Matrix Spike			Batch QCDMS KWG1006549-8 Duplicate Matrix Spike			%Rec Limits	RPD	RPD Limit
		Result	Expected	%Rec	Result	Expected	%Rec			
2,4'-DDE	ND	14.3	22.7	63	15.3	22.7	68	24-141	7	40
2,4'-DDD	0.19	12.8	22.7	55	14.0	22.7	61	12-147	10	40
2,4'-DDT	0.42	15.4	22.7	66	17.0	22.7	73	15-141	10	40

REVISED

5:36 pm, Jul 20, 2010

Results flagged with an asterisk (*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Pacific EcoRisk Laboratories
Project: ACOE San Rafael Channel/16087
Sample Matrix: Sediment

Service Request: K1006477
Date Extracted: 06/24/2010
Date Analyzed: 07/16/2010

**Lab Control Spike Summary
Organochlorine Pesticides**

Extraction Method: EPA 3541
Analysis Method: 8081A

Units: ug/Kg
Basis: Dry
Level: Low
Extraction Lot: KWG1006549

Analyte Name	Lab Control Sample KWG1006549-3 Lab Control Spike			%Rec Limits
	Result	Expected	%Rec	
alpha-BHC	13.8	20.0	69	36-139
alpha-Chlordane	12.4	20.0	62	41-134
beta-BHC	13.2	20.0	66	38-142
gamma-BHC (Lindane)	13.9	20.0	69	40-142
delta-BHC	15.0	20.0	75	48-145
Heptachlor	12.0	20.0	60	39-135
Aldrin	13.3	20.0	66	37-134
gamma-Chlordane	13.6	20.0	68	41-135
Heptachlor Epoxide	13.9	20.0	69	45-118
Endosulfan I	12.6	20.0	63	35-121
Dieldrin	14.3	20.0	72	46-136
4,4'-DDE	17.6	20.0	88	46-141
Endrin	13.6	20.0	68	40-152
Endosulfan II	13.2	20.0	66	39-128
4,4'-DDD	18.6	20.0	93	46-146
Endrin Aldehyde	12.3	20.0	62	32-132
Endosulfan Sulfate	14.1	20.0	71	43-138
4,4'-DDT	17.0	20.0	85	46-151
Toxaphene	190	200	95	53-133
Chlordane	159	200	80	52-140
2,4'-DDE	15.1	20.0	75	49-112
2,4'-DDD	15.0	20.0	75	53-115
2,4'-DDT	16.0	20.0	80	44-120

REVISED

5:36 pm, Jul 20, 2010

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

July 16, 2010

Analytical Report for Service Request No: K1006482

Jeffrey Cotsifas
Pacific EcoRisk Laboratories
2250 Cordelia Road
Fairfield, CA 94534

RE: ACOE San Rafael Channel/16087


Dear Jeffrey:

Enclosed are the results of the rush samples submitted to our laboratory on June 23, 2010. For your reference, these analyses have been assigned our service request number K1006482.

Analyses were performed according to our laboratory's NELAP-approved quality assurance program. The test results meet requirements of the current NELAP standards, where applicable, and except as noted in the laboratory case narrative provided. For a specific list of NELAP-accredited analytes, refer to the certifications section at www.caslab.com. All results are intended to be considered in their entirety, and Columbia Analytical Services, Inc. (CAS) is not responsible for use of less than the complete report. Results apply only to the items submitted to the laboratory for analysis and individual items (samples) analyzed, as listed in the report.

Please call if you have any questions. My extension is 3281. You may also contact me via Email at PDivvela@caslab.com.

Respectfully submitted,

Columbia Analytical Services, Inc.
Pradeep Divvela
Project Chemist

PD/ln

Page 1 of 68

Acronyms

ASTM	American Society for Testing and Materials
A2LA	American Association for Laboratory Accreditation
CARB	California Air Resources Board
CAS Number	Chemical Abstract Service registry Number
CFC	Chlorofluorocarbon
CFU	Colony-Forming Unit
DEC	Department of Environmental Conservation
DEQ	Department of Environmental Quality
DHS	Department of Health Services
DOE	Department of Ecology
DOH	Department of Health
EPA	U. S. Environmental Protection Agency
ELAP	Environmental Laboratory Accreditation Program
GC	Gas Chromatography
GC/MS	Gas Chromatography/Mass Spectrometry
LUFT	Leaking Underground Fuel Tank
M	Modified
MCL	Maximum Contaminant Level is the highest permissible concentration of a substance allowed in drinking water as established by the USEPA.
MDL	Method Detection Limit
MPN	Most Probable Number
MRL	Method Reporting Limit
NA	Not Applicable
NC	Not Calculated
NCASI	National Council of the Paper Industry for Air and Stream Improvement
ND	Not Detected
NIOSH	National Institute for Occupational Safety and Health
PQL	Practical Quantitation Limit
RCRA	Resource Conservation and Recovery Act
SIM	Selected Ion Monitoring
TPH	Total Petroleum Hydrocarbons
tr	Trace level is the concentration of an analyte that is less than the PQL but greater than or equal to the MDL.

Inorganic Data Qualifiers

- * The result is an outlier. See case narrative.
- # The control limit criteria is not applicable. See case narrative.
- B The analyte was found in the associated method blank at a level that is significant relative to the sample result as defined by the DOD or NELAC standards.
- E The result is an estimate amount because the value exceeded the instrument calibration range.
- J The result is an estimated value that was detected outside the quantitation range.
- U The analyte was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL.
DOD-QSM 4.1 definition : Analyte was not detected and is reported as less than the LOD or as defined by the project. The detection limit is adjusted for dilution.
- i The MRL/MDL or LOQ/LOD is elevated due to a matrix interference.
- X See case narrative.
- Q See case narrative. One or more quality control criteria was outside the limits.

Metals Data Qualifiers

- # The control limit criteria is not applicable. See case narrative.
- J The result is an estimated value that was detected outside the quantitation range.
- E The percent difference for the serial dilution was greater than 10%, indicating a possible matrix interference in the sample.
- M The duplicate injection precision was not met.
- N The Matrix Spike sample recovery is not within control limits. See case narrative.
- S The reported value was determined by the Method of Standard Additions (MSA).
- U The analyte was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL.
DOD-QSM 4.1 definition : Analyte was not detected and is reported as less than the LOD or as defined by the project. The detection limit is adjusted for dilution.
- W The post-digestion spike for furnace AA analysis is out of control limits, while sample absorbance is less than 50% of spike absorbance.
- i The MRL/MDL or LOQ/LOD is elevated due to a matrix interference.
- X See case narrative.
- + The correlation coefficient for the MSA is less than 0.995.
- Q See case narrative. One or more quality control criteria was outside the limits.

Organic Data Qualifiers

- * The result is an outlier. See case narrative.
- # The control limit criteria is not applicable. See case narrative.
- A A tentatively identified compound, a suspected aldol-condensation product.
- B The analyte was found in the associated method blank at a level that is significant relative to the sample result as defined by the DOD or NELAC standards.
- C The analyte was qualitatively confirmed using GC/MS techniques, pattern recognition, or by comparing to historical data.
- D The reported result is from a dilution.
- E The result is an estimate amount because the value exceeded the instrument calibration range.
- J The result is an estimated value that was detected outside the quantitation range.
- N The result is presumptive. The analyte was tentatively identified, but a confirmation analysis was not performed.
- p The GC or HPLC confirmation criteria was exceeded. The relative percent difference is greater than 40% between the two analytical results.
- U The analyte was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL.
DOD-QSM 4.1 definition : Analyte was not detected and is reported as less than the LOD or as defined by the project. The detection limit is adjusted for dilution.
- i The MRL/MDL or LOQ/LOD is elevated due to a chromatographic interference.
- X See case narrative.
- Q See case narrative. One or more quality control criteria was outside the limits.

Additional Petroleum Hydrocarbon Specific Qualifiers

- F The chromatographic fingerprint of the sample matches the elution pattern of the calibration standard.
- L The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of lighter molecular weight constituents than the calibration standard.
- H The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of heavier molecular weight constituents than the calibration standard.
- O The chromatographic fingerprint of the sample resembles an oil, but does not match the calibration standard.
- Y The chromatographic fingerprint of the sample resembles a petroleum product eluting in approximately the correct carbon range, but the elution pattern does not match the calibration standard.
- Z The chromatographic fingerprint does not resemble a petroleum product.

Columbia Analytical Services, Inc.
Kelso, WA
State Certifications, Accreditations, and Licenses

Program	Number
Alaska DEC UST	UST-040
Arizona DHS	AZ0339
Arkansas - DEQ	88-0637
California DHS	2286
Colorado DPHE	-
Florida DOH	E87412
Hawaii DOH	-
Idaho DHW	-
Indiana DOH	C-WA-01
Louisiana DEQ	3016
Louisiana DHH	LA050010
Maine DHS	WA0035
Michigan DEQ	9949
Minnesota DOH	053-999-368
Montana DPHHS	CERT0047
Nevada DEP	WA35
New Jersey DEP	WA005
New Mexico ED	-
North Carolina DWQ	605
Oklahoma DEQ	9801
Oregon - DHS	WA200001
South Carolina DHEC	61002
Utah DOH	COLU
Washington DOE	C1203
Wisconsin DNR	998386840
Wyoming (EPA Region 8)	-

Case Narrative

COLUMBIA ANALYTICAL SERVICES, INC.

Client: Pacific EcoRisk Laboratories
Project: ACOE San Rafael Channel
Sample Matrix: Sediment

Service Request No.: K1006482
Date Received: 06/23/10

CASE NARRATIVE

All analyses were performed consistent with the quality assurance program of Columbia Analytical Services, Inc. (CAS). This report contains analytical results for samples designated for Tier II data deliverables. When appropriate to the method, method blank results have been reported with each analytical test. Surrogate recoveries have been reported for all applicable organic analyses. Additional quality control analyses reported herein include: Laboratory Duplicate (DUP), Matrix Spike (MS), Matrix/Duplicate Matrix Spike (MS/DMS), Laboratory Control Sample (LCS), and Laboratory/Duplicate Laboratory Control Sample (LCS/DLCS).

Sample Receipt

Four sediment samples were received for analysis at Columbia Analytical Services on 06/23/10. The samples were received in good condition and consistent with the accompanying chain of custody form. The samples were stored in a refrigerator at 4°C upon receipt at the laboratory.

General Chemistry Parameters

No anomalies associated with the analysis of these samples were observed.

Total Metals

No anomalies associated with the analysis of these samples were observed.

Diesel Range Organics by EPA Method 8015B

Sample Notes and Discussion:

The control criteria for matrix spike recovery of Residual Range Organics (RRO) for sample SRC-2010-8-1 were not applicable. The analyte concentration in the sample was significantly higher than the added spike concentration, preventing accurate evaluation of the spike recovery.

No other anomalies associated with the analysis of these samples were observed.

Gasoline Range Organics by EPA Method 8015B

No anomalies associated with the analysis of these samples were observed.

Herbicides by EPA Method 8151

Calibration Verification (CCV) Exceptions:

The upper control criterion was exceeded for MCPP and MCPA in CCV 0629F003 and 0629F015. The field samples analyzed in this sequence did not contain the analytes in question. Since the apparent problem indicated a potential high bias, the data quality was not affected. No further corrective action was required.

Approved by _____ Date _____

The primary evaluation criterion was exceeded for 2,4-Dichlorophenylacetic Acid in CCV 0629F003 and 0629F015. In accordance with CAS standard operating procedures, the alternative evaluation specified in the EPA method was performed using the average percent recovery of all analytes in the verification standard. The standard met the alternative evaluation criteria.

Results for 2,4-Dichlorophenylacetic Acid in all samples were reported from a column using average percent recovery of all analytes in the verification standard.

Matrix Spike Recovery Exceptions:

The matrix spike recovery of MCPP for sample SRC-2010-8-1 was outside control criteria. Recoveries in the Laboratory Control Sample (LCS) were acceptable, which indicated the analytical batch was in control. The matrix spike outlier suggested a potential high bias in this matrix. No further corrective action was appropriate.

Relative Percent Difference Exceptions:

The Relative Percent Difference (RPD) for the replicate Matrix Spike analysis of MCPP and MCPA n sample SRC-2010-8-1 was outside the normal CAS control limits. The variability in the results was attributed to the heterogeneous character of the sample. The sample contained relatively large amounts of roots, grass, and leaves, which complicated the homogenization process. Standard mixing techniques were used, but were not sufficient for complete homogenization of this sample.

Elevated Detection Limits:

The detection limits were elevated for all analytes in all field samples. The sample extracts were diluted prior to instrumental analysis due to relatively high levels of non-target background components. The extracts were highly colored and viscous, which indicated the need to perform a dilution prior to injection into the instrument. A semiquantitative screen was performed prior to final analysis. The results of the screening indicated the need to perform a dilution. The results were flagged to indicate the matrix interference.

No other anomalies associated with the analysis of these samples were observed.

Semivolatile Organic Compounds by EPA Method 8270C

Relative Percent Difference Exceptions:

The Relative Percent Difference (RPD) for Pentachlorophenol in the replicate matrix spike analyses of Batch QC was outside control criteria. All spike recoveries in the MS, DMS, and associated Laboratory Control Sample (LCS) were within acceptance limits, indicating the analytical batch was in control. The compound was not detected in the associated samples. No further corrective action was appropriate.

Elevated Detection Limits:

The detection limits were elevated for in samples SRC-2010-8-1, SRC-2010-8-2, SRC-2010-8-3, and SRC-2010-8-4. The sample extracts were diluted prior to instrumental analysis due to relatively high levels of non-target background components. The extract was highly colored and viscous, which indicated the need to perform a dilution prior to injection into the instrument. Clean-up of the extract was performed within the scope of the method, but did not eliminate enough of the background components to prevent dilution.

The detection limit was elevated for Phenol in sample SRC-2010-8-3. The chromatogram indicated the presence of non-target background components. The matrix interference prevented adequate resolution of the target compound at the normal limit. The result was flagged to indicate the matrix interference.

No other anomalies associated with the analysis of these samples were observed.

Approved by  Date 07/16/10

Chain of Custody



Pacific EcoRisk

ENVIRONMENTAL CONSULTING & TESTING

2250 Cordelia Rd., Fairfield, CA 94534

(707)207-7760

CAS CHAIN-OF-CUSTODY RECORD

006

Client Name:		Pacific EcoRisk				REQUESTED ANALYSIS													
Client Address:		2250 Cordelia Rd. Fairfield, CA 94534				* See Scope of Work	Grain Size Analysis												
Sampled By:		Mike McElroy																	
Phone:		(707) 207-7760																	
FAX:		(707) 207-7916																	
Project Manager:		Jeff Cotsifas																	
Project Name:		ACOE (San Rafael Channel)																	
PO Number:		16087																	
	Client Sample ID	Sample Date	Sample Time	Sample Matrix*	Container														
					Number	Type													
1	SRC-2010-8-1	6/10/10	11:55	Sed	1	8oz glass	x	x											
2	SRC-2010-8-2	6/10/10	12:45	Sed	1	8oz glass	x	x											
3	SRC-2010-8-3	6/10/10	13:30	Sed	1	8oz glass	x	x											
4	SRC-2010-8-4	6/11/10	11:40	Sed	1	8oz glass	x	x											
5																			
6																			
7																			
8																			
9																			
10																			
Correct Containers:		Yes	No		RELIQUINSHED BY														
Sample Temperature:		Ambient	Cold	Warm	Signature:				Signature:										
Sample Preservative:		Yes	No		Print:				Print:										
Turnaround Time:		STD	Specify:		Organization:				Organization:										
Comments: * Analyze for all of the constituents in Table 1 of the ACOE Master SAP and the constituents identified in Section L of the USFWS Biological Opinion for placement at the HWRP. The HWRP specific constituents that are not in Table 1 of the Master SAP or have lower reporting limits than the Master SAP are identified in Table 6 of the San Rafael Channel SOW. Analyte list to follow via email. <u>NO DIOXINS FOR THESE INDIVIDUAL CORES!</u>					DATE:				DATE:										
					TIME:				TIME:										
					RECEIVED BY														
Please take grain size analysis from jar. We were volume limited.					Signature:				Signature:										
					Print:				Print:										
					Organization:				Organization:										
					DATE:				DATE:										
					TIME:				TIME:										

*MATRIX CODES: (SED = Sediment); (FW = Freshwater); (WW = Wastewater); (STRMW = Stormwater)

Columbia Analytical Services, Inc.
Cooler Receipt and Preservation Form

PC P.D

Client / Project: Pal. Ferriisk Service Request K10 06482
 Received: 6/23/10 Opened: 6/23/10 By: aj

1. Samples were received via? *Mail* Fed Ex *UPS* *DHL* *PDX* *Courier* *Hand Delivered*
 2. Samples were received in: (circle) Cooler *Box* *Envelope* *Other* NA
 3. Were custody seals on coolers? *NA* *Y* N If yes, how many and where? _____
 If present, were custody seals intact? *Y* *N* If present, were they signed and dated? *Y* *N*

Cooler Temp °C	Temp Blank °C	Thermometer ID	Cooler/COC ID	NA	Tracking Number	NA	Filed
0.3	2.0	2109			798784387489		X
1.0	5.4	223			793661755787		

7. Packing material used. *Inserts* Baggies Bubble Wrap Gel Packs *Wet Ice* *Sleeves* *Other* _____
 8. Were custody papers properly filled out (ink, signed, etc.)? *NA* Y *N*
 9. Did all bottles arrive in good condition (unbroken)? *Indicate in the table below.* *NA* Y *N*
 10. Were all sample labels complete (i.e analysis, preservation, etc.)? *NA* Y *N*
 11. Did all sample labels and tags agree with custody papers? *Indicate major discrepancies in the table on page 2.* *NA* Y *N*
 12. Were appropriate bottles/containers and volumes received for the tests indicated? *NA* Y *N*
 13. Were the pH-preserved bottles (*see SMO GEN SOP*) received at the appropriate pH? *Indicate in the table below* NA *Y* *N*
 14. Were VOA vials received without headspace? *Indicate in the table below.* NA *Y* *N*
 15. Was C12/Res negative? NA *Y* *N*

Sample ID on Bottle	Sample ID on COC	Identified by:

Sample ID	Bottle Count	Bottle Type	Out of Temp	Head-space	Broke	pH	Reagent	Volume added	Reagent Lot Number	Initials	Time

Notes, Discrepancies, & Resolutions: _____

Total Solids

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Pacific EcoRisk Laboratories
Project: ACOE San Rafael Chan/16087
Sample Matrix: Sediment

Service Request: K1006482

Total Solids

Prep Method: NONE
Analysis Method: 160.3M
Test Notes:

Units: PERCENT
Basis: Wet

Sample Name	Lab Code	Date Collected	Date Received	Date Analyzed	Result	Result Notes
SRC-2010-8-1	K1006482-001	06/10/2010	06/23/2010	06/26/2010	42.7	
SRC-2010-8-2	K1006482-002	06/10/2010	06/23/2010	06/26/2010	59.8	
SRC-2010-8-3	K1006482-003	06/10/2010	06/23/2010	06/26/2010	38.1	
SRC-2010-8-4	K1006482-004	06/10/2010	06/23/2010	06/26/2010	45.4	

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Pacific EcoRisk Laboratories
Project: ACOE San Rafael Chan/16087
Sample Matrix: Sediment

Service Request: K1006482
Date Collected: 06/10/2010
Date Received: 06/23/2010
Date Analyzed: 06/26/2010

Duplicate Sample Summary
Total Solids

Prep Method: NONE
Analysis Method: 160.3M
Test Notes:

Units: PERCENT
Basis: Wet

Sample Name	Lab Code	Sample Result	Duplicate Sample Result	Average	Relative Percent Difference	Result Notes
SRC-2010-8-1	K1006482-001	42.7	42.3	42.5	<1	

General Chemistry Parameters

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: Pacific EcoRisk Laboratories
Project: ACOE San Rafael Channel/16087
Sample Matrix: Sediment

Service Request: K1006482
Date Collected: 6/10/2010
Date Received: 6/23/2010
Date Analyzed: 6/29/2010

Particle Size Determination
 Puget Sound Estuary Program Protocol

Sample Name: SRC-2010-8-1
Lab Code: K1006482-001

Sand Fraction: Dry Weight (Grams) 9.9468
 Sand Fraction: Weight Recovered (Grams) 9.9736
 Sand Fraction: Percent Recovery 100

Description	Phi Size	Dry Weight (Grams)	Percent of Total Weight Recovered
Gravel (>2.00 mm)	<-1 Ø	1.3904	5.56
Sand, Very Coarse (1.00 mm to 2.00 mm)	-1 to 0 Ø	1.0911	4.36
Sand, Coarse (0.50	0 to 1 Ø	0.7939	3.17
Sand, Medium (0.250 mm to 0.500 mm)	1 to 2 Ø	1.0057	4.02
Sand, Fine (0.125 mm to 0.250 mm)	2 to 3 Ø	1.5588	6.23
Sand, Very Fine (0.0625 mm to 0.125 mm)	3 to 4 Ø	3.1362	12.5
Silt (0.0039 mm to 0.0625 mm)	4 to 8 Ø	8.6250	34.5
Clay (< 0.0039 mm)	> 8 Ø	7.8100	31.2
Total		25.4111	102

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: Pacific EcoRisk Laboratories
Project: ACOE San Rafael Channel/16087
Sample Matrix: Sediment

Service Request: K1006482
Date Collected: 6/10/2010
Date Received: 6/23/2010
Date Analyzed: 6/29/2010

Particle Size Determination
 Puget Sound Estuary Program Protocol

Sample Name: SRC-2010-8-2
 Lab Code: K1006482-002

Sand Fraction: Dry Weight (Grams) 27.9243
 Sand Fraction: Weight Recovered (Grams) 27.9318
 Sand Fraction: Percent Recovery 100

Description	Phi Size	Dry Weight (Grams)	Percent of Total Weight Recovered
Gravel (>2.00 mm)	<-1 Ø	5.5516	16.9
Sand, Very Coarse (1.00 mm to 2.00 mm)	-1 to 0 Ø	2.5425	7.73
Sand, Coarse (0.50	0 to 1 Ø	3.6567	11.1
Sand, Medium (0.250 mm to 0.500 mm)	1 to 2 Ø	6.5425	19.9
Sand, Fine (0.125 mm to 0.250 mm)	2 to 3 Ø	2.9954	9.10
Sand, Very Fine (0.0625 mm to 0.125 mm)	3 to 4 Ø	6.1913	18.8
Silt (0.0039 mm to 0.0625 mm)	4 to 8 Ø	2.9100	8.84
Clay (< 0.0039 mm)	> 8 Ø	2.2950	6.97
Total		32.6850	99.3

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: Pacific EcoRisk Laboratories
Project: ACOE San Rafael Channel/16087
Sample Matrix: Sediment

Service Request: K1006482
Date Collected: 6/10/2010
Date Received: 6/23/2010
Date Analyzed: 6/29/2010

Particle Size Determination
 Puget Sound Estuary Program Protocol

Sample Name: SRC-2010-8-3
Lab Code: K1006482-003

Sand Fraction: Dry Weight (Grams) 15.7488
 Sand Fraction: Weight Recovered (Grams) 15.5029
 Sand Fraction: Percent Recovery 98.4

Description	Phi Size	Dry Weight (Grams)	Percent of Total Weight Recovered
Gravel (>2.00 mm)	<-1 Ø	2.0884	10.8
Sand, Very Coarse (1.00 mm to 2.00 mm)	-1 to 0 Ø	1.0241	5.32
Sand, Coarse (0.50	0 to 1 Ø	0.8758	4.55
Sand, Medium (0.250 mm to 0.500 mm)	1 to 2 Ø	1.6658	8.65
Sand, Fine (0.125 mm to 0.250 mm)	2 to 3 Ø	5.7813	30.0
Sand, Very Fine (0.0625 mm to 0.125 mm)	3 to 4 Ø	3.3093	17.2
Silt (0.0039 mm to 0.0625 mm)	4 to 8 Ø	3.7250	19.3
Clay (< 0.0039 mm)	> 8 Ø	1.8950	9.84
Total		20.3647	106

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: Pacific EcoRisk Laboratories
Project: ACOE San Rafael Channel/16087
Sample Matrix: Sediment

Service Request: K1006482
Date Collected: 6/10/2010
Date Received: 6/23/2010
Date Analyzed: 6/29/2010

Particle Size Determination
 Puget Sound Estuary Program Protocol

Sample Name: SRC-2010-8-4
Lab Code: K1006482-004

Sand Fraction: Dry Weight (Grams) 11.0905
 Sand Fraction: Weight Recovered (Grams) 10.9696
 Sand Fraction: Percent Recovery 98.9

Description	Phi Size	Dry Weight (Grams)	Percent of Total Weight Recovered
Gravel (>2.00 mm)	<-1 Ø	0.9582	3.89
Sand, Very Coarse (1.00 mm to 2.00 mm)	-1 to 0 Ø	0.8253	3.35
Sand, Coarse (0.50	0 to 1 Ø	0.9766	3.97
Sand, Medium (0.250 mm to 0.500 mm)	1 to 2 Ø	1.3595	5.53
Sand, Fine (0.125 mm to 0.250 mm)	2 to 3 Ø	2.0573	8.36
Sand, Very Fine (0.0625 mm to 0.125 mm)	3 to 4 Ø	3.7221	15.1
Silt (0.0039 mm to 0.0625 mm)	4 to 8 Ø	10.2600	41.7
Clay (< 0.0039 mm)	> 8 Ø	4.4600	18.1
Total		24.6190	100

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: Pacific EcoRisk Laboratories
Project: ACOE San Rafael Channel/16087
Sample Matrix: Sediment

Service Request: K1006482
Date Collected: 6/10/2010
Date Received: 6/23/2010
Date Analyzed: 6/29/2010

Particle Size Determination
 Puget Sound Estuary Program Protocol

Sample Name: SRC-2010-8-2
Lab Code: K1006482-002DUP

Sand Fraction: Dry Weight (Grams) 27.4730
 Sand Fraction: Weight Recovered (Grams) 27.4749
 Sand Fraction: Percent Recovery 100

Description	Phi Size	Dry Weight (Grams)	Percent of Total Weight Recovered
Gravel (>2.00 mm)	<-1 Ø	6.3628	20.6
Sand, Very Coarse (1.00 mm to 2.00 mm)	-1 to 0 Ø	2.7957	9.06
Sand, Coarse (0.50	0 to 1 Ø	3.4387	11.1
Sand, Medium (0.250 mm to 0.500 mm)	1 to 2 Ø	6.3038	20.4
Sand, Fine (0.125 mm to 0.250 mm)	2 to 3 Ø	5.7238	18.6
Sand, Very Fine (0.0625 mm to 0.125 mm)	3 to 4 Ø	2.4253	7.86
Silt (0.0039 mm to 0.0625 mm)	4 to 8 Ø	2.8800	9.34
Clay (< 0.0039 mm)	> 8 Ø	2.2200	7.20
Total		32.1501	104

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: Pacific EcoRisk Laboratories
Project: ACOE San Rafael Channel/16087
Sample Matrix: Sediment

Service Request: K1006482
Date Collected: 6/10/2010
Date Received: 6/23/2010
Date Analyzed: 6/29/2010

Particle Size Determination
 Puget Sound Estuary Program Protocol

Sample Name: SRC-2010-8-2
Lab Code: K1006482-002TRP

Sand Fraction: Dry Weight (Grams) 30.1017
 Sand Fraction: Weight Recovered (Grams) 30.6925
 Sand Fraction: Percent Recovery 102

Description	Phi Size	Dry Weight (Grams)	Percent of Total Weight Recovered
Gravel (>2.00 mm)	<-1 Ø	6.3363	20.5
Sand, Very Coarse (1.00 mm to 2.00 mm)	-1 to 0 Ø	2.9863	9.68
Sand, Coarse (0.50	0 to 1 Ø	4.1688	13.5
Sand, Medium (0.250 mm to 0.500 mm)	1 to 2 Ø	7.2684	23.6
Sand, Fine (0.125 mm to 0.250 mm)	2 to 3 Ø	7.0336	22.8
Sand, Very Fine (0.0625 mm to 0.125 mm)	3 to 4 Ø	2.5376	8.23
Silt (0.0039 mm to 0.0625 mm)	4 to 8 Ø	1.0450	3.39
Clay (< 0.0039 mm)	> 8 Ø	2.3050	7.47
Total		33.6810	109

Metals

Columbia Analytical Services

- Cover Page - INORGANIC ANALYSIS DATA PACKAGE

Client: Pacific EcoRisk Laboratories
Project Name: ACOE San Rafael Channel
Project No.: 16087

Service Request: K1006482

Sample Name:

Batch QC1D

Batch QC1S

Batch QC2D

Batch QC2S

SRC-2010-8-1

SRC-2010-8-2

SRC-2010-8-3

SRC-2010-8-4

Method Blank

Lab Code:

K1006477-001D

K1006477-001S

K1006480-001D

K1006480-001S

K1006482-001

K1006482-002

K1006482-003

K1006482-004

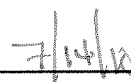
K1006482-MB

Comments:

Approved By:



Date:



Metals

- 1 -

INORGANIC ANALYSIS DATA PACKAGE

Client: Pacific EcoRisk Laboratories

Service Request: K1006482

Project No.: 16087

Date Collected: 06/10/10

Project Name: ACOE San Rafael Channel

Date Received: 06/23/10

Matrix: SEDIMENT

Units: mg/Kg

Basis: DRY

Sample Name: SRC-2010-8-1

Lab Code: K1006482-001

Analyte	Analysis Method	MRL	MDL	Dil. Factor	Date Extracted	Date Analyzed	Result	C	Q
Barium	6010B	2.0	0.3	2.0	07/08/10	07/09/10	70.4		
Beryllium	6020	0.020	0.003	5.0	07/08/10	07/12/10	0.611		
Boron	6010B	10.1	0.3	2.0	07/08/10	07/09/10	38.5		
Cobalt	6020	0.020	0.001	5.0	07/08/10	07/12/10	14.8		
Manganese	6010B	2.01	0.04	2.0	07/08/10	07/09/10	337		
Vanadium	6010B	2.0	0.4	2.0	07/08/10	07/09/10	60.5		

% Solids: 42.7

Comments:

Metals

- 1 -

INORGANIC ANALYSIS DATA PACKAGE

Client: Pacific EcoRisk Laboratories

Service Request: K1006482

Project No.: 16087

Date Collected: 06/10/10

Project Name: ACOE San Rafael Channel

Date Received: 06/23/10

Matrix: SEDIMENT

Units: mg/Kg

Basis: DRY

Sample Name: SRC-2010-8-2

Lab Code: K1006482-002

Analyte	Analysis Method	MRL	MDL	Dil. Factor	Date Extracted	Date Analyzed	Result	C	Q
Barium	6010B	2.0	0.3	2.0	07/08/10	07/09/10	58.3		
Beryllium	6020	0.021	0.003	5.0	07/08/10	07/12/10	0.519		
Boron	6010B	9.9	0.3	2.0	07/08/10	07/09/10	21.0		
Cobalt	6020	0.021	0.001	5.0	07/08/10	07/12/10	12.4		
Manganese	6010B	1.98	0.04	2.0	07/08/10	07/09/10	299		
Vanadium	6010B	2.0	0.4	2.0	07/08/10	07/09/10	32.0		

% Solids: 59.8

Comments:

Metals

- 1 -

INORGANIC ANALYSIS DATA PACKAGE

Client: Pacific EcoRisk Laboratories Service Request: K1006482
Project No.: 16087 Date Collected: 06/10/10
Project Name: ACOE San Rafael Channel Date Received: 06/23/10
Matrix: SEDIMENT Units: mg/Kg
Basis: DRY

Sample Name: SRC-2010-8-3 Lab Code: K1006482-003

Analyte	Analysis Method	MRL	MDL	Dil. Factor	Date Extracted	Date Analyzed	Result	C	Q
Barium	6010B	2.0	0.3	2.0	07/08/10	07/09/10	78.1		
Beryllium	6020	0.020	0.003	5.0	07/08/10	07/12/10	0.496		
Boron	6010B	9.9	0.3	2.0	07/08/10	07/09/10	55.0		
Cobalt	6020	0.020	0.001	5.0	07/08/10	07/12/10	11.1		
Manganese	6010B	1.98	0.04	2.0	07/08/10	07/09/10	254		
Vanadium	6010B	2.0	0.4	2.0	07/08/10	07/09/10	39.0		

% Solids: 38.1

Comments:

Metals

- 1 -

INORGANIC ANALYSIS DATA PACKAGE

Client: Pacific EcoRisk Laboratories

Service Request: K1006482

Project No.: 16087

Date Collected: 06/10/10

Project Name: ACOE San Rafael Channel

Date Received: 06/23/10

Matrix: SEDIMENT

Units: mg/Kg

Basis: DRY

Sample Name: SRC-2010-8-4

Lab Code: K1006482-004

Analyte	Analysis Method	MRL	MDL	Dil. Factor	Date Extracted	Date Analyzed	Result	C	Q
Barium	6010B	2.0	0.3	2.0	07/08/10	07/09/10	85.5		
Beryllium	6020	0.020	0.003	5.0	07/08/10	07/12/10	0.570		
Boron	6010B	10.0	0.3	2.0	07/08/10	07/09/10	37.9		
Cobalt	6020	0.020	0.001	5.0	07/08/10	07/12/10	15.2		
Manganese	6010B	1.99	0.04	2.0	07/08/10	07/09/10	326		
Vanadium	6010B	2.0	0.4	2.0	07/08/10	07/09/10	53.2		

% Solids: 45.4

Comments:

Metals

- 1 -

INORGANIC ANALYSIS DATA PACKAGE

Client: Pacific EcoRisk Laboratories Service Request: K1006482
Project No.: 16087 Date Collected:
Project Name: ACOE San Rafael Channel Date Received:
Matrix: SEDIMENT Units: mg/Kg
Basis: DRY

Sample Name: Method Blank Lab Code: K1006482-MB

Analyte	Analysis Method	MRL	MDL	Dil. Factor	Date Extracted	Date Analyzed	Result	C	Q
Barium	6010B	2.0	0.3	2.0	07/08/10	07/09/10	0.3	U	
Beryllium	6020	0.020	0.003	5.0	07/08/10	07/12/10	0.003	J	
Boron	6010B	10.0	0.3	2.0	07/08/10	07/09/10	0.4	J	
Cobalt	6020	0.020	0.001	5.0	07/08/10	07/12/10	0.010	J	
Manganese	6010B	2.00	0.04	2.0	07/08/10	07/09/10	0.07	J	
Vanadium	6010B	2.0	0.4	2.0	07/08/10	07/09/10	0.4	U	

% Solids: 100.0

Comments:

Metals

- 5A -

SPIKE SAMPLE RECOVERY

Client: Pacific EcoRisk Laboratories **Service Request:** K1006482
Project No.: 16087 **Units:** MG/KG
Project Name: ACOE San Rafael Channel **Basis:** DRY
Matrix: SEDIMENT **% Solids:** 51.0

Sample Name: Batch QC1S

Lab Code: K1006477-001S

Analyte	Control Limit %R	Spike Result	C	Sample Result	C	Spike Added	%R	Q	Method
Beryllium	64 - 133	11.3		0.597		10.16	105.3		6020
Cobalt	74 - 118	114		14.2		101.60	98.2		6020

An empty field in the Control Limit column indicates the control limit is not applicable

Metals

- 5A -

SPIKE SAMPLE RECOVERY

Client: Pacific EcoRisk Laboratories Service Request: K1006482
Project No.: 16087 Units: MG/KG
Project Name: ACOE San Rafael Channel Basis: DRY
Matrix: SEDIMENT % Solids: 54.4

Sample Name: Batch QC2S

Lab Code: K1006480-001S

Analyte	Control Limit %R	Spike Result	C	Sample Result	C	Spike Added	%R	Q	Method
Barium	60 - 139	458		70.3		404.01	96.0		6010B
Boron	53 - 135	128		31.7		101.00	95.3		6010B
Manganese	28 - 181	337		247		101.00	89.1		6010B
Vanadium	64 - 132	135		35.1		101.00	98.9		6010B

An empty field in the Control Limit column indicates the control limit is not applicable

Metals

- 6 -

DUPLICATES

Client: Pacific EcoRisk Laboratories

Service Request: K1006482

Project No.: 16087

Units: MG/KG

Project Name: ACOE San Rafael Channel

Basis: DRY

Matrix: SEDIMENT

% Solids: 51.0

Sample Name: Batch QC1D

Lab Code: K1006477-001D

Analyte	Control Limit	Sample (S)	C	Duplicate (D)	C	RPD	Q	Method
Beryllium	20	0.597		0.579		3.1		6020
Cobalt	20	14.2		13.9		2.1		6020

An empty field in the Control Limit column indicates the control limit is not applicable.

Metals

- 6 -

DUPLICATES

Client: Pacific EcoRisk Laboratories Service Request: K1006482
 Project No.: 16087 Units: MG/KG
 Project Name: ACOE San Rafael Channel Basis: DRY
 Matrix: SEDIMENT % Solids: 54.4

Sample Name: Batch QC2D

Lab Code: K1006480-001D

Analyte	Control Limit	Sample (S)	C	Duplicate (D)	C	RPD	Q	Method
Barium	30	70.3		70.2		0.1		6010B
Boron		32		31		3.2		6010B
Manganese	30	247		227		8.4		6010B
Vanadium	30	35.1		33.4		5.0		6010B

An empty field in the Control Limit column indicates the control limit is not applicable.

Metals

- 7 -

LABORATORY CONTROL SAMPLE

Client: Pacific EcoRisk Laboratories

Service Request: K1006482

Project No.: 16087

Project Name: ACOE San Rafael Channel

Aqueous LCS Source:

Solid LCS Source: ERA D065540

Analyte	Aqueous: ug/L			Solid: mg/kg					
	True	Found	%R	True	Found	C	Limits	%R	
Barium				432	438		81	119	101.4
Beryllium				58.2	63.6		83	117	109.3
Boron				101	113		67	133	111.9
Cobalt				190	210		82	118	110.5
Manganese				497	517		81	119	104.0
Vanadium				180	187		79	121	103.9

Diesel & Residual Range Organics

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Pacific EcoRisk Laboratories
Project: ACOE San Rafael Channel/16087
Sample Matrix: Sediment

Service Request: K1006482
Date Collected: 06/10/2010
Date Received: 06/23/2010

Diesel and Residual Range Organics

Sample Name: SRC-2010-8-1
Lab Code: K1006482-001
Extraction Method: EPA 3550B
Analysis Method: 8015B

Units: mg/Kg
Basis: Dry
Level: Low

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Diesel Range Organics (DRO)	360	H	58	3.8	1	06/24/10	06/28/10	KWG1006188	
Residual Range Organics (RRO)	1700	O	58	6.8	1	06/24/10	06/28/10	KWG1006188	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
o-Terphenyl	104	51-126	06/28/10	Acceptable
n-Triacontane	107	50-150	06/28/10	Acceptable

Comments: _____

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Pacific EcoRisk Laboratories
Project: ACOE San Rafael Channel/16087
Sample Matrix: Sediment

Service Request: K1006482
Date Collected: 06/10/2010
Date Received: 06/23/2010

Diesel and Residual Range Organics

Sample Name: SRC-2010-8-2
Lab Code: K1006482-002
Extraction Method: EPA 3550B
Analysis Method: 8015B

Units: mg/Kg
Basis: Dry
Level: Low

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Diesel Range Organics (DRO)	200	H	42	2.7	1	06/24/10	06/28/10	KWG1006188	
Residual Range Organics (RRO)	1300	O	42	4.9	1	06/24/10	06/28/10	KWG1006188	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
o-Terphenyl	94	51-126	06/28/10	Acceptable
n-Triacontane	107	50-150	06/28/10	Acceptable

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Pacific EcoRisk Laboratories
Project: ACOE San Rafael Channel/16087
Sample Matrix: Sediment

Service Request: K1006482
Date Collected: 06/10/2010
Date Received: 06/23/2010

Diesel and Residual Range Organics

Sample Name: SRC-2010-8-3
Lab Code: K1006482-003
Extraction Method: EPA 3550B
Analysis Method: 8015B

Units: mg/Kg
Basis: Dry
Level: Low

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Diesel Range Organics (DRO)	540	H	65	4.2	1	06/24/10	06/28/10	KWG1006188	
Residual Range Organics (RRO)	2900	O	65	7.6	1	06/24/10	06/28/10	KWG1006188	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
o-Terphenyl	109	51-126	06/28/10	Acceptable
n-Triacontane	125	50-150	06/28/10	Acceptable

Comments: _____

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Pacific EcoRisk Laboratories
Project: ACOE San Rafael Channel/16087
Sample Matrix: Sediment

Service Request: K1006482
Date Collected: 06/10/2010
Date Received: 06/23/2010

Diesel and Residual Range Organics

Sample Name: SRC-2010-8-4
Lab Code: K1006482-004
Extraction Method: EPA 3550B
Analysis Method: 8015B

Units: mg/Kg
Basis: Dry
Level: Low

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Diesel Range Organics (DRO)	610	H	55	3.6	1	06/24/10	06/28/10	KWG1006188	
Residual Range Organics (RRO)	2900	O	55	6.4	1	06/24/10	06/28/10	KWG1006188	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
o-Terphenyl	96	51-126	06/28/10	Acceptable
n-Triacontane	110	50-150	06/28/10	Acceptable

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Pacific EcoRisk Laboratories
Project: ACOE San Rafael Channel/16087
Sample Matrix: Sediment

Service Request: K1006482
Date Collected: NA
Date Received: NA

Diesel and Residual Range Organics

Sample Name: Method Blank
Lab Code: KWG1006188-4
Extraction Method: EPA 3550B
Analysis Method: 8015B

Units: mg/Kg
Basis: Dry
Level: Low

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Diesel Range Organics (DRO)	ND	U	25	1.6	1	06/24/10	06/28/10	KWG1006188	
Residual Range Organics (RRO)	ND	U	25	2.9	1	06/24/10	06/28/10	KWG1006188	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
o-Terphenyl	93	51-126	06/28/10	Acceptable
n-Triacontane	86	50-150	06/28/10	Acceptable

Comments: _____

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Pacific EcoRisk Laboratories
Project: ACOE San Rafael Channel/16087
Sample Matrix: Sediment

Service Request: K1006482

Surrogate Recovery Summary
Diesel and Residual Range Organics

Extraction Method: EPA 3550B
Analysis Method: 8015B

Units: PERCENT
Level: Low

<u>Sample Name</u>	<u>Lab Code</u>	<u>Sur1</u>	<u>Sur2</u>
SRC-2010-8-1	K1006482-001	104	107
SRC-2010-8-2	K1006482-002	94	107
SRC-2010-8-3	K1006482-003	109	125
SRC-2010-8-4	K1006482-004	96	110
Method Blank	KWG1006188-4	93	86
SRC-2010-8-1MS	KWG1006188-1	99	101
SRC-2010-8-1DMS	KWG1006188-2	97	95
Lab Control Sample	KWG1006188-3	102	94

Surrogate Recovery Control Limits (%)

Sur1 = o-Terphenyl	51-126
Sur2 = n-Triacontane	50-150

Results flagged with an asterisk (*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Pacific EcoRisk Laboratories
Project: ACOE San Rafael Channel/16087
Sample Matrix: Sediment

Service Request: K1006482
Date Extracted: 06/24/2010
Date Analyzed: 06/28/2010

**Matrix Spike/Duplicate Matrix Spike Summary
 Diesel and Residual Range Organics**

Sample Name: SRC-2010-8-1
Lab Code: K1006482-001
Extraction Method: EPA 3550B
Analysis Method: 8015B

Units: mg/Kg
Basis: Dry
Level: Low
Extraction Lot: KWG1006188

Analyte Name	Sample Result	SRC-2010-8-1MS KWG1006188-1 Matrix Spike			SRC-2010-8-1DMS KWG1006188-2 Duplicate Matrix Spike			%Rec Limits	RPD	RPD Limit
		Result	Expected	%Rec	Result	Expected	%Rec			
Diesel Range Organics (DRO)	360	1000	621	103	995	623	102	43-146	1	40
Residual Range Organics (RRO)	1700	2040	311	117 #	2080	312	128 #	29-167	2	40

Results flagged with an asterisk (*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Pacific EcoRisk Laboratories
Project: ACOE San Rafael Channel/16087
Sample Matrix: Sediment

Service Request: K1006482
Date Extracted: 06/24/2010
Date Analyzed: 06/28/2010

Lab Control Spike Summary
Diesel and Residual Range Organics

Extraction Method: EPA 3550B
Analysis Method: 8015B

Units: mg/Kg
Basis: Dry
Level: Low
Extraction Lot: KWG1006188

Lab Control Sample
KWG1006188-3
Lab Control Spike

Analyte Name	Lab Control Spike			%Rec Limits
	Result	Expected	%Rec	
Diesel Range Organics (DRO)	284	267	107	63-121
Residual Range Organics (RRO)	121	133	91	57-136

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

Gasoline Range Organics

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Pacific EcoRisk Laboratories
Project: ACOE San Rafael Channel/16087
Sample Matrix: Sediment

Service Request: K1006482
Date Collected: 06/10/2010
Date Received: 06/23/2010

Gasoline Range Organics

Sample Name: SRC-2010-8-1
Lab Code: K1006482-001
Extraction Method: EPA 5035A/5030B
Analysis Method: 8015B

Units: mg/Kg
Basis: Dry
Level: Med

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Gasoline Range Organics (GRO)	ND	U	16	4.0	1	06/23/10	06/23/10	KWG1006137	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
4-Bromofluorobenzene	95	83-119	06/23/10	Acceptable

Comments: _____

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Pacific EcoRisk Laboratories
Project: ACOE San Rafael Channel/16087
Sample Matrix: Sediment

Service Request: K1006482
Date Collected: 06/10/2010
Date Received: 06/23/2010

Gasoline Range Organics

Sample Name: SRC-2010-8-2
Lab Code: K1006482-002
Extraction Method: EPA 5035A/5030B
Analysis Method: 8015B

Units: mg/Kg
Basis: Dry
Level: Med

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Gasoline Range Organics (GRO)	ND	U	10	2.6	1	06/23/10	06/23/10	KWG1006137	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
4-Bromofluorobenzene	95	83-119	06/23/10	Acceptable

Comments: _____

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Pacific EcoRisk Laboratories
Project: ACOE San Rafael Channel/16087
Sample Matrix: Sediment

Service Request: K1006482
Date Collected: 06/10/2010
Date Received: 06/23/2010

Gasoline Range Organics

Sample Name: SRC-2010-8-3
Lab Code: K1006482-003
Extraction Method: EPA 5035A/5030B
Analysis Method: 8015B

Units: mg/Kg
Basis: Dry
Level: Med

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Gasoline Range Organics (GRO)	ND	U	17	4.4	1	06/23/10	06/23/10	KWG1006137	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
4-Bromofluorobenzene	100	83-119	06/23/10	Acceptable

Comments: _____

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Pacific EcoRisk Laboratories
Project: ACOE San Rafael Channel/16087
Sample Matrix: Sediment

Service Request: K1006482
Date Collected: 06/10/2010
Date Received: 06/23/2010

Gasoline Range Organics

Sample Name: SRC-2010-8-4
Lab Code: K1006482-004
Extraction Method: EPA 5035A/5030B
Analysis Method: 8015B

Units: mg/Kg
Basis: Dry
Level: Med

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Gasoline Range Organics (GRO)	7.2	J	14	3.7	1	06/23/10	06/23/10	KWG1006137	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
4-Bromofluorobenzene	92	83-119	06/23/10	Acceptable

Comments: _____

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Pacific EcoRisk Laboratories
Project: ACOE San Rafael Channel/16087
Sample Matrix: Sediment

Service Request: K1006482
Date Collected: NA
Date Received: NA

Gasoline Range Organics

Sample Name: Method Blank
Lab Code: KWG1006137-4
Extraction Method: EPA 5035A/5030B
Analysis Method: 8015B

Units: mg/Kg
Basis: Dry
Level: Med

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Gasoline Range Organics (GRO)	1.5	J	5.0	1.3	1	06/23/10	06/23/10	KWG1006137	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
4-Bromofluorobenzene	92	83-119	06/23/10	Acceptable

Comments: _____

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Pacific EcoRisk Laboratories
Project: ACOE San Rafael Channel/16087
Sample Matrix: Sediment

Service Request: K1006482**Surrogate Recovery Summary
Gasoline Range Organics**

Extraction Method: EPA 5035A/5030B
Analysis Method: 8015B

Units: PERCENT
Level: Med

<u>Sample Name</u>	<u>Lab Code</u>	<u>Sur1</u>
SRC-2010-8-1	K1006482-001	95
SRC-2010-8-2	K1006482-002	95
SRC-2010-8-3	K1006482-003	100
SRC-2010-8-4	K1006482-004	92
Method Blank	KWG1006137-4	92
SRC-2010-8-1MS	KWG1006137-1	94
SRC-2010-8-1DMS	KWG1006137-2	96
Lab Control Sample	KWG1006137-3	94

Surrogate Recovery Control Limits (%)

Sur1 = 4-Bromofluorobenzene 83-119

Results flagged with an asterisk (*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Pacific EcoRisk Laboratories
Project: ACOE San Rafael Channel/16087
Sample Matrix: Sediment

Service Request: K1006482
Date Extracted: 06/23/2010
Date Analyzed: 06/23/2010

Matrix Spike/Duplicate Matrix Spike Summary
Gasoline Range Organics

Sample Name: SRC-2010-8-1
Lab Code: K1006482-001
Extraction Method: EPA 5035A/5030B
Analysis Method: 8015B

Units: mg/Kg
Basis: Dry
Level: Med
Extraction Lot: KWG1006137

Analyte Name	Sample Result	SRC-2010-8-1MS KWG1006137-1 Matrix Spike			SRC-2010-8-1DMS KWG1006137-2 Duplicate Matrix Spike			%Rec Limits	RPD	RPD Limit
		Result	Expected	%Rec	Result	Expected	%Rec			
Gasoline Range Organics (GRO)	ND	111	146	76	114	144	79	68-112	3	40

Results flagged with an asterisk (*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Pacific EcoRisk Laboratories
Project: ACOE San Rafael Channel/16087
Sample Matrix: Sediment

Service Request: K1006482
Date Extracted: 06/23/2010
Date Analyzed: 06/23/2010

Lab Control Spike Summary
Gasoline Range Organics

Extraction Method: EPA 5035A/5030B
Analysis Method: 8015B

Units: mg/Kg
Basis: Dry
Level: Med
Extraction Lot: KWG1006137

Lab Control Sample
KWG1006137-3
Lab Control Spike

Analyte Name	Lab Control Spike			%Rec Limits
	Result	Expected	%Rec	
Gasoline Range Organics (GRO)	48.1	50.0	96	76-123

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

Chlorinated Herbicides

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Pacific EcoRisk Laboratories
Project: ACOE San Rafael Channel/16087
Sample Matrix: Sediment

Service Request: K1006482
Date Collected: 06/10/2010
Date Received: 06/23/2010

Chlorinated Herbicides

Sample Name: SRC-2010-8-1
Lab Code: K1006482-001
Extraction Method: Method
Analysis Method: 8151A

Units: ug/Kg
Basis: Dry
Level: Low

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
MCPP	ND	U	58000	15000	5	06/24/10	06/29/10	KWG1006203	
MCPA	ND	U	58000	15000	5	06/24/10	06/29/10	KWG1006203	
Dichlorprop	ND	U	290	53	5	06/24/10	06/29/10	KWG1006203	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
2,4-Dichlorophenylacetic Acid	71	27-166	06/29/10	Acceptable

Comments: _____

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Pacific EcoRisk Laboratories
Project: ACOE San Rafael Channel/16087
Sample Matrix: Sediment

Service Request: K1006482
Date Collected: 06/10/2010
Date Received: 06/23/2010

Chlorinated Herbicides

Sample Name: SRC-2010-8-2
Lab Code: K1006482-002
Extraction Method: Method
Analysis Method: 8151A

Units: ug/Kg
Basis: Dry
Level: Low

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
MCPP	ND	U	41000	13000	5	06/24/10	06/29/10	KWG1006203	
MCPA	ND	U	41000	13000	5	06/24/10	06/29/10	KWG1006203	
Dichlorprop	ND	Ui	210	65	5	06/24/10	06/29/10	KWG1006203	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
2,4-Dichlorophenylacetic Acid	65	27-166	06/29/10	Acceptable

Comments: _____

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Pacific EcoRisk Laboratories
Project: ACOE San Rafael Channel/16087
Sample Matrix: Sediment

Service Request: K1006482
Date Collected: 06/10/2010
Date Received: 06/23/2010

Chlorinated Herbicides

Sample Name: SRC-2010-8-3
Lab Code: K1006482-003
Extraction Method: Method
Analysis Method: 8151A

Units: ug/Kg
Basis: Dry
Level: Low

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
MCPP	ND	U	66000	18000	5	06/24/10	06/29/10	KWG1006203	
MCPA	ND	U	66000	18000	5	06/24/10	06/29/10	KWG1006203	
Dichlorprop	ND	Ui	330	330	5	06/24/10	06/29/10	KWG1006203	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
2,4-Dichlorophenylacetic Acid	59	27-166	06/29/10	Acceptable

Comments: _____

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Pacific EcoRisk Laboratories
Project: ACOE San Rafael Channel/16087
Sample Matrix: Sediment

Service Request: K1006482
Date Collected: 06/10/2010
Date Received: 06/23/2010

Chlorinated Herbicides

Sample Name: SRC-2010-8-4
Lab Code: K1006482-004
Extraction Method: Method
Analysis Method: 8151A

Units: ug/Kg
Basis: Dry
Level: Low

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
MCP	ND	U	56000	15000	5	06/24/10	06/29/10	KWG1006203	
MCPA	ND	U	56000	15000	5	06/24/10	06/29/10	KWG1006203	
Dichlorprop	ND	U	280	51	5	06/24/10	06/29/10	KWG1006203	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
2,4-Dichlorophenylacetic Acid	110	27-166	06/29/10	Acceptable

Comments: _____

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Pacific EcoRisk Laboratories
Project: ACOE San Rafael Channel/16087
Sample Matrix: Sediment

Service Request: K1006482
Date Collected: NA
Date Received: NA

Chlorinated Herbicides

Sample Name: Method Blank
Lab Code: KWG1006203-4
Extraction Method: Method
Analysis Method: 8151A

Units: ug/Kg
Basis: Dry
Level: Low

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
MCPP	ND	U	4900	2600	1	06/24/10	06/28/10	KWG1006203	
MCPA	ND	U	4900	2600	1	06/24/10	06/28/10	KWG1006203	
Dichlorprop	ND	U	25	9.1	1	06/24/10	06/28/10	KWG1006203	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
2,4-Dichlorophenylacetic Acid	76	27-166	06/28/10	Acceptable

Comments: _____

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Pacific EcoRisk Laboratories
Project: ACOE San Rafael Channel/16087
Sample Matrix: Sediment

Service Request: K1006482

Surrogate Recovery Summary
Chlorinated Herbicides

Extraction Method: Method
Analysis Method: 8151A

Units: PERCENT
Level: Low

<u>Sample Name</u>	<u>Lab Code</u>	<u>Sur1</u>
SRC-2010-8-1	K1006482-001	71 D
SRC-2010-8-2	K1006482-002	65 D
SRC-2010-8-3	K1006482-003	59 D
SRC-2010-8-4	K1006482-004	110 D #
Method Blank	KWG1006203-4	76
SRC-2010-8-1MS	KWG1006203-1	70 D
SRC-2010-8-1DMS	KWG1006203-2	67 D
Lab Control Sample	KWG1006203-3	72

Surrogate Recovery Control Limits (%)

Sur1 = 2,4-Dichlorophenylacetic Acid 27-166

Results flagged with an asterisk (*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Pacific EcoRisk Laboratories
Project: ACOE San Rafael Channel/16087
Sample Matrix: Sediment

Service Request: K1006482
Date Extracted: 06/24/2010
Date Analyzed: 06/29/2010

Matrix Spike/Duplicate Matrix Spike Summary
Chlorinated Herbicides

Sample Name: SRC-2010-8-1
Lab Code: K1006482-001
Extraction Method: Method
Analysis Method: 8151A

Units: ug/Kg
Basis: Dry
Level: Low
Extraction Lot: KWG1006203

Analyte Name	Sample Result	SRC-2010-8-1MS KWG1006203-1			SRC-2010-8-1DMS KWG1006203-2			%Rec Limits	RPD	RPD Limit
		Matrix Spike			Duplicate Matrix Spike					
		Result	Expected	%Rec	Result	Expected	%Rec			
MCPP	ND	31500	19400	162	64000	19400	330 *	10-192	68 *	40
MCPA	ND	9440	19400	49	6020	19400	31	10-165	44 *	40
Dichlorprop	ND	198	194	102	208	194	107	29-149	5	40

Results flagged with an asterisk (*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Pacific EcoRisk Laboratories
Project: ACOE San Rafael Channel/16087
Sample Matrix: Sediment

Service Request: K1006482
Date Extracted: 06/24/2010
Date Analyzed: 06/28/2010

Lab Control Spike Summary
Chlorinated Herbicides

Extraction Method: Method
Analysis Method: 8151A

Units: ug/Kg
Basis: Dry
Level: Low
Extraction Lot: KWG1006203

Analyte Name	Lab Control Sample KWG1006203-3 Lab Control Spike			%Rec Limits
	Result	Expected	%Rec	
MCPP	7970	8330	96	49-116
MCPA	6620	8330	79	52-111
Dichlorprop	59.5	83.3	71	58-112

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

Semi-Volatile Organic Compounds

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Pacific EcoRisk Laboratories
Project: ACOE San Rafael Channel/16087
Sample Matrix: Sediment

Service Request: K1006482
Date Collected: 06/10/2010
Date Received: 06/23/2010

Semi-Volatile Organic Compounds by GC/MS

Sample Name: SRC-2010-8-1
Lab Code: K1006482-001
Extraction Method: EPA 3541
Analysis Method: 8270C

Units: ug/Kg
Basis: Dry
Level: Low

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Phenol	ND	U	350	24	10	06/24/10	07/12/10	KWG1006611	
Pentachlorophenol	ND	U	1200	240	10	06/24/10	07/12/10	KWG1006611	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Phenol-d6	57	20-86	07/12/10	Acceptable
2,4,6-Tribromophenol	69	10-119	07/12/10	Acceptable

Comments: _____

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Pacific EcoRisk Laboratories
Project: ACOE San Rafael Channel/16087
Sample Matrix: Sediment

Service Request: K1006482
Date Collected: 06/10/2010
Date Received: 06/23/2010

Semi-Volatile Organic Compounds by GC/MS

Sample Name: SRC-2010-8-2
Lab Code: K1006482-002
Extraction Method: EPA 3541
Analysis Method: 8270C

Units: ug/Kg
Basis: Dry
Level: Low

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Phenol	29	JD	250	20	10	06/24/10	07/12/10	KWG1006611	
Pentachlorophenol	ND	U	830	200	10	06/24/10	07/12/10	KWG1006611	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Phenol-d6	63	20-86	07/12/10	Acceptable
2,4,6-Tribromophenol	74	10-119	07/12/10	Acceptable

Comments: _____

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Pacific EcoRisk Laboratories
Project: ACOE San Rafael Channel/16087
Sample Matrix: Sediment

Service Request: K1006482
Date Collected: 06/10/2010
Date Received: 06/23/2010

Semi-Volatile Organic Compounds by GC/MS

Sample Name: SRC-2010-8-3
Lab Code: K1006482-003
Extraction Method: EPA 3541
Analysis Method: 8270C

Units: ug/Kg
Basis: Dry
Level: Low

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Phenol	ND	Ui	590	590	10	06/24/10	07/12/10	KWG1006611	
Pentachlorophenol	ND	U	1400	270	10	06/24/10	07/12/10	KWG1006611	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Phenol-d6	60	20-86	07/12/10	Acceptable
2,4,6-Tribromophenol	71	10-119	07/12/10	Acceptable

Comments: _____

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Pacific EcoRisk Laboratories
Project: ACOE San Rafael Channel/16087
Sample Matrix: Sediment

Service Request: K1006482
Date Collected: 06/10/2010
Date Received: 06/23/2010

Semi-Volatile Organic Compounds by GC/MS

Sample Name: SRC-2010-8-4
Lab Code: K1006482-004
Extraction Method: EPA 3541
Analysis Method: 8270C

Units: ug/Kg
Basis: Dry
Level: Low

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Phenol	ND	U	330	22	10	06/24/10	07/12/10	KWG1006611	
Pentachlorophenol	ND	U	1100	220	10	06/24/10	07/12/10	KWG1006611	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Phenol-d6	60	20-86	07/12/10	Acceptable
2,4,6-Tribromophenol	71	10-119	07/12/10	Acceptable

Comments: _____

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Pacific EcoRisk Laboratories
Project: ACOE San Rafael Channel/16087
Sample Matrix: Sediment

Service Request: K1006482
Date Collected: NA
Date Received: NA

Semi-Volatile Organic Compounds by GC/MS

Sample Name: Method Blank
Lab Code: KWG1006611-5
Extraction Method: EPA 3541
Analysis Method: 8270C

Units: ug/Kg
Basis: Dry
Level: Low

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Phenol	ND	U	15	2.0	1	06/24/10	07/09/10	KWG1006611	
Pentachlorophenol	ND	U	49	20	1	06/24/10	07/09/10	KWG1006611	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Phenol-d6	60	20-86	07/09/10	Acceptable
2,4,6-Tribromophenol	58	10-119	07/09/10	Acceptable

Comments: _____

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Pacific EcoRisk Laboratories
Project: ACOE San Rafael Channel/16087
Sample Matrix: Sediment

Service Request: K1006482

Surrogate Recovery Summary
Semi-Volatile Organic Compounds by GC/MS

Extraction Method: EPA 3541
Analysis Method: 8270C

Units: PERCENT
Level: Low

<u>Sample Name</u>	<u>Lab Code</u>	<u>Sur1</u>	<u>Sur2</u>
SRC-2010-8-1	K1006482-001	57 D	69 D
SRC-2010-8-2	K1006482-002	63 D	74 D
SRC-2010-8-3	K1006482-003	60 D	71 D
SRC-2010-8-4	K1006482-004	60 D	71 D
Method Blank	KWG1006611-5	60	58
Batch QC	K1006356-008	62 D	65 D
Batch QCMS	KWG1006611-1	59 D	71 D
Batch QCDMS	KWG1006611-2	74 D	83 D
Lab Control Sample	KWG1006611-3	70	75
Duplicate Lab Control Sample	KWG1006611-4	58	59

Surrogate Recovery Control Limits (%)

Sur1 = Phenol-d6	20-86
Sur2 = 2,4,6-Tribromophenol	10-119

Results flagged with an asterisk (*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Pacific EcoRisk Laboratories
Project: ACOE San Rafael Channel/16087
Sample Matrix: Sediment

Service Request: K1006482
Date Extracted: 06/24/2010
Date Analyzed: 07/09/2010

Matrix Spike/Duplicate Matrix Spike Summary
Semi-Volatile Organic Compounds by GC/MS

Sample Name: Batch QC
Lab Code: K1006356-008

Units: ug/Kg
Basis: Dry

Extraction Method: EPA 3541
Analysis Method: 8270C

Level: Low
Extraction Lot: KWG1006611

Analyte Name	Sample Result	Batch QCMS KWG1006611-1 Matrix Spike			Batch QCDMS KWG1006611-2 Duplicate Matrix Spike			%Rec Limits	RPD	RPD Limit
		Result	Expected	%Rec	Result	Expected	%Rec			
Phenol	ND	140	262	54	158	262	60	15-98	12	40
Pentachlorophenol	ND	77.6	262	30	149	262	57	10-123	63 *	40

Results flagged with an asterisk (*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Pacific EcoRisk Laboratories
Project: ACOE San Rafael Channel/16087
Sample Matrix: Sediment

Service Request: K1006482
Date Extracted: 06/24/2010
Date Analyzed: 07/09/2010

Lab Control Spike/Duplicate Lab Control Spike Summary
Semi-Volatile Organic Compounds by GC/MS

Extraction Method: EPA 3541
Analysis Method: 8270C

Units: ug/Kg
Basis: Dry
Level: Low
Extraction Lot: KWG1006611

Analyte Name	Lab Control Sample KWG1006611-3 Lab Control Spike			Duplicate Lab Control Sample KWG1006611-4 Duplicate Lab Control Spike			%Rec Limits	RPD	RPD Limit
	Result	Expected	%Rec	Result	Expected	%Rec			
Phenol	158	250	63	130	250	52	28-91	19	40
Pentachlorophenol	149	250	60	103	250	41	21-97	37	40

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

July 16, 2010

Analytical Report for Service Request No: K1006559

Jeffrey Cotsifas
Pacific EcoRisk Laboratories
2250 Cordelia Road
Fairfield, CA 94534

RE: ACOE (San Rafael Channel)

Dear Jeffrey:

Enclosed are the results of the rush samples submitted to our laboratory on June 24, 2010. For your reference, these analyses have been assigned our service request number K1006559.

Analyses were performed according to our laboratory's NELAP-approved quality assurance program. The test results meet requirements of the current NELAP standards, where applicable, and except as noted in the laboratory case narrative provided. For a specific list of NELAP-accredited analytes, refer to the certifications section at www.caslab.com. All results are intended to be considered in their entirety, and Columbia Analytical Services, Inc. (CAS) is not responsible for use of less than the complete report. Results apply only to the items submitted to the laboratory for analysis and individual items (samples) analyzed, as listed in the report.

Please call if you have any questions. My extension is 3281. You may also contact me via Email at PDivvela@caslab.com.

Respectfully submitted,

Columbia Analytical Services, Inc.



Pradeep Divvela
Project Chemist

PD/ln

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Acronyms

ASTM	American Society for Testing and Materials
A2LA	American Association for Laboratory Accreditation
CARB	California Air Resources Board
CAS Number	Chemical Abstract Service registry Number
CFC	Chlorofluorocarbon
CFU	Colony-Forming Unit
DEC	Department of Environmental Conservation
DEQ	Department of Environmental Quality
DHS	Department of Health Services
DOE	Department of Ecology
DOH	Department of Health
EPA	U. S. Environmental Protection Agency
ELAP	Environmental Laboratory Accreditation Program
GC	Gas Chromatography
GC/MS	Gas Chromatography/Mass Spectrometry
LUFT	Leaking Underground Fuel Tank
M	Modified
MCL	Maximum Contaminant Level is the highest permissible concentration of a substance allowed in drinking water as established by the USEPA.
MDL	Method Detection Limit
MPN	Most Probable Number
MRL	Method Reporting Limit
NA	Not Applicable
NC	Not Calculated
NCASI	National Council of the Paper Industry for Air and Stream Improvement
ND	Not Detected
NIOSH	National Institute for Occupational Safety and Health
PQL	Practical Quantitation Limit
RCRA	Resource Conservation and Recovery Act
SIM	Selected Ion Monitoring
TPH	Total Petroleum Hydrocarbons
tr	Trace level is the concentration of an analyte that is less than the PQL but greater than or equal to the MDL.

Inorganic Data Qualifiers

- * The result is an outlier. See case narrative.
- # The control limit criteria is not applicable. See case narrative.
- B The analyte was found in the associated method blank at a level that is significant relative to the sample result as defined by the DOD or NELAC standards.
- E The result is an estimate amount because the value exceeded the instrument calibration range.
- J The result is an estimated value that was detected outside the quantitation range.
- U The analyte was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL.
DOD-QSM 4.1 definition: Analyte was not detected and is reported as less than the LOD or as defined by the project. The detection limit is adjusted for dilution.
- i The MRL/MDL or LOQ/LOD is elevated due to a matrix interference.
- X See case narrative.
- Q See case narrative. One or more quality control criteria was outside the limits.

Metals Data Qualifiers

- # The control limit criteria is not applicable. See case narrative.
- J The result is an estimated value that was detected outside the quantitation range.
- E The percent difference for the serial dilution was greater than 10%, indicating a possible matrix interference in the sample.
- M The duplicate injection precision was not met.
- N The Matrix Spike sample recovery is not within control limits. See case narrative.
- S The reported value was determined by the Method of Standard Additions (MSA).
- U The analyte was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL.
DOD-QSM 4.1 definition: Analyte was not detected and is reported as less than the LOD or as defined by the project. The detection limit is adjusted for dilution.
- W The post-digestion spike for furnace AA analysis is out of control limits, while sample absorbance is less than 50% of spike absorbance.
- i The MRL/MDL or LOQ/LOD is elevated due to a matrix interference.
- X See case narrative.
- + The correlation coefficient for the MSA is less than 0.995.
- Q See case narrative. One or more quality control criteria was outside the limits.

Organic Data Qualifiers

- * The result is an outlier. See case narrative.
- # The control limit criteria is not applicable. See case narrative.
- A A tentatively identified compound, a suspected aldol-condensation product.
- B The analyte was found in the associated method blank at a level that is significant relative to the sample result as defined by the DOD or NELAC standards.
- C The analyte was qualitatively confirmed using GC/MS techniques, pattern recognition, or by comparing to historical data.
- D The reported result is from a dilution.
- E The result is an estimate amount because the value exceeded the instrument calibration range.
- J The result is an estimated value that was detected outside the quantitation range.
- N The result is presumptive. The analyte was tentatively identified, but a confirmation analysis was not performed.
- P The GC or HPLC confirmation criteria was exceeded. The relative percent difference is greater than 40% between the two analytical results.
- U The analyte was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL.
DOD-QSM 4.1 definition: Analyte was not detected and is reported as less than the LOD or as defined by the project. The detection limit is adjusted for dilution.
- i The MRL/MDL or LOQ/LOD is elevated due to a chromatographic interference.
- X See case narrative.
- Q See case narrative. One or more quality control criteria was outside the limits.

Additional Petroleum Hydrocarbon Specific Qualifiers

- F The chromatographic fingerprint of the sample matches the elution pattern of the calibration standard.
- L The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of lighter molecular weight constituents than the calibration standard.
- H The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of heavier molecular weight constituents than the calibration standard.
- O The chromatographic fingerprint of the sample resembles an oil, but does not match the calibration standard.
- Y The chromatographic fingerprint of the sample resembles a petroleum product eluting in approximately the correct carbon range, but the elution pattern does not match the calibration standard.
- Z The chromatographic fingerprint does not resemble a petroleum product.

Columbia Analytical Services, Inc.
Kelso, WA
State Certifications, Accreditations, and Licenses

Program	Number
Alaska DEC UST	UST-040
Arizona DHS	AZ0339
Arkansas - DEQ	88-0637
California DHS	2286
Colorado DPHE	-
Florida DOH	E87412
Hawaii DOH	-
Idaho DHW	-
Indiana DOH	C-WA-01
Louisiana DEQ	3016
Louisiana DHH	LA050010
Maine DHS	WA0035
Michigan DEQ	9949
Minnesota DOH	053-999-368
Montana DPHHS	CERT0047
Nevada DEP	WA35
New Jersey DEP	WA005
New Mexico ED	-
North Carolina DWQ	605
Oklahoma DEQ	9801
Oregon - DHS	WA200001
South Carolina DHEC	61002
Utah DOH	COLU
Washington DOE	C1203
Wisconsin DNR	998386840
Wyoming (EPA Region 8)	-

Case Narrative

COLUMBIA ANALYTICAL SERVICES, INC.

Client: Pacific EcoRisk Laboratories
Project: ACOE (San Rafael Channel)
Sample Matrix: Sediment

Service Request No.: K1006559
Date Received: 06/24/10

CASE NARRATIVE

All analyses were performed consistent with the quality assurance program of Columbia Analytical Services, Inc. (CAS). This report contains analytical results for samples designated for Tier II data deliverables. When appropriate to the method, method blank results have been reported with each analytical test. Surrogate recoveries have been reported for all applicable organic analyses. Additional quality control analyses reported herein include: Laboratory Duplicate (DUP), Matrix Spike (MS), Matrix/Duplicate Matrix Spike (MS/DMS), Laboratory Control Sample (LCS), and Laboratory/Duplicate Laboratory Control Sample (LCS/DLCS).

Sample Receipt

Two sediment samples were received for analysis at Columbia Analytical Services on 06/24/10. The samples were received in good condition and consistent with the accompanying chain of custody form. The samples were stored in a refrigerator at 4°C upon receipt at the laboratory.

General Chemistry Parameters

No anomalies associated with the analysis of these samples were observed.

Total Metals

Matrix Spike Recovery Exceptions:

The control criteria for matrix spike recovery of Manganese for sample SF 10 were not applicable. The analyzed concentration in the sample was significantly higher than the added spike concentration, preventing accurate evaluation of the spike recovery.

No other anomalies associated with the analysis of these samples were observed.

Diesel Range Organics by EPA Method 8015B

No anomalies associated with the analysis of these samples were observed.

Gasoline Range Organics by EPA Method 8015B

No anomalies associated with the analysis of these samples were observed.

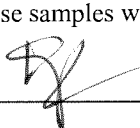
Organotin Compounds

Calibration Verification Exceptions:

The analysis of Butyltins requires the use of dual column confirmation. When the CCV criterion is met for both columns, the higher of the two sample results is generally reported. The primary evaluation criteria were not met on the confirmation column for Di-n-butyltin Cation. The results were reported from the column with an acceptable CCV. The data quality was not affected. No further corrective action was necessary.

No other anomalies associated with the analysis of these samples were observed.

Approved by _____



Date _____

07/21/10

Organochlorine Pesticides by EPA Method 8081A

Elevated Detection Limits:

The detection limit was elevated for 4,4-DDT in sample SF 10. The chromatogram indicated the presence of non-target background components. The matrix interference prevented adequate resolution of the target compound at the normal limit. The results were flagged to indicate the matrix interference.

No other anomalies associated with the analysis of these samples were observed.

PCB Aroclors by EPA Method 8082

Lab Control Sample Exceptions:

The upper control criterion was exceeded for Aroclor 1016 and Aroclor 1260 in Laboratory Control Sample (LCS) KWG1006609-13. The analytes in question were not detected in the associated field samples. The error associated with elevated recovery indicated a high bias. The sample data was not significantly affected. No further corrective action was appropriate.

No other anomalies associated with the analysis of these samples were observed.

Chlorophenoxy Herbicides by EPA Method 8151

Calibration Verification Exceptions:

The upper control criterion was exceeded for MCPP and/or MCPA in Continuing Calibration Verification (CCV) 0715F004 and 0715F012. The field samples analyzed in this sequence did not contain the analyte(s) in question. Since the apparent problem indicated a potential high bias, the data quality was not affected. No further corrective action was required.

No other anomalies associated with the analysis of these samples were observed.

Semivolatile Organic Compounds by EPA Method 8270C

No anomalies associated with the analysis of these samples were observed.

Polynuclear Aromatic Hydrocarbons by EPA Method 8270C

No anomalies associated with the analysis of these samples were observed.

Dioxins and Furans by EPA Method 8290

Dioxin and Furan analysis by EPA Method 1613B was performed at Columbia Analytical Services laboratory in Houston, TX. The narrative for this analysis can be found in the corresponding section of this data package.

Approved by  Date 07/21/10

Chain of Custody



Pacific EcoRisk

ENVIRONMENTAL CONSULTING & TESTING

2250 Cordelia Rd., Fairfield, CA 94534

(707)207-7760

K1006559

CAS CHAIN-OF-CUSTODY RECORD

004

Client Name:		Pacific EcoRisk				REQUESTED ANALYSIS													
Client Address:		2250 Cordelia Rd. Fairfield, CA 94534				* See Scope of Work	Grain Size Analysis												
Sampled By:		Mike McElroy																	
Phone:		(707) 207-7760																	
FAX:		(707) 207-7916																	
Project Manager:		Jeff Cotsifas																	
Project Name:		ACOE (San Rafael Channel)																	
PO Number:		16087																	
Client Sample ID	Sample Date	Sample Time	Sample Matrix*	Container		* See Scope of Work	Grain Size Analysis												
				Number	Type														
1 SF 10	6/15/10	10:05	Sed	2	8oz glass	x													
2 SF 10	6/15/10	10:05	Sed	1	1 poly bag		x												
3 SF 11	6/15/10	9:30	Sed	2	8oz glass	x													
4 SF 11	6/15/10	9:30	Sed	1	1 poly bag		x												
5																			
6																			
7																			
8																			
9																			
10																			

Correct Containers:	Yes	No		RELIQUINSHED BY											
Sample Temperature:	Ambient	Cold	Warm	Signature: <i>[Signature]</i>				Signature: <i>John Jones</i>							
Sample Preservative:	Yes	No		Print: <i>Jeremy Calvin</i>				Print: <i>John Jones</i>							
Turnaround Time:	STD	Specify:		Organization: <i>PER</i>				Organization: <i>CAS</i>							
Comments: * Analyze for all of the constituents in Table 1 of the ACOE Master SAP and the constituents identified in Section L of the USFWS Biological Opinion for placement at the HWRP. The HWRP specific constituents that are not in Table 1 of the Master SAP or have lower reporting limits than the Master SAP are identified in Table 6 of the San Rafael Channel SOW. Analyte list to follow via email.				DATE: <i>6/23/10</i> TIME: <i>1400</i>				DATE: <i>6/24/10</i> TIME: <i>0915</i>							
				RECEIVED BY											
				Signature:				Signature:							
				Print:				Print:							
				Organization:				Organization:							
DATE:				TIME:				DATE:				TIME:			

*MATRIX CODES: (SED = Sediment); (FW = Freshwater); (WW = Wastewater); (STRMW = Stormwater)

**Columbia Analytical Services, Inc.
Cooler Receipt and Preservation Form**

PC PD

Client / Project: Pacific Ecorisk Service Request K10 06559

Received: 6/24/10 Opened: 6/24/10 By: John

1. Samples were received via? *Mail* Fed Ex *UPS* *DHL* *PDX* *Courier* *Hand Delivered*
2. Samples were received in: (circle) Cooler *Box* *Envelope* *Other* NA
3. Were custody seals on coolers? *NA* *Y* N If yes, how many and where? _____
- If present, were custody seals intact? *Y* *N* If present, were they signed and dated? *Y* *N*

Cooler Temp °C	Temp Blank °C	Thermometer ID	Cooler/COC ID	Tracking Number	NA	Filed
0.4		287	NA			Y

7. Packing material used. *Inserts* Baggies *Bubble Wrap* *Gel Packs* Wet Ice *Sleeves* *Other* _____
8. Were custody papers properly filled out (ink, signed, etc.)? *NA* Y *N*
9. Did all bottles arrive in good condition (unbroken)? *Indicate in the table below.* *NA* Y *N*
10. Were all sample labels complete (i.e analysis, preservation, etc.)? *NA* Y *N*
11. Did all sample labels and tags agree with custody papers? *Indicate major discrepancies in the table on page 2.* *NA* Y *N*
12. Were appropriate bottles/containers and volumes received for the tests indicated? *NA* Y *N*
13. Were the pH-preserved bottles (*see SMO GEN SOP*) received at the appropriate pH? *Indicate in the table below* NA *Y* *N*
14. Were VOA vials received without headspace? *Indicate in the table below.* NA *Y* *N*
15. Was C12/Res negative? NA *Y* *N*

Sample ID on Bottle	Sample ID on COC	Identified by:

Sample ID	Bottle Count Bottle Type	Out of Temp	Head- space	Broke	pH	Reagent	Volume added	Reagent Lot Number	Initials	Time

Notes, Discrepancies, & Resolutions: _____

Total Solids

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Pacific EcoRisk Laboratories
Project: ACOE (San Rafael Cha
Sample Matrix: Sediment

Service Request: K1006559

Total Solids

Prep Method: NONE
Analysis Method: 160.3M
Test Notes:

Units: PERCENT
Basis: Wet

Sample Name	Lab Code	Date Collected	Date Received	Date Analyzed	Result	Result Notes
SF 10	K1006559-001	06/15/2010	06/24/2010	06/29/2010	67.1	
SF 11	K1006559-002	06/15/2010	06/24/2010	06/29/2010	80.9	

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Pacific EcoRisk Laboratories
Project: ACOE (San Rafael Cha
Sample Matrix: Sediment

Service Request: K1006559
Date Collected: 06/15/2010
Date Received: 06/24/2010
Date Analyzed: 06/29/2010

Duplicate Sample Summary
Total Solids

Prep Method: NONE
Analysis Method: 160.3M
Test Notes:

Units: PERCENT
Basis: Wet

Sample Name	Lab Code	Sample Result	Duplicate Sample Result	Average	Relative Percent Difference	Result Notes
SF 10	K1006559-001	67.1	67.4	67.3	<1	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Pacific EcoRisk Laboratories
Project: ACOE (San Rafael Cha
Sample Matrix: Sediment

Service Request: K1006559

Total Solids

Prep Method: NONE
Analysis Method: 160.3M
Test Notes:

Units: PERCENT
Basis: Wet

Sample Name	Lab Code	Date Collected	Date Received	Date Analyzed	Result	Result Notes
SF 10	K1006559-001	06/15/2010	06/24/2010	06/29/2010	67.1	
SF 11	K1006559-002	06/15/2010	06/24/2010	06/29/2010	80.9	

General Chemistry Parameters

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client : Pacific EcoRisk Laboratories
Project Name : ACOE (San Rafael Channel)
Project Number : NA
Sample Matrix : SEDIMENT

Service Request : K1006559
Date Collected : 06/15/10
Date Received : 06/24/10

Carbon, Total Organic (TOC)

Prep Method : Method
Analysis Method : ASTM D4129-82M
Test Notes :

Units : Percent
Basis : Dry, per method

Sample Name	Lab Code	MRL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Result	Result Notes
SF 10	K1006559-001	0.050	0.020	1	6/24/2010	07/10/10	0.871	
SF 11	K1006559-002	0.050	0.020	1	6/24/2010	07/10/10	0.271	
Method Blank	K1006559-MB	0.050	0.020	1	NA	07/10/10	ND	

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client : Pacific EcoRisk Laboratories
Project Name : ACOE (San Rafael Channel)
Project Number : NA
Sample Matrix : SEDIMENT

Service Request : K1006559
Date Collected : NA
Date Received : NA
Date Prepared : NA
Date Analyzed : 07/10/10

Duplicate Summary Inorganic Parameters

Sample Name : Batch QC
Lab Code : K1006477-001DUP
Test Notes :

Units : Percent
Basis : Dry, per method

Analyte	Prep Method	Analysis Method	MRL	Sample Result	Duplicate		Relative Percent Difference	Result Notes
					Sample Result	Average		
Carbon, Total Organic (TOC)	Method	ASTM D4129-82M	0.050	4.33	3.56	3.95	19	

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client : Pacific EcoRisk Laboratories
Project Name : ACOE (San Rafael Channel)
Project Number : NA
Sample Matrix : SEDIMENT

Service Request : K1006559
Date Collected : NA
Date Received : NA
Date Prepared : NA
Date Analyzed : 07/10/10

Matrix Spike/Duplicate Matrix Spike Summary

Sample Name : Batch QC
Lab Code : K1006477-001MS K1006477-001DMS
Test Notes :

Units : Percent
Basis : Dry, per method

Analyte	Prep Method	Analysis Method	MRL	Spike Level		Sample Result	Spike Result		Spike Recovery		CAS Acceptance Limits	Relative Percent Difference	Result Notes
				MS	DMS		MS	DMS	MS	DMS			
Carbon, Total Organic (TOC)	Method	ASTM D4129-82M	0.050	12.0	10.8	4.33	14.8	15.5	87	103	77-155	17	

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client : Pacific EcoRisk Laboratories
Project Name : ACOE (San Rafael Channel)
Project Number : NA
Sample Matrix : SOIL

Service Request : K1006559
Date Collected : NA
Date Received : NA
Date Prepared : NA
Date Analyzed : 07/10/10

Laboratory Control Sample Summary
Inorganic Parameters

Sample Name : Lab Control Sample
Lab Code : K1006559-LCS
Test Notes :

Units : Percent
Basis : Dry, per method

Analyte	Prep Method	Analysis Method	True Value	Result	Percent Recovery	CAS Percent Recovery	Result Notes
						Acceptance Limits	
Carbon, Total Organic (TOC)	Method	ASTM D4129-82M	0.550	0.476	87	82-119	

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client : Pacific EcoRisk Laboratories
Project : ACOE (San Rafael Channel)

Service Request : K1006559
Date Collected : NA
Date Received : NA

Carbon, Total Organic (TOC)
ASTM D4129-82M
Units: Percent

CONTINUING CALIBRATION VERIFICATION (CCV)

	Date Analyzed	True Value	Measured Value	Percent Recovery
CCV1 Result	7/10/2010	20.0	19.7	99
CCV2 Result	7/10/2010	20.0	19.6	98
CCV3 Result	7/10/2010	20.0	19.1	96

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client : Pacific EcoRisk Laboratories
Project : ACOE (San Rafael Channel)

Service Request : K1006559
Date Collected : NA
Date Received : NA

Carbon, Total Organic (TOC)
ASTM D4129-82M
Units: Percent

CONTINUING CALIBRATION BLANK (CCB)

	Date Analyzed	MRL	Blank Value
CCB1 Result	7/10/2010	0.050	ND
CCB2 Result	7/10/2010	0.050	ND
CCB3 Result	7/10/2010	0.050	ND

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: Pacific EcoRisk Laboratories
Project: ACOE (San Rafael Channel)
Sample Matrix: Sediment

Service Request: K1006559
Date Collected: 6/15/2010
Date Received: 6/24/2010
Date Analyzed: 7/1/2010

Particle Size Determination
 Puget Sound Estuary Program Protocol

Sample Name: SF 10
Lab Code: K1006559-001

Sand Fraction: Dry Weight (Grams) 47.7799
 Sand Fraction: Weight Recovered (Grams) 48.1468
 Sand Fraction: Percent Recovery 101

Description	Phi Size	Dry Weight (Grams)	Percent of Total Weight Recovered
Gravel (>2.00 mm)	<-1 Ø	8.1776	14.4
Sand, Very Coarse (1.00 mm to 2.00 mm)	-1 to 0 Ø	2.0267	3.58
Sand, Coarse (0.50 mm to 1.00 mm)	0 to 1 Ø	4.9241	8.69
Sand, Medium (0.250 mm to 0.500 mm)	1 to 2 Ø	19.6441	34.7
Sand, Fine (0.125 mm to 0.250 mm)	2 to 3 Ø	9.0624	16.0
Sand, Very Fine (0.0625 mm to 0.125 mm)	3 to 4 Ø	2.2125	3.91
Silt (0.0039 mm to 0.0625 mm)	4 to 8 Ø	6.4500	11.4
Clay (< 0.0039 mm)	> 8 Ø	6.1050	10.8
Total		58.6024	103

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: Pacific EcoRisk Laboratories
Project: ACOE (San Rafael Channel)
Sample Matrix: Sediment

Service Request: K1006559
Date Collected: 6/15/2010
Date Received: 6/24/2010
Date Analyzed: 7/1/2010

Particle Size Determination
 Puget Sound Estuary Program Protocol

Sample Name: SF 11
Lab Code: K1006559-002

Sand Fraction: Dry Weight (Grams) 54.7123
 Sand Fraction: Weight Recovered (Grams) 54.5433
 Sand Fraction: Percent Recovery 99.7

Description	Phi Size	Dry Weight (Grams)	Percent of Total Weight Recovered
Gravel (>2.00 mm)	<-1 Ø	1.3491	2.34
Sand, Very Coarse (1.00 mm to 2.00 mm)	-1 to 0 Ø	0.1604	0.28
Sand, Coarse (0.50 mm to 1.00 mm)	0 to 1 Ø	1.4568	2.52
Sand, Medium (0.250 mm to 0.500 mm)	1 to 2 Ø	39.9556	69.2
Sand, Fine (0.125 mm to 0.250 mm)	2 to 3 Ø	11.2923	19.6
Sand, Very Fine (0.0625 mm to 0.125 mm)	3 to 4 Ø	0.2914	0.50
Silt (0.0039 mm to 0.0625 mm)	4 to 8 Ø	0.3850	0.67
Clay (< 0.0039 mm)	> 8 Ø	0.8000	1.39
Total		55.6906	96.4

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: Pacific EcoRisk Laboratories
Project: ACOE (San Rafael Channel)
Sample Matrix: Sediment

Service Request: K1006559
Date Collected: NA
Date Received: NA
Date Analyzed: 7/1/2010

Particle Size Determination
 Puget Sound Estuary Program Protocol

Sample Name: Batch QC
Lab Code: K1006639-001

Sand Fraction: Dry Weight (Grams) 15.3109
 Sand Fraction: Weight Recovered (Grams) 14.7400
 Sand Fraction: Percent Recovery 96.3

Description	Phi Size	Dry Weight (Grams)	Percent of Total Weight Recovered
Gravel (>2.00 mm)	<-1 Ø	1.0266	2.91
Sand, Very Coarse (1.00 mm to 2.00 mm)	-1 to 0 Ø	0.7347	2.08
Sand, Coarse (0.50)	0 to 1 Ø	1.6235	4.60
Sand, Medium (0.250 mm to 0.500 mm)	1 to 2 Ø	1.9505	5.53
Sand, Fine (0.125 mm to 0.250 mm)	2 to 3 Ø	1.0719	3.04
Sand, Very Fine (0.0625 mm to 0.125 mm)	3 to 4 Ø	3.0650	8.68
Silt (0.0039 mm to 0.0625 mm)	4 to 8 Ø	17.4750	49.5
Clay (< 0.0039 mm)	> 8 Ø	7.4100	21.0
Total		34.3572	97.3

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: Pacific EcoRisk Laboratories
Project: ACOE (San Rafael Channel)
Sample Matrix: Sediment

Service Request: K1006559
Date Collected: NA
Date Received: NA
Date Analyzed: 7/1/2010

Particle Size Determination
 Puget Sound Estuary Program Protocol

Sample Name: Batch QC
Lab Code: K1006639-001DUP

Sand Fraction: Dry Weight (Grams) 13.1066
 Sand Fraction: Weight Recovered (Grams) 12.7392
 Sand Fraction: Percent Recovery 97.2

Description	Phi Size	Dry Weight (Grams)	Percent of Total Weight Recovered
Gravel (>2.00 mm)	<-1 Ø	2.1883	6.95
Sand, Very Coarse (1.00 mm to 2.00 mm)	-1 to 0 Ø	1.0291	3.27
Sand, Coarse (0.50	0 to 1 Ø	2.4145	7.67
Sand, Medium (0.250 mm to 0.500 mm)	1 to 2 Ø	1.6424	5.22
Sand, Fine (0.125 mm to 0.250 mm)	2 to 3 Ø	0.8600	2.73
Sand, Very Fine (0.0625 mm to 0.125 mm)	3 to 4 Ø	2.0133	6.40
Silt (0.0039 mm to 0.0625 mm)	4 to 8 Ø	13.6350	43.3
Clay (< 0.0039 mm)	> 8 Ø	7.6500	24.3
Total		31.4326	100

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: Pacific EcoRisk Laboratories
Project: ACOE (San Rafael Channel)
Sample Matrix: Sediment

Service Request: K1006559
Date Collected: NA
Date Received: NA
Date Analyzed: 7/1/2010

Particle Size Determination
 Puget Sound Estuary Program Protocol

Sample Name: Batch QC
Lab Code: K1006639-001TRP

Sand Fraction: Dry Weight (Grams) 14.6145
 Sand Fraction: Weight Recovered (Grams) 14.2727
 Sand Fraction: Percent Recovery 97.7

Description	Phi Size	Dry Weight (Grams)	Percent of Total Weight Recovered
Gravel (>2.00 mm)	<-1 Ø	0.4513	1.27
Sand, Very Coarse (1.00 mm to 2.00 mm)	-1 to 0 Ø	1.3773	3.88
Sand, Coarse (0.50	0 to 1 Ø	2.2650	6.38
Sand, Medium (0.250 mm to 0.500 mm)	1 to 2 Ø	2.4836	7.00
Sand, Fine (0.125 mm to 0.250 mm)	2 to 3 Ø	1.7124	4.82
Sand, Very Fine (0.0625 mm to 0.125 mm)	3 to 4 Ø	3.2969	9.29
Silt (0.0039 mm to 0.0625 mm)	4 to 8 Ø	16.6900	47.0
Clay (< 0.0039 mm)	> 8 Ø	8.3550	23.5
Total		36.6315	103

Metals

Columbia Analytical Services

- Cover Page -

INORGANIC ANALYSIS DATA PACKAGE

Client: Pacific EcoRisk Laboratories
Project Name: ACOE (San Rafael Channel)
Project No.:

Service Request: K1006559

Sample Name:

Batch QC1D

Batch QC1S

SF 10

SF 10D

SF 10S

SF 11

Method Blank

Lab Code:

K1006518-001D

K1006518-001S

K1006559-001

K1006559-001D

K1006559-001S

K1006559-002

K1006559-MB

Comments:

Approved By:

SC

Date:

7/13/10

Metals**- 1 -****INORGANIC ANALYSIS DATA PACKAGE****Client:** Pacific EcoRisk Laboratories**Service Request:** K1006559**Project No.:** NA**Date Collected:** 06/15/10**Project Name:** ACOE (San Rafael Channel)**Date Received:** 06/24/10**Matrix:** SEDIMENT**Units:** mg/Kg**Basis:** DRY**Sample Name:** SF 10**Lab Code:** K1006559-001

Analyte	Analysis Method	MRL	MDL	Dil. Factor	Date Extracted	Date Analyzed	Result	C	Q
Arsenic	6020	0.53	0.05	5.0	06/28/10	06/30/10	8.02		
Barium	6010B	2.1	0.3	2.0	06/29/10	07/03/10	38.4		
Beryllium	6020	0.021	0.003	5.0	06/28/10	06/30/10	0.352		
Boron	6010B	11	0.3	2.0	06/29/10	07/03/10	0.3	U	
Cadmium	6020	0.021	0.004	5.0	06/28/10	06/30/10	0.145		
Chromium	6020	0.21	0.02	5.0	06/28/10	06/30/10	42.2		
Cobalt	6020	0.021	0.001	5.0	06/28/10	06/30/10	13.7		
Copper	6020	0.11	0.08	5.0	06/28/10	06/30/10	24.3		
Lead	6020	0.052	0.006	5.0	06/28/10	06/30/10	14.1		
Manganese	6010B	2.10	0.04	2.0	06/29/10	07/03/10	434		
Mercury	7471A	0.010	0.001	1.0	06/30/10	07/02/10	0.138		
Nickel	6020	0.21	0.02	5.0	06/28/10	06/30/10	59.9		
Selenium	7742	0.11	0.03	2.0	06/29/10	07/09/10	0.04	J	
Silver	6020	0.021	0.008	5.0	06/29/10	06/30/10	0.106		
Vanadium	6010B	2.1	0.4	2.0	06/29/10	07/03/10	52.3		
Zinc	6010B	2.1	0.3	2.0	06/29/10	07/03/10	67.3		

% Solids: 67.1

Comments:

Metals**- 1 -****INORGANIC ANALYSIS DATA PACKAGE**

Client: Pacific EcoRisk Laboratories **Service Request:** K1006559
Project No.: NA **Date Collected:** 06/15/10
Project Name: ACOE (San Rafael Channel) **Date Received:** 06/24/10
Matrix: SEDIMENT **Units:** mg/Kg
Basis: DRY

Sample Name: SF 11 **Lab Code:** K1006559-002

Analyte	Analysis Method	MRL	MDL	Dil. Factor	Date Extracted	Date Analyzed	Result	C	Q
Arsenic	6020	0.51	0.05	5.0	06/28/10	06/30/10	4.12		
Barium	6010B	2.1	0.3	2.0	06/29/10	07/03/10	8.5		
Beryllium	6020	0.020	0.003	5.0	06/28/10	06/30/10	0.140		
Boron	6010B	10	0.3	2.0	06/29/10	07/03/10	2.0	J	
Cadmium	6020	0.020	0.004	5.0	06/28/10	06/30/10	0.035		
Chromium	6020	0.20	0.02	5.0	06/28/10	06/30/10	21.4		
Cobalt	6020	0.020	0.001	5.0	06/28/10	06/30/10	7.090		
Copper	6020	0.10	0.08	5.0	06/28/10	06/30/10	4.13		
Lead	6020	0.051	0.006	5.0	06/28/10	06/30/10	6.840		
Manganese	6010B	2.06	0.04	2.0	06/29/10	07/03/10	303		
Mercury	7471A	0.017	0.002	1.0	06/30/10	07/02/10	0.033		
Nickel	6020	0.20	0.02	5.0	06/28/10	06/30/10	27.4		
Selenium	7742	0.10	0.03	2.0	06/29/10	07/09/10	0.03	U	
Silver	6020	0.021	0.008	5.0	06/29/10	06/30/10	0.018	J	
Vanadium	6010B	2.1	0.4	2.0	06/29/10	07/03/10	18.6		
Zinc	6010B	2.1	0.3	2.0	06/29/10	07/03/10	23.6		

% Solids: 80.9

Comments:

Metals**- 1 -****INORGANIC ANALYSIS DATA PACKAGE**

Client: Pacific EcoRisk Laboratories

Service Request: K1006559

Project No.: NA

Date Collected:

Project Name: ACOE (San Rafael Channel)

Date Received:

Matrix: SEDIMENT

Units: mg/Kg

Basis: DRY

Sample Name: Method Blank

Lab Code: K1006559-MB

Analyte	Analysis Method	MRL	MDL	Dil. Factor	Date Extracted	Date Analyzed	Result	C	Q
Arsenic	6020	0.50	0.05	5.0	06/28/10	06/30/10	0.05	U	
Barium	6010B	2.0	0.3	2.0	06/29/10	07/03/10	0.3	U	
Beryllium	6020	0.020	0.003	5.0	06/28/10	06/30/10	0.003	U	
Boron	6010B	10	0.3	2.0	06/29/10	07/03/10	0.3	U	
Cadmium	6020	0.020	0.004	5.0	06/28/10	06/30/10	0.004	U	
Chromium	6020	0.20	0.02	5.0	06/28/10	06/30/10	0.05	J	
Cobalt	6020	0.020	0.001	5.0	06/28/10	06/30/10	0.006	J	
Copper	6020	0.10	0.08	5.0	06/28/10	06/30/10	0.08	U	
Lead	6020	0.050	0.006	5.0	06/28/10	06/30/10	0.060		
Manganese	6010B	2.00	0.04	2.0	06/29/10	07/03/10	0.04	U	
Mercury	7471A	0.020	0.002	1.0	06/30/10	07/02/10	0.002	U	
Nickel	6020	0.20	0.02	5.0	06/28/10	06/30/10	0.04	J	
Selenium	7742	0.10	0.03	2.0	06/29/10	07/09/10	0.03	U	
Silver	6020	0.020	0.008	5.0	06/29/10	06/30/10	0.008	U	
Vanadium	6010B	2.0	0.4	2.0	06/29/10	07/03/10	0.6	J	
Zinc	6010B	2.0	0.3	2.0	06/29/10	07/03/10	0.3	U	

% Solids: 100.0

Comments:

Metals
- 5A -

SPIKE SAMPLE RECOVERY

Client: Pacific EcoRisk Laboratories Service Request: K1006559
Project No.: NA Units: MG/KG
Project Name: ACOE (San Rafael Channel) Basis: DRY
Matrix: SEDIMENT % Solids: 56.6

Sample Name: Batch QC1S Lab Code: K1006518-001S

Analyte	Control Limit %R	Spike Result	C	Sample Result	C	Spike Added	%R	Q	Method
Mercury	60 - 135	0.474		0.046		0.49	87.3		7471A

An empty field in the Control Limit column indicates the control limit is not applicable

Metals

- 5A -

SPIKE SAMPLE RECOVERY

Client: Pacific EcoRisk Laboratories

Service Request: K1006559

Project No.: NA

Units: MG/KG

Project Name: ACOE (San Rafael Channel)

Basis: DRY

Matrix: SEDIMENT

% Solids: 67.1

Sample Name: SF 10S

Lab Code: K1006559-001S

Analyte	Control Limit %R	Spike Result	C	Sample Result	C	Spike Added	%R	Q	Method
Arsenic	57 - 133	116		8.02		104.95	102.9		6020
Barium	60 - 139	457		38.4		425.80	98.3		6010B
Beryllium	64 - 133	12.1		0.352		10.50	111.9		6020
Boron	53 - 135	98		0.3	U	106.45	92.1		6010B
Cadmium	68 - 137	11.2		0.145		10.50	105.3		6020
Chromium	34 - 175	80.1		42.2		41.98	90.3		6020
Cobalt	74 - 118	116		13.7		104.95	97.5		6020
Copper	22 - 181	77.7		24.3		52.48	101.8		6020
Lead	27 - 178	123		14.1		104.95	103.8		6020
Manganese		542		434		106.45	101.5		6010B
Nickel	59 - 132	161		59.9		104.95	96.3		6020
Selenium	57 - 134	1.98		0.04	J	2.10	92.4		7742
Silver	62 - 131	11.2		0.106		10.65	104.2		6020
Vanadium	64 - 132	166		52.3		106.45	106.8		6010B
Zinc	13 - 172	181		67.3		106.45	106.8		6010B

An empty field in the Control Limit column indicates the control limit is not applicable

Metals
- 6 -
DUPLICATES

Client: Pacific EcoRisk Laboratories Service Request: K1006559
Project No.: NA Units: MG/KG
Project Name: ACOE (San Rafael Channel) Basis: DRY
Matrix: SEDIMENT % Solids: 56.6

Sample Name: Batch QC1D Lab Code: K1006518-001D

Analyte	Control Limit	Sample (S)C	Duplicate (D)C	RPD	Q	Method
Mercury		0.046	0.046	0.0		7471A

An empty field in the Control Limit column indicates the control limit is not applicable.

Metals

- 6 -

DUPLICATES

Client: Pacific EcoRisk Laboratories Service Request: K1006559
 Project No.: NA Units: MG/KG
 Project Name: ACOE (San Rafael Channel) Basis: DRY
 Matrix: SEDIMENT % Solids: 67.1

Sample Name: SF 10D

Lab Code: K1006559-001D

Analyte	Control Limit	Sample (S)	C	Duplicate (D)	C	RPD	Q	Method
Arsenic	20	8.02		7.73		3.7		6020
Barium	30	38.4		32.7		16.0		6010B
Beryllium	20	0.352		0.334		5.2		6020
Boron		0.3	U	0.3	U			6010B
Cadmium	20	0.145		0.148		2.0		6020
Chromium	20	42.2		40.9		3.1		6020
Cobalt	20	13.7		12.8		6.8		6020
Copper	20	24.3		24.3		0.0		6020
Lead	20	14.1		14.1		0.0		6020
Manganese	30	434		467		7.3		6010B
Nickel	20	59.9		58.5		2.4		6020
Selenium		0.04	J	0.04	J	0.0		7742
Silver	20	0.106		0.108		1.9		6020
Vanadium	30	52.3		53.9		3.0		6010B
Zinc	30	67.3		68.1		1.2		6010B

An empty field in the Control Limit column indicates the control limit is not applicable.

Metals

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LABORATORY CONTROL SAMPLE

Client: Pacific EcoRisk Laboratories

Service Request: K1006559

Project No.: NA

Project Name: ACOE (San Rafael Channel)

Aqueous LCS Source:

Solid LCS Source: ERA D065540

Analyte	Aqueous: ug/L			Solid: mg/kg					
	True	Found	%R	True	Found	C	Limits	%R	
Arsenic				88.3	88.2		78 122	99.9	
Barium				432	460		81 119	106.5	
Beryllium				58.2	60.6		83 117	104.1	
Boron				101	101		67 133	100.0	
Cadmium				91	87.2		81 119	95.8	
Chromium				144	133		80 119	92.4	
Cobalt				190	188		82 118	98.9	
Copper				237	228		83 116	96.2	
Lead				104	114		79 121	109.6	
Manganese				497	549		81 119	110.5	
Mercury				6.8	6.580		71 128	96.8	
Nickel				200	196		81 118	98.0	
Selenium				192	179		80 120	93.2	
Silver				76.4	85.6		66 134	112.0	
Vanadium				180	198		79 121	110.0	
Zinc				292	313		73 121	107.2	

Butyltins

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Pacific EcoRisk Laboratories
Project: ACOE (San Rafael Channel)
Sample Matrix: Sediment

Service Request: K1006559
Date Collected: 06/15/2010
Date Received: 06/24/2010

Butyltins (as cation)

Sample Name: SF 10
Lab Code: K1006559-001
Extraction Method: METHOD
Analysis Method: Krone

Units: ug/Kg
Basis: Dry
Level: Low

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Tetra-n-butyltin	ND	U	1.5	0.64	1	06/29/10	07/15/10	KWG1006968	
Tri-n-butyltin Cation	ND	U	1.5	0.62	1	06/29/10	07/15/10	KWG1006968	
Di-n-butyltin Cation	0.63	J	1.5	0.28	1	06/29/10	07/15/10	KWG1006968	
n-Butyltin Cation	0.93	J	1.5	0.38	1	06/29/10	07/15/10	KWG1006968	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Tri-n-propyltin	60	18-95	07/15/10	Acceptable

Comments: _____

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Pacific EcoRisk Laboratories
Project: ACOE (San Rafael Channel)
Sample Matrix: Sediment

Service Request: K1006559
Date Collected: 06/15/2010
Date Received: 06/24/2010

Butyltins (as cation)

Sample Name: SF 11
Lab Code: K1006559-002
Extraction Method: METHOD
Analysis Method: Krone

Units: ug/Kg
Basis: Dry
Level: Low

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Tetra-n-butyltin	ND	U	1.3	0.54	1	06/29/10	07/15/10	KWG1006968	
Tri-n-butyltin Cation	ND	U	1.3	0.53	1	06/29/10	07/15/10	KWG1006968	
Di-n-butyltin Cation	ND	U	1.3	0.24	1	06/29/10	07/15/10	KWG1006968	
n-Butyltin Cation	ND	U	1.3	0.32	1	06/29/10	07/15/10	KWG1006968	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Tri-n-propyltin	56	18-95	07/15/10	Acceptable

Comments: _____

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Pacific EcoRisk Laboratories
Project: ACOE (San Rafael Channel)
Sample Matrix: Sediment

Service Request: K1006559
Date Collected: NA
Date Received: NA

Butyltins (as cation)

Sample Name: Method Blank
Lab Code: KWG1006968-4
Extraction Method: METHOD
Analysis Method: Krone

Units: ug/Kg
Basis: Dry
Level: Low

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Tetra-n-butyltin	ND	U	0.97	0.44	1	06/29/10	07/15/10	KWG1006968	
Tri-n-butyltin Cation	ND	U	0.97	0.43	1	06/29/10	07/15/10	KWG1006968	
Di-n-butyltin Cation	ND	U	0.97	0.19	1	06/29/10	07/15/10	KWG1006968	
n-Butyltin Cation	ND	U	0.97	0.26	1	06/29/10	07/15/10	KWG1006968	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Tri-n-propyltin	63	18-95	07/15/10	Acceptable

Comments: _____

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Pacific EcoRisk Laboratories
Project: ACOE (San Rafael Channel)
Sample Matrix: Sediment

Service Request: K1006559

Surrogate Recovery Summary
Butyltins (as cation)

Extraction Method: METHOD
Analysis Method: Krone

Units: PERCENT
Level: Low

<u>Sample Name</u>	<u>Lab Code</u>	<u>Sur1</u>
SF 10	K1006559-001	60
SF 11	K1006559-002	56
Method Blank	KWG1006968-4	63
Batch QC	K1006453-001	69
Batch QCMS	KWG1006968-1	95
Batch QCDMS	KWG1006968-2	80
Lab Control Sample	KWG1006968-3	53

Surrogate Recovery Control Limits (%)

Sur1 = Tri-n-propyltin 18-95

Results flagged with an asterisk (*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Pacific EcoRisk Laboratories
Project: ACOE (San Rafael Channel)
Sample Matrix: Sediment

Service Request: K1006559
Date Extracted: 06/29/2010
Date Analyzed: 07/15/2010

Matrix Spike/Duplicate Matrix Spike Summary
Butyltins (as cation)

Sample Name: Batch QC
Lab Code: K1006453-001

Units: ug/Kg
Basis: Dry

Extraction Method: METHOD
Analysis Method: Krone

Level: Low
Extraction Lot: KWG1006968

Analyte Name	Sample Result	Batch QCMS KWG1006968-1 Matrix Spike			Batch QCDMS KWG1006968-2 Duplicate Matrix Spike			%Rec Limits	RPD	RPD Limit
		Result	Expected	%Rec	Result	Expected	%Rec			
Tetra-n-butyltin	1.2	29.2	30.3	92	26.7	29.9	85	10-120	9	40
Tri-n-butyltin Cation	0.62	25.2	26.9	91	23.1	26.6	84	10-118	9	40
Di-n-butyltin Cation	0.53	20.8	23.3	87	17.8	23.0	75	10-145	15	40
n-Butyltin Cation	1.1	21.9	18.9	110	20.6	18.7	104	10-126	6	40

Results flagged with an asterisk (*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Pacific EcoRisk Laboratories
Project: ACOE (San Rafael Channel)
Sample Matrix: Sediment

Service Request: K1006559
Date Extracted: 06/29/2010
Date Analyzed: 07/15/2010

Lab Control Spike Summary
Butyltins (as cation)

Extraction Method: METHOD
Analysis Method: Krone

Units: ug/Kg
Basis: Dry
Level: Low
Extraction Lot: KWG1006968

Analyte Name	Lab Control Sample KWG1006968-3 Lab Control Spike			%Rec Limits
	Result	Expected	%Rec	
Tetra-n-butyltin	13.9	25.0	55	30-110
Tri-n-butyltin Cation	11.5	22.2	52	25-101
Di-n-butyltin Cation	10.3	19.2	53	35-108
n-Butyltin Cation	8.93	15.6	57	20-123

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

Diesel & Residual Range Organics

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Pacific EcoRisk Laboratories
Project: ACOE (San Rafael Channel)
Sample Matrix: Sediment

Service Request: K1006559
Date Collected: 06/15/2010
Date Received: 06/24/2010

Diesel and Residual Range Organics

Sample Name: SF 10
Lab Code: K1006559-001
Extraction Method: EPA 3550B
Analysis Method: 8015B

Units: mg/Kg
Basis: Dry
Level: Low

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Diesel Range Organics (DRO)	8.8	J	37	2.4	1	06/29/10	07/08/10	KWG1006626	
Residual Range Organics (RRO)	34	J	37	4.3	1	06/29/10	07/08/10	KWG1006626	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
o-Terphenyl	76	51-126	07/08/10	Acceptable
n-Triacontane	77	50-150	07/08/10	Acceptable

Comments: _____

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Pacific EcoRisk Laboratories
Project: ACOE (San Rafael Channel)
Sample Matrix: Sediment

Service Request: K1006559
Date Collected: 06/15/2010
Date Received: 06/24/2010

Diesel and Residual Range Organics

Sample Name: SF 11
Lab Code: K1006559-002
Extraction Method: EPA 3550B
Analysis Method: 8015B

Units: mg/Kg
Basis: Dry
Level: Low

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Diesel Range Organics (DRO)	3.9	J	31	2.0	1	06/29/10	07/08/10	KWG1006626	
Residual Range Organics (RRO)	17	J	31	3.6	1	06/29/10	07/08/10	KWG1006626	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
o-Terphenyl	82	51-126	07/08/10	Acceptable
n-Triacontane	83	50-150	07/08/10	Acceptable

Comments: _____

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Pacific EcoRisk Laboratories
Project: ACOE (San Rafael Channel)
Sample Matrix: Sediment

Service Request: K1006559
Date Collected: NA
Date Received: NA

Diesel and Residual Range Organics

Sample Name: Method Blank
Lab Code: KWG1006626-4
Extraction Method: EPA 3550B
Analysis Method: 8015B

Units: mg/Kg
Basis: Dry
Level: Low

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Diesel Range Organics (DRO)	ND	U	25	1.6	1	06/29/10	07/08/10	KWG1006626	
Residual Range Organics (RRO)	3.1	J	25	2.9	1	06/29/10	07/08/10	KWG1006626	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
o-Terphenyl	78	51-126	07/08/10	Acceptable
n-Triacontane	76	50-150	07/08/10	Acceptable

Comments: _____

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Pacific EcoRisk Laboratories
Project: ACOE (San Rafael Channel)
Sample Matrix: Sediment

Service Request: K1006559

Surrogate Recovery Summary
Diesel and Residual Range Organics

Extraction Method: EPA 3550B
Analysis Method: 8015B

Units: PERCENT
Level: Low

<u>Sample Name</u>	<u>Lab Code</u>	<u>Sur1</u>	<u>Sur2</u>
SF 10	K1006559-001	76	77
SF 11	K1006559-002	82	83
Method Blank	KWG1006626-4	78	76
SF 10MS	KWG1006626-1	85	84
SF 10DMS	KWG1006626-2	83	85
Lab Control Sample	KWG1006626-3	83	85

Surrogate Recovery Control Limits (%)

Sur1 = o-Terphenyl	51-126
Sur2 = n-Triacontane	50-150

Results flagged with an asterisk (*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Pacific EcoRisk Laboratories
Project: ACOE (San Rafael Channel)
Sample Matrix: Sediment

Service Request: K1006559
Date Extracted: 06/29/2010
Date Analyzed: 07/08/2010

Matrix Spike/Duplicate Matrix Spike Summary
Diesel and Residual Range Organics

Sample Name: SF 10
Lab Code: K1006559-001
Extraction Method: EPA 3550B
Analysis Method: 8015B

Units: mg/Kg
Basis: Dry
Level: Low
Extraction Lot: KWG1006626

Analyte Name	Sample Result	SF 10MS KWG1006626-1 Matrix Spike			SF 10DMS KWG1006626-2 Duplicate Matrix Spike			%Rec Limits	RPD	RPD Limit
		Result	Expected	%Rec	Result	Expected	%Rec			
Diesel Range Organics (DRO)	8.8	356	397	88	340	396	84	43-146	5	40
Residual Range Organics (RRO)	34	198	199	82	197	198	83	29-167	0	40

Results flagged with an asterisk (*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Pacific EcoRisk Laboratories
Project: ACOE (San Rafael Channel)
Sample Matrix: Sediment

Service Request: K1006559
Date Extracted: 06/29/2010
Date Analyzed: 07/08/2010

**Lab Control Spike Summary
 Diesel and Residual Range Organics**

Extraction Method: EPA 3550B
Analysis Method: 8015B

Units: mg/Kg
Basis: Dry
Level: Low
Extraction Lot: KWG1006626

Analyte Name	Lab Control Sample KWG1006626-3 Lab Control Spike			%Rec Limits
	Result	Expected	%Rec	
Diesel Range Organics (DRO)	222	267	83	63-121
Residual Range Organics (RRO)	105	133	78	57-136

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

Gasoline Range Organics

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Pacific EcoRisk Laboratories
Project: ACOE (San Rafael Channel)
Sample Matrix: Sediment

Service Request: K1006559
Date Collected: 06/15/2010
Date Received: 06/24/2010

Gasoline Range Organics

Sample Name: SF 10
Lab Code: K1006559-001
Extraction Method: EPA 5035A/5030B
Analysis Method: 8015B

Units: mg/Kg
Basis: Dry
Level: Med

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Gasoline Range Organics (GRO)	ND	U	8.7	2.3	1	06/29/10	06/29/10	KWG1006510	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
4-Bromofluorobenzene	90	83-119	06/29/10	Acceptable

Comments: _____

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Pacific EcoRisk Laboratories
Project: ACOE (San Rafael Channel)
Sample Matrix: Sediment

Service Request: K1006559
Date Collected: 06/15/2010
Date Received: 06/24/2010

Gasoline Range Organics

Sample Name: SF 11
Lab Code: K1006559-002
Extraction Method: EPA 5035A/5030B
Analysis Method: 8015B

Units: mg/Kg
Basis: Dry
Level: Med

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Gasoline Range Organics (GRO)	ND	U	6.6	1.7	1	06/29/10	06/29/10	KWG1006510	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
4-Bromofluorobenzene	90	83-119	06/29/10	Acceptable

Comments: _____

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Pacific EcoRisk Laboratories
Project: ACOE (San Rafael Channel)
Sample Matrix: Sediment

Service Request: K1006559
Date Collected: NA
Date Received: NA

Gasoline Range Organics

Sample Name: Method Blank
Lab Code: KWG1006510-4
Extraction Method: EPA 5035A/5030B
Analysis Method: 8015B

Units: mg/Kg
Basis: Dry
Level: Med

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Gasoline Range Organics (GRO)	1.6	J	5.0	1.3	1	06/29/10	06/29/10	KWG1006510	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
4-Bromofluorobenzene	93	83-119	06/29/10	Acceptable

Comments: _____

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Pacific EcoRisk Laboratories
Project: ACOE (San Rafael Channel)
Sample Matrix: Sediment

Service Request: K1006559**Surrogate Recovery Summary
Gasoline Range Organics**

Extraction Method: EPA 5035A/5030B
Analysis Method: 8015B

Units: PERCENT
Level: Med

<u>Sample Name</u>	<u>Lab Code</u>	<u>Sur1</u>
SF 10	K1006559-001	90
SF 11	K1006559-002	90
Method Blank	KWG1006510-4	93
SF 11MS	KWG1006510-1	90
SF 11DMS	KWG1006510-2	90
Lab Control Sample	KWG1006510-3	91

Surrogate Recovery Control Limits (%)

Sur1 = 4-Bromofluorobenzene 83-119

Results flagged with an asterisk (*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Pacific EcoRisk Laboratories
Project: ACOE (San Rafael Channel)
Sample Matrix: Sediment

Service Request: K1006559
Date Extracted: 06/29/2010
Date Analyzed: 06/29/2010

Matrix Spike/Duplicate Matrix Spike Summary
Gasoline Range Organics

Sample Name: SF 11
Lab Code: K1006559-002
Extraction Method: EPA 5035A/5030B
Analysis Method: 8015B

Units: mg/Kg
Basis: Dry
Level: Med
Extraction Lot: KWG1006510

Analyte Name	Sample Result	SF 11MS KWG1006510-1 Matrix Spike			SF 11DMS KWG1006510-2 Duplicate Matrix Spike			%Rec Limits	RPD	RPD Limit
		Result	Expected	%Rec	Result	Expected	%Rec			
Gasoline Range Organics (GRO)	ND	57.8	65.5	88	57.8	65.9	88	68-112	0	40

Results flagged with an asterisk (*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Pacific EcoRisk Laboratories
Project: ACOE (San Rafael Channel)
Sample Matrix: Sediment

Service Request: K1006559
Date Extracted: 06/29/2010
Date Analyzed: 06/29/2010

Lab Control Spike Summary
Gasoline Range Organics

Extraction Method: EPA 5035A/5030B
Analysis Method: 8015B

Units: mg/Kg
Basis: Dry
Level: Med
Extraction Lot: KWG1006510

Lab Control Sample
KWG1006510-3

Lab Control Spike

Analyte Name	Lab Control Spike			%Rec Limits
	Result	Expected	%Rec	
Gasoline Range Organics (GRO)	46.5	50.0	93	76-123

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

Organochlorine Pesticides

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Pacific EcoRisk Laboratories
Project: ACOE (San Rafael Channel)
Sample Matrix: Sediment

Service Request: K1006559
Date Collected: 06/15/2010
Date Received: 06/24/2010

Organochlorine Pesticides

Sample Name: SF 10
Lab Code: K1006559-001

Units: ug/Kg
Basis: Dry

Extraction Method: EPA 3541
Analysis Method: 8081A

Level: Low

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
alpha-BHC	ND	U	0.30	0.087	1	06/29/10	07/17/10	KWG1006610	
beta-BHC	ND	U	0.30	0.27	1	06/29/10	07/17/10	KWG1006610	
gamma-BHC (Lindane)	ND	U	0.30	0.076	1	06/29/10	07/17/10	KWG1006610	
delta-BHC	ND	U	0.30	0.11	1	06/29/10	07/17/10	KWG1006610	
Heptachlor	ND	U	0.30	0.069	1	06/29/10	07/17/10	KWG1006610	
Aldrin	ND	U	0.30	0.069	1	06/29/10	07/17/10	KWG1006610	
Heptachlor Epoxide	ND	U	0.30	0.072	1	06/29/10	07/17/10	KWG1006610	
gamma-Chlordane†	0.16	J	0.30	0.084	1	06/29/10	07/17/10	KWG1006610	
Endosulfan I	ND	U	0.30	0.084	1	06/29/10	07/17/10	KWG1006610	
alpha-Chlordane	ND	U	0.30	0.094	1	06/29/10	07/17/10	KWG1006610	
Dieldrin	ND	U	0.30	0.076	1	06/29/10	07/17/10	KWG1006610	
4,4'-DDE	0.87		0.30	0.070	1	06/29/10	07/17/10	KWG1006610	
Endrin	ND	U	0.30	0.085	1	06/29/10	07/17/10	KWG1006610	
Endosulfan II	ND	U	0.30	0.13	1	06/29/10	07/17/10	KWG1006610	
4,4'-DDD	0.44		0.30	0.15	1	06/29/10	07/17/10	KWG1006610	
Endrin Aldehyde	ND	U	0.30	0.072	1	06/29/10	07/17/10	KWG1006610	
Endosulfan Sulfate	ND	U	0.30	0.076	1	06/29/10	07/17/10	KWG1006610	
4,4'-DDT	ND	Ui	0.30	0.30	1	06/29/10	07/17/10	KWG1006610	
Toxaphene	ND	U	15	3.6	1	06/29/10	07/17/10	KWG1006610	
Chlordane	ND	U	15	15	1	06/29/10	07/17/10	KWG1006610	
2,4'-DDE	ND	U	0.30	0.093	1	06/29/10	07/17/10	KWG1006610	
2,4'-DDD	0.17	JP	0.30	0.090	1	06/29/10	07/17/10	KWG1006610	
2,4'-DDT	0.21	J	0.30	0.066	1	06/29/10	07/17/10	KWG1006610	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Tetrachloro-m-xylene	54	21-112	07/17/10	Acceptable
Decachlorobiphenyl	66	15-130	07/17/10	Acceptable

Comments: _____

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Pacific EcoRisk Laboratories
Project: ACOE (San Rafael Channel)
Sample Matrix: Sediment

Service Request: K1006559
Date Collected: 06/15/2010
Date Received: 06/24/2010

Organochlorine Pesticides

Sample Name: SF 10
Lab Code: K1006559-001

Units: ug/Kg
Basis: Dry

† Analyte Comments

gamma-Chlordane For this analyte (CAS Registry No. 5103-74-2), USEPA has corrected the name to be beta-Chlordane, also known as trans-Chlordane.

Comments: _____

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Pacific EcoRisk Laboratories
Project: ACOE (San Rafael Channel)
Sample Matrix: Sediment

Service Request: K1006559
Date Collected: 06/15/2010
Date Received: 06/24/2010

Organochlorine Pesticides

Sample Name: SF 11
Lab Code: K1006559-002

Units: ug/Kg
Basis: Dry

Extraction Method: EPA 3541
Analysis Method: 8081A

Level: Low

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
alpha-BHC	ND	U	0.25	0.072	1	06/29/10	07/17/10	KWG1006610	
beta-BHC	ND	U	0.25	0.23	1	06/29/10	07/17/10	KWG1006610	
gamma-BHC (Lindane)	ND	U	0.25	0.063	1	06/29/10	07/17/10	KWG1006610	
delta-BHC	ND	U	0.25	0.087	1	06/29/10	07/17/10	KWG1006610	
Heptachlor	ND	U	0.25	0.057	1	06/29/10	07/17/10	KWG1006610	
Aldrin	ND	U	0.25	0.057	1	06/29/10	07/17/10	KWG1006610	
Heptachlor Epoxide	ND	U	0.25	0.060	1	06/29/10	07/17/10	KWG1006610	
gamma-Chlordane†	ND	U	0.25	0.070	1	06/29/10	07/17/10	KWG1006610	
Endosulfan I	ND	U	0.25	0.070	1	06/29/10	07/17/10	KWG1006610	
alpha-Chlordane	ND	U	0.25	0.078	1	06/29/10	07/17/10	KWG1006610	
Dieldrin	ND	U	0.25	0.063	1	06/29/10	07/17/10	KWG1006610	
4,4'-DDE	ND	U	0.25	0.059	1	06/29/10	07/17/10	KWG1006610	
Endrin	ND	U	0.25	0.071	1	06/29/10	07/17/10	KWG1006610	
Endosulfan II	ND	U	0.25	0.11	1	06/29/10	07/17/10	KWG1006610	
4,4'-DDD	ND	U	0.25	0.13	1	06/29/10	07/17/10	KWG1006610	
Endrin Aldehyde	ND	U	0.25	0.060	1	06/29/10	07/17/10	KWG1006610	
Endosulfan Sulfate	ND	U	0.25	0.063	1	06/29/10	07/17/10	KWG1006610	
4,4'-DDT	ND	U	0.25	0.071	1	06/29/10	07/17/10	KWG1006610	
Toxaphene	ND	U	13	3.0	1	06/29/10	07/17/10	KWG1006610	
Chlordane	ND	U	13	13	1	06/29/10	07/17/10	KWG1006610	
2,4'-DDE	ND	U	0.25	0.077	1	06/29/10	07/17/10	KWG1006610	
2,4'-DDD	ND	U	0.25	0.075	1	06/29/10	07/17/10	KWG1006610	
2,4'-DDT	ND	U	0.25	0.055	1	06/29/10	07/17/10	KWG1006610	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Tetrachloro-m-xylene	54	21-112	07/17/10	Acceptable
Decachlorobiphenyl	67	15-130	07/17/10	Acceptable

Comments: _____

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Pacific EcoRisk Laboratories
Project: ACOE (San Rafael Channel)
Sample Matrix: Sediment

Service Request: K1006559
Date Collected: 06/15/2010
Date Received: 06/24/2010

Organochlorine Pesticides

Sample Name: SF 11
Lab Code: K1006559-002

Units: ug/Kg
Basis: Dry

† Analyte Comments

gamma-Chlordane

For this analyte (CAS Registry No. 5103-74-2), USEPA has corrected the name to be beta-Chlordane, also known as trans-Chlordane.

Comments: _____

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Pacific EcoRisk Laboratories
Project: ACOE (San Rafael Channel)
Sample Matrix: Sediment

Service Request: K1006559
Date Collected: NA
Date Received: NA

Organochlorine Pesticides

Sample Name: Method Blank
Lab Code: KWG1006610-10

Units: ug/Kg
Basis: Dry

Extraction Method: EPA 3541
Analysis Method: 8081A

Level: Low

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
alpha-BHC	ND	U	0.20	0.058	1	06/29/10	07/17/10	KWG1006610	
beta-BHC	ND	U	0.20	0.18	1	06/29/10	07/17/10	KWG1006610	
gamma-BHC (Lindane)	ND	U	0.20	0.051	1	06/29/10	07/17/10	KWG1006610	
delta-BHC	ND	U	0.20	0.070	1	06/29/10	07/17/10	KWG1006610	
Heptachlor	ND	U	0.20	0.046	1	06/29/10	07/17/10	KWG1006610	
Aldrin	ND	U	0.20	0.046	1	06/29/10	07/17/10	KWG1006610	
Heptachlor Epoxide	ND	U	0.20	0.048	1	06/29/10	07/17/10	KWG1006610	
gamma-Chlordane†	ND	U	0.20	0.056	1	06/29/10	07/17/10	KWG1006610	
Endosulfan I	ND	U	0.20	0.056	1	06/29/10	07/17/10	KWG1006610	
alpha-Chlordane	ND	U	0.20	0.063	1	06/29/10	07/17/10	KWG1006610	
Dieldrin	ND	U	0.20	0.051	1	06/29/10	07/17/10	KWG1006610	
4,4'-DDE	ND	U	0.20	0.047	1	06/29/10	07/17/10	KWG1006610	
Endrin	ND	U	0.20	0.057	1	06/29/10	07/17/10	KWG1006610	
Endosulfan II	ND	U	0.20	0.086	1	06/29/10	07/17/10	KWG1006610	
4,4'-DDD	ND	U	0.20	0.10	1	06/29/10	07/17/10	KWG1006610	
Endrin Aldehyde	ND	U	0.20	0.048	1	06/29/10	07/17/10	KWG1006610	
Endosulfan Sulfate	ND	U	0.20	0.051	1	06/29/10	07/17/10	KWG1006610	
4,4'-DDT	ND	U	0.20	0.057	1	06/29/10	07/17/10	KWG1006610	
Toxaphene	ND	U	10	2.4	1	06/29/10	07/17/10	KWG1006610	
Chlordane	ND	U	10	10	1	06/29/10	07/17/10	KWG1006610	
2,4'-DDE	ND	U	0.20	0.062	1	06/29/10	07/17/10	KWG1006610	
2,4'-DDD	ND	U	0.20	0.060	1	06/29/10	07/17/10	KWG1006610	
2,4'-DDT	ND	U	0.20	0.044	1	06/29/10	07/17/10	KWG1006610	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Tetrachloro-m-xylene	57	21-112	07/17/10	Acceptable
Decachlorobiphenyl	69	15-130	07/17/10	Acceptable

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Pacific EcoRisk Laboratories
Project: ACOE (San Rafael Channel)
Sample Matrix: Sediment

Service Request: K1006559
Date Collected: NA
Date Received: NA

Organochlorine Pesticides

Sample Name: Method Blank
Lab Code: KWG1006610-10

Units: ug/Kg
Basis: Dry

† **Analyte Comments**

gamma-Chlordane

For this analyte (CAS Registry No. 5103-74-2), USEPA has corrected the name to be beta-Chlordane, also known as trans-Chlordane.

Comments: _____

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Pacific EcoRisk Laboratories
Project: ACOE (San Rafael Channel)
Sample Matrix: Sediment

Service Request: K1006559

Surrogate Recovery Summary
Organochlorine Pesticides

Extraction Method: EPA 3541
Analysis Method: 8081A

Units: PERCENT
Level: Low

<u>Sample Name</u>	<u>Lab Code</u>	<u>Sur1</u>	<u>Sur2</u>
SF 10	K1006559-001	54	66
SF 11	K1006559-002	54	67
Method Blank	KWG1006610-10	57	69
SF 10MS	KWG1006610-1	49	60
SF 10DMS	KWG1006610-2	50	62
SF 10MS	KWG1006610-4	55	63
SF 10DMS	KWG1006610-5	47	58
SF 11MS	KWG1006610-7	58	64
SF 11DMS	KWG1006610-8	60	62
Lab Control Sample	KWG1006610-3	57	68

Surrogate Recovery Control Limits (%)

Sur1 = Tetrachloro-m-xylene	21-112
Sur2 = Decachlorobiphenyl	15-130

Results flagged with an asterisk (*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Pacific EcoRisk Laboratories
Project: ACOE (San Rafael Channel)
Sample Matrix: Sediment

Service Request: K1006559
Date Extracted: 06/29/2010
Date Analyzed: 07/17/2010

Matrix Spike/Duplicate Matrix Spike Summary
Organochlorine Pesticides

Sample Name: SF 10
Lab Code: K1006559-001

Units: ug/Kg
Basis: Dry

Extraction Method: EPA 3541
Analysis Method: 8081A

Level: Low
Extraction Lot: KWG1006610

Analyte Name	Sample Result	SF 10MS KWG1006610-1 Matrix Spike			SF 10DMS KWG1006610-2 Duplicate Matrix Spike			%Rec Limits	RPD	RPD Limit
		Result	Expected	%Rec	Result	Expected	%Rec			
alpha-BHC	ND	7.47	14.9	50	7.96	14.9	53	23-133	6	40
beta-BHC	ND	7.48	14.9	50	8.48	14.9	57	22-142	12	40
gamma-BHC (Lindane)	ND	7.71	14.9	52	8.28	14.9	56	26-135	7	40
delta-BHC	ND	8.42	14.9	57	9.44	14.9	63	25-148	11	40
Heptachlor	ND	8.72	14.9	59	9.38	14.9	63	21-136	7	40
Aldrin	ND	7.44	14.9	50	8.10	14.9	54	22-135	9	40
Heptachlor Epoxide	ND	7.77	14.9	52	8.62	14.9	58	25-129	10	40
gamma-Chlordane	0.16	7.91	14.9	52	8.83	14.9	58	24-133	11	40
Endosulfan I	ND	6.23	14.9	42	6.92	14.9	46	15-119	11	40
alpha-Chlordane	ND	7.80	14.9	53	8.70	14.9	58	24-132	11	40
Dieldrin	ND	7.87	14.9	53	8.80	14.9	59	26-133	11	40
4,4'-DDE	0.87	9.42	14.9	58	10.5	14.9	65	22-142	11	40
Endrin	ND	7.83	14.9	53	8.70	14.9	58	22-145	11	40
Endosulfan II	ND	6.60	14.9	44	7.23	14.9	49	13-129	9	40
4,4'-DDD	0.44	8.93	14.9	57	9.71	14.9	62	19-143	8	40
Endrin Aldehyde	ND	7.38	14.9	50	8.02	14.9	54	10-129	8	40
Endosulfan Sulfate	ND	7.82	14.9	53	8.71	14.9	58	20-134	11	40
4,4'-DDT	ND	10.6	14.9	71	11.7	14.9	79	19-154	10	40

Results flagged with an asterisk (*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Pacific EcoRisk Laboratories
Project: ACOE (San Rafael Channel)
Sample Matrix: Sediment

Service Request: K1006559
Date Extracted: 06/29/2010
Date Analyzed: 07/17/2010

Matrix Spike/Duplicate Matrix Spike Summary
Organochlorine Pesticides

Sample Name: SF 10
Lab Code: K1006559-001
Extraction Method: EPA 3541
Analysis Method: 8081A

Units: ug/Kg
Basis: Dry
Level: Low
Extraction Lot: KWG1006610

Analyte Name	Sample Result	SF 10MS KWG1006610-4 Matrix Spike			SF 10DMS KWG1006610-5 Duplicate Matrix Spike			%Rec Limits	RPD	RPD Limit
		Result	Expected	%Rec	Result	Expected	%Rec			
2,4'-DDE	ND	9.97	14.9	67	9.29	14.9	62	24-141	7	40
2,4'-DDD	0.17	9.42	14.9	62	8.73	14.9	57	12-147	8	40
2,4'-DDT	0.21	10.9	14.9	71	9.87	14.9	65	15-141	9	40

Results flagged with an asterisk (*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Pacific EcoRisk Laboratories
Project: ACOE (San Rafael Channel)
Sample Matrix: Sediment

Service Request: K1006559
Date Extracted: 06/29/2010
Date Analyzed: 07/17/2010

Matrix Spike/Duplicate Matrix Spike Summary
Organochlorine Pesticides

Sample Name: SF 11
Lab Code: K1006559-002
Extraction Method: EPA 3541
Analysis Method: 8081A

Units: ug/Kg
Basis: Dry
Level: Low
Extraction Lot: KWG1006610

Analyte Name	Sample Result	SF 11MS KWG1006610-7 Matrix Spike			SF 11DMS KWG1006610-8 Duplicate Matrix Spike			%Rec Limits	RPD	RPD Limit
		Result	Expected	%Rec	Result	Expected	%Rec			
Toxaphene	ND	115	123	94	132	123	107	20-155	14	40
Chlordane	ND	108	123	88	104	123	84	46-139	4	40

Results flagged with an asterisk (*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Pacific EcoRisk Laboratories
Project: ACOE (San Rafael Channel)
Sample Matrix: Sediment

Service Request: K1006559
Date Extracted: 06/29/2010
Date Analyzed: 07/17/2010

**Lab Control Spike Summary
Organochlorine Pesticides**

Extraction Method: EPA 3541
Analysis Method: 8081A

Units: ug/Kg
Basis: Dry
Level: Low
Extraction Lot: KWG1006610

Analyte Name	Lab Control Sample KWG1006610-3 Lab Control Spike			%Rec Limits
	Result	Expected	%Rec	
alpha-BHC	6.26	10.0	63	36-139
beta-BHC	6.97	10.0	70	38-142
gamma-BHC (Lindane)	6.41	10.0	64	40-142
delta-BHC	6.94	10.0	69	48-145
Heptachlor	6.60	10.0	66	39-135
Aldrin	5.93	10.0	59	37-134
Heptachlor Epoxide	6.47	10.0	65	45-118
gamma-Chlordane	6.40	10.0	64	41-135
Endosulfan I	5.25	10.0	52	35-121
alpha-Chlordane	6.43	10.0	64	41-134
Dieldrin	6.67	10.0	67	46-136
4,4'-DDE	7.12	10.0	71	46-141
Endrin	6.37	10.0	64	40-152
Endosulfan II	5.65	10.0	57	39-128
4,4'-DDD	7.18	10.0	72	46-146
Endrin Aldehyde	5.86	10.0	59	32-132
Endosulfan Sulfate	6.57	10.0	66	43-138
4,4'-DDT	7.43	10.0	74	46-151
Toxaphene	91.7	100	92	53-133
Chlordane	84.4	100	84	52-140
2,4'-DDE	6.78	10.0	68	49-112
2,4'-DDD	6.76	10.0	68	53-115
2,4'-DDT	7.08	10.0	71	44-120

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Pacific EcoRisk Laboratories
Project: ACOE (San Rafael Channel)
Sample Matrix: Sediment

Service Request: K1006559
Date Collected: 06/15/2010
Date Received: 06/24/2010

Organochlorine Pesticides

Sample Name: SF 10
Lab Code: K1006559-001
Extraction Method: EPA 3541
Analysis Method: 8081A

Units: ug/Kg
Basis: Dry
Level: Low

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Methoxychlor	ND	U	0.30	0.23	1	06/29/10	07/17/10	KWG1006610	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Tetrachloro-m-xylene	54	21-112	07/17/10	Acceptable
Decachlorobiphenyl	66	15-130	07/17/10	Acceptable

Comments: _____

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Pacific EcoRisk Laboratories
Project: ACOE (San Rafael Channel)
Sample Matrix: Sediment

Service Request: K1006559
Date Collected: 06/15/2010
Date Received: 06/24/2010

Organochlorine Pesticides

Sample Name: SF 11
Lab Code: K1006559-002
Extraction Method: EPA 3541
Analysis Method: 8081A

Units: ug/Kg
Basis: Dry
Level: Low

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Methoxychlor	ND	U	0.25	0.19	1	06/29/10	07/17/10	KWG1006610	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Tetrachloro-m-xylene	54	21-112	07/17/10	Acceptable
Decachlorobiphenyl	67	15-130	07/17/10	Acceptable

Comments: _____

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Pacific EcoRisk Laboratories
Project: ACOE (San Rafael Channel)
Sample Matrix: Sediment

Service Request: K1006559
Date Collected: NA
Date Received: NA

Organochlorine Pesticides

Sample Name: Method Blank
Lab Code: KWG1006610-10
Extraction Method: EPA 3541
Analysis Method: 8081A

Units: ug/Kg
Basis: Dry
Level: Low

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Methoxychlor	ND	U	0.20	0.15	1	06/29/10	07/17/10	KWG1006610	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Tetrachloro-m-xylene	57	21-112	07/17/10	Acceptable
Decachlorobiphenyl	69	15-130	07/17/10	Acceptable

Comments: _____

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Pacific EcoRisk Laboratories
Project: ACOE (San Rafael Channel)
Sample Matrix: Sediment

Service Request: K1006559

Surrogate Recovery Summary
Organochlorine Pesticides

Extraction Method: EPA 3541
Analysis Method: 8081A

Units: PERCENT
Level: Low

<u>Sample Name</u>	<u>Lab Code</u>	<u>Sur1</u>	<u>Sur2</u>
SF 10	K1006559-001	54	66
SF 11	K1006559-002	54	67
Method Blank	KWG1006610-10	57	69
SF 10MS	KWG1006610-1	49	60
SF 10DMS	KWG1006610-2	50	62
Lab Control Sample	KWG1006610-3	57	68

Surrogate Recovery Control Limits (%)

Sur1 = Tetrachloro-m-xylene	21-112
Sur2 = Decachlorobiphenyl	15-130

Results flagged with an asterisk (*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Pacific EcoRisk Laboratories
Project: ACOE (San Rafael Channel)
Sample Matrix: Sediment

Service Request: K1006559
Date Extracted: 06/29/2010
Date Analyzed: 07/17/2010

Matrix Spike/Duplicate Matrix Spike Summary
Organochlorine Pesticides

Sample Name: SF 10
Lab Code: K1006559-001
Extraction Method: EPA 3541
Analysis Method: 8081A

Units: ug/Kg
Basis: Dry
Level: Low
Extraction Lot: KWG1006610

Analyte Name	Sample Result	SF 10MS KWG1006610-1 Matrix Spike			SF 10DMS KWG1006610-2 Duplicate Matrix Spike			%Rec Limits	RPD	RPD Limit
		Result	Expected	%Rec	Result	Expected	%Rec			
Methoxychlor	ND	10.5	14.9	71	11.5	14.9	77	24-151	9	40

Results flagged with an asterisk (*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Pacific EcoRisk Laboratories
Project: ACOE (San Rafael Channel)
Sample Matrix: Sediment

Service Request: K1006559
Date Extracted: 06/29/2010
Date Analyzed: 07/17/2010

Lab Control Spike Summary
Organochlorine Pesticides

Extraction Method: EPA 3541
Analysis Method: 8081A

Units: ug/Kg
Basis: Dry
Level: Low
Extraction Lot: KWG1006610

Analyte Name	Lab Control Sample KWG1006610-3 Lab Control Spike			%Rec Limits
	Result	Expected	%Rec	
Methoxychlor	6.95	10.0	70	42-147

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

Polychlorinated Biphenyls

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Pacific EcoRisk Laboratories
Project: ACOE (San Rafael Channel)
Sample Matrix: Sediment

Service Request: K1006559
Date Collected: 06/15/2010
Date Received: 06/24/2010

Polychlorinated Biphenyls (PCBs)

Sample Name: SF 10
Lab Code: K1006559-001

Units: ug/Kg
Basis: Dry

Extraction Method: EPA 3541
Analysis Method: 8082

Level: Low

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Aroclor 1016	ND	U	3.8	2.0	1	06/29/10	07/08/10	KWG1006609	*
Aroclor 1221	ND	U	7.5	2.0	1	06/29/10	07/08/10	KWG1006609	
Aroclor 1232	ND	U	3.8	2.0	1	06/29/10	07/08/10	KWG1006609	
Aroclor 1242	ND	U	3.8	2.0	1	06/29/10	07/08/10	KWG1006609	
Aroclor 1248	ND	U	3.8	2.0	1	06/29/10	07/08/10	KWG1006609	
Aroclor 1254	ND	U	3.8	2.0	1	06/29/10	07/08/10	KWG1006609	
Aroclor 1260	2.9	J	3.8	2.0	1	06/29/10	07/08/10	KWG1006609	*
Aroclor 1262	ND	U	3.8	2.0	1	06/29/10	07/08/10	KWG1006609	
Aroclor 1268	ND	U	3.8	2.0	1	06/29/10	07/08/10	KWG1006609	

* See Case Narrative

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Decachlorobiphenyl	87	35-133	07/08/10	Acceptable

Comments: _____

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Pacific EcoRisk Laboratories
Project: ACOE (San Rafael Channel)
Sample Matrix: Sediment

Service Request: K1006559
Date Collected: 06/15/2010
Date Received: 06/24/2010

Polychlorinated Biphenyls (PCBs)

Sample Name: SF 11
Lab Code: K1006559-002

Units: ug/Kg
Basis: Dry

Extraction Method: EPA 3541
Analysis Method: 8082

Level: Low

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Aroclor 1016	ND	U	3.1	1.7	1	06/29/10	07/08/10	KWG1006609	*
Aroclor 1221	ND	U	6.2	1.7	1	06/29/10	07/08/10	KWG1006609	
Aroclor 1232	ND	U	3.1	1.7	1	06/29/10	07/08/10	KWG1006609	
Aroclor 1242	ND	U	3.1	1.7	1	06/29/10	07/08/10	KWG1006609	
Aroclor 1248	ND	U	3.1	1.7	1	06/29/10	07/08/10	KWG1006609	
Aroclor 1254	ND	U	3.1	1.7	1	06/29/10	07/08/10	KWG1006609	
Aroclor 1260	ND	U	3.1	1.7	1	06/29/10	07/08/10	KWG1006609	*
Aroclor 1262	ND	U	3.1	1.7	1	06/29/10	07/08/10	KWG1006609	
Aroclor 1268	ND	U	3.1	1.7	1	06/29/10	07/08/10	KWG1006609	

* See Case Narrative

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Decachlorobiphenyl	86	35-133	07/08/10	Acceptable

Comments: _____

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Pacific EcoRisk Laboratories
Project: ACOE (San Rafael Channel)
Sample Matrix: Sediment

Service Request: K1006559
Date Collected: NA
Date Received: NA

Polychlorinated Biphenyls (PCBs)

Sample Name: Method Blank
Lab Code: KWG1006609-13

Units: ug/Kg
Basis: Dry

Extraction Method: EPA 3541

Level: Low

Analysis Method: 8082

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Aroclor 1016	ND	U	2.5	1.3	1	06/29/10	07/08/10	KWG1006609	*
Aroclor 1221	ND	U	5.0	1.3	1	06/29/10	07/08/10	KWG1006609	
Aroclor 1232	ND	U	2.5	1.3	1	06/29/10	07/08/10	KWG1006609	
Aroclor 1242	ND	U	2.5	1.3	1	06/29/10	07/08/10	KWG1006609	
Aroclor 1248	ND	U	2.5	1.3	1	06/29/10	07/08/10	KWG1006609	
Aroclor 1254	ND	U	2.5	1.3	1	06/29/10	07/08/10	KWG1006609	
Aroclor 1260	ND	U	2.5	1.3	1	06/29/10	07/08/10	KWG1006609	*
Aroclor 1262	ND	U	2.5	1.3	1	06/29/10	07/08/10	KWG1006609	
Aroclor 1268	ND	U	2.5	1.3	1	06/29/10	07/08/10	KWG1006609	

* See Case Narrative

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Decachlorobiphenyl	100	35-133	07/08/10	Acceptable

Comments: _____

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Pacific EcoRisk Laboratories
Project: ACOE (San Rafael Channel)
Sample Matrix: Sediment

Service Request: K1006559

Surrogate Recovery Summary
Polychlorinated Biphenyls (PCBs)

Extraction Method: EPA 3541
Analysis Method: 8082

Units: PERCENT
Level: Low

<u>Sample Name</u>	<u>Lab Code</u>	<u>Sur1</u>
SF 10	K1006559-001	87
SF 11	K1006559-002	86
Method Blank	KWG1006609-13	100
SF 11MS	KWG1006609-10	77
SF 11DMS	KWG1006609-11	79
Lab Control Sample	KWG1006609-12	81

Surrogate Recovery Control Limits (%)

Sur1 = Decachlorobiphenyl 35-133

Results flagged with an asterisk (*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Pacific EcoRisk Laboratories
Project: ACOE (San Rafael Channel)
Sample Matrix: Sediment

Service Request: K1006559
Date Extracted: 06/29/2010
Date Analyzed: 07/08/2010

Matrix Spike/Duplicate Matrix Spike Summary
Polychlorinated Biphenyls (PCBs)

Sample Name: SF 11
Lab Code: K1006559-002
Extraction Method: EPA 3541
Analysis Method: 8082

Units: ug/Kg
Basis: Dry
Level: Low
Extraction Lot: KWG1006609

Analyte Name	Sample Result	SF 11MS KWG1006609-10 Matrix Spike			SF 11DMS KWG1006609-11 Duplicate Matrix Spike			%Rec Limits	RPD	RPD Limit
		Result	Expected	%Rec	Result	Expected	%Rec			
Aroclor 1016	ND	148	123	120	158	123	128	27-174	7	40
Aroclor 1260	ND	158	123	128	165	123	133	20-185	4	40

Results flagged with an asterisk (*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Pacific EcoRisk Laboratories
Project: ACOE (San Rafael Channel)
Sample Matrix: Sediment

Service Request: K1006559
Date Extracted: 06/29/2010
Date Analyzed: 07/08/2010

Lab Control Spike Summary
Polychlorinated Biphenyls (PCBs)

Extraction Method: EPA 3541
Analysis Method: 8082

Units: ug/Kg
Basis: Dry
Level: Low
Extraction Lot: KWG1006609

Analyte Name	Lab Control Sample KWG1006609-12 Lab Control Spike			%Rec Limits
	Result	Expected	%Rec	
Aroclor 1016	124	100	124 *	48-121
Aroclor 1260	133	100	133 *	53-129

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

Polynuclear Aromatic Hydrocarbons

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Pacific EcoRisk Laboratories
Project: ACOE (San Rafael Channel)
Sample Matrix: Sediment

Service Request: K1006559
Date Collected: 06/15/2010
Date Received: 06/24/2010

Polynuclear Aromatic Hydrocarbons

Sample Name: SF 10
Lab Code: K1006559-001
Extraction Method: EPA 3541
Analysis Method: 8270C SIM

Units: ug/Kg
Basis: Dry
Level: Low

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Naphthalene	5.2		2.5	0.60	1	06/29/10	07/10/10	KWG1006686	
Acenaphthylene	1.8	J	2.5	0.59	1	06/29/10	07/10/10	KWG1006686	
Acenaphthene	1.4	J	2.5	0.76	1	06/29/10	07/10/10	KWG1006686	
Fluorene	3.1		2.5	0.61	1	06/29/10	07/10/10	KWG1006686	
Phenanthrene	27		2.5	1.4	1	06/29/10	07/10/10	KWG1006686	
Anthracene	16		2.5	0.58	1	06/29/10	07/10/10	KWG1006686	
Fluoranthene	47		2.5	0.98	1	06/29/10	07/10/10	KWG1006686	
Pyrene	57		2.5	0.76	1	06/29/10	07/10/10	KWG1006686	
Benzo(b)fluoranthene	35		2.5	0.92	1	06/29/10	07/10/10	KWG1006686	
Benzo(k)fluoranthene	13		2.5	0.87	1	06/29/10	07/10/10	KWG1006686	
Benz(a)anthracene	23		2.5	0.72	1	06/29/10	07/10/10	KWG1006686	
Chrysene	26		2.5	0.80	1	06/29/10	07/10/10	KWG1006686	
Benzo(a)pyrene	37		2.5	0.76	1	06/29/10	07/10/10	KWG1006686	
Indeno(1,2,3-cd)pyrene	32		2.5	0.87	1	06/29/10	07/10/10	KWG1006686	
Dibenz(a,h)anthracene	3.9		2.5	0.80	1	06/29/10	07/10/10	KWG1006686	
Benzo(g,h,i)perylene	39		2.5	0.85	1	06/29/10	07/10/10	KWG1006686	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Fluorene-d10	72	17-104	07/10/10	Acceptable
Fluoranthene-d10	82	27-106	07/10/10	Acceptable
Terphenyl-d14	81	35-109	07/10/10	Acceptable

Comments: _____

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Pacific EcoRisk Laboratories
Project: ACOE (San Rafael Channel)
Sample Matrix: Sediment

Service Request: K1006559
Date Collected: 06/15/2010
Date Received: 06/24/2010

Polynuclear Aromatic Hydrocarbons

Sample Name: SF 11
Lab Code: K1006559-002
Extraction Method: EPA 3541
Analysis Method: 8270C SIM

Units: ug/Kg
Basis: Dry
Level: Low

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Naphthalene	7.9		2.5	0.60	1	06/29/10	07/10/10	KWG1006686	
Acenaphthylene	0.94	J	2.5	0.59	1	06/29/10	07/10/10	KWG1006686	
Acenaphthene	ND	U	2.5	0.76	1	06/29/10	07/10/10	KWG1006686	
Fluorene	1.7	J	2.5	0.61	1	06/29/10	07/10/10	KWG1006686	
Phenanthrene	13		2.5	1.4	1	06/29/10	07/10/10	KWG1006686	
Anthracene	4.0		2.5	0.58	1	06/29/10	07/10/10	KWG1006686	
Fluoranthene	14		2.5	0.98	1	06/29/10	07/10/10	KWG1006686	
Pyrene	15		2.5	0.76	1	06/29/10	07/10/10	KWG1006686	
Benzo(b)fluoranthene	8.2		2.5	0.92	1	06/29/10	07/10/10	KWG1006686	
Benzo(k)fluoranthene	2.9		2.5	0.87	1	06/29/10	07/10/10	KWG1006686	
Benz(a)anthracene	7.6		2.5	0.72	1	06/29/10	07/10/10	KWG1006686	
Chrysene	7.1		2.5	0.80	1	06/29/10	07/10/10	KWG1006686	
Benzo(a)pyrene	7.3		2.5	0.76	1	06/29/10	07/10/10	KWG1006686	
Indeno(1,2,3-cd)pyrene	5.4		2.5	0.87	1	06/29/10	07/10/10	KWG1006686	
Dibenz(a,h)anthracene	1.5	J	2.5	0.80	1	06/29/10	07/10/10	KWG1006686	
Benzo(g,h,i)perylene	6.6		2.5	0.85	1	06/29/10	07/10/10	KWG1006686	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Fluorene-d10	73	17-104	07/10/10	Acceptable
Fluoranthene-d10	75	27-106	07/10/10	Acceptable
Terphenyl-d14	85	35-109	07/10/10	Acceptable

Comments: _____

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Pacific EcoRisk Laboratories
Project: ACOE (San Rafael Channel)
Sample Matrix: Sediment

Service Request: K1006559
Date Collected: NA
Date Received: NA

Polynuclear Aromatic Hydrocarbons

Sample Name: Method Blank
Lab Code: KWG1006686-5
Extraction Method: EPA 3541
Analysis Method: 8270C SIM

Units: ug/Kg
Basis: Dry
Level: Low

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Naphthalene	0.76	J	1.3	0.60	1	06/29/10	07/10/10	KWG1006686	
Acenaphthylene	ND	U	1.3	0.59	1	06/29/10	07/10/10	KWG1006686	
Acenaphthene	ND	U	1.3	0.76	1	06/29/10	07/10/10	KWG1006686	
Fluorene	ND	U	1.3	0.61	1	06/29/10	07/10/10	KWG1006686	
Phenanthrene	ND	U	1.4	1.4	1	06/29/10	07/10/10	KWG1006686	
Anthracene	ND	U	1.3	0.58	1	06/29/10	07/10/10	KWG1006686	
Fluoranthene	ND	U	1.3	0.98	1	06/29/10	07/10/10	KWG1006686	
Pyrene	ND	U	1.3	0.76	1	06/29/10	07/10/10	KWG1006686	
Benzo(b)fluoranthene	ND	U	1.3	0.92	1	06/29/10	07/10/10	KWG1006686	
Benzo(k)fluoranthene	ND	U	1.3	0.87	1	06/29/10	07/10/10	KWG1006686	
Benz(a)anthracene	ND	U	1.3	0.72	1	06/29/10	07/10/10	KWG1006686	
Chrysene	ND	U	1.3	0.80	1	06/29/10	07/10/10	KWG1006686	
Benzo(a)pyrene	ND	U	1.3	0.76	1	06/29/10	07/10/10	KWG1006686	
Indeno(1,2,3-cd)pyrene	ND	U	1.3	0.87	1	06/29/10	07/10/10	KWG1006686	
Dibenz(a,h)anthracene	ND	U	1.3	0.80	1	06/29/10	07/10/10	KWG1006686	
Benzo(g,h,i)perylene	ND	U	1.3	0.85	1	06/29/10	07/10/10	KWG1006686	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Fluorene-d10	74	17-104	07/10/10	Acceptable
Fluoranthene-d10	74	27-106	07/10/10	Acceptable
Terphenyl-d14	91	35-109	07/10/10	Acceptable

Comments: _____

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Pacific EcoRisk Laboratories
Project: ACOE (San Rafael Channel)
Sample Matrix: Sediment

Service Request: K1006559

Surrogate Recovery Summary
Polynuclear Aromatic Hydrocarbons

Extraction Method: EPA 3541
Analysis Method: 8270C SIM

Units: PERCENT
Level: Low

<u>Sample Name</u>	<u>Lab Code</u>	<u>Sur1</u>	<u>Sur2</u>	<u>Sur3</u>
SF 10	K1006559-001	72	82	81
SF 11	K1006559-002	73	75	85
Method Blank	KWG1006686-5	74	74	91
SF 11MS	KWG1006686-1	66	68	77
SF 11DMS	KWG1006686-2	64	72	76
Lab Control Sample	KWG1006686-3	72	84	86
Duplicate Lab Control Sample	KWG1006686-4	69	74	78

Surrogate Recovery Control Limits (%)

Sur1 = Fluorene-d10	17-104
Sur2 = Fluoranthene-d10	27-106
Sur3 = Terphenyl-d14	35-109

Results flagged with an asterisk (*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Pacific EcoRisk Laboratories
Project: ACOE (San Rafael Channel)
Sample Matrix: Sediment

Service Request: K1006559
Date Extracted: 06/29/2010
Date Analyzed: 07/10/2010

Matrix Spike/Duplicate Matrix Spike Summary
Polynuclear Aromatic Hydrocarbons

Sample Name: SF 11
Lab Code: K1006559-002
Extraction Method: EPA 3541
Analysis Method: 8270C SIM

Units: ug/Kg
Basis: Dry
Level: Low
Extraction Lot: KWG1006686

Analyte Name	Sample Result	SF 11MS KWG1006686-1 Matrix Spike			SF 11DMS KWG1006686-2 Duplicate Matrix Spike			%Rec Limits	RPD	RPD Limit
		Result	Expected	%Rec	Result	Expected	%Rec			
Naphthalene	7.9	180	249	69	188	249	72	11-119	4	40
Acenaphthylene	0.94	191	249	76	203	249	81	32-106	6	40
Acenaphthene	ND	191	249	76	202	249	81	29-110	6	40
Fluorene	1.7	200	249	80	215	249	85	29-117	7	40
Phenanthrene	13	206	249	77	226	249	85	19-128	9	40
Anthracene	4.0	218	249	86	251	249	99	31-115	14	40
Fluoranthene	14	260	249	99	221	249	83	22-138	16	40
Pyrene	15	304	249	116	240	249	90	11-148	23	40
Benzo(b)fluoranthene	8.2	241	249	93	223	249	86	15-136	8	40
Benzo(k)fluoranthene	2.9	223	249	88	227	249	90	29-126	1	40
Benz(a)anthracene	7.6	250	249	97	212	249	82	25-128	16	40
Chrysene	7.1	242	249	94	219	249	85	25-132	10	40
Benzo(a)pyrene	7.3	254	249	99	229	249	89	24-131	10	40
Indeno(1,2,3-cd)pyrene	5.4	245	249	96	235	249	92	20-136	4	40
Dibenz(a,h)anthracene	1.5	206	249	82	221	249	88	29-124	7	40
Benzo(g,h,i)perylene	6.6	249	249	97	245	249	96	24-127	1	40

Results flagged with an asterisk (*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Pacific EcoRisk Laboratories
Project: ACOE (San Rafael Channel)
Sample Matrix: Sediment

Service Request: K1006559
Date Extracted: 06/29/2010
Date Analyzed: 07/10/2010

Lab Control Spike/Duplicate Lab Control Spike Summary
Polynuclear Aromatic Hydrocarbons

Extraction Method: EPA 3541
Analysis Method: 8270C SIM

Units: ug/Kg
Basis: Dry
Level: Low
Extraction Lot: KWG1006686

Analyte Name	Lab Control Sample KWG1006686-3 Lab Control Spike			Duplicate Lab Control Sample KWG1006686-4 Duplicate Lab Control Spike			%Rec Limits	RPD	RPD Limit
	Result	Expected	%Rec	Result	Expected	%Rec			
Naphthalene	384	500	77	320	500	64	43-99	18	40
Acenaphthylene	425	500	85	359	500	72	41-110	17	40
Acenaphthene	416	500	83	354	500	71	44-104	16	40
Fluorene	424	500	85	372	500	74	49-105	13	40
Phenanthrene	467	500	93	390	500	78	47-104	18	40
Anthracene	470	500	94	369	500	74	47-112	24	40
Fluoranthene	461	500	92	377	500	75	51-111	20	40
Pyrene	443	500	89	377	500	75	48-113	16	40
Benzo(b)fluoranthene	441	500	88	387	500	77	51-113	13	40
Benzo(k)fluoranthene	436	500	87	380	500	76	56-114	14	40
Benz(a)anthracene	431	500	86	358	500	72	51-111	19	40
Chrysene	431	500	86	369	500	74	54-111	16	40
Benzo(a)pyrene	454	500	91	388	500	78	52-118	16	40
Indeno(1,2,3-cd)pyrene	471	500	94	404	500	81	42-123	15	40
Dibenz(a,h)anthracene	437	500	87	376	500	75	44-119	15	40
Benzo(g,h,i)perylene	464	500	93	408	500	82	46-114	13	40

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.



Chlorinated Herbicides

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Pacific EcoRisk Laboratories
Project: ACOE (San Rafael Channel)
Sample Matrix: Sediment

Service Request: K1006559
Date Collected: 06/15/2010
Date Received: 06/24/2010

Chlorinated Herbicides

Sample Name: SF 10
Lab Code: K1006559-001
Extraction Method: Method
Analysis Method: 8151A

Units: ug/Kg
Basis: Dry
Level: Low

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
MCPP	ND	U	9000	2600	1	06/29/10	07/15/10	KWG1006967	
MCPA	ND	U	9000	2600	1	06/29/10	07/15/10	KWG1006967	
Dichlorprop	ND	U	45	9.1	1	06/29/10	07/15/10	KWG1006967	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
2,4-Dichlorophenylacetic Acid	86	27-166	07/15/10	Acceptable

Comments: _____

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Pacific EcoRisk Laboratories
Project: ACOE (San Rafael Channel)
Sample Matrix: Sediment

Service Request: K1006559
Date Collected: 06/15/2010
Date Received: 06/24/2010

Chlorinated Herbicides

Sample Name: SF 11
Lab Code: K1006559-002
Extraction Method: Method
Analysis Method: 8151A

Units: ug/Kg
Basis: Dry
Level: Low

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
MCPP	ND	U	7500	2600	1	06/29/10	07/15/10	KWG1006967	
MCPA	ND	U	7500	2600	1	06/29/10	07/15/10	KWG1006967	
Dichlorprop	ND	U	38	9.1	1	06/29/10	07/15/10	KWG1006967	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
2,4-Dichlorophenylacetic Acid	70	27-166	07/15/10	Acceptable

Comments: _____

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Pacific EcoRisk Laboratories
Project: ACOE (San Rafael Channel)
Sample Matrix: Sediment

Service Request: K1006559
Date Collected: NA
Date Received: NA

Chlorinated Herbicides

Sample Name: Method Blank
Lab Code: KWG1006967-2
Extraction Method: Method
Analysis Method: 8151A

Units: ug/Kg
Basis: Dry
Level: Low

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
MCPP	ND	U	6000	2600	1	06/29/10	07/15/10	KWG1006967	
MCPA	ND	U	6000	2600	1	06/29/10	07/15/10	KWG1006967	
Dichlorprop	ND	U	30	9.1	1	06/29/10	07/15/10	KWG1006967	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
2,4-Dichlorophenylacetic Acid	75	27-166	07/15/10	Acceptable

Comments: _____

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Pacific EcoRisk Laboratories
Project: ACOE (San Rafael Channel)
Sample Matrix: Sediment

Service Request: K1006559

Surrogate Recovery Summary
Chlorinated Herbicides

Extraction Method: Method
Analysis Method: 8151A

Units: PERCENT
Level: Low

<u>Sample Name</u>	<u>Lab Code</u>	<u>Sur1</u>
SF 10	K1006559-001	86
SF 11	K1006559-002	70
Method Blank	KWG1006967-2	75
SF 11MS	KWG1006967-3	72
SF 11DMS	KWG1006967-4	77
Lab Control Sample	KWG1006967-1	71

Surrogate Recovery Control Limits (%)

Sur1 = 2,4-Dichlorophenylacetic Acid 27-166

Results flagged with an asterisk (*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Pacific EcoRisk Laboratories
Project: ACOE (San Rafael Channel)
Sample Matrix: Sediment

Service Request: K1006559
Date Extracted: 06/29/2010
Date Analyzed: 07/15/2010

**Matrix Spike/Duplicate Matrix Spike Summary
Chlorinated Herbicides**

Sample Name: SF 11
Lab Code: K1006559-002
Extraction Method: Method
Analysis Method: 8151A

Units: ug/Kg
Basis: Dry
Level: Low
Extraction Lot: KWG1006967

Analyte Name	Sample Result	SF 11MS KWG1006967-3 Matrix Spike			SF 11DMS KWG1006967-4 Duplicate Matrix Spike			%Rec Limits	RPD	RPD Limit
		Result	Expected	%Rec	Result	Expected	%Rec			
MCP	ND	11800	12300	96	10400	12300	84	10-192	13	40
MCPA	ND	10000	12300	81	11000	12300	89	10-165	10	40
Dichlorprop	ND	105	123	85	101	123	82	29-149	4	40

Results flagged with an asterisk (*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Pacific EcoRisk Laboratories
Project: ACOE (San Rafael Channel)
Sample Matrix: Sediment

Service Request: K1006559
Date Extracted: 06/29/2010
Date Analyzed: 07/15/2010

Lab Control Spike Summary
Chlorinated Herbicides

Extraction Method: Method
Analysis Method: 8151A

Units: ug/Kg
Basis: Dry
Level: Low
Extraction Lot: KWG1006967

Lab Control Sample
KWG1006967-1
Lab Control Spike

Analyte Name	Lab Control Spike			%Rec Limits
	Result	Expected	%Rec	
MCPP	16200	16700	97	49-116
MCPA	13700	16700	82	52-111
Dichlorprop	142	167	85	58-112

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

Semi-Volatile Organic Compounds

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Pacific EcoRisk Laboratories
Project: ACOE (San Rafael Channel)
Sample Matrix: Sediment

Service Request: K1006559
Date Collected: 06/15/2010
Date Received: 06/24/2010

Semi-Volatile Organic Compounds by GC/MS

Sample Name: SF 10
Lab Code: K1006559-001
Extraction Method: EPA 3541
Analysis Method: 8270C

Units: ug/Kg
Basis: Dry
Level: Low

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Phenol	29	J	30	2.0	1	06/29/10	07/12/10	KWG1006676	
Pentachlorophenol	ND	U	100	20	1	06/29/10	07/12/10	KWG1006676	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Phenol-d6	55	20-86	07/12/10	Acceptable
2,4,6-Tribromophenol	68	10-119	07/12/10	Acceptable

Comments: _____

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Pacific EcoRisk Laboratories
Project: ACOE (San Rafael Channel)
Sample Matrix: Sediment

Service Request: K1006559
Date Collected: 06/15/2010
Date Received: 06/24/2010

Semi-Volatile Organic Compounds by GC/MS

Sample Name: SF 11
Lab Code: K1006559-002
Extraction Method: EPA 3541
Analysis Method: 8270C

Units: ug/Kg
Basis: Dry
Level: Low

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Phenol	3.0	J	30	2.0	1	06/29/10	07/16/10	KWG1006676	
Pentachlorophenol	ND	U	100	20	1	06/29/10	07/16/10	KWG1006676	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Phenol-d6	48	20-86	07/16/10	Acceptable
2,4,6-Tribromophenol	48	10-119	07/16/10	Acceptable

Comments: _____

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Pacific EcoRisk Laboratories
Project: ACOE (San Rafael Channel)
Sample Matrix: Sediment

Service Request: K1006559
Date Collected: NA
Date Received: NA

Semi-Volatile Organic Compounds by GC/MS

Sample Name: Method Blank
Lab Code: KWG1006676-5
Extraction Method: EPA 3541
Analysis Method: 8270C

Units: ug/Kg
Basis: Dry
Level: Low

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Phenol	ND	U	15	2.0	1	06/29/10	07/12/10	KWG1006676	
Pentachlorophenol	ND	U	50	20	1	06/29/10	07/12/10	KWG1006676	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Phenol-d6	69	20-86	07/12/10	Acceptable
2,4,6-Tribromophenol	70	10-119	07/12/10	Acceptable

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Pacific EcoRisk Laboratories
Project: ACOE (San Rafael Channel)
Sample Matrix: Sediment

Service Request: K1006559

Surrogate Recovery Summary
Semi-Volatile Organic Compounds by GC/MS

Extraction Method: EPA 3541
Analysis Method: 8270C

Units: PERCENT
Level: Low

<u>Sample Name</u>	<u>Lab Code</u>	<u>Sur1</u>	<u>Sur2</u>
SF 10	K1006559-001	55	68
SF 11	K1006559-002	48	48
Method Blank	KWG1006676-5	69	70
SF 10MS	KWG1006676-1	54	65
SF 10DMS	KWG1006676-2	55	61
Lab Control Sample	KWG1006676-3	62	71
Duplicate Lab Control Sample	KWG1006676-4	68	74

Surrogate Recovery Control Limits (%)

Sur1 = Phenol-d6	20-86
Sur2 = 2,4,6-Tribromophenol	10-119

Results flagged with an asterisk (*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Pacific EcoRisk Laboratories
Project: ACOE (San Rafael Channel)
Sample Matrix: Sediment

Service Request: K1006559
Date Extracted: 06/29/2010
Date Analyzed: 07/12/2010

Matrix Spike/Duplicate Matrix Spike Summary
Semi-Volatile Organic Compounds by GC/MS

Sample Name: SF 10
Lab Code: K1006559-001
Extraction Method: EPA 3541
Analysis Method: 8270C

Units: ug/Kg
Basis: Dry
Level: Low
Extraction Lot: KWG1006676

Analyte Name	Sample Result	SF 10MS KWG1006676-1 Matrix Spike			SF 10DMS KWG1006676-2 Duplicate Matrix Spike			%Rec Limits	RPD	RPD Limit
		Result	Expected	%Rec	Result	Expected	%Rec			
Phenol	29	165	250	54	155	250	50	15-98	6	40
Pentachlorophenol	ND	110	250	44	79.0	250	32	10-123	33	40

Results flagged with an asterisk (*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Pacific EcoRisk Laboratories
Project: ACOE (San Rafael Channel)
Sample Matrix: Sediment

Service Request: K1006559
Date Extracted: 06/29/2010
Date Analyzed: 07/12/2010

Lab Control Spike/Duplicate Lab Control Spike Summary
Semi-Volatile Organic Compounds by GC/MS

Extraction Method: EPA 3541
Analysis Method: 8270C

Units: ug/Kg
Basis: Dry
Level: Low
Extraction Lot: KWG1006676

Analyte Name	Lab Control Sample KWG1006676-3 Lab Control Spike			Duplicate Lab Control Sample KWG1006676-4 Duplicate Lab Control Spike			%Rec Limits	RPD	RPD Limit
	Result	Expected	%Rec	Result	Expected	%Rec			
Phenol	145	250	58	142	250	57	28-91	2	40
Pentachlorophenol	130	250	52	127	250	51	21-97	2	40

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

Dioxins and Furans

July 21, 2010

Service Request No: K1006559

Pradeep Divvela

Columbia Analytical Services, Inc
1317 S. 13th Avenue
Kelso, WA 98626

Laboratory Results for: Pacific EcoRisk Laboratories/ACOE (San Rafael Channel)

Dear Pradeep:

Enclosed are the results of the sample(s) submitted to our laboratory on July 3rd, 2010. For your reference, these analyses have been assigned our service request number: **K1006559**. All analyses were performed according to our laboratory's quality assurance program. The test results meet requirements of the NELAP standards except as noted in the case narrative report. All results are intended to be considered in their entirety, and Columbia Analytical Services, Inc. (CAS) is not responsible for use of less than the complete report. Results apply only to the items submitted to the laboratory for analysis and individual items (samples) analyzed, as listed in the report. In accordance to the NELAC 2003 Standard, a statement on the estimated uncertainty of measurement of any quantitative analysis will be supplied upon request.

Please contact me if you have any questions. My direct number is 281-994-2954. You may also contact me via email at DBiles@caslab.com.

Respectfully submitted,

Columbia Analytical Services, Inc.

Darren Biles
Project Manager

Page 1 of _____

For a specific list of NELAP-accredited analytes, refer to the certifications section at www.caslab.com.





Certificate of Analysis

19408 Park Row, Suite 320, Houston, TX 77084

Phone (713)266-1599 Fax (713)266-0130

www.caslab.com

An Employee Owned Company

COLUMBIA ANALYTICAL SERVICES, INC

Client: Pacific EcoRisk Laboratories
Project: ACOE (San Rafael Channel)
Sample Matrix: Sediment

Service Request No.: K1006559
Date Received: 7/03/10

CASE NARRATIVE

All analyses were performed in adherence to the quality assurance program of Columbia Analytical Services, Inc. (CAS). This report contains analytical results for samples designated for Tier II. When appropriate to the method, method blank results have been reported with each analytical test.

Sample Receipt

Two sediment samples were received for analysis at Columbia Analytical Services on 7/03/10.

The samples were received at 0°C in good condition and are consistent with the accompanying chain of custody form. The samples were stored in a refrigerator at 4°C upon receipt at the laboratory.

Please note the reporting forms are currently referencing the date CAS- Kelso received the samples (6/24/10) and not the date CAS-Houston received the samples (7/3/10.)

Data Validation Notes and Discussion

B flags – Method Blanks

The Method Blank EQ1000340-01 contained low levels of 1234678-HpCDD and OCDD at or below the Method Reporting Limit (MRL).

The associated compounds in the samples are flagged with 'B' flags.

Y flags – Labeled Standards

Samples that had recoveries of labeled standards outside the acceptance limits are flagged with 'Y' flags. In all cases, the signal-to-noise ratios are greater than 10:1, making these data acceptable.

MS/DMS

EQ1000340: Laboratory Control Spike/Duplicate Laboratory Control Spike (LCS/DLCS) samples were analyzed and reported in lieu of an MS/DMS for this extraction batch. The batch quality control criteria were met.

Approved by:

Date: 07/21/10

Xiangqiu Liang, Laboratory Director

C flags – 2378-TCDF Confirmation

Confirmation of the TCDF compound: When 2378-TCDF is detected on the DB-5 column, confirmation analyses are performed on a second column (DB-225.) The results from both the DB-5 column and the DB-225 column are included in this data package.

The valid result for the 2378-TCDF compound is reported from the confirmation column.

The confirmation results have been included on the TEQ summary pages.

K flags

EMPC - When the ion abundance ratios associated with a particular compound are outside the QC limits, samples are flagged with a 'K' flag. A 'K' flag indicates an estimated maximum possible concentration for the associated compound.

Detection Limits

Detection limits are calculated for each congener in each sample by measuring the height of the noise level for each quantitation ion for the associated labeled standard. The concentration equivalent to 2.5 times the height of the noise is then calculated using the appropriate response factor and the weight of the sample. The calculated concentration equals the detection limit.

The TEQ results for each sample have been calculated by CAS/Houston to include:

- WHO-2005 TEFs ("The 2005 World Health Organization Reevaluation of Human and Mammalian Toxic Equivalency Factors for Dioxins and Dioxin-Like Compounds", M. Van den Berg et al., Toxicological Sciences 93(2):223-241, 2006)
- 2378-TCDF from the DB-225 column, when confirmation required
- Non-detected compounds are not included in the 'Total'

Approved by:

Date: 07/21/10

Xiangqiu Liang, Laboratory Director

Client: Pacific EcoRisk Laboratories
Project: ACOE (San Rafael Channel)

Service Request: K1006559

SAMPLE CROSS-REFERENCE

<u>SAMPLE #</u>	<u>CLIENT SAMPLE ID</u>	<u>DATE</u>	<u>TIME</u>
K1006559-001	SF 10	6/15/10	10:05
K1006559-002	SF 11	6/15/10	09:30

Laboratory Certifications 2010-2011

STATE/PROGRAM	AGENCY	CERTIFICATION ID	EXP DATE
ARIZONA	AZ-DHS	AZ0725	05/27/11
ARKANSAS	ADEQ	10-035-0	06/16/11
CALIFORNIA	CA-ELAP	2452	02/28/11
DoD ELAP	A2LA	2897.01	11/30/11
FLORIDA/NELAP	FL-DOHS	E87611	06/30/11
HAWAII	HI-DOH	N/A	06/30/11
ILLINOIS/NELAP	IL-EPA	002380	10/06/10
ISO 17025	A2LA	2897.01	11/30/11
LOUISIANA/NELAP	LELAP	03048	06/30/10
LOUISIANA/NELAP	LDHH	LA100032	12/31/10
MAINE	ME-DOHS	2010041	06/05/12
MICHIGAN	MIDEQ	9971	06/30/10
MINNESOTA	MDH	048-999-427	12/31/10
NEVADA	NDEP	TX014112010A	07/31/10
NEW JERSEY	NJDEP	TX008	06/30/11
NEW MEXICO	NMED-DWB	N/A	06/30/11
NEW YORK/NELAP	NY-DOH	11707	04/01/11
OKLAHOMA	OKDEQ	2009-25	08/31/10
OREGON/NELAP	ORELAP	TX200002-006	03/24/10
PENNSYLVANIA/NELAP	PLAP	002	06/30/11
TENNESSEE	TNDEC	04016	06/30/11
TEXAS/NELAP	TCEQ	T104704216-10-1	06/30/11
UTAH/NELAP	UTELCP	COLU2	06/30/10
SOIL IMPORT PERMIT	USDA	P330-09-00067	03/27/12
WASHINGTON/NELAP	WA-Ecology	C1855	11/14/10
WEST VIRGINIA	WVDEP	347	06/30/11

Abbreviations, Acronyms & Definitions

Cal	Calibration
Conc	CONCentration
Dioxin(s)	Polychlorinated dibenzo-p-dioxin(s)
EDL	Estimated Detection Limit
EMPC	Estimated Maximum Possible Concentration
Flags	Data qualifiers
Furan(s)	Polychlorinated dibenzofuran(s)
g	Grams
ICAL	Initial CALibration
ID	IDentifier
Ions	Masses monitored for the analyte during data acquisition
L	Liter (s)
LCS	Laboratory Control Sample
DLCS	Duplicate Laboratory Control Sample
MB	Method Blank
MCL	Method Calibration Limit
MDL	Method Detection Limit
MRL	Method Reporting Limit
mL	Milliliters
MS	Matrix Spiked sample
DMS	Duplicate Matrix Spiked sample
NO	Number of peaks meeting all identification criteria
PCDD(s)	Polychlorinated dibenzo-p-dioxin(s)
PCDF(s)	Polychlorinated dibenzofuran(s)
ppb	Parts per billion
ppm	Parts per million
ppq	Parts per quadrillion
ppt	Parts per trillion
QA	Quality Assurance
QC	Quality Control
Ratio	Ratio of areas from monitored ions for an analyte
% Rec.	Percent Recovery
RPD	Relative Percent Difference
RRF	Relative Response Factor
RT	Retention Time
RRT	Relative Retention Time
SDG	Sample Delivery Group
S/N	Signal-to-Noise ratio
TEF	Toxicity Equivalence Factor
TEQ	Toxicity Equivalence Quotient

Data Qualifier Flags – Dioxin/Furans

- **B** Indicates the associated analyte is found in the method blank, as well as in the sample.
- **C** Confirmation of the TCDF compound: When 2378-TCDF is detected on the DB-5 column, confirmation analyses are performed on a second column (DB-225). The results from both the DB-5 column and the DB-225 column are included in this data package. The results from the DB-225 analyses should be used to evaluate the 2378-TCDF in the samples. The confirmed result should be used in determining the TEQ value for TCDF.
- **E** Indicates an estimated value – used when the analyte concentration exceeds the upper end of the linear calibration range.
- **J** Indicates an estimated value – used when the analyte concentration is below the method reporting limit (MRL) and above the estimated detection limit (EDL).
- **K** EMPC - When the ion abundance ratios associated with a particular compound are outside the QC limits, samples are flagged with a 'K' flag. A 'K' flag indicates an estimated maximum possible concentration for the associated compound.
- **U** Indicates the compound was analyzed and not detected.
- **Y** Samples that had recoveries of labeled standards outside the acceptance limits are flagged with 'Y'. In all cases, the signal-to-noise ratios are greater than 10:1, making these data acceptable.
- **ND** Indicates concentration is reported as 'Not Detected.'
- **S** Peak is saturated; data not reportable.
- **P** Indicates chlorodiphenyl ether interference present at the retention time of the target compound.
- **Q** Lock-mass interference by chlorodiphenyl ether compounds.

COLUMBIA ANALYTICAL SERVICES, INC. – Houston
Data Processing/Form Production and Peer Review Signatures

SR# Unique ID

K1006559

DB-5

DB-225

SPB-Octyl

First Level - Data Processing - to be filled by person generating the forms

Date:

07/19/10

Analyst:

mc

Samples:

001, 002

Second Level - Data Review – to be filled by person doing peer review

Date:

7/21/10

Analyst:

gc

Samples:

001-002

COLUMBIA ANALYTICAL SERVICES, INC. – Houston
Data Processing/Form Production and Peer Review Signatures

SR# Unique ID

K1006559

DB-5

DB-225

SPB-Octyl

First Level - Data Processing - to be filled by person generating the forms

Date:	Analyst:	Samples:
07/20/10	LL	(-001)

Second Level - Data Review – to be filled by person doing peer review

Date:	Analyst:	Samples:
07/20/10	R	901

Analytical Results

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COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: Pacific EcoRisk Laboratories
Project: ACOE (San Rafael Channel)
Sample Matrix: Sediment
Sample Name: SF 10
Lab Code: K1006559-001

Service Request: K1006559
Date Collected: 6/15/10 1005
Date Received: 6/24/10
Units: ng/Kg
Basis: Dry
Percent Solids: 67.1

Polychlorinated Dibenzodioxins and Polychlorinated Dibenzofurans by HRGC/HRMS

Analytical Method: 8290
Prep Method: Method
Sample Amount: 11.860g
Data File Name: P208660
ICAL Date: 08/01/08

Date Analyzed: 7/16/10 1940
Date Extracted: 7/8/10
Instrument Name: E-HRMS-04
GC Column: DB-5
Blank File Name: P208658
Cal Ver. File Name: P208656

Analyte Name	Result	Q	EDL	MRL	Ion Ratio	RRT	Dilution Factor
2,3,7,8-TCDD	ND	U	0.102	1.26			1
1,2,3,7,8-PeCDD	ND	U	0.0575	3.14			1
1,2,3,4,7,8-HxCDD	ND	U	0.0439	3.14			1
1,2,3,6,7,8-HxCDD	0.440	J	0.0419	3.14	1.30	1.000	1
1,2,3,7,8,9-HxCDD	0.263	JK	0.0438	3.14	1.54	1.009	1
1,2,3,4,6,7,8-HpCDD	5.09	B	0.0496	3.14	1.01	1.001	1
OCDD	34.4	B	0.0796	6.28	0.89	1.000	1
2,3,7,8-TCDF	0.383	CJ	0.0469	1.26	0.88	1.001	1
1,2,3,7,8-PeCDF	ND	U	0.0410	3.14			1
2,3,4,7,8-PeCDF	ND	U	0.0394	3.14			1
1,2,3,4,7,8-HxCDF	0.167	JK	0.0341	3.14	1.02	1.000	1
1,2,3,6,7,8-HxCDF	0.0868	JK	0.0328	3.14	1.04	1.003	1
1,2,3,7,8,9-HxCDF	ND	U	0.0415	3.14			1
2,3,4,6,7,8-HxCDF	0.0867	JK	0.0354	3.14	1.75	1.016	1
1,2,3,4,6,7,8-HpCDF	1.05	J	0.0726	3.14	1.06	1.000	1
1,2,3,4,7,8,9-HpCDF	ND	U	0.0953	3.14			1
OCDF	2.70	J	0.0723	6.28	0.88	1.004	1
Total Tetra-Dioxins	ND	U	0.102	1.26			1
Total Penta-Dioxins	0.207	J	0.0575	3.14	1.43		1
Total Hexa-Dioxins	2.98	J	0.0419	3.14	1.20		1
Total Hepta-Dioxins	13.1		0.0496	3.14	1.05		1
Total Tetra-Furans	0.383	J	0.0469	1.26	0.88		1
Total Penta-Furans	0.438	J	0.0394	3.14	1.48		1
Total Hexa-Furans	1.39	J	0.0328	3.14	1.23		1
Total Hepta-Furans	2.92	J	0.0726	3.14	1.06		1

Comments: _____

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: Pacific EcoRisk Laboratories
Project: ACOE (San Rafael Channel)
Sample Matrix: Sediment
Sample Name: SF 10
Lab Code: K1006559-001

Service Request: K1006559
Date Collected: 6/15/10 1005
Date Received: 6/24/10
Units: Percent
Basis: Dry
Percent Solids: 67.1

Polychlorinated Dibenzodioxins and Polychlorinated Dibenzofurans by HRGC/HRMS

Analytical Method: 8290
Prep Method: Method
Sample Amount: 11.860g
Data File Name: P208660
ICAL Date: 08/01/08

Date Analyzed: 7/16/10 1940
Date Extracted: 7/8/10
Instrument Name: E-HRMS-04
GC Column: DB-5
Blank File Name: P208658
Cal Ver. File Name: P208656

Labeled Compounds	Spike Conc.(pg)	Conc. Found (pg)	%Rec	Q	Control Limits	Ion Ratio	RRT
13C-2,3,7,8-TCDD	1000	717.479	72		40-135	0.78	1.008
13C-1,2,3,7,8-PeCDD	1000	685.983	69		40-135	1.56	1.167
13C-1,2,3,6,7,8-HxCDD	2500	1680.906	67		40-135	1.25	0.992
13C-1,2,3,4,6,7,8-HpCDD	2500	1396.940	56		40-135	1.05	1.068
13C-OCDD	5000	1826.862	37	Y	40-135	0.91	1.148
13C-2,3,7,8-TCDF	1000	627.606	63		40-135	0.79	0.980
13C-1,2,3,7,8-PeCDF	1000	764.364	76		40-135	1.56	1.129
13C-1,2,3,4,7,8-HxCDF	2500	1637.086	65		40-135	0.52	0.972
13C-1,2,3,4,6,7,8-HpCDF	2500	1373.774	55		40-135	0.44	1.044
37Cl-2,3,7,8-TCDD	800	700.311	88		40-135	NA	1.009

Comments: _____

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: Pacific EcoRisk Laboratories
Project: ACOE (San Rafael Channel)
Sample Matrix: Sediment
Sample Name: SF 10
Lab Code: K1006559-001

Service Request: K1006559
Date Collected: 6/15/10 1005
Date Received: 6/24/10
Units: ng/Kg
Basis: Dry

Polychlorinated Dibenzodioxins and Polychlorinated Dibenzofurans by HRGC/HRMS

Analytical Method: 8290
Prep Method: Method

Analyte Name	Result	DL	Dilution Factor	TEF	TEF - Adjusted Concentration
2,3,7,8-TCDD	ND	0.102	1	1	
1,2,3,7,8-PeCDD	ND	0.0575	1	1	
1,2,3,4,7,8-HxCDD	ND	0.0439	1	0.1	
1,2,3,6,7,8-HxCDD	0.440	0.0419	1	0.1	0.0440
1,2,3,7,8,9-HxCDD	0.263	0.0438	1	0.1	0.0263
1,2,3,4,6,7,8-HpCDD	5.09	0.0496	1	0.01	0.0509
OCDD	34.4	0.0796	1	0.0003	0.0103
2,3,7,8-TCDF	0.333	0.0594	1	0.1	0.0333
1,2,3,7,8-PeCDF	ND	0.0410	1	0.03	
2,3,4,7,8-PeCDF	ND	0.0394	1	0.3	
1,2,3,4,7,8-HxCDF	0.167	0.0341	1	0.1	0.0167
1,2,3,6,7,8-HxCDF	0.0868	0.0328	1	0.1	0.00868
1,2,3,7,8,9-HxCDF	ND	0.0415	1	0.1	
2,3,4,6,7,8-HxCDF	0.0867	0.0354	1	0.1	0.00867
1,2,3,4,6,7,8-HpCDF	1.05	0.0726	1	0.01	0.0105
1,2,3,4,7,8,9-HpCDF	ND	0.0953	1	0.01	
OCDF	2.70	0.0723	1	0.0003	0.000810
Total TEQ					0.210

2005 WHO TEFs, ND = 0

Comments: _____

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: Pacific EcoRisk Laboratories
Project: ACOE (San Rafael Channel)
Sample Matrix: Sediment
Sample Name: SF 10
Lab Code: K1006559-001
Run Type: Reanalysis

Service Request: K1006559
Date Collected: 6/15/10 1005
Date Received: 6/24/10
Units: ng/Kg
Basis: Dry
Percent Solids: 67.1

Polychlorinated Dibenzodioxins and Polychlorinated Dibenzofurans by HRGC/HRMS

Analytical Method: 8290
Prep Method: Method
Sample Amount: 11.860g
Data File Name: U137166
ICAL Date: 12/17/07

Date Analyzed: 7/17/10 1723
Date Extracted: 7/8/10
Instrument Name: E-HRMS-01
GC Column: DB-225
Blank File Name: U137156
Cal Ver. File Name: U137155

Analyte Name	Result	Q	EDL	MRL	Ion Ratio	RRT	Dilution Factor
2,3,7,8-TCDF	0.333	J	0.0594	1.26	0.82	1.001	1

Labeled Compounds	Spike Conc.(pg)	Conc. Found (pg)	%Rec	Q	Control Limits	Ion Ratio	RRT
13C-2,3,7,8-TCDF	1000	675.659	68		40-135	0.79	1.060
37Cl-2,3,7,8-TCDD	800	703.467	88		40-135	NA	0.989

Comments: _____

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: Pacific EcoRisk Laboratories
Project: ACOE (San Rafael Channel)
Sample Matrix: Sediment
Sample Name: SF 11
Lab Code: K1006559-002

Service Request: K1006559
Date Collected: 6/15/10 0930
Date Received: 6/24/10
Units: ng/Kg
Basis: Dry
Percent Solids: 80.9

Polychlorinated Dibenzodioxins and Polychlorinated Dibenzofurans by HRGC/HRMS

Analytical Method: 8290
Prep Method: Method
Sample Amount: 11.958g
Data File Name: P208661
ICAL Date: 08/01/08

Date Analyzed: 7/16/10 2029
Date Extracted: 7/8/10
Instrument Name: E-HRMS-04
GC Column: DB-5
Blank File Name: P208658
Cal Ver. File Name: P208656

Analyte Name	Result	Q	EDL	MRL	Ion Ratio	RRT	Dilution Factor
2,3,7,8-TCDD	ND	U	0.0567	1.03			1
1,2,3,7,8-PeCDD	ND	U	0.0485	2.58			1
1,2,3,4,7,8-HxCDD	ND	U	0.0288	2.58			1
1,2,3,6,7,8-HxCDD	ND	U	0.0273	2.58			1
1,2,3,7,8,9-HxCDD	ND	U	0.0287	2.58			1
1,2,3,4,6,7,8-HpCDD	0.259	BJ	0.0446	2.58	1.04	1.000	1
OCDD	1.72	BJ	0.0639	5.17	0.97	1.000	1
2,3,7,8-TCDF	ND	U	0.0417	1.03			1
1,2,3,7,8-PeCDF	ND	U	0.0333	2.58			1
2,3,4,7,8-PeCDF	ND	U	0.0320	2.58			1
1,2,3,4,7,8-HxCDF	ND	U	0.0243	2.58			1
1,2,3,6,7,8-HxCDF	ND	U	0.0234	2.58			1
1,2,3,7,8,9-HxCDF	ND	U	0.0296	2.58			1
2,3,4,6,7,8-HxCDF	ND	U	0.0252	2.58			1
1,2,3,4,6,7,8-HpCDF	0.0725	J	0.0311	2.58	1.12	1.000	1
1,2,3,4,7,8,9-HpCDF	ND	U	0.0409	2.58			1
OCDF	0.310	JK	0.0711	5.17	0.68	1.005	1
Total Tetra-Dioxins	ND	U	0.0567	1.03			1
Total Penta-Dioxins	ND	U	0.0485	2.58			1
Total Hexa-Dioxins	ND	U	0.0273	2.58			1
Total Hepta-Dioxins	0.259	J	0.0446	2.58	1.04		1
Total Tetra-Furans	ND	U	0.0417	1.03			1
Total Penta-Furans	ND	U	0.0320	2.58			1
Total Hexa-Furans	ND	U	0.0234	2.58			1
Total Hepta-Furans	0.0725	J	0.0311	2.58	1.12		1

Comments: _____

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: Pacific EcoRisk Laboratories
Project: ACOE (San Rafael Channel)
Sample Matrix: Sediment
Sample Name: SF 11
Lab Code: K1006559-002

Service Request: K1006559
Date Collected: 6/15/10 0930
Date Received: 6/24/10
Units: Percent
Basis: Dry
Percent Solids: 80.9

Polychlorinated Dibenzodioxins and Polychlorinated Dibenzofurans by HRGC/HRMS

Analytical Method: 8290
Prep Method: Method
Sample Amount: 11.958g
Data File Name: P208661
ICAL Date: 08/01/08

Date Analyzed: 7/16/10 2029
Date Extracted: 7/8/10
Instrument Name: E-HRMS-04
GC Column: DB-5
Blank File Name: P208658
Cal Ver. File Name: P208656

Labeled Compounds	Spike Conc.(pg)	Conc. Found (pg)	%Rec	Q	Control Limits	Ion Ratio	RRT
13C-2,3,7,8-TCDD	1000	713.655	71		40-135	0.78	1.008
13C-1,2,3,7,8-PeCDD	1000	655.683	66		40-135	1.57	1.167
13C-1,2,3,6,7,8-HxCDD	2500	1606.541	64		40-135	1.25	0.992
13C-1,2,3,4,6,7,8-HpCDD	2500	1242.374	50		40-135	1.05	1.068
13C-OCDD	5000	1716.869	34	Y	40-135	0.91	1.148
13C-2,3,7,8-TCDF	1000	615.998	62		40-135	0.78	0.980
13C-1,2,3,7,8-PeCDF	1000	716.813	72		40-135	1.56	1.130
13C-1,2,3,4,7,8-HxCDF	2500	1501.349	60		40-135	0.52	0.972
13C-1,2,3,4,6,7,8-HpCDF	2500	1185.949	47		40-135	0.44	1.044
37Cl-2,3,7,8-TCDD	800	658.344	82		40-135	NA	1.009

Comments: _____

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: Pacific EcoRisk Laboratories
Project: ACOE (San Rafael Channel)
Sample Matrix: Sediment
Sample Name: SF 11
Lab Code: K1006559-002

Service Request: K1006559
Date Collected: 6/15/10 0930
Date Received: 6/24/10
Units: ng/Kg
Basis: Dry

Polychlorinated Dibenzodioxins and Polychlorinated Dibenzofurans by HRGC/HRMS

Analytical Method: 8290
Prep Method: Method

Analyte Name	Result	DL	Dilution Factor	TEF	TEF - Adjusted Concentration
2,3,7,8-TCDD	ND	0.0567	1	1	
1,2,3,7,8-PeCDD	ND	0.0485	1	1	
1,2,3,4,7,8-HxCDD	ND	0.0288	1	0.1	
1,2,3,6,7,8-HxCDD	ND	0.0273	1	0.1	
1,2,3,7,8,9-HxCDD	ND	0.0287	1	0.1	
1,2,3,4,6,7,8-HpCDD	0.259	0.0446	1	0.01	0.00259
OCDD	1.72	0.0639	1	0.0003	0.000516
2,3,7,8-TCDF	ND	0.0417	1	0.1	
1,2,3,7,8-PeCDF	ND	0.0333	1	0.03	
2,3,4,7,8-PeCDF	ND	0.0320	1	0.3	
1,2,3,4,7,8-HxCDF	ND	0.0243	1	0.1	
1,2,3,6,7,8-HxCDF	ND	0.0234	1	0.1	
1,2,3,7,8,9-HxCDF	ND	0.0296	1	0.1	
2,3,4,6,7,8-HxCDF	ND	0.0252	1	0.1	
1,2,3,4,6,7,8-HpCDF	0.0725	0.0311	1	0.01	0.000725
1,2,3,4,7,8,9-HpCDF	ND	0.0409	1	0.01	
OCDF	0.310	0.0711	1	0.0003	0.0000930
Total TEQ					0.00392

2005 WHO TEFs, ND = 0

Comments: _____

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: Pacific EcoRisk Laboratories
Project: ACOE (San Rafael Channel)
Sample Matrix: Sediment
Sample Name: Method Blank
Lab Code: EQ1000340-01

Service Request: K1006559
Date Collected: NA
Date Received: NA
Units: ng/Kg
Basis: Dry

Polychlorinated Dibenzodioxins and Polychlorinated Dibenzofurans by HRGC/HRMS

Analytical Method: 8290
Prep Method: Method
Sample Amount: 10.000g
Data File Name: P208658
ICAL Date: 08/01/08

Date Analyzed: 7/16/10 1803
Date Extracted: 7/8/10
Instrument Name: E-HRMS-04
GC Column: DB-5
Blank File Name: P208658
Cal Ver. File Name: P208656

Analyte Name	Result	Q	EDL	MRL	Ion Ratio	RRT	Dilution Factor
2,3,7,8-TCDD	ND	U	0.0535	1.00			1
1,2,3,7,8-PeCDD	ND	U	0.0504	2.50			1
1,2,3,4,7,8-HxCDD	ND	U	0.0256	2.50			1
1,2,3,6,7,8-HxCDD	ND	U	0.0242	2.50			1
1,2,3,7,8,9-HxCDD	ND	U	0.0255	2.50			1
1,2,3,4,6,7,8-HpCDD	0.0926	JK	0.0302	2.50	1.57	1.001	1
OCDD	0.375	J	0.0597	5.00	0.77	1.000	1
2,3,7,8-TCDF	ND	U	0.0388	1.00			1
1,2,3,7,8-PeCDF	ND	U	0.0312	2.50			1
2,3,4,7,8-PeCDF	ND	U	0.0300	2.50			1
1,2,3,4,7,8-HxCDF	ND	U	0.0229	2.50			1
1,2,3,6,7,8-HxCDF	ND	U	0.0220	2.50			1
1,2,3,7,8,9-HxCDF	ND	U	0.0279	2.50			1
2,3,4,6,7,8-HxCDF	ND	U	0.0237	2.50			1
1,2,3,4,6,7,8-HpCDF	ND	U	0.0238	2.50			1
1,2,3,4,7,8,9-HpCDF	ND	U	0.0313	2.50			1
OCDF	ND	U	0.0474	5.00			1
Total Tetra-Dioxins	ND	U	0.0535	1.00			1
Total Penta-Dioxins	ND	U	0.0504	2.50			1
Total Hexa-Dioxins	ND	U	0.0242	2.50			1
Total Hepta-Dioxins	ND	U	0.0302	2.50			1
Total Tetra-Furans	ND	U	0.0388	1.00			1
Total Penta-Furans	ND	U	0.0300	2.50			1
Total Hexa-Furans	ND	U	0.0220	2.50			1
Total Hepta-Furans	ND	U	0.0238	2.50			1

Comments: _____

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: Pacific EcoRisk Laboratories
Project: ACOE (San Rafael Channel)
Sample Matrix: Sediment

Sample Name: Method Blank
Lab Code: EQ1000340-01

Service Request: K1006559
Date Collected: NA
Date Received: NA

Units: Percent
Basis: Dry

Polychlorinated Dibenzodioxins and Polychlorinated Dibenzofurans by HRGC/HRMS

Analytical Method: 8290
Prep Method: Method
Sample Amount: 10.000g

Data File Name: P208658
ICAL Date: 08/01/08

Date Analyzed: 7/16/10 1803
Date Extracted: 7/8/10
Instrument Name: E-HRMS-04
GC Column: DB-5
Blank File Name: P208658
Cal Ver. File Name: P208656

Labeled Compounds	Spike Conc.(pg)	Conc. Found (pg)	%Rec	Q	Control Limits	Ion Ratio	RRT
13C-2,3,7,8-TCDD	1000	672.048	67		40-135	0.77	1.009
13C-1,2,3,7,8-PeCDD	1000	686.581	69		40-135	1.56	1.168
13C-1,2,3,6,7,8-HxCDD	2500	1647.296	66		40-135	1.26	0.992
13C-1,2,3,4,6,7,8-HpCDD	2500	1396.904	56		40-135	1.05	1.068
13C-OCDD	5000	1744.035	35	Y	40-135	0.91	1.148
13C-2,3,7,8-TCDF	1000	608.785	61		40-135	0.77	0.980
13C-1,2,3,7,8-PeCDF	1000	739.405	74		40-135	1.58	1.130
13C-1,2,3,4,7,8-HxCDF	2500	1616.719	65		40-135	0.53	0.971
13C-1,2,3,4,6,7,8-HpCDF	2500	1382.723	55		40-135	0.44	1.044
37Cl-2,3,7,8-TCDD	800	636.934	80		40-135	NA	1.009

Comments: _____

Accuracy and Precision

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COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Pacific EcoRisk Laboratories
Project: ACOE (San Rafael Channel)
Sample Matrix: Sediment

Service Request: K1006559
Date Analyzed: 7/17/10

Lab Control Sample Summary
Polychlorinated Dibenzodioxins and Polychlorinated Dibenzofurans by HRGC/HRMS

Analytical Method: 8290
Prep Method: Method

Units: ng/Kg
Basis: Dry

Extraction Lot: 114850

Analyte Name	Lab Control Sample EQ1000340-02			Duplicate Lab Control Sample EQ1000340-03			% Rec Limits	RPD	RPD Limit
	Result	Expected	% Rec	Result	Expected	% Rec			
2,3,7,8-TCDD	19.6	20.0	98	18.5	20.0	93	74 - 127	5	18
1,2,3,7,8-PeCDD	52.3	50.0	105	51.1	50.0	102	73 - 122	3	14
1,2,3,4,7,8-HxCDD	47.1	50.0	94	42.1	50.0	84	60 - 153	11	26
1,2,3,6,7,8-HxCDD	49.5	50.0	99	49.2	50.0	98	72 - 126	1	16
1,2,3,7,8,9-HxCDD	44.9	50.0	90	41.7	50.0	83	59 - 140	8	32
1,2,3,4,6,7,8-HpCDD	50.0	50.0	100	48.9	50.0	98	66 - 132	2	19
OCDD	95.7	100	96	92.6	100	93	73 - 140	3	28
2,3,7,8-TCDF	20.2	20.0	101	19.9	20.0	100	66 - 129	1	18
1,2,3,7,8-PeCDF	46.7	50.0	93	45.5	50.0	91	70 - 123	2	14
2,3,4,7,8-PeCDF	45.5	50.0	91	44.9	50.0	90	69 - 122	1	17
1,2,3,4,7,8-HxCDF	47.9	50.0	96	46.4	50.0	93	71 - 121	3	15
1,2,3,6,7,8-HxCDF	52.7	50.0	105	50.4	50.0	101	70 - 130	4	14
1,2,3,7,8,9-HxCDF	51.7	50.0	103	53.1	50.0	106	53 - 130	3	28
2,3,4,6,7,8-HxCDF	50.3	50.0	101	51.1	50.0	102	66 - 126	1	22
1,2,3,4,6,7,8-HpCDF	47.7	50.0	95	46.6	50.0	93	66 - 122	2	17
1,2,3,4,7,8,9-HpCDF	52.6	50.0	105	53.2	50.0	106	69 - 136	1	21
OCDF	110	100	110	111	100	111	66 - 146	1	24

Comments: _____

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: Pacific EcoRisk Laboratories
Project: ACOE (San Rafael Channel)
Sample Matrix: Sediment
Sample Name: Lab Control Sample
Lab Code: EQ1000340-02

Service Request: K1006559
Date Collected: NA
Date Received: NA
Units: ng/Kg
Basis: Dry

Polychlorinated Dibenzodioxins and Polychlorinated Dibenzofurans by HRGC/HRMS

Analytical Method: 8290
Prep Method: Method
Sample Amount: 10.000g
Data File Name: P208667
ICAL Date: 08/01/08

Date Analyzed: 7/17/10 0120
Date Extracted: 7/8/10
Instrument Name: E-HRMS-04
GC Column: DB-5
Blank File Name: P208658
Cal Ver. File Name: P208656

Analyte Name	Result	Q	EDL	MRL	Ion Ratio	RRT	Dilution Factor
2,3,7,8-TCDD	19.6		0.0439	1.00	0.78	1.001	1
1,2,3,7,8-PeCDD	52.3		0.0477	2.50	1.54	1.000	1
1,2,3,4,7,8-HxCDD	47.1		0.0326	2.50	1.25	0.999	1
1,2,3,6,7,8-HxCDD	49.5		0.0312	2.50	1.26	1.000	1
1,2,3,7,8,9-HxCDD	44.9		0.0325	2.50	1.25	1.008	1
1,2,3,4,6,7,8-HpCDD	50.0		0.0310	2.50	1.04	1.000	1
OCDD	95.7		0.0517	5.00	0.90	1.000	1
2,3,7,8-TCDF	20.2		0.0402	1.00	0.80	1.001	1
1,2,3,7,8-PeCDF	46.7		0.0324	2.50	1.51	1.001	1
2,3,4,7,8-PeCDF	45.5		0.0312	2.50	1.52	1.024	1
1,2,3,4,7,8-HxCDF	47.9		0.0184	2.50	1.19	1.000	1
1,2,3,6,7,8-HxCDF	52.7		0.0177	2.50	1.20	1.003	1
1,2,3,7,8,9-HxCDF	51.7		0.0226	2.50	1.18	1.036	1
2,3,4,6,7,8-HxCDF	50.3		0.0191	2.50	1.17	1.017	1
1,2,3,4,6,7,8-HpCDF	47.7		0.0620	2.50	0.99	1.000	1
1,2,3,4,7,8,9-HpCDF	52.6		0.0816	2.50	0.99	1.034	1
OCDF	110		0.0664	5.00	0.87	1.004	1
Total Tetra-Dioxins	19.6		0.0439	1.00	0.80		1
Total Penta-Dioxins	52.3		0.0477	2.50	1.54		1
Total Hexa-Dioxins	141		0.0312	2.50	1.25		1
Total Hepta-Dioxins	50.5		0.0310	2.50	1.15		1
Total Tetra-Furans	20.2		0.0402	1.00	0.80		1
Total Penta-Furans	94.1		0.0312	2.50	1.69		1
Total Hexa-Furans	203		0.0177	2.50	1.19		1
Total Hepta-Furans	100		0.0620	2.50	0.99		1

Comments: _____

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: Pacific EcoRisk Laboratories
Project: ACOE (San Rafael Channel)
Sample Matrix: Sediment

Sample Name: Lab Control Sample
Lab Code: EQ1000340-02

Service Request: K1006559
Date Collected: NA
Date Received: NA

Units: Percent
Basis: Dry

Polychlorinated Dibenzodioxins and Polychlorinated Dibenzofurans by HRGC/HRMS

Analytical Method: 8290
Prep Method: Method
Sample Amount: 10.000g

Data File Name: P208667
ICAL Date: 08/01/08

Date Analyzed: 7/17/10 0120
Date Extracted: 7/8/10
Instrument Name: E-HRMS-04
GC Column: DB-5
Blank File Name: P208658
Cal Ver. File Name: P208656

Labeled Compounds	Spike Conc.(pg)	Conc. Found (pg)	%Rec	Q	Control Limits	Ion Ratio	RRT
13C-2,3,7,8-TCDD	1000	743.420	74		40-135	0.79	1.009
13C-1,2,3,7,8-PeCDD	1000	658.775	66		40-135	1.56	1.168
13C-1,2,3,6,7,8-HxCDD	2500	1764.231	71		40-135	1.28	0.992
13C-1,2,3,4,6,7,8-HpCDD	2500	1506.198	60		40-135	1.05	1.068
13C-OCDD	5000	1909.832	38	Y	40-135	0.91	1.148
13C-2,3,7,8-TCDF	1000	652.828	65		40-135	0.78	0.981
13C-1,2,3,7,8-PeCDF	1000	729.057	73		40-135	1.53	1.130
13C-1,2,3,4,7,8-HxCDF	2500	1643.241	66		40-135	0.53	0.971
13C-1,2,3,4,6,7,8-HpCDF	2500	1512.814	61		40-135	0.44	1.044
37Cl-2,3,7,8-TCDD	800	703.620	88		40-135	NA	1.009

Comments: _____

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: Pacific EcoRisk Laboratories
Project: ACOE (San Rafael Channel)
Sample Matrix: Sediment
Sample Name: Duplicate Lab Control Sample
Lab Code: EQ1000340-03

Service Request: K1006559
Date Collected: NA
Date Received: NA
Units: ng/Kg
Basis: Dry

Polychlorinated Dibenzodioxins and Polychlorinated Dibenzofurans by HRGC/HRMS

Analytical Method: 8290
Prep Method: Method
Sample Amount: 10.000g
Data File Name: P208668
ICAL Date: 08/01/08

Date Analyzed: 7/17/10 0209
Date Extracted: 7/8/10
Instrument Name: E-HRMS-04
GC Column: DB-5
Blank File Name: P208658
Cal Ver. File Name: P208656

Analyte Name	Result	Q	EDL	MRL	Ion Ratio	RRT	Dilution Factor
2,3,7,8-TCDD	18.5		0.0398	1.00	0.77	1.001	1
1,2,3,7,8-PeCDD	51.1		0.0488	2.50	1.54	1.001	1
1,2,3,4,7,8-HxCDD	42.1		0.0224	2.50	1.40	0.998	1
1,2,3,6,7,8-HxCDD	49.2		0.0213	2.50	1.14	1.000	1
1,2,3,7,8,9-HxCDD	41.7		0.0223	2.50	1.21	1.008	1
1,2,3,4,6,7,8-HpCDD	48.9		0.0286	2.50	1.05	1.000	1
OCDD	92.6		0.0589	5.00	0.89	1.000	1
2,3,7,8-TCDF	19.9		0.0517	1.00	0.75	1.001	1
1,2,3,7,8-PeCDF	45.5		0.0266	2.50	1.49	1.000	1
2,3,4,7,8-PeCDF	44.9		0.0255	2.50	1.51	1.023	1
1,2,3,4,7,8-HxCDF	46.4		0.0244	2.50	1.21	1.000	1
1,2,3,6,7,8-HxCDF	50.4		0.0235	2.50	1.19	1.003	1
1,2,3,7,8,9-HxCDF	53.1		0.0297	2.50	1.18	1.036	1
2,3,4,6,7,8-HxCDF	51.1		0.0252	2.50	1.19	1.017	1
1,2,3,4,6,7,8-HpCDF	46.6		0.0476	2.50	0.99	1.000	1
1,2,3,4,7,8,9-HpCDF	53.2		0.0626	2.50	0.98	1.034	1
OCDF	111		0.0703	5.00	0.87	1.004	1
Total Tetra-Dioxins	18.6		0.0398	1.00	0.77		1
Total Penta-Dioxins	51.3		0.0488	2.50	1.54		1
Total Hexa-Dioxins	133		0.0213	2.50	1.40		1
Total Hepta-Dioxins	49.3		0.0286	2.50	1.06		1
Total Tetra-Furans	20.0		0.0517	1.00	0.88		1
Total Penta-Furans	92.1		0.0255	2.50	1.49		1
Total Hexa-Furans	201		0.0235	2.50	1.21		1
Total Hepta-Furans	99.8		0.0476	2.50	0.99		1

Comments: _____

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: Pacific EcoRisk Laboratories
Project: ACOE (San Rafael Channel)
Sample Matrix: Sediment

Sample Name: Duplicate Lab Control Sample
Lab Code: EQ1000340-03

Service Request: K1006559
Date Collected: NA
Date Received: NA

Units: Percent
Basis: Dry

Polychlorinated Dibenzodioxins and Polychlorinated Dibenzofurans by HRGC/HRMS

Analytical Method: 8290
Prep Method: Method
Sample Amount: 10.000g

Data File Name: P208668
ICAL Date: 08/01/08

Date Analyzed: 7/17/10 0209
Date Extracted: 7/8/10
Instrument Name: E-HRMS-04
GC Column: DB-5
Blank File Name: P208658
Cal Ver. File Name: P208656

Labeled Compounds	Spike Conc.(pg)	Conc. Found (pg)	%Rec	Q	Control Limits	Ion Ratio	RRT
13C-2,3,7,8-TCDD	1000	757.168	76		40-135	0.79	1.008
13C-1,2,3,7,8-PeCDD	1000	679.783	68		40-135	1.57	1.167
13C-1,2,3,6,7,8-HxCDD	2500	1822.545	73		40-135	1.25	0.992
13C-1,2,3,4,6,7,8-HpCDD	2500	1416.448	57		40-135	1.06	1.068
13C-OCDD	5000	1707.522	34	Y	40-135	0.90	1.148
13C-2,3,7,8-TCDF	1000	664.112	66		40-135	0.75	0.980
13C-1,2,3,7,8-PeCDF	1000	738.431	74		40-135	1.56	1.130
13C-1,2,3,4,7,8-HxCDF	2500	1618.962	65		40-135	0.52	0.972
13C-1,2,3,4,6,7,8-HpCDF	2500	1407.768	56		40-135	0.44	1.044
37Cl-2,3,7,8-TCDD	800	695.624	87		40-135	NA	1.009

Comments: _____



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CAS Contact: Pradeep Divvela

Project Name: ACOE (San Rafael Channel)
Project Number:
Project Manager: Jeffrey Cotsifas
Company: Pacific EcoRisk Laboratories

PCDD PCDF
8290

Lab Code	Client Sample ID	# of Cont.	Matrix	Sample Date	Time	Date Received	Send To	
K1006559-001	SF 10	1	Sediment	6/15/10	1005	6/24/10	HOUSTON	V
K1006559-002	SF 11	1	Sediment	6/15/10	0930	6/24/10	HOUSTON	V

Test Comments
 PCDD PCDF - 8290 K1006559-001,2

Analyte list attached

Special Instructions/Comments Please provide the electronic (PDF and EDD) report to the following e-mail address: kelso_data@caslab.com	Turnaround Requirements <input type="checkbox"/> RUSH (Surcharges Apply) PLEASE CIRCLE WORK DAYS 1 2 3 4 5 <input checked="" type="checkbox"/> STANDARD Requested FAX Date: _____ Requested Report Date: <u>07/15/10</u>	Report Requirements <input type="checkbox"/> I. Results Only <input checked="" type="checkbox"/> II. Results + QC Summaries <input type="checkbox"/> III. Results + QC and Calibration Summaries <input type="checkbox"/> IV. Data Validation Report with Raw Data PQL/MDL/J <input checked="" type="checkbox"/> EDD	Invoice Information <hr/> PO# K1006559 <hr/> Bill to
--	--	---	--

Relinquished By: James Jones 7/2/10 1130 Received By: Pradeep Divvela 7/2/10 1000 POC

Airbill Number: 179736594446764848
 bubble wrap 2 seals-front
 hure ico.

Pag

Columbia Analytical Services, Inc.
Cooler Receipt Form

Client/Project: Pacific EcoRisk Labs/ ACOE (San Rafael Channel) Service Request: K1006559

Received: 7/3/10; 1000 Opened (Date/Time): 7/3/10; 1000 By: CD for JB

1. Samples were received via? ☐ US Mail ☐ Fedex ☒ UPS ☐ DHL ☐ Courier ☐ Hand Delivered
2. Samples were received in: (circle) ☒ Cooler ☐ Box ☐ Other _____ ☐ NA
3. Were custody seals present on coolers? ☒ Y ☐ N If yes, how many and where? 2-front
If present, were custody seals intact? ☒ Y ☐ N If present, were they signed and dated? ☒ Y ☐ N
4. Is shipper's air-bill filed? ☐ NA ☐ Y ☒ N If not, record air bill number: 1Z9736594446764848
5. Temperature of cooler(s) upon receipt (°C): 0
6. If applicable, list Chain of Custody numbers: _____
7. Were custody papers properly filled out (ink, signed, etc.)? ☐ NA ☒ Y ☐ N
8. Packing material used: ☐ Inserts ☒ Bubble Wrap ☒ Blue Ice ☐ Wet Ice ☐ Sleeves ☐ Other _____
9. Were the correct types of bottles used for the tests indicated? ☒ Y ☐ N
Did all bottles arrive in good condition (i.e. unbroken, out of temp.)? *Indicate in the table below.* ☒ Y ☐ N

Sample ID	Bottle Count	Bottle Type	Out of Temp	Broken	Initials
			<input type="checkbox"/>	<input type="checkbox"/>	
			<input type="checkbox"/>	<input type="checkbox"/>	
			<input type="checkbox"/>	<input type="checkbox"/>	
			<input type="checkbox"/>	<input type="checkbox"/>	
			<input type="checkbox"/>	<input type="checkbox"/>	
			<input type="checkbox"/>	<input type="checkbox"/>	
			<input type="checkbox"/>	<input type="checkbox"/>	

10. Were all bottle labels complete (i.e. analysis, ID, etc.)? ☒ Y ☐ N
Did all bottle labels and tags agree with custody papers? *Indicate in the table below.* ☒ Y ☐ N

Sample ID on Bottle	Sample ID on COC	Sample ID on Bottle	Sample ID on COC

11. Additional notes, discrepancies, and resolutions:

Sample Acceptance Policy

Custody Seals (desirable, mandatory if specified in SAP):

- ✓ On outside of cooler
- ✓ Seals intact, signed and dated

Chain-of-Custody documentation (mandatory):

- ✓ Properly filled out in ink & signed by the client
- ✓ Sign and date the coc for CAS/HOU upon cooler receipt
- ✓ Coc must list method number
- ✓ If no coc was submitted with the samples, complete a CAS/HOU coc for the client

Sample Integrity (mandatory):

- ✓ Sample containers must arrive in good condition (not broken or leaking)
- ✓ Sample IDs on the bottles must match the sample IDs on the coc
- ✓ The correct type of sample bottle must be used for the method requested
- ✓ The correct number of sample containers received must agree with the documentation on the coc
- ✓ The correct sample matrix must appear on the coc
- ✓ An appropriate sample volume or weight must be received

Temperature Preservatives (varies by sample matrix):

- ✓ Aqueous and Non-aqueous samples must be shipped and stored cold, at 0 to 6°C
- ✓ Tissue samples must be shipped and stored frozen, at -20 to -10°C
- ✓ Air samples can be shipped and stored at ambient temperature, ~23°C
- ✓ The sample temperature must be recorded on the coc
- ✓ Notify a Project Chemist if any samples are outside the acceptance temperature or have compromised sample integrity – the client must decide re: replacement sample submittal or continue with the analysis

Cooler Receipt Form, CRF (mandatory):

- ✓ Cooler receipt forms must be completed for each coc & SR#
- ✓ Sample integrity issues must be documented on the CRF
- ✓ A scan of the carrier and the airbill number must be recorded in CAS LIMS

Sample Integrity Issues/Resolutions (mandatory):

- ✓ Sample integrity issues are documented on the CRF and given to the Project Chemist for resolution with the client
- ✓ Client resolution is documented in writing (typically email or on the CRF) and filed in the project folder(s)

Service Request Summary

Folder #: K1006559
Client Name: Pacific EcoRisk Laboratories
Project Name: ACOE (San Rafael Channel)
Project Number:

Report To: Jeffrey Cotsifas
 Pacific EcoRisk Laboratories
 2250 Cordelia Road
 Fairfield, CA 94534

Phone Number: 707-207-7760

Cell Number:

Fax Number: 707-207-7916

E-mail: cotsifas@pacificcorisk.com

Project Chemist: Darren Biles
Originating Lab: KELSO
Logged By: JJONES
Date Received: 6/24/10
Internal Due Date: 7/16/10
QAP: LAB QAP
Qualifier Set: CAS Standard
Formset: CAS Standard
Merged?: N,Y
Report to MDL?: N,Y
P.O. Number: 16087
EDD: BASIC_WQC

4 - 16 oz-Glass Jar WM Unpreserved
 2 - 2 oz-Glass Jar WM CLEAR Teflon Liner 4-deg C
 2 - 1 each-Plastic Bag Ziplock Unpreserved
 2 - -N/A N/A

Location: K-Delilah-100, K-PETUNIA-02,
 E-WIC-02-Box168, SMO

RUSH

CAS Samp No	Client Samp No.	Matrix	Collected	1005	KELSO			KELSO					KELSO		
					ASTM D4129-82M/ TOC	PSEP PS/ PSEP PartSizeCB	Subsample/ Sub Sample	6010B/ Metals T	6020/ Metals T	6020/ Sb Ag T	7471A/ Hg	7742/ Se T	8015B/ DRO_RRO	8081A/ PEST_OC_LL	8082/ PCB_LL
K1006559-001	SF 10	Sediment	6/15/10	1005	V	V	V	V	V	V	V	V	V	V	V
K1006559-002	SF 11	Sediment	6/15/10	0930	V	V	V	V	V	V	V	V	V	V	V

Test Comments:

Group	Test/Method	Samples	Comments
GenChem	Sub Sample/Subsample	1-2	Lab to aliquot a portion of sample for dioxins and bring to SMO for shipping
Metals	Metals T/6010B	1-2	B
Metals	Metals T/6020	1-2	As,Cd,Cr,Cu,Pb,Ni,Zn,Ba,Be,Co,Mn,V
Metals	Sb Ag T/6020	1-2	Ag
Semivola GC	HERB/8151A	1-2	Dichlorprop,MCPA and MCPP
Semivola GCMS	PCDD PCDF/8290	1-2, 0	Analyte list attached
Semivola GCMS	SVO_LL/8270C	1-2	Phenol and Pentachlorophenol only
SMO	Archive -20C/Archive	1-2	Archive samples after analysis has been performed.
SMO	Archive 4C/Archive	1-2	Archive samples after analysis has been performed.

CAS Samp No.	Client Samp No.	Matrix	Collected		KELSO		KELSO		KELSO		KELSO	KELSO	SVM	
					8151A/ HERB	Butyltins/ BUTYL TINS	8270C SIM/ PAH_SIM	8270C/ SVO_LL	Archive/ Archive -20C	Archive/ Archive 4C	TS-MET/ Total Solids	8015B/ VOC_GRO	8290/ PCDD PCDF	CAS SOP/ Total Solids
K1006559-001	SF 10	Sediment	6/15/10	1005	V	V	V	V	V	V	V	V	II	V
K1006559-002	SF 11	Sediment	6/15/10	0930	V	V	V	V	V	V	V	V	II	V

Preparation Information Benchsheet

Prep Run#: 114850
Team: Semivoa GCMS/AKODUR

Prep WorkFlow: OrgExtDioxS(30)
Prep Method: Method

Status: Prepped
Prep Date/Time: 7/8/10 12:55 PM

#	Lab Code	Client ID	B#	Method /Test	pH	Matrix	Amt. Ext.	Sample Description
1	E1000731-001	10068313-1	.01	8290/PCDD PCDF		Paper	5.217g	white paper squares
2	E1000740-001	10068632-1	.01	8290/PCDD PCDF		Paper	5.142g	white cardboard
3	EQ1000340-01	MB		8290/PCDD PCDF		Solid	10.000g	
4	EQ1000340-02	LCS		8290/PCDD PCDF		Solid	10.000g	
5	EQ1000340-03	DLCS		8290/PCDD PCDF		Solid	10.000g	
6	K1006356-021	SRC-2010-8-Z-Comp	.04	8290/PCDD PCDF		Sediment	13.336g	dark brown wet soil
7	K1006559-001	SF 10	.04	8290/PCDD PCDF		Sediment	11.860g	dark brown wet soil
8	K1006559-002	SF 11	.04	8290/PCDD PCDF		Sediment	11.958g	dark brown wet soil
9	K1006816-001	OUTSIDE-CB2-062910	.03	8290/PCDD PCDF		Soil	10.990g	brown soil
10	K1006816-002	OUTSIDE-CB3-062910	.03	8290/PCDD PCDF		Soil	10.870g	brown soil
11	K1006816-003	OUTSIDE-CB5-062910	.03	8290/PCDD PCDF		Soil	10.318g	brown soil
12	K1006816-004	DALLAS AVE-062910	.03	8290/PCDD PCDF		Soil	13.406g	brown soil

Spiking Solutions

Name:	8290 Matrix Working Standard	Inventory ID	17186	Logbook Ref:	D11-21-5A	Expires On:	04/16/2011
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EQ1000340-02 100.00µL EQ1000340-03 100.00µL

Name:	8290 Internal Working Standard	Inventory ID	19025	Logbook Ref:	D11-41-1A	Expires On:	06/24/2011
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E1000731-001 100.00µL E1000740-001 100.00µL EQ1000340-01 100.00µL EQ1000340-02 100.00µL EQ1000340-03 100.00µL K1006356-021 100.00µL
K1006559-001 100.00µL K1006559-002 100.00µL K1006816-001 100.00µL K1006816-002 100.00µL K1006816-003 100.00µL K1006816-004 100.00µL

Name:	8290/1613B Cleanup Working Standard	Inventory ID	19198	Logbook Ref:	D11-42-2A/B	Expires On:	07/01/2011
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E1000731-001 100.00µL E1000740-001 100.00µL EQ1000340-01 100.00µL EQ1000340-02 100.00µL EQ1000340-03 100.00µL K1006356-021 100.00µL
K1006559-001 100.00µL K1006559-002 100.00µL K1006816-001 100.00µL K1006816-002 100.00µL K1006816-003 100.00µL K1006816-004 100.00µL

Preparation Materials

Carbon, High Purity	C2-40-1 (19119)	Ethyl Acetate 99.9% Minimum EtOAc	C2-41-3 (19127)	Extraction Thimbles 43 x123 mm	(1577)
Glass Wool	C2-37-2 (19132)	Sulfuric Acid Reagent Grade H2SO4	C2-40-2 (19147)	Dichloromethane (Methylene Chloride) 99.9% MeCl2	C2-41-2 (19145)
Sodium Chloride Reagent Grade NaCl	C2-38-1 (19137)	Sodium Hydroxide Reagent Grade NaOH	C2-40-5 (19149)	Sodium Sulfate Anhydrous Reagent Grade Na2SO4	C2-36-004 (16226)
Tridecane (n-Tridecane)	C2-40-3 (19135)	Hexane (n-Hexane) 98.5% Minimum	C2-40-6 (19125)	Nonane (n-Nonane) 99%	C2-33-001 (13944)
Silica Gel Reagent Grade	C2-38-6 (19140)	Toluene 99.9% Minimum	C2-41-1 (19142)		

Preparation Information Benchsheet

Prep Run#: 114850
Team: Semivoa GCMS/AKODUR

Prep WorkFlow: OrgExtDioxS(30)
Prep Method: Method

Status: Prepped
Prep Date/Time: 7/8/10 12:55 PM

Preparation Steps

Step:	Extraction	Step:	Acid Clean	Step:	Silica Gel Clean	Step:	Final Volume
Started:	7/8/10 12:55	Started:	7/12/10 09:58	Started:	7/12/10 12:00	Started:	7/13/10 06:30
Finished:	7/9/10 07:10	Finished:	7/12/10 11:21	Finished:	7/12/10 14:00	Finished:	7/13/10 10:00
By:	CDONOVAN	By:	CDONOVAN	By:	CDONOVAN	By:	CDONOVAN

Comments: _____

Reviewed By: CD Date: 7/14/2010

Chain of Custody

Relinquished By:	_____	Date:	_____	<u>Extracts Examined</u>
Received By:	_____	Date:	_____	Yes No

COLUMBIA ANALYTICAL SERVICES, INC.

Total Solids Report

[illegible]

Batch No.:

Comments:

Analyst:	ak	Date/Time:	7/15/10	11:14 AM
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July 16, 2010

Analytical Report for Service Request No: K1006947

Jeffrey Cotsifas
Pacific EcoRisk Laboratories
2250 Cordelia Road
Fairfield, CA 94534

RE: ACOE- San Rafael Channel

Dear Jeffrey:


Enclosed are the results of the samples submitted to our laboratory on July 07, 2010. For your reference, these analyses have been assigned our service request number K1006947.

Analyses were performed according to our laboratory's NELAP-approved quality assurance program. The test results meet requirements of the current NELAP standards, where applicable, and except as noted in the laboratory case narrative provided. For a specific list of NELAP-accredited analytes, refer to the certifications section at www.caslab.com. All results are intended to be considered in their entirety, and Columbia Analytical Services, Inc. (CAS) is not responsible for use of less than the complete report. Results apply only to the items submitted to the laboratory for analysis and individual items (samples) analyzed, as listed in the report.

Please call if you have any questions. My extension is 3281. You may also contact me via Email at PDivvela@caslab.com.

Respectfully submitted,

Columbia Analytical Services, Inc.


Pradeep Divvela
Project Chemist

PD/ln

Page 1 of 41

Acronyms

ASTM	American Society for Testing and Materials
A2LA	American Association for Laboratory Accreditation
CARB	California Air Resources Board
CAS Number	Chemical Abstract Service registry Number
CFC	Chlorofluorocarbon
CFU	Colony-Forming Unit
DEC	Department of Environmental Conservation
DEQ	Department of Environmental Quality
DHS	Department of Health Services
DOE	Department of Ecology
DOH	Department of Health
EPA	U. S. Environmental Protection Agency
ELAP	Environmental Laboratory Accreditation Program
GC	Gas Chromatography
GC/MS	Gas Chromatography/Mass Spectrometry
LUFT	Leaking Underground Fuel Tank
M	Modified
MCL	Maximum Contaminant Level is the highest permissible concentration of a substance allowed in drinking water as established by the USEPA.
MDL	Method Detection Limit
MPN	Most Probable Number
MRL	Method Reporting Limit
NA	Not Applicable
NC	Not Calculated
NCASI	National Council of the Paper Industry for Air and Stream Improvement
ND	Not Detected
NIOSH	National Institute for Occupational Safety and Health
PQL	Practical Quantitation Limit
RCRA	Resource Conservation and Recovery Act
SIM	Selected Ion Monitoring
TPH	Total Petroleum Hydrocarbons
tr	Trace level is the concentration of an analyte that is less than the PQL but greater than or equal to the MDL.

Inorganic Data Qualifiers

- * The result is an outlier. See case narrative.
- # The control limit criteria is not applicable. See case narrative.
- B The analyte was found in the associated method blank at a level that is significant relative to the sample result as defined by the DOD or NELAC standards.
- E The result is an estimate amount because the value exceeded the instrument calibration range.
- J The result is an estimated value that was detected outside the quantitation range.
- U The analyte was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL.
DOD-QSM 4.1 definition : Analyte was not detected and is reported as less than the LOD or as defined by the project. The detection limit is adjusted for dilution.
- i The MRL/MDL or LOQ/LOD is elevated due to a matrix interference.
- X See case narrative.
- Q See case narrative. One or more quality control criteria was outside the limits.

Metals Data Qualifiers

- # The control limit criteria is not applicable. See case narrative.
- J The result is an estimated value that was detected outside the quantitation range.
- E The percent difference for the serial dilution was greater than 10%, indicating a possible matrix interference in the sample.
- M The duplicate injection precision was not met.
- N The Matrix Spike sample recovery is not within control limits. See case narrative.
- S The reported value was determined by the Method of Standard Additions (MSA).
- U The analyte was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL.
DOD-QSM 4.1 definition : Analyte was not detected and is reported as less than the LOD or as defined by the project. The detection limit is adjusted for dilution.
- W The post-digestion spike for furnace AA analysis is out of control limits, while sample absorbance is less than 50% of spike absorbance.
- i The MRL/MDL or LOQ/LOD is elevated due to a matrix interference.
- X See case narrative.
- + The correlation coefficient for the MSA is less than 0.995.
- Q See case narrative. One or more quality control criteria was outside the limits.

Organic Data Qualifiers

- * The result is an outlier. See case narrative.
- # The control limit criteria is not applicable. See case narrative.
- A A tentatively identified compound, a suspected aldol-condensation product.
- B The analyte was found in the associated method blank at a level that is significant relative to the sample result as defined by the DOD or NELAC standards.
- C The analyte was qualitatively confirmed using GC/MS techniques, pattern recognition, or by comparing to historical data.
- D The reported result is from a dilution.
- E The result is an estimate amount because the value exceeded the instrument calibration range.
- J The result is an estimated value that was detected outside the quantitation range.
- N The result is presumptive. The analyte was tentatively identified, but a confirmation analysis was not performed.
- P The GC or HPLC confirmation criteria was exceeded. The relative percent difference is greater than 40% between the two analytical results.
- U The analyte was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL.
DOD-QSM 4.1 definition : Analyte was not detected and is reported as less than the LOD or as defined by the project. The detection limit is adjusted for dilution.
- i The MRL/MDL or LOQ/LOD is elevated due to a chromatographic interference.
- X See case narrative.
- Q See case narrative. One or more quality control criteria was outside the limits.

Additional Petroleum Hydrocarbon Specific Qualifiers

- F The chromatographic fingerprint of the sample matches the elution pattern of the calibration standard.
- L The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of lighter molecular weight constituents than the calibration standard.
- H The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of heavier molecular weight constituents than the calibration standard.
- O The chromatographic fingerprint of the sample resembles an oil, but does not match the calibration standard.
- Y The chromatographic fingerprint of the sample resembles a petroleum product eluting in approximately the correct carbon range, but the elution pattern does not match the calibration standard.
- Z The chromatographic fingerprint does not resemble a petroleum product.

Columbia Analytical Services, Inc.
Kelso, WA
State Certifications, Accreditations, and Licenses

Program	Number
Alaska DEC UST	UST-040
Arizona DHS	AZ0339
Arkansas - DEQ	88-0637
California DHS	2286
Colorado DPHE	-
Florida DOH	E87412
Hawaii DOH	-
Idaho DHW	-
Indiana DOH	C-WA-01
Louisiana DEQ	3016
Louisiana DHH	LA050010
Maine DHS	WA0035
Michigan DEQ	9949
Minnesota DOH	053-999-368
Montana DPHHS	CERT0047
Nevada DEP	WA35
New Jersey DEP	WA005
New Mexico ED	-
North Carolina DWQ	605
Oklahoma DEQ	9801
Oregon - DHS	WA200001
South Carolina DHEC	61002
Utah DOH	COLU
Washington DOE	C1203
Wisconsin DNR	998386840
Wyoming (EPA Region 8)	-

Case Narrative

COLUMBIA ANALYTICAL SERVICES, INC.

Client: Pacific EcoRisk Laboratories
Project: ACOE - San Rafael Channel
Sample Matrix: Oceanwater

Service Request No.: K1006947
Date Received: 07/07/10

CASE NARRATIVE

All analyses were performed consistent with the quality assurance program of Columbia Analytical Services, Inc. (CAS). This report contains analytical results for samples designated for Tier II data deliverables. When appropriate to the method, method blank results have been reported with each analytical test. Additional quality control analyses reported herein include: Laboratory Duplicate (DUP), Matrix Spike (MS), Matrix/Duplicate Matrix Spike (MS/DMS), and Laboratory Control Sample (LCS).

Sample Receipt

Eight field samples were received for analysis at Columbia Analytical Services on 07/07/10. The samples were received in good condition and consistent with the accompanying chain of custody form. The samples were stored in a refrigerator at 4°C upon receipt at the laboratory.

General Chemistry Parameters

No anomalies associated with the analysis of these samples were observed.

Total and Dissolved Metals

Method Blank Exceptions:

The Method Blank contained low levels of Lead above the Method Reporting Limit (MRL). In accordance with CAS QA/QC policy, all sample results less than twenty times the level found in the Method Blank were flagged as estimated. The samples were not re-prepared and re-analyzed as insufficient sample remained for additional testing.

No other anomalies associated with the analysis of these samples were observed.

Approved by _____ Date 07/16/10

Chain of Custody

K1006947



Pacific EcoRisk

ENVIRONMENTAL CONSULTING & TESTING

2250 Cordelia Rd., Fairfield, CA 94534

(707)207-7760

CAS CHAIN-OF-CUSTODY RECORD

Client Name:		ACOE				REQUESTED ANALYSIS											
Client Address:						Total Metals with reductive precipitation	Dissolved Metals with reductive precipitation	1631E - Total Hg	1631E - Dissolved Hg	Total Se	Dissolved Se	TSS					
Sampled By:		Mike McElroy															
Phone:		707-207-7760															
FAX:																	
Project Manager:		Jeff Cotsifas (PER)															
Project Name:		Pine Street ACOE - San Rafael Channel															
PO Number:		16087															
Client Sample ID	Sample Date	Sample Time	Sample Matrix*	Container													
				Number	Type												
1	SRC-2010-01	07/06/10 12:00:00	MET	12	multiple	X	X	X	X	X	X	X					
2	SRC-2010-02	07/06/10 12:01	MET	7	multiple	X	X	X	X	X	X	X					
3	SRC-2010-03	07/06/10 12:02	MET	7	multiple	X	X	X	X	X	X	X					
4	SRC-2010-04	07/06/10 12:03	MET	7	multiple	X	X	X	X	X	X	X					
5	SRC-2010-05	07/06/10 12:04	MET	7	multiple	X	X	X	X	X	X	X					
6	SRC-2010-06	07/06/10 12:05	MET	7	multiple	X	X	X	X	X	X	X					
7	SRC-2010-07	07/06/10 12:06	MET	7	multiple	X	X	X	X	X	X	X					
8	SRC-2010-08	07/06/10 12:07:00	MET	7	multiple	X	X	X	X	X	X	X					
Correct Containers:		Yes	No														
Sample Temperature:		Ambient	Cold	Warm													
Sample Preservative:		Yes	No														
Turnaround Time:		STD	Specify:														
Comments: SRC-2010-01 Extra volume for QC provided. Sample date and time are when the sample was extracted after 24 hour settling period.				RELIQUINSHED BY													
				Signature: <i>M. McElroy</i>						Signature:							
				Print: M. McElroy						Print:							
				Organization: PER						Organization:							
				DATE: 7-6-10 TIME: 1600						DATE: TIME							
				RECEIVED BY													
				Signature: <i>John Florio</i>						Signature:							
Print: John Florio						Print:											
Organization: CAS						Organization:											
DATE: 7-7-10 TIME: 850						DATE: TIME											

*MATRIX CODES: (SED = Sediment); (FW = Freshwater); (WW = Wastewater); (STRMW = Stormwater)

Columbia Analytical Services, Inc.
Cooler Receipt and Preservation Form

PC PD

Client / Project: Pacific Ecolisk Service Request K10 010947
 Received: 7-7-10 Opened: 7-7-10 By: SF

1. Samples were received via? *Mail* Fed Ex *UPS* *DHL* *PDX* *Courier* *Hand Delivered*
 2. Samples were received in: (circle) Cooler *Box* *Envelope* *Other* NA
 3. Were custody seals on coolers? *NA* *Y* N If yes, how many and where? _____
 If present, were custody seals intact? *Y* *N* If present, were they signed and dated? *Y* *N*

Cooler Temp °C	Temp Blank °C	Thermometer ID	Cooler/COC ID	NA	Tracking Number	NA	Filed
1.6	NA	289	2 of 4				X
3.6	NA	276			8723 1453 4409		X
0.0	9.8	263					X
0.2	6.9	223					X

7. Packing material used. *Inserts* *Baggies* *Bubble Wrap* Gel Packs *Wet Ice* *Sleeves* *Other* _____
 8. Were custody papers properly filled out (ink, signed, etc.)? *NA* Y *N*
 9. Did all bottles arrive in good condition (unbroken)? *Indicate in the table below.* *NA* Y *N*
 10. Were all sample labels complete (i.e analysis, preservation, etc.)? *NA* Y *N*
 11. Did all sample labels and tags agree with custody papers? *Indicate major discrepancies in the table on page 2.* *NA* Y *N*
 12. Were appropriate bottles/containers and volumes received for the tests indicated? *NA* Y *N*
 13. Were the pH-preserved bottles (*see SMO GEN SOP*) received at the appropriate pH? *Indicate in the table below* *NA* Y *N*
 14. Were VOA vials received without headspace? *Indicate in the table below.* NA *Y* *N*
 15. Was C12/Res negative? NA *Y* *N*

Sample ID on Bottle	Sample ID on COC	Identified by:

Sample ID	Bottle Count Bottle Type	Out of Temp	Head- space	Broke	pH	Reagent	Volume added	Reagent Lot Number	Initials	Time

SHORT HOLD TIME

Notes, Discrepancies, & Resolutions: _____

General Chemistry Parameters

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client : Pacific EcoRisk Laboratories
Project Name : ACOE- San Rafael Channel
Project Number : NA
Sample Matrix : OCEAN WATER

Service Request : K1006947
Date Collected : 07/06/10
Date Received : 07/07/10

Solids, Total Suspended (TSS)

Analysis Method SM 2540 D
Test Notes :

Units : mg/L
Basis : NA

Sample Name	Lab Code	MRL	MDL	Dilution Factor	Date Analyzed	Result	Result Notes
SRC-2010-01	K1006947-001	10	10	1	07/08/10	56	
SRC-2010-02	K1006947-002	10	10	1	07/08/10	382	
SRC-2010-03	K1006947-003	10	10	1	07/08/10	169	
SRC-2010-04	K1006947-004	6.7	6.7	1	07/08/10	42.7	
SRC-2010-05	K1006947-005	5.0	5.0	1	07/08/10	25.5	
SRC-2010-06	K1006947-006	10	10	1	07/08/10	48	
SRC-2010-07	K1006947-007	10	10	1	07/08/10	172	
SRC-2010-08	K1006947-008	5.0	5.0	1	07/08/10	28.0	
Method Blank	K1006947-MB	4.0	5.0	1	07/08/10	ND	

SM Standard Methods for the Examination of Water and Wastewater, 20th Ed., 1998.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client : Pacific EcoRisk Laboratories
Project Name : ACOE- San Rafael Channel
Project Number : NA
Sample Matrix : OCEAN WATER

Service Request : K1006947
Date Collected : 7/6/2010
Date Received : 7/7/2010
Date Prepared : NA
Date Analyzed : 07/08/10

Duplicate Summary Inorganic Parameters

Sample Name : SRC-2010-01
Lab Code : K1006947-001DUP
Test Notes :

Units : mg/L
Basis : NA

Analyte	Analysis Method	MRL	Sample Result	Duplicate		Relative Percent Difference	Result Notes
				Sample Result	Average		
Solids, Total Suspended (TSS)	SM 2540 D	10	56	57	57	2	

SM Standard Methods for the Examination of Water and Wastewater, 20th Ed., 1998.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client : Pacific EcoRisk Laboratories
Project Name : ACOE- San Rafael Channel
Project Number : NA
Sample Matrix : OCEAN WATER

Service Request : K1006947
Date Collected : NA
Date Received : NA
Date Prepared : NA
Date Analyzed : 07/08/10

Laboratory Control Sample Summary Inorganic Parameters

Sample Name : Lab Control Sample
Lab Code : K1006947-LCS
Test Notes :

Units : mg/L
Basis : NA

Analyte	Prep Method	Analysis Method	True Value	Result	Percent Recovery	CAS Percent Recovery	Result Notes
						Acceptance Limits	
Solids, Total Suspended (TSS)	NONE	SM 2540 D	165	170	103	80-115	

SM Standard Methods for the Examination of Water and Wastewater, 20th Ed., 1998.

Metals

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: Pacific EcoRisk Laboratories
Project: ACOE- San Rafael Channel
Sample Matrix: Ocean water

Service Request: K1006947
Date Collected: 07/06/10
Date Received: 07/07/10

Mercury, Total

Prep Method: METHOD
 Analysis Method: 1631E
 Test Notes:

Units: ng/L
 Basis: NA

Sample Name	Lab Code	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
SRC-2010-01	K1006947-001	1.0	0.06	1	07/09/10	07/12/10	39.2	
SRC-2010-02	K1006947-002	1.0	0.06	1	07/09/10	07/12/10	3.60	
SRC-2010-03	K1006947-003	1.0	0.06	1	07/09/10	07/12/10	3.45	
SRC-2010-04	K1006947-004	1.0	0.06	1	07/09/10	07/12/10	26.3	
SRC-2010-05	K1006947-005	1.0	0.06	1	07/09/10	07/12/10	5.93	
SRC-2010-06	K1006947-006	1.0	0.06	1	07/09/10	07/12/10	72.5	
SRC-2010-07	K1006947-007	1.0	0.06	1	07/09/10	07/12/10	84.3	
SRC-2010-08	K1006947-008	1.0	0.06	1	07/09/10	07/12/10	1.86	
Method Blank 1	K1006947-MB1	1.0	0.06	1	07/09/10	07/12/10	ND	
Method Blank 2	K1006947-MB2	1.0	0.06	1	07/09/10	07/12/10	ND	
Method Blank 3	K1006947-MB3	1.0	0.06	1	07/09/10	07/12/10	0.16	J

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: Pacific EcoRisk Laboratories
Project: ACOE- San Rafael Channel
Sample Matrix: Ocean water

Service Request: K1006947
Date Collected: 07/06/10
Date Received: 07/07/10

Mercury, Dissolved

Prep Method: METHOD
 Analysis Method: 1631E
 Test Notes:

Units: ng/L
 Basis: NA

Sample Name	Lab Code	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
SRC-2010-01	K1006947-001 DISS	1.0	0.06	1	07/09/10	07/12/10	1.35	
SRC-2010-02	K1006947-002 DISS	1.0	0.06	1	07/09/10	07/12/10	1.41	
SRC-2010-03	K1006947-003 DISS	1.0	0.06	1	07/09/10	07/12/10	1.02	
SRC-2010-04	K1006947-004 DISS	1.0	0.06	1	07/09/10	07/12/10	0.81	
SRC-2010-05	K1006947-005 DISS	1.0	0.06	1	07/09/10	07/12/10	0.92	
SRC-2010-06	K1006947-006 DISS	1.0	0.06	1	07/09/10	07/12/10	1.48	
SRC-2010-07	K1006947-007 DISS	1.0	0.06	1	07/09/10	07/12/10	0.61	
SRC-2010-08	K1006947-008 DISS	1.0	0.06	1	07/09/10	07/12/10	0.68	

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Pacific EcoRisk Laboratories
Project: ACOE- San Rafael Channel
Sample Matrix: Ocean water

Service Request: K1006947
Date Collected: 07/06/10
Date Received: 07/07/10
Date Extracted: 07/09/10
Date Analyzed: 07/12/10

Matrix Spike/Duplicate Matrix Spike Summary
 Total Metals

Sample Name: SRC-2010-01 Units: ng/L
 Lab Code: K1006947-001MS, K1006947-001DMS Basis: NA
 Test Notes:

Analyte	Prep Method	Analysis Method	MRL	Spike Level		Sample Result	Spike Result		Percent Recovery		CAS Acceptance Limits	Relative Percent Difference	Result Notes
				MS	DMS		MS	DMS	MS	DMS			
Mercury	METHOD	1631E	1.0	20	20	39.2	58.4	59.3	96	101	71-125	2	

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Pacific EcoRisk Laboratories
Project: ACOE- San Rafael Channel
LCS Matrix: Water

Service Request: K1006947
Date Collected: NA
Date Received: NA
Date Extracted: NA
Date Analyzed: 07/12/10

Ongoing Precision and Recovery (OPR) Sample Summary
Total Metals

Sample Name: Ongoing Precision and Recovery (Initial) Units: ng/L
Basis: NA

Test Notes:

Analyte	Prep Method	Analysis Method	True Value	Result	Percent Recovery	CAS	Result Notes
						Percent Recovery Acceptance Limits	
Mercury	METHOD	1631E	5.00	5.28	106	77-123	

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Pacific EcoRisk Laboratories
Project: ACOE- San Rafael Channel
LCS Matrix: Water

Service Request: K1006947
Date Collected: NA
Date Received: NA
Date Extracted: NA
Date Analyzed: 07/12/10

Ongoing Precision and Recovery (OPR) Sample Summary
Total Metals

Sample Name: Ongoing Precision and Recovery (Final) **Units:** ng/L
Basis: NA

Test Notes:

Analyte	Prep Method	Analysis Method	True Value	Result	Percent Recovery	CAS	Result Notes
						Percent Recovery Acceptance Limits	
Mercury	METHOD	1631E	5.00	4.79	96	77-123	

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Pacific EcoRisk Laboratories
Project: ACOE- San Rafael Channel
LCS Matrix: Water

Service Request: K1006947
Date Collected: NA
Date Received: NA
Date Extracted: NA
Date Analyzed: 07/12/10

Quality Control Sample (QCS) Summary
Total Metals

Sample Name: Quality Control Sample

Units: ng/L
Basis: NA

Test Notes:

Analyte	Prep Method	Analysis Method	True Value	Result	Percent Recovery	CAS	Result Notes
						Percent Recovery Acceptance Limits	
Mercury	METHOD	1631E	5.00	4.25	85	77-123	

Columbia Analytical Services

- Cover Page - INORGANIC ANALYSIS DATA PACKAGE

Client: Pacific EcoRisk Laboratories
Project Name:
Project No.: ACOE - San Rafael Channel

Service Request: K1006947

Sample Name:

SRC-2010-01

SRC-2010-01

SRC-2010-01D

SRC-2010-01S

SRC-2010-02

SRC-2010-02

SRC-2010-03

SRC-2010-03

SRC-2010-04

SRC-2010-04

SRC-2010-05

SRC-2010-05

SRC-2010-06

SRC-2010-06

SRC-2010-07

SRC-2010-07

SRC-2010-08

SRC-2010-08

Method Blank

Lab Code:

K1006947-001

K1006947-001 DISS

K1006947-001D

K1006947-001S

K1006947-002

K1006947-002 DISS

K1006947-003

K1006947-003 DISS

K1006947-004

K1006947-004 DISS

K1006947-005

K1006947-005 DISS

K1006947-006

K1006947-006 DISS

K1006947-007

K1006947-007 DISS

K1006947-008

K1006947-008 DISS

K1006947-MB

Comments:

Approved By:



Date:



Metals**- 1 -****INORGANIC ANALYSIS DATA PACKAGE**

Client: Pacific EcoRisk Laboratories **Service Request:** K1006947
Project No.: ACOE - San Rafael Channel **Date Collected:** 07/06/10
Project Name: NA **Date Received:** 07/07/10
Matrix: WATER **Units:** ug/L
Basis: N/A

Sample Name: SRC-2010-01 **Lab Code:** K1006947-001

Analyte	Analysis Method	MRL	MDL	Dil. Factor	Date Extracted	Date Analyzed	Result	C	Q
Arsenic	6020	0.83	0.07	1.0	07/14/10	07/16/10	4.86		
Cadmium	6020	0.033	0.003	1.0	07/14/10	07/16/10	0.034		
Chromium	6020	0.33	0.05	1.0	07/14/10	07/16/10	2.00		
Copper	6020	0.167	0.007	1.0	07/14/10	07/16/10	3.430		
Lead	6020	0.033	0.015	1.0	07/14/10	07/16/10	1.620		
Nickel	6020	0.33	0.05	1.0	07/14/10	07/16/10	5.99		
Selenium	7742	1.0	0.2	2.0	07/14/10	07/16/10	0.3	J	
Zinc	6020	0.83	0.10	1.0	07/14/10	07/16/10	6.30		

% Solids: 0.0

Comments:

Metals**- 1 -****INORGANIC ANALYSIS DATA PACKAGE**

Client: Pacific EcoRisk Laboratories **Service Request:** K1006947
Project No.: ACOE - San Rafael Channel **Date Collected:** 07/06/10
Project Name: NA **Date Received:** 07/07/10
Matrix: WATER **Units:** ug/L
Basis: N/A

Sample Name: SRC-2010-01**Lab Code:** K1006947-001 DISS

Analyte	Analysis Method	MRL	MDL	Dil. Factor	Date Extracted	Date Analyzed	Result	C	Q
Arsenic	6020	0.50	0.04	1.0	07/14/10	07/16/10	2.83		
Cadmium	6020	0.020	0.002	1.0	07/14/10	07/16/10	0.014	J	
Chromium	6020	0.20	0.03	1.0	07/14/10	07/16/10	0.04	J	
Copper	6020	0.100	0.004	1.0	07/14/10	07/16/10	1.070		
Lead	6020	0.020	0.009	1.0	07/14/10	07/16/10	0.014	J	X
Nickel	6020	0.20	0.03	1.0	07/14/10	07/16/10	2.10		
Selenium	7742	1.0	0.2	2.0	07/14/10	07/16/10	0.2	U	
Zinc	6020	0.50	0.06	1.0	07/14/10	07/16/10	0.62		

% Solids: 0.0

Comments:

Metals**- 1 -****INORGANIC ANALYSIS DATA PACKAGE**

Client: Pacific EcoRisk Laboratories **Service Request:** K1006947
Project No.: ACOE - San Rafael Channel **Date Collected:** 07/06/10
Project Name: NA **Date Received:** 07/07/10
Matrix: WATER **Units:** ug/L
Basis: N/A

Sample Name: SRC-2010-02 **Lab Code:** K1006947-002

Analyte	Analysis Method	MRL	MDL	Dil. Factor	Date Extracted	Date Analyzed	Result	C	Q
Arsenic	6020	0.63	0.05	1.0	07/14/10	07/16/10	11.9		
Cadmium	6020	0.025	0.002	1.0	07/14/10	07/16/10	0.035		
Chromium	6020	0.25	0.04	1.0	07/14/10	07/16/10	3.10		
Copper	6020	0.125	0.005	1.0	07/14/10	07/16/10	5.640		
Lead	6020	0.025	0.011	1.0	07/14/10	07/16/10	2.840		
Nickel	6020	0.25	0.04	1.0	07/14/10	07/16/10	7.28		
Selenium	7742	1.0	0.2	2.0	07/14/10	07/16/10	0.3	J	
Zinc	6020	0.63	0.08	1.0	07/14/10	07/16/10	10.8		

% Solids: 0.0

Comments:

Metals**- 1 -****INORGANIC ANALYSIS DATA PACKAGE**

Client: Pacific EcoRisk Laboratories **Service Request:** K1006947
Project No.: ACOE - San Rafael Channel **Date Collected:** 07/06/10
Project Name: NA **Date Received:** 07/07/10
Matrix: WATER **Units:** ug/L
Basis: N/A

Sample Name: SRC-2010-02**Lab Code:** K1006947-002 DISS

Analyte	Analysis Method	MRL	MDL	Dil. Factor	Date Extracted	Date Analyzed	Result	C	Q
Arsenic	6020	0.67	0.05	1.0	07/14/10	07/16/10	7.24		
Cadmium	6020	0.027	0.003	1.0	07/14/10	07/16/10	0.018	J	
Chromium	6020	0.27	0.04	1.0	07/14/10	07/16/10	0.07	J	
Copper	6020	0.133	0.005	1.0	07/14/10	07/16/10	1.790		
Lead	6020	0.027	0.012	1.0	07/14/10	07/16/10	0.016	J	X
Nickel	6020	0.27	0.04	1.0	07/14/10	07/16/10	2.51		
Selenium	7742	1.0	0.2	2.0	07/14/10	07/16/10	0.2	U	
Zinc	6020	0.67	0.08	1.0	07/14/10	07/16/10	1.53		

% Solids: 0.0**Comments:**

Metals**- 1 -****INORGANIC ANALYSIS DATA PACKAGE**

Client: Pacific EcoRisk Laboratories **Service Request:** K1006947
Project No.: ACOE - San Rafael Channel **Date Collected:** 07/06/10
Project Name: NA **Date Received:** 07/07/10
Matrix: WATER **Units:** ug/L
Basis: N/A

Sample Name: SRC-2010-03 **Lab Code:** K1006947-003

Analyte	Analysis Method	MRL	MDL	Dil. Factor	Date Extracted	Date Analyzed	Result	C	Q
Arsenic	6020	0.56	0.04	1.0	07/14/10	07/16/10	7.09		
Cadmium	6020	0.022	0.002	1.0	07/14/10	07/16/10	0.010	J	
Chromium	6020	0.22	0.03	1.0	07/14/10	07/16/10	0.27		
Copper	6020	0.111	0.004	1.0	07/14/10	07/16/10	0.569		
Lead	6020	0.022	0.010	1.0	07/14/10	07/16/10	0.178		X
Nickel	6020	0.22	0.03	1.0	07/14/10	07/16/10	1.89		
Selenium	7742	1.0	0.2	2.0	07/14/10	07/16/10	0.2	U	
Zinc	6020	0.56	0.07	1.0	07/14/10	07/16/10	2.30		

% Solids: 0.0

Comments:

Metals**- 1 -****INORGANIC ANALYSIS DATA PACKAGE**

Client: Pacific EcoRisk Laboratories **Service Request:** K1006947
Project No.: ACOE - San Rafael Channel **Date Collected:** 07/06/10
Project Name: NA **Date Received:** 07/07/10
Matrix: WATER **Units:** ug/L
Basis: N/A

Sample Name: SRC-2010-03 **Lab Code:** K1006947-003 DISS

Analyte	Analysis Method	MRL	MDL	Dil. Factor	Date Extracted	Date Analyzed	Result	C	Q
Arsenic	6020	0.59	0.05	1.0	07/14/10	07/16/10	3.99		
Cadmium	6020	0.024	0.002	1.0	07/14/10	07/16/10	0.016	J	
Chromium	6020	0.24	0.04	1.0	07/14/10	07/16/10	0.06	J	
Copper	6020	0.118	0.005	1.0	07/14/10	07/16/10	1.790		
Lead	6020	0.024	0.011	1.0	07/14/10	07/16/10	0.023	J	X
Nickel	6020	0.24	0.04	1.0	07/14/10	07/16/10	2.29		
Selenium	7742	1.0	0.2	2.0	07/14/10	07/16/10	0.2	U	
Zinc	6020	0.59	0.07	1.0	07/14/10	07/16/10	1.09		

% Solids: 0.0

Comments:

Metals**- 1 -****INORGANIC ANALYSIS DATA PACKAGE**

Client: Pacific EcoRisk Laboratories **Service Request:** K1006947
Project No.: ACOE - San Rafael Channel **Date Collected:** 07/06/10
Project Name: NA **Date Received:** 07/07/10
Matrix: WATER **Units:** ug/L
Basis: N/A

Sample Name: SRC-2010-04 **Lab Code:** K1006947-004

Analyte	Analysis Method	MRL	MDL	Dil. Factor	Date Extracted	Date Analyzed	Result	C	Q
Arsenic	6020	1.00	0.08	1.0	07/14/10	07/16/10	5.11		
Cadmium	6020	0.040	0.004	1.0	07/14/10	07/16/10	0.027	J	
Chromium	6020	0.40	0.06	1.0	07/14/10	07/16/10	2.73		
Copper	6020	0.200	0.008	1.0	07/14/10	07/16/10	3.910		
Lead	6020	0.040	0.018	1.0	07/14/10	07/16/10	2.120		
Nickel	6020	0.40	0.06	1.0	07/14/10	07/16/10	7.44		
Selenium	7742	1.0	0.2	2.0	07/14/10	07/16/10	0.2	U	
Zinc	6020	1.00	0.12	1.0	07/14/10	07/16/10	7.32		

% Solids: 0.0

Comments:

Metals**- 1 -****INORGANIC ANALYSIS DATA PACKAGE****Client:** Pacific EcoRisk Laboratories**Service Request:** K1006947**Project No.:** ACOE - San Rafael Channel**Date Collected:** 07/06/10**Project Name:** NA**Date Received:** 07/07/10**Matrix:** WATER**Units:** ug/L**Basis:** N/A**Sample Name:** SRC-2010-04**Lab Code:** K1006947-004 DISS

Analyte	Analysis Method	MRL	MDL	Dil. Factor	Date Extracted	Date Analyzed	Result	C	Q
Arsenic	6020	1.00	0.08	1.0	07/14/10	07/16/10	3.22		
Cadmium	6020	0.040	0.004	1.0	07/14/10	07/16/10	0.014	J	
Chromium	6020	0.40	0.06	1.0	07/14/10	07/16/10	0.07	J	
Copper	6020	0.200	0.008	1.0	07/14/10	07/16/10	1.450		
Lead	6020	0.040	0.018	1.0	07/14/10	07/16/10	0.019	J	X
Nickel	6020	0.40	0.06	1.0	07/14/10	07/16/10	2.38		
Selenium	7742	1.0	0.2	2.0	07/14/10	07/16/10	0.2	U	
Zinc	6020	1.00	0.12	1.0	07/14/10	07/16/10	0.64	J	

% Solids: 0.0**Comments:**

Metals**- 1 -****INORGANIC ANALYSIS DATA PACKAGE**

Client: Pacific EcoRisk Laboratories **Service Request:** K1006947
Project No.: ACOE - San Rafael Channel **Date Collected:** 07/06/10
Project Name: NA **Date Received:** 07/07/10
Matrix: WATER **Units:** ug/L
Basis: N/A

Sample Name: SRC-2010-05 **Lab Code:** K1006947-005

Analyte	Analysis Method	MRL	MDL	Dil. Factor	Date Extracted	Date Analyzed	Result	C	Q
Arsenic	6020	0.83	0.07	1.0	07/14/10	07/16/10	14.9		
Cadmium	6020	0.033	0.003	1.0	07/14/10	07/16/10	0.017	J	
Chromium	6020	0.33	0.05	1.0	07/14/10	07/16/10	1.33		
Copper	6020	0.167	0.007	1.0	07/14/10	07/16/10	2.250		
Lead	6020	0.033	0.015	1.0	07/14/10	07/16/10	1.100		
Nickel	6020	0.33	0.05	1.0	07/14/10	07/16/10	3.25		
Selenium	7742	1.0	0.2	2.0	07/14/10	07/16/10	0.2	U	
Zinc	6020	0.83	0.10	1.0	07/14/10	07/16/10	4.24		

% Solids: 0.0

Comments:

Metals**- 1 -****INORGANIC ANALYSIS DATA PACKAGE**

Client: Pacific EcoRisk Laboratories **Service Request:** K1006947
Project No.: ACOE - San Rafael Channel **Date Collected:** 07/06/10
Project Name: NA **Date Received:** 07/07/10
Matrix: WATER **Units:** ug/L
Basis: N/A

Sample Name: SRC-2010-05 **Lab Code:** K1006947-005 DISS

Analyte	Analysis Method	MRL	MDL	Dil. Factor	Date Extracted	Date Analyzed	Result	C	Q
Arsenic	6020	1.00	0.08	1.0	07/14/10	07/16/10	13.4		
Cadmium	6020	0.040	0.004	1.0	07/14/10	07/16/10	0.011	J	
Chromium	6020	0.40	0.06	1.0	07/14/10	07/16/10	0.09	J	
Copper	6020	0.200	0.008	1.0	07/14/10	07/16/10	1.040		
Lead	6020	0.040	0.018	1.0	07/14/10	07/16/10	0.018	U	X
Nickel	6020	0.40	0.06	1.0	07/14/10	07/16/10	1.45		
Selenium	7742	1.0	0.2	2.0	07/14/10	07/16/10	0.2	U	
Zinc	6020	1.00	0.12	1.0	07/14/10	07/16/10	0.58	J	

% Solids: 0.0

Comments:

Metals**- 1 -****INORGANIC ANALYSIS DATA PACKAGE**

Client: Pacific EcoRisk Laboratories **Service Request:** K1006947
Project No.: ACOE - San Rafael Channel **Date Collected:** 07/06/10
Project Name: NA **Date Received:** 07/07/10
Matrix: WATER **Units:** ug/L
Basis: N/A

Sample Name: SRC-2010-06 **Lab Code:** K1006947-006

Analyte	Analysis Method	MRL	MDL	Dil. Factor	Date Extracted	Date Analyzed	Result	C	Q
Arsenic	6020	0.83	0.07	1.0	07/14/10	07/16/10	18.6		
Cadmium	6020	0.033	0.003	1.0	07/14/10	07/16/10	0.028	J	
Chromium	6020	0.33	0.05	1.0	07/14/10	07/16/10	2.96		
Copper	6020	0.167	0.007	1.0	07/14/10	07/16/10	6.830		
Lead	6020	0.033	0.015	1.0	07/14/10	07/16/10	3.510		
Nickel	6020	0.33	0.05	1.0	07/14/10	07/16/10	5.93		
Selenium	7742	1.0	0.2	2.0	07/14/10	07/16/10	0.2	U	
Zinc	6020	0.83	0.10	1.0	07/14/10	07/16/10	9.39		

% Solids: 0.0

Comments:

Metals**- 1 -****INORGANIC ANALYSIS DATA PACKAGE**

Client: Pacific EcoRisk Laboratories **Service Request:** K1006947
Project No.: ACOE - San Rafael Channel **Date Collected:** 07/06/10
Project Name: NA **Date Received:** 07/07/10
Matrix: WATER **Units:** ug/L
Basis: N/A

Sample Name: SRC-2010-06**Lab Code:** K1006947-006 DISS

Analyte	Analysis Method	MRL	MDL	Dil. Factor	Date Extracted	Date Analyzed	Result	C	Q
Arsenic	6020	1.00	0.08	1.0	07/14/10	07/16/10	15.3		
Cadmium	6020	0.040	0.004	1.0	07/14/10	07/16/10	0.010	J	
Chromium	6020	0.40	0.06	1.0	07/14/10	07/16/10	0.08	J	
Copper	6020	0.200	0.008	1.0	07/14/10	07/16/10	1.400		
Lead	6020	0.040	0.018	1.0	07/14/10	07/16/10	0.081		X
Nickel	6020	0.40	0.06	1.0	07/14/10	07/16/10	1.14		
Selenium	7742	1.0	0.2	2.0	07/14/10	07/16/10	0.2	U	
Zinc	6020	1.00	0.12	1.0	07/14/10	07/16/10	0.56	J	

% Solids: 0.0

Comments:

Metals**- 1 -****INORGANIC ANALYSIS DATA PACKAGE**

Client: Pacific EcoRisk Laboratories **Service Request:** K1006947
Project No.: ACOE - San Rafael Channel **Date Collected:** 07/06/10
Project Name: NA **Date Received:** 07/07/10
Matrix: WATER **Units:** ug/L
Basis: N/A

Sample Name: SRC-2010-07 **Lab Code:** K1006947-007

Analyte	Analysis Method	MRL	MDL	Dil. Factor	Date Extracted	Date Analyzed	Result	C	Q
Arsenic	6020	0.71	0.06	1.0	07/14/10	07/16/10	9.23		
Cadmium	6020	0.029	0.003	1.0	07/14/10	07/16/10	0.061		
Chromium	6020	0.29	0.04	1.0	07/14/10	07/16/10	4.35		
Copper	6020	0.143	0.006	1.0	07/14/10	07/16/10	12.1		
Lead	6020	0.029	0.013	1.0	07/14/10	07/16/10	8.590		
Nickel	6020	0.29	0.04	1.0	07/14/10	07/16/10	9.75		
Selenium	7742	1.0	0.2	2.0	07/14/10	07/16/10	0.2	U	
Zinc	6020	0.71	0.09	1.0	07/14/10	07/16/10	21.0		

% Solids: 0.0

Comments:

Metals**- 1 -****INORGANIC ANALYSIS DATA PACKAGE**

Client: Pacific EcoRisk Laboratories **Service Request:** K1006947
Project No.: ACOE - San Rafael Channel **Date Collected:** 07/06/10
Project Name: NA **Date Received:** 07/07/10
Matrix: WATER **Units:** ug/L
Basis: N/A

Sample Name: SRC-2010-07**Lab Code:** K1006947-007 DISS

Analyte	Analysis Method	MRL	MDL	Dil. Factor	Date Extracted	Date Analyzed	Result	C	Q
Arsenic	6020	1.00	0.08	1.0	07/14/10	07/16/10	8.77		
Cadmium	6020	0.040	0.004	1.0	07/14/10	07/16/10	0.029	J	
Chromium	6020	0.40	0.06	1.0	07/14/10	07/16/10	0.09	J	
Copper	6020	0.200	0.008	1.0	07/14/10	07/16/10	2.880		
Lead	6020	0.040	0.018	1.0	07/14/10	07/16/10	0.068		X
Nickel	6020	0.40	0.06	1.0	07/14/10	07/16/10	1.86		
Selenium	7742	1.0	0.2	2.0	07/14/10	07/16/10	0.2	U	
Zinc	6020	1.00	0.12	1.0	07/14/10	07/16/10	3.94		

% Solids: 0.0

Comments:

Metals**- 1 -****INORGANIC ANALYSIS DATA PACKAGE**

Client: Pacific EcoRisk Laboratories **Service Request:** K1006947
Project No.: ACOE - San Rafael Channel **Date Collected:** 07/06/10
Project Name: NA **Date Received:** 07/07/10
Matrix: WATER **Units:** ug/L
Basis: N/A

Sample Name: SRC-2010-08 **Lab Code:** K1006947-008

Analyte	Analysis Method	MRL	MDL	Dil. Factor	Date Extracted	Date Analyzed	Result	C	Q
Arsenic	6020	0.56	0.04	1.0	07/14/10	07/16/10	3.19		
Cadmium	6020	0.022	0.002	1.0	07/14/10	07/16/10	0.010	J	
Chromium	6020	0.22	0.03	1.0	07/14/10	07/16/10	0.21	J	
Copper	6020	0.111	0.004	1.0	07/14/10	07/16/10	0.602		
Lead	6020	0.022	0.010	1.0	07/14/10	07/16/10	0.640		X
Nickel	6020	0.22	0.03	1.0	07/14/10	07/16/10	2.53		
Selenium	7742	1.0	0.2	2.0	07/14/10	07/16/10	0.2	U	
Zinc	6020	0.56	0.07	1.0	07/14/10	07/16/10	1.31		

% Solids: 0.0

Comments:

Metals**- 1 -****INORGANIC ANALYSIS DATA PACKAGE**

Client: Pacific EcoRisk Laboratories **Service Request:** K1006947
Project No.: ACOE - San Rafael Channel **Date Collected:** 07/06/10
Project Name: NA **Date Received:** 07/07/10
Matrix: WATER **Units:** ug/L
Basis: N/A

Sample Name: SRC-2010-08 **Lab Code:** K1006947-008 DISS

Analyte	Analysis Method	MRL	MDL	Dil. Factor	Date Extracted	Date Analyzed	Result	C	Q
Arsenic	6020	0.56	0.04	1.0	07/14/10	07/16/10	2.07		
Cadmium	6020	0.022	0.002	1.0	07/14/10	07/16/10	0.011	J	
Chromium	6020	0.22	0.03	1.0	07/14/10	07/16/10	0.05	J	
Copper	6020	0.111	0.004	1.0	07/14/10	07/16/10	0.562		
Lead	6020	0.022	0.010	1.0	07/14/10	07/16/10	0.036		X
Nickel	6020	0.22	0.03	1.0	07/14/10	07/16/10	2.10		
Selenium	7742	1.0	0.2	2.0	07/14/10	07/16/10	0.2	U	
Zinc	6020	0.56	0.07	1.0	07/14/10	07/16/10	1.31		

% Solids: 0.0

Comments:

Metals**- 1 -****INORGANIC ANALYSIS DATA PACKAGE**

Client: Pacific EcoRisk Laboratories **Service Request:** K1006947
Project No.: ACOE - San Rafael Channel **Date Collected:**
Project Name: NA **Date Received:**
Matrix: WATER **Units:** ug/L
Basis: N/A

Sample Name: Method Blank **Lab Code:** K1006947-MB

Analyte	Analysis Method	MRL	MDL	Dil. Factor	Date Extracted	Date Analyzed	Result	C	Q
Arsenic	6020	0.50	0.04	1.0	07/14/10	07/16/10	0.04	U	
Cadmium	6020	0.020	0.002	1.0	07/14/10	07/16/10	0.005	J	
Chromium	6020	0.20	0.03	1.0	07/14/10	07/16/10	0.03	U	
Copper	6020	0.100	0.004	1.0	07/14/10	07/16/10	0.007	J	
Lead	6020	0.020	0.009	1.0	07/14/10	07/16/10	0.041		
Nickel	6020	0.20	0.03	1.0	07/14/10	07/16/10	0.03	U	
Selenium	7742	1.0	0.2	2.0	07/14/10	07/16/10	0.2	U	
Zinc	6020	0.50	0.06	1.0	07/14/10	07/16/10	0.06	U	

% Solids: 0.0

Comments:

Metals

- 5A -

SPIKE SAMPLE RECOVERY

Client: Pacific EcoRisk Laboratories Service Request: K1006947
Project No.: ACOE - San Rafael Channel Units: UG/L
Project Name: NA Basis: N/A
Matrix: WATER % Solids: 0.0

Sample Name: SRC-2010-01S

Lab Code: K1006947-001S

Analyte	Control Limit %R	Spike Result	C	Sample Result	C	Spike Added	%R	Q	Method
Arsenic	50 - 147	6.82		4.86		3.33	58.9		6020
Cadmium	65 - 114	2.960		0.034		3.33	87.9		6020
Chromium	50 - 130	5.06		2.00		3.33	91.9		6020
Copper	50 - 120	5.880		3.430		3.33	73.6		6020
Lead	55 - 118	4.690		1.620		3.33	92.2		6020
Nickel	60 - 126	9.38		5.99		3.33	101.8		6020
Selenium	67 - 128	14.1		0.3	J	16.00	86.2		7742
Zinc	50 - 133	9.36		6.30		3.33	91.9		6020

An empty field in the Control Limit column indicates the control limit is not applicable

Metals

- 6 -

DUPLICATES

Client: Pacific EcoRisk Laboratories Service Request: K1006947
Project No.: ACOE - San Rafael Channel Units: UG/L
Project Name: NA Basis: N/A
Matrix: WATER % Solids: 0.0

Sample Name: SRC-2010-01D

Lab Code: K1006947-001D

Analyte	Control Limit	Sample (S)	C	Duplicate (D)	C	RPD	Q	Method
Arsenic	20	4.86		4.75		2.3		6020
Cadmium		0.034		0.033	J	3.0		6020
Chromium	20	2.00		1.95		2.5		6020
Copper	20	3.430		3.430		0.0		6020
Lead	20	1.620		1.640		1.2		6020
Nickel	20	5.99		6.08		1.5		6020
Selenium		0.3	J	0.3	J	0.0		7742
Zinc	20	6.30		6.41		1.7		6020

An empty field in the Control Limit column indicates the control limit is not applicable.

Metals

- 7 -

LABORATORY CONTROL SAMPLE

Client: Pacific EcoRisk Laboratories

Service Request: K1006947

Project No.: ACOE - San Rafael Channel

Project Name: NA

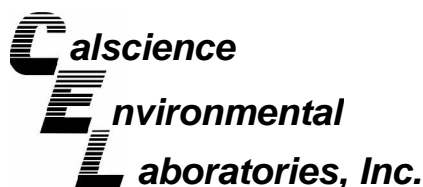
Aqueous LCS Source: CAS MIXED

Solid LCS Source:

Analyte	Aqueous: ug/L			Solid: mg/kg					
	True	Found	%R	True	Found	C	Limits	%R	
Arsenic	2	1.99	99.5						
Cadmium	2	1.960	98.0						
Chromium	2	1.96	98.0						
Copper	2	1.950	97.5						
Lead	2	1.970	98.5						
Nickel	2	2.10	105.0						
Selenium	10	9.1	91.0						
Zinc	2	2.01	100.5						

Appendix C

Analytical Chemistry Laboratory Data Report Submitted by CalScience Environmental Laboratories, Inc.



Supplemental Report 2

July 29, 2010

Additional requested analytes have been added to the original report.

Jeff Cotsifas
Pacific Ecorisk
2250 Cordelia Road
Fairfield, CA 94534-1912

Subject: **CalScience Work Order No.: 10-07-1713**

Client Reference: ACOE (San Rafael Channel)

Dear Client:

Enclosed is an analytical report for the above-referenced project. The samples included in this report were received 7/23/2010 and analyzed in accordance with the attached chain-of-custody.

CalScience Environmental Laboratories certifies that the test results provided in this report meet all NELAC requirements for parameters for which accreditation is required or available. Any exceptions to NELAC requirements are noted in the case narrative. The original report of subcontracted analysis, if any, is provided herein, and follows the standard CalScience data package. The results in this analytical report are limited to the samples tested and any reproduction thereof must be made in its entirety.

If you have any questions regarding this report, please do not hesitate to contact the undersigned.

Sincerely,

A handwritten signature in black ink, appearing to read 'Danielle Gonsman'.

CalScience Environmental
Laboratories, Inc.
Danielle Gonsman
Project Manager

CASE NARRATIVE

Calscience Work Order No.: 10-07-1713
Project Name: ACOE (San Rafael Channel)

Provided below is a narrative of our analytical effort, including any unique features or anomalies encountered as part of the analysis of the marine sediment samples.

Sample Condition on Receipt

Four sediment samples, housed 8oz glass containers, were received for this project on July 23, 2010. The samples were transferred to the laboratory in an ice-chest with wet ice, following strict chain-of-custody (COC) procedures. The temperature of the samples upon receipt at the laboratory was 1.1°C. All samples were logged into the Laboratory Information Management System (LIMS), given laboratory identification numbers, and then stored under refrigeration pending sediment chemistry testing.

The glass container for sample SRC-2010-8-4 was received broken, but the sample was transferred to a new glass container.

Tests Performed

Trace Metals by EPA 6020
Chlorinated Pesticides by EPA 8081A
PCB Aroclors by EPA 8082
PAHs by EPA 8270C SIM
Organotins by Krone et. al.
Total Solids by SM 2540 B
TOC by EPA 9060A

Data Summary

All sample concentrations and reporting limits were dry weight corrected.

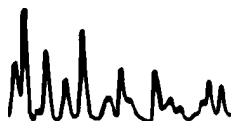
All samples were homogenized prior to preparation/analysis.

Holding times

According to the client, as referenced on the COC, the samples were stored frozen prior to 6/24/10 and remained in that condition until received by Calscience on 7/23/10. In accordance with the project SAP, the holding time is extended beyond the EPA recommended extraction/analysis time period, and therefore not in violation of the holding time rules.

Calibration

Frequency and control criteria for initial and continuing calibration verifications were met.



Reporting Limits

The Method Detection Limits were met. All sample results were evaluated to the MDL, and where applicable, "J" flags were reported.

Blanks

Concentrations of target analytes in the method blank were found to be below reporting limits for all testing.

Laboratory Control Samples

A Laboratory Control Sample (LCS) analysis was performed for each test and all parameters were within the specified control limits.

Matrix Spikes

Matrix spike analyses were performed at the required frequencies, and all parameters were within control limits for each method with the following exceptions.

The MS and/or MSD recoveries for Chromium, Copper, Lead and Nickel by EPA 6020 were out of the acceptance range due to matrix interference. However, since the associated PDS/PDSD and LCS/LCSD recoveries were in control, the data are released with no further action.

The matrix spike recovery for the Organotin, Tributyltin, was outside the established control limits. Yet the results are released with no further clarification since the matrix spike duplicate and corresponding LCS/LCSD recoveries were in control.

Surrogates

Surrogate recoveries for all applicable tests and samples were within the established control limits.

Acronyms

LCS/LCSD- Laboratory Control Sample/Laboratory Control Sample Duplicate
PDS/PDSD- Post Digestion Spike/Post Digestion Spike Duplicate
MS/MSD- Matrix Spike/Matrix Spike Duplicate
RPD- Relative Percent Difference



Analytical Report



Pacific Ecorisk
2250 Cordelia Road
Fairfield, CA 94534-1912

Date Received: 07/23/10
Work Order No: 10-07-1713
Preparation: N/A
Method: EPA 9060A

Project: ACOE (San Rafael Channel)

Page 1 of 1

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
SRC-2010-8-1	10-07-1713-1-A	06/10/10 11:55	Solid	TOC 5	N/A	07/28/10 15:30	A0728TOCL1

-Results are reported on a dry weight basis.

Parameter	Result	RL	DF	Qual	Units
Carbon, Total Organic	2.7	0.11	1		%

SRC-2010-8-2	10-07-1713-2-A	06/10/10 12:45	Solid	TOC 5	N/A	07/28/10 15:30	A0728TOCL1
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-Results are reported on a dry weight basis.

Parameter	Result	RL	DF	Qual	Units
Carbon, Total Organic	9.5	0.12	1		%

SRC-2010-8-3	10-07-1713-3-A	06/10/10 13:30	Solid	TOC 5	N/A	07/28/10 15:30	A0728TOCL1
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-Results are reported on a dry weight basis.

Parameter	Result	RL	DF	Qual	Units
Carbon, Total Organic	7.6	0.11	1		%

SRC-2010-8-4	10-07-1713-4-A	06/10/10 11:40	Solid	TOC 5	N/A	07/28/10 15:30	A0728TOCL1
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-Results are reported on a dry weight basis.

Parameter	Result	RL	DF	Qual	Units
Carbon, Total Organic	3.8	0.083	1		%

Method Blank	099-06-013-510	N/A	Solid	TOC 5	N/A	07/28/10 15:30	A0728TOCL1
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Parameter	Result	RL	DF	Qual	Units
Carbon, Total Organic	ND	0.050	1		%

RL - Reporting Limit , DF - Dilution Factor , Qual - Qualifiers

Analytical Report



Pacific Ecorisk
2250 Cordelia Road
Fairfield, CA 94534-1912

Date Received: 07/23/10
Work Order No: 10-07-1713
Preparation: N/A
Method: SM 2540 B

Project: ACOE (San Rafael Channel)

Page 1 of 1

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
SRC-2010-8-1	10-07-1713-1-A	06/10/10 11:55	Solid	N/A	07/24/10	07/24/10 16:00	A0724TSB1

Parameter	Result	RL	DF	Qual	Units
Solids, Total	47.4	0.100	1		%

SRC-2010-8-2	10-07-1713-2-A	06/10/10 12:45	Solid	N/A	07/24/10	07/24/10 16:00	A0724TSB1
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Parameter	Result	RL	DF	Qual	Units
Solids, Total	42.6	0.100	1		%

SRC-2010-8-3	10-07-1713-3-A	06/10/10 13:30	Solid	N/A	07/24/10	07/24/10 16:00	A0724TSB1
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Parameter	Result	RL	DF	Qual	Units
Solids, Total	43.9	0.100	1		%

SRC-2010-8-4	10-07-1713-4-A	06/10/10 11:40	Solid	N/A	07/24/10	07/24/10 16:00	A0724TSB1
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Parameter	Result	RL	DF	Qual	Units
Solids, Total	60.3	0.100	1		%

Method Blank	099-05-019-1,442	N/A	Solid	N/A	07/24/10	07/24/10 16:00	A0724TSB1
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Parameter	Result	RL	DF	Qual	Units
Solids, Total	ND	0.100	1		%

RL - Reporting Limit , DF - Dilution Factor , Qual - Qualifiers

Analytical Report



Pacific Ecorisk
 2250 Cordelia Road
 Fairfield, CA 94534-1912

Date Received: 07/23/10
 Work Order No: 10-07-1713
 Preparation: EPA 3545
 Method: Organotins by Krone et al.
 Units: ug/kg

Project: ACOE (San Rafael Channel)

Page 1 of 2

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
SRC-2010-8-1	10-07-1713-1-A	06/10/10 11:55	Solid	GC/MS Y	07/23/10	07/24/10 12:19	100723L18

Comment(s): -Results were evaluated to the MDL, concentrations >= to the MDL but < RL, if found, are qualified with a "J" flag.

-Results are reported on a dry weight basis.

Parameter	Result	RL	MDL	DF	Qual	Parameter	Result	RL	MDL	DF	Qual
Dibutyltin	6.1	6.3	1.3	1	J	Tetrabutyltin	ND	6.3	0.75	1	
Monobutyltin	ND	6.3	2.1	1		Tributyltin	ND	6.3	0.71	1	

Surrogates:	REC (%)	Control Limits	Qual
Triphenyltin	102	50-130	

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
SRC-2010-8-2	10-07-1713-2-A	06/10/10 12:45	Solid	GC/MS Y	07/23/10	07/24/10 12:53	100723L18

Comment(s): -Results were evaluated to the MDL, concentrations >= to the MDL but < RL, if found, are qualified with a "J" flag.

-Results are reported on a dry weight basis.

Parameter	Result	RL	MDL	DF	Qual	Parameter	Result	RL	MDL	DF	Qual
Dibutyltin	16	7.0	1.4	1		Tetrabutyltin	ND	7.0	0.84	1	
Monobutyltin	ND	7.0	2.3	1		Tributyltin	7.2	7.0	0.78	1	

Surrogates:	REC (%)	Control Limits	Qual
Triphenyltin	105	50-130	

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
SRC-2010-8-3	10-07-1713-3-A	06/10/10 13:30	Solid	GC/MS Y	07/23/10	07/24/10 13:27	100723L18

Comment(s): -Results were evaluated to the MDL, concentrations >= to the MDL but < RL, if found, are qualified with a "J" flag.

-Results are reported on a dry weight basis.

Parameter	Result	RL	MDL	DF	Qual	Parameter	Result	RL	MDL	DF	Qual
Dibutyltin	67	6.8	1.4	1		Tetrabutyltin	ND	6.8	0.82	1	
Monobutyltin	ND	6.8	2.2	1		Tributyltin	23	6.8	0.76	1	

Surrogates:	REC (%)	Control Limits	Qual
Triphenyltin	105	50-130	

RL - Reporting Limit , DF - Dilution Factor , Qual - Qualifiers

Analytical Report



Pacific Ecorisk
 2250 Cordelia Road
 Fairfield, CA 94534-1912

Date Received: 07/23/10
 Work Order No: 10-07-1713
 Preparation: EPA 3545
 Method: Organotins by Krone et al.
 Units: ug/kg

Project: ACOE (San Rafael Channel)

Page 2 of 2

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
SRC-2010-8-4	10-07-1713-4-A	06/10/10 11:40	Solid	GC/MS Y	07/23/10	07/24/10 14:00	100723L18

Comment(s): -Results were evaluated to the MDL, concentrations >= to the MDL but < RL, if found, are qualified with a "J" flag.

-Results are reported on a dry weight basis.

Parameter	Result	RL	MDL	DF	Qual	Parameter	Result	RL	MDL	DF	Qual
Dibutyltin	32	5.0	0.99	1		Tetrabutyltin	ND	5.0	0.59	1	
Monobutyltin	ND	5.0	1.6	1		Tributyltin	18	5.0	0.55	1	
Surrogates:	REC (%)	Control Limits	Qual								
Triphenyltin	104	50-130									

Method Blank	099-07-016-765	N/A	Solid	GC/MS Y	07/23/10	07/24/10 11:46	100723L18
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Comment(s): -Results were evaluated to the MDL, concentrations >= to the MDL but < RL, if found, are qualified with a "J" flag.

Parameter	Result	RL	MDL	DF	Qual	Parameter	Result	RL	MDL	DF	Qual
Dibutyltin	ND	3.0	0.60	1		Tetrabutyltin	ND	3.0	0.36	1	
Monobutyltin	ND	3.0	0.97	1		Tributyltin	ND	3.0	0.33	1	
Surrogates:	REC (%)	Control Limits	Qual								
Triphenyltin	114	50-130									



Analytical Report



Pacific Ecorisk
 2250 Cordelia Road
 Fairfield, CA 94534-1912

Date Received: 07/23/10
 Work Order No: 10-07-1713
 Preparation: EPA 3545
 Method: EPA 8270C SIM PAHs
 Units: ug/kg

Project: ACOE (San Rafael Channel)

Page 1 of 3

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
SRC-2010-8-1	10-07-1713-1-A	06/10/10 11:55	Solid	GC/MS BBB	07/23/10	07/24/10 21:00	100723L14

Comment(s): -Results were evaluated to the MDL, concentrations >= to the MDL but < RL, if found, are qualified with a "J" flag.

-Results are reported on a dry weight basis.

Parameter	Result	RL	MDL	DF	Qual	Parameter	Result	RL	MDL	DF	Qual
Acenaphthene	13	21	3.2	1	J	Chrysene	80	21	3.2	1	
Acenaphthylene	15	21	3.1	1	J	Dibenz (a,h) Anthracene	13	21	2.2	1	J
Anthracene	16	21	2.8	1	J	Fluoranthene	150	21	3.3	1	
Benzo (a) Anthracene	41	21	4.3	1		Fluorene	17	21	2.9	1	J
Benzo (a) Pyrene	110	21	2.7	1		Indeno (1,2,3-c,d) Pyrene	86	21	2.8	1	
Benzo (b) Fluoranthene	84	21	3.3	1		Naphthalene	30	21	3.5	1	
Benzo (g,h,i) Perylene	140	21	2.7	1		Phenanthrene	41	21	4.5	1	
Benzo (k) Fluoranthene	67	21	4.1	1		Pyrene	320	21	3.5	1	

Surrogates:	REC (%)	Control Limits	Qual
2-Fluorobiphenyl	52	14-146	
p-Terphenyl-d14	65	34-148	

Surrogates:	REC (%)	Control Limits	Qual
Nitrobenzene-d5	83	18-162	

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
SRC-2010-8-2	10-07-1713-2-A	06/10/10 12:45	Solid	GC/MS BBB	07/23/10	07/24/10 21:26	100723L14

Comment(s): -Results were evaluated to the MDL, concentrations >= to the MDL but < RL, if found, are qualified with a "J" flag.

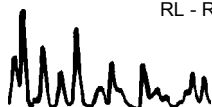
-Results are reported on a dry weight basis.

Parameter	Result	RL	MDL	DF	Qual	Parameter	Result	RL	MDL	DF	Qual
Acenaphthene	69	23	3.5	1		Chrysene	170	23	3.5	1	
Acenaphthylene	65	23	3.4	1		Dibenz (a,h) Anthracene	28	23	2.5	1	
Anthracene	39	23	3.1	1		Fluoranthene	290	23	3.7	1	
Benzo (a) Anthracene	110	23	4.7	1		Fluorene	130	23	3.3	1	
Benzo (a) Pyrene	160	23	3.0	1		Indeno (1,2,3-c,d) Pyrene	100	23	3.1	1	
Benzo (b) Fluoranthene	150	23	3.6	1		Naphthalene	36	23	3.9	1	
Benzo (g,h,i) Perylene	170	23	3.1	1		Phenanthrene	130	23	5.1	1	
Benzo (k) Fluoranthene	130	23	4.5	1		Pyrene	530	23	3.8	1	

Surrogates:	REC (%)	Control Limits	Qual
2-Fluorobiphenyl	65	14-146	
p-Terphenyl-d14	69	34-148	

Surrogates:	REC (%)	Control Limits	Qual
Nitrobenzene-d5	55	18-162	

RL - Reporting Limit , DF - Dilution Factor , Qual - Qualifiers



Analytical Report



Pacific Ecorisk
2250 Cordelia Road
Fairfield, CA 94534-1912

Date Received: 07/23/10
Work Order No: 10-07-1713
Preparation: EPA 3545
Method: EPA 8270C SIM PAHs
Units: ug/kg

Project: ACOE (San Rafael Channel)

Page 2 of 3

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
SRC-2010-8-3	10-07-1713-3-A	06/10/10 13:30	Solid	GC/MS BBB	07/23/10	07/24/10 21:51	100723L14

Comment(s): -Results were evaluated to the MDL, concentrations >= to the MDL but < RL, if found, are qualified with a "J" flag.

-Results are reported on a dry weight basis.

Parameter	Result	RL	MDL	DF	Qual	Parameter	Result	RL	MDL	DF	Qual
Acenaphthene	18	23	3.4	1	J	Chrysene	210	23	3.4	1	
Acenaphthylene	13	23	3.3	1	J	Dibenz (a,h) Anthracene	26	23	2.4	1	
Anthracene	45	23	3.0	1		Fluoranthene	370	23	3.6	1	
Benzo (a) Anthracene	140	23	4.6	1		Fluorene	42	23	3.2	1	
Benzo (a) Pyrene	190	23	2.9	1		Indeno (1,2,3-c,d) Pyrene	120	23	3.0	1	
Benzo (b) Fluoranthene	190	23	3.5	1		Naphthalene	22	23	3.8	1	J
Benzo (g,h,i) Perylene	190	23	3.0	1		Phenanthrene	150	23	4.9	1	
Benzo (k) Fluoranthene	170	23	4.4	1		Pyrene	400	23	3.7	1	

Surrogates:	REC (%)	Control Limits	Qual
2-Fluorobiphenyl	64	14-146	
p-Terphenyl-d14	54	34-148	

Surrogates:	REC (%)	Control Limits	Qual
Nitrobenzene-d5	66	18-162	

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
SRC-2010-8-4	10-07-1713-4-A	06/10/10 11:40	Solid	GC/MS BBB	07/23/10	07/25/10 17:02	100723L14

Comment(s): -Results were evaluated to the MDL, concentrations >= to the MDL but < RL, if found, are qualified with a "J" flag.


-Results are reported on a dry weight basis.

Parameter	Result	RL	MDL	DF	Qual	Parameter	Result	RL	MDL	DF	Qual
Acenaphthene	29	17	2.5	1		Chrysene	350	17	2.5	1	
Acenaphthylene	9.6	17	2.4	1	J	Dibenz (a,h) Anthracene	30	17	1.8	1	
Anthracene	74	17	2.2	1		Fluoranthene	570	17	2.6	1	
Benzo (a) Anthracene	290	17	3.4	1		Fluorene	32	17	2.3	1	
Benzo (a) Pyrene	290	17	2.1	1		Indeno (1,2,3-c,d) Pyrene	140	17	2.2	1	
Benzo (b) Fluoranthene	210	17	2.6	1		Naphthalene	19	17	2.7	1	
Benzo (g,h,i) Perylene	210	17	2.2	1		Phenanthrene	410	17	3.6	1	
Benzo (k) Fluoranthene	210	17	3.2	1		Pyrene	820	17	2.7	1	

Surrogates:	REC (%)	Control Limits	Qual
2-Fluorobiphenyl	28	14-146	
p-Terphenyl-d14	35	34-148	

Surrogates:	REC (%)	Control Limits	Qual
Nitrobenzene-d5	40	18-162	

RL - Reporting Limit , DF - Dilution Factor , Qual - Qualifiers



Analytical Report



Pacific Ecorisk
 2250 Cordelia Road
 Fairfield, CA 94534-1912

Date Received: 07/23/10
 Work Order No: 10-07-1713
 Preparation: EPA 3545
 Method: EPA 8270C SIM PAHs
 Units: ug/kg

Project: ACOE (San Rafael Channel)

Page 3 of 3

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
Method Blank	099-12-471-55	N/A	Solid	GC/MS BBB	07/23/10	07/24/10 16:42	100723L14

Comment(s): -Results were evaluated to the MDL, concentrations >= to the MDL but < RL, if found, are qualified with a "J" flag.

Parameter	Result	RL	MDL	DF	Qual	Parameter	Result	RL	MDL	DF	Qual
Acenaphthene	ND	10	1.5	1		Chrysene	ND	10	1.5	1	
Acenaphthylene	ND	10	1.5	1		Dibenz (a,h) Anthracene	ND	10	1.1	1	
Anthracene	ND	10	1.3	1		Fluoranthene	ND	10	1.6	1	
Benzo (a) Anthracene	ND	10	2.0	1		Fluorene	ND	10	1.4	1	
Benzo (a) Pyrene	ND	10	1.3	1		Indeno (1,2,3-c,d) Pyrene	ND	10	1.3	1	
Benzo (b) Fluoranthene	ND	10	1.5	1		Naphthalene	ND	10	1.7	1	
Benzo (g,h,i) Perylene	ND	10	1.3	1		Phenanthrene	ND	10	2.2	1	
Benzo (k) Fluoranthene	ND	10	1.9	1		Pyrene	ND	10	1.6	1	

Surrogates:	REC (%)	Control Limits	Qual	Surrogates:	REC (%)	Control Limits	Qual
2-Fluorobiphenyl	118	14-146		Nitrobenzene-d5	127	18-162	
p-Terphenyl-d14	115	34-148					

RL - Reporting Limit , DF - Dilution Factor , Qual - Qualifiers

Analytical Report



Pacific Ecorisk
2250 Cordelia Road
Fairfield, CA 94534-1912

Date Received: 07/23/10
Work Order No: 10-07-1713
Preparation: EPA 3545
Method: EPA 8082
Units: ug/kg

Project: ACOE (San Rafael Channel)

Page 1 of 2

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
SRC-2010-8-1	10-07-1713-1-A	06/10/10 11:55	Solid	GC 58	07/23/10	07/24/10 15:31	100723L13

Comment(s): -Results are reported on a dry weight basis.

-Results were evaluated to the MDL, concentrations \geq to the MDL but $<$ RL, if found, are qualified with a "J" flag.

Parameter	Result	RL	MDL	DF	Qual	Parameter	Result	RL	MDL	DF	Qual
Aroclor-1016	ND	21	4.3	1		Aroclor-1248	ND	21	4.2	1	
Aroclor-1221	ND	21	4.2	1		Aroclor-1254	ND	21	4.2	1	
Aroclor-1232	ND	21	4.2	1		Aroclor-1260	ND	21	4.7	1	
Aroclor-1242	ND	21	4.2	1							
Surrogates:	REC (%)	Control Limits	Qual			Surrogates:	REC (%)	Control Limits	Qual		
2,4,5,6-Tetrachloro-m-Xylene	97	50-130				Decachlorobiphenyl	109	50-130			

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
SRC-2010-8-2	10-07-1713-2-A	06/10/10 12:45	Solid	GC 58	07/23/10	07/24/10 15:49	100723L13

Comment(s): -Results are reported on a dry weight basis.

-Results were evaluated to the MDL, concentrations \geq to the MDL but $<$ RL, if found, are qualified with a "J" flag.

Parameter	Result	RL	MDL	DF	Qual	Parameter	Result	RL	MDL	DF	Qual
Aroclor-1016	ND	23	4.7	1		Aroclor-1248	ND	23	4.7	1	
Aroclor-1221	ND	23	4.7	1		Aroclor-1254	ND	23	4.7	1	
Aroclor-1232	ND	23	4.7	1		Aroclor-1260	ND	23	5.2	1	
Aroclor-1242	ND	23	4.7	1							
Surrogates:	REC (%)	Control Limits	Qual			Surrogates:	REC (%)	Control Limits	Qual		
2,4,5,6-Tetrachloro-m-Xylene	65	50-130				Decachlorobiphenyl	78	50-130			

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
SRC-2010-8-3	10-07-1713-3-A	06/10/10 13:30	Solid	GC 58	07/23/10	07/24/10 16:07	100723L13

Comment(s): -Results are reported on a dry weight basis.

-Results were evaluated to the MDL, concentrations \geq to the MDL but $<$ RL, if found, are qualified with a "J" flag.

Parameter	Result	RL	MDL	DF	Qual	Parameter	Result	RL	MDL	DF	Qual
Aroclor-1016	ND	23	4.6	1		Aroclor-1248	ND	23	4.6	1	
Aroclor-1221	ND	23	4.6	1		Aroclor-1254	ND	23	4.6	1	
Aroclor-1232	ND	23	4.6	1		Aroclor-1260	ND	23	5.1	1	
Aroclor-1242	ND	23	4.6	1							
Surrogates:	REC (%)	Control Limits	Qual			Surrogates:	REC (%)	Control Limits	Qual		
2,4,5,6-Tetrachloro-m-Xylene	75	50-130				Decachlorobiphenyl	91	50-130			

RL - Reporting Limit , DF - Dilution Factor , Qual - Qualifiers



Analytical Report



Pacific Ecorisk
 2250 Cordelia Road
 Fairfield, CA 94534-1912

Date Received: 07/23/10
 Work Order No: 10-07-1713
 Preparation: EPA 3545
 Method: EPA 8082
 Units: ug/kg

Project: ACOE (San Rafael Channel)

Page 2 of 2

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
SRC-2010-8-4	10-07-1713-4-A	06/10/10 11:40	Solid	GC 58	07/23/10	07/24/10 16:25	100723L13

Comment(s): -Results are reported on a dry weight basis.

-Results were evaluated to the MDL, concentrations >= to the MDL but < RL, if found, are qualified with a "J" flag.

Parameter	Result	RL	MDL	DF	Qual	Parameter	Result	RL	MDL	DF	Qual
Aroclor-1016	ND	17	3.3	1		Aroclor-1248	ND	17	3.3	1	
Aroclor-1221	ND	17	3.3	1		Aroclor-1254	ND	17	3.3	1	
Aroclor-1232	ND	17	3.3	1		Aroclor-1260	ND	17	3.7	1	
Aroclor-1242	ND	17	3.3	1							
Surrogates:	REC (%)	Control Limits	Qual			Surrogates:	REC (%)	Control Limits	Qual		
2,4,5,6-Tetrachloro-m-Xylene	85	50-130				Decachlorobiphenyl	126	50-130			

Method Blank	099-12-565-156	N/A	Solid	GC 58	07/23/10	07/24/10 15:13	100723L13
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Comment(s): -Results were evaluated to the MDL, concentrations >= to the MDL but < RL, if found, are qualified with a "J" flag.

Parameter	Result	RL	MDL	DF	Qual	Parameter	Result	RL	MDL	DF	Qual
Aroclor-1016	ND	10	2.0	1		Aroclor-1248	ND	10	2.0	1	
Aroclor-1221	ND	10	2.0	1		Aroclor-1254	ND	10	2.0	1	
Aroclor-1232	ND	10	2.0	1		Aroclor-1260	ND	10	2.2	1	
Aroclor-1242	ND	10	2.0	1							
Surrogates:	REC (%)	Control Limits	Qual			Surrogates:	REC (%)	Control Limits	Qual		
2,4,5,6-Tetrachloro-m-Xylene	115	50-130				Decachlorobiphenyl	112	50-130			

RL - Reporting Limit , DF - Dilution Factor , Qual - Qualifiers

Analytical Report



Pacific Ecorisk
 2250 Cordelia Road
 Fairfield, CA 94534-1912

Date Received: 07/23/10
 Work Order No: 10-07-1713
 Preparation: EPA 3545
 Method: EPA 8081A
 Units: ug/kg

Project: ACOE (San Rafael Channel)

Page 1 of 3

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
SRC-2010-8-1	10-07-1713-1-A	06/10/10 11:55	Solid	GC 41	07/23/10	07/26/10 12:40	100723L12

Comment(s): -Results were evaluated to the MDL, concentrations >= to the MDL but < RL, if found, are qualified with a "J" flag.

-Results are reported on a dry weight basis.

Parameter	Result	RL	MDL	DF	Qual	Parameter	Result	RL	MDL	DF	Qual
Aldrin	ND	2.1	0.65	1		Endosulfan I	ND	2.1	0.75	1	
Alpha-BHC	ND	2.1	0.62	1		Endosulfan II	ND	2.1	0.37	1	
Beta-BHC	ND	2.1	0.54	1		Endosulfan Sulfate	1.2	2.1	0.55	1	J
Delta-BHC	ND	2.1	0.67	1		Endrin	ND	2.1	0.43	1	
Gamma-BHC	ND	2.1	0.48	1		Endrin Aldehyde	ND	2.1	0.41	1	
Chlordane	ND	21	8.5	1		Endrin Ketone	ND	2.1	0.63	1	
Dieldrin	1.8	2.1	0.48	1	J	Heptachlor	ND	2.1	0.47	1	
2,4'-DDD	ND	2.1	0.42	1		Heptachlor Epoxide	2.5	2.1	0.39	1	
2,4'-DDE	ND	2.1	0.38	1		Methoxychlor	ND	2.1	0.35	1	
2,4'-DDT	0.45	2.1	0.30	1	J	Toxaphene	ND	42	18	1	
4,4'-DDD	76	21	5.4	10		Alpha Chlordane	1.2	2.1	0.54	1	J
4,4'-DDE	16	2.1	0.63	1		Gamma Chlordane	2.8	2.1	0.54	1	
4,4'-DDT	44	21	6.9	10							

Surrogates:	REC (%)	Control Limits	Qual	Surrogates:	REC (%)	Control Limits	Qual
2,4,5,6-Tetrachloro-m-Xylene	98	50-130		Decachlorobiphenyl	94	50-130	

SRC-2010-8-2	10-07-1713-2-A	06/10/10 12:45	Solid	GC 41	07/23/10	07/26/10 13:09	100723L12
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Comment(s): -Results were evaluated to the MDL, concentrations >= to the MDL but < RL, if found, are qualified with a "J" flag.

-Results are reported on a dry weight basis.

Parameter	Result	RL	MDL	DF	Qual	Parameter	Result	RL	MDL	DF	Qual
Aldrin	ND	2.3	0.73	1		Endosulfan I	ND	2.3	0.84	1	
Alpha-BHC	ND	2.3	0.69	1		Endosulfan II	ND	2.3	0.41	1	
Beta-BHC	ND	2.3	0.60	1		Endosulfan Sulfate	ND	2.3	0.62	1	
Delta-BHC	ND	2.3	0.75	1		Endrin	ND	2.3	0.47	1	
Gamma-BHC	ND	2.3	0.54	1		Endrin Aldehyde	ND	2.3	0.46	1	
Chlordane	170	23	9.4	1		Endrin Ketone	ND	2.3	0.71	1	
Dieldrin	ND	2.3	0.53	1		Heptachlor	ND	2.3	0.52	1	
2,4'-DDD	ND	2.3	0.47	1		Heptachlor Epoxide	ND	2.3	0.43	1	
2,4'-DDE	ND	2.3	0.42	1		Methoxychlor	ND	2.3	0.39	1	
2,4'-DDT	ND	2.3	0.33	1		Toxaphene	ND	47	20	1	
4,4'-DDD	15	2.3	0.61	1		Alpha Chlordane	10	2.3	0.61	1	
4,4'-DDE	13	2.3	0.71	1		Gamma Chlordane	11	2.3	0.61	1	
4,4'-DDT	ND	2.3	0.77	1							

Surrogates:	REC (%)	Control Limits	Qual	Surrogates:	REC (%)	Control Limits	Qual
2,4,5,6-Tetrachloro-m-Xylene	73	50-130		Decachlorobiphenyl	61	50-130	

RL - Reporting Limit , DF - Dilution Factor , Qual - Qualifiers

Analytical Report



Pacific Ecorisk
 2250 Cordelia Road
 Fairfield, CA 94534-1912

Date Received: 07/23/10
 Work Order No: 10-07-1713
 Preparation: EPA 3545
 Method: EPA 8081A
 Units: ug/kg

Project: ACOE (San Rafael Channel)

Page 2 of 3

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
SRC-2010-8-3	10-07-1713-3-A	06/10/10 13:30	Solid	GC 41	07/23/10	07/26/10 13:37	100723L12

Comment(s): -Results were evaluated to the MDL, concentrations >= to the MDL but < RL, if found, are qualified with a "J" flag.

-Results are reported on a dry weight basis.

Parameter	Result	RL	MDL	DF	Qual	Parameter	Result	RL	MDL	DF	Qual
Aldrin	ND	2.3	0.70	1		Endosulfan I	ND	2.3	0.81	1	
Alpha-BHC	ND	2.3	0.67	1		Endosulfan II	ND	2.3	0.40	1	
Beta-BHC	ND	2.3	0.58	1		Endosulfan Sulfate	ND	2.3	0.60	1	
Delta-BHC	ND	2.3	0.72	1		Endrin	ND	2.3	0.46	1	
Gamma-BHC	ND	2.3	0.52	1		Endrin Aldehyde	ND	2.3	0.45	1	
Chlordane	250	23	9.1	1		Endrin Ketone	ND	2.3	0.68	1	
Dieldrin	5.1	2.3	0.52	1		Heptachlor	ND	2.3	0.51	1	
2,4'-DDD	ND	2.3	0.46	1		Heptachlor Epoxide	ND	2.3	0.42	1	
2,4'-DDE	ND	2.3	0.41	1		Methoxychlor	ND	2.3	0.38	1	
2,4'-DDT	ND	2.3	0.32	1		Toxaphene	ND	46	19	1	
4,4'-DDD	29	4.6	1.2	2		Alpha Chlordane	18	2.3	0.59	1	
4,4'-DDE	21	4.6	1.4	2		Gamma Chlordane	36	4.6	1.2	2	
4,4'-DDT	7.1	2.3	0.75	1							

Surrogates:	REC (%)	Control Limits	Qual	Surrogates:	REC (%)	Control Limits	Qual
2,4,5,6-Tetrachloro-m-Xylene	73	50-130		Decachlorobiphenyl	61	50-130	

SRC-2010-8-4	10-07-1713-4-A	06/10/10 11:40	Solid	GC 41	07/23/10	07/26/10 14:05	100723L12
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Comment(s): -Results were evaluated to the MDL, concentrations >= to the MDL but < RL, if found, are qualified with a "J" flag.

-Results are reported on a dry weight basis.

Parameter	Result	RL	MDL	DF	Qual	Parameter	Result	RL	MDL	DF	Qual
Aldrin	ND	1.7	0.51	1		Endosulfan I	ND	1.7	0.59	1	
Alpha-BHC	ND	1.7	0.49	1		Endosulfan II	ND	1.7	0.29	1	
Beta-BHC	ND	1.7	0.42	1		Endosulfan Sulfate	ND	1.7	0.44	1	
Delta-BHC	ND	1.7	0.53	1		Endrin	ND	1.7	0.33	1	
Gamma-BHC	ND	1.7	0.38	1		Endrin Aldehyde	ND	1.7	0.32	1	
Chlordane	190	17	6.6	1		Endrin Ketone	ND	1.7	0.50	1	
Dieldrin	4.2	1.7	0.38	1		Heptachlor	ND	1.7	0.37	1	
2,4'-DDD	ND	1.7	0.33	1		Heptachlor Epoxide	ND	1.7	0.30	1	
2,4'-DDE	ND	1.7	0.29	1		Methoxychlor	ND	1.7	0.28	1	
2,4'-DDT	ND	1.7	0.23	1		Toxaphene	ND	33	14	1	
4,4'-DDD	29	8.3	2.1	5		Alpha Chlordane	16	1.7	0.43	1	
4,4'-DDE	14	8.3	2.5	5		Gamma Chlordane	23	8.3	2.1	5	
4,4'-DDT	ND	1.7	0.54	1							

Surrogates:	REC (%)	Control Limits	Qual	Surrogates:	REC (%)	Control Limits	Qual
2,4,5,6-Tetrachloro-m-Xylene	84	50-130		Decachlorobiphenyl	53	50-130	

RL - Reporting Limit , DF - Dilution Factor , Qual - Qualifiers

Analytical Report



Pacific Ecorisk
 2250 Cordelia Road
 Fairfield, CA 94534-1912

Date Received: 07/23/10
 Work Order No: 10-07-1713
 Preparation: EPA 3545
 Method: EPA 8081A
 Units: ug/kg

Project: ACOE (San Rafael Channel)

Page 3 of 3

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
Method Blank	099-12-858-70	N/A	Solid	GC 41	07/23/10	07/26/10 12:12	100723L12

Comment(s): -Results were evaluated to the MDL, concentrations >= to the MDL but < RL, if found, are qualified with a "J" flag.

Parameter	Result	RL	MDL	DF	Qual	Parameter	Result	RL	MDL	DF	Qual
Aldrin	ND	1.0	0.31	1		Endosulfan I	ND	1.0	0.36	1	
Alpha-BHC	ND	1.0	0.29	1		Endosulfan II	ND	1.0	0.18	1	
Beta-BHC	ND	1.0	0.25	1		Endosulfan Sulfate	ND	1.0	0.26	1	
Delta-BHC	ND	1.0	0.32	1		Endrin	ND	1.0	0.20	1	
Gamma-BHC	ND	1.0	0.23	1		Endrin Aldehyde	ND	1.0	0.20	1	
Chlordane	ND	10	4.0	1		Endrin Ketone	ND	1.0	0.30	1	
Dieldrin	ND	1.0	0.23	1		Heptachlor	ND	1.0	0.22	1	
2,4'-DDD	ND	1.0	0.20	1		Heptachlor Epoxide	ND	1.0	0.18	1	
2,4'-DDE	ND	1.0	0.18	1		Methoxychlor	ND	1.0	0.17	1	
2,4'-DDT	ND	1.0	0.14	1		Toxaphene	ND	20	8.5	1	
4,4'-DDD	ND	1.0	0.26	1		Alpha Chlordane	ND	1.0	0.26	1	
4,4'-DDE	ND	1.0	0.30	1		Gamma Chlordane	ND	1.0	0.26	1	
4,4'-DDT	ND	1.0	0.33	1							
<u>Surrogates:</u>	<u>REC (%)</u>	<u>Control Limits</u>	<u>Qual</u>			<u>Surrogates:</u>	<u>REC (%)</u>	<u>Control Limits</u>	<u>Qual</u>		
2,4,5,6-Tetrachloro-m-Xylene	105	50-130				Decachlorobiphenyl	101	50-130			

RL - Reporting Limit , DF - Dilution Factor , Qual - Qualifiers

Analytical Report



Pacific Ecorisk
2250 Cordelia Road
Fairfield, CA 94534-1912

Date Received: 07/23/10
Work Order No: 10-07-1713
Preparation: EPA 3050B
Method: EPA 6020
Units: mg/kg

Project: ACOE (San Rafael Channel)

Page 1 of 2

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
SRC-2010-8-1	10-07-1713-1-A	06/10/10 11:55	Solid	ICP/MS 04	07/23/10	07/23/10 19:15	100723L04

Comment(s): -Results were evaluated to the MDL, concentrations \geq to the MDL but $<$ RL, if found, are qualified with a "J" flag.
-Results are reported on a dry weight basis.

Parameter	Result	RL	MDL	DF	Qual	Parameter	Result	RL	MDL	DF	Qual
Arsenic	17.1	0.211	0.107	1		Nickel	130	0.211	0.0347	1	B
Cadmium	1.11	0.211	0.00948	1		Selenium	0.603	0.211	0.0728	1	
Chromium	111	0.211	0.0366	1		Silver	0.763	0.211	0.00745	1	
Copper	75.0	0.211	0.0385	1	B	Zinc	237	2.11	0.559	1	B
Lead	126	0.211	0.0188	1							

SRC-2010-8-2	10-07-1713-2-A	06/10/10 12:45	Solid	ICP/MS 04	07/23/10	07/23/10 19:19	100723L04
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Comment(s): -Results were evaluated to the MDL, concentrations \geq to the MDL but $<$ RL, if found, are qualified with a "J" flag.
-Results are reported on a dry weight basis.

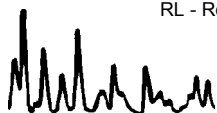
Parameter	Result	RL	MDL	DF	Qual	Parameter	Result	RL	MDL	DF	Qual
Arsenic	8.59	0.235	0.119	1		Nickel	85.8	0.235	0.0386	1	B
Cadmium	1.03	0.235	0.0105	1		Selenium	0.528	0.235	0.0810	1	
Chromium	70.7	0.235	0.0408	1		Silver	0.316	0.235	0.00829	1	
Copper	79.2	0.235	0.0429	1	B	Zinc	358	2.35	0.622	1	B
Lead	86.5	0.235	0.0209	1							

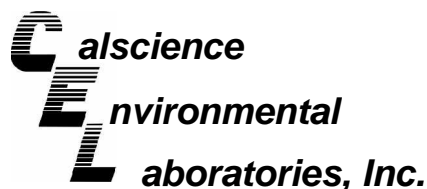
SRC-2010-8-3	10-07-1713-3-A	06/10/10 13:30	Solid	ICP/MS 04	07/23/10	07/23/10 19:24	100723L04
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Comment(s): -Results were evaluated to the MDL, concentrations \geq to the MDL but $<$ RL, if found, are qualified with a "J" flag.
-Results are reported on a dry weight basis.

Parameter	Result	RL	MDL	DF	Qual	Parameter	Result	RL	MDL	DF	Qual
Arsenic	10.5	0.228	0.116	1		Nickel	94.9	0.228	0.0375	1	B
Cadmium	1.13	0.228	0.0102	1		Selenium	0.462	0.228	0.0786	1	
Chromium	82.5	0.228	0.0396	1		Silver	0.499	0.228	0.00805	1	
Copper	115	0.228	0.0416	1	B	Zinc	392	2.28	0.603	1	B
Lead	227	0.228	0.0203	1							

RL - Reporting Limit , DF - Dilution Factor , Qual - Qualifiers





Analytical Report



Pacific Ecorisk
2250 Cordelia Road
Fairfield, CA 94534-1912

Date Received: 07/23/10
Work Order No: 10-07-1713
Preparation: EPA 3050B
Method: EPA 6020
Units: mg/kg

Project: ACOE (San Rafael Channel)

Page 2 of 2

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
SRC-2010-8-4	10-07-1713-4-A	06/10/10 11:40	Solid	ICP/MS 04	07/23/10	07/23/10 19:29	100723L04

Comment(s): -Results were evaluated to the MDL, concentrations \geq to the MDL but $<$ RL, if found, are qualified with a "J" flag.
-Results are reported on a dry weight basis.

Parameter	Result	RL	MDL	DF	Qual	Parameter	Result	RL	MDL	DF	Qual
Arsenic	5.88	0.166	0.0842	1		Nickel	56.5	0.166	0.0273	1	B
Cadmium	0.577	0.166	0.00745	1		Selenium	0.217	0.166	0.0572	1	
Chromium	47.8	0.166	0.0288	1		Silver	0.165	0.166	0.00586	1	J
Copper	39.5	0.166	0.0303	1	B	Zinc	201	1.66	0.439	1	B
Lead	131	0.166	0.0148	1							

Method Blank	096-10-002-1,785	N/A	Solid	ICP/MS 04	07/23/10	07/23/10 18:15	100723L04
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Comment(s): -Results were evaluated to the MDL, concentrations \geq to the MDL but $<$ RL, if found, are qualified with a "J" flag.

Parameter	Result	RL	MDL	DF	Qual	Parameter	Result	RL	MDL	DF	Qual
Arsenic	ND	0.100	0.0507	1		Nickel	0.0222	0.100	0.0164	1	J
Cadmium	ND	0.100	0.00449	1		Selenium	ND	0.100	0.0345	1	
Chromium	ND	0.100	0.0174	1		Silver	ND	0.100	0.00353	1	
Copper	0.0502	0.100	0.0183	1	J	Zinc	0.484	1.00	0.265	1	J
Lead	ND	0.100	0.00892	1							

RL - Reporting Limit , DF - Dilution Factor , Qual - Qualifiers

Analytical Report



Pacific Ecorisk
2250 Cordelia Road
Fairfield, CA 94534-1912

Date Received: 07/23/10
Work Order No: 10-07-1713
Preparation: EPA 7471A Total
Method: EPA 7471A

Project: ACOE (San Rafael Channel)

Page 1 of 1

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
SRC-2010-8-1	10-07-1713-1-A	06/10/10 11:55	Solid	Mercury	07/23/10	07/23/10 15:54	100723L07

Comment(s): -Results were evaluated to the MDL, concentrations \geq to the MDL but $<$ RL, if found, are qualified with a "J" flag.
-Results are reported on a dry weight basis.

Parameter	Result	RL	MDL	DF	Qual	Units
Mercury	1.54	0.0423	0.0274	1		mg/kg

SRC-2010-8-2	10-07-1713-2-A	06/10/10 12:45	Solid	Mercury	07/23/10	07/23/10 15:56	100723L07
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Comment(s): -Results were evaluated to the MDL, concentrations \geq to the MDL but $<$ RL, if found, are qualified with a "J" flag.
-Results are reported on a dry weight basis.

Parameter	Result	RL	MDL	DF	Qual	Units
Mercury	0.293	0.0470	0.0305	1		mg/kg

SRC-2010-8-3	10-07-1713-3-A	06/10/10 13:30	Solid	Mercury	07/23/10	07/23/10 15:59	100723L07
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Comment(s): -Results were evaluated to the MDL, concentrations \geq to the MDL but $<$ RL, if found, are qualified with a "J" flag.
-Results are reported on a dry weight basis.

Parameter	Result	RL	MDL	DF	Qual	Units
Mercury	0.332	0.0456	0.0296	1		mg/kg

SRC-2010-8-4	10-07-1713-4-A	06/10/10 11:40	Solid	Mercury	07/23/10	07/23/10 16:01	100723L07
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Comment(s): -Results were evaluated to the MDL, concentrations \geq to the MDL but $<$ RL, if found, are qualified with a "J" flag.
-Results are reported on a dry weight basis.

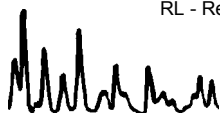
Parameter	Result	RL	MDL	DF	Qual	Units
Mercury	0.262	0.0332	0.0215	1		mg/kg

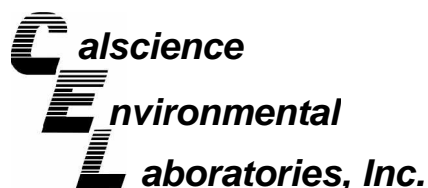
Method Blank	099-12-452-138	N/A	Solid	Mercury	07/23/10	07/23/10 15:34	100723L07
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Comment(s): -Results were evaluated to the MDL, concentrations \geq to the MDL but $<$ RL, if found, are qualified with a "J" flag.

Parameter	Result	RL	MDL	DF	Qual	Units
Mercury	ND	0.0200	0.0130	1		mg/kg

RL - Reporting Limit , DF - Dilution Factor , Qual - Qualifiers





Quality Control - Spike/Spike Duplicate



Pacific Ecorisk
2250 Cordelia Road
Fairfield, CA 94534-1912

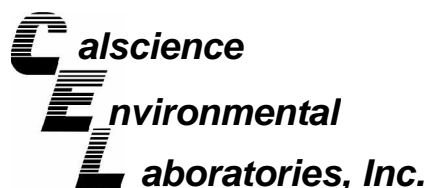
Date Received: 07/23/10
Work Order No: 10-07-1713
Preparation: EPA 3050B
Method: EPA 6020

Project ACOE (San Rafael Channel)

Quality Control Sample ID	Matrix	Instrument	Date Prepared	Date Analyzed	MS/MSD Batch Number
10-07-1715-1	Sediment	ICP/MS 04	07/23/10	07/23/10	100723S04

Parameter	MS %REC	MSD %REC	%REC CL	RPD	RPD CL	Qualifiers
Arsenic	107	109	80-120	2	0-20	
Cadmium	98	102	80-120	4	0-20	
Chromium	70	78	80-120	4	0-20	3
Copper	44	48	80-120	2	0-20	3
Lead	67	65	80-120	1	0-20	3
Nickel	76	81	80-120	3	0-20	3
Selenium	107	108	80-120	1	0-20	
Silver	103	107	80-120	4	0-20	
Zinc	4X	4X	80-120	4X	0-20	Q

RPD - Relative Percent Difference , CL - Control Limit



Quality Control - PDS / PDSD



Pacific Ecorisk
2250 Cordelia Road
Fairfield, CA 94534-1912

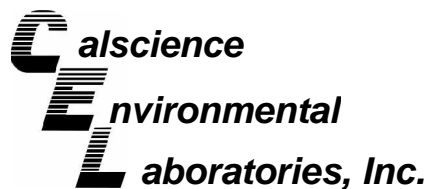
Date Received 07/23/10
Work Order No: 10-07-1713
Preparation: EPA 3050B
Method: EPA 6020

Project: ACOE (San Rafael Channel)

Quality Control Sample ID	Matrix	Instrument	Date Prepared	Date Analyzed	PDS / PDSD Batch Number
10-07-1715-1	Sediment	ICP/MS 04	07/23/10	07/23/10	100723S04

Parameter	PDS %REC	PDSD %REC	%REC CL	RPD	RPD CL	Qualifiers
Arsenic	99	96	75-125	3	0-20	
Cadmium	92	92	75-125	1	0-20	
Chromium	80	84	75-125	1	0-20	
Copper	57	63	75-125	3	0-20	
Lead	63	60	75-125	2	0-20	
Nickel	81	87	75-125	3	0-20	
Selenium	87	89	75-125	2	0-20	
Silver	97	98	75-125	1	0-20	
Zinc	4X	4X	75-125	4X	0-20	Q

RPD - Relative Percent Difference , CL - Control Limit



Quality Control - Spike/Spike Duplicate



Pacific Ecorisk
2250 Cordelia Road
Fairfield, CA 94534-1912

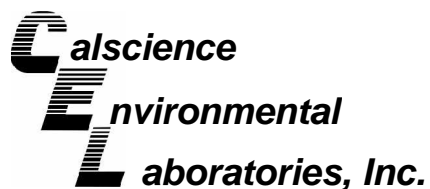
Date Received: 07/23/10
Work Order No: 10-07-1713
Preparation: N/A
Method: EPA 9060A

Project ACOE (San Rafael Channel)

Quality Control Sample ID	Matrix	Instrument	Date Prepared	Date Analyzed	MS/MSD Batch Number
SRC-2010-8-1	Solid	TOC 5	N/A	07/28/10	A0728TOCS1

Parameter	MS %REC	MSD %REC	%REC CL	RPD	RPD CL	Qualifiers
Carbon, Total Organic	100	98	75-125	1	0-25	

RPD - Relative Percent Difference , CL - Control Limit



Quality Control - Duplicate



Pacific Ecorisk
2250 Cordelia Road
Fairfield, CA 94534-1912

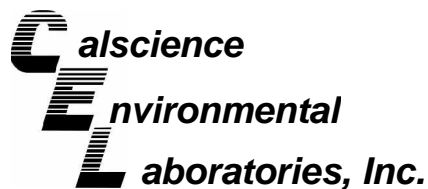
Date Received: 07/23/10
Work Order No: 10-07-1713
Preparation: N/A
Method: SM 2540 B

Project: ACOE (San Rafael Channel)

Quality Control Sample ID	Matrix	Instrument	Date Prepared:	Date Analyzed:	Duplicate Batch Number
10-07-1714-1	Sediment	N/A	07/24/10	07/24/10	A0724TSD1

Parameter	Sample Conc.	DUP Conc	RPD	RPD CL	Qualifiers
Solids, Total	54.5	54.9	1	0-25	

RPD - Relative Percent Difference , CL - Control Limit



Quality Control - Spike/Spike Duplicate



Pacific Ecorisk
2250 Cordelia Road
Fairfield, CA 94534-1912

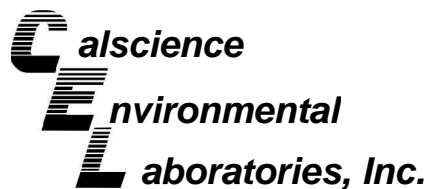
Date Received: 07/23/10
Work Order No: 10-07-1713
Preparation: EPA 7471A Total
Method: EPA 7471A

Project ACOE (San Rafael Channel)

Quality Control Sample ID	Matrix	Instrument	Date Prepared	Date Analyzed	MS/MSD Batch Number
10-07-1715-1	Sediment	Mercury	07/23/10	07/23/10	100723S07

Parameter	MS %REC	MSD %REC	%REC CL	RPD	RPD CL	Qualifiers
Mercury	88	87	76-136	1	0-16	

RPD - Relative Percent Difference , CL - Control Limit



Quality Control - Spike/Spike Duplicate



Pacific Ecorisk
2250 Cordelia Road
Fairfield, CA 94534-1912

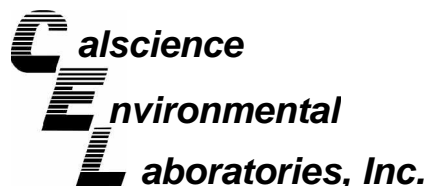
Date Received: 07/23/10
Work Order No: 10-07-1713
Preparation: EPA 3545
Method: Organotins by Krone et al.

Project ACOE (San Rafael Channel)

Quality Control Sample ID	Matrix	Instrument	Date Prepared	Date Analyzed	MS/MSD Batch Number
10-07-1715-1	Sediment	GC/MS Y	07/23/10	07/24/10	100723S18

Parameter	MS %REC	MSD %REC	%REC CL	RPD	RPD CL	Qualifiers
Tetrabutyltin	123	118	50-130	4	0-20	
Tributyltin	134	127	50-130	6	0-20	3

RPD - Relative Percent Difference , CL - Control Limit



Quality Control - Spike/Spike Duplicate



Pacific Ecorisk
2250 Cordelia Road
Fairfield, CA 94534-1912

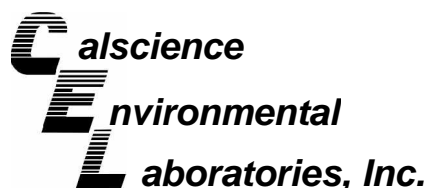
Date Received: 07/23/10
Work Order No: 10-07-1713
Preparation: EPA 3545
Method: EPA 8270C SIM
PAHs

Project ACOE (San Rafael Channel)

Quality Control Sample ID	Matrix	Instrument	Date Prepared	Date Analyzed	MS/MSD Batch Number
10-07-1715-1	Sediment	GC/MS BBB	07/23/10	07/25/10	100723S14

Parameter	MS %REC	MSD %REC	%REC CL	RPD	RPD CL	Qualifiers
Acenaphthene	67	68	40-160	0	0-20	
Acenaphthylene	63	64	40-160	1	0-20	
Anthracene	43	45	40-160	4	0-20	
Benzo (a) Anthracene	46	48	40-160	3	0-20	
Benzo (a) Pyrene	52	53	40-160	2	0-20	
Benzo (b) Fluoranthene	57	54	40-160	3	0-20	
Benzo (g,h,i) Perylene	49	53	40-160	7	0-20	
Benzo (k) Fluoranthene	48	47	40-160	0	0-20	
Chrysene	46	47	40-160	1	0-20	
Dibenz (a,h) Anthracene	58	59	40-160	1	0-20	
Fluoranthene	44	48	40-160	5	0-20	
Fluorene	64	66	40-160	3	0-20	
Indeno (1,2,3-c,d) Pyrene	57	59	40-160	2	0-20	
2-Methylnaphthalene	69	67	40-160	2	0-20	
1-Methylnaphthalene	67	62	40-160	7	0-20	
Naphthalene	59	59	40-160	0	0-20	
Phenanthrene	61	61	40-160	0	0-20	
Pyrene	53	49	40-160	3	0-46	

RPD - Relative Percent Difference , CL - Control Limit



Quality Control - Spike/Spike Duplicate



Pacific Ecorisk
2250 Cordelia Road
Fairfield, CA 94534-1912

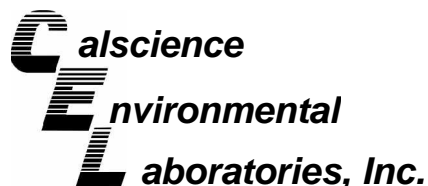
Date Received: 07/23/10
Work Order No: 10-07-1713
Preparation: EPA 3545
Method: EPA 8082

Project ACOE (San Rafael Channel)

Quality Control Sample ID	Matrix	Instrument	Date Prepared	Date Analyzed	MS/MSD Batch Number
10-07-1715-1	Sediment	GC 58	07/23/10	07/24/10	100723S13

Parameter	MS %REC	MSD %REC	%REC CL	RPD	RPD CL	Qualifiers
Aroclor-1016	115	118	50-135	3	0-25	
Aroclor-1260	131	124	50-135	5	0-25	

RPD - Relative Percent Difference , CL - Control Limit



Quality Control - Spike/Spike Duplicate



Pacific Ecorisk
2250 Cordelia Road
Fairfield, CA 94534-1912

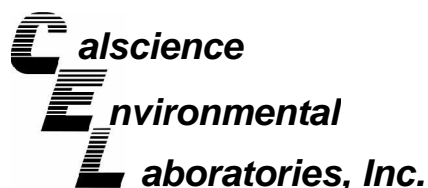
Date Received: 07/23/10
Work Order No: 10-07-1713
Preparation: EPA 3545
Method: EPA 8081A

Project ACOE (San Rafael Channel)

Quality Control Sample ID	Matrix	Instrument	Date Prepared	Date Analyzed	MS/MSD Batch Number
10-07-1715-1	Sediment	GC 41	07/23/10	07/27/10	100723S12

Parameter	MS %REC	MSD %REC	%REC CL	RPD	RPD CL	Qualifiers
Aldrin	71	69	50-135	3	0-25	
Alpha-BHC	88	86	50-135	3	0-25	
Beta-BHC	83	80	50-135	4	0-25	
Delta-BHC	88	86	50-135	3	0-25	
Gamma-BHC	79	76	50-135	4	0-25	
Dieldrin	83	79	50-135	4	0-25	
4,4'-DDD	85	83	50-135	2	0-25	
4,4'-DDE	87	84	50-135	3	0-25	
4,4'-DDT	106	101	50-135	5	0-25	
Endosulfan I	72	68	50-135	5	0-25	
Endosulfan II	78	75	50-135	4	0-25	
Endosulfan Sulfate	86	82	50-135	4	0-25	
Endrin	80	76	50-135	4	0-25	
Endrin Aldehyde	69	59	50-135	16	0-25	
Endrin Ketone	96	94	50-135	2	0-25	
Heptachlor	68	66	50-135	4	0-25	
Heptachlor Epoxide	73	71	50-135	3	0-25	
Methoxychlor	88	88	50-135	0	0-25	
Alpha Chlordane	76	73	50-135	4	0-25	
Gamma Chlordane	77	74	50-135	3	0-25	

RPD - Relative Percent Difference , CL - Control Limit



Quality Control - LCS/LCS Duplicate



Pacific Ecorisk
2250 Cordelia Road
Fairfield, CA 94534-1912

Date Received: N/A
Work Order No: 10-07-1713
Preparation: EPA 3050B
Method: EPA 6020

Project: ACOE (San Rafael Channel)

Quality Control Sample ID	Matrix	Instrument	Date Prepared	Date Analyzed	LCS/LCSD Batch Number
096-10-002-1,785	Solid	ICP/MS 04	07/23/10	07/23/10	100723L04

Parameter	LCS %REC	LCSD %REC	%REC CL	RPD	RPD CL	Qualifiers
Arsenic	99	98	80-120	1	0-20	
Cadmium	96	96	80-120	0	0-20	
Chromium	94	94	80-120	0	0-20	
Copper	100	98	80-120	2	0-20	
Lead	96	95	80-120	1	0-20	
Nickel	100	97	80-120	3	0-20	
Selenium	102	100	80-120	2	0-20	
Silver	91	91	80-120	0	0-20	
Zinc	103	100	80-120	2	0-20	

RPD - Relative Percent Difference , CL - Control Limit



Quality Control - Laboratory Control Sample



Pacific Ecorisk
2250 Cordelia Road
Fairfield, CA 94534-1912

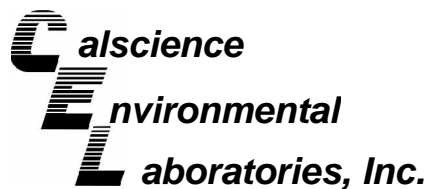
Date Received: N/A
Work Order No: 10-07-1713
Preparation: N/A
Method: EPA 9060A

Project: ACOE (San Rafael Channel)

Quality Control Sample ID	Matrix	Instrument	Date Analyzed	Lab File ID	LCS Batch Number
099-06-013-510	Solid	TOC 5	07/28/10	NONE	A0728TOCL1

Parameter	Conc Added	Conc Recovered	LCS %Rec	%Rec CL	Qualifiers
Carbon, Total Organic	0.6	0.642	107	80-120	

RPD - Relative Percent Difference , CL - Control Limit



Quality Control - LCS/LCS Duplicate



Pacific Ecorisk
2250 Cordelia Road
Fairfield, CA 94534-1912

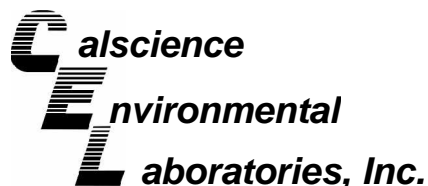
Date Received: N/A
Work Order No: 10-07-1713
Preparation: EPA 7471A Total
Method: EPA 7471A

Project: ACOE (San Rafael Channel)

Quality Control Sample ID	Matrix	Instrument	Date Prepared	Date Analyzed	LCS/LCSD Batch Number
099-12-452-138	Solid	Mercury	07/23/10	07/23/10	100723L07

Parameter	LCS %REC	LCSD %REC	%REC CL	RPD	RPD CL	Qualifiers
Mercury	97	99	82-124	2	0-16	

RPD - Relative Percent Difference , CL - Control Limit



Quality Control - LCS/LCS Duplicate



Pacific Ecorisk
2250 Cordelia Road
Fairfield, CA 94534-1912

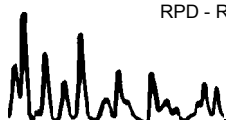
Date Received: N/A
Work Order No: 10-07-1713
Preparation: EPA 3545
Method: Organotins by Krone et al.

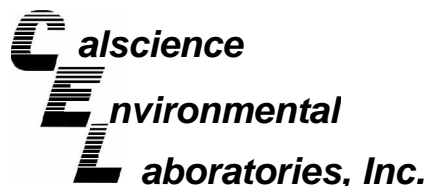
Project: ACOE (San Rafael Channel)

Quality Control Sample ID	Matrix	Instrument	Date Prepared	Date Analyzed	LCS/LCSD Batch Number
099-07-016-765	Solid	GC/MS Y	07/23/10	07/24/10	100723L18

Parameter	LCS %REC	LCSD %REC	%REC CL	RPD	RPD CL	Qualifiers
Tetrabutyltin	95	99	50-130	4	0-20	
Tributyltin	108	117	50-130	8	0-20	

RPD - Relative Percent Difference , CL - Control Limit





Quality Control - LCS/LCS Duplicate



Pacific Ecorisk
2250 Cordelia Road
Fairfield, CA 94534-1912

Date Received: N/A
Work Order No: 10-07-1713
Preparation: EPA 3545
Method: EPA 8270C SIM PAHs

Project: ACOE (San Rafael Channel)

Quality Control Sample ID	Matrix	Instrument	Date Prepared	Date Analyzed	LCS/LCSD Batch Number		
099-12-471-55	Solid	GC/MS BBB	07/23/10	07/24/10	100723L14		
Parameter	LCS %REC	LCSD %REC	%REC CL	ME CL	RPD	RPD CL	Qualifiers
Acenaphthene	88	87	48-108	38-118	1	0-11	
Acenaphthylene	84	84	40-160	20-180	0	0-20	
Anthracene	66	65	40-160	20-180	2	0-20	
Benzo (a) Anthracene	82	83	40-160	20-180	1	0-20	
Benzo (a) Pyrene	87	86	40-160	20-180	2	0-20	
Benzo (b) Fluoranthene	87	83	40-160	20-180	4	0-20	
Benzo (g,h,i) Perylene	73	73	40-160	20-180	0	0-20	
Benzo (k) Fluoranthene	81	82	40-160	20-180	1	0-20	
Chrysene	83	83	40-160	20-180	0	0-20	
Dibenz (a,h) Anthracene	79	79	40-160	20-180	0	0-20	
Fluoranthene	88	87	40-160	20-180	1	0-20	
Fluorene	91	90	40-160	20-180	1	0-20	
Indeno (1,2,3-c,d) Pyrene	84	84	40-160	20-180	0	0-20	
2-Methylnaphthalene	92	92	40-160	20-180	0	0-20	
1-Methylnaphthalene	89	87	40-160	20-180	2	0-20	
Naphthalene	88	89	40-160	20-180	1	0-20	
Phenanthrene	87	87	40-160	20-180	0	0-20	
Pyrene	83	83	40-160	20-180	0	0-16	

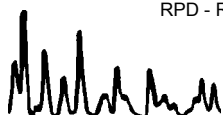
Total number of LCS compounds : 18

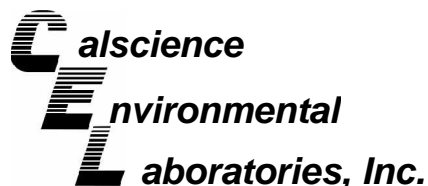
Total number of ME compounds : 0

Total number of ME compounds allowed : 1

LCS ME CL validation result : Pass

RPD - Relative Percent Difference , CL - Control Limit





Quality Control - LCS/LCS Duplicate



Pacific Ecorisk
2250 Cordelia Road
Fairfield, CA 94534-1912

Date Received: N/A
Work Order No: 10-07-1713
Preparation: EPA 3545
Method: EPA 8082

Project: ACOE (San Rafael Channel)

Quality Control Sample ID	Matrix	Instrument	Date Prepared	Date Analyzed	LCS/LCSD Batch Number
099-12-565-156	Solid	GC 58	07/23/10	07/24/10	100723L13

Parameter	LCS %REC	LCSD %REC	%REC CL	RPD	RPD CL	Qualifiers
Aroclor-1016	103	108	50-135	4	0-25	
Aroclor-1260	104	116	50-135	11	0-25	

RPD - Relative Percent Difference , CL - Control Limit



Quality Control - Laboratory Control Sample



Pacific Ecorisk
2250 Cordelia Road
Fairfield, CA 94534-1912

Date Received: N/A
Work Order No: 10-07-1713
Preparation: EPA 3545
Method: EPA 8081A

Project: ACOE (San Rafael Channel)

Quality Control Sample ID	Matrix	Instrument	Date Analyzed	Lab File ID	LCS Batch Number
099-12-858-70	Solid	GC 41	07/26/10	10072605	100723L12

Parameter	Conc Added	Conc Recovered	LCS %Rec	%Rec CL	ME_CL	Qualifiers
Aldrin	5.00	4.74	95	50-135	36-149	
Alpha-BHC	5.00	4.47	89	50-135	36-149	
Beta-BHC	5.00	4.52	90	50-135	36-149	
Delta-BHC	5.00	2.57	51	50-135	36-149	
Gamma-BHC	5.00	4.53	91	50-135	36-149	
Dieldrin	5.00	4.80	96	50-135	36-149	
4,4'-DDD	5.00	4.55	91	50-135	36-149	
4,4'-DDE	5.00	4.46	89	50-135	36-149	
4,4'-DDT	5.00	5.04	101	50-135	36-149	
Endosulfan I	5.00	4.73	95	50-135	36-149	
Endosulfan II	5.00	4.70	94	50-135	36-149	
Endosulfan Sulfate	5.00	4.29	86	50-135	36-149	
Endrin	5.00	5.01	100	50-135	36-149	
Endrin Aldehyde	5.00	4.58	92	50-135	36-149	
Endrin Ketone	5.00	4.83	97	50-135	36-149	
Heptachlor	5.00	4.98	100	50-135	36-149	
Heptachlor Epoxide	5.00	4.52	90	50-135	36-149	
Methoxychlor	5.00	4.82	96	50-135	36-149	
Alpha Chlordane	5.00	4.80	96	50-135	36-149	
Gamma Chlordane	5.00	4.59	92	50-135	36-149	

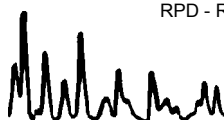
Total number of LCS compounds : 20

Total number of ME compounds: 0

Total number of ME compounds allowed : 1

LCS ME CL validation result : Pass

RPD - Relative Percent Difference , CL - Control Limit



Glossary of Terms and Qualifiers



Work Order Number: 10-07-1713

<u>Qualifier</u>	<u>Definition</u>
*	See applicable analysis comment.
<	Less than the indicated value.
>	Greater than the indicated value.
1	Surrogate compound recovery was out of control due to a required sample dilution, therefore, the sample data was reported without further clarification.
2	Surrogate compound recovery was out of control due to matrix interference. The associated method blank surrogate spike compound was in control and, therefore, the sample data was reported without further clarification.
3	Recovery of the Matrix Spike (MS) or Matrix Spike Duplicate (MSD) compound was out of control due to matrix interference. The associated LCS and/or LCSD was in control and, therefore, the sample data was reported without further clarification.
4	The MS/MSD RPD was out of control due to matrix interference. The LCS/LCSD RPD was in control and, therefore, the sample data was reported without further clarification.
5	The PDS/PDSD or PES/PESD associated with this batch of samples was out of control due to a matrix interference effect. The associated batch LCS/LCSD was in control and, hence, the associated sample data was reported without further clarification.
B	Analyte was present in the associated method blank.
E	Concentration exceeds the calibration range.
J	Analyte was detected at a concentration below the reporting limit and above the laboratory method detection limit. Reported value is estimated.
ME	LCS Recovery Percentage is within LCS ME Control Limit range.
ND	Parameter not detected at the indicated reporting limit.
Q	Spike recovery and RPD control limits do not apply resulting from the parameter concentration in the sample exceeding the spike concentration by a factor of four or greater.
X	% Recovery and/or RPD out-of-range.
Z	Analyte presence was not confirmed by second column or GC/MS analysis.
	Solid - Unless otherwise indicated, solid sample data is reported on a wet weight basis, not corrected for % moisture.





Pacific EcoRisk

ENVIRONMENTAL CONSULTING & TESTING

2250 Cordelia Rd., Fairfield, CA 94534

(707)207-7760

1713

Calscience CHAIN-OF-CUSTODY RECORD

Client Name:		Pacific EcoRisk				REQUESTED ANALYSIS													
Client Address:		2250 Cordelia Rd. Fairfield, CA 94534				<div>* See Analyte List</div>													
Sampled By:		Mike McElroy																	
Phone:		(707) 207-7760																	
FAX:		(707) 207-7916																	
Project Manager:		Jeff Cotsifas																	
Project Name:		ACOE (San Rafael Channel)																	
PO Number:		16087																	
Client Sample ID	Sample Date	Sample Time	Sample Matrix*	Container															
				Number	Type														
1	SRC-2010-8-1	6/10/10	11:55	Sed	1	8oz glass	x												
2	SRC-2010-8-2	6/10/10	12:45	Sed	1	8oz glass	x												
3	SRC-2010-8-3	6/10/10	13:30	Sed	1	8oz glass	x												
4	SRC-2010-8-4	6/11/10	11:40	Sed	1	8oz glass	x												
5																			
6																			
7																			
8																			
9																			
10																			
Correct Containers:		Yes	No	RELIQUISHED BY															
Sample Temperature:		Ambient	Cold	Warm	Signature:				Signature:										
Sample Preservative:		Yes	No	Print:				Print:											
Turnaround Time:		STD	Specify:	Organization:				Organization:											
Comments: Sample frozen prior to 6/24/10				DATE:				TIME:				DATE:				TIME:			
				RECEIVED BY															
				Signature:				Signature:											
				Print:				Print:											
				Organization:				Organization:											
				DATE:				TIME:				DATE:				TIME:			

*MATRIX CODES: (SED = Sediment); (FW = Freshwater); (WW = Wastewater); (STRMW = Stormwater)

(FedEx)

ANALYTE LIST

Pacific EcoRisk
2250 Cordelia Rd.
Fairfield, CA 94534

1713

Project Proponent: Pacific EcoRisk

Project #: 16087

Site #: SRC-2010-8-1, SRC-2010-8-2, SRC-2010-8-3, and SRC-2010-8-4

Standard Ocean Disposal List (SF Bay)

Solids, Total	160.3	
Solids, Volatile	160.4	
Total Organic Carbon	ASTM D4129-82M	
Sulfides	9030M	
Particle Size	PSEP	
Ammonia as Nitrogen	350.3M	
Arsenic	6020	X
Cadmium	6020	X
Chromium	6020	X
Copper	6020	X
Lead	6020	X
Nickel	6020	X
Silver	6020	X
Zinc	6020	X
Mercury	7471A	X
Selenium	7740 - GFAA	X
2,4'-DDD	8081A	X
2,4'-DDE	8081A	X
2,4'-DDT	8081A	X
4,4'-DDD	8081A	X
4,4'-DDE	8081A	X
4,4'-DDT	8081A	X
Aldrin	8081A	X
alpha-BHC	8081A	X
alpha-Chlordane	8081A	X
beta-BHC	8081A	X
Chlordane	8081A	X
delta-BHC	8081A	X
Dieldrin	8081A	X
Endosulfan I	8081A	X
Endosulfan II	8081A	X
Endosulfan Sulfate	8081A	X
Endrin	8081A	X
Endrin Aldehyde	8081A	X
gamma-BHC (Lindane)	8081A	X
gamma-Chlordane	8081A	X
Heptachlor	8081A	X
Heptachlor Epoxide	8081A	X
Toxaphene	8081A	X
Aroclor 1016	8082	X
Aroclor 1221	8082	X
Aroclor 1232	8082	X
Aroclor 1242	8082	X
Aroclor 1248	8082	X
Aroclor 1254	8082	X

(1713)

Aroclor 1260	8082	X
Aroclor 1262	8082	
Aroclor 1268	8082	
Acenaphthene	8270C-SIM PAH	X
Acenaphthylene	8270C-SIM PAH	X
Anthracene	8270C-SIM PAH	X
Benz(a)anthracene	8270C-SIM PAH	X
Benzo(a)pyrene	8270C-SIM PAH	X
Benzo(b)fluoranthene	8270C-SIM PAH	X
Benzo(g,h,i)perylene	8270C-SIM PAH	X
Benzo(k)fluoranthene	8270C-SIM PAH	X
Chrysene	8270C-SIM PAH	X
Dibenz(a,h)anthracene	8270C-SIM PAH	X
Fluoranthene	8270C-SIM PAH	X
Fluorene	8270C-SIM PAH	X
Indeno(1,2,3-cd)pyrene	8270C-SIM PAH	X
Naphthalene	8270C-SIM PAH	X
Phenanthrene	8270C-SIM PAH	X
Pyrene	8270C-SIM PAH	X
Di-n-butyltin	Organotins	X
n-Butyltin	Organotins	X
Tetra-n-butyltin	Organotins	X
Tri-n-butyltin	Organotins	X
QA/QC		

If you have any questions regarding this request as checked,
please call Jeff Cotsifas at (707)207-7760

WORK ORDER #: **10-07-1713****SAMPLE RECEIPT FORM**Cooler 1 of 1CLIENT: Pacific EcoriskDATE: 07/23/10**TEMPERATURE:** Thermometer ID: SC1 (Criteria: 0.0 °C – 6.0 °C, not frozen)Temperature 0.6 °C + 0.5 °C (CF) = 1.1 °C ☐ Blank ☒ Sample☐ Sample(s) outside temperature criteria (PM/APM contacted by: _____).☐ Sample(s) outside temperature criteria but received on ice/chilled on same day of sampling.☐ Received at ambient temperature, placed on ice for transport by Courier.Ambient Temperature: ☐ Air ☐ Filter ☐ Metals Only ☐ PCBs OnlyInitial: NC**CUSTODY SEALS INTACT:**☐ Cooler ☐ _____ ☐ No (Not Intact) ☒ Not Present ☐ N/AInitial: NC☐ Sample ☐ _____ ☐ No (Not Intact) ☒ Not PresentInitial: NC**SAMPLE CONDITION:**

	Yes	No	N/A
Chain-Of-Custody (COC) document(s) received with samples.....	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
COC document(s) received complete.....	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

☐ Collection date/time, matrix, and/or # of containers logged in based on sample labels.☐ No analysis requested. ☐ Not relinquished. ☐ No date/time relinquished.Sampler's name indicated on COC..... ☒ ☐ ☐Sample container label(s) consistent with COC..... ☒ ☐ ☐Sample container(s) intact and good condition..... ☐ ☒ ☐Proper containers and sufficient volume for analyses requested..... ☒ ☐ ☐Analyses received within holding time..... ☒ ☐ ☐pH / Residual Chlorine / Dissolved Sulfide received within 24 hours..... ☐ ☐ ☒Proper preservation noted on COC or sample container..... ☐ ☐ ☒☐ Unpreserved vials received for Volatiles analysisVolatile analysis container(s) free of headspace..... ☐ ☐ ☒Tedlar bag(s) free of condensation..... ☐ ☐ ☒**CONTAINER TYPE:**Solid: ☐ 4ozCGJ ☐ 8ozCGJ ☒ 16ozCGJ ☐ Sleeve (____) ☐ EnCores® ☐ TerraCores® ☐ _____Water: ☐ VOA ☐ VOA_h ☐ VOA_{na2} ☐ 125AGB ☐ 125AGB_h ☐ 125AGB_p ☐ 1AGB ☐ 1AGB_{na2} ☐ 1AGB_s☐ 500AGB ☐ 500AGJ ☐ 500AGJ_s ☐ 250AGB ☐ 250CGB ☐ 250CGB_s ☐ 1PB ☐ 500PB ☐ 500PB_{na}☐ 250PB ☐ 250PB_n ☐ 125PB ☐ 125PB_{znna} ☐ 100PJ ☐ 100PJ_{na2} ☐ _____ ☐ _____ ☐ _____Air: ☐ Tedlar® ☐ Summa® Other: ☐ _____ Trip Blank Lot#: _____ Labeled/Checked by: NCContainer: C: Clear A: Amber P: Plastic G: Glass J: Jar B: Bottle Z: Ziploc/Resealable Bag E: Envelope Reviewed by: NCPreservative: h: HCL n: HNO₃ na₂: Na₂S₂O₃ na: NaOH p: H₃PO₄ s: H₂SO₄ znna: ZnAc₂+NaOH f: Field-filtered Scanned by: NC* Samples were frozen per COC. NC

WORK ORDER #: 10-07-1713

SAMPLE ANOMALY FORM

SAMPLES - CONTAINERS & LABELS:

- ☐ Sample(s)/Container(s) NOT RECEIVED but listed on COC
- ☐ Sample(s)/Container(s) received but NOT LISTED on COC
- ☐ Holding time expired – list sample ID(s) and test
- ☐ Insufficient quantities for analysis – list test
- ☐ Improper container(s) used – list test
- ☐ Improper preservative used – list test
- ☐ No preservative noted on COC or label – list test & notify lab
- ☐ Sample labels illegible – note test/container type
- ☐ Sample label(s) do not match COC – Note in comments
 - ☐ Sample ID
 - ☐ Date and/or Time Collected
 - ☐ Project Information
 - ☐ # of Container(s)
 - ☐ Analysis
- ☒ Sample container(s) compromised – Note in comments
 - ☐ Water present in sample container
 - ☒ Broken
 - ☐ Without Label(s)
- ☐ Air sample container(s) compromised – Note in comments
 - ☐ Flat
 - ☐ Very low in volume
 - ☐ Leaking (Not transferred - duplicate bag submitted)
 - ☐ Leaking (transferred into Calscience Tedlar® Bag*)
 - ☐ Leaking (transferred into Client's Tedlar® Bag*)
- ☐ Other: _____

Comments:

(-4) SRC-2010-8-4 received
container (bottom) broken.

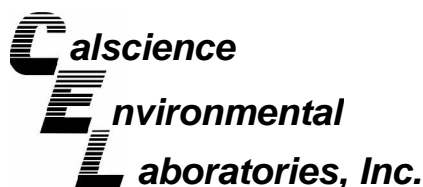
HEADSPACE – Containers with Bubble > 6mm or ¼ inch:

Sample #	Container ID(s)	# of Vials Received	Sample #	Container ID(s)	# of Vials Received	Sample #	Container ID(s)	# of Cont. received	Analysis

Comments: _____

*Transferred at Client's request.

Initial / Date: NC 07/23/10



Supplemental Report 1

July 27, 2010

The original report has been revised/corrected.

Jeff Cotsifas
Pacific Ecorisk
2250 Cordelia Road
Fairfield, CA 94534-1912

Subject: **CalScience Work Order No.: 10-07-1714**
Client Reference: **ACOE (San Rafael Channel)**

Dear Client:

Enclosed is an analytical report for the above-referenced project. The samples included in this report were received 7/23/2010 and analyzed in accordance with the attached chain-of-custody.

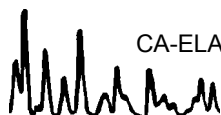
CalScience Environmental Laboratories certifies that the test results provided in this report meet all NELAC requirements for parameters for which accreditation is required or available. Any exceptions to NELAC requirements are noted in the case narrative. The original report of subcontracted analysis, if any, is provided herein, and follows the standard CalScience data package. The results in this analytical report are limited to the samples tested and any reproduction thereof must be made in its entirety.

If you have any questions regarding this report, please do not hesitate to contact the undersigned.

Sincerely,

A handwritten signature in black ink, appearing to read 'Danielle Gonsman', with a horizontal line extending to the right.

CalScience Environmental
Laboratories, Inc.
Danielle Gonsman
Project Manager



CASE NARRATIVE

CalScience Work Order No.: 10-07-1714
Project Name: ACOE (San Rafael Channel)

Provided below is a narrative of our analytical effort, including any unique features or anomalies encountered as part of the analysis of the marine sediment samples.

Sample Condition on Receipt

One sediment sample, housed in an 8oz glass container, was received for this project on July 23, 2010. The sample was transferred to the laboratory in an ice-chest with wet ice, following strict chain-of-custody (COC) procedures. The temperature of the sample upon receipt at the laboratory was 1.1°C. The sample was logged into the Laboratory Information Management System (LIMS), given a laboratory identification number, and then stored under refrigeration pending sediment chemistry testing.

No sample receiving anomalies were noted.

Tests Performed

Trace Metals by EPA 6020
TPH-Diesel by EPA 8015B (M)
TPH-Motor Oil by EPA 8015B (M)
TPH-JP-4 by EPA 8015B (M)
TPH-Gasoline by EPA 8015B (M)
Methoxychlor by EPA 8081A
Phenol and Pentachlorophenol by EPA 8270C SIM
Total Solids by SM 2540 B

Data Summary

All sample concentrations and reporting limits were dry weight corrected.

All samples were homogenized prior to preparation/analysis.

Holding times

According to the client, as referenced on the COC, the sample was stored frozen prior to 6/24/10 and remained in that condition until received by CalScience on 7/23/10. In accordance with the project SAP, the holding time is extended beyond the EPA recommended extraction/analysis time period, and therefore not in violation of the holding time rules.

Calibration

Frequency and control criteria for initial and continuing calibration verifications were met.



Reporting Limits

The Method Detection Limits were met. All sample results were evaluated to the MDL, and where applicable, "J" flags were reported.

Blanks

Concentrations of target analytes in the method blank were found to be below reporting limits for all testing.

Laboratory Control Samples

A Laboratory Control Sample (LCS) analysis was performed for each test and all parameters were within the specified control limits.

Matrix Spikes

Matrix spike analyses were performed at the required frequencies, and all parameters were within control limits for each method with the following exceptions.

The matrix spike and/or matrix spike duplicate recoveries for Barium and Vanadium (by EPA 6020) were out of the acceptance ranges due to matrix interference. However, since the associated PDS/PDSD and LCS/LCSD recoveries were in control, the data are released with no further action.

Since the Manganese concentration found in the sample exceeded the matrix spike concentrations by four times or more, the percent recoveries and RPDs were out of range. Yet, the results are released since the corresponding LCS/LCSD recoveries and RPD value were within the established control limits.

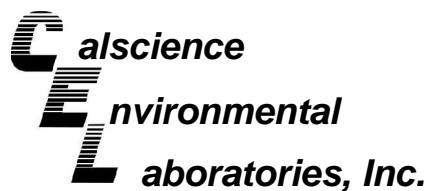
Surrogates

Surrogate recoveries for all applicable tests and samples were within the established control limits.

Acronyms

LCS/LCSD- Laboratory Control Sample/Laboratory Control Sample Duplicate
PDS/PDSD- Post Digestion Spike/Post Digestion Spike Duplicate
MS/MSD- Matrix Spike/Matrix Spike Duplicate
RPD- Relative Percent Difference





Analytical Report



Pacific Ecorisk
2250 Cordelia Road
Fairfield, CA 94534-1912

Date Received: 07/23/10
Work Order No: 10-07-1714
Preparation: N/A
Method: SM 2540 B

Project: ACOE (San Rafael Channel)

Page 1 of 1

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
SRC-2010-8-COMP	10-07-1714-1-A	06/10/10 11:55	Sediment	N/A	07/24/10	07/24/10 16:00	A0724TSB1

Comment(s): -Sample received after recommended holding time.

-Results were evaluated to the MDL, concentrations \geq to the MDL but $<$ RL, if found, are qualified with a "J" flag.

<u>Parameter</u>	<u>Result</u>	<u>RL</u>	<u>MDL</u>	<u>DF</u>	<u>Qual</u>	<u>Units</u>
Solids, Total	54.5	0.100	0.100	1		%

Method Blank	099-05-019-1,442	N/A	Solid	N/A	07/24/10	07/24/10 16:00	A0724TSB1
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Comment(s): -Results were evaluated to the MDL, concentrations \geq to the MDL but $<$ RL, if found, are qualified with a "J" flag.

<u>Parameter</u>	<u>Result</u>	<u>RL</u>	<u>MDL</u>	<u>DF</u>	<u>Qual</u>	<u>Units</u>
Solids, Total	ND	0.100	0.100	1		%

RL - Reporting Limit , DF - Dilution Factor , Qual - Qualifiers

Analytical Report



Pacific Ecorisk
2250 Cordelia Road
Fairfield, CA 94534-1912

Date Received: 07/23/10
Work Order No: 10-07-1714
Preparation: EPA 3550B
Method: EPA 8015B (M)

Project: ACOE (San Rafael Channel)

Page 1 of 1

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
SRC-2010-8-COMP	10-07-1714-1-A	06/10/10 11:55	Sediment	GC 27	07/23/10	07/24/10 01:52	100723B26

Comment(s): -Results were evaluated to the MDL, concentrations \geq to the MDL but $<$ RL, if found, are qualified with a "J" flag.
-Results are reported on a dry weight basis.

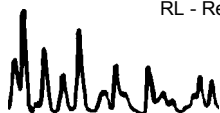
Parameter	Result	RL	MDL	DF	Qual	Units
TPH as Motor Oil	210	46	13	1		mg/kg
Surrogates:	<u>REC (%)</u>	<u>Control Limits</u>	<u>MDL</u>		<u>Qual</u>	
Decachlorobiphenyl	121	61-145				

Method Blank	099-12-254-1,365	N/A	Solid	GC 27	07/23/10	07/23/10 22:00	100723B26
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Comment(s): -Results were evaluated to the MDL, concentrations \geq to the MDL but $<$ RL, if found, are qualified with a "J" flag.

Parameter	Result	RL	MDL	DF	Qual	Units
TPH as Motor Oil	ND	25	7.0	1		mg/kg
Surrogates:	<u>REC (%)</u>	<u>Control Limits</u>	<u>MDL</u>		<u>Qual</u>	
Decachlorobiphenyl	98	61-145				

RL - Reporting Limit , DF - Dilution Factor , Qual - Qualifiers



Analytical Report



Pacific Ecorisk
 2250 Cordelia Road
 Fairfield, CA 94534-1912

Date Received: 07/23/10
 Work Order No: 10-07-1714
 Preparation: EPA 3550B
 Method: EPA 8015B (M)

Project: ACOE (San Rafael Channel)

Page 1 of 1

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
SRC-2010-8-COMP	10-07-1714-1-A	06/10/10 11:55	Sediment	GC 27	07/23/10	07/24/10 01:52	100723B25

Comment(s): -The sample chromatographic pattern for TPH does not match the chromatographic pattern of the specified standard.
 Quantitation of the unknown hydrocarbon(s) in the sample was based upon the specified standard.
 -Results were evaluated to the MDL, concentrations \geq to the MDL but $<$ RL, if found, are qualified with a "J" flag.
 -Results are reported on a dry weight basis.

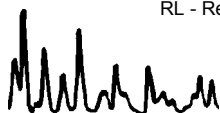
Parameter	Result	RL	MDL	DF	Qual	Units
TPH as Diesel	51	9.2	8.8	1		mg/kg
<u>Surrogates:</u>	<u>REC (%)</u>	<u>Control Limits</u>	<u>MDL</u>		<u>Qual</u>	
Decachlorobiphenyl	121	61-145				

Method Blank	099-12-275-3,578	N/A	Solid	GC 27	07/23/10	07/23/10 22:00	100723B25
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Comment(s): -Results were evaluated to the MDL, concentrations \geq to the MDL but $<$ RL, if found, are qualified with a "J" flag.

Parameter	Result	RL	MDL	DF	Qual	Units
TPH as Diesel	ND	5.0	4.8	1		mg/kg
<u>Surrogates:</u>	<u>REC (%)</u>	<u>Control Limits</u>	<u>MDL</u>		<u>Qual</u>	
Decachlorobiphenyl	98	61-145				

RL - Reporting Limit , DF - Dilution Factor , Qual - Qualifiers



Analytical Report



Pacific Ecorisk
 2250 Cordelia Road
 Fairfield, CA 94534-1912

Date Received: 07/23/10
 Work Order No: 10-07-1714
 Preparation: EPA 3550B
 Method: EPA 8015B (M)

Project: ACOE (San Rafael Channel)

Page 1 of 1

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
SRC-2010-8-COMP	10-07-1714-1-A	06/10/10 11:55	Sediment	GC 27	07/23/10	07/24/10 19:13	100723B27

Comment(s): -The sample chromatographic pattern for TPH does not match the chromatographic pattern of the specified standard.
 Quantitation of the unknown hydrocarbon(s) in the sample was based upon the specified standard.
 -Results were evaluated to the MDL, concentrations \geq to the MDL but $<$ RL, if found, are qualified with a "J" flag.
 -Results are reported on a dry weight basis.

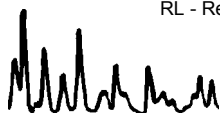
Parameter	Result	RL	MDL	DF	Qual	Units
TPH as JP4	15	9.2	8.8	1		mg/kg
<u>Surrogates:</u>	<u>REC (%)</u>	<u>Control Limits</u>	<u>MDL</u>		<u>Qual</u>	
Decachlorobiphenyl	122	61-145				

Method Blank	099-12-293-7	N/A	Solid	GC 27	07/23/10	07/24/10 17:43	100723B27
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Comment(s): -Results were evaluated to the MDL, concentrations \geq to the MDL but $<$ RL, if found, are qualified with a "J" flag.

Parameter	Result	RL	MDL	DF	Qual	Units
TPH as JP4	ND	5.0	4.8	1		mg/kg
<u>Surrogates:</u>	<u>REC (%)</u>	<u>Control Limits</u>	<u>MDL</u>		<u>Qual</u>	
Decachlorobiphenyl	98	61-145				

RL - Reporting Limit , DF - Dilution Factor , Qual - Qualifiers



Analytical Report



Pacific Ecorisk
 2250 Cordelia Road
 Fairfield, CA 94534-1912

Date Received: 07/23/10
 Work Order No: 10-07-1714
 Preparation: EPA 5030B
 Method: EPA 8015B (M)

Project: ACOE (San Rafael Channel)

Page 1 of 1

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
SRC-2010-8-COMP	10-07-1714-1-A	06/10/10 11:55	Sediment	GC 42	07/23/10	07/24/10 09:07	100723B02

Comment(s): -Results were evaluated to the MDL, concentrations >= to the MDL but < RL, if found, are qualified with a "J" flag.
 -Results are reported on a dry weight basis.

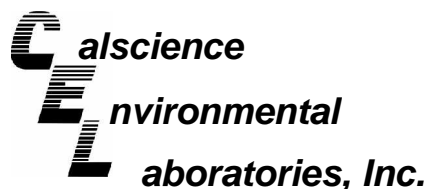
Parameter	Result	RL	MDL	DF	Qual	Units
TPH as Gasoline	ND	0.92	0.77	1		mg/kg
Surrogates:	REC (%)	Control Limits	MDL		Qual	
1,4-Bromofluorobenzene	89	42-126				

Method Blank	099-12-279-3,807	N/A	Solid	GC 42	07/23/10	07/23/10 18:29	100723B02
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Comment(s): -Results were evaluated to the MDL, concentrations >= to the MDL but < RL, if found, are qualified with a "J" flag.

Parameter	Result	RL	MDL	DF	Qual	Units
TPH as Gasoline	ND	0.50	0.42	1		mg/kg
Surrogates:	REC (%)	Control Limits	MDL		Qual	
1,4-Bromofluorobenzene - FID	93	42-126				

RL - Reporting Limit , DF - Dilution Factor , Qual - Qualifiers



Analytical Report



Pacific Ecorisk
2250 Cordelia Road
Fairfield, CA 94534-1912

Date Received: 07/23/10
Work Order No: 10-07-1714
Preparation: EPA 3545
Method: EPA 8270C SIM
Units: ug/kg

Project: ACOE (San Rafael Channel)

Page 1 of 1

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
SRC-2010-8-COMP	10-07-1714-1-A	06/10/10 11:55	Sediment	GC/MS MM	07/23/10	07/24/10 15:28	100723L15

Comment(s): -Results were evaluated to the MDL, concentrations \geq to the MDL but $<$ RL, if found, are qualified with a "J" flag.

-Results are reported on a dry weight basis.

Parameter	Result	RL	MDL	DF	Qual	Parameter	Result	RL	MDL	DF	Qual
Pentachlorophenol	ND	230	25	0.25		Phenol	ND	4.6	0.83	0.25	
Surrogates:	REC (%)	Control Limits	Qual			Surrogates:	REC (%)	Control Limits	Qual		
2,4,6-Tribromophenol	101	32-143				2-Fluorobiphenyl	90	14-146			
2-Fluorophenol	82	15-138				Nitrobenzene-d5	89	18-162			
p-Terphenyl-d14	72	34-148				Phenol-d6	87	17-141			

Method Blank	099-12-413-283	N/A	Solid	GC/MS MM	07/23/10	07/24/10 14:12	100723L15
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Comment(s): -Results were evaluated to the MDL, concentrations \geq to the MDL but $<$ RL, if found, are qualified with a "J" flag.

Parameter	Result	RL	MDL	DF	Qual	Parameter	Result	RL	MDL	DF	Qual
Pentachlorophenol	ND	120	14	0.25		Phenol	ND	2.5	0.45	0.25	
Surrogates:	REC (%)	Control Limits	Qual			Surrogates:	REC (%)	Control Limits	Qual		
2,4,6-Tribromophenol	99	32-143				2-Fluorobiphenyl	98	14-146			
2-Fluorophenol	109	15-138				Nitrobenzene-d5	104	18-162			
p-Terphenyl-d14	95	34-148				Phenol-d6	107	17-141			

RL - Reporting Limit , DF - Dilution Factor , Qual - Qualifiers



Analytical Report



Pacific Ecorisk
2250 Cordelia Road
Fairfield, CA 94534-1912

Date Received: 07/23/10
Work Order No: 10-07-1714
Preparation: EPA 3545
Method: EPA 8081A

Project: ACOE (San Rafael Channel)

Page 1 of 1

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
SRC-2010-8-COMP	10-07-1714-1-A	06/10/10 11:55	Sediment	GC 41	07/23/10	07/26/10 14:33	100723L12

Comment(s): -Results were evaluated to the MDL, concentrations \geq to the MDL but $<$ RL, if found, are qualified with a "J" flag.
-Results are reported on a dry weight basis.

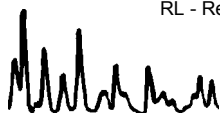
Parameter	Result	RL	MDL	DF	Qual	Units
Methoxychlor	ND	1.8	0.31	1		ug/kg
Surrogates:	REC (%)	Control Limits	MDL		Qual	
2,4,5,6-Tetrachloro-m-Xylene	88	50-130				
Decachlorobiphenyl	58	50-130				

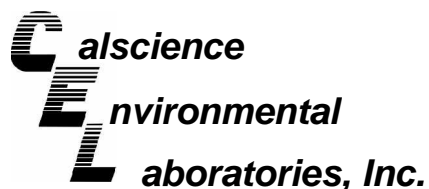
Method Blank	099-12-858-70	N/A	Solid	GC 41	07/23/10	07/26/10 12:12	100723L12
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Comment(s): -Results were evaluated to the MDL, concentrations \geq to the MDL but $<$ RL, if found, are qualified with a "J" flag.

Parameter	Result	RL	MDL	DF	Qual	Units
Methoxychlor	ND	1.0	0.17	1		ug/kg
Surrogates:	REC (%)	Control Limits	MDL		Qual	
2,4,5,6-Tetrachloro-m-Xylene	105	50-130				
Decachlorobiphenyl	101	50-130				

RL - Reporting Limit , DF - Dilution Factor , Qual - Qualifiers





Analytical Report



Pacific Ecorisk
2250 Cordelia Road
Fairfield, CA 94534-1912

Date Received: 07/23/10
Work Order No: 10-07-1714
Preparation: EPA 3050B
Method: EPA 6020
Units: mg/kg

Project: ACOE (San Rafael Channel)

Page 1 of 1

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
SRC-2010-8-COMP	10-07-1714-1-A	06/10/10 11:55	Sediment	ICP/MS 04	07/23/10	07/23/10 19:33	100723L04

Comment(s): -Results were evaluated to the MDL, concentrations \geq to the MDL but $<$ RL, if found, are qualified with a "J" flag.
-Results are reported on a dry weight basis.

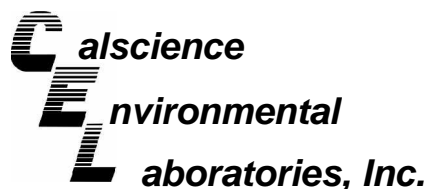
Parameter	Result	RL	MDL	DF	Qual	Parameter	Result	RL	MDL	DF	Qual
Barium	58.7	0.183	0.0409	1		Cobalt	11.0	0.183	0.0124	1	
Beryllium	0.276	0.183	0.0323	1		Vanadium	32.9	1.83	0.0415	1	B

Method Blank	096-10-002-1,785	N/A	Solid	ICP/MS 04	07/23/10	07/23/10 18:15	100723L04
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Comment(s): -Results were evaluated to the MDL, concentrations \geq to the MDL but $<$ RL, if found, are qualified with a "J" flag.

Parameter	Result	RL	MDL	DF	Qual	Parameter	Result	RL	MDL	DF	Qual
Barium	ND	0.100	0.0223	1		Cobalt	ND	0.100	0.00674	1	
Beryllium	ND	0.100	0.0176	1		Vanadium	0.0622	1.00	0.0226	1	J

RL - Reporting Limit , DF - Dilution Factor , Qual - Qualifiers



Analytical Report



Pacific Ecorisk
2250 Cordelia Road
Fairfield, CA 94534-1912

Date Received: 07/23/10
Work Order No: 10-07-1714
Preparation: EPA 3050B
Method: EPA 6020
Units: mg/kg

Project: ACOE (San Rafael Channel)

Page 1 of 1

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
SRC-2010-8-COMP	10-07-1714-1-A	06/10/10 11:55	Sediment	ICP/MS 04	07/23/10	07/23/10 19:33	100723L04

Comment(s): -Results were evaluated to the MDL, concentrations \geq to the MDL but $<$ RL, if found, are qualified with a "J" flag.
-Results are reported on a dry weight basis.

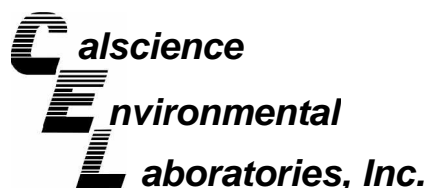
Parameter	Result	RL	MDL	DF	Qual	Parameter	Result	RL	MDL	DF	Qual
Manganese	241	4.59	1.34	1		Boron	25.1	45.9	6.77	1	J

Method Blank	096-10-002-1,786	N/A	Solid	ICP/MS 04	07/23/10	07/23/10 18:15	100723L04
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Comment(s): -Results were evaluated to the MDL, concentrations \geq to the MDL but $<$ RL, if found, are qualified with a "J" flag.

Parameter	Result	RL	MDL	DF	Qual	Parameter	Result	RL	MDL	DF	Qual
Manganese	ND	2.50	0.728	1		Boron	ND	25.0	3.69	1	

RL - Reporting Limit , DF - Dilution Factor , Qual - Qualifiers



Quality Control - Spike/Spike Duplicate



Pacific Ecorisk
2250 Cordelia Road
Fairfield, CA 94534-1912

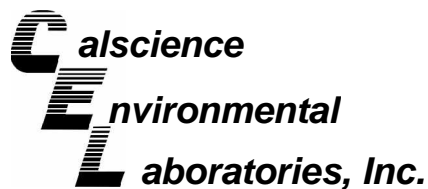
Date Received: 07/23/10
Work Order No: 10-07-1714
Preparation: EPA 3050B
Method: EPA 6020

Project ACOE (San Rafael Channel)

Quality Control Sample ID	Matrix	Instrument	Date Prepared	Date Analyzed	MS/MSD Batch Number
10-07-1715-1	Sediment	ICP/MS 04	07/23/10	07/23/10	100723S04

Parameter	MS %REC	MSD %REC	%REC CL	RPD	RPD CL	Qualifiers
Barium	66	79	80-120	6	0-20	3
Beryllium	99	104	80-120	5	0-20	
Cobalt	89	95	80-120	5	0-20	
Vanadium	79	85	80-120	3	0-20	3
Manganese	4X	4X	80-120	4X	0-20	Q
Boron	89	92	80-120	2	0-20	

RPD - Relative Percent Difference , CL - Control Limit



Quality Control - PDS / PDSD



Pacific Ecorisk
2250 Cordelia Road
Fairfield, CA 94534-1912

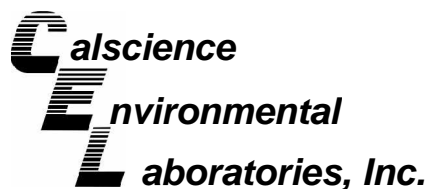
Date Received 07/23/10
Work Order No: 10-07-1714
Preparation: EPA 3050B
Method: EPA 6020

Project: ACOE (San Rafael Channel)

Quality Control Sample ID	Matrix	Instrument	Date Prepared	Date Analyzed	PDS / PDSD Batch Number
10-07-1715-1	Sediment	ICP/MS 04	07/23/10	07/23/10	100723S04

Parameter	PDS %REC	PDSD %REC	%REC CL	RPD	RPD CL	Qualifiers
Barium	62	63	75-125	1	0-20	
Beryllium	88	84	75-125	4	0-20	
Cobalt	90	89	75-125	1	0-20	
Vanadium	91	93	75-125	1	0-20	
Manganese	4X	4X	75-125	4X	0-20	Q
Boron	78	82	75-125	4	0-20	

RPD - Relative Percent Difference , CL - Control Limit



Quality Control - Duplicate



Pacific Ecorisk
2250 Cordelia Road
Fairfield, CA 94534-1912

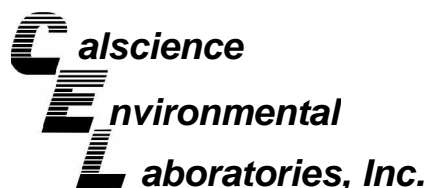
Date Received: 07/23/10
Work Order No: 10-07-1714
Preparation: N/A
Method: SM 2540 B

Project: ACOE (San Rafael Channel)

Quality Control Sample ID	Matrix	Instrument	Date Prepared:	Date Analyzed:	Duplicate Batch Number
SRC-2010-8-COMP	Sediment	N/A	07/24/10	07/24/10	A0724TSD1

<u>Parameter</u>	<u>Sample Conc.</u>	<u>DUP Conc</u>	<u>RPD</u>	<u>RPD CL</u>	<u>Qualifiers</u>
Solids, Total	54.5	54.9	1	0-25	

RPD - Relative Percent Difference , CL - Control Limit



Quality Control - Spike/Spike Duplicate



Pacific Ecorisk
2250 Cordelia Road
Fairfield, CA 94534-1912

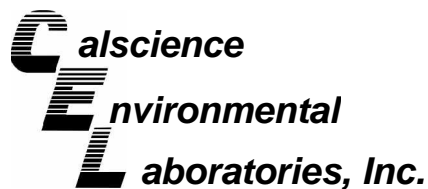
Date Received: 07/23/10
Work Order No: 10-07-1714
Preparation: EPA 3550B
Method: EPA 8015B (M)

Project ACOE (San Rafael Channel)

Quality Control Sample ID	Matrix	Instrument	Date Prepared	Date Analyzed	MS/MSD Batch Number
SRC-2010-8-COMP	Sediment	GC 27	07/23/10	07/24/10	100723S26

Parameter	MS %REC	MSD %REC	%REC CL	RPD	RPD CL	Qualifiers
TPH as Motor Oil	89	105	64-130	12	0-15	

RPD - Relative Percent Difference , CL - Control Limit



Quality Control - Spike/Spike Duplicate



Pacific Ecorisk
2250 Cordelia Road
Fairfield, CA 94534-1912

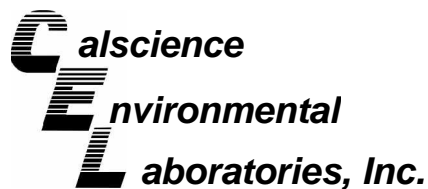
Date Received: 07/23/10
Work Order No: 10-07-1714
Preparation: EPA 3550B
Method: EPA 8015B (M)

Project ACOE (San Rafael Channel)

Quality Control Sample ID	Matrix	Instrument	Date Prepared	Date Analyzed	MS/MSD Batch Number
SRC-2010-8-COMP	Sediment	GC 27	07/23/10	07/23/10	100723S25

Parameter	MS %REC	MSD %REC	%REC CL	RPD	RPD CL	Qualifiers
TPH as Diesel	90	82	64-130	9	0-15	

RPD - Relative Percent Difference , CL - Control Limit



Quality Control - Spike/Spike Duplicate



Pacific Ecorisk
2250 Cordelia Road
Fairfield, CA 94534-1912

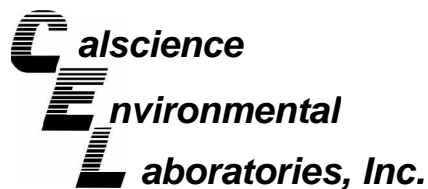
Date Received: 07/23/10
Work Order No: 10-07-1714
Preparation: EPA 3550B
Method: EPA 8015B (M)

Project ACOE (San Rafael Channel)

Quality Control Sample ID	Matrix	Instrument	Date Prepared	Date Analyzed	MS/MSD Batch Number
SRC-2010-8-COMP	Sediment	GC 27	07/23/10	07/24/10	100723S27

Parameter	MS %REC	MSD %REC	%REC CL	RPD	RPD CL	Qualifiers
TPH as JP4	103	99	64-130	3	0-15	

RPD - Relative Percent Difference , CL - Control Limit



Quality Control - Spike/Spike Duplicate



Pacific Ecorisk
2250 Cordelia Road
Fairfield, CA 94534-1912

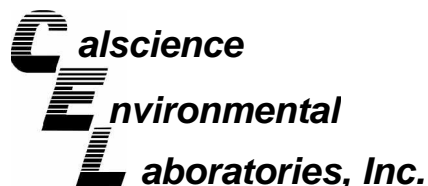
Date Received: 07/23/10
Work Order No: 10-07-1714
Preparation: EPA 5030B
Method: EPA 8015B (M)

Project ACOE (San Rafael Channel)

Quality Control Sample ID	Matrix	Instrument	Date Prepared	Date Analyzed	MS/MSD Batch Number
10-07-1600-5	Solid	GC 42	07/23/10	07/24/10	100723S02

Parameter	MS %REC	MSD %REC	%REC CL	RPD	RPD CL	Qualifiers
TPH as Gasoline	77	78	48-114	1	0-23	

RPD - Relative Percent Difference , CL - Control Limit



Quality Control - Spike/Spike Duplicate



Pacific Ecorisk
2250 Cordelia Road
Fairfield, CA 94534-1912

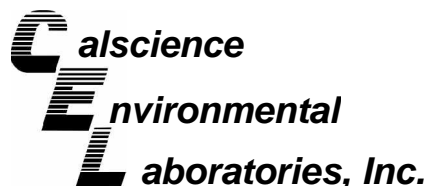
Date Received: 07/23/10
Work Order No: 10-07-1714
Preparation: EPA 3545
Method: EPA 8270C SIM

Project ACOE (San Rafael Channel)

Quality Control Sample ID	Matrix	Instrument	Date Prepared	Date Analyzed	MS/MSD Batch Number
SRC-2010-8-COMP	Sediment	GC/MS MM	07/23/10	07/24/10	100723S15

Parameter	MS %REC	MSD %REC	%REC CL	RPD	RPD CL	Qualifiers
2,4,6-Trichlorophenol	69	73	40-160	6	0-20	
2,4-Dichlorophenol	66	68	40-160	3	0-20	
2-Methylphenol	66	69	40-160	5	0-20	
2-Nitrophenol	73	76	40-160	5	0-20	
4-Chloro-3-Methylphenol	76	80	40-160	5	0-20	
Acenaphthene	62	65	40-106	4	0-20	
Benzo (a) Pyrene	59	62	17-163	3	0-20	
Chrysene	46	50	17-168	4	0-20	
Di-n-Butyl Phthalate	56	59	40-160	4	0-20	
Dimethyl Phthalate	72	74	40-160	2	0-20	
Fluoranthene	43	46	26-137	3	0-20	
Fluorene	63	65	59-121	3	0-20	
Naphthalene	62	65	21-133	4	0-20	
Phenanthrene	58	62	54-120	5	0-20	
Phenol	88	91	40-160	4	0-20	
Pyrene	46	49	6-156	2	0-46	

RPD - Relative Percent Difference , CL - Control Limit



Quality Control - Spike/Spike Duplicate



Pacific Ecorisk
2250 Cordelia Road
Fairfield, CA 94534-1912

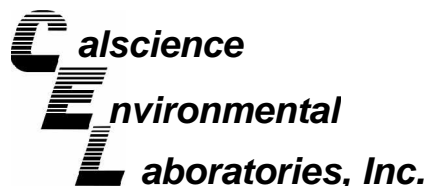
Date Received: 07/23/10
Work Order No: 10-07-1714
Preparation: EPA 3545
Method: EPA 8081A

Project ACOE (San Rafael Channel)

Quality Control Sample ID	Matrix	Instrument	Date Prepared	Date Analyzed	MS/MSD Batch Number
10-07-1715-1	Sediment	GC 41	07/23/10	07/27/10	100723S12

Parameter	MS %REC	MSD %REC	%REC CL	RPD	RPD CL	Qualifiers
Aldrin	71	69	50-135	3	0-25	
Alpha-BHC	88	86	50-135	3	0-25	
Beta-BHC	83	80	50-135	4	0-25	
Delta-BHC	88	86	50-135	3	0-25	
Gamma-BHC	79	76	50-135	4	0-25	
Dieldrin	83	79	50-135	4	0-25	
4,4'-DDD	85	83	50-135	2	0-25	
4,4'-DDE	87	84	50-135	3	0-25	
4,4'-DDT	106	101	50-135	5	0-25	
Endosulfan I	72	68	50-135	5	0-25	
Endosulfan II	78	75	50-135	4	0-25	
Endosulfan Sulfate	86	82	50-135	4	0-25	
Endrin	80	76	50-135	4	0-25	
Endrin Aldehyde	69	59	50-135	16	0-25	
Endrin Ketone	96	94	50-135	2	0-25	
Heptachlor	68	66	50-135	4	0-25	
Heptachlor Epoxide	73	71	50-135	3	0-25	
Methoxychlor	88	88	50-135	0	0-25	
Alpha Chlordane	76	73	50-135	4	0-25	
Gamma Chlordane	77	74	50-135	3	0-25	

RPD - Relative Percent Difference , CL - Control Limit



Quality Control - LCS/LCS Duplicate



Pacific Ecorisk
2250 Cordelia Road
Fairfield, CA 94534-1912

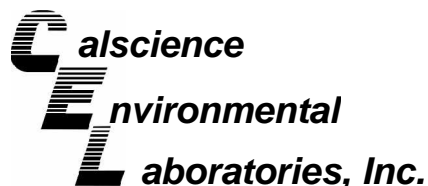
Date Received: N/A
Work Order No: 10-07-1714
Preparation: EPA 3050B
Method: EPA 6020

Project: ACOE (San Rafael Channel)

Quality Control Sample ID	Matrix	Instrument	Date Prepared	Date Analyzed	LCS/LCSD Batch Number
096-10-002-1,785	Solid	ICP/MS 04	07/23/10	07/23/10	100723L04

Parameter	LCS %REC	LCSD %REC	%REC CL	RPD	RPD CL	Qualifiers
Barium	90	90	80-120	0	0-20	
Beryllium	104	99	80-120	4	0-20	
Cobalt	99	98	80-120	1	0-20	
Vanadium	97	96	80-120	1	0-20	

RPD - Relative Percent Difference , CL - Control Limit



Quality Control - LCS/LCS Duplicate



Pacific Ecorisk
2250 Cordelia Road
Fairfield, CA 94534-1912

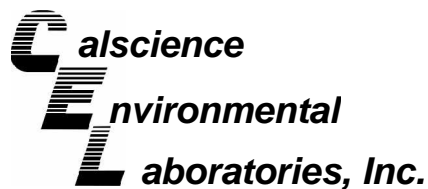
Date Received: N/A
Work Order No: 10-07-1714
Preparation: EPA 3050B
Method: EPA 6020

Project: ACOE (San Rafael Channel)

Quality Control Sample ID	Matrix	Instrument	Date Prepared	Date Analyzed	LCS/LCSD Batch Number
096-10-002-1,786	Solid	ICP/MS 04	07/23/10	07/23/10	100723L04

Parameter	LCS %REC	LCSD %REC	%REC CL	RPD	RPD CL	Qualifiers
Manganese	96	95	80-120	1	0-20	
Boron	98	99	80-120	1	0-20	

RPD - Relative Percent Difference , CL - Control Limit



Quality Control - LCS/LCS Duplicate



Pacific Ecorisk
2250 Cordelia Road
Fairfield, CA 94534-1912

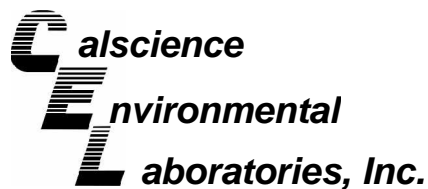
Date Received: N/A
Work Order No: 10-07-1714
Preparation: EPA 3550B
Method: EPA 8015B (M)

Project: ACOE (San Rafael Channel)

Quality Control Sample ID	Matrix	Instrument	Date Prepared	Date Analyzed	LCS/LCSD Batch Number
099-12-254-1,365	Solid	GC 27	07/23/10	07/23/10	100723B26

Parameter	LCS %REC	LCSD %REC	%REC CL	RPD	RPD CL	Qualifiers
TPH as Motor Oil	96	87	75-123	10	0-12	

RPD - Relative Percent Difference , CL - Control Limit



Quality Control - LCS/LCS Duplicate



Pacific Ecorisk
2250 Cordelia Road
Fairfield, CA 94534-1912

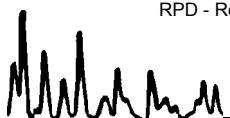
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Work Order No: 10-07-1714
Preparation: EPA 3550B
Method: EPA 8015B (M)

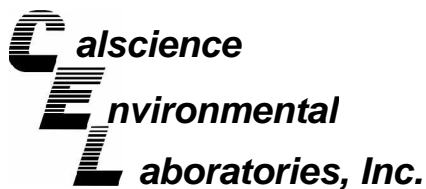
Project: ACOE (San Rafael Channel)

Quality Control Sample ID	Matrix	Instrument	Date Prepared	Date Analyzed	LCS/LCSD Batch Number
099-12-275-3,578	Solid	GC 27	07/23/10	07/23/10	100723B25

Parameter	LCS %REC	LCSD %REC	%REC CL	RPD	RPD CL	Qualifiers
TPH as Diesel	94	93	75-123	1	0-12	

RPD - Relative Percent Difference , CL - Control Limit





Quality Control - LCS/LCS Duplicate



Pacific Ecorisk
2250 Cordelia Road
Fairfield, CA 94534-1912

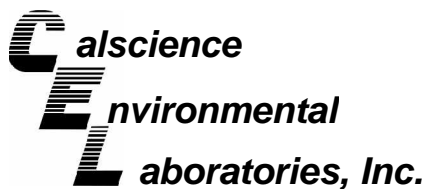
Date Received: N/A
Work Order No: 10-07-1714
Preparation: EPA 3550B
Method: EPA 8015B (M)

Project: ACOE (San Rafael Channel)

Quality Control Sample ID	Matrix	Instrument	Date Prepared	Date Analyzed	LCS/LCSD Batch Number
099-12-293-7	Solid	GC 27	07/23/10	07/24/10	100723B27

Parameter	LCS %REC	LCSD %REC	%REC CL	RPD	RPD CL	Qualifiers
TPH as JP4	89	90	75-123	1	0-12	

RPD - Relative Percent Difference , CL - Control Limit



Quality Control - LCS/LCS Duplicate



Pacific Ecorisk
2250 Cordelia Road
Fairfield, CA 94534-1912

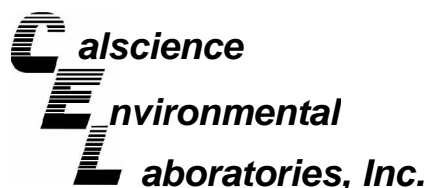
Date Received: N/A
Work Order No: 10-07-1714
Preparation: EPA 5030B
Method: EPA 8015B (M)

Project: ACOE (San Rafael Channel)

Quality Control Sample ID	Matrix	Instrument	Date Prepared	Date Analyzed	LCS/LCSD Batch Number
099-12-279-3,807	Solid	GC 42	07/23/10	07/23/10	100723B02

Parameter	LCS %REC	LCSD %REC	%REC CL	RPD	RPD CL	Qualifiers
TPH as Gasoline	87	87	70-124	1	0-18	

RPD - Relative Percent Difference , CL - Control Limit



Quality Control - LCS/LCS Duplicate



Pacific Ecorisk
2250 Cordelia Road
Fairfield, CA 94534-1912

Date Received: N/A
Work Order No: 10-07-1714
Preparation: EPA 3545
Method: EPA 8270C SIM

Project: ACOE (San Rafael Channel)

Quality Control Sample ID	Matrix	Instrument	Date Prepared	Date Analyzed	LCS/LCSD Batch Number		
099-12-413-283	Solid	GC/MS MM	07/23/10	07/24/10	100723L15		
Parameter	LCS %REC	LCSD %REC	%REC CL	ME CL	RPD	RPD CL	Qualifiers
2,4,6-Trichlorophenol	91	92	40-160	20-180	2	0-20	
2,4-Dichlorophenol	96	96	40-160	20-180	0	0-20	
2-Methylphenol	100	100	40-160	20-180	0	0-20	
2-Nitrophenol	63	62	40-160	20-180	0	0-20	
4-Chloro-3-Methylphenol	113	112	40-160	20-180	1	0-20	
Acenaphthene	100	100	48-108	38-118	1	0-11	
Benzo (a) Pyrene	97	96	17-163	0-187	1	0-20	
Chrysene	92	92	17-168	0-193	1	0-20	
Di-n-Butyl Phthalate	87	89	40-160	20-180	2	0-20	
Dimethyl Phthalate	97	96	40-160	20-180	1	0-20	
Fluoranthene	89	90	26-137	8-156	1	0-20	
Fluorene	106	105	59-121	49-131	1	0-20	
Naphthalene	102	101	21-133	2-152	0	0-20	
Phenanthrene	88	88	54-120	43-131	1	0-20	
Phenol	119	120	40-160	20-180	1	0-20	
Pyrene	91	92	28-106	15-119	0	0-16	

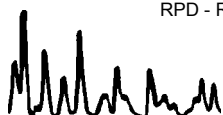
Total number of LCS compounds : 16

Total number of ME compounds : 0

Total number of ME compounds allowed : 1

LCS ME CL validation result : Pass

RPD - Relative Percent Difference , CL - Control Limit





Quality Control - Laboratory Control Sample



Pacific Ecorisk
2250 Cordelia Road
Fairfield, CA 94534-1912

Date Received: N/A
Work Order No: 10-07-1714
Preparation: EPA 3545
Method: EPA 8081A

Project: ACOE (San Rafael Channel)

Quality Control Sample ID	Matrix	Instrument	Date Analyzed	Lab File ID	LCS Batch Number
099-12-858-70	Solid	GC 41	07/26/10	10072605	100723L12

Parameter	Conc Added	Conc Recovered	LCS %Rec	%Rec CL	ME_CL	Qualifiers
Aldrin	5.00	4.74	95	50-135	36-149	
Alpha-BHC	5.00	4.47	89	50-135	36-149	
Beta-BHC	5.00	4.52	90	50-135	36-149	
Delta-BHC	5.00	2.57	51	50-135	36-149	
Gamma-BHC	5.00	4.53	91	50-135	36-149	
Dieldrin	5.00	4.80	96	50-135	36-149	
4,4'-DDD	5.00	4.55	91	50-135	36-149	
4,4'-DDE	5.00	4.46	89	50-135	36-149	
4,4'-DDT	5.00	5.04	101	50-135	36-149	
Endosulfan I	5.00	4.73	95	50-135	36-149	
Endosulfan II	5.00	4.70	94	50-135	36-149	
Endosulfan Sulfate	5.00	4.29	86	50-135	36-149	
Endrin	5.00	5.01	100	50-135	36-149	
Endrin Aldehyde	5.00	4.58	92	50-135	36-149	
Endrin Ketone	5.00	4.83	97	50-135	36-149	
Heptachlor	5.00	4.98	100	50-135	36-149	
Heptachlor Epoxide	5.00	4.52	90	50-135	36-149	
Methoxychlor	5.00	4.82	96	50-135	36-149	
Alpha Chlordane	5.00	4.80	96	50-135	36-149	
Gamma Chlordane	5.00	4.59	92	50-135	36-149	

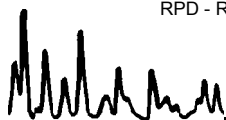
Total number of LCS compounds : 20

Total number of ME compounds: 0

Total number of ME compounds allowed : 1

LCS ME CL validation result : Pass

RPD - Relative Percent Difference , CL - Control Limit



Glossary of Terms and Qualifiers



Work Order Number: 10-07-1714

<u>Qualifier</u>	<u>Definition</u>
*	See applicable analysis comment.
<	Less than the indicated value.
>	Greater than the indicated value.
1	Surrogate compound recovery was out of control due to a required sample dilution, therefore, the sample data was reported without further clarification.
2	Surrogate compound recovery was out of control due to matrix interference. The associated method blank surrogate spike compound was in control and, therefore, the sample data was reported without further clarification.
3	Recovery of the Matrix Spike (MS) or Matrix Spike Duplicate (MSD) compound was out of control due to matrix interference. The associated LCS and/or LCSD was in control and, therefore, the sample data was reported without further clarification.
4	The MS/MSD RPD was out of control due to matrix interference. The LCS/LCSD RPD was in control and, therefore, the sample data was reported without further clarification.
5	The PDS/PDSD or PES/PESD associated with this batch of samples was out of control due to a matrix interference effect. The associated batch LCS/LCSD was in control and, hence, the associated sample data was reported without further clarification.
B	Analyte was present in the associated method blank.
E	Concentration exceeds the calibration range.
J	Analyte was detected at a concentration below the reporting limit and above the laboratory method detection limit. Reported value is estimated.
ME	LCS Recovery Percentage is within LCS ME Control Limit range.
ND	Parameter not detected at the indicated reporting limit.
Q	Spike recovery and RPD control limits do not apply resulting from the parameter concentration in the sample exceeding the spike concentration by a factor of four or greater.
X	% Recovery and/or RPD out-of-range.
Z	Analyte presence was not confirmed by second column or GC/MS analysis.
	Solid - Unless otherwise indicated, solid sample data is reported on a wet weight basis, not corrected for % moisture.





Pacific EcoRisk

ENVIRONMENTAL CONSULTING & TESTING

2250 Cordelia Rd., Fairfield, CA 94534

(707)207-7760

Calscience CHAIN-OF-CUSTODY RECORD

1714

Client Name:		Pacific EcoRisk				REQUESTED ANALYSIS														
Client Address:		2250 Cordelia Rd. Fairfield, CA 94534				See analyte list														
Sampled By:		Mike McElroy																		
Phone:		(707) 207-7760																		
FAX:		(707) 207-7916																		
Project Manager:		Jeff Cotsifas																		
Project Name:		ACOE (San Rafael Channel)																		
PO Number:		16087																		
Client Sample ID	Sample Date	Sample Time	Sample Matrix*	Container																
				Number	Type															
1 SRC-2010-8-Comp	6/10/10	11:55	Sed	1	8oz glass	x														
2																				
3																				
4																				
5																				
6																				
7																				
8																				
9																				
10																				
Correct Containers:		Yes	No	RELIQUINSHED BY																
Sample Temperature:		Ambient	Cold	Warm	Signature:						Signature:									
Sample Preservative:		Yes	No		Print:		JEREMY LAWIN				Print:									
Turnaround Time:		STD	Specify:		Organization:		FOR				Organization:									
Comments: Sample frozen prior to 6/24/10					DATE:		7/22/10		TIME:		1700		DATE:		TIME:					
					RECEIVED BY															
					Signature:						Signature:									
					Print:		Noel Cruise				Print:									
					Organization:		CALSCIENCE				Organization:									
					DATE:		07/23/10		TIME:		1030		DATE:		TIME:					

*MATRIX CODES: (SED = Sediment); (FW = Freshwater); (WW = Wastewater); (STRMW = Stormwater)

ANALYTE LIST

Pacific EcoRisk
 2250 Cordelia Rd.
 Fairfield, CA 94534

Project Proponent: Pacific EcoRisk

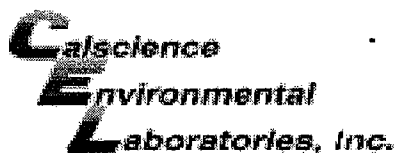
Project #: 16087

1714

Site #: SRC-2010-8-Comp

Standard Hamilton Wetlands List

Barium	6020	X
Beryllium	6020	X
Boron	6010B	X
Cobalt	6020	X
Manganese	6020	X
Vanadium	6020	X
TPH Diesel / motor oil	8015	X
TPH Gasoline / JP-4	8015B	X
Pentachlorophenol	8270C	X
Phenol	8270C	X
Dichlorprop	8151A	
MCPA	8151A	
MCPP	8151A	
Methoxychlor	8081	X
Dioxins (total TCDD TEQ)	EPA 8290	



WORK ORDER #: 10-07-1714

SAMPLE RECEIPT FORMCooler 1 of 1CLIENT: Pacific EcoriskDATE: 07/23/10**TEMPERATURE:** Thermometer ID: SC1 (Criteria: 0.0 °C – 6.0 °C, not frozen)Temperature 0.6 °C + 0.5 °C (CF) = 1.1 °C ☐ Blank ☒ Sample☐ Sample(s) outside temperature criteria (PM/APM contacted by: _____).☐ Sample(s) outside temperature criteria but received on ice/chilled on same day of sampling.☐ Received at ambient temperature, placed on ice for transport by Courier.Ambient Temperature: ☐ Air ☐ Filter ☐ Metals Only ☐ PCBs OnlyInitial: NC**CUSTODY SEALS INTACT:**☐ Cooler ☐ _____ ☐ No (Not Intact) ☒ Not Present ☐ N/AInitial: NC☐ Sample ☐ _____ ☐ No (Not Intact) ☒ Not PresentInitial: P**SAMPLE CONDITION:**

	Yes	No	N/A
Chain-Of-Custody (COC) document(s) received with samples.....	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
COC document(s) received complete.....	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

☐ Collection date/time, matrix, and/or # of containers logged in based on sample labels.☐ No analysis requested. ☐ Not relinquished. ☐ No date/time relinquished.Sampler's name indicated on COC..... ☒ ☐ ☐Sample container label(s) consistent with COC..... ☒ ☐ ☐Sample container(s) intact and good condition..... ☒ ☐ ☐Proper containers and sufficient volume for analyses requested..... ☒ ☐ ☐Analyses received within holding time..... ☒ ☐ ☐pH / Residual Chlorine / Dissolved Sulfide received within 24 hours..... ☐ ☐ ☒Proper preservation noted on COC or sample container..... ☐ ☐ ☒☐ Unpreserved vials received for Volatiles analysisVolatile analysis container(s) free of headspace..... ☐ ☐ ☒Tedlar bag(s) free of condensation..... ☐ ☐ ☒**CONTAINER TYPE:**Solid: ☐ 4ozCGJ ☐ 8ozCGJ ☒ 16ozCGJ ☐ Sleeve (____) ☐ EnCores® ☐ TerraCores® ☐ _____Water: ☐ VOA ☐ VOA_h ☐ VOA_{na2} ☐ 125AGB ☐ 125AGB_h ☐ 125AGB_p ☐ 1AGB ☐ 1AGB_{na2} ☐ 1AGB_s☐ 500AGB ☐ 500AGJ ☐ 500AGJ_s ☐ 250AGB ☐ 250CGB ☐ 250CGB_s ☐ 1PB ☐ 500PB ☐ 500PB_{na}☐ 250PB ☐ 250PB_n ☐ 125PB ☐ 125PB_{znna} ☐ 100PJ ☐ 100PJ_{na2} ☐ _____ ☐ _____ ☐ _____Air: ☐ Tedlar® ☐ Summa® Other: ☐ _____ Trip Blank Lot#: _____ Labeled/Checked by: PContainer: C: Clear A: Amber P: Plastic G: Glass J: Jar B: Bottle Z: Ziploc/Resealable Bag E: Envelope Reviewed by: NCPreservative: h: HCL n: HNO₃ na₂: Na₂S₂O₃ na: NaOH p: H₃PO₄ s: H₂SO₄ znna: ZnAc₂+NaOH f: Field-filtered Scanned by: P* Sample was frozen per OC. P

July 30, 2010

Service Request No: E1000811

Bob Stearns
Calscience Environmental Laboratories, Incorporated
7440 Lincoln Way
Garden Grove, CA 92841

Laboratory Results for: ACOE (San Rafael Channel)

Dear Bob:

Enclosed are the results of the sample(s) submitted to our laboratory on July 24, 2010. For your reference, these analyses have been assigned our service request number **E1000811**.

Analyses were performed according to our laboratory's NELAP-approved quality assurance program. The test results meet requirements of the current NELAP standards, where applicable, and except as noted in the laboratory case narrative provided. All results are intended to be considered in their entirety, and Columbia Analytical Services, Inc. (CAS) is not responsible for use of less than the final complete report. Results apply only to the items submitted to the laboratory for analysis and individual items (samples) analyzed, as listed in the report. In accordance to the NELAC 2003 Standard, a statement on the estimated uncertainty of measurement of any quantitative analysis will be supplied upon request.

Please contact me if you have any questions. My extension is 2959. You may also contact me via email at NBrown@caslab.com.

Respectfully submitted,

Columbia Analytical Services, Inc.

Nicole Brown
Project Manager

Page 1 of _____



Certificate of Analysis

19408 Park Row, Suite 320, Houston, TX 77084

Phone (713)266-1599 Fax (713)266-0130

www.caslab.com

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COLUMBIA ANALYTICAL SERVICES, INC

Client:	Calscience Environmental Laboratory	Service Request No.:	E1000811
Project:	ACOE (San Rafael Channel)	Date Received:	07/24/10
Sample Matrix:	Sediment		

CASE NARRATIVE

All analyses were performed in adherence to the quality assurance program of Columbia Analytical Services, Inc. (CAS). This report contains analytical results for samples designated for Tier IV. When appropriate to the method, method blank results have been reported with each analytical test.

Sample Receipt

One sediment sample was received for analysis at Columbia Analytical Services on 07/24/10.

The following discrepancies were noted upon initial sample inspection: no custody seals on cooler. The exceptions are also noted on the cooler receipt and preservation form included in this data package.

The sample was received at 2°C in good condition and is consistent with the accompanying chain of custody form. The sample was stored in a refrigerator at 4°C upon receipt at the laboratory.

Data Validation Notes and Discussion

B flags – Method Blanks

The Method Blank EQ1000358-01 contained low levels of 1234678-HpCDD, OCDD and OCDF below the Method Reporting Limit (MRL). The associated compounds in the samples are flagged with 'B' flags.

MS/MSD

EQ1000358: Laboratory Control Spike/Laboratory Control Spike Duplicate (LCS/LCSD) samples were analyzed and reported in lieu of an MS/MSD for this extraction batch. The batch quality control criteria were met.

Y flags – Labeled Standards

Samples that had recoveries of labeled standards outside the acceptance limits are flagged with 'Y' flags on the Labeled Compound summary pages. In all cases, the signal-to-noise ratios are greater than 10:1, making these data acceptable.

Approved by _____ Date 08/02/10

Xiangqiu Liang, Laboratory Director

C flags – 2378-TCDF Confirmation

Confirmation of the TCDF compound: When 2378-TCDF is detected on the DB-5 column, confirmation analyses are performed on a second column (DB-225.) The results from both the DB-5 column and the DB-225 column are included in this data package.

The valid result for the 2378-TCDF compound is reported from the confirmation column.

The confirmation results have been included on the Total TEQ summary pages.

K flags

EMPC - When the ion abundance ratios associated with a particular compound are outside the QC limits, samples are flagged with a 'K' flag. A 'K' flag indicates an estimated maximum possible concentration for the associated compound.

Detection Limits

Detection limits are calculated for each congener in each sample by measuring the height of the noise level for each quantitation ion for the associated labeled standard. The concentration equivalent to 2.5 times the height of the noise is then calculated using the appropriate response factor and the weight of the sample. The calculated concentration equals the detection limit.

The TEQ Summary results for each sample have been calculated by CAS/Houston to include:

- WHO-2005 TEFs, The 2005 World Health Organization Reevaluation of Human and Mammalian Toxic Equivalency Factors for Dioxins and Dioxin-Like Compounds (M. Van den Berg et al., Toxicological Sciences 93(2):223-241, 2006)
- 2378-TCDF from the DB-225 column, when confirmation required
- Non-detected compounds are not included in the 'Total'

Approved by _____ Date 08/02/10

Xiangqiu Liang, Laboratory Director

Client: Calscience Environmental Laboratories, Incorporated
Project: ACOE (San Rafael Channel)

Service Request: E1000811

SAMPLE CROSS-REFERENCE

<u>SAMPLE #</u>	<u>CLIENT SAMPLE ID</u>	<u>DATE</u>	<u>TIME</u>
E1000811-001	SRC-2010-8-Comp	6/10/10	11:55

Superset Summary

Service Request: E1000811

SuperSet Reference: 10-0000150135 rev 00

8290/PCDD PCDF

Calibrations: 08/01/08 12/17/07

Data Files:

<i>Raw Data</i>	<i>Begin CCAL</i>	<i>Method Blank</i>	<i>Lab ID</i>
P208830	P208826	P208830	EQ1000358-01
P208831	P208826	P208830	E1000811-001.R01
P208836	P208826	P208830	EQ1000358-02
P208837	P208826	P208830	EQ1000358-03
U137251	U137248	U137250	E1000811-001

Laboratory Certifications 2010-2011

STATE/PROGRAM	AGENCY	CERTIFICATION ID	EXP DATE
ARIZONA	AZ-DHS	AZ0725	05/27/11
ARKANSAS	ADEQ	10-035-0	06/16/11
CALIFORNIA	CA-ELAP	2452	02/28/11
DoD ELAP	A2LA	2897.01	11/30/11
FLORIDA/NELAP	FL-DOHS	E87611	06/30/11
HAWAII	HI-DOH	N/A	06/30/11
ILLINOIS/NELAP	IL-EPA	002380	10/06/10
ISO 17025	A2LA	2897.01	11/30/11
LOUISIANA/NELAP	LELAP	03048	06/30/10
LOUISIANA/NELAP	LDHH	LA100032	12/31/10
MAINE	ME-DOHS	2010041	06/05/12
MICHIGAN	MIDEQ	9971	06/30/11
MINNESOTA	MDH	048-999-427	12/31/10
NEVADA	NDEP	TX014112010A	07/31/10
NEW JERSEY	NJDEP	TX008	06/30/11
NEW MEXICO	NMED-DWB	N/A	06/30/11
NEW YORK/NELAP	NY-DOH	11707	04/01/11
OKLAHOMA	OKDEQ	2009-25	08/31/10
OREGON/NELAP	ORELAP	TX200002-006	03/24/10
PENNSYLVANIA/NELAP	PLAP	002	06/30/11
TENNESSEE	TNDEC	04016	06/30/11
TEXAS/NELAP	TCEQ	T104704216-10-1	06/30/11
UTAH/NELAP	UTELCP	COLU2	06/30/10
SOIL IMPORT PERMIT	USDA	P330-09-00067	03/27/12
WASHINGTON/NELAP	WA-Ecology	C1855	11/14/10
WEST VIRGINIA	WVDEP	347	06/30/11

Abbreviations, Acronyms & Definitions

Cal	Calibration
Conc	CONCentration
Dioxin(s)	Polychlorinated dibenzo-p-dioxin(s)
EDL	Estimated Detection Limit
EMPC	Estimated Maximum Possible Concentration
Flags	Data qualifiers
Furan(s)	Polychlorinated dibenzofuran(s)
g	Grams
ICAL	Initial CALibration
ID	IDentifier
Ions	Masses monitored for the analyte during data acquisition
L	Liter (s)
LCS	Laboratory Control Sample
DLCS	Duplicate Laboratory Control Sample
MB	Method Blank
MCL	Method Calibration Limit
MDL	Method Detection Limit
MRL	Method Reporting Limit
mL	Milliliters
MS	Matrix Spiked sample
DMS	Duplicate Matrix Spiked sample
NO	Number of peaks meeting all identification criteria
PCDD(s)	Polychlorinated dibenzo-p-dioxin(s)
PCDF(s)	Polychlorinated dibenzofuran(s)
ppb	Parts per billion
ppm	Parts per million
ppq	Parts per quadrillion
ppt	Parts per trillion
QA	Quality Assurance
QC	Quality Control
Ratio	Ratio of areas from monitored ions for an analyte
% Rec.	Percent Recovery
RPD	Relative Percent Difference
RRF	Relative Response Factor
RT	Retention Time
RRT	Relative Retention Time
SDG	Sample Delivery Group
S/N	Signal-to-Noise ratio
TEF	Toxicity Equivalence Factor
TEQ	Toxicity Equivalence Quotient

Data Qualifier Flags – Dioxin/Furans

- **B** Indicates the associated analyte is found in the method blank, as well as in the sample.
- **C** Confirmation of the TCDF compound: When 2378-TCDF is detected on the DB-5 column, confirmation analyses are performed on a second column (DB-225). The results from both the DB-5 column and the DB-225 column are included in this data package. The results from the DB-225 analyses should be used to evaluate the 2378-TCDF in the samples. The confirmed result should be used in determining the TEQ value for TCDF.
- **E** Indicates an estimated value – used when the analyte concentration exceeds the upper end of the linear calibration range.
- **J** Indicates an estimated value – used when the analyte concentration is below the method reporting limit (MRL) and above the estimated detection limit (EDL).
- **K** EMPC - When the ion abundance ratios associated with a particular compound are outside the QC limits, samples are flagged with a 'K' flag. A 'K' flag indicates an estimated maximum possible concentration for the associated compound.
- **U** Indicates the compound was analyzed and not detected.
- **Y** Samples that had recoveries of labeled standards outside the acceptance limits are flagged with 'Y'. In all cases, the signal-to-noise ratios are greater than 10:1, making these data acceptable.
- **ND** Indicates concentration is reported as 'Not Detected.'
- **S** Peak is saturated; data not reportable.
- **P** Indicates chlorodiphenyl ether interference present at the retention time of the target compound.
- **Q** Lock-mass interference by chlorodiphenyl ether compounds.

COLUMBIA ANALYTICAL SERVICES, INC. – Houston
Data Processing/Form Production and Peer Review Signatures

SR# Unique ID E1000811

DB-5

DB-225

SPB-Octyl

First Level - Data Processing - to be filled by person generating the forms

Date: 7/28/10 Analyst: ce Samples: 1

Second Level - Data Review – to be filled by person doing peer review

Date: 07/28/10 Analyst: me Samples: 001

COLUMBIA ANALYTICAL SERVICES, INC. – Houston
Data Processing/Form Production and Peer Review Signatures

SR# Unique ID

E1000811

DB-5

DB-225

SPB-Octyl

First Level - Data Processing - to be filled by person generating the forms

Date:

7/28/10

Analyst:

gc

Samples:

001

Second Level - Data Review – to be filled by person doing peer review

Date:

07/29/10

Analyst:

mc

Samples:

001

Analytical Results

19408 Park Row, Suite 320, Houston, TX 77084

Phone (713)266-1599 Fax (713)266-0130

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COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: Calscience Environmental Laboratory
Project: ACOE (San Rafael Channel)
Sample Matrix: Sediment
Sample Name: SRC-2010-8-Comp
Lab Code: E1000811-001

Service Request: E1000811
Date Collected: 6/10/10 1155
Date Received: 7/24/10
Units: ng/Kg
Basis: Dry
Percent Solids: 55.1

Polychlorinated Dibenzodioxins and Polychlorinated Dibenzofurans by HRGC/HRMS

Analytical Method: 8290
Prep Method: Method
Sample Amount: 9.712g
Data File Name: P208831
ICAL Date: 08/01/08

Date Analyzed: 7/27/10 1050
Date Extracted: 7/24/10
Instrument Name: E-HRMS-04
GC Column: DB-5
Blank File Name: P208830
Cal Ver. File Name: P208826

Analyte Name	Result	Q	EDL	MRL	Ion Ratio	RRT	Dilution Factor
2,3,7,8-TCDD	0.340	JK	0.0684	1.87	0.46	1.001	1
1,2,3,7,8-PeCDD	1.71	J	0.0698	4.67	1.64	1.000	1
1,2,3,4,7,8-HxCDD	2.05	J	0.0991	4.67	1.19	0.999	1
1,2,3,6,7,8-HxCDD	6.13		0.0869	4.67	1.29	1.000	1
1,2,3,7,8,9-HxCDD	3.05	J	0.0950	4.67	1.25	1.007	1
1,2,3,4,6,7,8-HpCDD	109	B	0.151	4.67	1.02	1.000	1
OCDD	771	B	0.171	9.34	0.89	1.000	1
2,3,7,8-TCDF	1.94	C	0.0632	1.87	0.75	1.001	1
1,2,3,7,8-PeCDF	0.633	J	0.0877	4.67	1.77	1.001	1
2,3,4,7,8-PeCDF	1.22	J	0.0866	4.67	1.58	1.024	1
1,2,3,4,7,8-HxCDF	4.20	J	0.199	4.67	1.20	1.000	1
1,2,3,6,7,8-HxCDF	2.44	J	0.189	4.67	1.13	1.003	1
1,2,3,7,8,9-HxCDF	ND	U	0.247	4.67			1
2,3,4,6,7,8-HxCDF	0.984	J	0.212	4.67	1.13	1.018	1
1,2,3,4,6,7,8-HpCDF	25.5		0.168	4.67	0.96	1.000	1
1,2,3,4,7,8,9-HpCDF	2.79	J	0.228	4.67	0.97	1.034	1
OCDF	102	B	0.127	9.34	0.85	1.004	1
Total Tetra-Dioxins	1.61	J	0.0684	1.87	0.76		1
Total Penta-Dioxins	7.17		0.0698	4.67	1.45		1
Total Hexa-Dioxins	37.6		0.0869	4.67	1.29		1
Total Hepta-Dioxins	209		0.151	4.67	1.02		1
Total Tetra-Furans	23.4		0.0632	1.87	0.77		1
Total Penta-Furans	43.1		0.0866	4.67	1.51		1
Total Hexa-Furans	53.5		0.189	4.67	1.13		1
Total Hepta-Furans	93.3		0.168	4.67	0.96		1

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: Calscience Environmental Laboratory
Project: ACOE (San Rafael Channel)
Sample Matrix: Sediment
Sample Name: SRC-2010-8-Comp
Lab Code: E1000811-001

Service Request: E1000811
Date Collected: 6/10/10 1155
Date Received: 7/24/10
Units: Percent
Basis: Dry
Percent Solids: 55.1

Polychlorinated Dibenzodioxins and Polychlorinated Dibenzofurans by HRGC/HRMS

Analytical Method: 8290
Prep Method: Method
Sample Amount: 9.712g
Data File Name: P208831
ICAL Date: 08/01/08

Date Analyzed: 7/27/10 1050
Date Extracted: 7/24/10
Instrument Name: E-HRMS-04
GC Column: DB-5
Blank File Name: P208830
Cal Ver. File Name: P208826

Labeled Compounds	Spike Conc.(pg)	Conc. Found (pg)	%Rec	Q	Control Limits	Ion Ratio	RRT
13C-2,3,7,8-TCDD	1000	603.785	60		40-135	0.78	1.008
13C-1,2,3,7,8-PeCDD	1000	699.664	70		40-135	1.59	1.168
13C-1,2,3,6,7,8-HxCDD	2500	2037.299	81		40-135	1.26	0.994
13C-1,2,3,4,6,7,8-HpCDD	2500	2036.527	81		40-135	1.06	1.068
13C-OCDD	5000	3034.342	61		40-135	0.90	1.149
13C-2,3,7,8-TCDF	1000	542.613	54		40-135	0.78	0.980
13C-1,2,3,7,8-PeCDF	1000	682.089	68		40-135	1.56	1.130
13C-1,2,3,4,7,8-HxCDF	2500	1968.276	79		40-135	0.52	0.972
13C-1,2,3,4,6,7,8-HpCDF	2500	1802.968	72		40-135	0.44	1.044
37Cl-2,3,7,8-TCDD	800	613.456	77		40-135	NA	1.009

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: Calscience Environmental Laboratory
Project: ACOE (San Rafael Channel)
Sample Matrix: Sediment
Sample Name: SRC-2010-8-Comp
Lab Code: E1000811-001

Service Request: E1000811
Date Collected: 6/10/10 1155
Date Received: 7/24/10
Units: ng/Kg
Basis: Dry

Polychlorinated Dibenzodioxins and Polychlorinated Dibenzofurans by HRGC/HRMS

Analytical Method: 8290
Prep Method: Method

Analyte Name	Result	DL	Dilution Factor	TEF	TEF - Adjusted Concentration
2,3,7,8-TCDD	0.340	0.0684	1	1	0.340
1,2,3,7,8-PeCDD	1.71	0.0698	1	1	1.71
1,2,3,4,7,8-HxCDD	2.05	0.0991	1	0.1	0.205
1,2,3,6,7,8-HxCDD	6.13	0.0869	1	0.1	0.613
1,2,3,7,8,9-HxCDD	3.05	0.0950	1	0.1	0.305
1,2,3,4,6,7,8-HpCDD	109	0.151	1	0.01	1.09
OCDD	771	0.171	1	0.0003	0.231
2,3,7,8-TCDF	1.05	0.232	1	0.1	0.105
1,2,3,7,8-PeCDF	0.633	0.0877	1	0.03	0.0190
2,3,4,7,8-PeCDF	1.22	0.0866	1	0.3	0.366
1,2,3,4,7,8-HxCDF	4.20	0.199	1	0.1	0.420
1,2,3,6,7,8-HxCDF	2.44	0.189	1	0.1	0.244
1,2,3,7,8,9-HxCDF	ND	0.247	1	0.1	
2,3,4,6,7,8-HxCDF	0.984	0.212	1	0.1	0.0984
1,2,3,4,6,7,8-HpCDF	25.5	0.168	1	0.01	0.255
1,2,3,4,7,8,9-HpCDF	2.79	0.228	1	0.01	0.0279
OCDF	102	0.127	1	0.0003	0.0306
Total TEQ					6.06

2005 WHO TEFs, ND = 0

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: Calscience Environmental Laboratory
Project: ACOE (San Rafael Channel)
Sample Matrix: Sediment
Sample Name: SRC-2010-8-Comp
Lab Code: E1000811-001
Run Type: Reanalysis

Service Request: E1000811
Date Collected: 6/10/10 1155
Date Received: 7/24/10
Units: ng/Kg
Basis: Dry
Percent Solids: 55.1

Polychlorinated Dibenzodioxins and Polychlorinated Dibenzofurans by HRGC/HRMS

Analytical Method: 8290
Prep Method: Method
Sample Amount: 9.712g
Data File Name: U137251
ICAL Date: 12/17/07

Date Analyzed: 7/27/10 1453
Date Extracted: 7/24/10
Instrument Name: E-HRMS-01
GC Column: DB-225
Blank File Name: U137250
Cal Ver. File Name: U137248

Analyte Name	Result	Q	EDL	MRL	Ion Ratio	RRT	Dilution Factor
2,3,7,8-TCDF	1.05	J	0.232	1.87	0.76	1.001	1

Labeled Compounds	Spike Conc.(pg)	Conc. Found (pg)	%Rec	Q	Control Limits	Ion Ratio	RRT
13C-2,3,7,8-TCDF	1000	672.054	67		40-135	0.79	1.060
37Cl-2,3,7,8-TCDD	800	635.335	79		40-135	NA	0.988

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: Calscience Environmental Laboratory
Project: ACOE (San Rafael Channel)
Sample Matrix: Sediment
Sample Name: Method Blank
Lab Code: EQ1000358-01

Service Request: E1000811
Date Collected: NA
Date Received: NA
Units: ng/Kg
Basis: Dry

Polychlorinated Dibenzodioxins and Polychlorinated Dibenzofurans by HRGC/HRMS

Analytical Method: 8290
Prep Method: Method
Sample Amount: 10.000g
Data File Name: P208830
ICAL Date: 08/01/08

Date Analyzed: 7/27/10 1003
Date Extracted: 7/24/10
Instrument Name: E-HRMS-04
GC Column: DB-5
Blank File Name: P208830
Cal Ver. File Name: P208826

Analyte Name	Result	Q	EDL	MRL	Ion Ratio	RRT	Dilution Factor
2,3,7,8-TCDD	ND	U	0.0275	1.00			1
1,2,3,7,8-PeCDD	ND	U	0.0421	2.50			1
1,2,3,4,7,8-HxCDD	ND	U	0.0535	2.50			1
1,2,3,6,7,8-HxCDD	ND	U	0.0469	2.50			1
1,2,3,7,8,9-HxCDD	ND	U	0.0512	2.50			1
1,2,3,4,6,7,8-HpCDD	0.188	JK	0.0760	2.50	0.80	1.001	1
OCDD	0.612	J	0.117	5.00	0.84	1.000	1
2,3,7,8-TCDF	ND	U	0.0673	1.00			1
1,2,3,7,8-PeCDF	ND	U	0.0634	2.50			1
2,3,4,7,8-PeCDF	ND	U	0.0626	2.50			1
1,2,3,4,7,8-HxCDF	ND	U	0.0309	2.50			1
1,2,3,6,7,8-HxCDF	ND	U	0.0293	2.50			1
1,2,3,7,8,9-HxCDF	ND	U	0.0383	2.50			1
2,3,4,6,7,8-HxCDF	ND	U	0.0329	2.50			1
1,2,3,4,6,7,8-HpCDF	ND	U	0.111	2.50			1
1,2,3,4,7,8,9-HpCDF	ND	U	0.150	2.50			1
OCDF	0.152	J	0.0854	5.00	0.83	1.004	1
Total Tetra-Dioxins	ND	U	0.0275	1.00			1
Total Penta-Dioxins	ND	U	0.0421	2.50			1
Total Hexa-Dioxins	ND	U	0.0469	2.50			1
Total Hepta-Dioxins	ND	U	0.0760	2.50			1
Total Tetra-Furans	0.325	J	0.0673	1.00	0.87		1
Total Penta-Furans	ND	U	0.0626	2.50			1
Total Hexa-Furans	ND	U	0.0293	2.50			1
Total Hepta-Furans	ND	U	0.111	2.50			1

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: Calscience Environmental Laboratory
Project: ACOE (San Rafael Channel)
Sample Matrix: Sediment
Sample Name: Method Blank
Lab Code: EQ1000358-01

Service Request: E1000811
Date Collected: NA
Date Received: NA
Units: Percent
Basis: Dry

Polychlorinated Dibenzodioxins and Polychlorinated Dibenzofurans by HRGC/HRMS

Analytical Method: 8290
Prep Method: Method
Sample Amount: 10.000g
Data File Name: P208830
ICAL Date: 08/01/08

Date Analyzed: 7/27/10 1003
Date Extracted: 7/24/10
Instrument Name: E-HRMS-04
GC Column: DB-5
Blank File Name: P208830
Cal Ver. File Name: P208826

Labeled Compounds	Spike Conc.(pg)	Conc. Found (pg)	%Rec	Q	Control Limits	Ion Ratio	RRT
13C-2,3,7,8-TCDD	1000	741.337	74		40-135	0.78	1.008
13C-1,2,3,7,8-PeCDD	1000	793.512	79		40-135	1.59	1.168
13C-1,2,3,6,7,8-HxCDD	2500	1458.648	58		40-135	1.27	0.992
13C-1,2,3,4,6,7,8-HpCDD	2500	1428.835	57		40-135	1.05	1.068
13C-OCDD	5000	1928.878	39	Y	40-135	0.91	1.148
13C-2,3,7,8-TCDF	1000	325.709	33	Y	40-135	0.78	0.980
13C-1,2,3,7,8-PeCDF	1000	438.886	44		40-135	1.56	1.130
13C-1,2,3,4,7,8-HxCDF	2500	1476.368	59		40-135	0.52	0.972
13C-1,2,3,4,6,7,8-HpCDF	2500	1273.910	51		40-135	0.45	1.044
37Cl-2,3,7,8-TCDD	800	747.209	93		40-135	NA	1.009

Accuracy and Precision

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COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Calscience Environmental Laboratory
Project: ACOE (San Rafael Channel)
Sample Matrix: Sediment

Service Request: E1000811
Date Analyzed: 7/27/10

Lab Control Sample Summary
Polychlorinated Dibenzodioxins and Polychlorinated Dibenzofurans by HRGC/HRMS

Analytical Method: 8290
Prep Method: Method

Units: ng/Kg
Basis: Dry

Extraction Lot: 115761

Analyte Name	Lab Control Sample EQ1000358-02			Duplicate Lab Control Sample EQ1000358-03			% Rec Limits	RPD	RPD Limit
	Result	Spike Amount	% Rec	Result	Spike Amount	% Rec			
2,3,7,8-TCDD	19.2	20.0	96	20.5	20.0	103	74 - 127	7	18
1,2,3,7,8-PeCDD	48.0	50.0	96	48.2	50.0	96	73 - 122	0	14
1,2,3,4,7,8-HxCDD	46.9	50.0	94	42.5	50.0	85	60 - 153	10	26
1,2,3,6,7,8-HxCDD	47.1	50.0	94	49.5	50.0	99	72 - 126	5	16
1,2,3,7,8,9-HxCDD	49.6	50.0	99	50.5	50.0	101	59 - 140	2	32
1,2,3,4,6,7,8-HpCDD	49.8	50.0	100	50.0	50.0	100	66 - 132	0	19
OCDD	108	100	108	107	100	107	73 - 140	1	28
2,3,7,8-TCDF	21.4	20.0	107	21.6	20.0	108	66 - 129	1	18
1,2,3,7,8-PeCDF	45.0	50.0	90	45.0	50.0	90	70 - 123	0	14
2,3,4,7,8-PeCDF	44.6	50.0	89	47.3	50.0	95	69 - 122	7	17
1,2,3,4,7,8-HxCDF	45.3	50.0	91	45.4	50.0	91	71 - 121	0	15
1,2,3,6,7,8-HxCDF	47.7	50.0	95	50.0	50.0	100	70 - 130	5	14
1,2,3,7,8,9-HxCDF	43.4	50.0	87	46.2	50.0	92	53 - 130	6	28
2,3,4,6,7,8-HxCDF	45.6	50.0	91	45.8	50.0	92	66 - 126	1	22
1,2,3,4,6,7,8-HpCDF	41.9	50.0	84	43.0	50.0	86	66 - 122	2	17
1,2,3,4,7,8,9-HpCDF	53.6	50.0	107	56.9	50.0	114	69 - 136	6	21
OCDF	105	100	105	109	100	109	66 - 146	4	24

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: Calscience Environmental Laboratory
Project: ACOE (San Rafael Channel)
Sample Matrix: Sediment
Sample Name: Lab Control Sample
Lab Code: EQ1000358-02

Service Request: E1000811
Date Collected: NA
Date Received: NA
Units: ng/Kg
Basis: Dry

Polychlorinated Dibenzodioxins and Polychlorinated Dibenzofurans by HRGC/HRMS

Analytical Method: 8290
Prep Method: Method
Sample Amount: 10.000g
Data File Name: P208836
ICAL Date: 08/01/08

Date Analyzed: 7/27/10 1457
Date Extracted: 7/24/10
Instrument Name: E-HRMS-04
GC Column: DB-5
Blank File Name: P208830
Cal Ver. File Name: P208826

Analyte Name	Result	Q	EDL	MRL	Ion Ratio	RRT	Dilution Factor
2,3,7,8-TCDD	19.2		0.0287	1.00	0.74	1.000	1
1,2,3,7,8-PeCDD	48.0		0.0558	2.50	1.56	1.000	1
1,2,3,4,7,8-HxCDD	46.9		0.114	2.50	1.25	0.998	1
1,2,3,6,7,8-HxCDD	47.1		0.100	2.50	1.26	1.000	1
1,2,3,7,8,9-HxCDD	49.6		0.110	2.50	1.24	1.008	1
1,2,3,4,6,7,8-HpCDD	49.8		0.180	2.50	1.05	1.000	1
OCDD	108		0.740	5.00	0.90	1.000	1
2,3,7,8-TCDF	21.4		0.0228	1.00	0.75	1.001	1
1,2,3,7,8-PeCDF	45.0		0.0293	2.50	1.52	1.000	1
2,3,4,7,8-PeCDF	44.6		0.0290	2.50	1.51	1.023	1
1,2,3,4,7,8-HxCDF	45.3		0.0683	2.50	1.19	1.000	1
1,2,3,6,7,8-HxCDF	47.7		0.0649	2.50	1.20	1.003	1
1,2,3,7,8,9-HxCDF	43.4		0.0847	2.50	1.24	1.036	1
2,3,4,6,7,8-HxCDF	45.6		0.0727	2.50	1.22	1.017	1
1,2,3,4,6,7,8-HpCDF	41.9		0.200	2.50	0.98	1.000	1
1,2,3,4,7,8,9-HpCDF	53.6		0.272	2.50	1.00	1.034	1
OCDF	105		0.247	5.00	0.89	1.004	1
Total Tetra-Dioxins	19.2		0.0287	1.00	0.74		1
Total Penta-Dioxins	48.0		0.0558	2.50	1.56		1
Total Hexa-Dioxins	144		0.100	2.50	1.25		1
Total Hepta-Dioxins	49.8		0.180	2.50	1.05		1
Total Tetra-Furans	21.4		0.0228	1.00	0.75		1
Total Penta-Furans	89.7		0.0290	2.50	1.52		1
Total Hexa-Furans	182		0.0649	2.50	1.19		1
Total Hepta-Furans	95.5		0.200	2.50	0.98		1

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: Calscience Environmental Laboratory
Project: ACOE (San Rafael Channel)
Sample Matrix: Sediment
Sample Name: Lab Control Sample
Lab Code: EQ1000358-02

Service Request: E1000811
Date Collected: NA
Date Received: NA
Units: Percent
Basis: Dry

Polychlorinated Dibenzodioxins and Polychlorinated Dibenzofurans by HRGC/HRMS

Analytical Method: 8290
Prep Method: Method
Sample Amount: 10.000g
Data File Name: P208836
ICAL Date: 08/01/08

Date Analyzed: 7/27/10 1457
Date Extracted: 7/24/10
Instrument Name: E-HRMS-04
GC Column: DB-5
Blank File Name: P208830
Cal Ver. File Name: P208826

Labeled Compounds	Spike Conc.(pg)	Conc. Found (pg)	%Rec	Q	Control Limits	Ion Ratio	RRT
13C-2,3,7,8-TCDD	1000	731.349	73		40-135	0.78	1.009
13C-1,2,3,7,8-PeCDD	1000	751.458	75		40-135	1.57	1.168
13C-1,2,3,6,7,8-HxCDD	2500	1449.284	58		40-135	1.25	0.992
13C-1,2,3,4,6,7,8-HpCDD	2500	1368.915	55		40-135	1.05	1.068
13C-OCDD	5000	1803.947	36	Y	40-135	0.91	1.148
13C-2,3,7,8-TCDF	1000	625.312	63		40-135	0.78	0.980
13C-1,2,3,7,8-PeCDF	1000	683.346	68		40-135	1.58	1.131
13C-1,2,3,4,7,8-HxCDF	2500	1360.792	54		40-135	0.52	0.971
13C-1,2,3,4,6,7,8-HpCDF	2500	1209.858	48		40-135	0.44	1.044
37Cl-2,3,7,8-TCDD	800	703.967	88		40-135	NA	1.009

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: Calscience Environmental Laboratory
Project: ACOE (San Rafael Channel)
Sample Matrix: Sediment
Sample Name: Duplicate Lab Control Sample
Lab Code: EQ1000358-03

Service Request: E1000811
Date Collected: NA
Date Received: NA
Units: ng/Kg
Basis: Dry

Polychlorinated Dibenzodioxins and Polychlorinated Dibenzofurans by HRGC/HRMS

Analytical Method: 8290
Prep Method: Method
Sample Amount: 10.000g
Data File Name: P208837
ICAL Date: 08/01/08

Date Analyzed: 7/27/10 1546
Date Extracted: 7/24/10
Instrument Name: E-HRMS-04
GC Column: DB-5
Blank File Name: P208830
Cal Ver. File Name: P208826

Analyte Name	Result	Q	EDL	MRL	Ion Ratio	RRT	Dilution Factor
2,3,7,8-TCDD	20.5		0.0348	1.00	0.76	1.001	1
1,2,3,7,8-PeCDD	48.2		0.0555	2.50	1.57	1.001	1
1,2,3,4,7,8-HxCDD	42.5		0.0655	2.50	1.26	0.999	1
1,2,3,6,7,8-HxCDD	49.5		0.0575	2.50	1.25	1.000	1
1,2,3,7,8,9-HxCDD	50.5		0.0628	2.50	1.25	1.008	1
1,2,3,4,6,7,8-HpCDD	50.0		0.158	2.50	1.05	1.000	1
OCDD	107		0.147	5.00	0.89	1.000	1
2,3,7,8-TCDF	21.6		0.0310	1.00	0.75	1.001	1
1,2,3,7,8-PeCDF	45.0		0.0293	2.50	1.51	1.000	1
2,3,4,7,8-PeCDF	47.3		0.0290	2.50	1.48	1.023	1
1,2,3,4,7,8-HxCDF	45.4		0.0675	2.50	1.20	1.000	1
1,2,3,6,7,8-HxCDF	50.0		0.0643	2.50	1.20	1.003	1
1,2,3,7,8,9-HxCDF	46.2		0.0838	2.50	1.22	1.036	1
2,3,4,6,7,8-HxCDF	45.8		0.0719	2.50	1.23	1.017	1
1,2,3,4,6,7,8-HpCDF	43.0		0.392	2.50	1.01	1.000	1
1,2,3,4,7,8,9-HpCDF	56.9		0.531	2.50	0.99	1.033	1
OCDF	109		0.116	5.00	0.88	1.004	1
Total Tetra-Dioxins	20.5		0.0348	1.00	0.76		1
Total Penta-Dioxins	48.2		0.0555	2.50	1.57		1
Total Hexa-Dioxins	143		0.0575	2.50	1.26		1
Total Hepta-Dioxins	50.0		0.158	2.50	1.05		1
Total Tetra-Furans	21.6		0.0310	1.00	0.75		1
Total Penta-Furans	92.3		0.0290	2.50	1.51		1
Total Hexa-Furans	187		0.0643	2.50	1.20		1
Total Hepta-Furans	99.9		0.392	2.50	1.01		1

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: Calscience Environmental Laboratory
Project: ACOE (San Rafael Channel)
Sample Matrix: Sediment
Sample Name: Duplicate Lab Control Sample
Lab Code: EQ1000358-03

Service Request: E1000811
Date Collected: NA
Date Received: NA
Units: Percent
Basis: Dry

Polychlorinated Dibenzodioxins and Polychlorinated Dibenzofurans by HRGC/HRMS

Analytical Method: 8290
Prep Method: Method
Sample Amount: 10.000g
Data File Name: P208837
ICAL Date: 08/01/08

Date Analyzed: 7/27/10 1546
Date Extracted: 7/24/10
Instrument Name: E-HRMS-04
GC Column: DB-5
Blank File Name: P208830
Cal Ver. File Name: P208826

Labeled Compounds	Spike Conc.(pg)	Conc. Found (pg)	%Rec	Q	Control Limits	Ion Ratio	RRT
13C-2,3,7,8-TCDD	1000	746.431	75		40-135	0.77	1.009
13C-1,2,3,7,8-PeCDD	1000	852.804	85		40-135	1.58	1.168
13C-1,2,3,6,7,8-HxCDD	2500	1465.396	59		40-135	1.25	0.992
13C-1,2,3,4,6,7,8-HpCDD	2500	1448.541	58		40-135	1.05	1.068
13C-OCDD	5000	2006.913	40		40-135	0.91	1.148
13C-2,3,7,8-TCDF	1000	635.440	64		40-135	0.77	0.980
13C-1,2,3,7,8-PeCDF	1000	754.715	75		40-135	1.58	1.131
13C-1,2,3,4,7,8-HxCDF	2500	1337.441	53		40-135	0.52	0.971
13C-1,2,3,4,6,7,8-HpCDF	2500	1243.719	50		40-135	0.44	1.044
37Cl-2,3,7,8-TCDD	800	746.156	93		40-135	NA	1.009



Chain of Custody

19408 Park Row, Suite 320, Houston, TX 77084

Phone (713)266-1599 Fax (713)266-0130

www.caslab.com

An Employee Owned Company



Pacific EcoRisk

ENVIRONMENTAL CONSULTING & TESTING

2250 Cordelia Rd., Fairfield, CA 94534

(707)207-7760

CAS CHAIN-OF-CUSTODY RECORD

Client Name:		Pacific EcoRisk				REQUESTED ANALYSIS												
Client Address:		2250 Cordelia Rd. Fairfield, CA 94534				Dioxins (total TCDD TEQ)												
Sampled By:		Mike McElroy																
Phone:		(707) 207-7760																
FAX:		(707) 207-7916																
Project Manager:		Jeff Cotsifas																
Project Name:		ACOE (San Rafael Channel)																
PO Number:		16087																
Client Sample ID	Sample Date	Sample Time	Sample Matrix*	Container														
				Number	Type													
1	SRC-2010-8-Comp	6/10/10	11:55	Sed	1	8oz glass	x											
2																		
3																		
4																		
5																		
6																		
7																		
8																		
9																		
10																		
Correct Containers:		Yes	No	RELIQUISHED BY														
Sample Temperature:		Ambient	Cold	Warm	Signature:						Signature:							
Sample Preservative:		Yes	No	Print:		J. LARIN				Print:								
Turnaround Time:		STD	Specify:	Organization:		PER				Organization:								
Comments:						DATE:		7-23-10		TIME:		17:00		DATE:		TIME:		
Sample frozen prior to 6/24/10 CABA delivery to CAIScience LABS MS. Danielle Gonsman dgonsman@CAIScience.com Please Invoice to CAIScience		RECEIVED BY																
		Signature:		Gisela Cruz				Signature:										
		Print:		Gisela Cruz				Print:										
		Organization:		CAS-Houston				Organization:										
		DATE:		7/24/10		TIME:		12:00pm		DATE:		TIME:						

*MATRIX CODES: (SED = Sediment); (FW = Freshwater); (WW = Wastewater); (STRMW = Stormwater)

box of styrofoam cooler
bubble wrap, wet ice

no seals
7937 5550 1105

Columbia Analytical Services, Inc.
Cooler Receipt Form

Client/Project: Calscience/ ACOE (San Rafael Channel) Service Request: E1000811

Received: 07/24/10; 1200 Opened (Date/Time): 7/24/10; 1200 By: CD for GC

1. Samples were received via? ☐ *US Mail* ☒ *Fedex* ☐ *UPS* ☐ *DHL* ☐ *Courier* ☐ *Hand Delivered*
2. Samples were received in: (circle) ☐ *Cooler* ☒ *Box* ☒ *Other* styrofoam cooler ☐ *NA*
3. Were custody seals present on coolers? ☐ *Y* ☒ *N* If yes, how many and where? _____
If present, were custody seals intact? ☐ *Y* ☐ *N* If present, were they signed and dated? ☐ *Y* ☐ *N*
4. Is shipper's air-bill filed? ☐ *NA* ☐ *Y* ☒ *N* If not, record air bill number: 793755501105
5. Temperature of cooler(s) upon receipt (°C): 2
6. If applicable, list Chain of Custody numbers: _____
7. Were custody papers properly filled out (ink, signed, etc.)? ☐ *NA* ☒ *Y* ☐ *N*
8. Packing material used: ☐ *Inserts* ☒ *Bubble Wrap* ☐ *Blue Ice* ☒ *Wet Ice* ☐ *Sleeves* ☒ *Other* plastic bag
9. Were the correct types of bottles used for the tests indicated? ☒ *Y* ☐ *N*
Did all bottles arrive in good condition (i.e. unbroken, out of temp.)? *Indicate in the table below.* ☒ *Y* ☐ *N*

Sample ID	Bottle Count	Bottle Type	Out of Temp	Broken	Initials
			<input type="checkbox"/>	<input type="checkbox"/>	
			<input type="checkbox"/>	<input type="checkbox"/>	
			<input type="checkbox"/>	<input type="checkbox"/>	
			<input type="checkbox"/>	<input type="checkbox"/>	
			<input type="checkbox"/>	<input type="checkbox"/>	
			<input type="checkbox"/>	<input type="checkbox"/>	
			<input type="checkbox"/>	<input type="checkbox"/>	

10. Were all bottle labels complete (i.e. analysis, ID, etc.)? ☒ *Y* ☐ *N*
Did all bottle labels and tags agree with custody papers? *Indicate in the table below.* ☒ *Y* ☐ *N*

Sample ID on Bottle	Sample ID on COC	Sample ID on Bottle	Sample ID on COC

11. Additional notes, discrepancies, and resolutions:

Sample Acceptance Policy

Custody Seals (desirable, mandatory if specified in SAP):

- ✓ On outside of cooler
- ✓ Seals intact, signed and dated

Chain-of-Custody documentation (mandatory):

- ✓ Properly filled out in ink & signed by the client
- ✓ Sign and date the coc for CAS/HOU upon cooler receipt
- ✓ Coc must list method number
- ✓ If no coc was submitted with the samples, complete a CAS/HOU coc for the client

Sample Integrity (mandatory):

- ✓ Sample containers must arrive in good condition (not broken or leaking)
- ✓ Sample IDs on the bottles must match the sample IDs on the coc
- ✓ The correct type of sample bottle must be used for the method requested
- ✓ The correct number of sample containers received must agree with the documentation on the coc
- ✓ The correct sample matrix must appear on the coc
- ✓ An appropriate sample volume or weight must be received

Temperature Preservatives (varies by sample matrix):

- ✓ Aqueous and Non-aqueous samples must be shipped and stored cold, at 0 to 6°C
- ✓ Tissue samples must be shipped and stored frozen, at -20 to -10°C
- ✓ Air samples can be shipped and stored at ambient temperature, ~23°C
- ✓ The sample temperature must be recorded on the coc
- ✓ Notify a Project Chemist if any samples are outside the acceptance temperature or have compromised sample integrity – the client must decide re: replacement sample submittal or continue with the analysis

Cooler Receipt Form, CRF (mandatory):

- ✓ Cooler receipt forms must be completed for each coc & SR#
- ✓ Sample integrity issues must be documented on the CRF
- ✓ A scan of the carrier and the airbill number must be recorded in CAS LIMS

Sample Integrity Issues/Resolutions (mandatory):

- ✓ Sample integrity issues are documented on the CRF and given to the Project Chemist for resolution with the client
- ✓ Client resolution is documented in writing (typically email or on the CRF) and filed in the project folder(s)

Service Request Summary

Folder #: E1000811
Client Name: Calscience Environmental Laboratory
Project Name: ACOE (San Rafael Channel)
Project Number:

Report To: Bob Stearns
 Calscience Environmental Laboratories, Incorporated
 7440 Lincoln Way
 Garden Grove, CA 92841

Phone Number: 714-895-5494
Cell Number:
Fax Number: 714-894-7501
E-mail: rstearns@calscience.com

Project Chemist: Nicole Brown
Originating Lab: HOUSTON
Logged By: CDONOVAN
Date Received: 7/24/10
Internal Due Date: 7/29/10
QAP: LAB QAP
Qualifier Set: CAS Standard
Formset: CAS Standard
Merged?: N
Report to MDL?: N,Y
P.O. Number: 16087
EDD: Shaw View - ITEMS 6.5

1 . 4 oz-Glass Jar WM CLEAR Teflon Liner Unpreserved

Location: E-WIC02-Box169

RUSH

CAS Samp No	Client Samp No.	Matrix	Collected	SVM	
				8290/ PCDD PCDF	CAS SOP/ Total Solids
E1000811-001	SRC-2010-8-Comp	Sediment	6/10/10 1155	IV	IV

Preparation Information Benchsheet

Prep Run#: 115761
Team: Semivoa GCMS/AKODUR

Prep WorkFlow: OrgExtDioxS(30)
Prep Method: Method

Status: Prepped
Prep Date/Time: 7/24/10 01:00 PM

#	Lab Code	Client ID	B#	Method /Test	pH	Matrix	Amt. Ext.	Sample Description
1	E1000811-001	SRC-2010-8-Comp	.01	8290/PCDD PCDF		Sediment	9.712g	black, thick wet soil
2	EQ1000358-01	MB		8290/PCDD PCDF		Solid	10.000g	
3	EQ1000358-02	LCS		8290/PCDD PCDF		Solid	10.000g	
4	EQ1000358-03	DLCS		8290/PCDD PCDF		Solid	10.000g	
5	J1003350-009	SB-20 6-8'	.02	8290/PCDD PCDF		Soil	10.704g	orange, thick clay
6	J1003407-007	SB-10 0-2'	.02	8290/PCDD PCDF		Soil	11.835g	damp, grey soil with rock debris
7	J1003461-013	SB-30 14-16'	.02	8290/PCDD PCDF		Soil	10.456g	damp, brown soil

Spiking Solutions

Name:	8290 Matrix Working Standard	Inventory ID	17186	Logbook Ref:	D11-21-5A	Expires On:	04/16/2011
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EQ1000358-02 100.00µL EQ1000358-03 100.00µL

Name:	8290/1613B Cleanup Working Standard	Inventory ID	19668	Logbook Ref:	D11-44-3A/B	Expires On:	07/19/2011
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E1000811-001 100.00µL EQ1000358-01 100.00µL EQ1000358-02 100.00µL EQ1000358-03 100.00µL J1003350-009 100.00µL J1003407-007 100.00µL
J1003461-013 100.00µL

Name:	8290 Internal Working Standard	Inventory ID	19669	Logbook Ref:	D11-43-5A	Expires On:	07/15/2011
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E1000811-001 200.00µL EQ1000358-01 200.00µL EQ1000358-02 200.00µL EQ1000358-03 200.00µL J1003350-009 200.00µL J1003407-007 200.00µL
J1003461-013 200.00µL

Preparation Materials

Carbon, High Purity	C2-41-5 (19649)	Ethyl Acetate 99.9% Minimum EtOAc	C2-41-3 (19127)	Extraction Thimbles 43 x123 mm	(1577)
Glass Wool	C2-42-6 (19656)	Sulfuric Acid Reagent Grade H2SO4	C2-40-2 (19147)	Dichloromethane (Methylene Chloride) 99.9% MeCl2	C2-42-4 (19654)
Sodium Chloride Reagent Grade NaCl	C2-41-7 (19652)	Sodium Hydroxide Reagent Grade NaOH	C2-40-5 (19149)	Sodium Sulfate Anhydrous Reagent Grade Na2SO4	C2-43-1 (19711)
Tridecane (n-Tridecane)	C2-42-7 (19710)	Hexane (n-Hexane) 98.5% Minimum	C2-42-3 (19653)	Nonane (n-Nonane) 99%	C2-33-001 (13944)
Silica Gel Reagent Grade	C2-38-6 (19140)	Toluene 99.9% Minimum	C2-42-5 (19655)		

Preparation Steps

Step:	Extraction	Step:	Acid Clean	Step:	Silica Gel Clean	Step:	Final Volume
Started:	7/24/10 13:00	Started:	7/26/10 09:37	Started:	7/26/10 11:45	Started:	7/27/10 06:05
Finished:	7/25/10 09:10	Finished:	7/26/10 10:07	Finished:	7/26/10 13:25	Finished:	7/27/10 08:15
By:	CDONOVAN	By:	CDONOVAN	By:	CDONOVAN	By:	CDONOVAN

Preparation Information Benchsheet

Prep Run#: 115761
Team: Semivoa GCMS/AKODUR

Prep WorkFlow: OrgExtDioxS(30)
Prep Method: Method

Status: Prepped
Prep Date/Time: 7/24/10 01:00 PM

Comments: _____

Reviewed By: CD Date: 7/27/2010

Chain of Custody

Relinquished By: _____	Date: _____	<u>Extracts Examined</u>
Received By: _____	Date: _____	Yes No

COLUMBIA ANALYTICAL SERVICES, INC.

Total Solids Report

[illegible]

Batch No.: EQ1000358

Comments:

Analyst:

AK

Date/Time:

7/28/10

8:06 AM

Chromatograms and Selected Ion Monitoring

19408 Park Row, Suite 320, Houston, TX 77084

Phone (713)266-1599 Fax (713)266-0130

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Columbia Analytical Services, Inc.
Sample Response Summary

CLIENT ID.
SRC-2010-8-COMP

Run #11 Filename P208831 Samp: 1 Inj: 1 Acquired: 27-JUL-10 10:50:01
Processed: 28-JUL-10 11:09:05 LAB. ID: E1000811-001

Typ	Name	RT-1	Resp 1	Resp 2	Ratio	Meet	Mod?	RRF
1 Unk	2,3,7,8-TCDF	28:15	4.504e+02	6.018e+02	0.75	yes	no	0.831
2 Unk	1,2,3,7,8-PeCDF	32:34	2.468e+02	1.392e+02	1.77	yes	no	0.840
3 Unk	2,3,4,7,8-PeCDF	33:19	4.610e+02	2.912e+02	1.58	yes	no	0.850
4 Unk	1,2,3,4,7,8-HxCDF	36:08	1.329e+03	1.112e+03	1.20	yes	no	1.072
5 Unk	1,2,3,6,7,8-HxCDF	36:14	7.899e+02	6.990e+02	1.13	yes	no	1.128
6 Unk	2,3,4,6,7,8-HxCDF	36:45	2.841e+02	2.524e+02	1.13	yes	no	1.006
7 Unk	1,2,3,7,8,9-HxCDF	NotFnd	*	*	*	no	no	0.864
8 Unk	1,2,3,4,6,7,8-HpCDF	38:49	5.735e+03	5.984e+03	0.96	yes	no	1.315
9 Unk	1,2,3,4,7,8,9-HpCDF	40:07	4.661e+02	4.800e+02	0.97	yes	no	0.970
10 Unk	OCDF	42:51	1.238e+04	1.463e+04	0.85	yes	no	1.103
11 Unk	2,3,7,8-TCDD	29:04	7.294e+01	1.590e+02	0.46	no	no	0.916
12 Unk	1,2,3,7,8-PeCDD	33:40	4.751e+02	2.893e+02	1.64	yes	no	0.869
13 Unk	1,2,3,4,7,8-HxCDD	36:52	4.512e+02	3.799e+02	1.19	yes	no	0.925
14 Unk	1,2,3,6,7,8-HxCDD	36:55	1.594e+03	1.234e+03	1.29	yes	no	1.054
15 Unk	1,2,3,7,8,9-HxCDD	37:10	7.152e+02	5.739e+02	1.25	yes	no	0.966
16 Unk	1,2,3,4,6,7,8-HpCDD	39:42	1.761e+04	1.723e+04	1.02	yes	no	0.879
17 Unk	OCDD	42:42	8.333e+04	9.389e+04	0.89	yes	no	0.959
18 IS	13C-2,3,7,8-TCDF	28:13	5.324e+04	6.849e+04	0.78	yes	no	1.424
19 IS	13C-1,2,3,7,8-PeCDF	32:33	8.270e+04	5.302e+04	1.56	yes	no	1.263
20 IS	13C-1,2,3,4,7,8-HxCDF	36:07	8.712e+04	1.660e+05	0.52	yes	no	1.279
21 IS	13C-1,2,3,4,6,7,8-HpCDF	38:48	5.014e+04	1.134e+05	0.44	yes	no	0.902
22 IS	13C-2,3,7,8-TCDD	29:02	4.393e+04	5.662e+04	0.78	yes	no	1.057
23 IS	13C-1,2,3,7,8-PeCDD	33:39	5.908e+04	3.713e+04	1.59	yes	no	0.873
24 IS	13C-1,2,3,6,7,8-HxCDD	36:55	1.138e+05	9.057e+04	1.26	yes	no	0.997
25 IS	13C-1,2,3,4,6,7,8-HpCDD	39:41	8.776e+04	8.285e+04	1.06	yes	no	0.833
26 IS	13C-OCDD	42:41	1.062e+05	1.175e+05	0.90	yes	no	0.733
27 RS/RT	13C-1,2,3,4-TCDD	28:48	6.926e+04	8.831e+04	0.78	yes	no	-
28 RS/RT	13C-1,2,3,7,8,9-HxCDD	37:09	5.596e+04	4.463e+04	1.25	yes	no	-
29 C/Up	37Cl-2,3,7,8-TCDD	29:04	9.501e+04				no	0.983
SUM AREA								
30 Tot	Total Tetra-Furans	24:11		1.269e+04	0.77	yes		0.831
31 Tot	Total Tetra-Dioxins	25:59		7.952e+02	0.76	yes		0.916
32 Tot	Total Penta-Furans	30:27		2.642e+04	1.51	yes		0.845
33 Tot	Total Penta-Dioxins	31:47		3.207e+03	1.45	yes		0.869
34 Tot	Total Hexa-Furans	35:09		2.976e+04	1.13	yes		1.018
35 Tot	Total Hexa-Dioxins	35:39		1.626e+04	1.29	yes		0.982
36 Tot	Total Hepta-Furans	38:49		3.868e+04	0.96	yes		1.143
37 Tot	Total Hepta-Dioxins	39:04		6.705e+04	1.02	yes		0.879

---Sample Calculation---

$$\text{OCDD} = \frac{(8.333e+04 + 9.389e+04) \times 5000 \text{ pg}}{(1.062e+05 + 1.175e+05) \times (9.712 \text{ g}) \times (400 - 55.1) / 100 \times 0.96} = 77 \text{ ng/kg}$$

Columbia Analytical Services, Inc.
19408 Park Row., Suite 320
Houston, TX 77084
Office (713) 266-1599. Fax (713) 266-0130

Columbia Analytical Services, Inc.
Signal/Noise Height Ratio Summary

CLIENT ID.
SRC-2010-8-COMP

Run #11 Filename P208831 Samp: 1 Inj: 1 Acquired: 27-JUL-10 10:50:01
Processed: 28-JUL-10 11:09:051 LAB. ID: E1000811-001

	Name	Signal 1	Noise 1	S/N Rat.1	Signal 2	Noise 2	S/N Rat.2
1	2,3,7,8-TCDF	5.26e+04	7.40e+02	7.1e+01	7.31e+04	1.10e+03	6.6e+01
2	1,2,3,7,8-PeCDF	4.15e+04	2.17e+03	1.9e+01	2.56e+04	1.96e+03	1.3e+01
3	2,3,4,7,8-PeCDF	7.44e+04	2.17e+03	3.4e+01	4.93e+04	1.96e+03	2.5e+01
4	1,2,3,4,7,8-HxCDF	2.41e+05	3.50e+03	6.9e+01	2.04e+05	5.74e+03	3.5e+01
5	1,2,3,6,7,8-HxCDF	1.48e+05	3.50e+03	4.2e+01	1.33e+05	5.74e+03	2.3e+01
6	2,3,4,6,7,8-HxCDF	6.58e+04	3.50e+03	1.9e+01	5.31e+04	5.74e+03	9.3e+00
7	1,2,3,7,8,9-HxCDF	*	3.50e+03	*	*	5.74e+03	*
8	1,2,3,4,6,7,8-HpCDF	1.24e+06	3.51e+03	3.5e+02	1.28e+06	3.11e+03	4.1e+02
9	1,2,3,4,7,8,9-HpCDF	9.47e+04	3.51e+03	2.7e+01	9.26e+04	3.11e+03	3.0e+01
10	OCDF	2.09e+06	5.92e+02	3.5e+03	2.40e+06	1.77e+03	1.4e+03
11	2,3,7,8-TCDD	1.28e+04	7.56e+02	1.7e+01	2.50e+04	1.21e+03	2.1e+01
12	1,2,3,7,8-PeCDD	8.57e+04	1.20e+03	7.2e+01	5.19e+04	1.13e+03	4.6e+01
13	1,2,3,4,7,8-HxCDD	1.18e+05	2.33e+03	5.1e+01	9.94e+04	1.59e+03	6.3e+01
14	1,2,3,6,7,8-HxCDD	3.85e+05	2.33e+03	1.7e+02	2.88e+05	1.59e+03	1.8e+02
15	1,2,3,7,8,9-HxCDD	1.27e+05	2.33e+03	5.5e+01	1.08e+05	1.59e+03	6.8e+01
16	1,2,3,4,6,7,8-HpCDD	3.67e+06	1.78e+03	2.1e+03	3.57e+06	2.40e+03	1.5e+03
17	OCDD	1.48e+07	1.29e+03	1.2e+04	1.66e+07	1.48e+03	1.1e+04
18	13C-2,3,7,8-TCDF	7.13e+06	3.11e+03	2.3e+03	9.25e+06	2.76e+03	3.3e+03
19	13C-1,2,3,7,8-PeCDF	1.59e+07	1.32e+03	1.2e+04	1.02e+07	9.08e+02	1.1e+04
20	13C-1,2,3,4,7,8-HxCDF	1.74e+07	8.32e+02	2.1e+04	3.31e+07	1.18e+03	2.8e+04
21	13C-1,2,3,4,6,7,8-HpCDF	1.07e+07	5.72e+03	1.9e+03	2.43e+07	4.88e+03	5.0e+03
22	13C-2,3,7,8-TCDD	6.40e+06	4.54e+03	1.4e+03	8.21e+06	1.91e+03	4.3e+03
23	13C-1,2,3,7,8-PeCDD	1.10e+07	8.64e+02	1.3e+04	6.88e+06	1.14e+03	6.1e+03
24	13C-1,2,3,6,7,8-HxCDD	2.78e+07	2.81e+03	9.9e+03	2.19e+07	2.20e+03	1.0e+04
25	13C-1,2,3,4,6,7,8-HpCDD	1.89e+07	1.37e+03	1.4e+04	1.78e+07	1.16e+03	1.5e+04
26	13C-OCDD	1.87e+07	1.27e+03	1.5e+04	2.06e+07	1.80e+03	1.1e+04
27	13C-1,2,3,4-TCDD	1.08e+07	4.54e+03	2.4e+03	1.38e+07	1.91e+03	7.2e+03
28	13C-1,2,3,7,8,9-HxCDD	1.25e+07	2.81e+03	4.4e+03	9.90e+06	2.20e+03	4.5e+03
29	37Cl-2,3,7,8-TCDD	1.30e+07	1.34e+03	9.7e+03			

Columbia Analytical Services, Inc.
19408 Park Row, Suite 320
Houston, TX 77084
Office: (713) 266-1599. Fax: (713) 266-0130

Columbia Analytical Services, Inc.
Peak List Summary

CLIENT ID.

SRC-2010-8-COMP

Entry: 30 Totals Name: Total Tetra-Furans

Run: 11 File: P208831 Sample:1 Injection:1 Function:1

Acquired: 27-JUL-10 10:50:01 Processed: 28-JUL-10 11:09:05

Mass: 303.9020 305.8990		Response:				Name	Mod1?	Mod2
#	RT	Resp	Resp Ratio	Meet	Tot Resp			
1	24:11	1.33e+02	1.72e+02	0.77	yes	3.05e+02	n	n
2	24:51	2.66e+02	3.89e+02	0.68	yes	6.54e+02	n	n
3	25:14	1.56e+03	2.15e+03	0.73	yes	3.71e+03	n	n
4	26:09	7.19e+02	9.67e+02	0.74	yes	1.69e+03	n	n
5	26:31	8.63e+02	1.19e+03	0.73	yes	2.05e+03	y	n
6	27:00	7.83e+02	1.02e+03	0.77	yes	1.81e+03	n	n
7	27:20	1.64e+02	2.28e+02	0.72	yes	3.92e+02	n	n
8	27:45	2.08e+02	3.05e+02	0.68	yes	5.14e+02	n	n
9	28:15	4.50e+02	6.02e+02	0.75	yes	1.05e+03	n	n
10	28:45	1.47e+02	1.77e+02	0.83	yes	3.24e+02	n	n
11	28:59	8.94e+01	1.03e+02	0.87	yes	1.93e+02	n	n

2,3,7,8-TCDF

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Peak List Summary

CLIENT ID.

SRC-2010-8-COMP

Entry: 31 Totals Name: Total Tetra-Dioxins

Run: 11 File: P208831 Sample:1 Injection:1 Function:1

Acquired: 27-JUL-10 10:50:01 Processed: 28-JUL-10 11:09:05

Mass: 319.8970		321.8940		Response:			Name	Mod1?	Mod2
#	RT	Resp	Resp Ratio	Meet	Tot	Resp			
1	25:59	1.41e+02	1.85e+02	0.76	yes	3.26e+02		n	n
2	26:31	1.31e+02	1.88e+02	0.70	yes	3.19e+02		y	n
3	27:42	6.68e+01	8.33e+01	0.80	yes	1.50e+02		n	y

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CLIENT ID.

SRC-2010-8-COMP

Entry: 32 Totals Name: Total Penta-Furans

Run: 11 File: P208831 Sample:1 Injection:1 Function:2

Acquired: 27-JUL-10 10:50:01 Processed: 28-JUL-10 11:09:05

Mass: 339.8600		341.8570		Response:			Name	Mod1?	Mod2
#	RT	Resp	Resp	Ratio	Meet	Tot Resp			
1	30:27	8.30e+03	5.50e+03	1.51	yes	1.38e+04		n	n
2	31:40	3.82e+03	2.61e+03	1.46	yes	6.42e+03		n	n
3	31:50	3.99e+02	2.63e+02	1.52	yes	6.62e+02		n	n
4	32:11	7.55e+02	5.10e+02	1.48	yes	1.27e+03		n	n
5	32:17	3.74e+02	2.24e+02	1.67	yes	5.99e+02		n	n
6	32:34	2.47e+02	1.39e+02	1.77	yes	3.86e+02	1,2,3,7,8-PeCDF	n	n
7	32:51	5.73e+02	4.02e+02	1.42	yes	9.76e+02		n	n
8	33:19	4.61e+02	2.91e+02	1.58	yes	7.52e+02	2,3,4,7,8-PeCDF	n	n
9	33:30	9.48e+02	6.07e+02	1.56	yes	1.55e+03		n	n

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Peak List Summary

CLIENT ID.

SRC-2010-8-COMP

Entry: 33 Totals Name: Total Penta-Dioxins

Run: 11 File: P208831 Sample:1 Injection:1 Function:2

Acquired: 27-JUL-10 10:50:01 Processed: 28-JUL-10 11:09:05

Mass: 355.8550 357.8520		Response:									
#	RT	Resp	Resp	Ratio	Meet	Tot	Resp	Name	Mod1?	Mod2	
1	31:47	6.18e+02	4.26e+02	1.45	yes	1.04e+03			n	n	
2	32:33	2.30e+02	1.43e+02	1.61	yes	3.73e+02			n	n	
3	32:41	3.94e+02	2.38e+02	1.66	yes	6.32e+02			n	n	
4	33:08	1.71e+02	1.07e+02	1.60	yes	2.78e+02			n	n	
5	33:40	4.75e+02	2.89e+02	1.64	yes	7.64e+02		1,2,3,7,8-PeCDD	n	n	
6	34:08	6.84e+01	4.78e+01	1.43	yes	1.16e+02			n	n	

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Peak List Summary

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SRC-2010-8-COMP

Entry: 34 Totals Name: Total Hexa-Furans

Run: 11 File: P208831 Sample:1 Injection:1 Function:3

Acquired: 27-JUL-10 10:50:01 Processed: 28-JUL-10 11:09:05

Mass: 373.8210 375.8180		Response:				Name	Mod1?	Mod2
#	RT	Resp	Resp Ratio	Meet	Tot Resp			
1	35:09	1.48e+03	1.32e+03	1.13	yes	2.80e+03	n	n
2	35:18	5.99e+03	5.14e+03	1.17	yes	1.11e+04	n	n
3	35:35	1.74e+02	1.36e+02	1.28	yes	3.10e+02	n	n
4	35:45	5.25e+03	4.53e+03	1.16	yes	9.78e+03	n	n
5	36:08	1.33e+03	1.11e+03	1.20	yes	2.44e+03	n	n
6	36:14	7.90e+02	6.99e+02	1.13	yes	1.49e+03	n	n
7	36:41	4.44e+02	3.81e+02	1.16	yes	8.24e+02	n	n
8	36:45	2.84e+02	2.52e+02	1.13	yes	5.37e+02	n	n
9	37:27	2.42e+02	2.08e+02	1.16	yes	4.50e+02	n	n

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Peak List Summary

CLIENT ID.

SRC-2010-8-COMP

Entry: 35 Totals Name: Total Hexa-Dioxins

Run: 11 File: P208831 Sample:1 Injection:1 Function:3

Acquired: 27-JUL-10 10:50:01 Processed: 28-JUL-10 11:09:05

Mass: 389.8160 391.8130		Response:									
#	RT	Resp	Resp Ratio	Meet	Tot	Resp	Name	Mod1?	Mod2		
1	35:39	2.54e+03	1.97e+03	1.29	yes	4.51e+03		n	n		
2	36:07	3.69e+02	2.60e+02	1.42	yes	6.30e+02		n	n		
3	36:19	3.33e+03	2.62e+03	1.27	yes	5.95e+03		n	n		
4	36:28	1.26e+02	9.63e+01	1.30	yes	2.22e+02		n	n		
5	36:52	4.51e+02	3.80e+02	1.19	yes	8.31e+02	1,2,3,4,7,8-HxCDD	n	n		
6	36:55	1.59e+03	1.23e+03	1.29	yes	2.83e+03	1,2,3,6,7,8-HxCDD	n	n		
7	37:10	7.15e+02	5.74e+02	1.25	yes	1.29e+03	1,2,3,7,8,9-HxCDD	n	n		

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Peak List Summary

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SRC-2010-8-COMP

Entry: 36 Totals Name: Total Hepta-Furans

Run: 11 File: P208831 Sample:1 Injection:1 Function:4

Acquired: 27-JUL-10 10:50:01 Processed: 28-JUL-10 11:09:05

Mass: 407.7820 409.7790		Response:									
#	RT	Resp	Resp	Ratio	Meet	Tot	Resp	Name	Mod1?	Mod2	
1	38:49	5.73e+03	5.98e+03	0.96	yes	1.17e+04		1,2,3,4,6,7,8-HpCDF	n	n	
2	39:03	1.33e+02	1.47e+02	0.90	yes	2.81e+02			n	n	
3	39:10	1.28e+04	1.30e+04	0.99	yes	2.57e+04			n	n	
4	40:07	4.66e+02	4.80e+02	0.97	yes	9.46e+02		1,2,3,4,7,8,9-HpCDF	n	n	

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SRC-2010-8-COMP

Entry: 37 Totals Name: Total Hepta-Dioxins

Run: 11 File: P208831 Sample:1 Injection:1 Function:4

Acquired: 27-JUL-10 10:50:01 Processed: 28-JUL-10 11:09:05

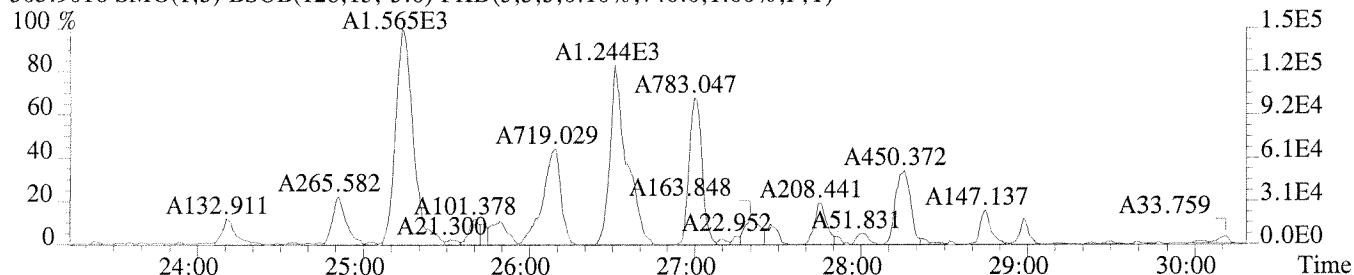
Mass: 423.7770 425.7740		Response:									
#	RT	Resp	Resp Ratio	Meet	Tot	Resp	Name	Mod1?	Mod2		
1	39:04	1.62e+04	1.60e+04	1.02	yes	3.22e+04		n	n		
2	39:42	1.76e+04	1.72e+04	1.02	yes	3.48e+04	1,2,3,4,6,7,8-HpCDD	n	n		

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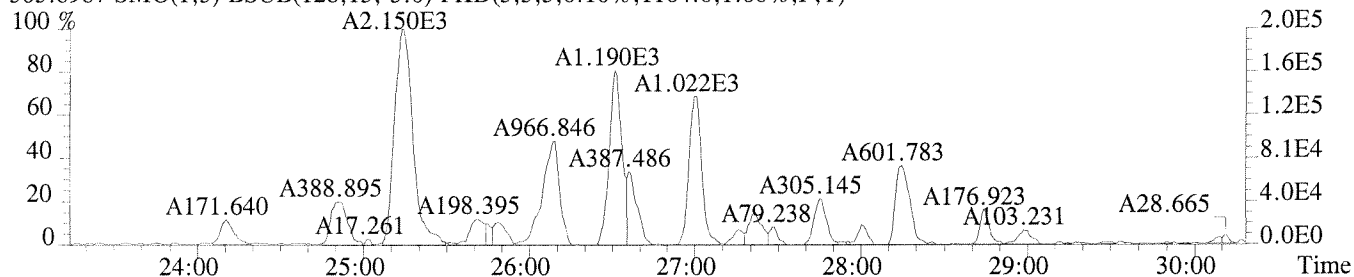
File:P208831 #1-590 Acq:27-JUL-2010 10:50:01 Probe EI+ Magnet SIR VG BioTech Mass spectf

Sample#1 Exp:E1000811-001 SRC-2010-8-

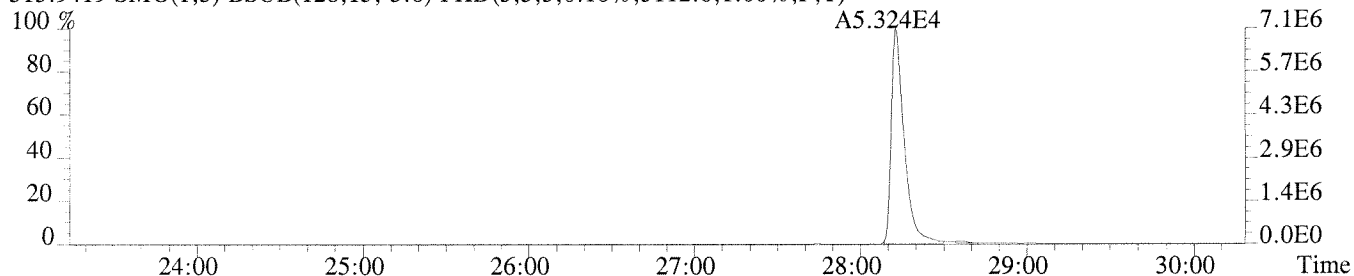
303.9016 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.10%,740.0,1.00%,F,T)



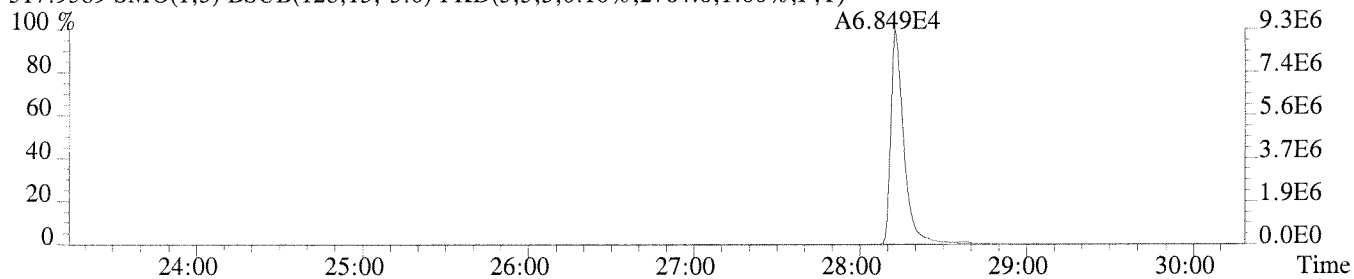
305.8987 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.10%,1104.0,1.00%,F,T)



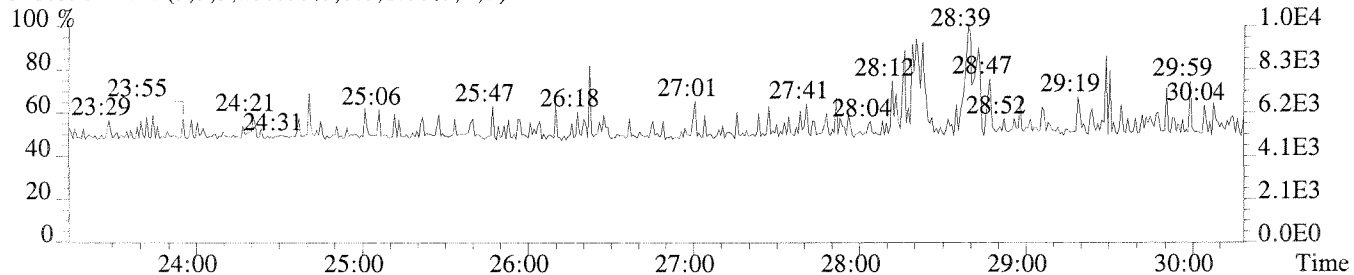
315.9419 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.10%,3112.0,1.00%,F,T)



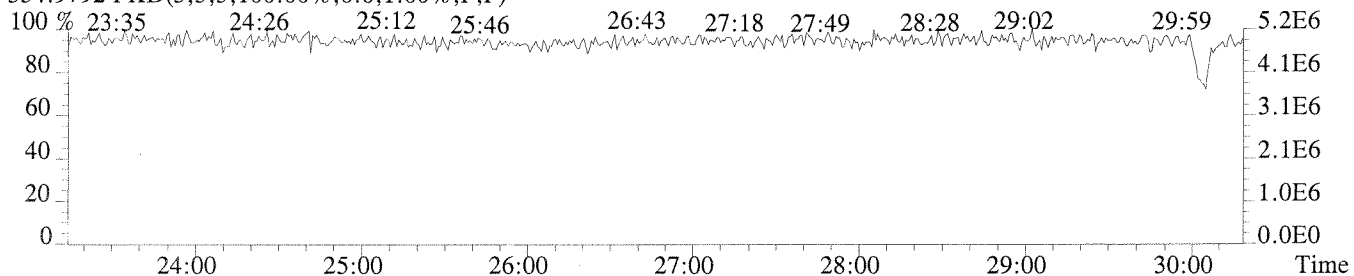
317.9389 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.10%,2764.0,1.00%,F,T)



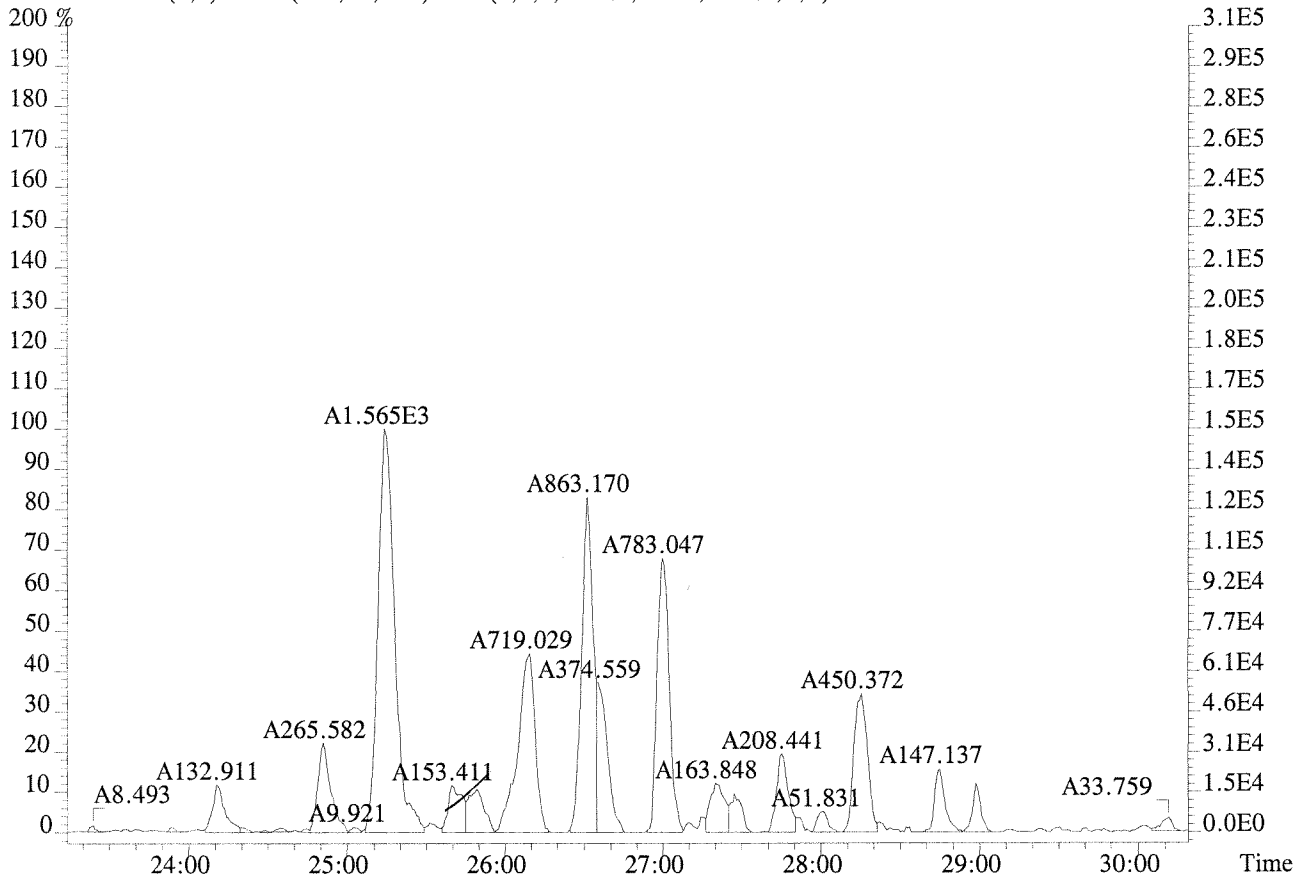
375.8364 PKD(5,3,3,100.00%,0.0,1.00%,F,F)



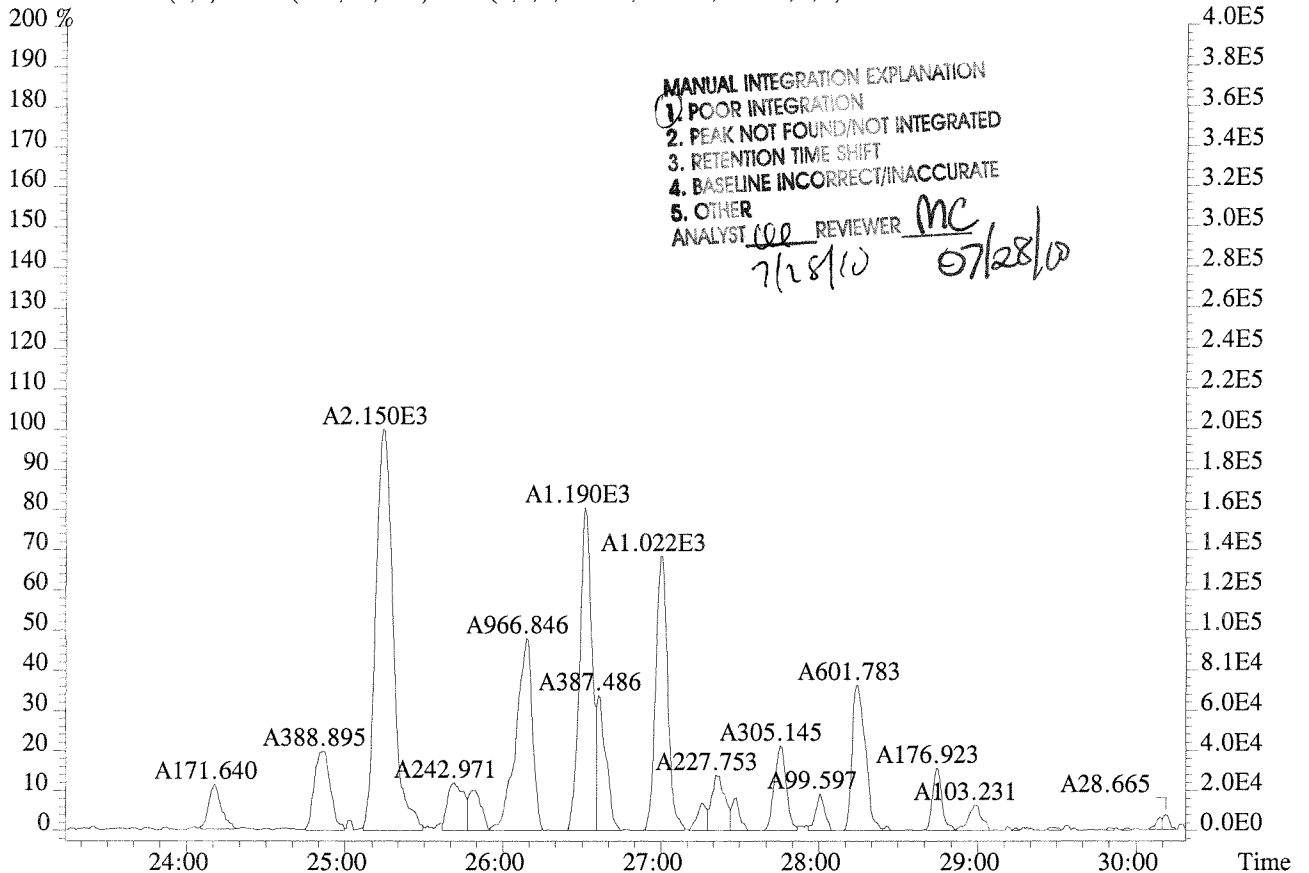
354.9792 PKD(3,3,3,100.00%,0.0,1.00%,F,F)



File:P208831 #1-590 Acq:27-JUL-2010 10:50:01 Probe EI+ Magnet SIR VG BioTech Mass sf
 Sample#1 Exp:E1000811-001 SRC-2010-8-
 303.9016 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.10%,740.0,1.00%,F,T)



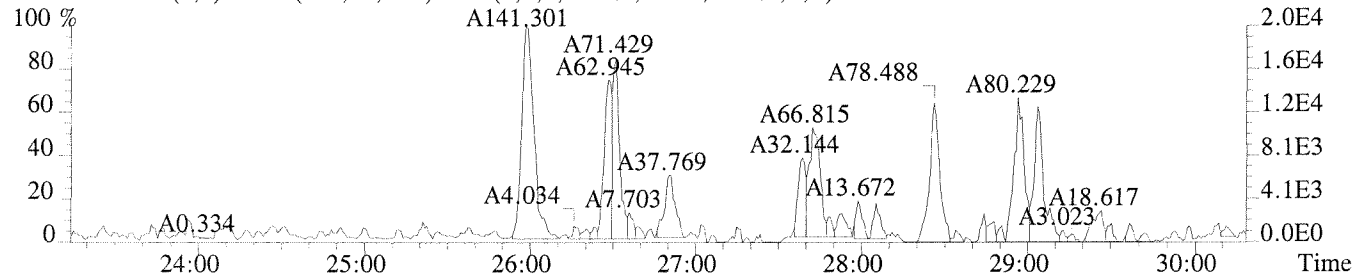
305.8987 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.10%,1104.0,1.00%,F,T)



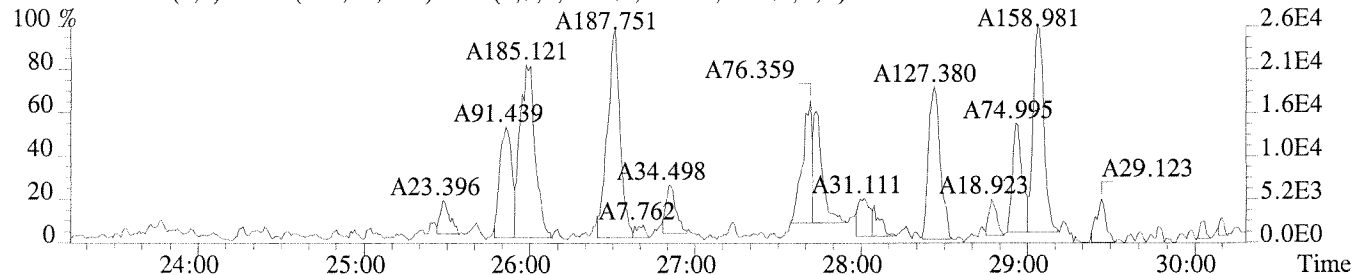
File:P208831 #1-590 Acq:27-JUL-2010 10:50:01 Probe EI+ Magnet SIR VG BioTech Mass spectf

Sample#1 Exp:E1000811-001 SRC-2010-8-

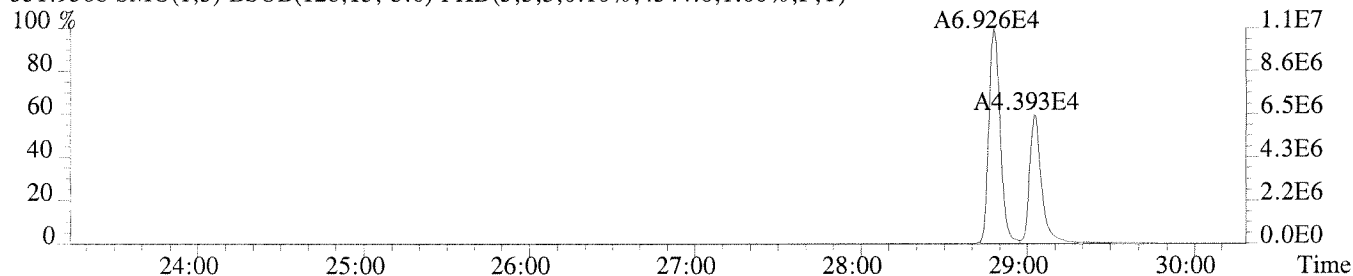
319.8965 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.10%,756.0,1.00%,F,T)



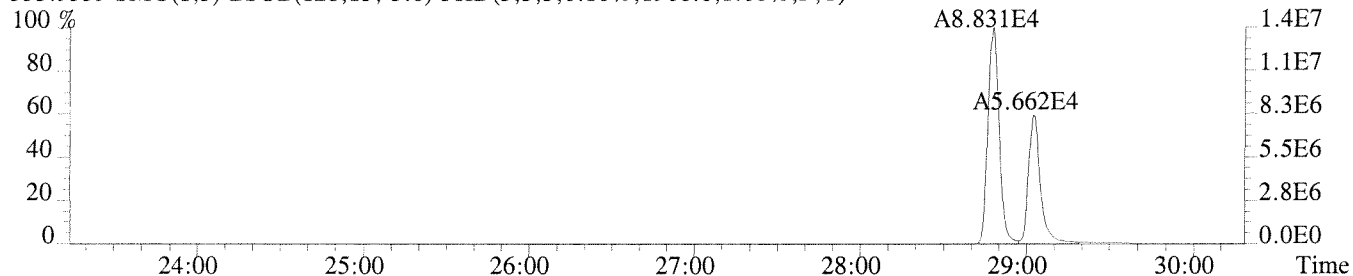
321.8936 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.10%,1212.0,1.00%,F,T)



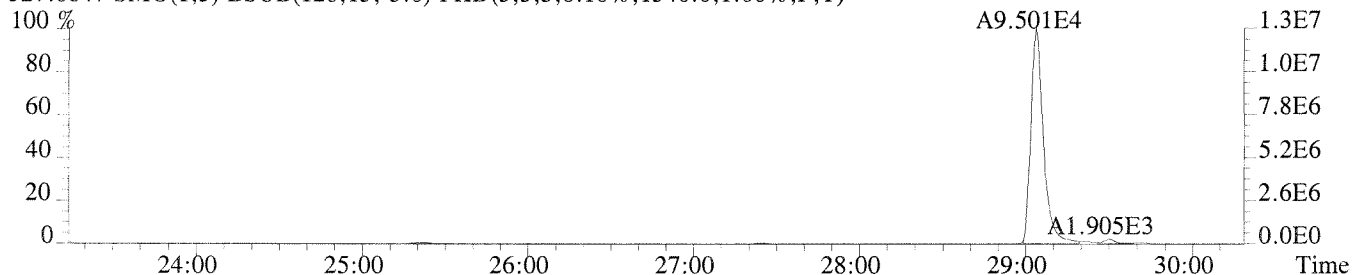
331.9368 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.10%,4544.0,1.00%,F,T)



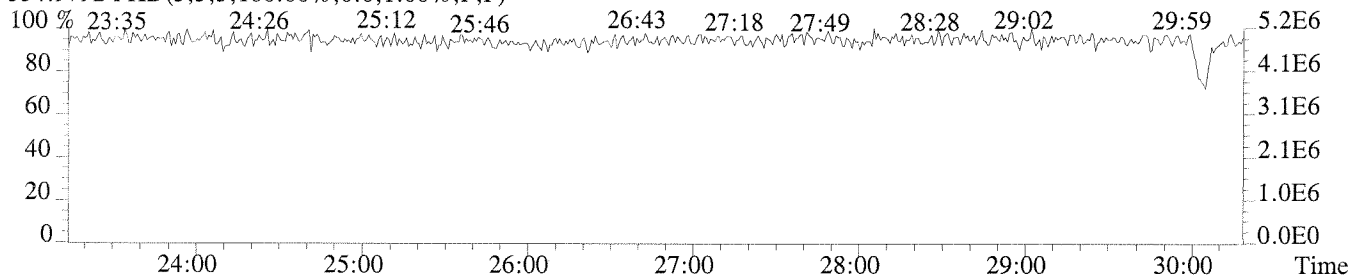
333.9339 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.10%,1908.0,1.00%,F,T)



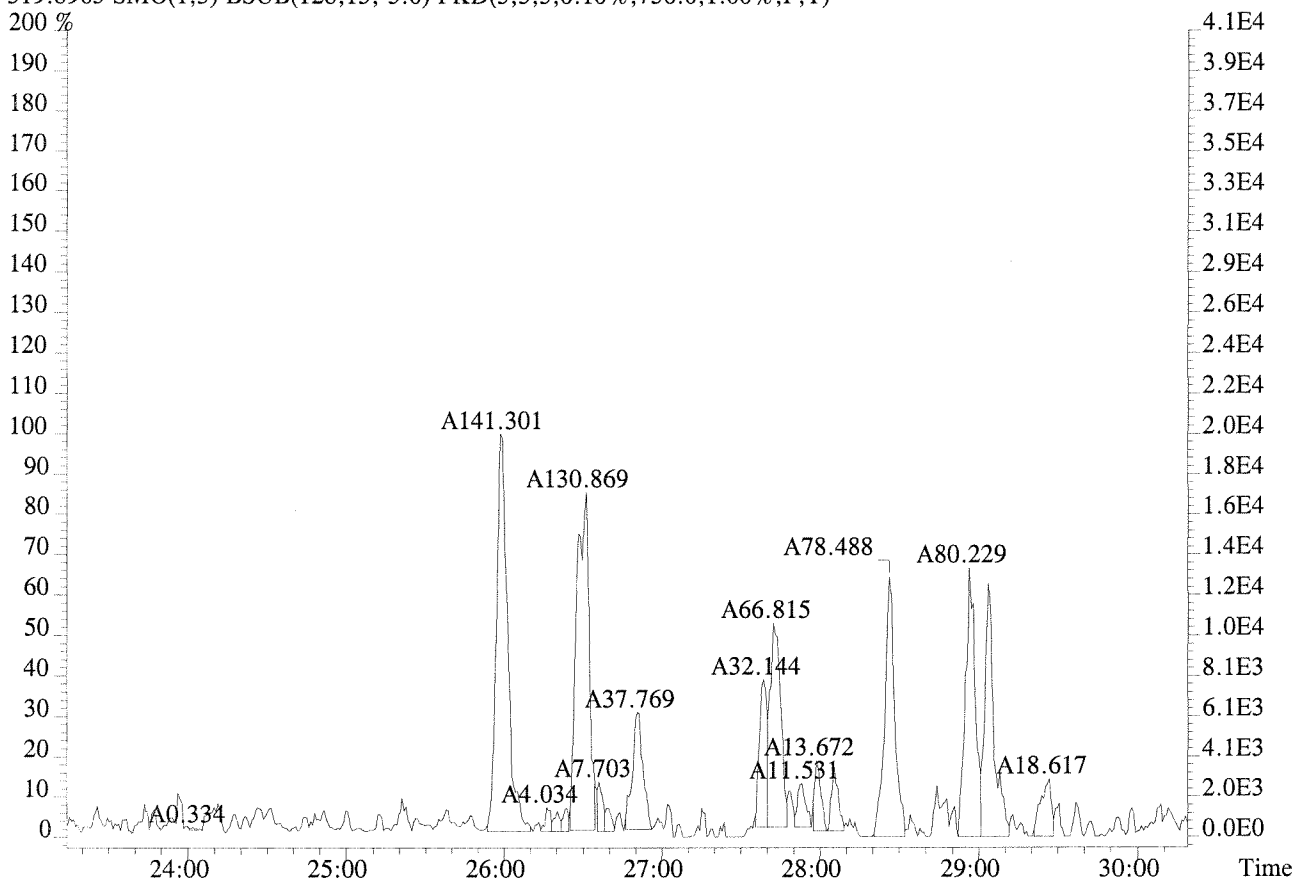
327.8847 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.10%,1340.0,1.00%,F,T)



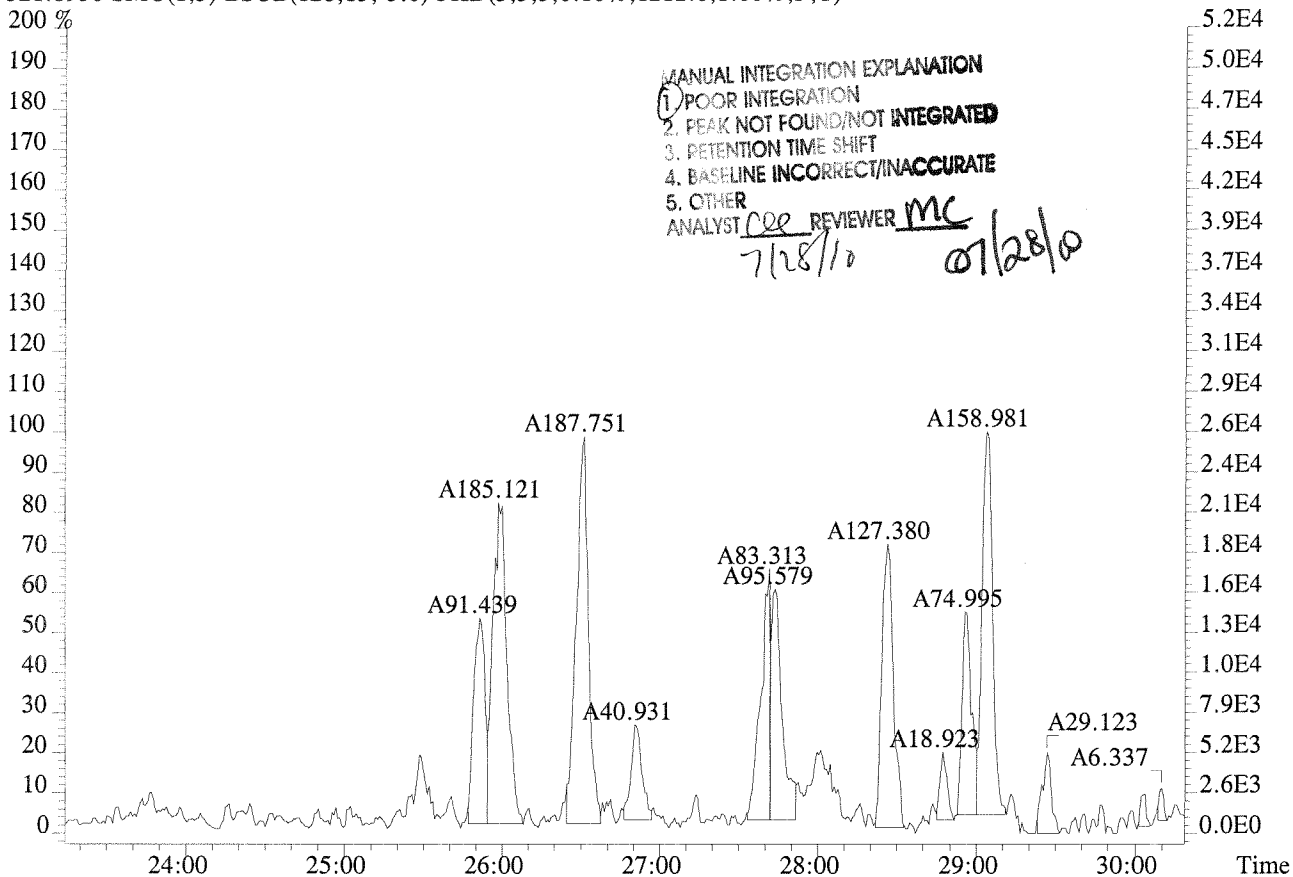
354.9792 PKD(3,3,3,100.00%,0.0,1.00%,F,F)



File:P208831 #1-590 Acq:27-JUL-2010 10:50:01 Probe EI+ Magnet SIR VG BioTech Mass sf
Sample#1 Exp:E1000811-001 SRC-2010-8-
319.8965 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.10%,756.0,1.00%,F,T)



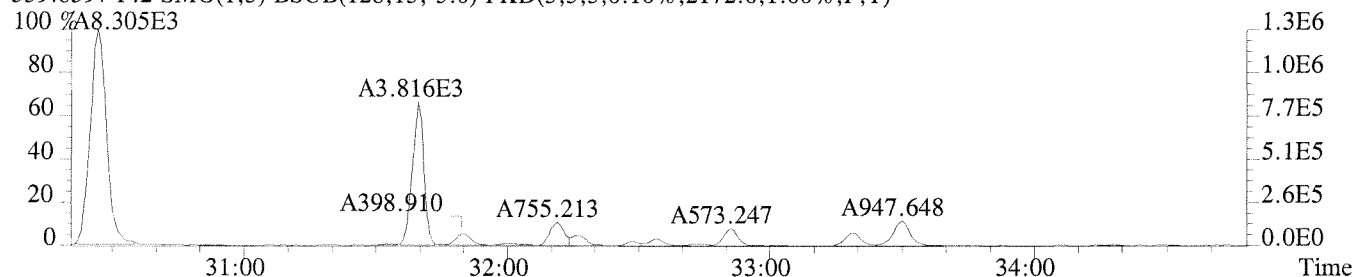
321.8936 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.10%,1212.0,1.00%,F,T)



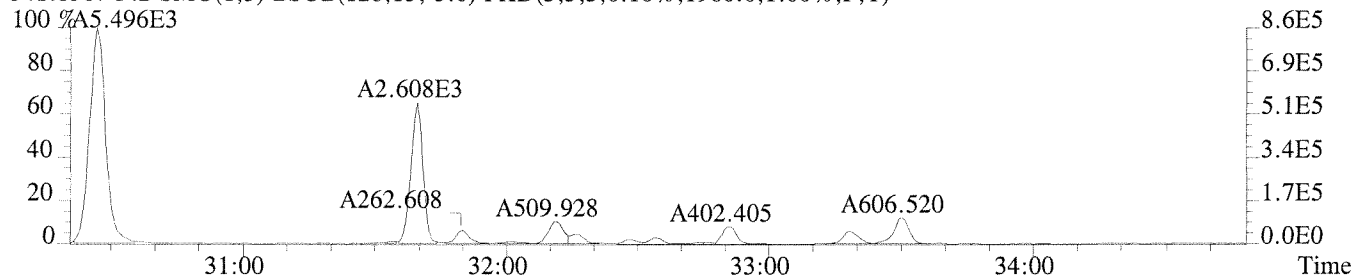
File:P208831 #1-405 Acq:27-JUL-2010 10:50:01 Probe EI+ Magnet SIR VG BioTech Mass spectf

Sample#1 Exp:E1000811-001 SRC-2010-8-

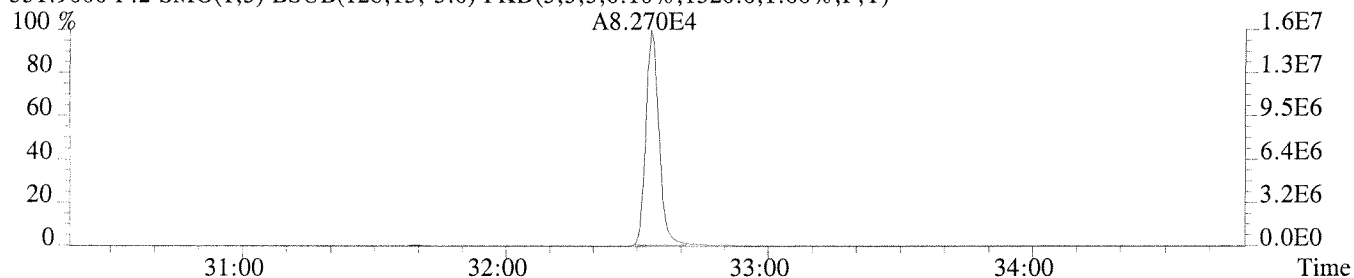
339.8597 F:2 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.10%,2172.0,1.00%,F,T)



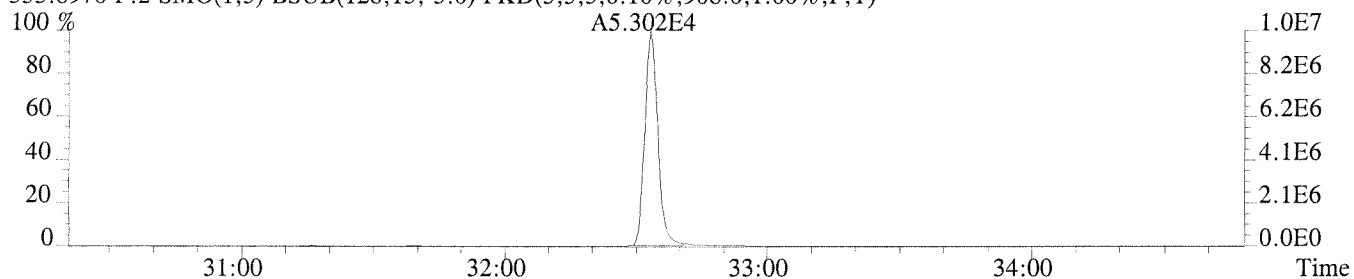
341.8567 F:2 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.10%,1960.0,1.00%,F,T)



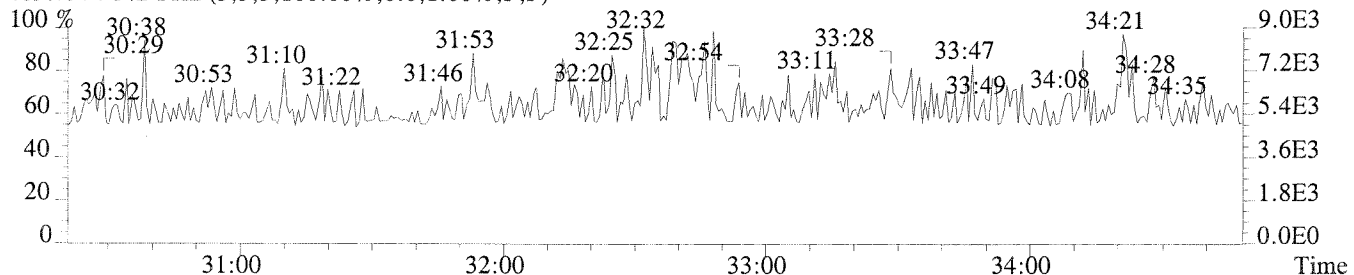
351.9000 F:2 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.10%,1320.0,1.00%,F,T)



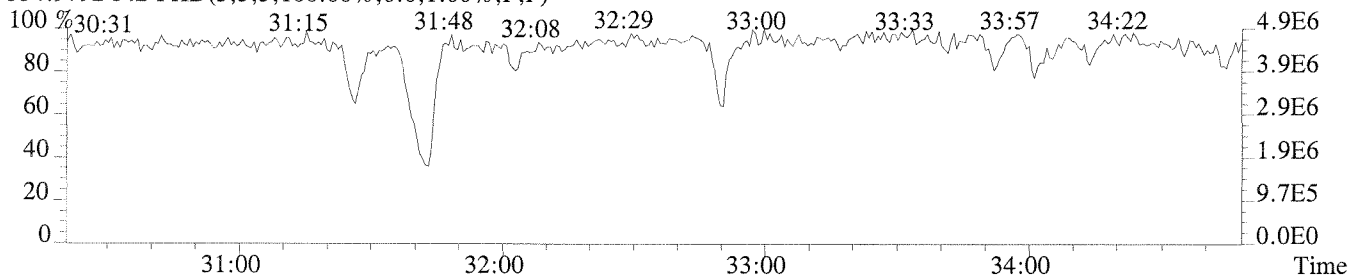
353.8970 F:2 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.10%,908.0,1.00%,F,T)



409.7974 F:2 PKD(5,3,5,100.00%,0.0,1.00%,F,F)



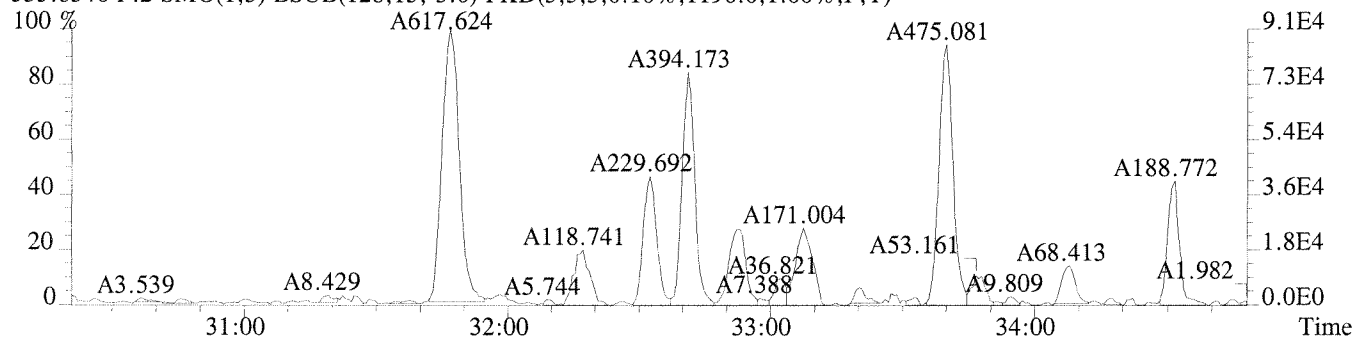
354.9792 F:2 PKD(3,3,3,100.00%,0.0,1.00%,F,F)



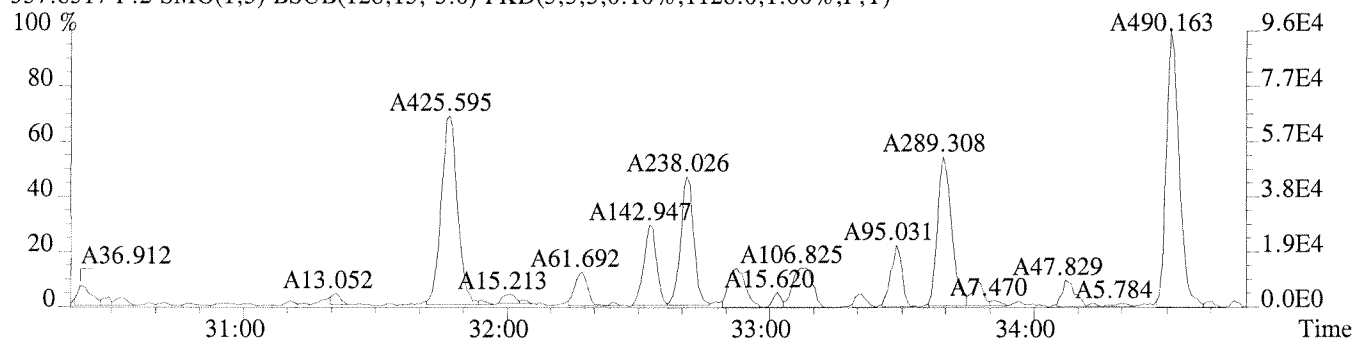
File:P208831 #1-405 Acq:27-JUL-2010 10:50:01 Probe EI+ Magnet SIR VG BioTech Mass spectf

Sample#1 Exp:E1000811-001 SRC-2010-8-

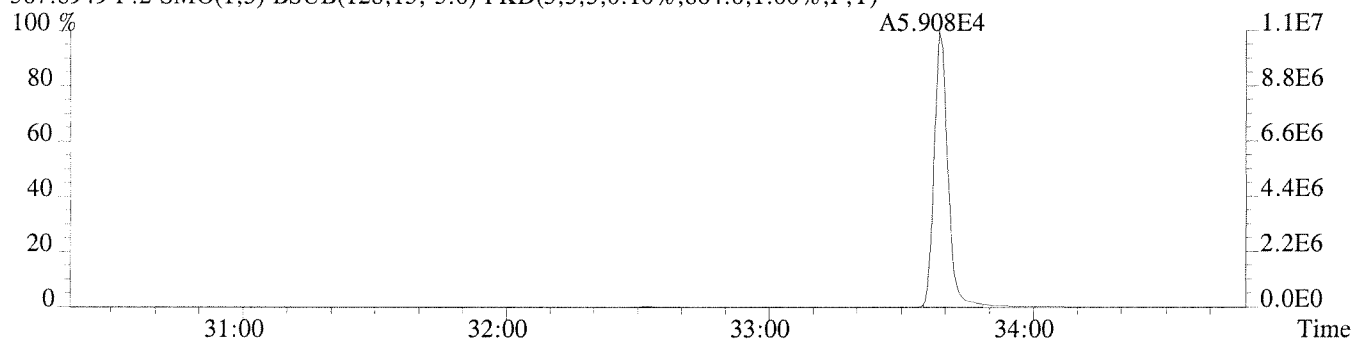
355.8546 F:2 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.10%,1196.0,1.00%,F,T)



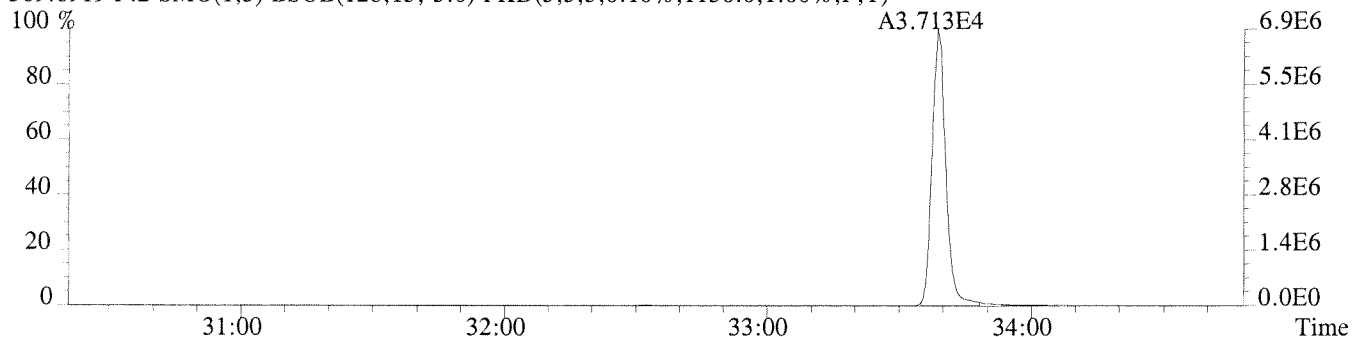
357.8517 F:2 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.10%,1128.0,1.00%,F,T)



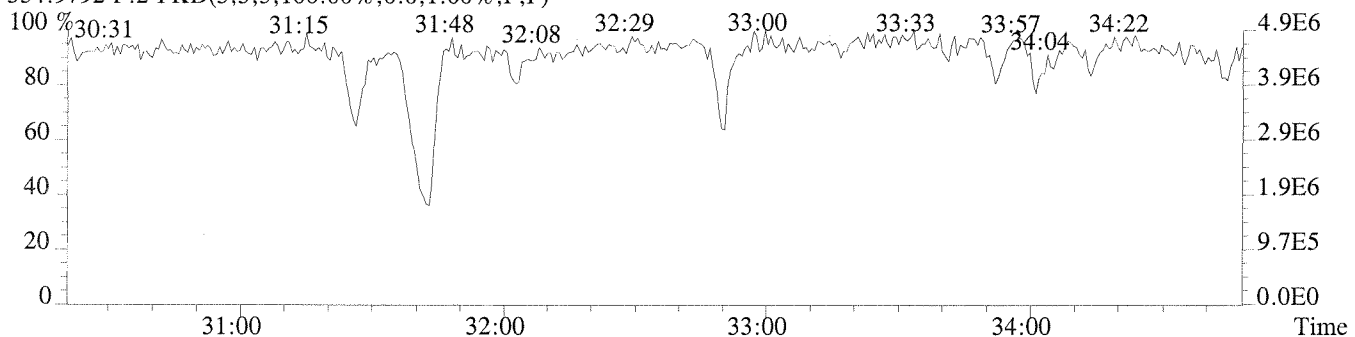
367.8949 F:2 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.10%,864.0,1.00%,F,T)



369.8919 F:2 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.10%,1136.0,1.00%,F,T)



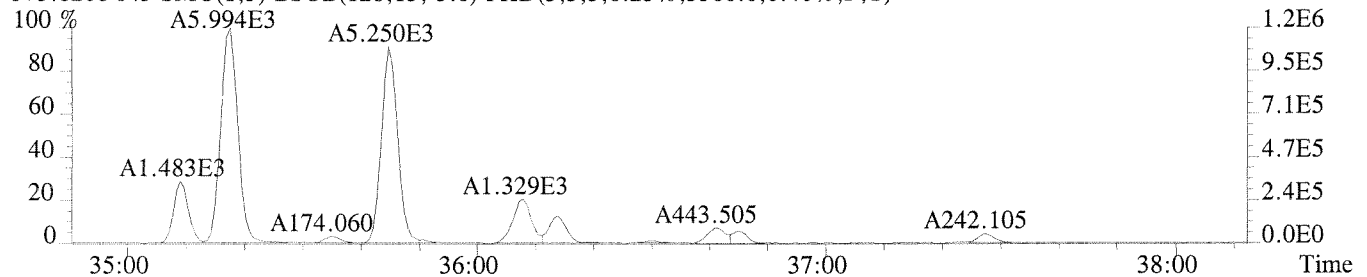
354.9792 F:2 PKD(3,3,3,100.00%,0.0,1.00%,F,F)



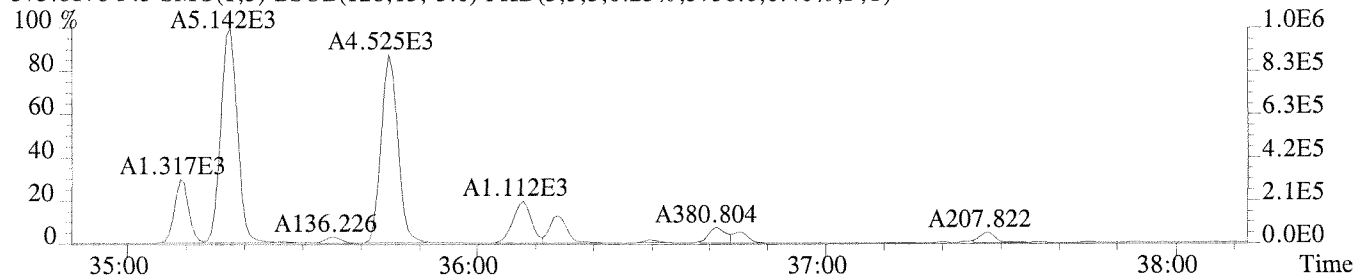
File:P208831 #1-306 Acq:27-JUL-2010 10:50:01 Probe EI+ Magnet SIR VG BioTech Mass spectf

Sample#1 Exp:E1000811-001 SRC-2010-8-

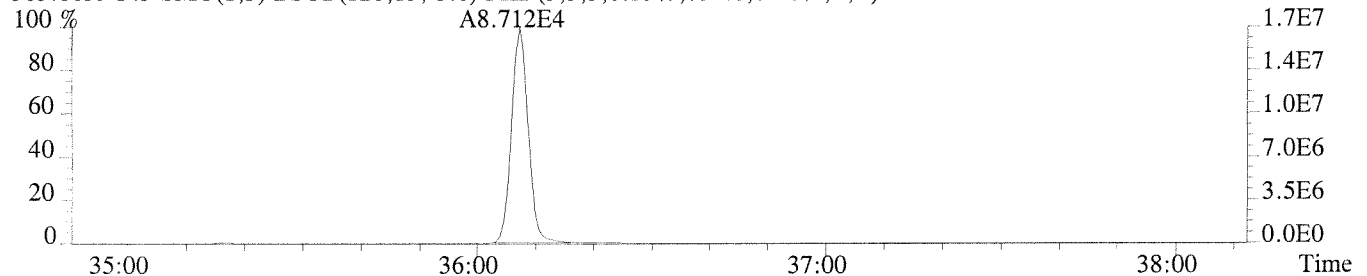
373.8208 F:3 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.25%,3500.0,0.40%,F,T)



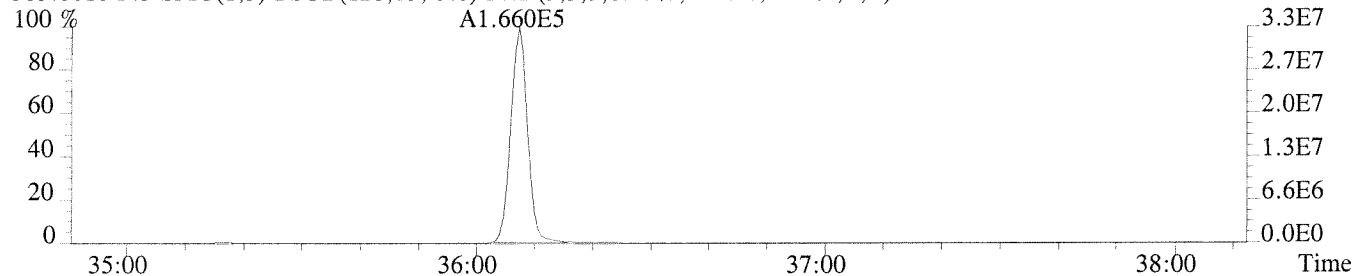
375.8178 F:3 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.25%,5736.0,0.40%,F,T)



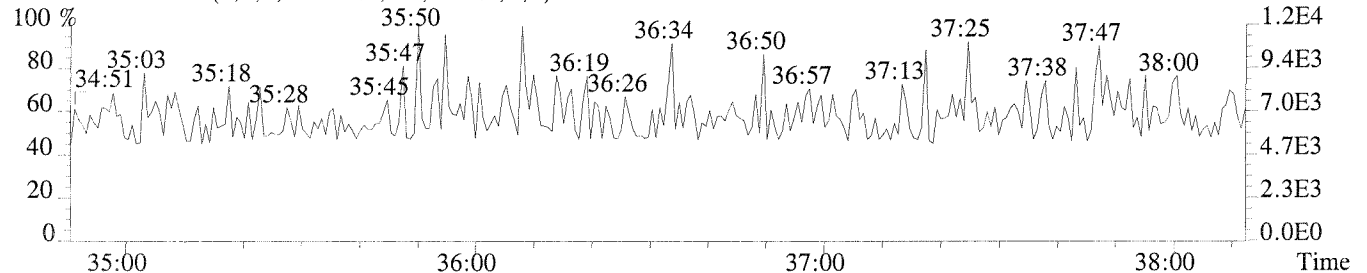
383.8639 F:3 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.25%,832.0,0.40%,F,T)



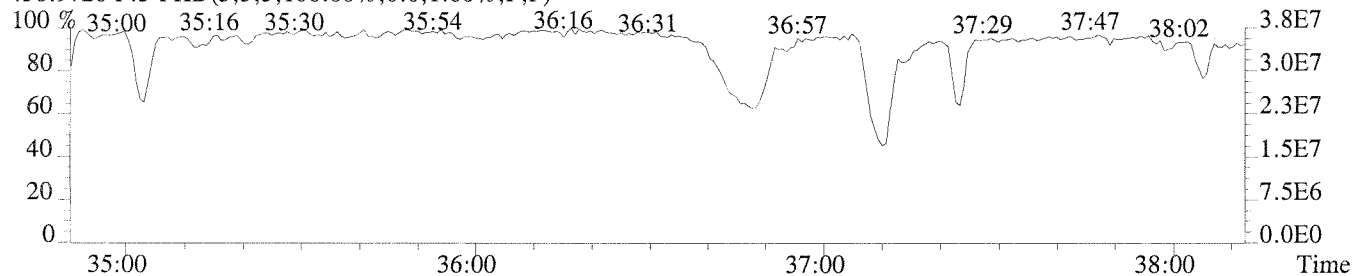
385.8610 F:3 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.25%,1176.0,0.40%,F,T)



445.7555 F:3 PKD(5,3,5,100.00%,0.0,1.00%,F,F)



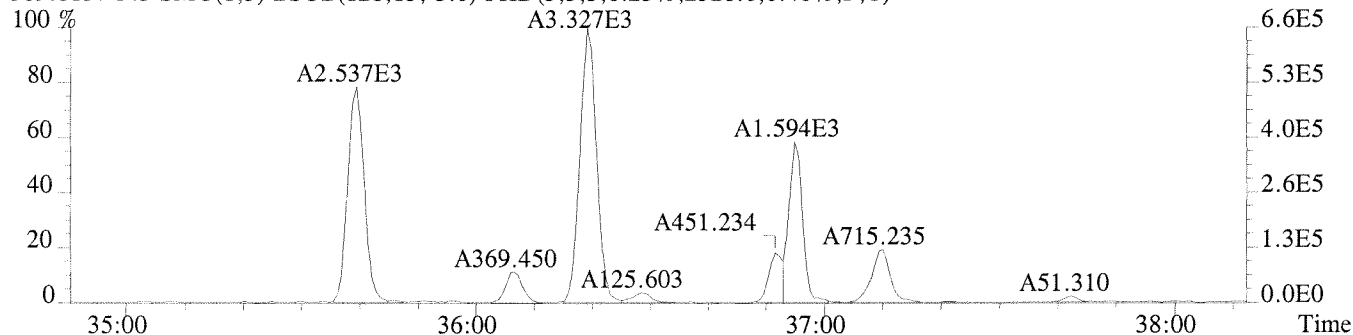
430.9728 F:3 PKD(3,3,3,100.00%,0.0,1.00%,F,F)



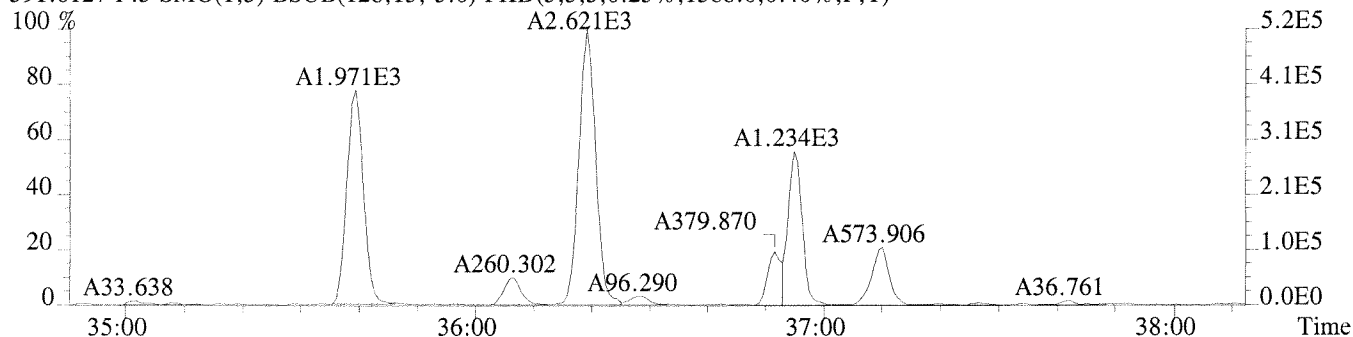
File:P208831 #1-306 Acq:27-JUL-2010 10:50:01 Probe EI+ Magnet SIR VG BioTech Mass spectf

Sample#1 Exp:E1000811-001 SRC-2010-8-

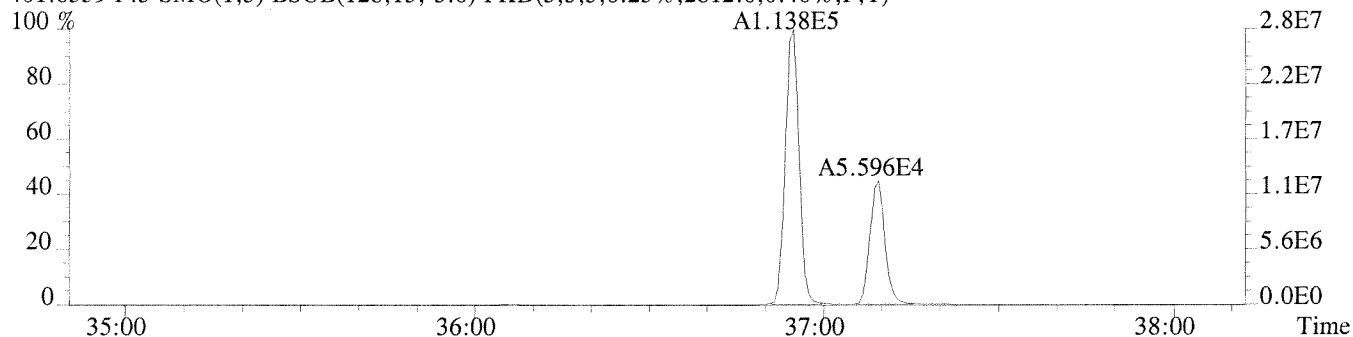
389.8157 F:3 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.25%,2328.0,0.40%,F,T)



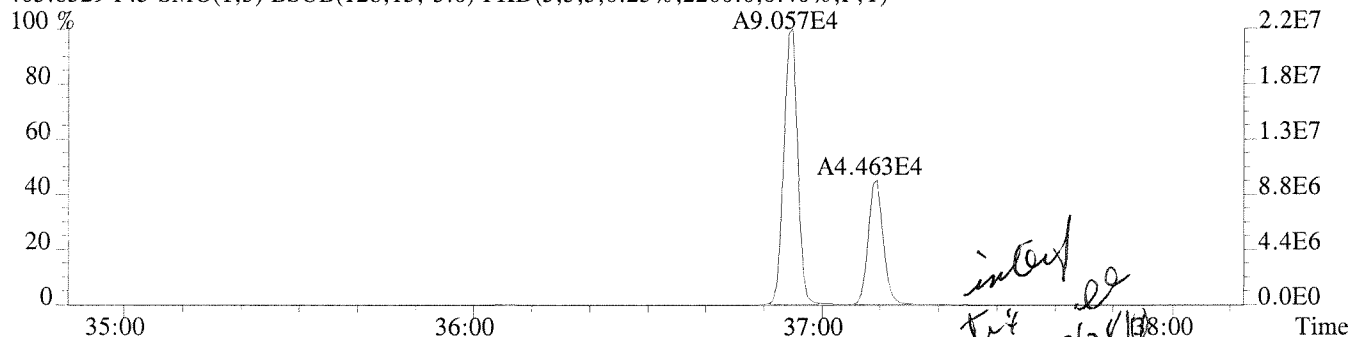
391.8127 F:3 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.25%,1588.0,0.40%,F,T)



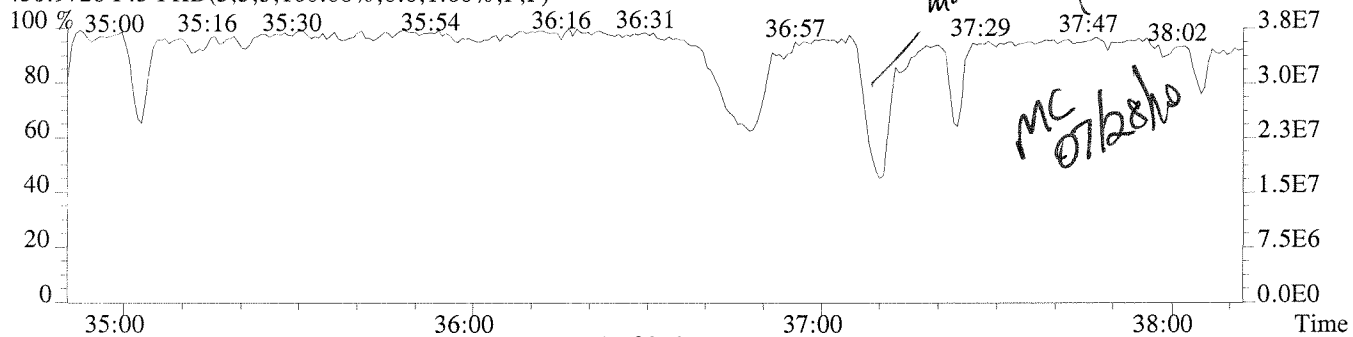
401.8559 F:3 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.25%,2812.0,0.40%,F,T)



403.8529 F:3 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.25%,2200.0,0.40%,F,T)



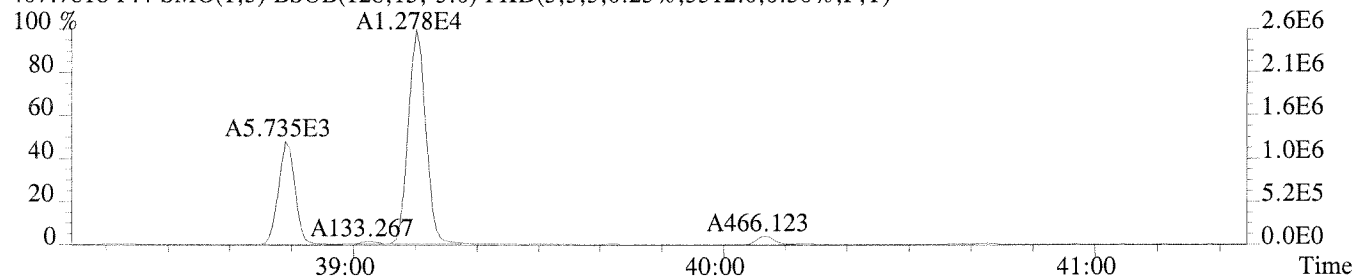
430.9728 F:3 PKD(3,3,3,100.00%,0.0,1.00%,F,F)



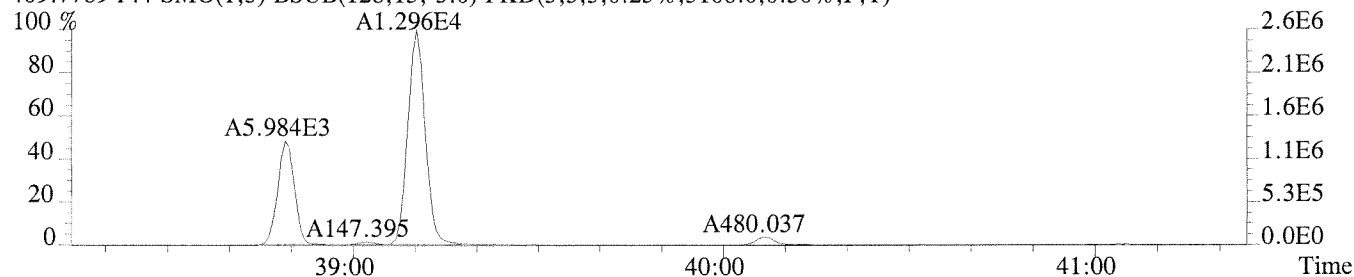
File:P208831 #1-288 Acq:27-JUL-2010 10:50:01 Probe EI+ Magnet SIR VG BioTech Mass spectf

Sample#1 Exp:E1000811-001 SRC-2010-8-

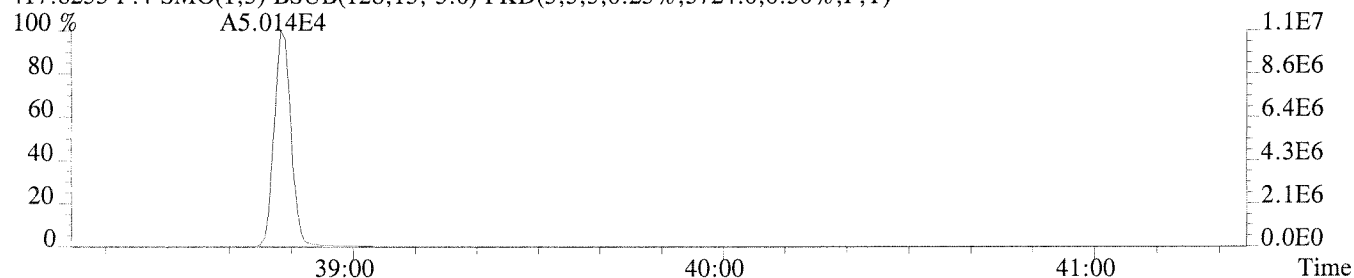
407.7818 F:4 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.25%,3512.0,0.50%,F,T)



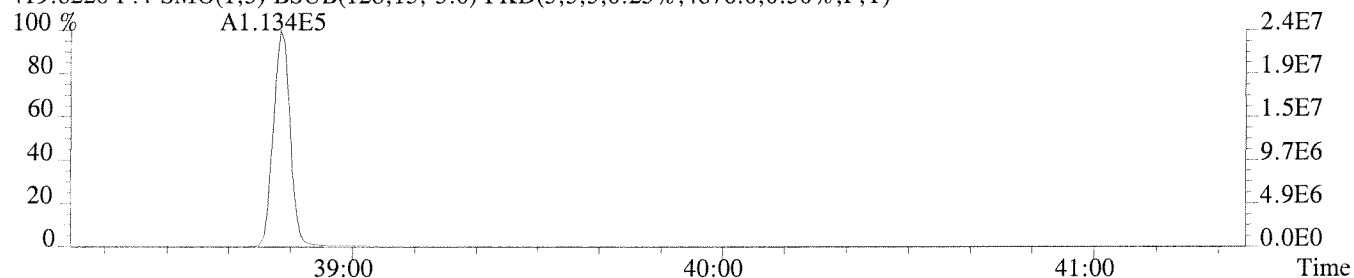
409.7789 F:4 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.25%,3108.0,0.50%,F,T)



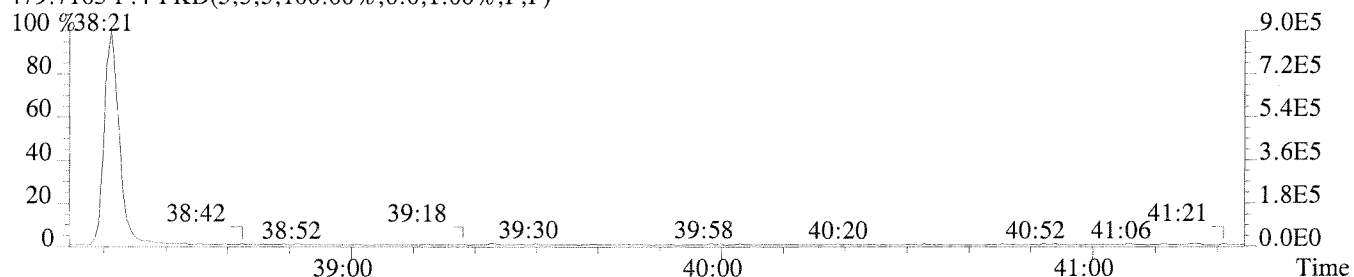
417.8253 F:4 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.25%,5724.0,0.50%,F,T)



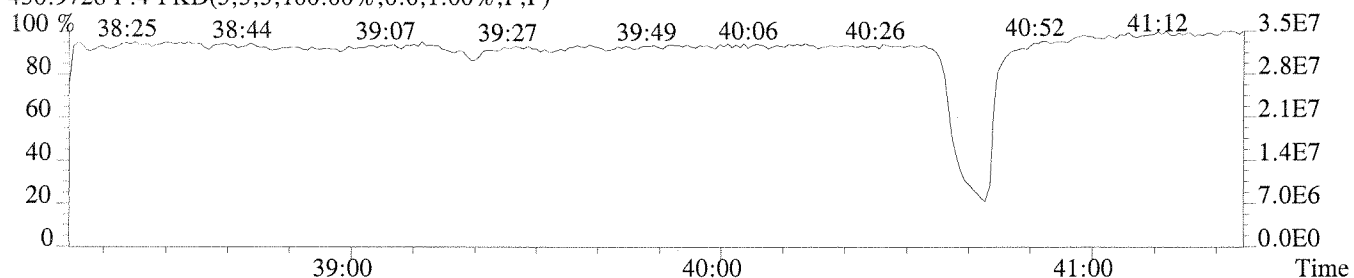
419.8220 F:4 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.25%,4876.0,0.50%,F,T)



479.7165 F:4 PKD(5,3,5,100.00%,0.0,1.00%,F,F)



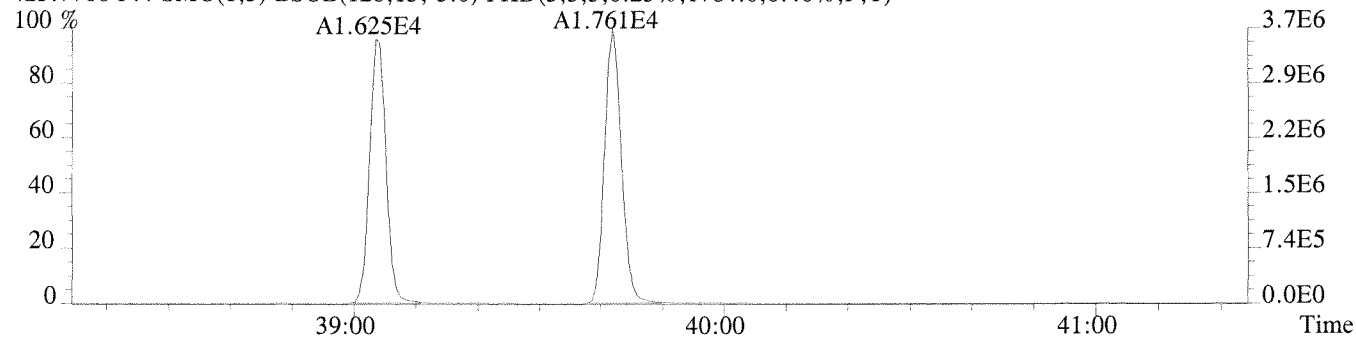
430.9728 F:4 PKD(3,3,3,100.00%,0.0,1.00%,F,F)



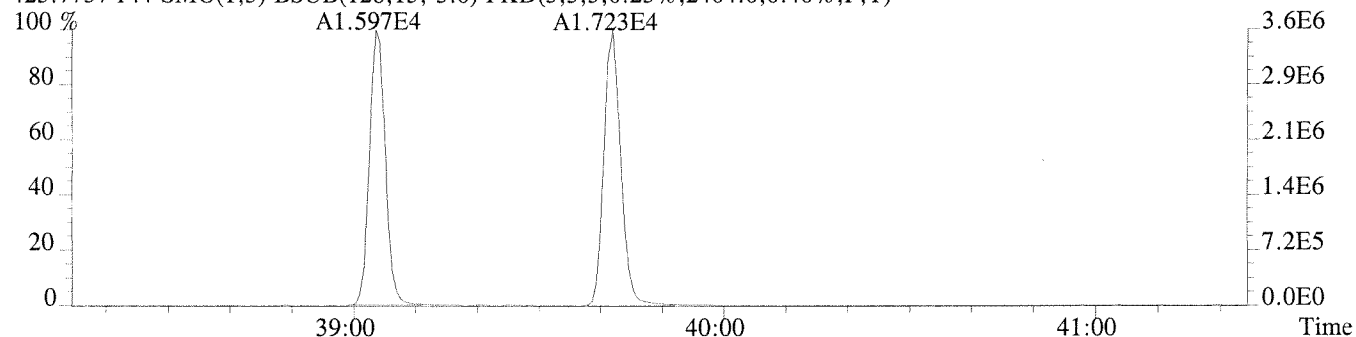
File:P208831 #1-288 Acq:27-JUL-2010 10:50:01 Probe EI+ Magnet SIR VG BioTech Mass spectf

Sample#1 Exp:E1000811-001 SRC-2010-8-

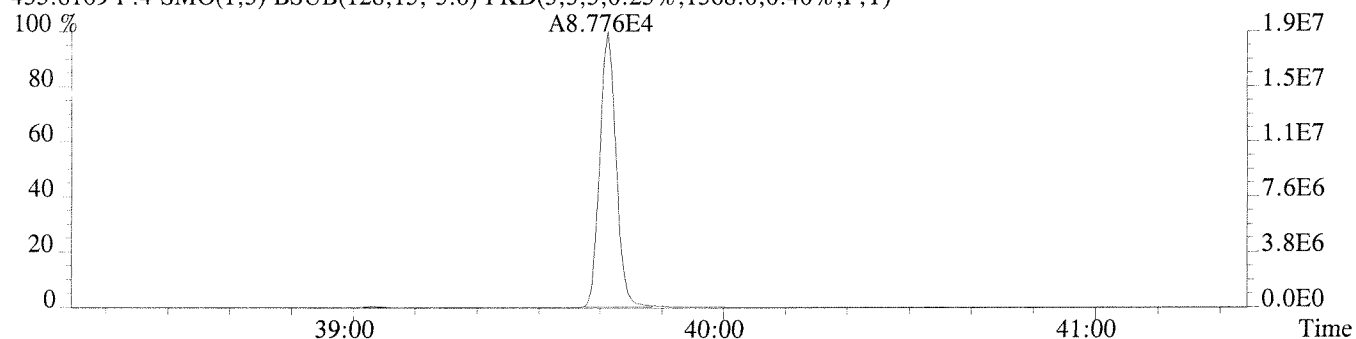
423.7766 F:4 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.25%,1784.0,0.40%,F,T)



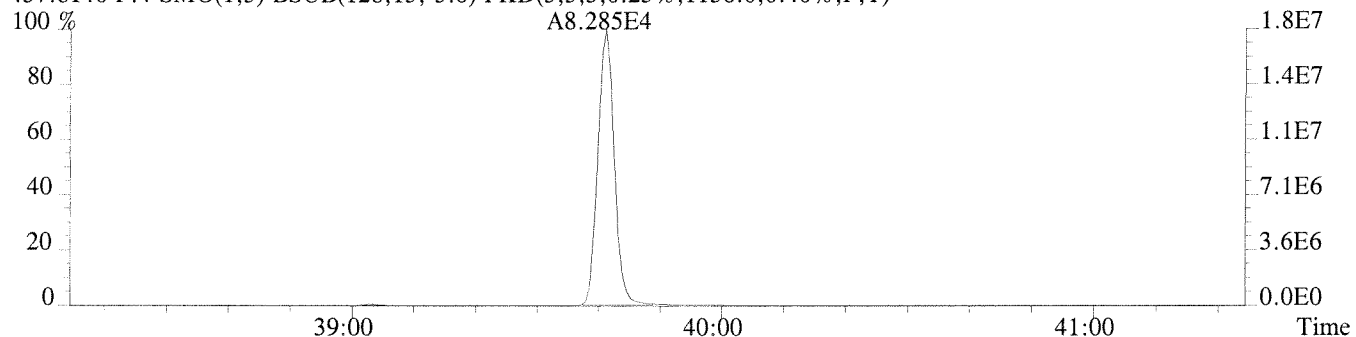
425.7737 F:4 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.25%,2404.0,0.40%,F,T)



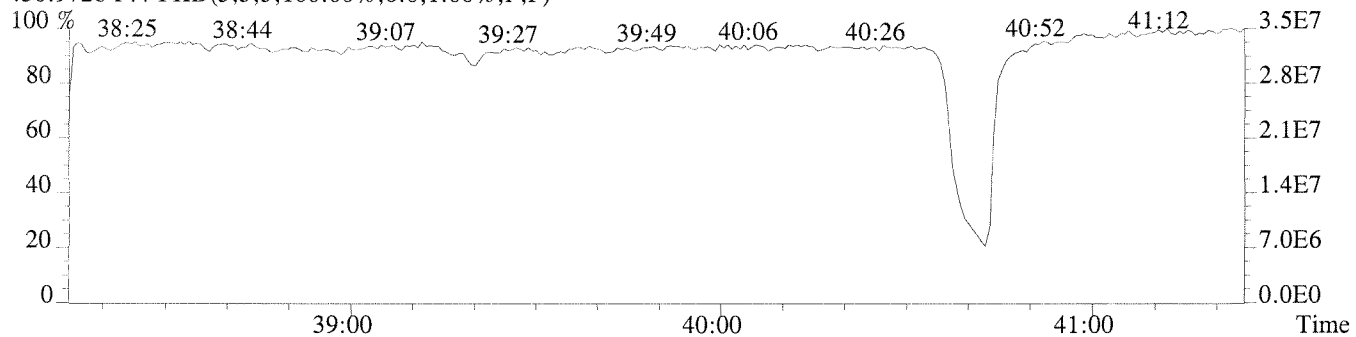
435.8169 F:4 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.25%,1368.0,0.40%,F,T)



437.8140 F:4 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.25%,1156.0,0.40%,F,T)



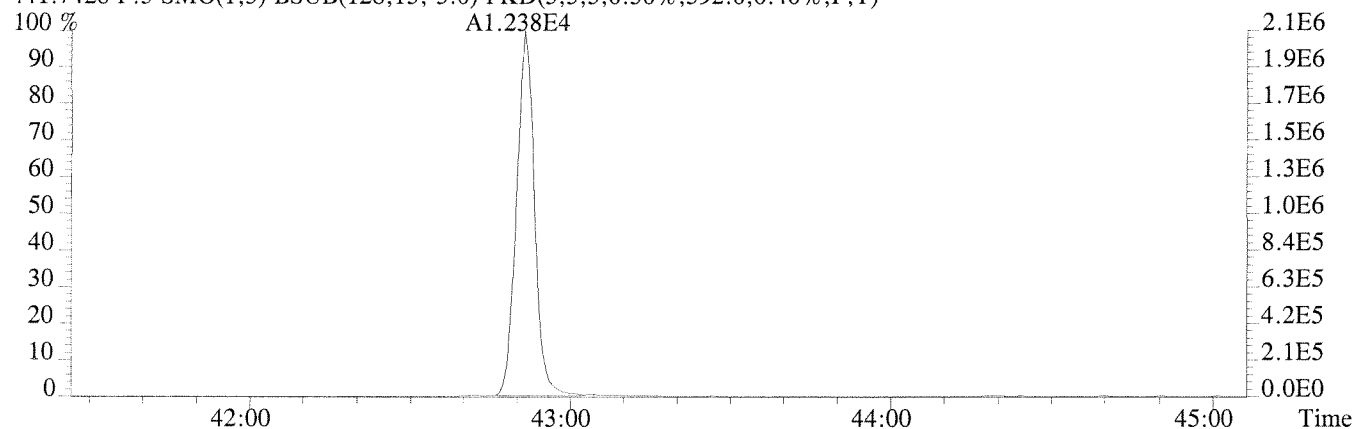
430.9728 F:4 PKD(3,3,3,100.00%,0.0,1.00%,F,F)



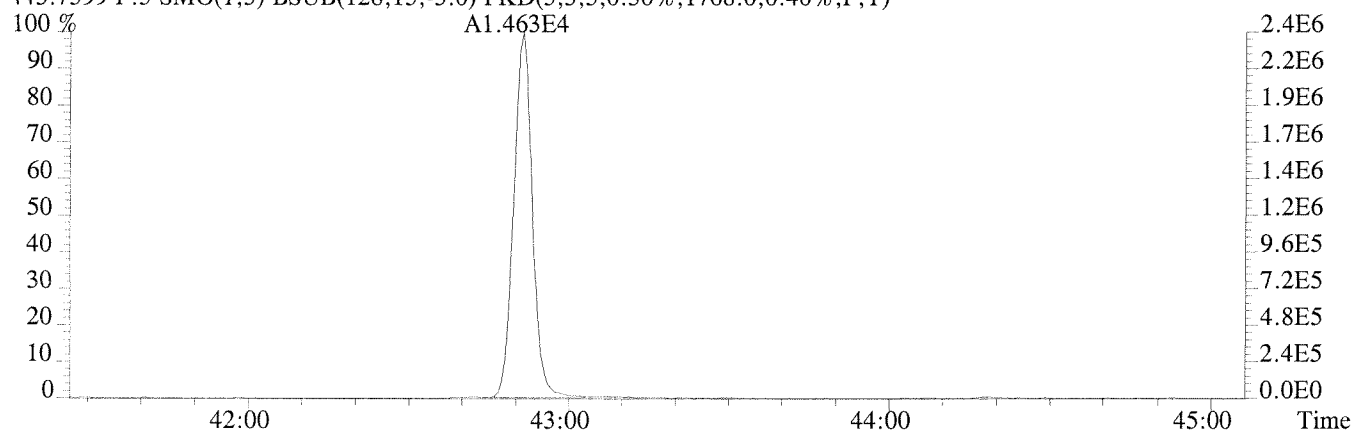
File:P208831 #1-333 Acq:27-JUL-2010 10:50:01 Probe EI+ Magnet SIR VG BioTech Mass spectf

Sample#1 Exp:E1000811-001 SRC-2010-8-

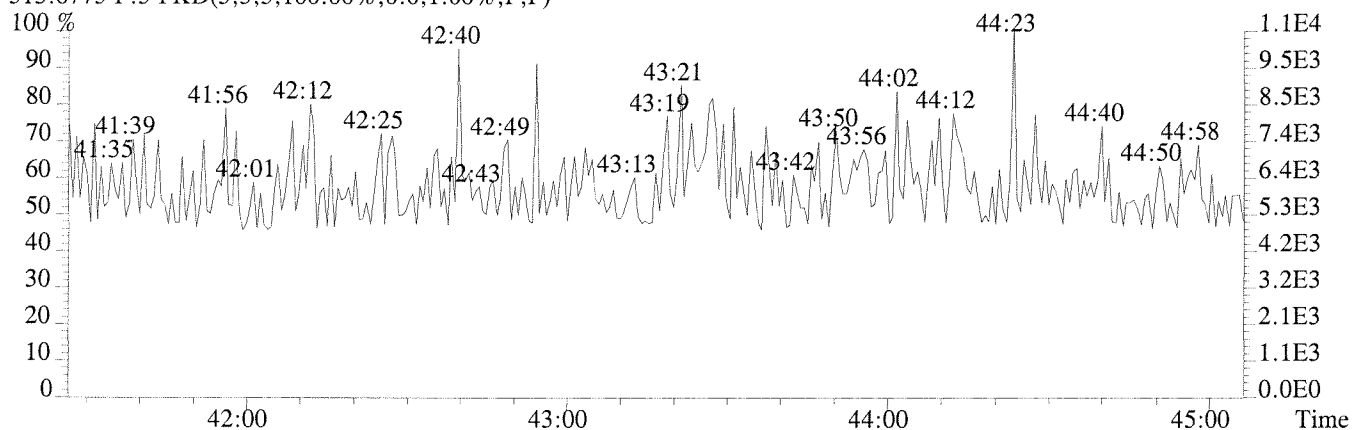
441.7428 F:5 SMO(1,3) BSUB(128,15,-3.0) PKD(5,3,5,0.30%,592.0,0.40%,F,T)



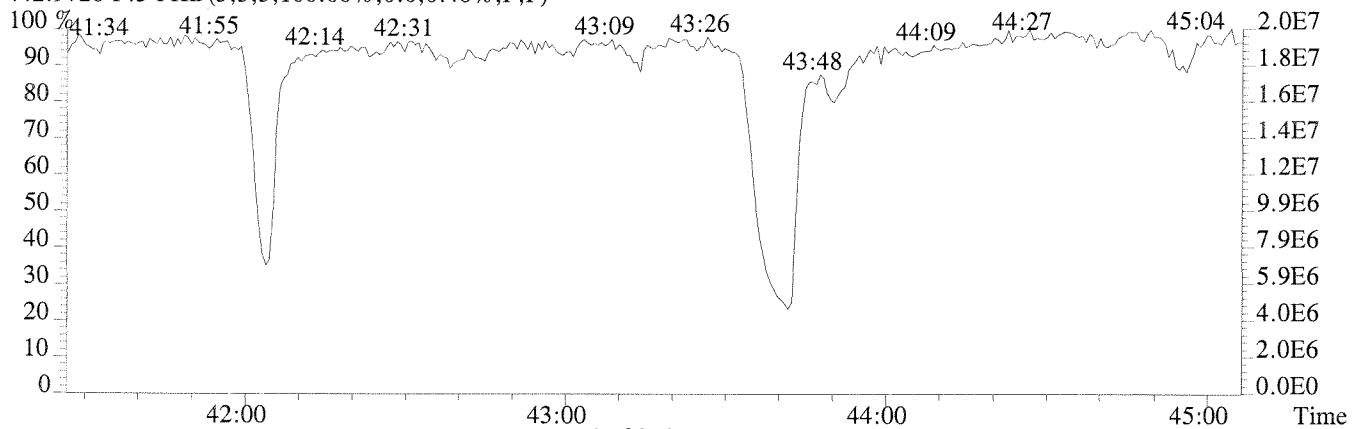
443.7399 F:5 SMO(1,3) BSUB(128,15,-3.0) PKD(5,3,5,0.30%,1768.0,0.40%,F,T)



513.6775 F:5 PKD(5,3,5,100.00%,0.0,1.00%,F,F)



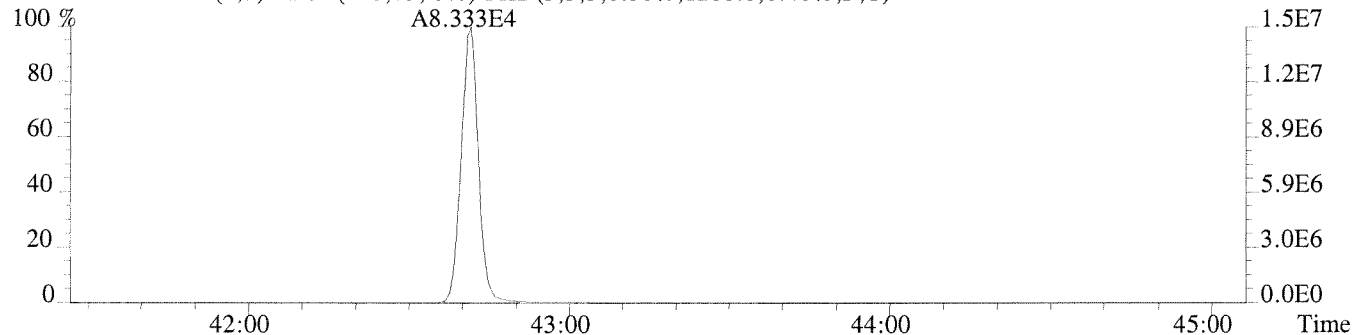
442.9728 F:5 PKD(3,3,3,100.00%,0.0,0.40%,F,F)



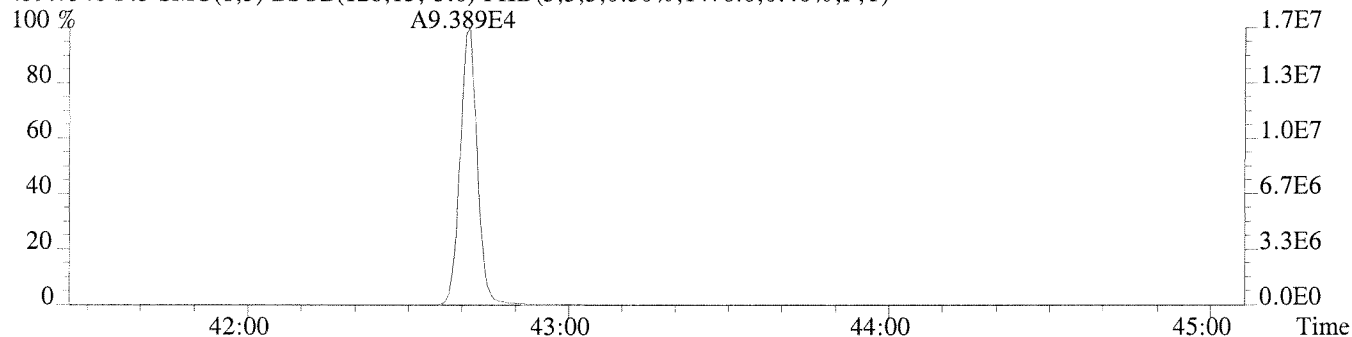
File:P208831 #1-333 Acq:27-JUL-2010 10:50:01 Probe EI+ Magnet SIR VG BioTech Mass spectf

Sample#1 Exp:E1000811-001 SRC-2010-8-

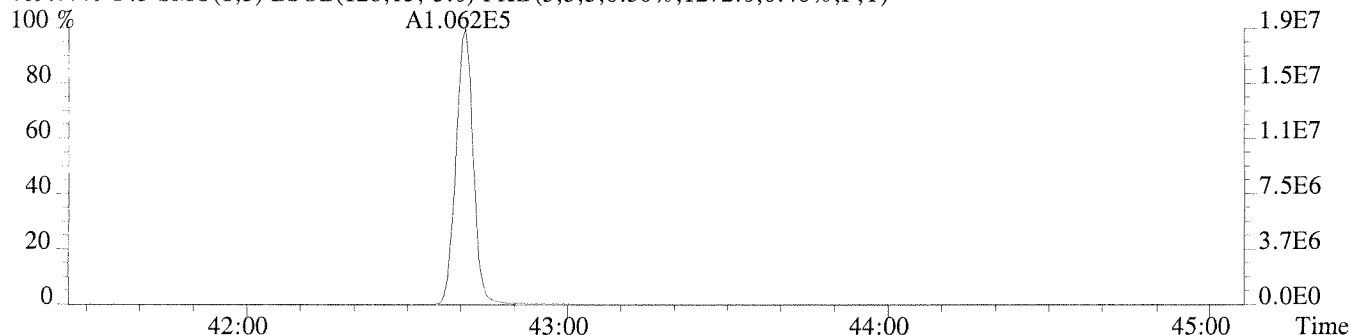
457.7377 F:5 SMO(1,3) BSUB(128,15,-3.0) PKD(5,3,5,0.30%,1288.0,0.40%,F,T)



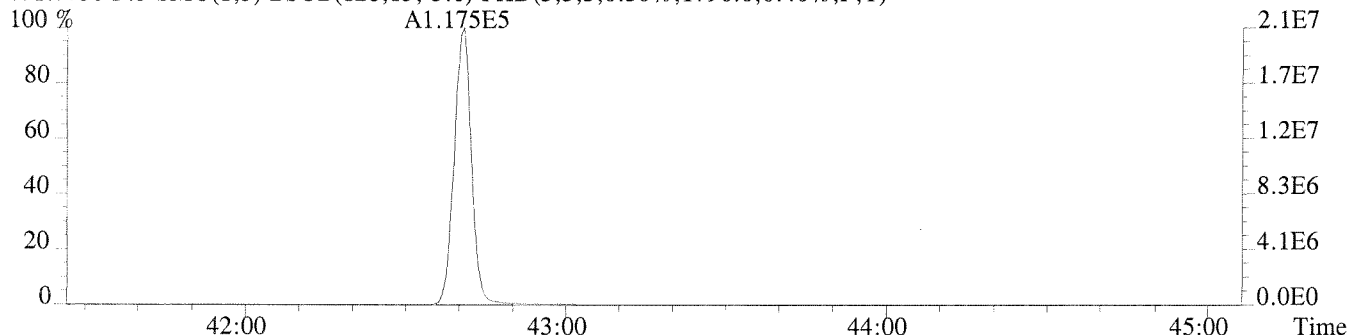
459.7348 F:5 SMO(1,3) BSUB(128,15,-3.0) PKD(5,3,5,0.30%,1476.0,0.40%,F,T)



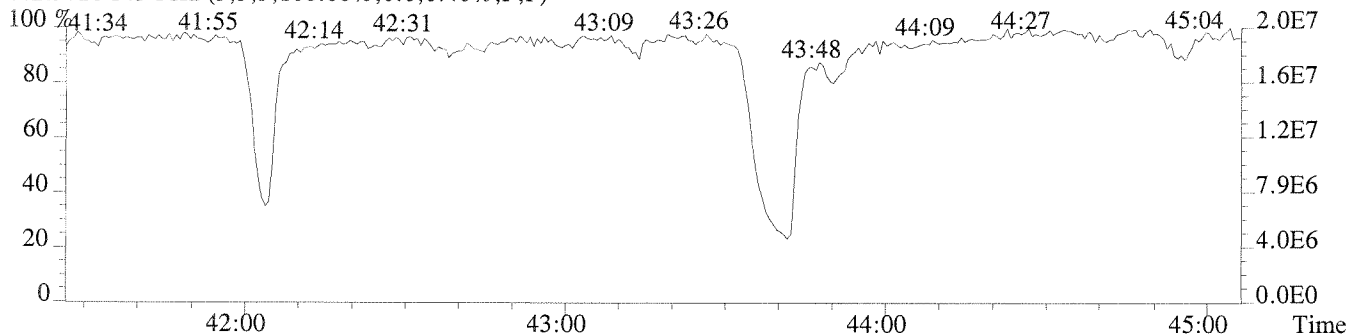
469.7779 F:5 SMO(1,3) BSUB(128,15,-3.0) PKD(5,3,5,0.30%,1272.0,0.40%,F,T)



471.7750 F:5 SMO(1,3) BSUB(128,15,-3.0) PKD(5,3,5,0.30%,1796.0,0.40%,F,T)



442.9728 F:5 PKD(3,3,3,100.00%,0.0,0.40%,F,F)



Columbia Analytical Services, Inc.
Sample Response Summary

Page 8 of 13
EPA SAMPLE NO.
SRC-2010-8-CO7

Run #8 Filename U137251 Samp: 1 Inj: 1 Acquired: 27-JUL-10 14:53:12
Processed: 28-JUL-10 11:41:00 Sample ID: E1000811-001

Typ	Name	RT-1	Resp 1	Resp 2	Ratio	Meet	Mod?
1 Unk	2,3,7,8-TCDF	22:20	1.371e+02	1.804e+02	0.76	yes	n n
2 IS	13C-2,3,7,8-TCDF	22:18	2.426e+04	3.075e+04	0.79	yes	n n
3 RS/RT	13C-1,2,3,4-TCDD	21:02	2.905e+04	3.638e+04	0.80	yes	n n
4 C/Up	37Cl-2,3,7,8-TCDD	20:47	3.925e+04				n

Signal/Noise Height Ratio Summary

		Signal 1	Noise 1	S/N Rat.1	Signal 2	Noise 2	S/N
	Name						
1	2,3,7,8-TCDF	2.40e+04	2.27e+03	1.1e+01	2.76e+04	1.84e+03	1.5e+01
2	13C-2,3,7,8-TCDF	3.57e+06	4.64e+03	7.7e+02	4.50e+06	5.37e+03	8.4e+02
3	13C-1,2,3,4-TCDD	4.81e+06	3.93e+03	1.2e+03	6.06e+06	3.26e+03	1.9e+03
4	37Cl-2,3,7,8-TCDD	6.40e+06	1.93e+03	3.3e+03			

--- 2378-TCDF EDL Calculation---

$$\text{EDL} = \frac{(2.272\text{e}+03 + 1.840\text{e}+03) \times 1000 \times 2.5 \text{ pg}}{(3.572\text{e}+06 + 4.504\text{e}+06) \times (0.000 \text{ g}) \times (100 - 0.00) / 100 \times 1.02} =$$

9.712

55.1

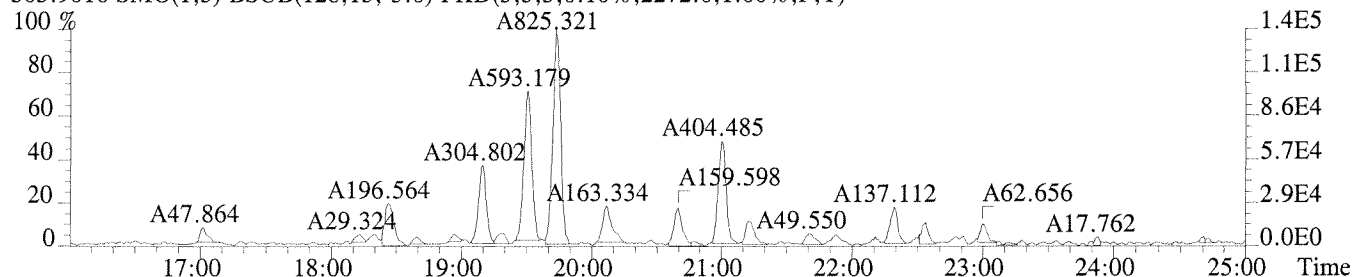
0.233 ng/kg
MC
5/30/10

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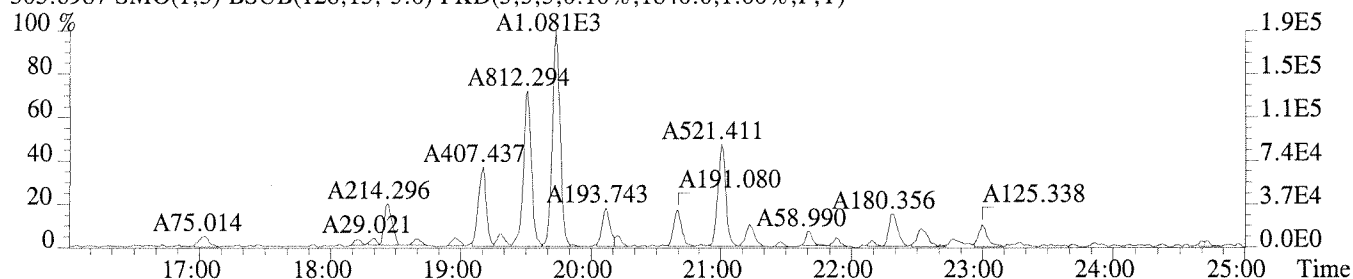
File:U137251 #1-750 Acq:27-JUL-2010 14:53:12 Probe EI+ Magnet SIR VG BioTech Mass spectf

Sample#1 Exp:E1000811-001 SRC-2010-8-

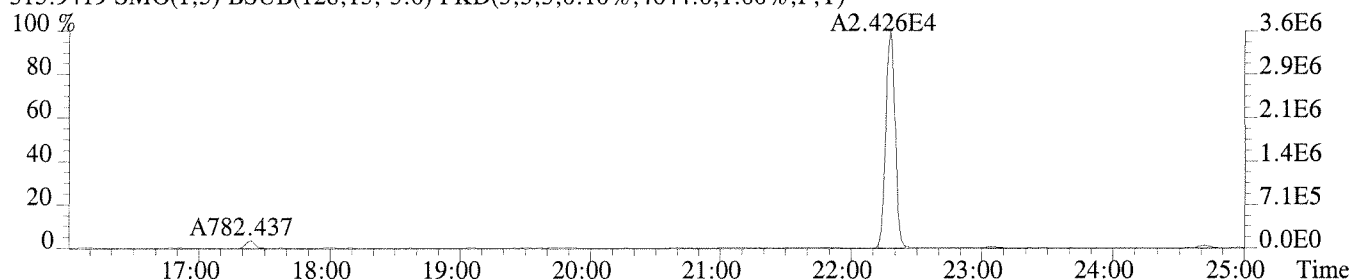
303.9016 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.10%,2272.0,1.00%,F,T)



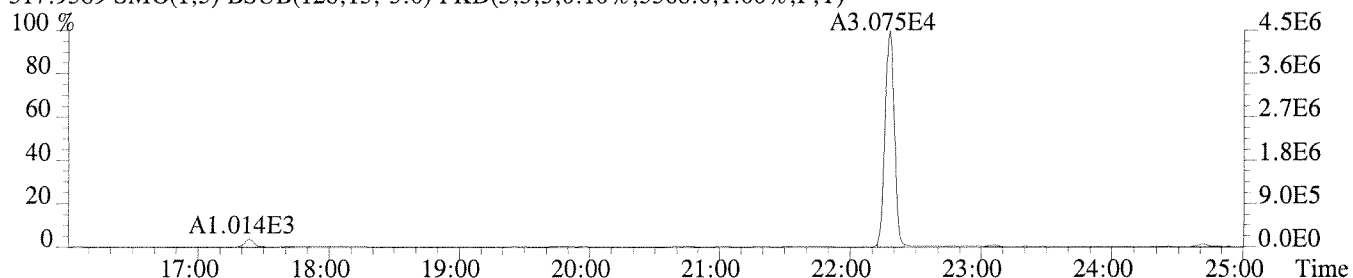
305.8987 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.10%,1840.0,1.00%,F,T)



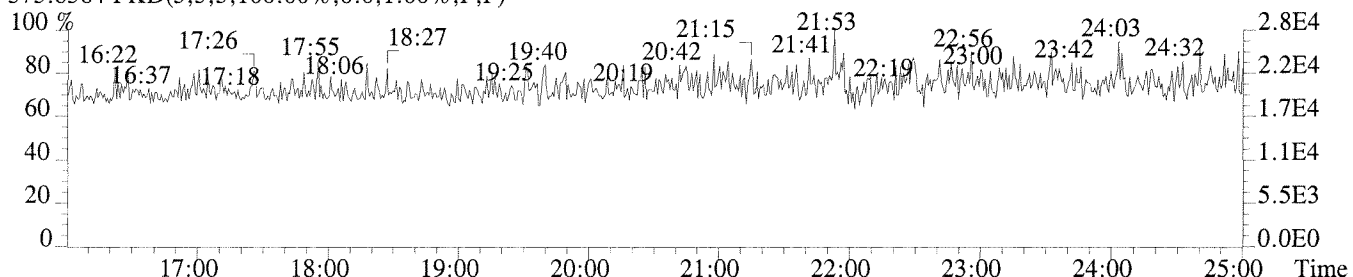
315.9419 SMO(1,5) BSUB(128,15,-3.0) PKD(3,3,3,0.10%,4644.0,1.00%,F,T)



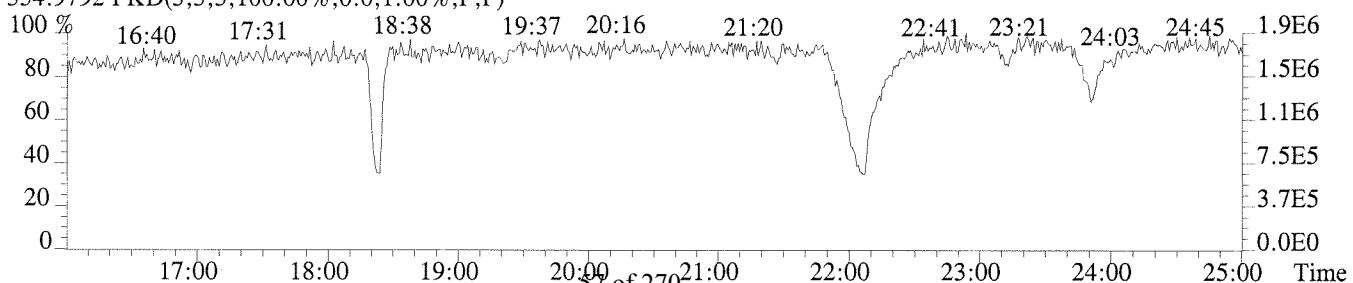
317.9389 SMO(1,5) BSUB(128,15,-3.0) PKD(3,3,3,0.10%,5368.0,1.00%,F,T)



375.8364 PKD(5,3,5,100.00%,0.0,1.00%,F,F)



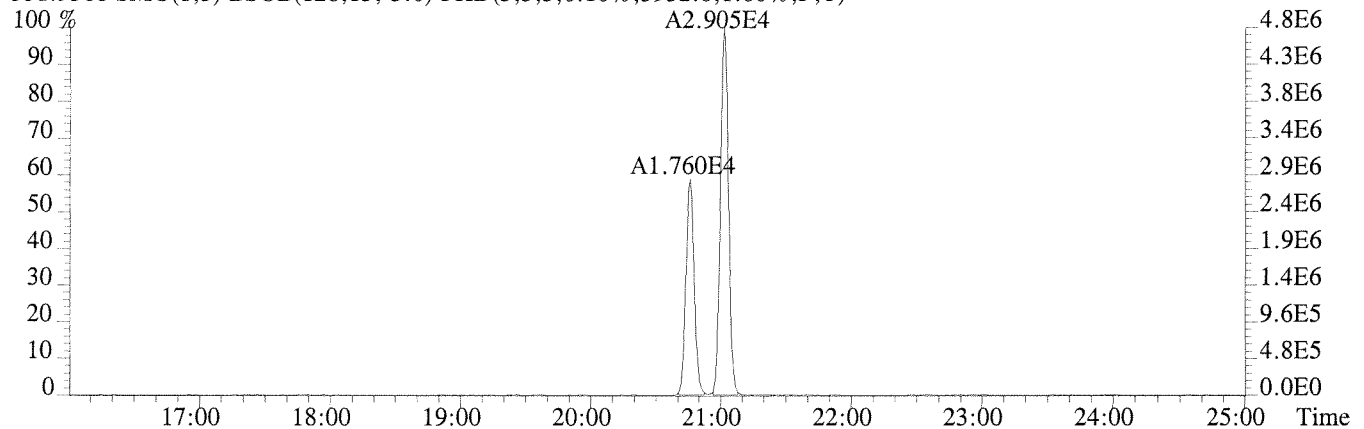
354.9792 PKD(3,3,3,100.00%,0.0,1.00%,F,F)



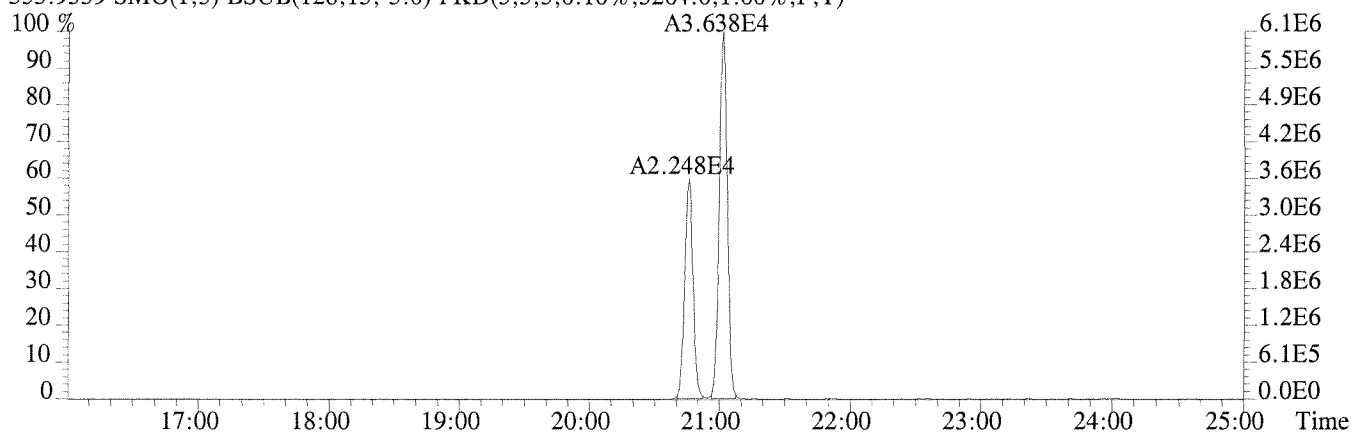
File:U137251 #1-750 Acq:27-JUL-2010 14:53:12 Probe EI+ Magnet SIR VG BioTech Mass spectf

Sample#1 Exp:E1000811-001 SRC-2010-8-

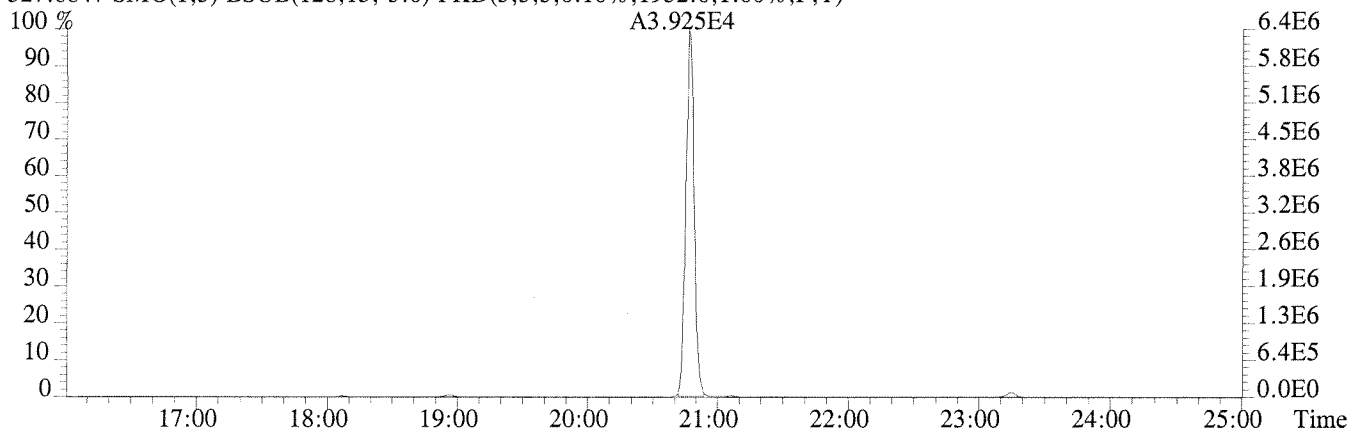
331.9368 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.10%,3932.0,1.00%,F,T)



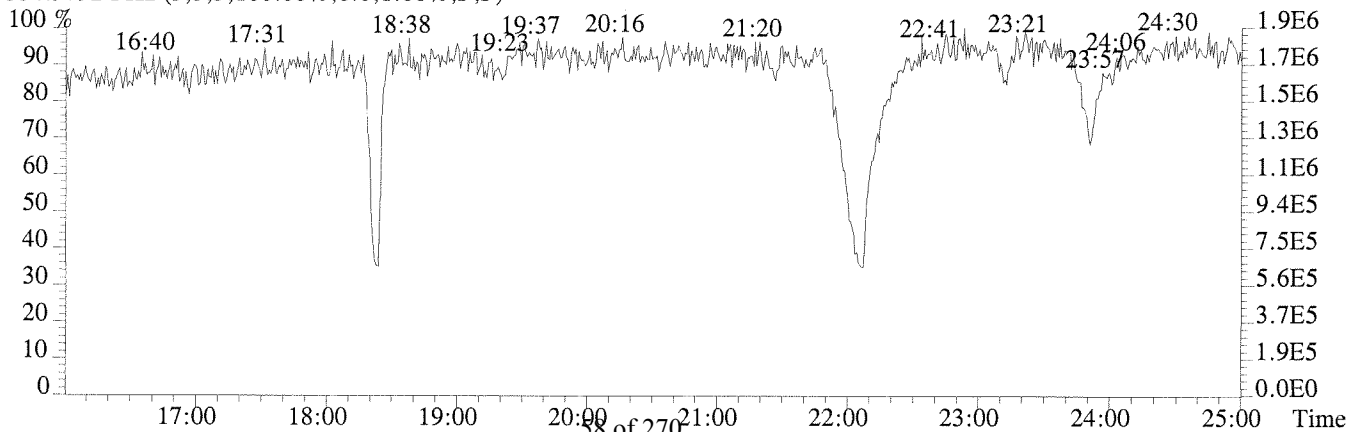
333.9339 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.10%,3264.0,1.00%,F,T)



327.8847 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.10%,1932.0,1.00%,F,T)



354.9792 PKD(3,3,3,100.00%,0.0,1.00%,F,F)



Columbia Analytical Services, Inc.
Sample Response Summary

CLIENT ID.
METHOD BLANK

Run #10 Filename P208830 Samp: 1 Inj: 1 Acquired: 27-JUL-10 10:03:42
Processed: 28-JUL-10 10:57:24 LAB. ID: EQ1000358-01

Typ	Name	RT-1	Resp 1	Resp 2	Ratio	Meet	Mod?	RRF
1 Unk	2,3,7,8-TCDF	NotFnd	*	*	*	no	yes	0.831
2 Unk	1,2,3,7,8-PeCDF	NotFnd	*	*	*	no	no	0.840
3 Unk	2,3,4,7,8-PeCDF	NotFnd	*	*	*	no	no	0.850
4 Unk	1,2,3,4,7,8-HxCDF	NotFnd	*	*	*	no	yes	1.072
5 Unk	1,2,3,6,7,8-HxCDF	NotFnd	*	*	*	no	no	1.128
6 Unk	2,3,4,6,7,8-HxCDF	NotFnd	*	*	*	no	no	1.006
7 Unk	1,2,3,7,8,9-HxCDF	NotFnd	*	*	*	no	no	0.864
8 Unk	1,2,3,4,6,7,8-HpCDF	NotFnd	*	*	*	no	no	1.315
9 Unk	1,2,3,4,7,8,9-HpCDF	NotFnd	*	*	*	no	no	0.970
10 Unk	OCDF	42:50	4.018e+01	4.829e+01	0.83	yes	no	1.103
11 Unk	2,3,7,8-TCDD	NotFnd	*	*	*	no	yes	0.916
12 Unk	1,2,3,7,8-PeCDD	NotFnd	*	*	*	no	no	0.869
13 Unk	1,2,3,4,7,8-HxCDD	NotFnd	*	*	*	no	no	0.925
14 Unk	1,2,3,6,7,8-HxCDD	NotFnd	*	*	*	no	no	1.054
15 Unk	1,2,3,7,8,9-HxCDD	NotFnd	*	*	*	no	no	0.966
16 Unk	1,2,3,4,6,7,8-HpCDD	39:43	7.486e+01	9.411e+01	0.80	no	yes	0.879
17 Unk	OCDD	42:41	1.414e+02	1.681e+02	0.84	yes	no	0.959
18 IS	13C-2,3,7,8-TCDF	28:14	4.127e+04	5.301e+04	0.78	yes	no	1.424
19 IS	13C-1,2,3,7,8-PeCDF	32:34	6.870e+04	4.398e+04	1.56	yes	no	1.263
20 IS	13C-1,2,3,4,7,8-HxCDF	36:07	1.204e+05	2.318e+05	0.52	yes	no	1.279
21 IS	13C-1,2,3,4,6,7,8-HpCDF	38:48	6.623e+04	1.481e+05	0.45	yes	no	0.902
22 IS	13C-2,3,7,8-TCDD	29:03	7.000e+04	8.929e+04	0.78	yes	no	1.057
23 IS	13C-1,2,3,7,8-PeCDD	33:39	8.644e+04	5.437e+04	1.59	yes	no	0.873
24 IS	13C-1,2,3,6,7,8-HxCDD	36:53	1.519e+05	1.196e+05	1.27	yes	no	0.997
25 IS	13C-1,2,3,4,6,7,8-HpCDD	39:41	1.138e+05	1.082e+05	1.05	yes	no	0.833
26 IS	13C-OCDD	42:40	1.254e+05	1.384e+05	0.91	yes	no	0.733
27 RS/RT	13C-1,2,3,4-TCDD	28:49	8.998e+04	1.133e+05	0.79	yes	no	-
28 RS/RT	13C-1,2,3,7,8,9-HxCDD	37:10	1.040e+05	8.257e+04	1.26	yes	no	-
29 C/Up	37Cl-2,3,7,8-TCDD	29:04	1.493e+05				no	0.983
				SUM AREA				
30 Tot	Total Tetra-Furans	27:45		2.543e+02	0.87	yes		0.831
31 Tot	Total Tetra-Dioxins	NotFnd		*	*	no		0.916
32 Tot	Total Penta-Furans	NotFnd		*	*	no		0.845
33 Tot	Total Penta-Dioxins	NotFnd		*	*	no		0.869
34 Tot	Total Hexa-Furans	NotFnd		*	*	no		1.018
35 Tot	Total Hexa-Dioxins	NotFnd		*	*	no		0.982
36 Tot	Total Hepta-Furans	NotFnd		*	*	no		1.143
37 Tot	Total Hepta-Dioxins	NotFnd		*	*	no		0.879

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Columbia Analytical Services, Inc.
Signal/Noise Height Ratio Summary

CLIENT ID.
METHOD BLANK

Run #10 Filename P208830 Samp: 1 Inj: 1 Acquired: 27-JUL-10 10:03:42
Processed: 28-JUL-10 10:57:241 LAB. ID: EQ1000358-01

	Name	Signal 1	Noise 1	S/N Rat.1	Signal 2	Noise 2	S/N Rat.2
1	2,3,7,8-TCDF	*	1.56e+03	*	*	1.31e+03	*
2	1,2,3,7,8-PeCDF	*	1.66e+03	*	*	2.06e+03	*
3	2,3,4,7,8-PeCDF	*	1.66e+03	*	*	2.06e+03	*
4	1,2,3,4,7,8-HxCDF	*	2.30e+03	*	*	1.51e+03	*
5	1,2,3,6,7,8-HxCDF	*	2.30e+03	*	*	1.51e+03	*
6	2,3,4,6,7,8-HxCDF	*	2.30e+03	*	*	1.51e+03	*
7	1,2,3,7,8,9-HxCDF	*	2.30e+03	*	*	1.51e+03	*
8	1,2,3,4,6,7,8-HpCDF	*	7.84e+03	*	*	2.89e+03	*
9	1,2,3,4,7,8,9-HpCDF	*	7.84e+03	*	*	2.89e+03	*
10	OCDF	6.49e+03	1.18e+03	5.5e+00	8.25e+03	2.30e+03	3.6e+00
11	2,3,7,8-TCDD	*	1.13e+03	*	*	1.30e+03	*
12	1,2,3,7,8-PeCDD	*	2.04e+03	*	*	1.66e+03	*
13	1,2,3,4,7,8-HxCDD	*	1.63e+03	*	*	2.96e+03	*
14	1,2,3,6,7,8-HxCDD	*	1.63e+03	*	*	2.96e+03	*
15	1,2,3,7,8,9-HxCDD	*	1.63e+03	*	*	2.96e+03	*
16	1,2,3,4,6,7,8-HpCDD	1.45e+04	3.50e+03	4.1e+00	2.06e+04	1.32e+03	1.6e+01
17	OCDD	2.77e+04	1.38e+03	2.0e+01	2.98e+04	2.75e+03	1.1e+01
18	13C-2,3,7,8-TCDF	5.56e+06	2.90e+03	1.9e+03	7.23e+06	1.96e+03	3.7e+03
19	13C-1,2,3,7,8-PeCDF	1.06e+07	1.36e+03	7.8e+03	6.80e+06	1.88e+03	3.6e+03
20	13C-1,2,3,4,7,8-HxCDF	2.47e+07	1.26e+03	2.0e+04	4.70e+07	1.72e+03	2.7e+04
21	13C-1,2,3,4,6,7,8-HpCDF	1.43e+07	4.96e+03	2.9e+03	3.18e+07	9.67e+03	3.3e+03
22	13C-2,3,7,8-TCDD	1.05e+07	4.36e+03	2.4e+03	1.34e+07	1.54e+03	8.7e+03
23	13C-1,2,3,7,8-PeCDD	1.54e+07	1.54e+03	1.0e+04	9.74e+06	9.92e+02	9.8e+03
24	13C-1,2,3,6,7,8-HxCDD	3.22e+07	2.17e+03	1.5e+04	2.56e+07	2.58e+03	9.9e+03
25	13C-1,2,3,4,6,7,8-HpCDD	2.30e+07	2.92e+03	7.9e+03	2.19e+07	1.99e+03	1.1e+04
26	13C-OCDD	2.20e+07	6.92e+02	3.2e+04	2.41e+07	1.29e+03	1.9e+04
27	13C-1,2,3,4-TCDD	1.44e+07	4.36e+03	3.3e+03	1.81e+07	1.54e+03	1.2e+04
28	13C-1,2,3,7,8,9-HxCDD	2.21e+07	2.17e+03	1.0e+04	1.76e+07	2.58e+03	6.8e+03
29	37Cl-2,3,7,8-TCDD	2.02e+07	1.92e+03	1.1e+04			

Columbia Analytical Services, Inc.
19408 Park Row, Suite 320
Houston, TX 77084
Office: (713) 266-1599. Fax: (713) 266-0130

Columbia Analytical Services, Inc.
Peak List Summary

CLIENT ID.

METHOD BLANK

Entry: 30 Totals Name: Total Tetra-Furans

Run: 10 File: P208830 Sample:1 Injection:1 Function:1

Acquired: 27-JUL-10 10:03:42 Processed: 28-JUL-10 10:57:24

Mass: 303.9020 305.8990 Response:

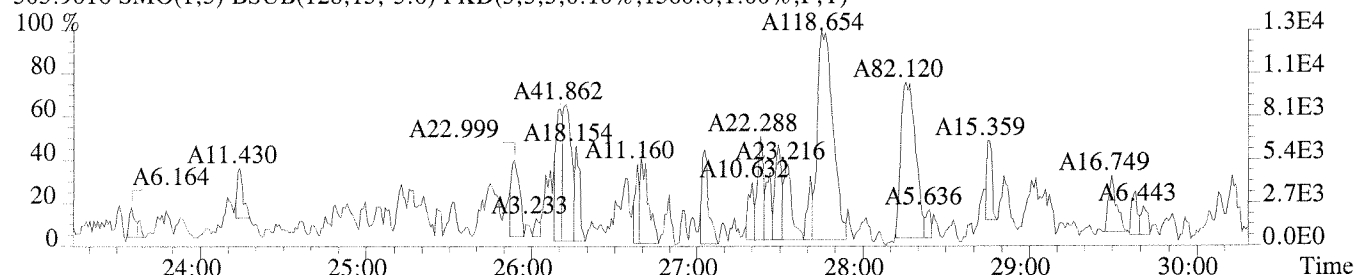
#	RT	Resp	Resp Ratio	Meet	Tot	Resp	Name	Mod1?	Mod2
1	27:45	1.19e+02	1.36e+02	0.87	yes	2.54e+02		n	n

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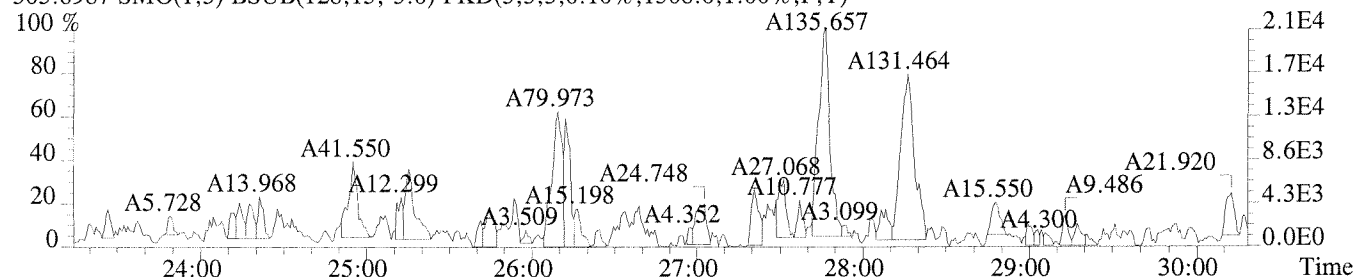
File:P208830 #1-590 Acq:27-JUL-2010 10:03:42 Probe EI+ Magnet SIR VG BioTech Mass spectf

Sample#1 Exp:EQ1000358-01 MB

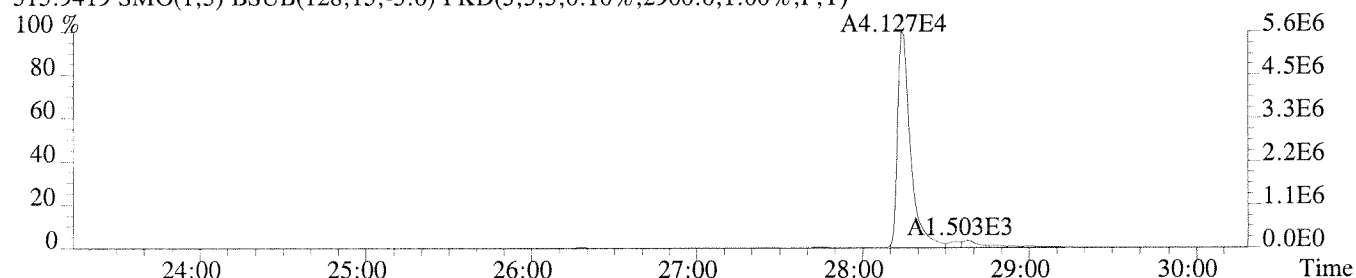
303.9016 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.10%,1560.0,1.00%,F,T)



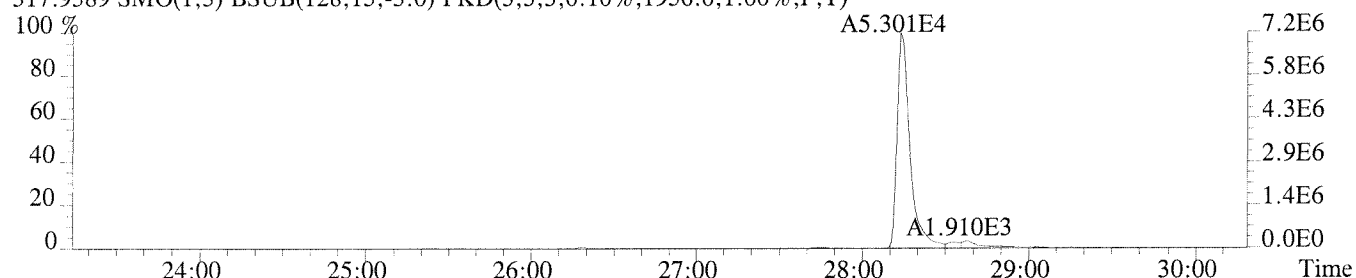
305.8987 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.10%,1308.0,1.00%,F,T)



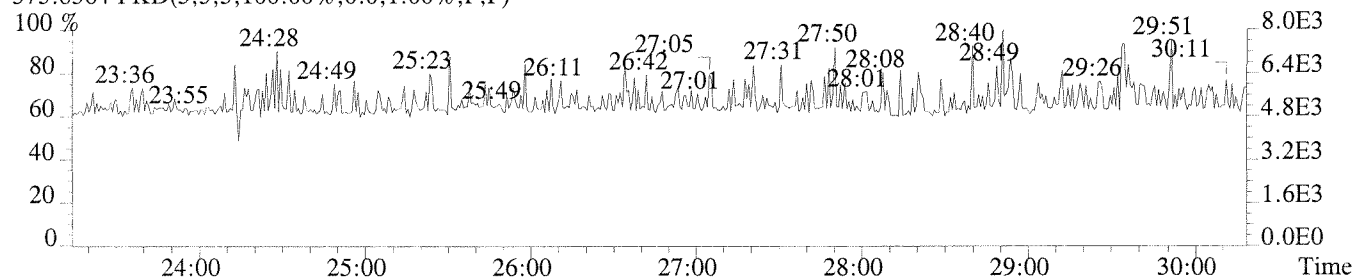
315.9419 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.10%,2900.0,1.00%,F,T)



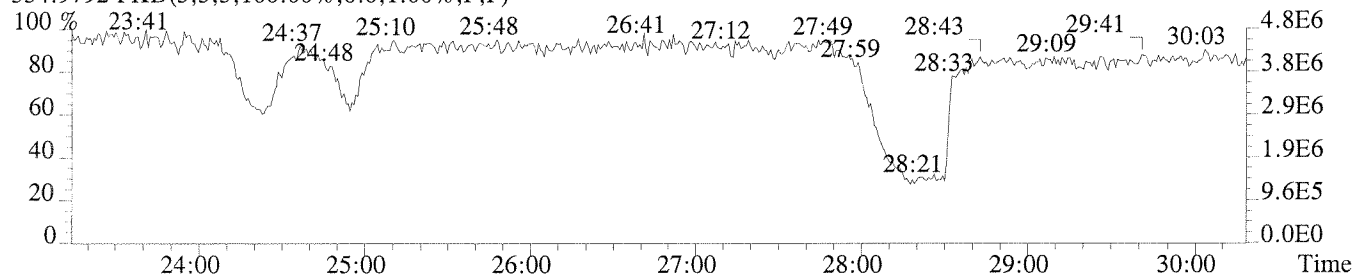
317.9389 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.10%,1956.0,1.00%,F,T)



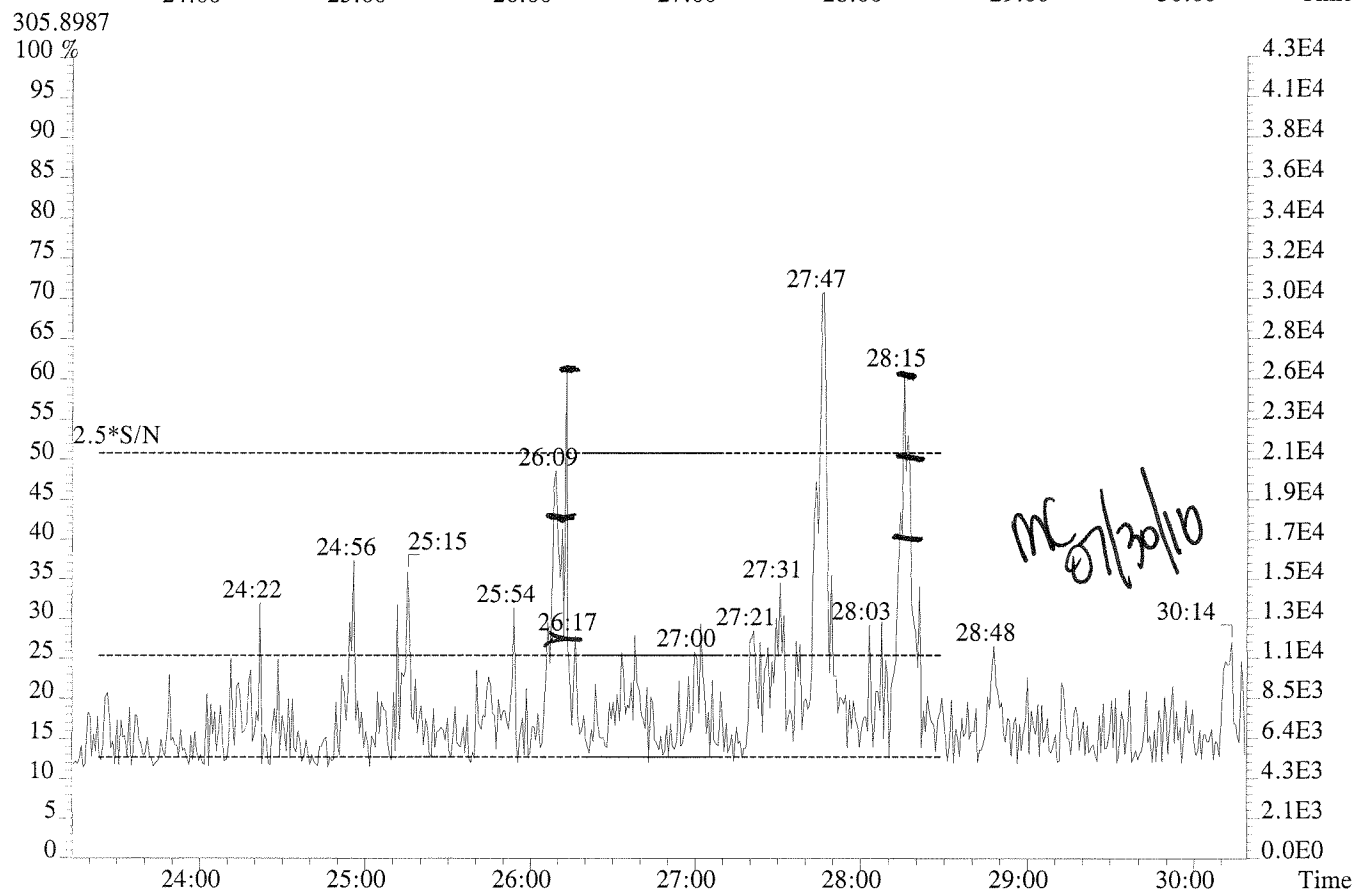
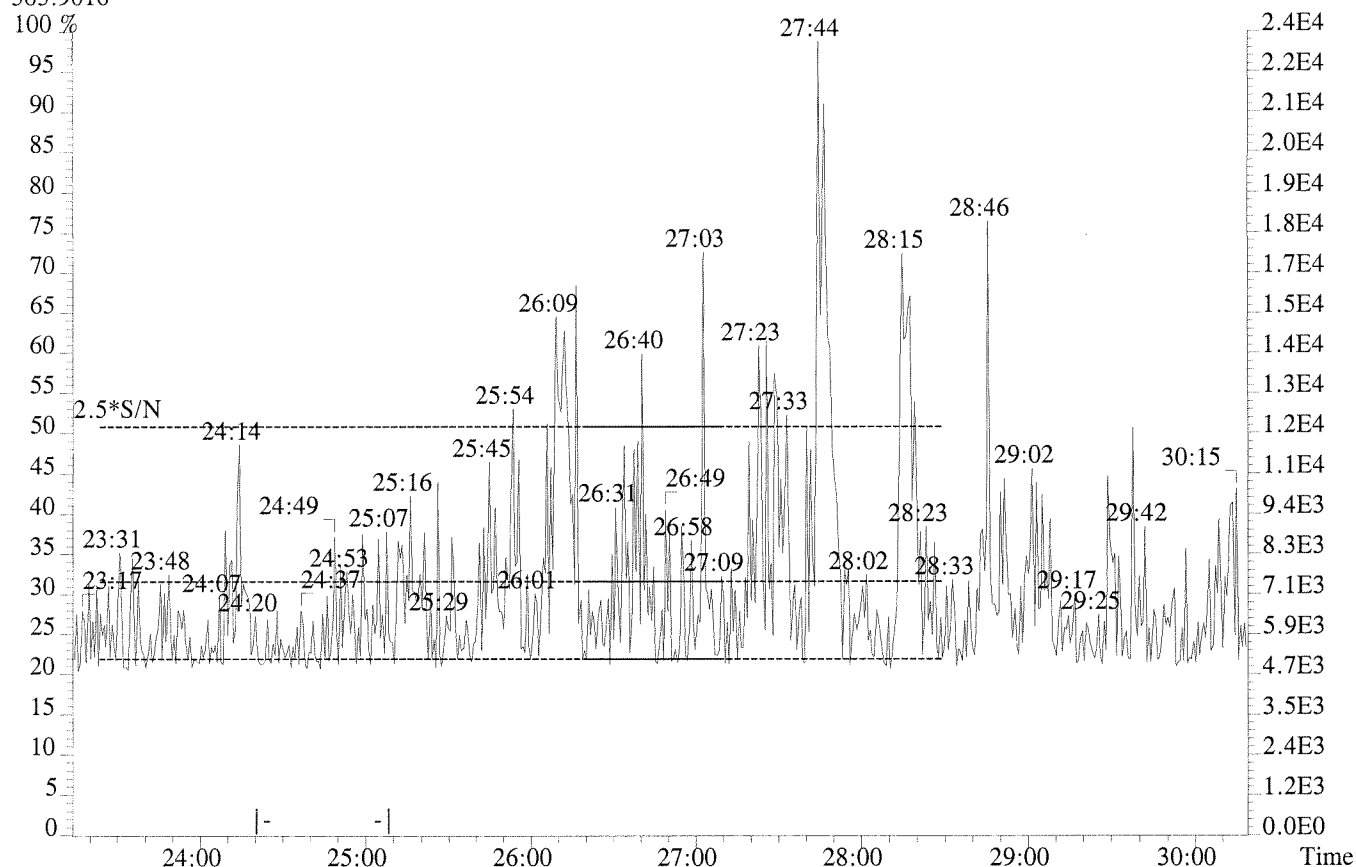
375.8364 PKD(5,3,5,100.00%,0.0,1.00%,F,F)



354.9792 PKD(3,3,3,100.00%,0.0,1.00%,F,F)



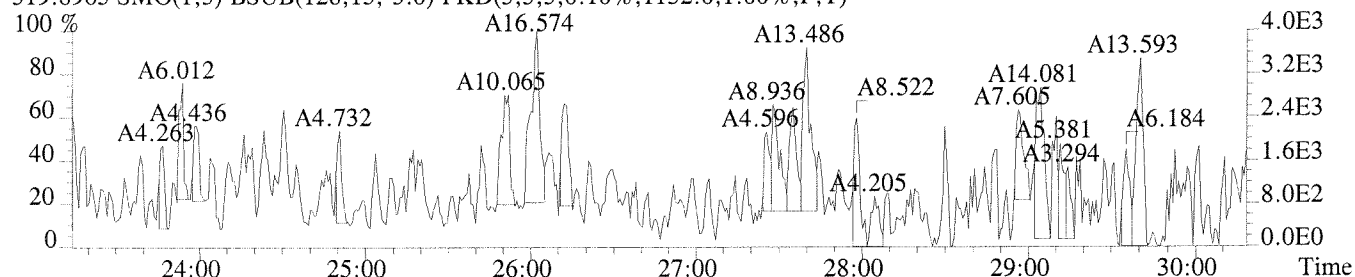
File:P208830 #1-590 Acq:27-JUL-2010 10:03:42 Probe EI+ Magnet SIR VG BioTech Mass spectf
Sample#1 Exp:EQ1000358-01 MB
303.9016



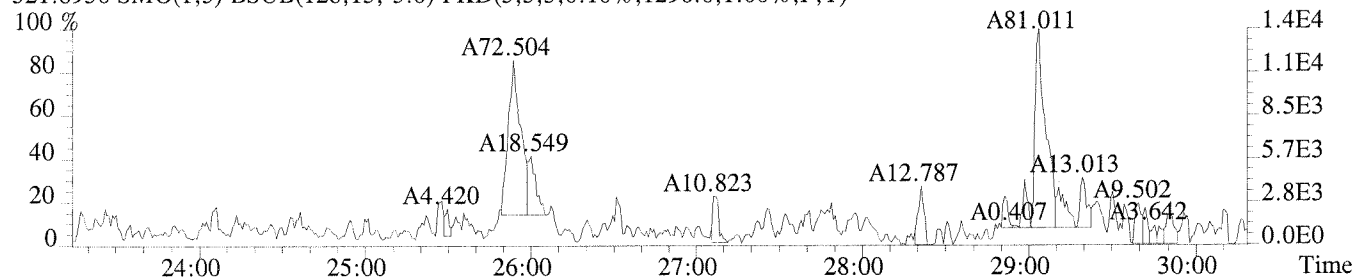
File:P208830 #1-590 Acq:27-JUL-2010 10:03:42 Probe EI+ Magnet SIR VG BioTech Mass spectf

Sample#1 Exp:EQ1000358-01 MB

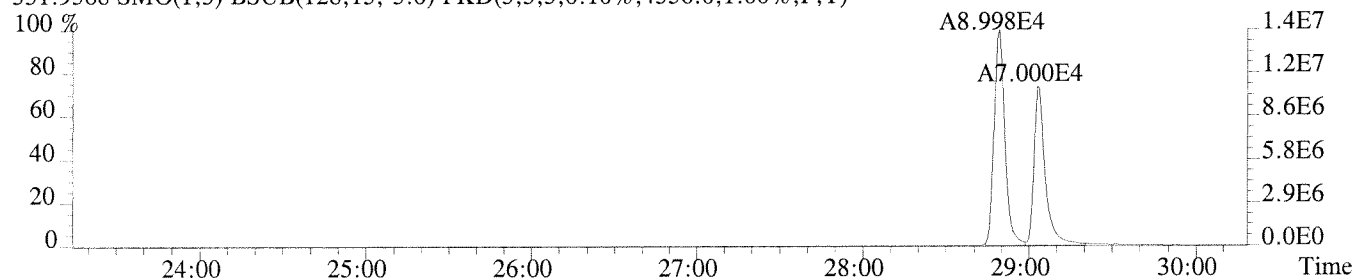
319.8965 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.10%,1132.0,1.00%,F,T)



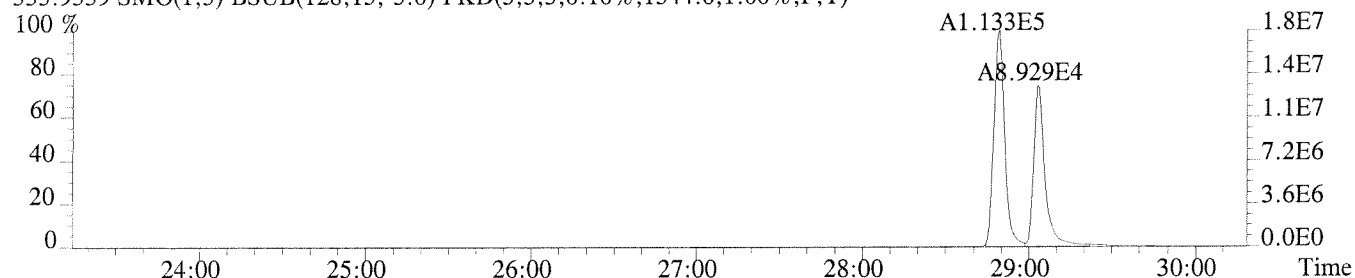
321.8936 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.10%,1296.0,1.00%,F,T)



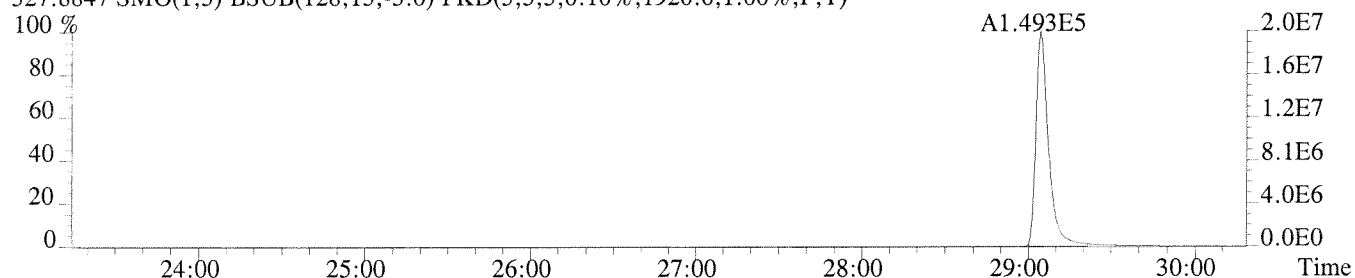
331.9368 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.10%,4356.0,1.00%,F,T)



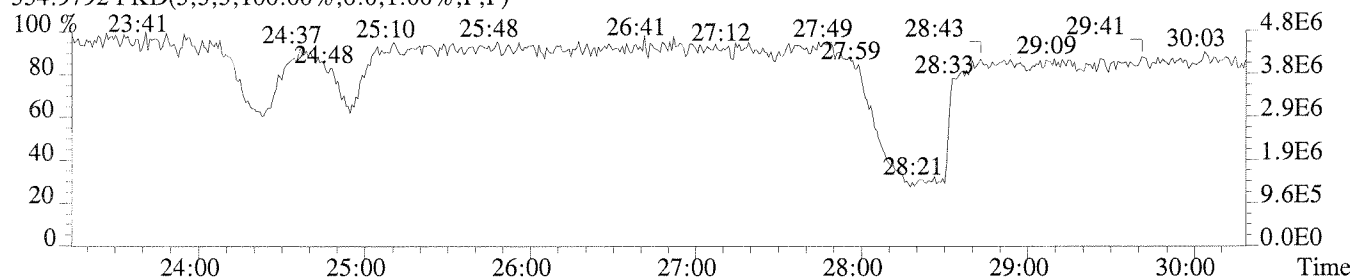
333.9339 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.10%,1544.0,1.00%,F,T)



327.8847 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.10%,1920.0,1.00%,F,T)



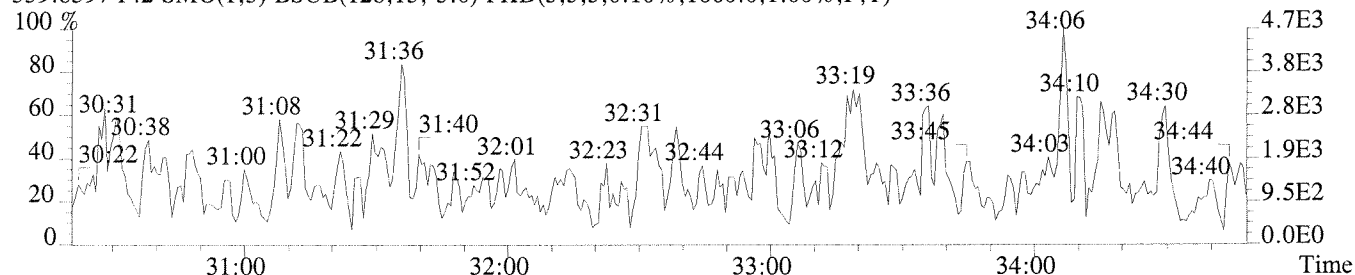
354.9792 PKD(3,3,3,100.00%,0.0,1.00%,F,F)



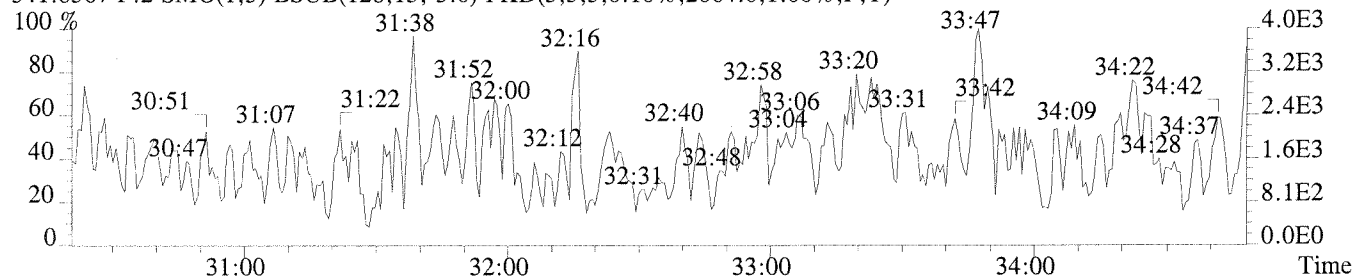
File:P208830 #1-405 Acq:27-JUL-2010 10:03:42 Probe EI+ Magnet SIR VG BioTech Mass spectf

Sample#1 Exp:EQ1000358-01 MB

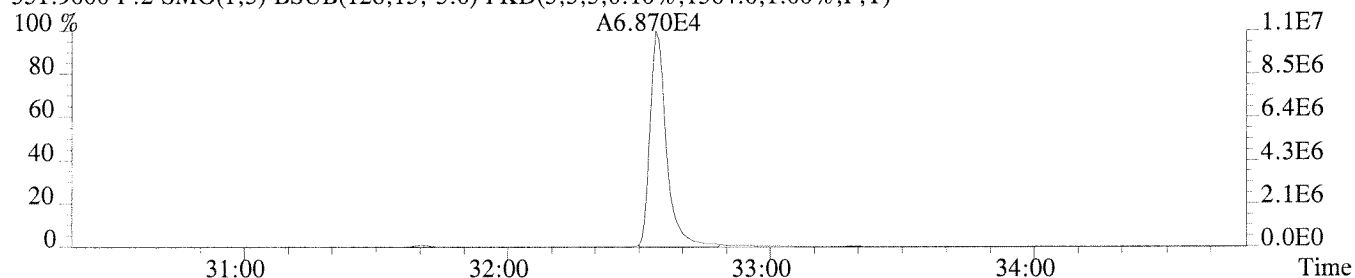
339.8597 F:2 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.10%,1660.0,1.00%,F,T)



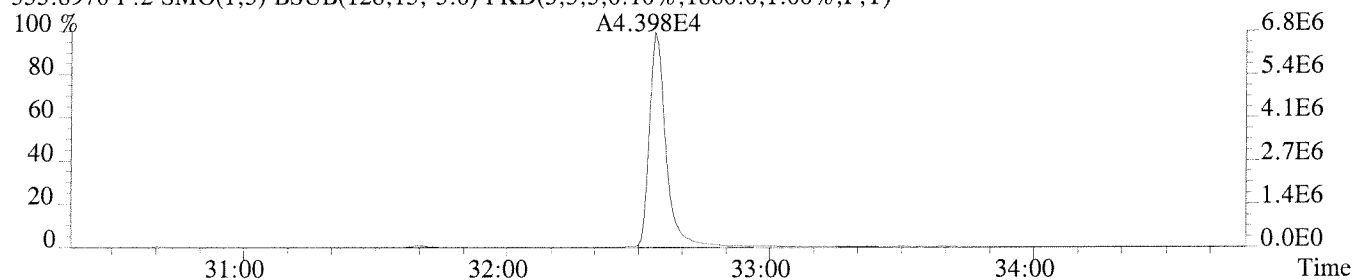
341.8567 F:2 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.10%,2064.0,1.00%,F,T)



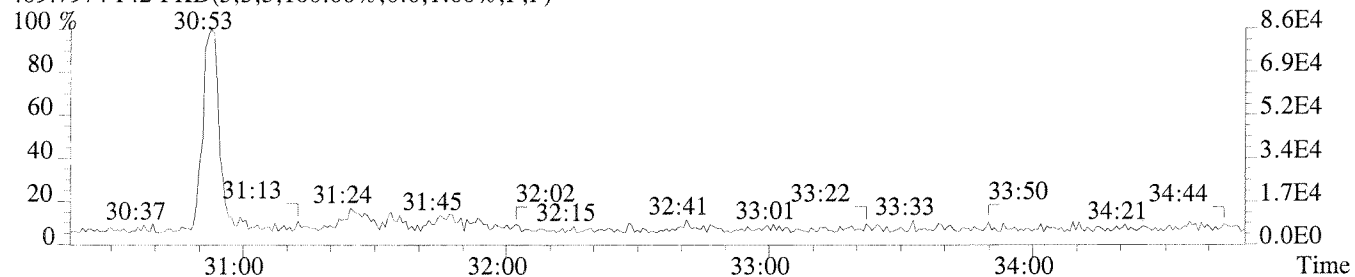
351.9000 F:2 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.10%,1364.0,1.00%,F,T)



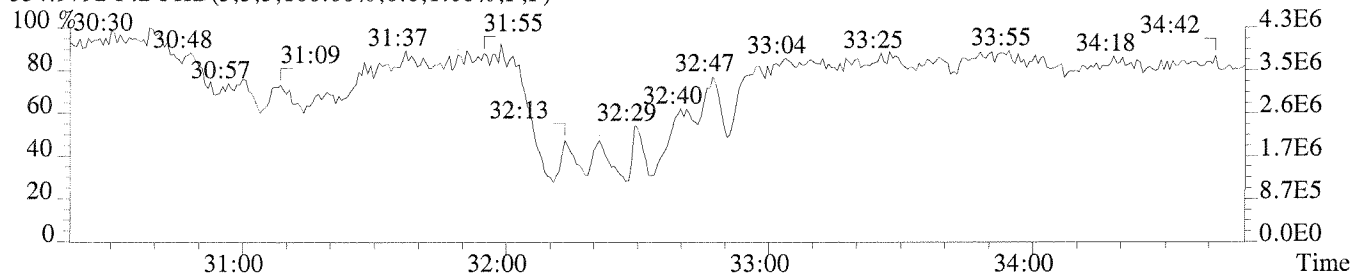
353.8970 F:2 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.10%,1880.0,1.00%,F,T)



409.7974 F:2 PKD(5,3,5,100.00%,0.0,1.00%,F,F)



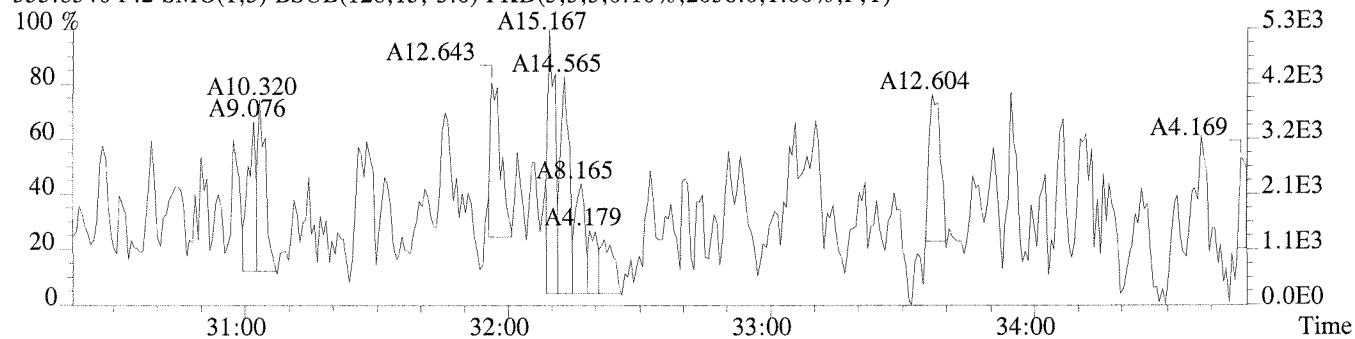
354.9792 F:2 PKD(3,3,3,100.00%,0.0,1.00%,F,F)



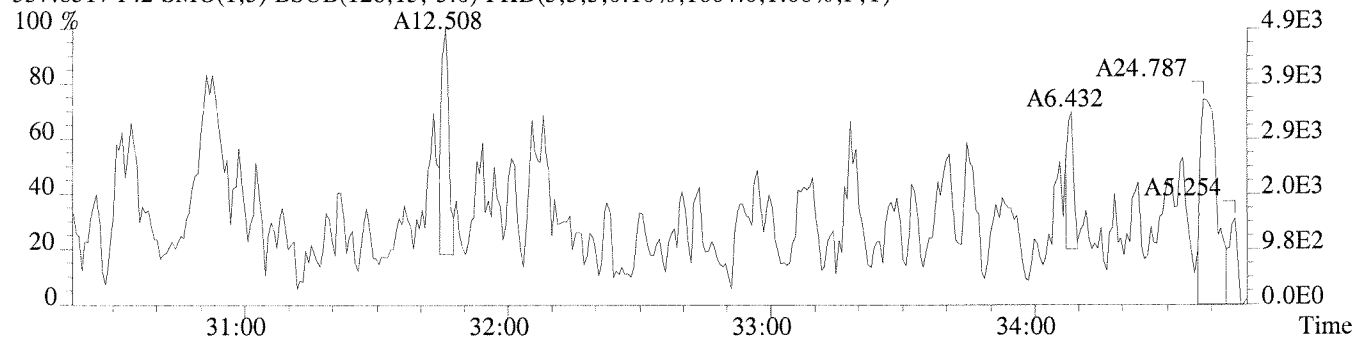
File:P208830 #1-405 Acq:27-JUL-2010 10:03:42 Probe EI+ Magnet SIR VG BioTech Mass spectf

Sample#1 Exp:EQ1000358-01 MB

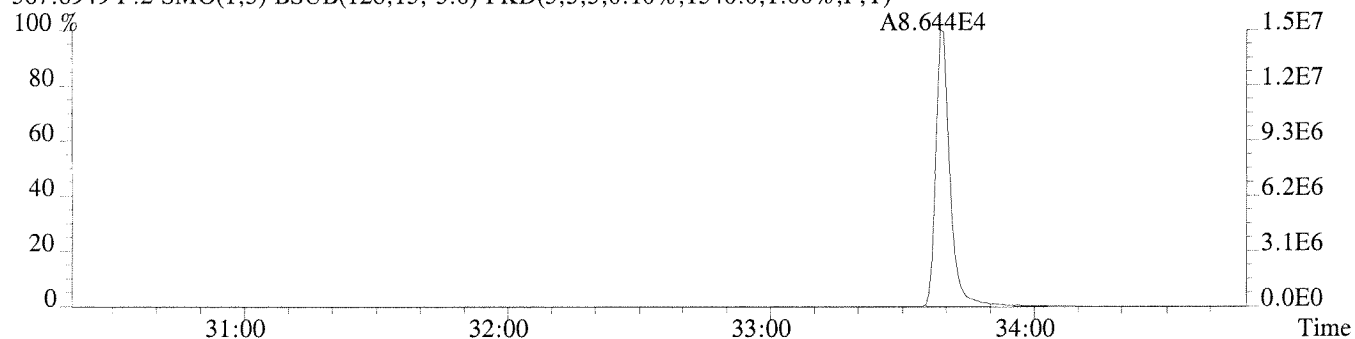
355.8546 F:2 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.10%,2036.0,1.00%,F,T)



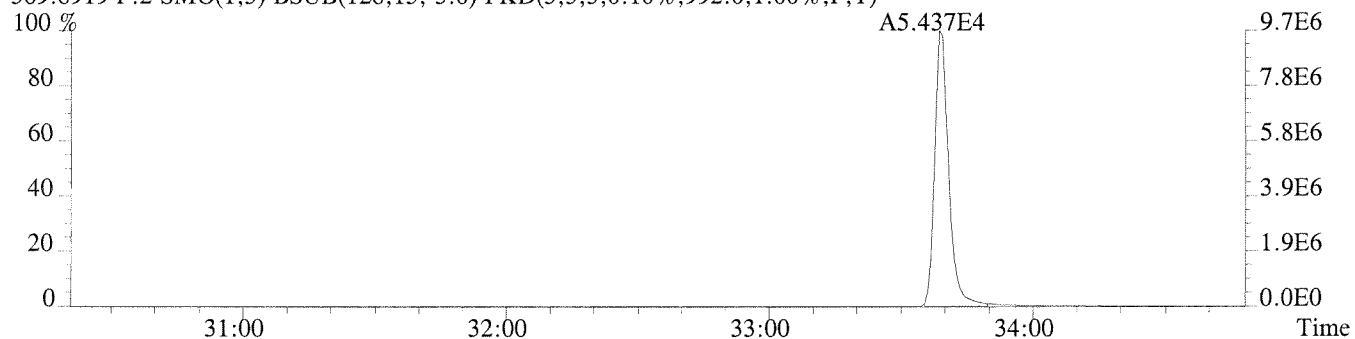
357.8517 F:2 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.10%,1664.0,1.00%,F,T)



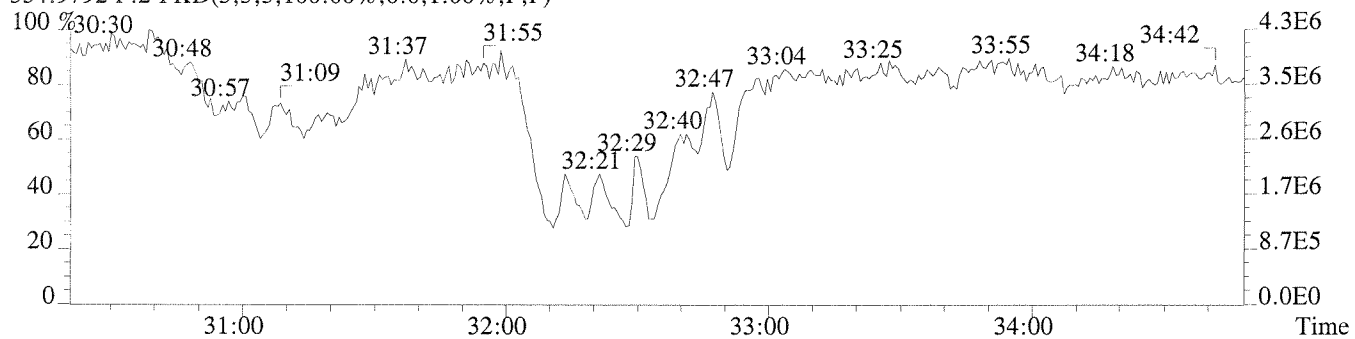
367.8949 F:2 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.10%,1540.0,1.00%,F,T)



369.8919 F:2 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.10%,992.0,1.00%,F,T)



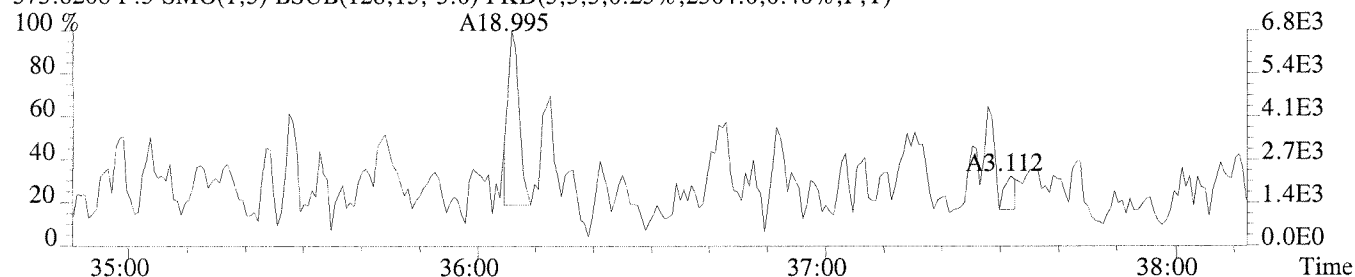
354.9792 F:2 PKD(3,3,3,100.00%,0.0,1.00%,F,F)



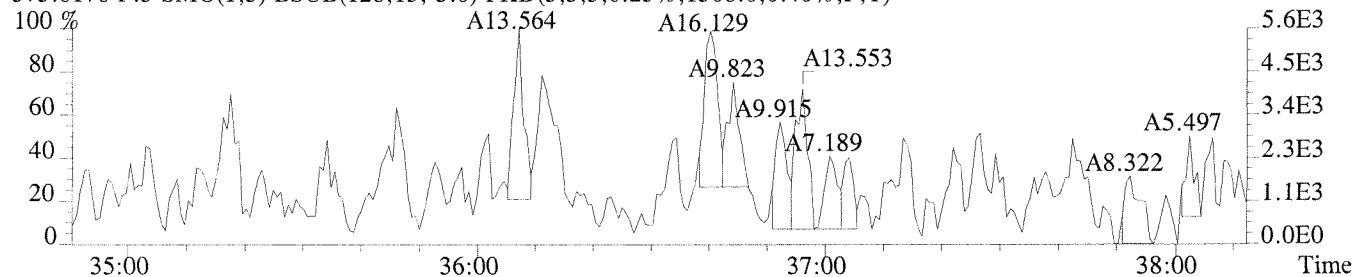
File:P208830 #1-306 Acq:27-JUL-2010 10:03:42 Probe EI+ Magnet SIR VG BioTech Mass spectf

Sample#1 Exp:EQ1000358-01 MB

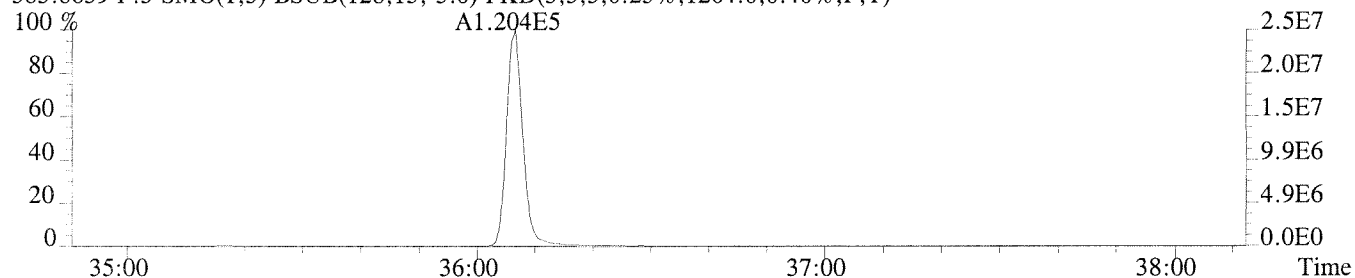
373.8208 F:3 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.25%,2304.0,0.40%,F,T)



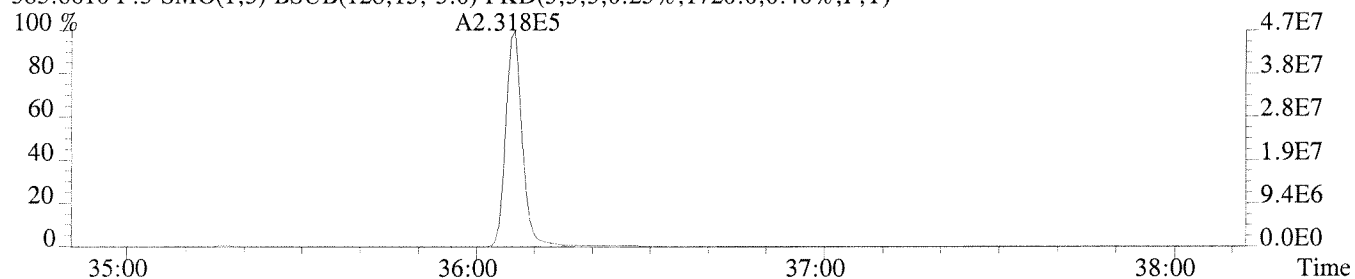
375.8178 F:3 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.25%,1508.0,0.40%,F,T)



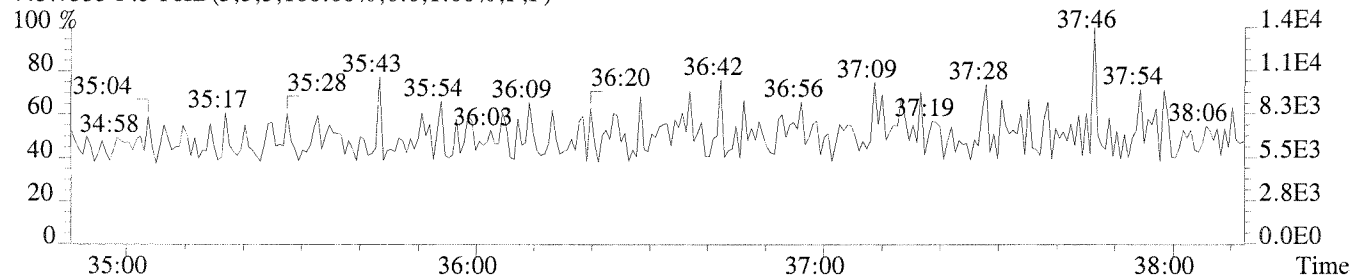
383.8639 F:3 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.25%,1264.0,0.40%,F,T)



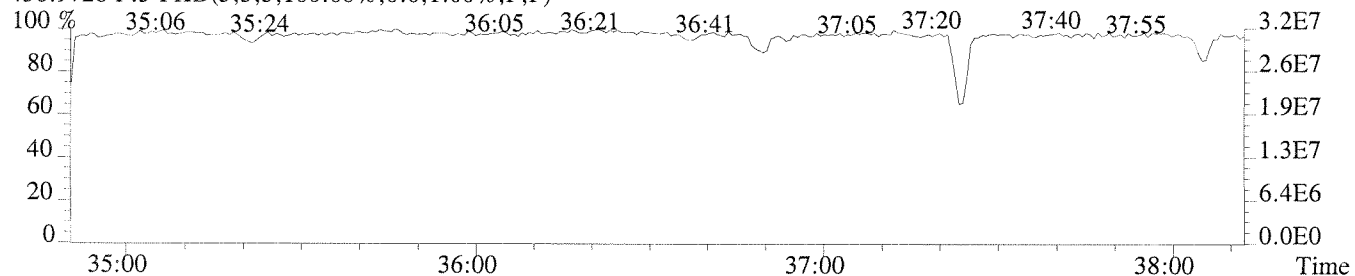
385.8610 F:3 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.25%,1720.0,0.40%,F,T)



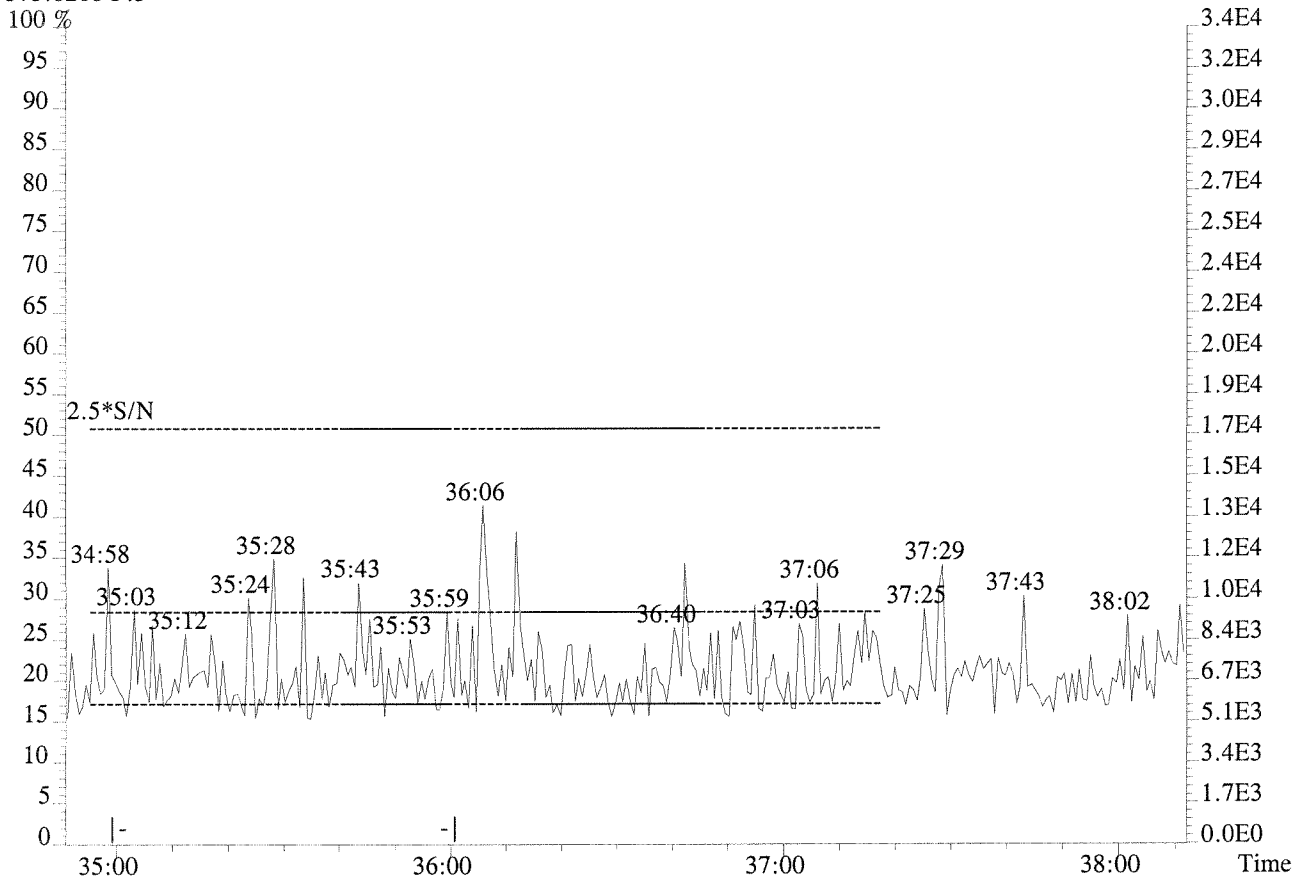
445.7555 F:3 PKD(5,3,5,100.00%,0.0,1.00%,F,F)



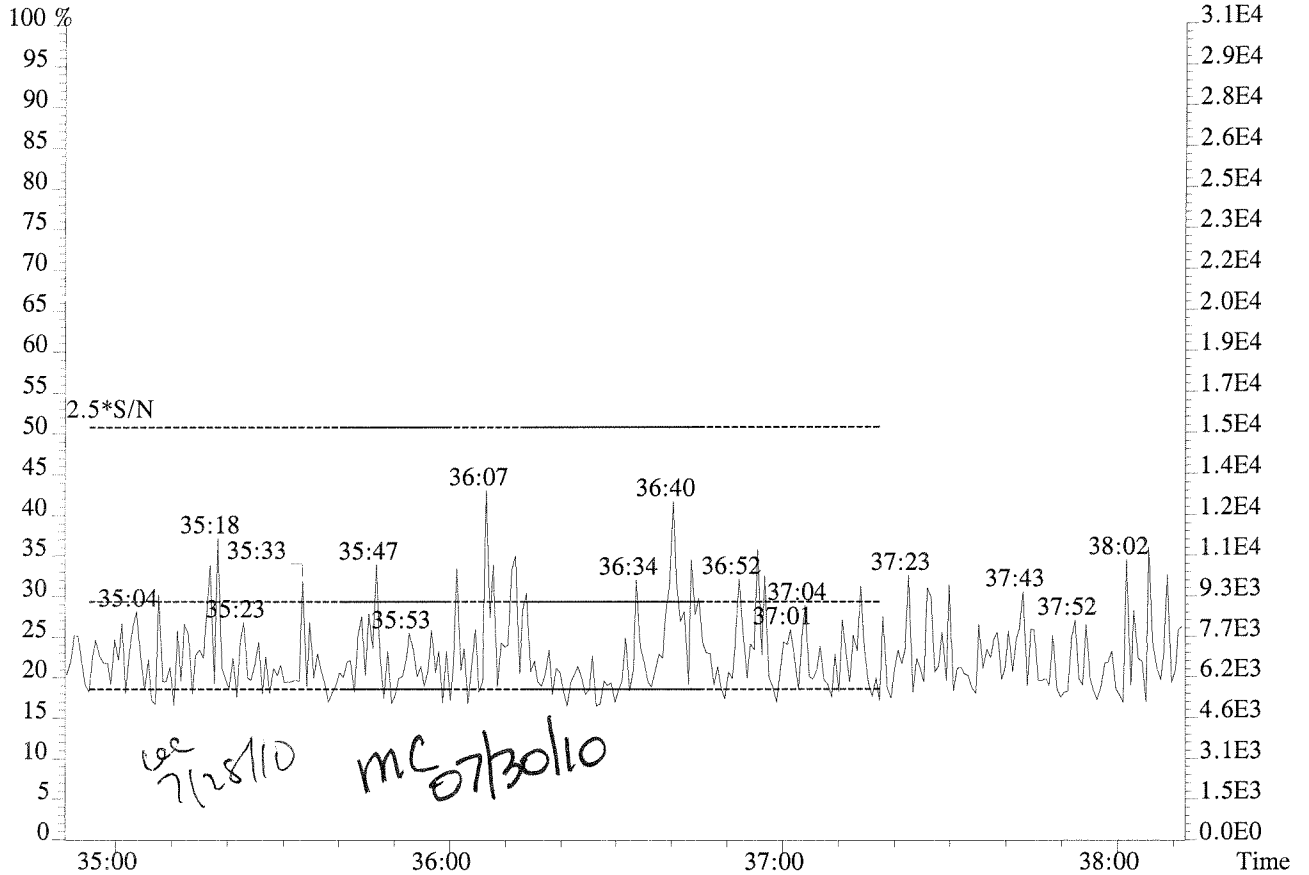
430.9728 F:3 PKD(3,3,3,100.00%,0.0,1.00%,F,F)



File:P208830 #1-306 Acq:27-JUL-2010 10:03:42 Probe EI+ Magnet SIR VG BioTech Mass sf
Sample#1 Exp:EQ1000358-01 MB
373.8208 F:3
100 %



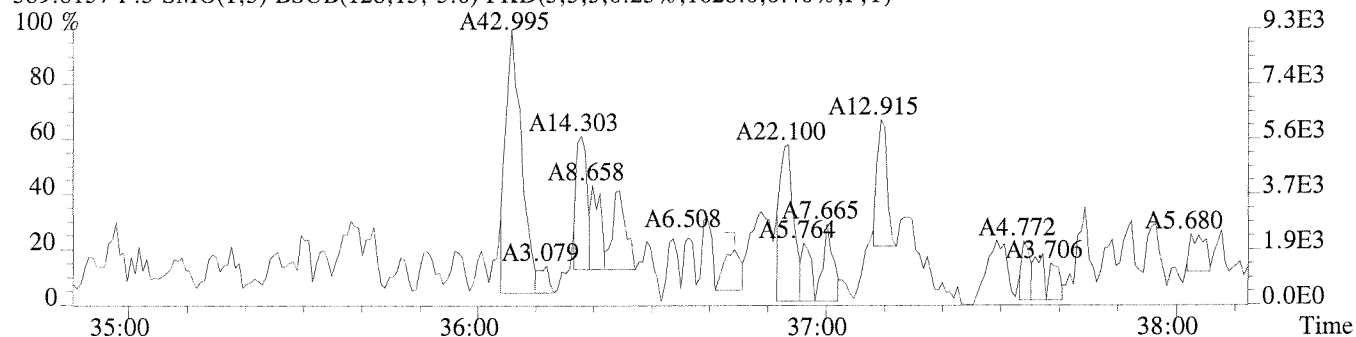
375.8178 F:3



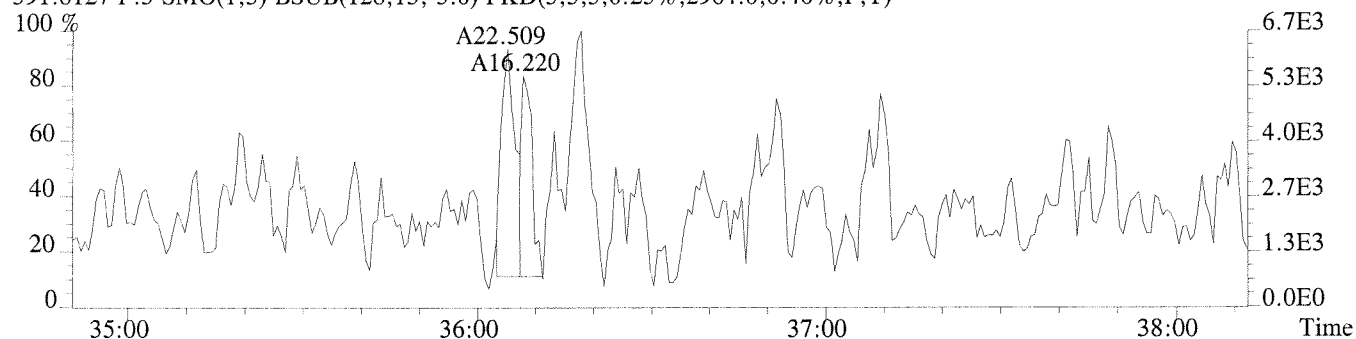
File:P208830 #1-306 Acq:27-JUL-2010 10:03:42 Probe EI+ Magnet SIR VG BioTech Mass spectf

Sample#1 Exp:EQ1000358-01 MB

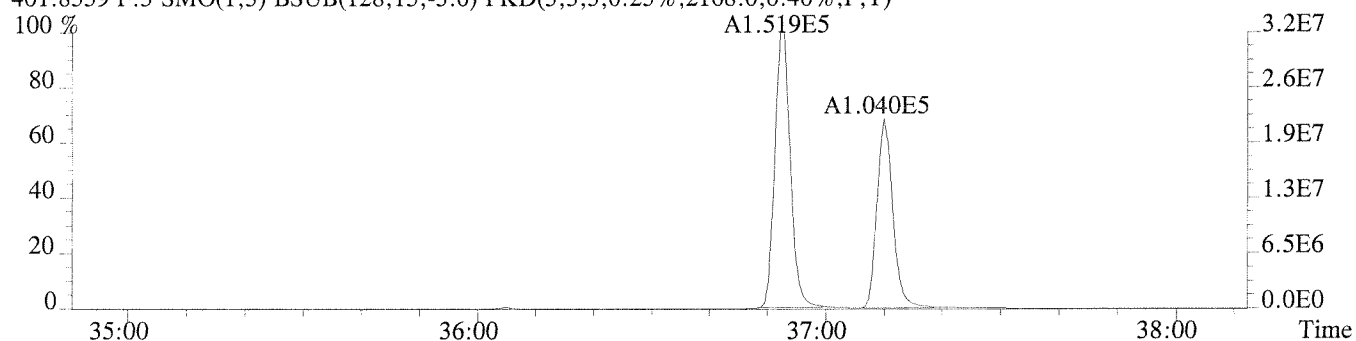
389.8157 F:3 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.25%,1628.0,0.40%,F,T)



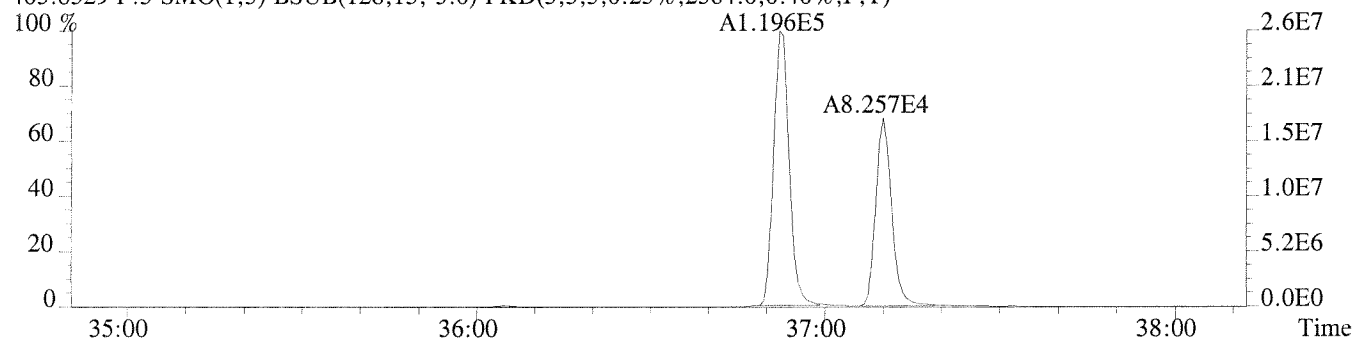
391.8127 F:3 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.25%,2964.0,0.40%,F,T)



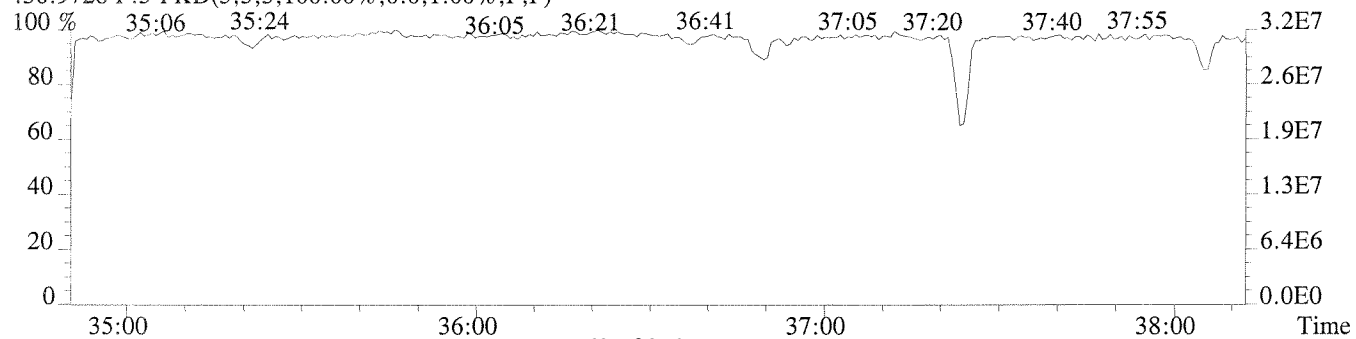
401.8559 F:3 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.25%,2168.0,0.40%,F,T)



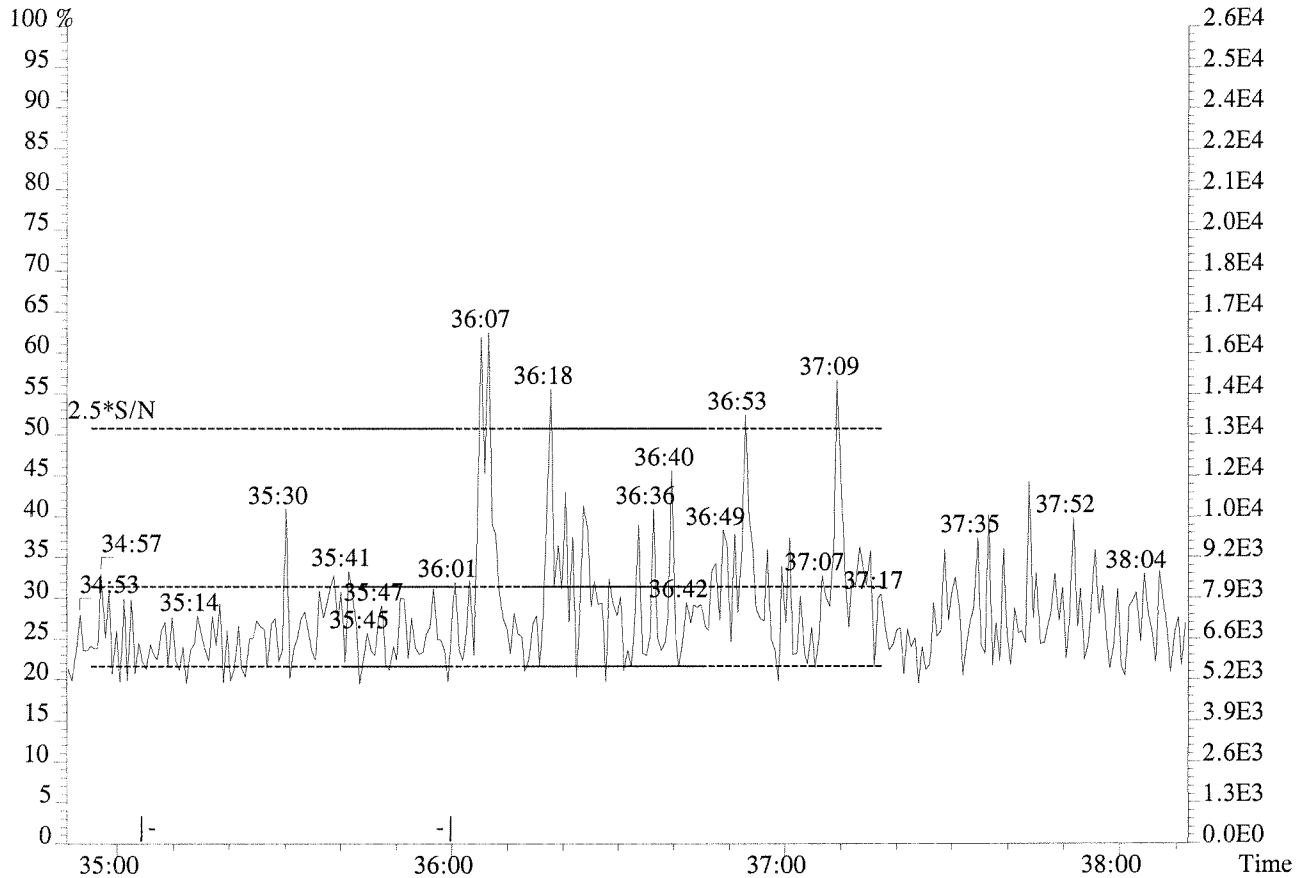
403.8529 F:3 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.25%,2584.0,0.40%,F,T)



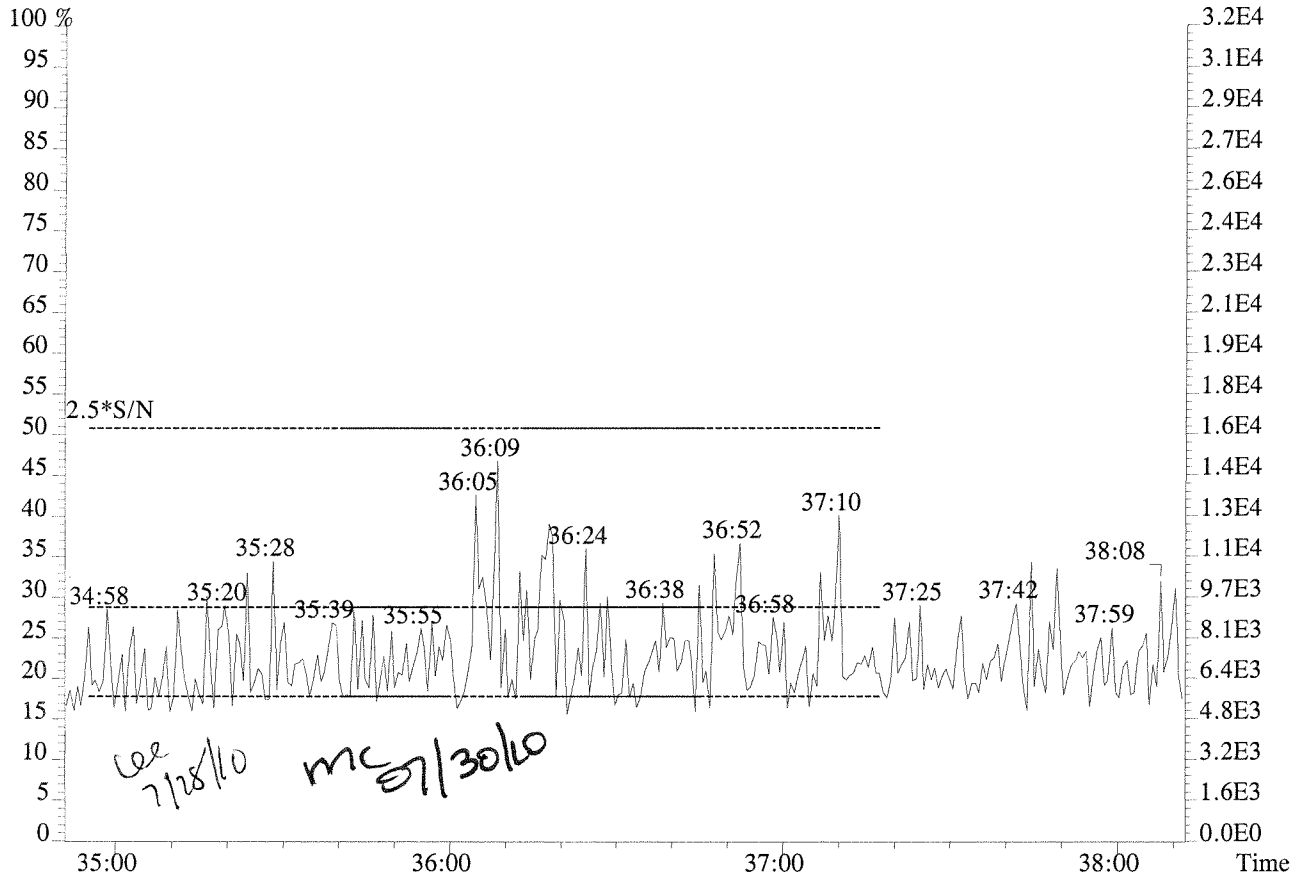
430.9728 F:3 PKD(3,3,3,100.00%,0.0,1.00%,F,F)



File:P208830 #1-306 Acq:27-JUL-2010 10:03:42 Probe EI+ Magnet SIR VG BioTech Mass s£
Sample#1 Exp:EQ1000358-01 MB
389.8157 F:3



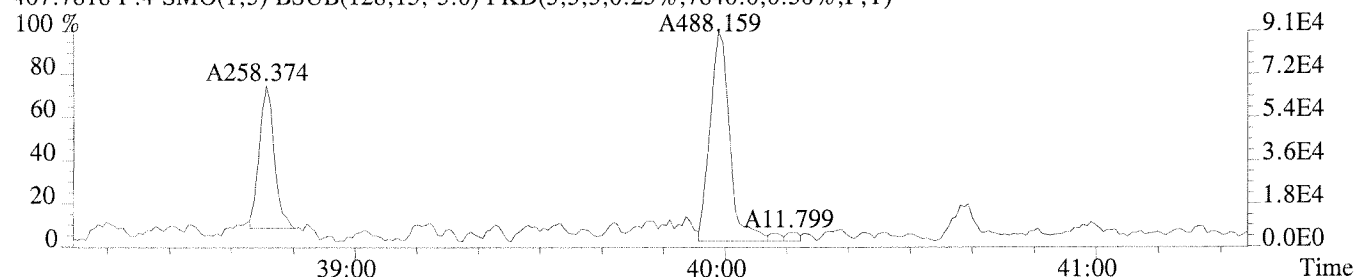
391.8127 F:3



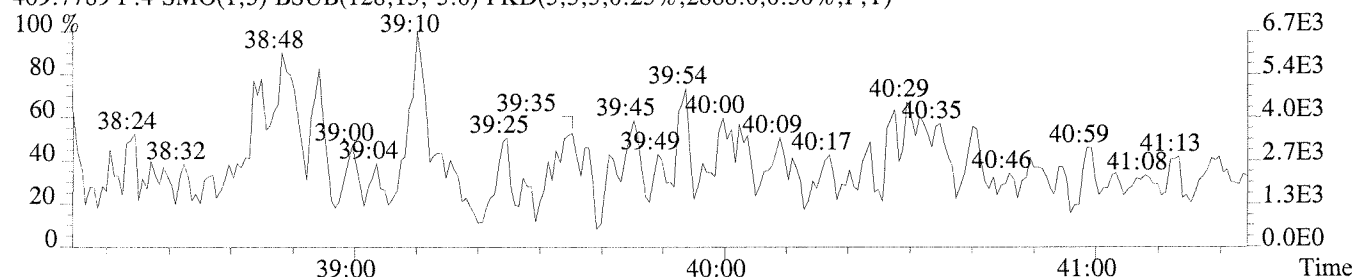
File:P208830 #1-288 Acq:27-JUL-2010 10:03:42 Probe EI+ Magnet SIR VG BioTech Mass spectf

Sample#1 Exp:EQ1000358-01 MB

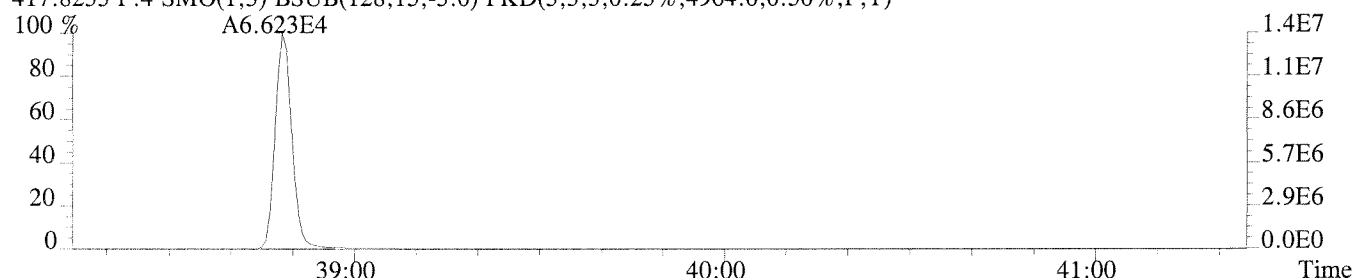
407.7818 F:4 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.25%,7840.0,0.50%,F,T)



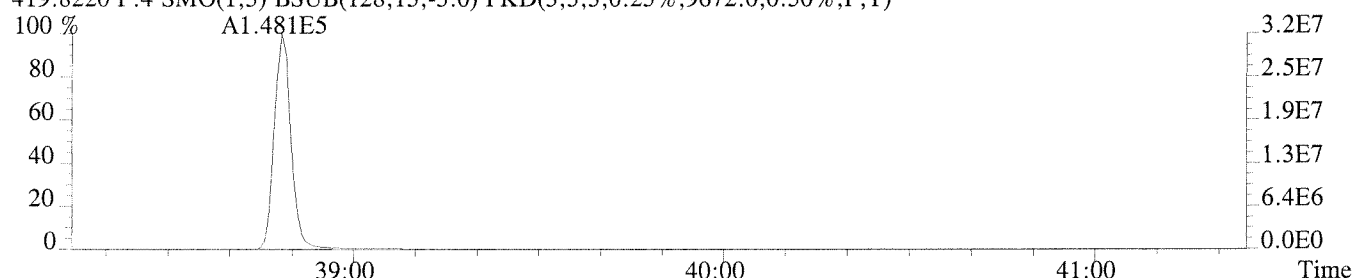
409.7789 F:4 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.25%,2888.0,0.50%,F,T)



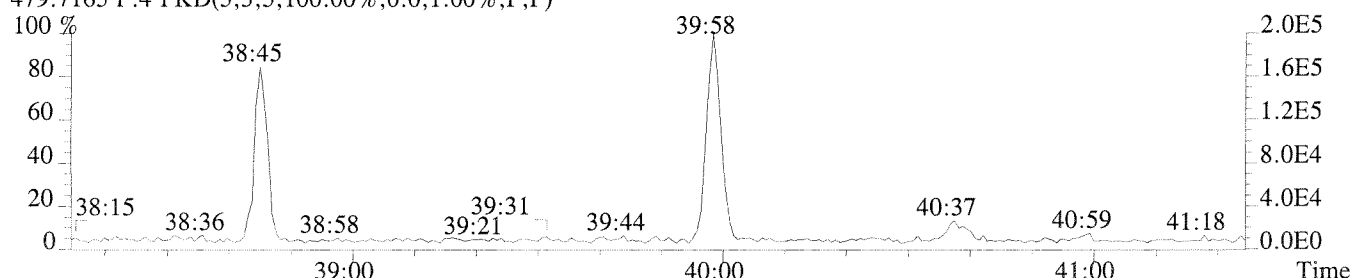
417.8253 F:4 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.25%,4964.0,0.50%,F,T)



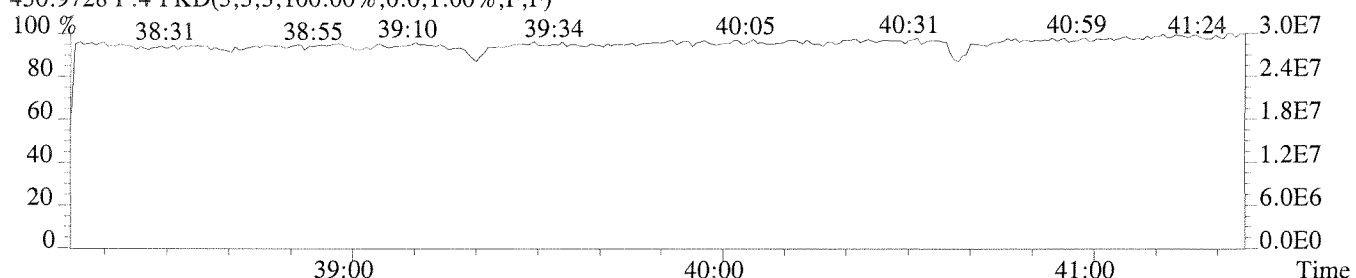
419.8220 F:4 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.25%,9672.0,0.50%,F,T)



479.7165 F:4 PKD(5,3,5,100.00%,0.0,1.00%,F,F)



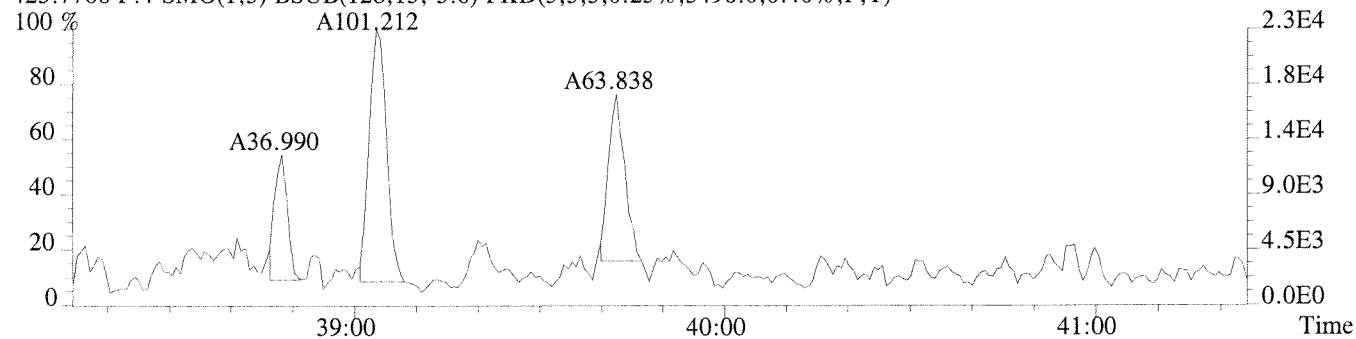
430.9728 F:4 PKD(3,3,3,100.00%,0.0,1.00%,F,F)



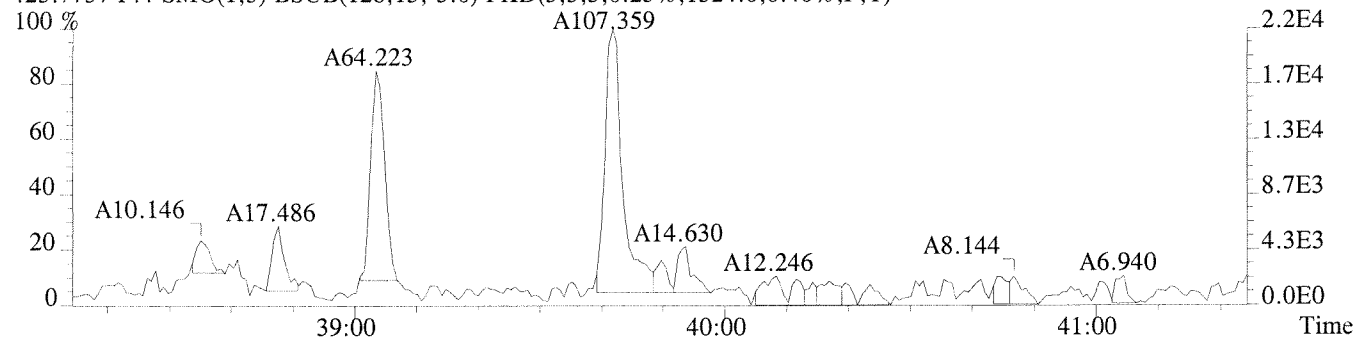
File:P208830 #1-288 Acq:27-JUL-2010 10:03:42 Probe EI+ Magnet SIR VG BioTech Mass spectf

Sample#1 Exp:EQ1000358-01 MB

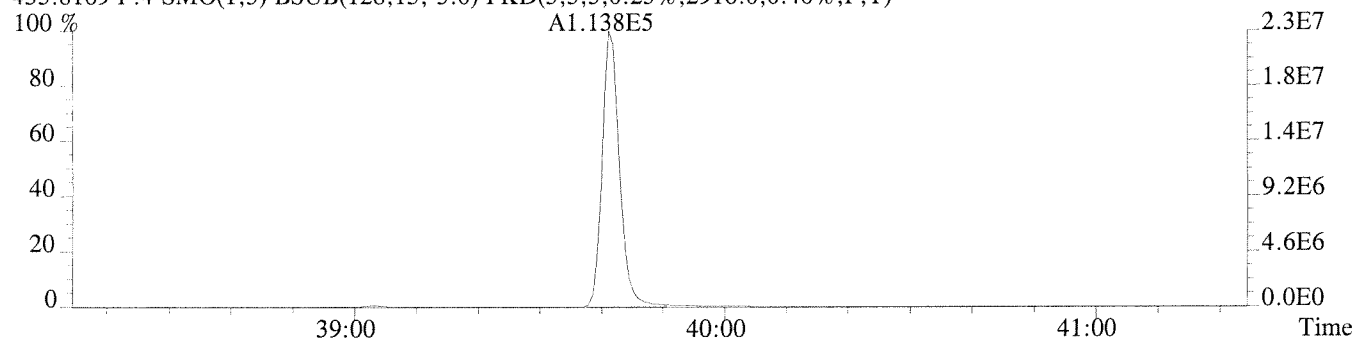
423.7766 F:4 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.25%,3496.0,0.40%,F,T)



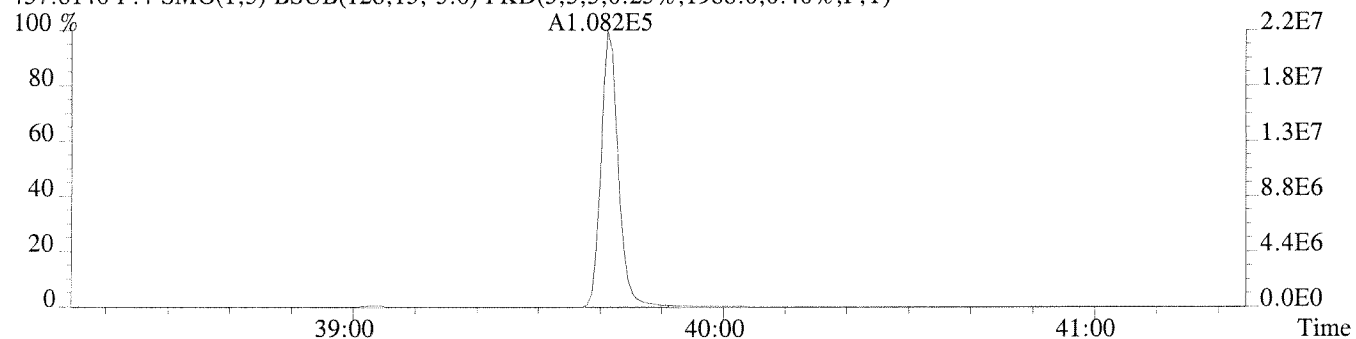
425.7737 F:4 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.25%,1324.0,0.40%,F,T)



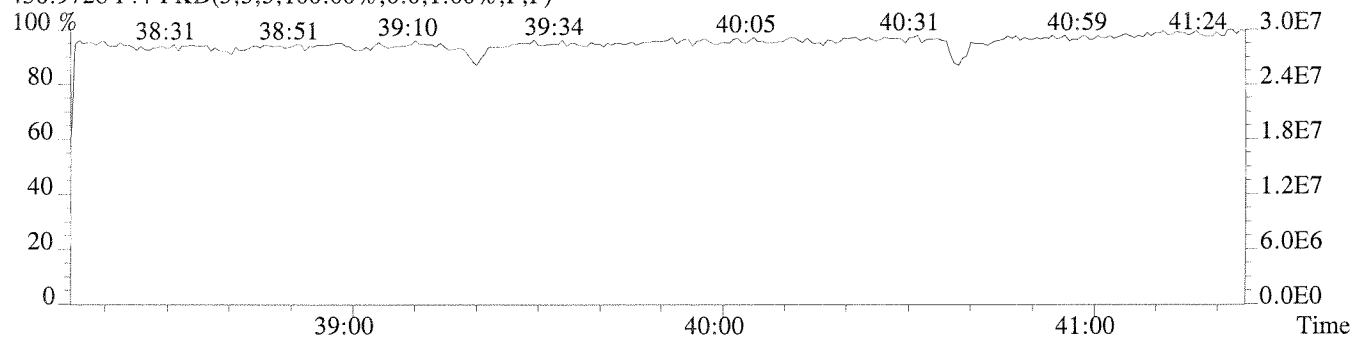
435.8169 F:4 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.25%,2916.0,0.40%,F,T)



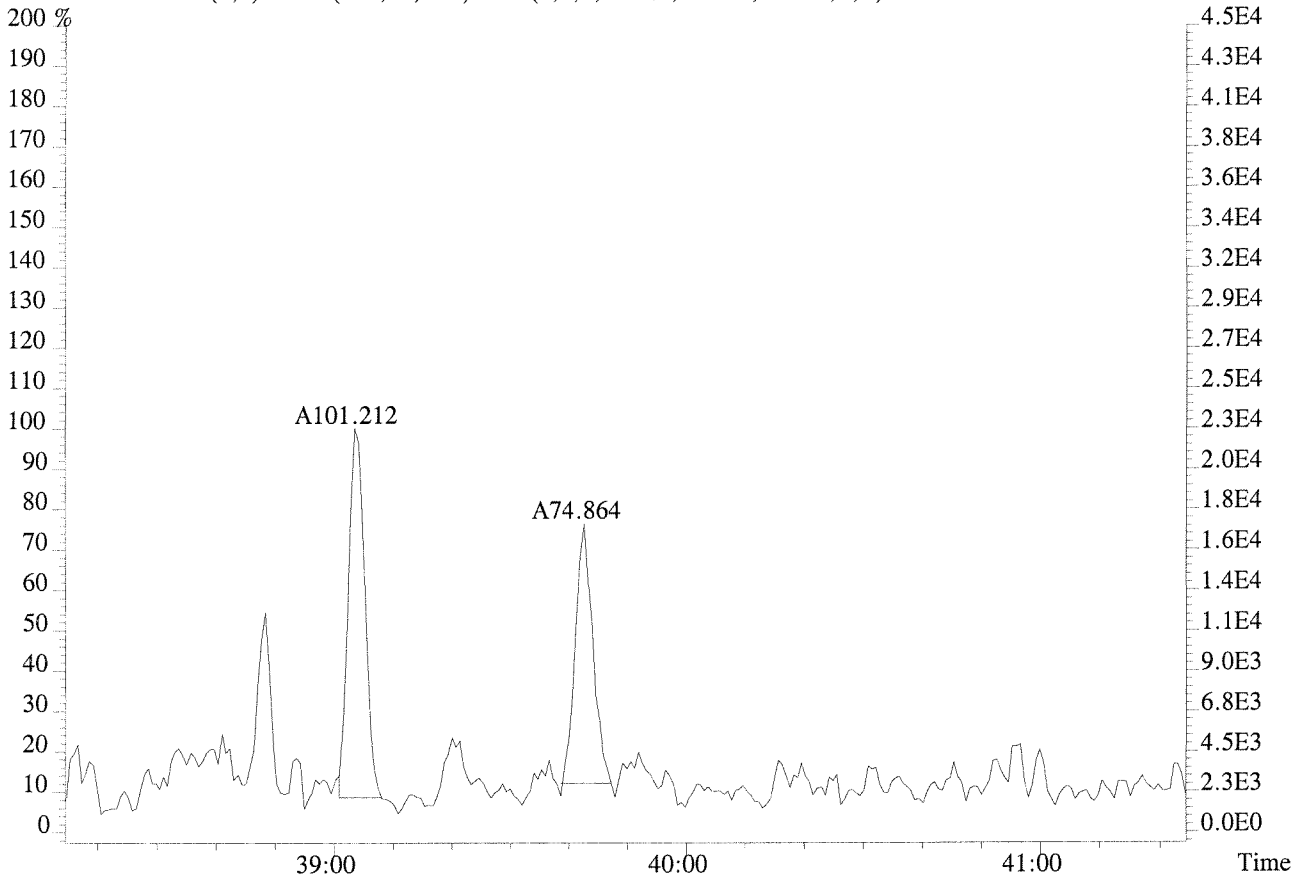
437.8140 F:4 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.25%,1988.0,0.40%,F,T)



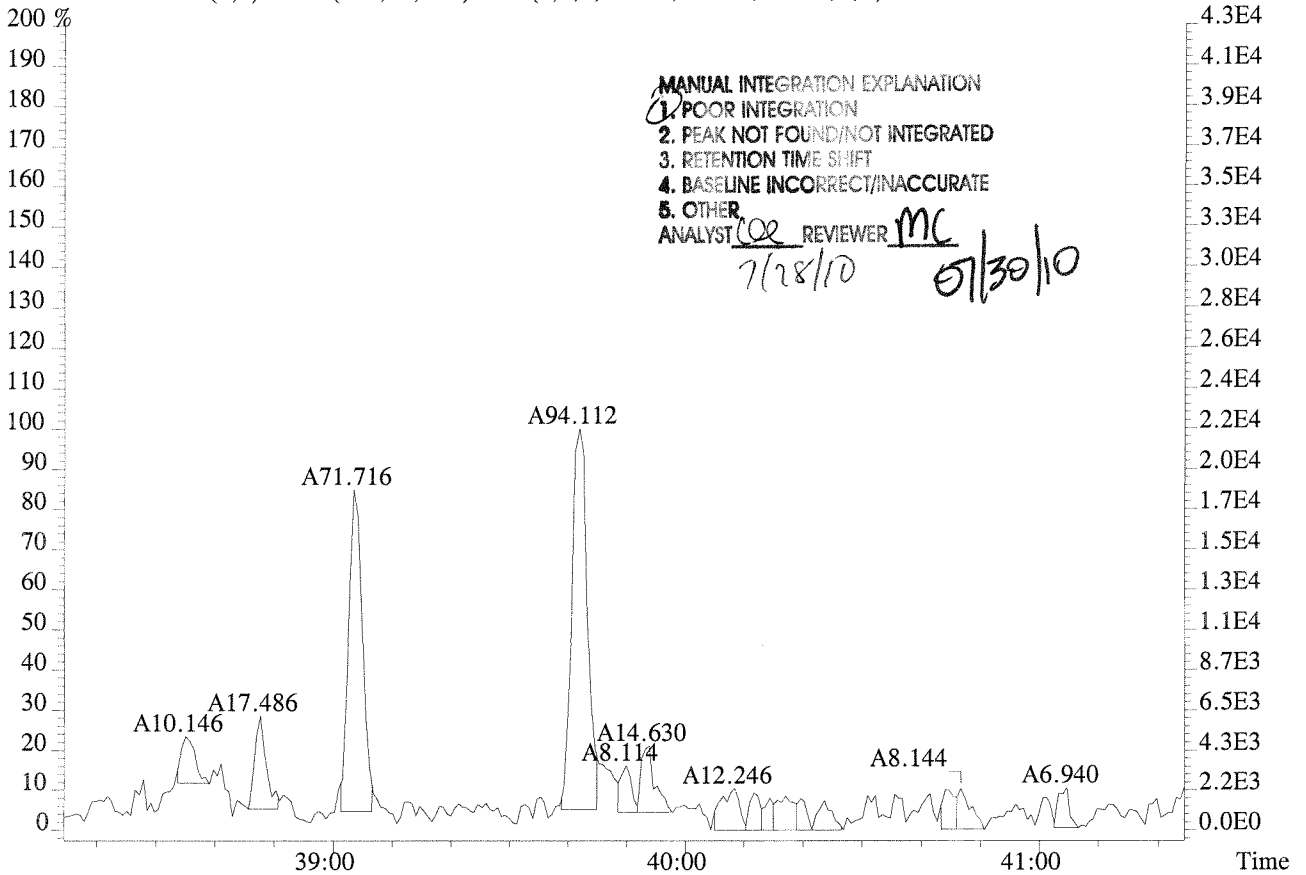
430.9728 F:4 PKD(3,3,3,100.00%,0.0,1.00%,F,F)



File:P208830 #1-288 Acq:27-JUL-2010 10:03:42 Probe EI+ Magnet SIR VG BioTech Mass sf
Sample#1 Exp:EQ1000358-01 MB
423.7766 F:4 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.25%,3496.0,0.40%,F,T)

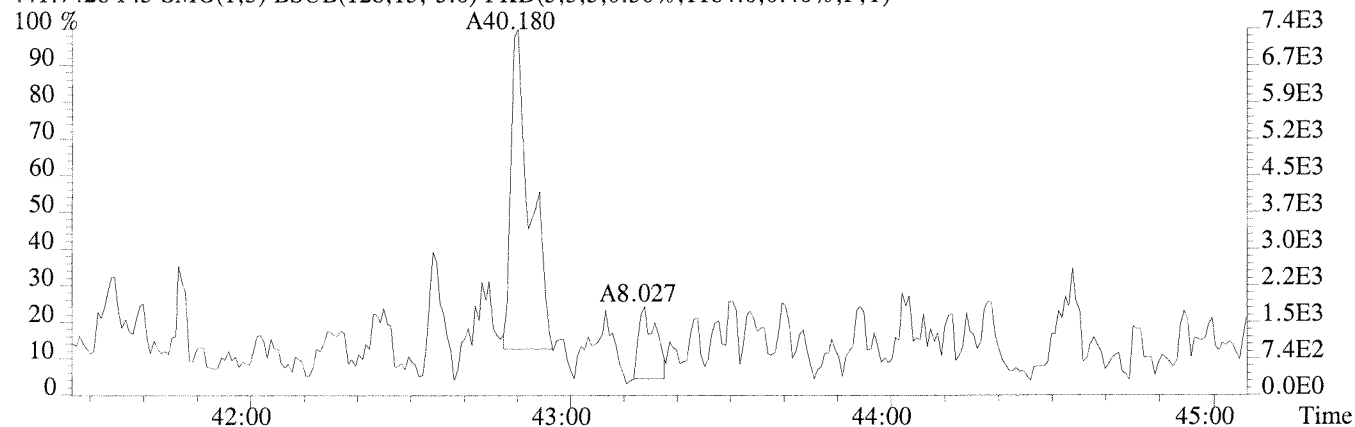


425.7737 F:4 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.25%,1324.0,0.40%,F,T)

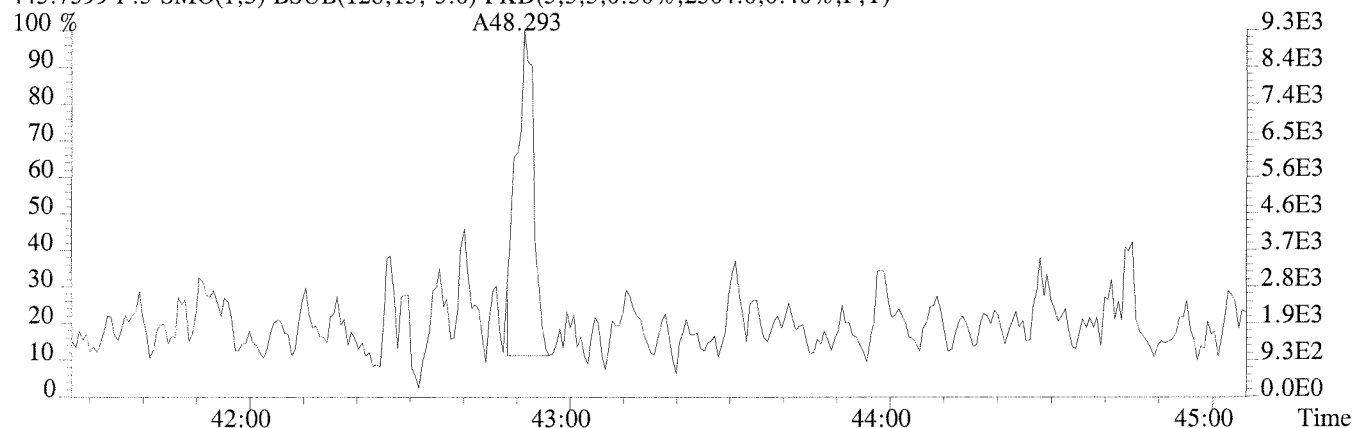


File:P208830 #1-333 Acq:27-JUL-2010 10:03:42 Probe EI+ Magnet SIR VG BioTech Mass spectf
Sample#1 Exp:EQ1000358-01 MB

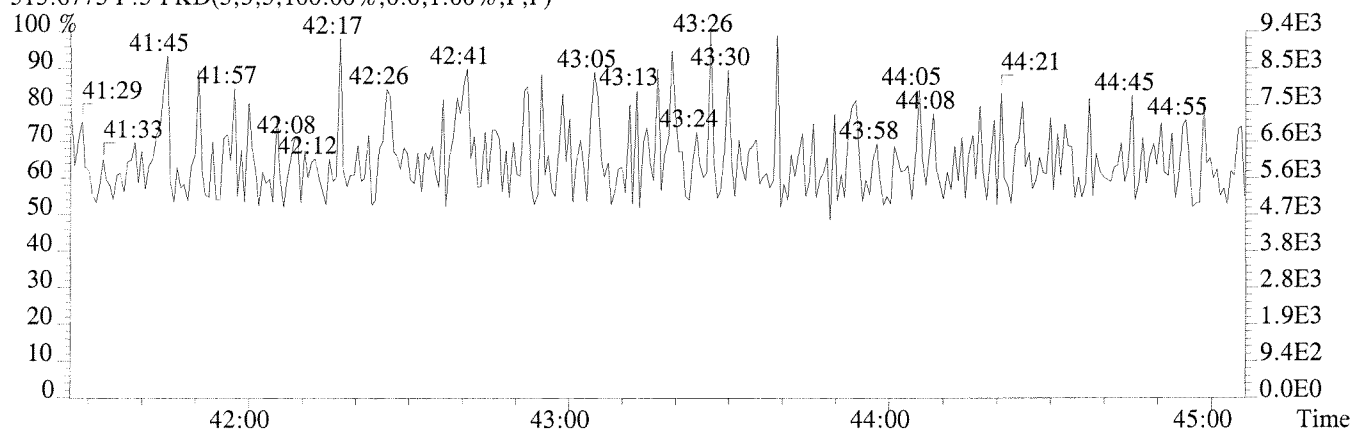
441.7428 F:5 SMO(1,3) BSUB(128,15,-3.0) PKD(5,3,5,0.30%,1184.0,0.40%,F,T)



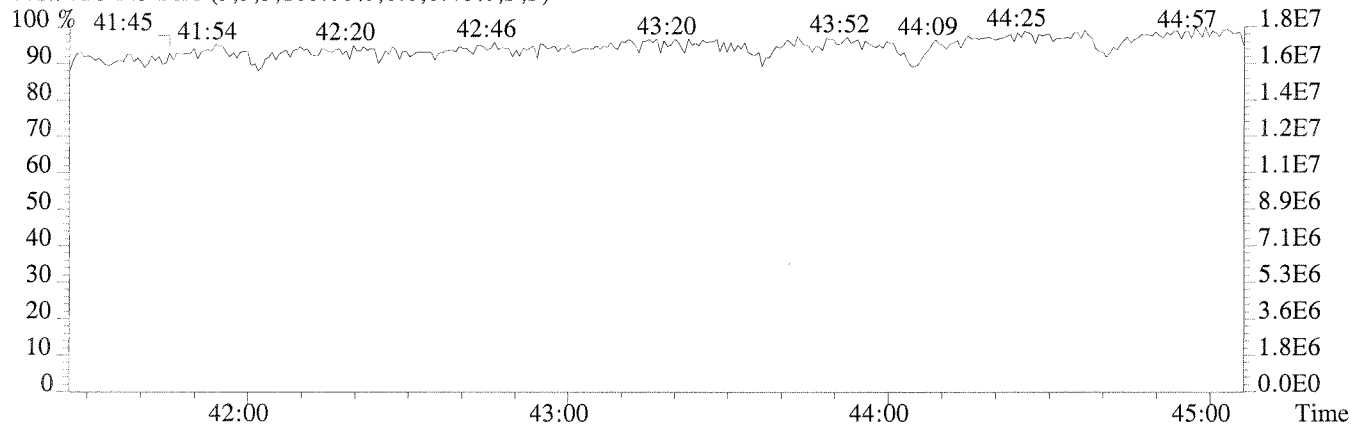
443.7399 F:5 SMO(1,3) BSUB(128,15,-3.0) PKD(5,3,5,0.30%,2304.0,0.40%,F,T)



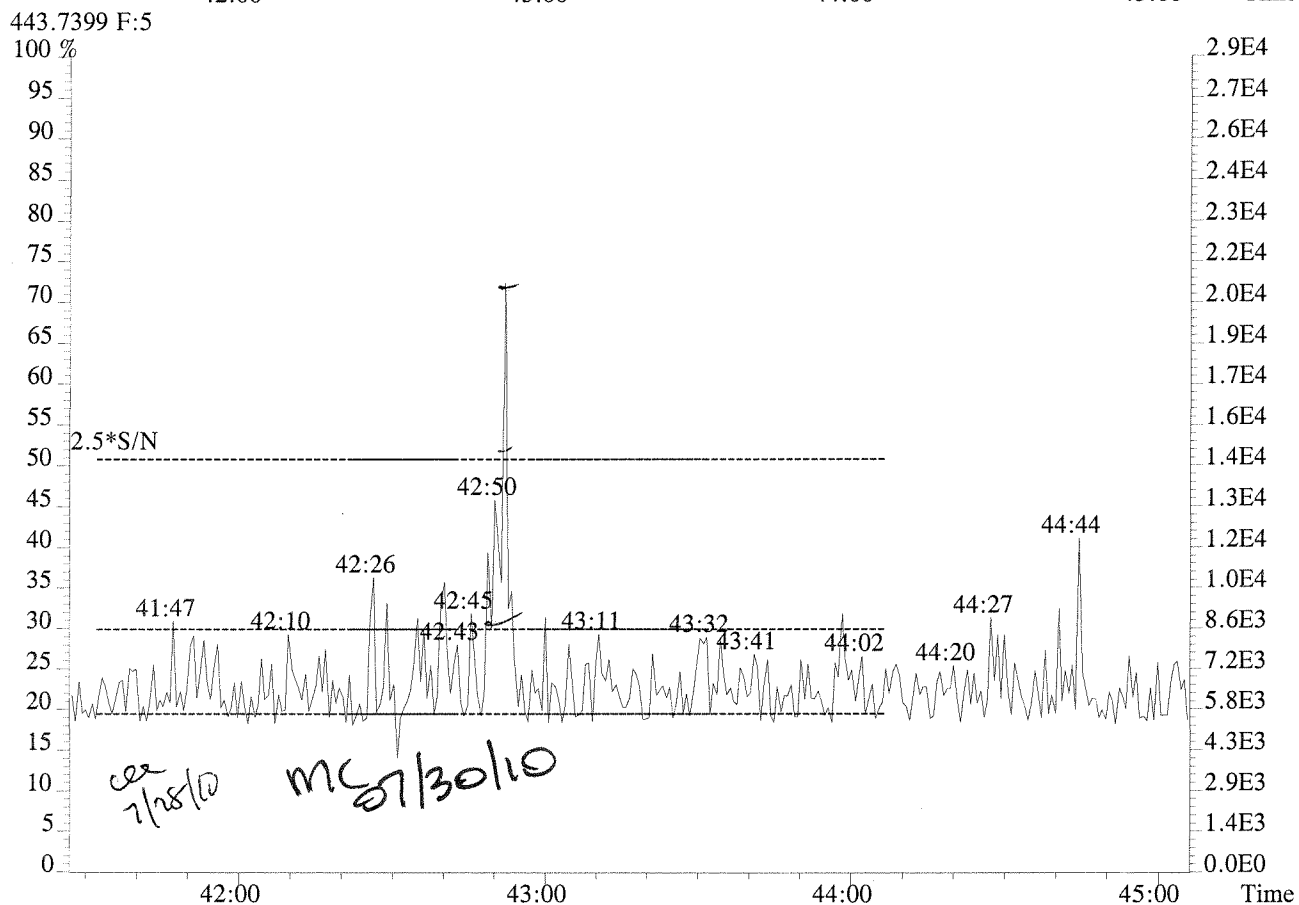
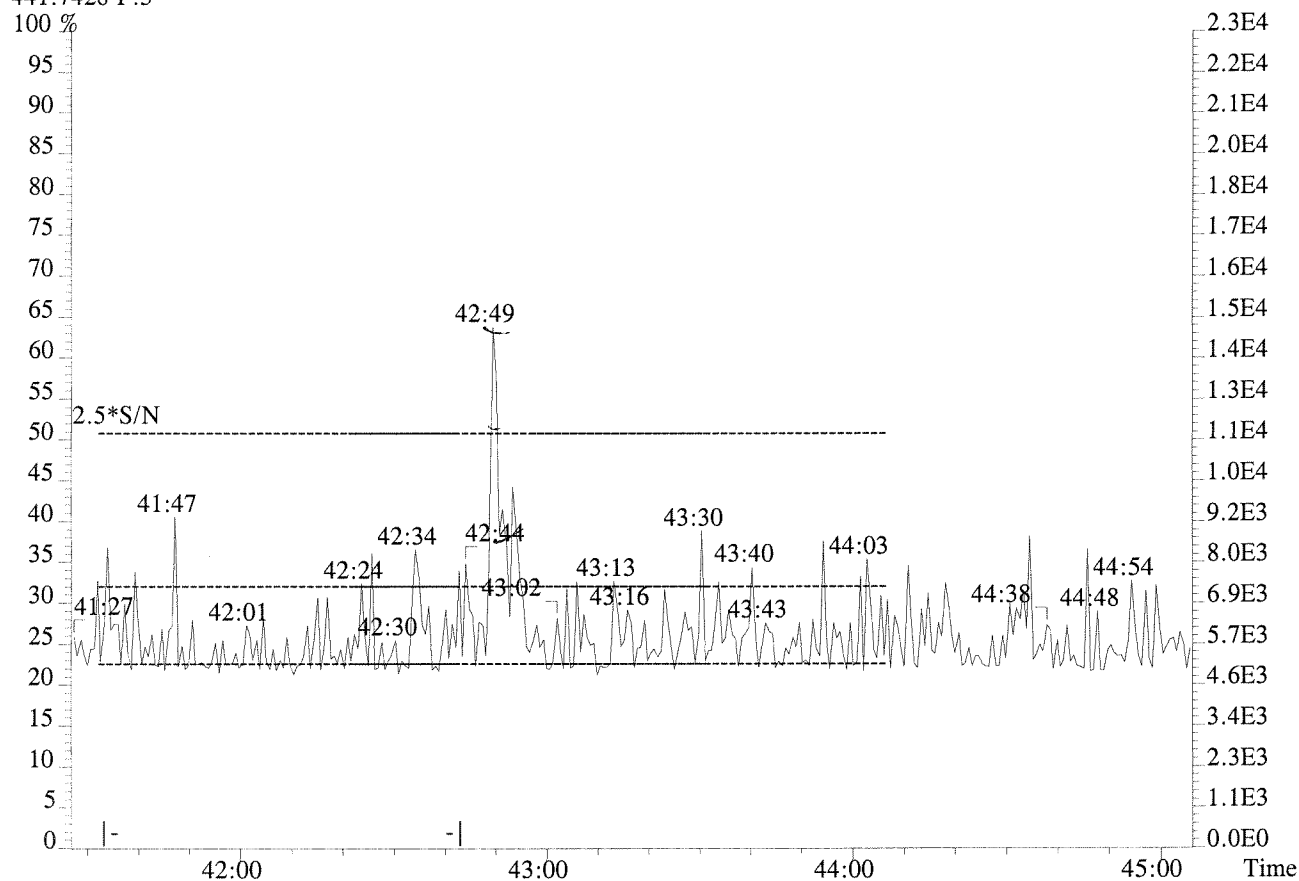
513.6775 F:5 PKD(5,3,5,100.00%,0.0,1.00%,F,F)



442.9728 F:5 PKD(3,3,3,100.00%,0.0,0.40%,F,F)



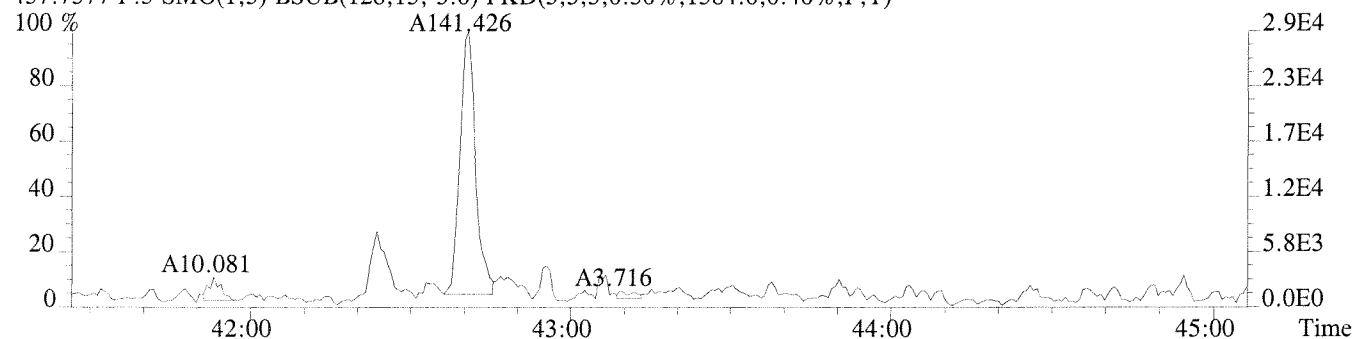
File:P208830 #1-333 Acq:27-JUL-2010 10:03:42 Probe EI+ Magnet SIR VG BioTech Mass sf
Sample#1 Exp:EQ1000358-01 MB
441.7428 F:5



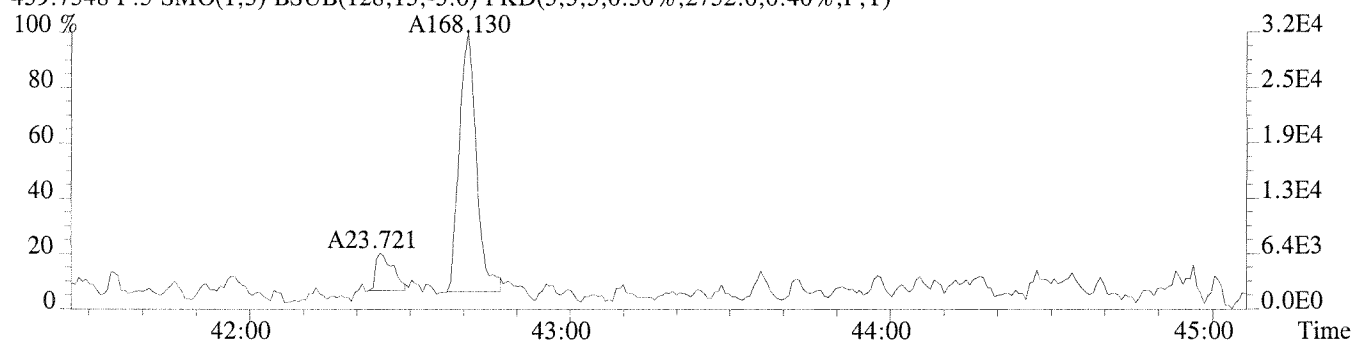
File:P208830 #1-333 Acq:27-JUL-2010 10:03:42 Probe EI+ Magnet SIR VG BioTech Mass spectf

Sample#1 Exp:EQ1000358-01 MB

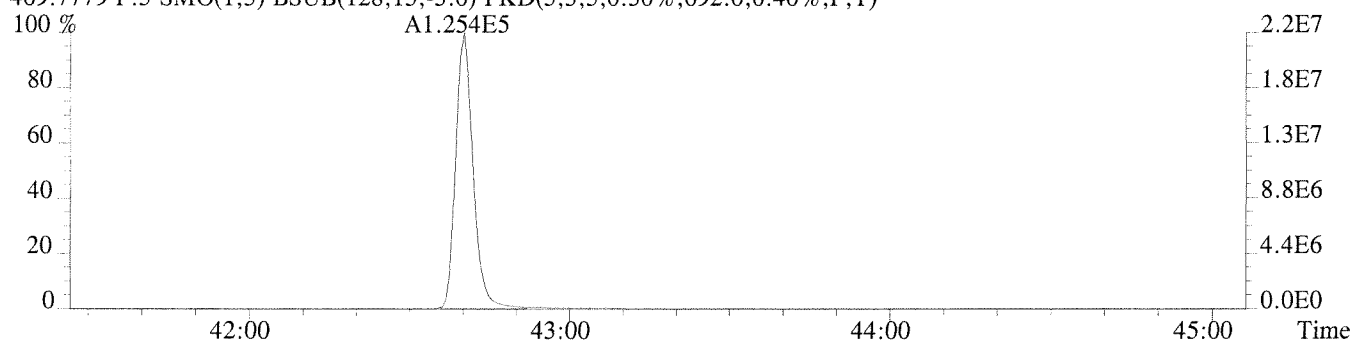
457.7377 F:5 SMO(1,3) BSUB(128,15,-3.0) PKD(5,3,5,0.30%,1384.0,0.40%,F,T)



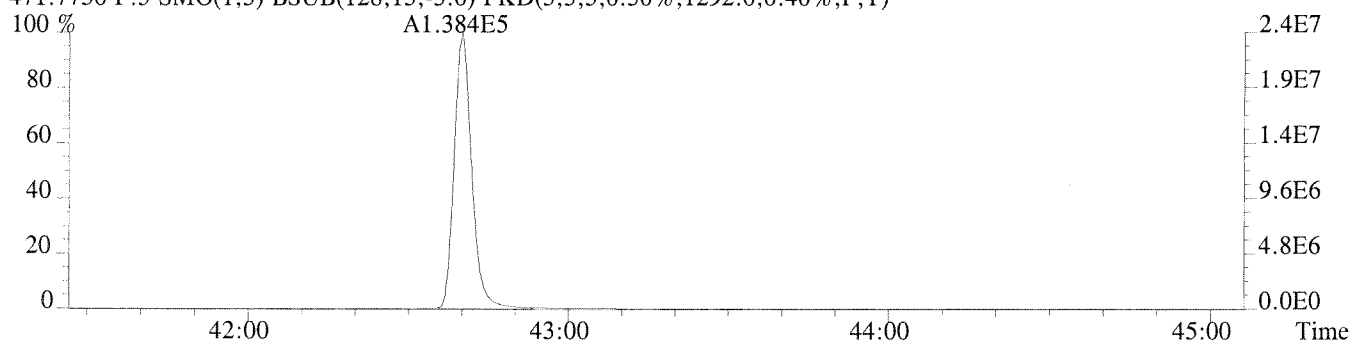
459.7348 F:5 SMO(1,3) BSUB(128,15,-3.0) PKD(5,3,5,0.30%,2752.0,0.40%,F,T)



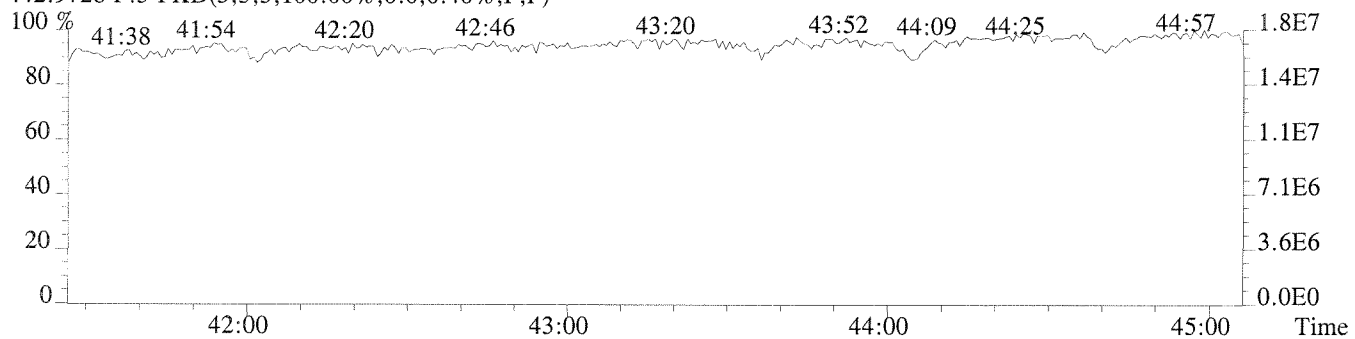
469.7779 F:5 SMO(1,3) BSUB(128,15,-3.0) PKD(5,3,5,0.30%,692.0,0.40%,F,T)



471.7750 F:5 SMO(1,3) BSUB(128,15,-3.0) PKD(5,3,5,0.30%,1292.0,0.40%,F,T)



442.9728 F:5 PKD(3,3,3,100.00%,0.0,0.40%,F,F)



Columbia Analytical Services, Inc.

Sample Response Summary

CLIENT ID.

LCS

Run #16 Filename P208836 Samp: 1 Inj: 1 Acquired: 27-JUL-10 14:57:51
 Processed: 28-JUL-10 12:27:31 LAB. ID: EQ1000358-02

Typ	Name	RT-1	Resp 1	Resp 2	Ratio	Meet	Mod?	RRF
1 Unk	2,3,7,8-TCDF	28:16	1.390e+04	1.862e+04	0.75	yes	no	0.831
2 Unk	1,2,3,7,8-PeCDF	32:35	4.050e+04	2.661e+04	1.52	yes	no	0.840
3 Unk	2,3,4,7,8-PeCDF	33:20	4.054e+04	2.677e+04	1.51	yes	no	0.850
4 Unk	1,2,3,4,7,8-HxCDF	36:07	3.643e+04	3.050e+04	1.19	yes	no	1.072
5 Unk	1,2,3,6,7,8-HxCDF	36:14	4.046e+04	3.367e+04	1.20	yes	no	1.128
6 Unk	2,3,4,6,7,8-HxCDF	36:43	3.475e+04	2.847e+04	1.22	yes	no	1.006
7 Unk	1,2,3,7,8,9-HxCDF	37:26	2.861e+04	2.312e+04	1.24	yes	no	0.864
8 Unk	1,2,3,4,6,7,8-HpCDF	38:50	2.363e+04	2.401e+04	0.98	yes	no	1.315
9 Unk	1,2,3,4,7,8,9-HpCDF	40:08	2.245e+04	2.251e+04	1.00	yes	no	0.970
10 Unk	OCDF	42:52	2.849e+04	3.211e+04	0.89	yes	no	1.103
11 Unk	2,3,7,8-TCDD	29:04	1.185e+04	1.612e+04	0.74	yes	no	0.916
12 Unk	1,2,3,7,8-PeCDD	33:40	3.424e+04	2.199e+04	1.56	yes	no	0.869
13 Unk	1,2,3,4,7,8-HxCDD	36:49	2.768e+04	2.208e+04	1.25	yes	no	0.925
14 Unk	1,2,3,6,7,8-HxCDD	36:54	3.179e+04	2.514e+04	1.26	yes	no	1.054
15 Unk	1,2,3,7,8,9-HxCDD	37:11	3.032e+04	2.450e+04	1.24	yes	no	0.966
16 Unk	1,2,3,4,6,7,8-HpCDD	39:43	2.027e+04	1.928e+04	1.05	yes	no	0.879
17 Unk	OCDD	42:41	2.561e+04	2.847e+04	0.90	yes	no	0.959
18 IS	13C-2,3,7,8-TCDF	28:15	8.032e+04	1.028e+05	0.78	yes	no	1.424
19 IS	13C-1,2,3,7,8-PeCDF	32:35	1.087e+05	6.872e+04	1.58	yes	no	1.263
20 IS	13C-1,2,3,4,7,8-HxCDF	36:07	1.186e+05	2.261e+05	0.52	yes	no	1.279
21 IS	13C-1,2,3,4,6,7,8-HpCDF	38:49	6.652e+04	1.496e+05	0.44	yes	no	0.902
22 IS	13C-2,3,7,8-TCDD	29:04	6.989e+04	8.905e+04	0.78	yes	no	1.057
23 IS	13C-1,2,3,7,8-PeCDD	33:39	8.232e+04	5.253e+04	1.57	yes	no	0.873
24 IS	13C-1,2,3,6,7,8-HxCDD	36:53	1.590e+05	1.274e+05	1.25	yes	no	0.997
25 IS	13C-1,2,3,4,6,7,8-HpCDD	39:42	1.155e+05	1.103e+05	1.05	yes	no	0.833
26 IS	13C-OCDD	42:41	1.248e+05	1.372e+05	0.91	yes	no	0.733
27 RS/RT	13C-1,2,3,4-TCDD	28:49	9.107e+04	1.146e+05	0.79	yes	no	-
28 RS/RT	13C-1,2,3,7,8,9-HxCDD	37:11	1.107e+05	8.743e+04	1.27	yes	no	-
29 C/Up	37Cl-2,3,7,8-TCDD	29:04	1.423e+05				no	0.983
				SUM AREA				
30 Tot	Total Tetra-Furans	28:16		3.252e+04	0.75	yes		0.831
31 Tot	Total Tetra-Dioxins	29:04		2.797e+04	0.74	yes		0.916
32 Tot	Total Penta-Furans	32:35		1.344e+05	1.52	yes		0.845
33 Tot	Total Penta-Dioxins	33:40		5.623e+04	1.56	yes		0.869
34 Tot	Total Hexa-Furans	36:07		2.560e+05	1.19	yes		1.018
35 Tot	Total Hexa-Dioxins	36:49		1.615e+05	1.25	yes		0.982
36 Tot	Total Hepta-Furans	38:50		9.260e+04	0.98	yes		1.143
37 Tot	Total Hepta-Dioxins	39:43		3.955e+04	1.05	yes		0.879

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Columbia Analytical Services, Inc.
Signal/Noise Height Ratio Summary

CLIENT ID.
LCS

Run #16 Filename P208836 Samp: 1 Inj: 1 Acquired: 27-JUL-10 14:57:51
Processed: 28-JUL-10 12:27:311 LAB. ID: EQ1000358-02

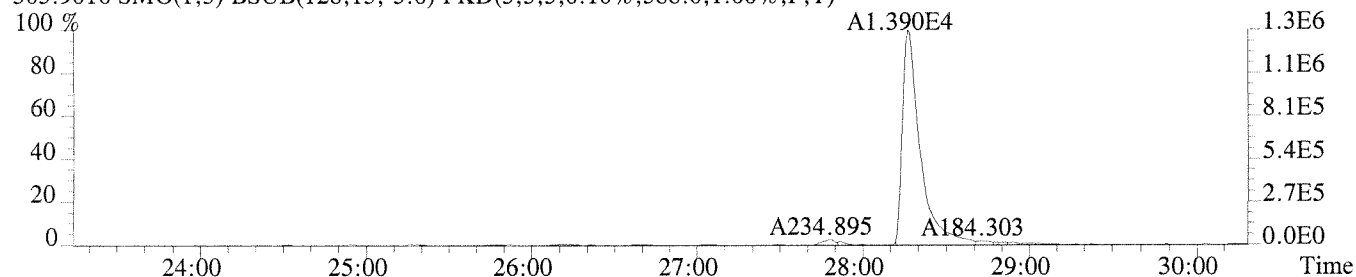
	Name	Signal 1	Noise 1	S/N Rat.1	Signal 2	Noise 2	S/N Rat.2
1	2,3,7,8-TCDF	1.35e+06	5.88e+02	2.3e+03	1.83e+06	9.64e+02	1.9e+03
2	1,2,3,7,8-PeCDF	6.11e+06	1.07e+03	5.7e+03	4.03e+06	1.74e+03	2.3e+03
3	2,3,4,7,8-PeCDF	6.15e+06	1.07e+03	5.7e+03	4.06e+06	1.74e+03	2.3e+03
4	1,2,3,4,7,8-HxCDF	7.53e+06	5.22e+03	1.4e+03	6.32e+06	2.96e+03	2.1e+03
5	1,2,3,6,7,8-HxCDF	7.07e+06	5.22e+03	1.4e+03	5.98e+06	2.96e+03	2.0e+03
6	2,3,4,6,7,8-HxCDF	6.55e+06	5.22e+03	1.3e+03	5.46e+06	2.96e+03	1.8e+03
7	1,2,3,7,8,9-HxCDF	5.00e+06	5.22e+03	9.6e+02	4.03e+06	2.96e+03	1.4e+03
8	1,2,3,4,6,7,8-HpCDF	4.84e+06	8.07e+03	6.0e+02	4.86e+06	1.11e+04	4.4e+02
9	1,2,3,4,7,8,9-HpCDF	3.73e+06	8.07e+03	4.6e+02	3.76e+06	1.11e+04	3.4e+02
10	OCDF	4.53e+06	4.82e+03	9.4e+02	5.03e+06	4.88e+03	1.0e+03
11	2,3,7,8-TCDD	1.51e+06	1.25e+03	1.2e+03	1.98e+06	1.09e+03	1.8e+03
12	1,2,3,7,8-PeCDD	5.56e+06	2.64e+03	2.1e+03	3.55e+06	1.90e+03	1.9e+03
13	1,2,3,4,7,8-HxCDD	5.73e+06	5.74e+03	1.0e+03	4.61e+06	4.71e+03	9.8e+02
14	1,2,3,6,7,8-HxCDD	6.31e+06	5.74e+03	1.1e+03	5.02e+06	4.71e+03	1.1e+03
15	1,2,3,7,8,9-HxCDD	5.81e+06	5.74e+03	1.0e+03	4.67e+06	4.71e+03	9.9e+02
16	1,2,3,4,6,7,8-HpCDD	3.82e+06	3.92e+03	9.7e+02	3.66e+06	7.35e+03	5.0e+02
17	OCDD	4.09e+06	5.25e+03	7.8e+02	4.63e+06	2.00e+04	2.3e+02
18	13C-2,3,7,8-TCDF	8.96e+06	3.26e+03	2.7e+03	1.14e+07	2.33e+03	4.9e+03
19	13C-1,2,3,7,8-PeCDF	1.74e+07	6.40e+02	2.7e+04	1.10e+07	2.04e+03	5.4e+03
20	13C-1,2,3,4,7,8-HxCDF	2.39e+07	9.40e+02	2.5e+04	4.58e+07	2.33e+03	2.0e+04
21	13C-1,2,3,4,6,7,8-HpCDF	1.40e+07	8.04e+03	1.7e+03	3.14e+07	2.30e+04	1.4e+03
22	13C-2,3,7,8-TCDD	9.76e+06	4.18e+03	2.3e+03	1.24e+07	1.99e+03	6.2e+03
23	13C-1,2,3,7,8-PeCDD	1.42e+07	1.25e+03	1.1e+04	9.11e+06	7.92e+02	1.1e+04
24	13C-1,2,3,6,7,8-HxCDD	3.43e+07	3.10e+03	1.1e+04	2.74e+07	2.20e+03	1.2e+04
25	13C-1,2,3,4,6,7,8-HpCDD	2.27e+07	4.32e+03	5.3e+03	2.17e+07	2.82e+03	7.7e+03
26	13C-OCDD	2.11e+07	3.12e+03	6.8e+03	2.33e+07	4.26e+03	5.5e+03
27	13C-1,2,3,4-TCDD	1.36e+07	4.18e+03	3.3e+03	1.69e+07	1.99e+03	8.5e+03
28	13C-1,2,3,7,8,9-HxCDD	2.26e+07	3.10e+03	7.3e+03	1.76e+07	2.20e+03	8.0e+03
29	37Cl-2,3,7,8-TCDD	1.74e+07	1.41e+03	1.2e+04			

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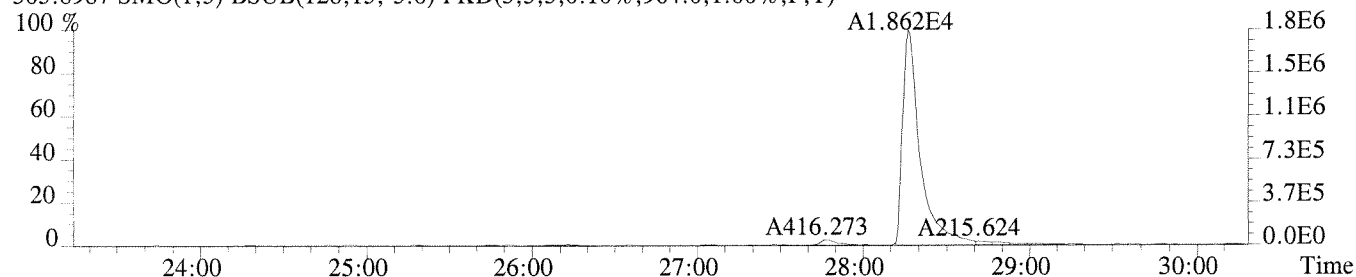
File:P208836 #1-590 Acq:27-JUL-2010 14:57:51 Probe EI+ Magnet SIR VG BioTech Mass spectf

Sample#1 Exp:EQ1000358-02 LCS

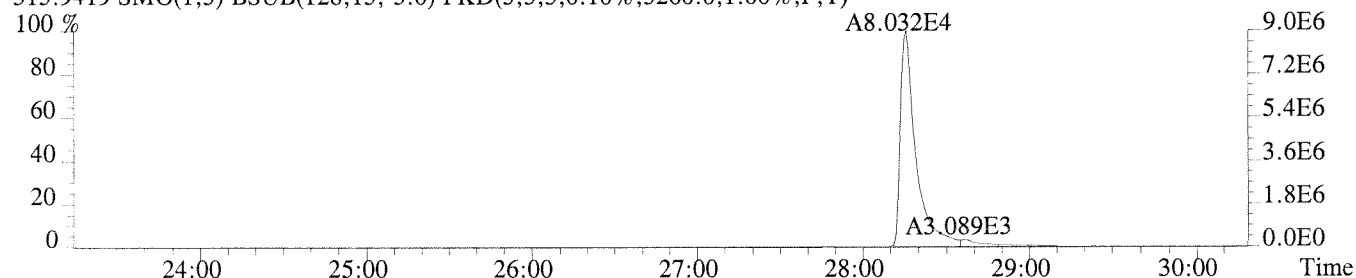
303.9016 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.10%,588.0,1.00%,F,T)



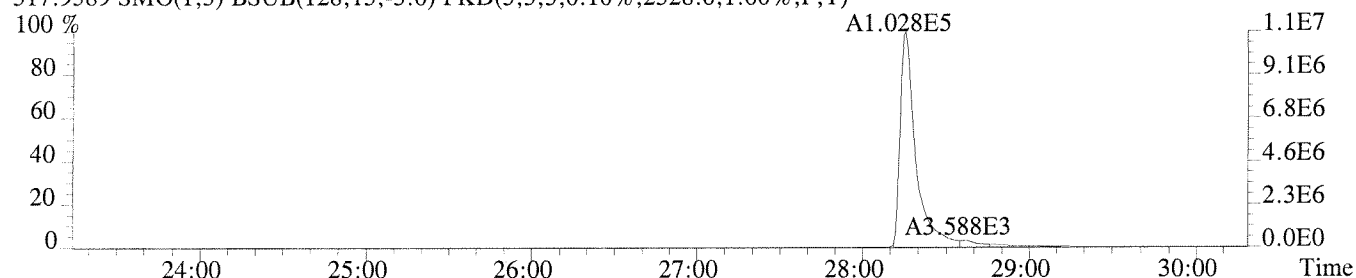
305.8987 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.10%,964.0,1.00%,F,T)



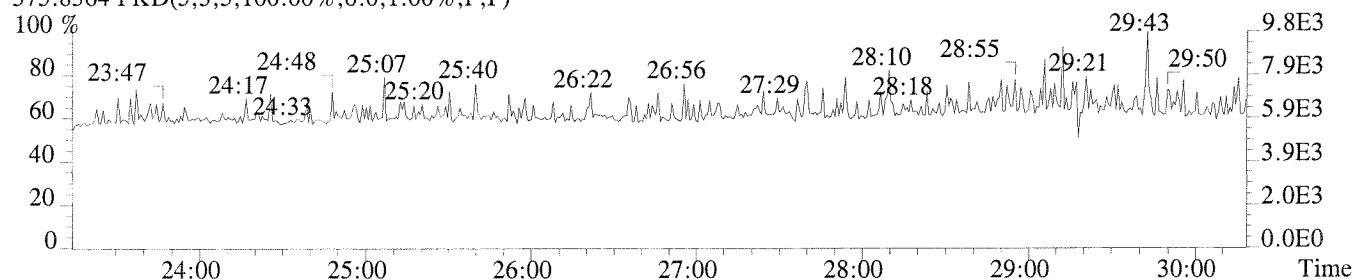
315.9419 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.10%,3260.0,1.00%,F,T)



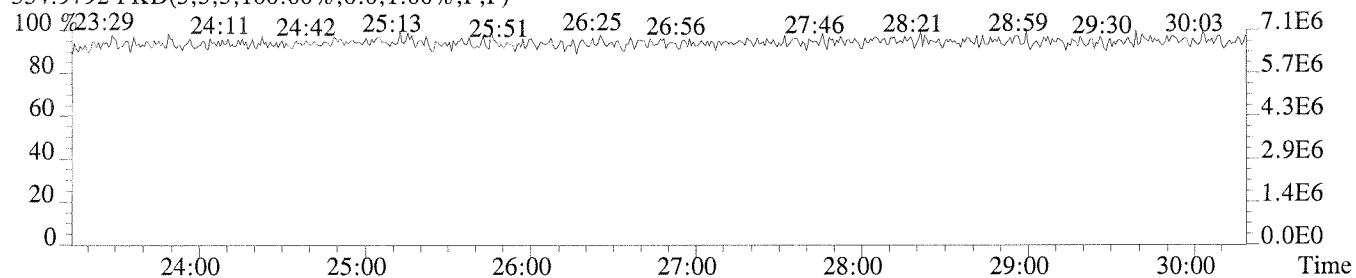
317.9389 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.10%,2328.0,1.00%,F,T)



375.8364 PKD(5,3,5,100.00%,0.0,1.00%,F,F)



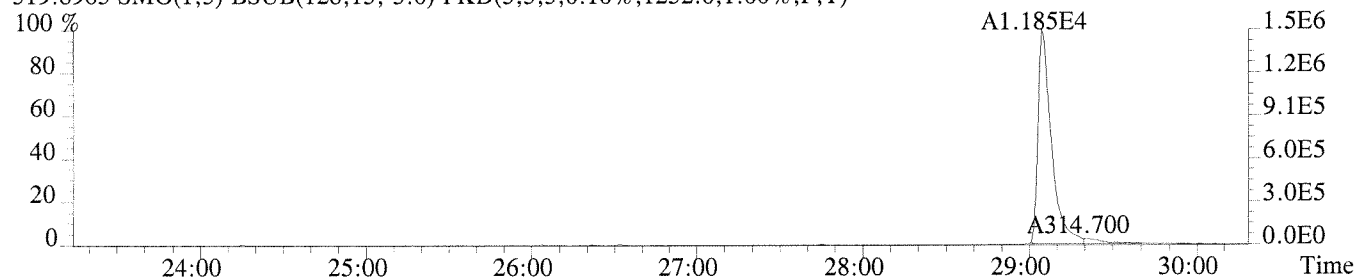
354.9792 PKD(3,3,3,100.00%,0.0,1.00%,F,F)



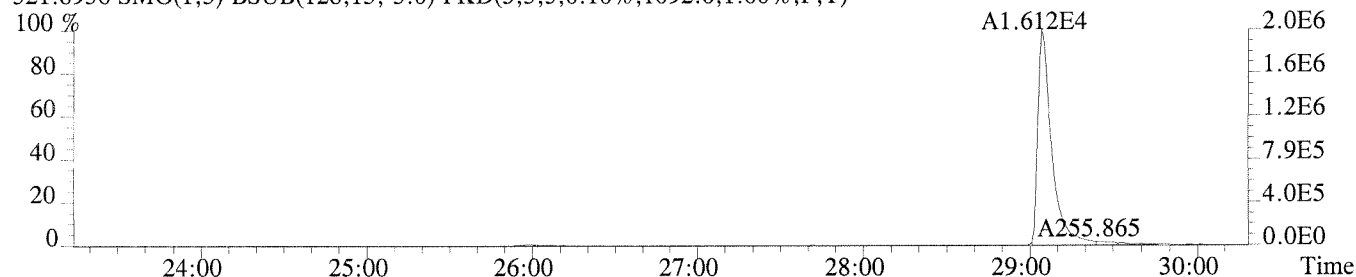
File:P208836 #1-590 Acq:27-JUL-2010 14:57:51 Probe EI+ Magnet SIR VG BioTech Mass spectf

Sample#1 Exp:EQ1000358-02 LCS

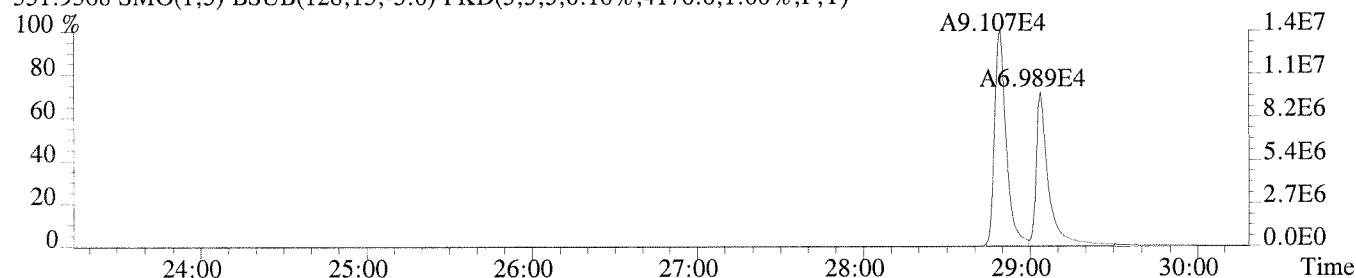
319.8965 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.10%,1252.0,1.00%,F,T)



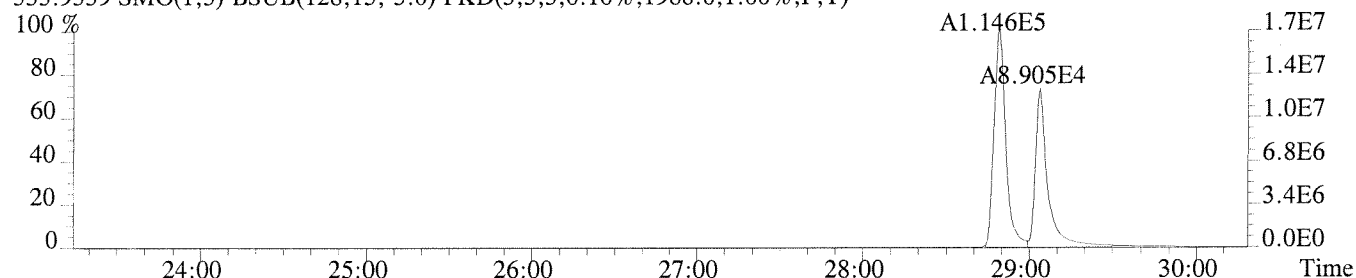
321.8936 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.10%,1092.0,1.00%,F,T)



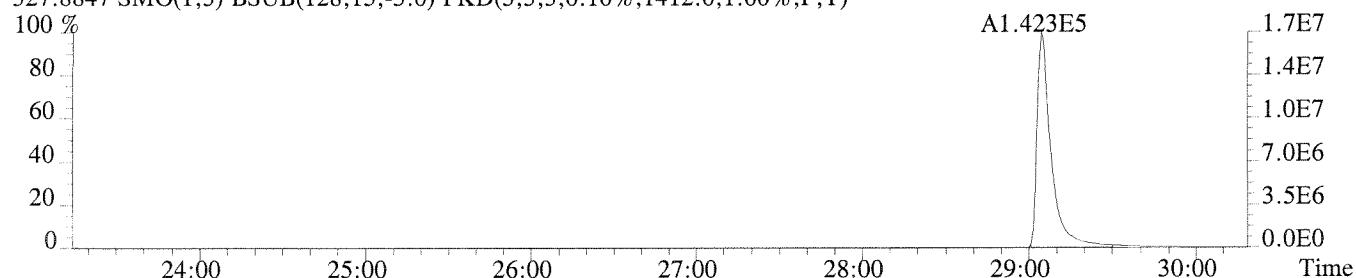
331.9368 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.10%,4176.0,1.00%,F,T)



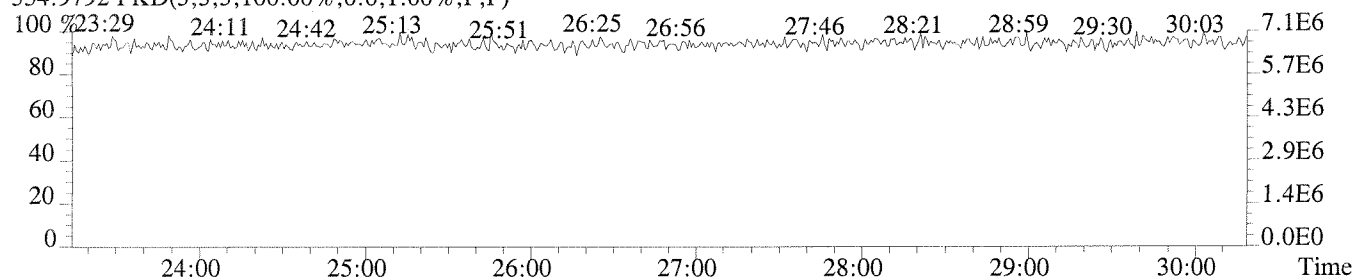
333.9339 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.10%,1988.0,1.00%,F,T)



327.8847 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.10%,1412.0,1.00%,F,T)



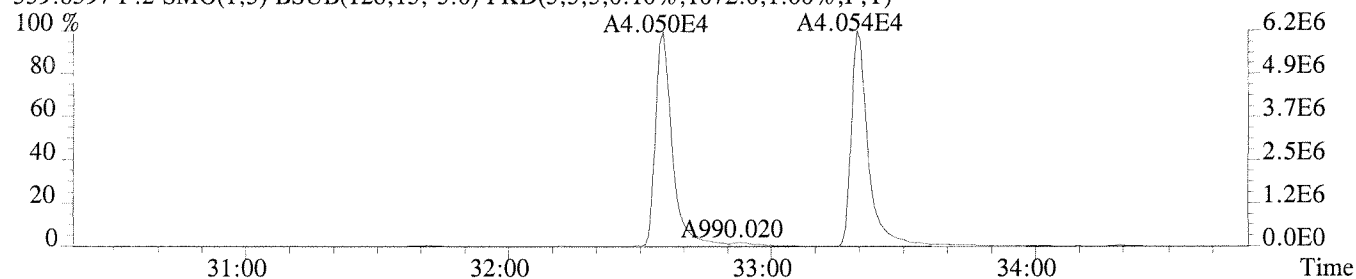
354.9792 PKD(3,3,3,100.00%,0.0,1.00%,F,F)



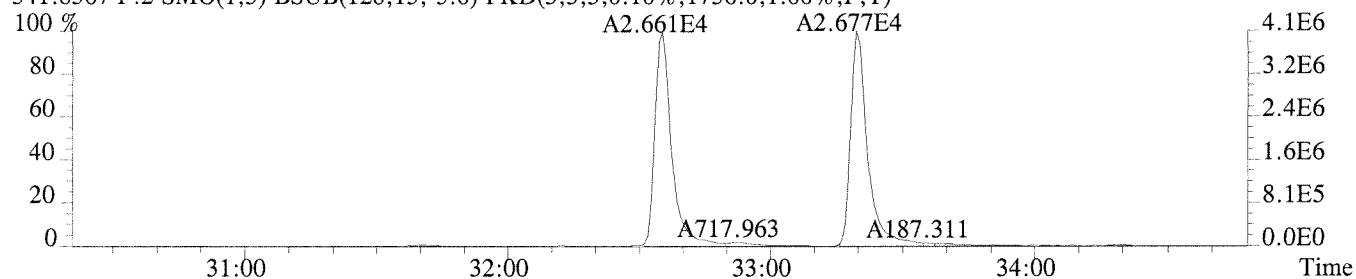
File:P208836 #1-405 Acq:27-JUL-2010 14:57:51 Probe EI+ Magnet SIR VG BioTech Mass spectf

Sample#1 Exp:EQ1000358-02 LCS

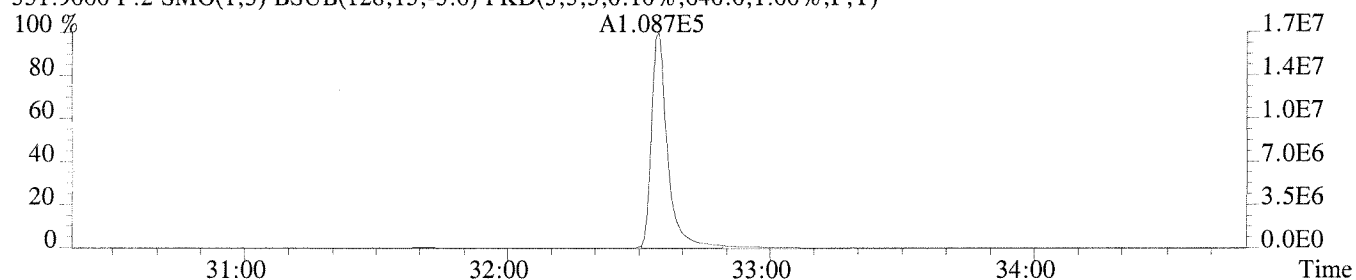
339.8597 F:2 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.10%,1072.0,1.00%,F,T)



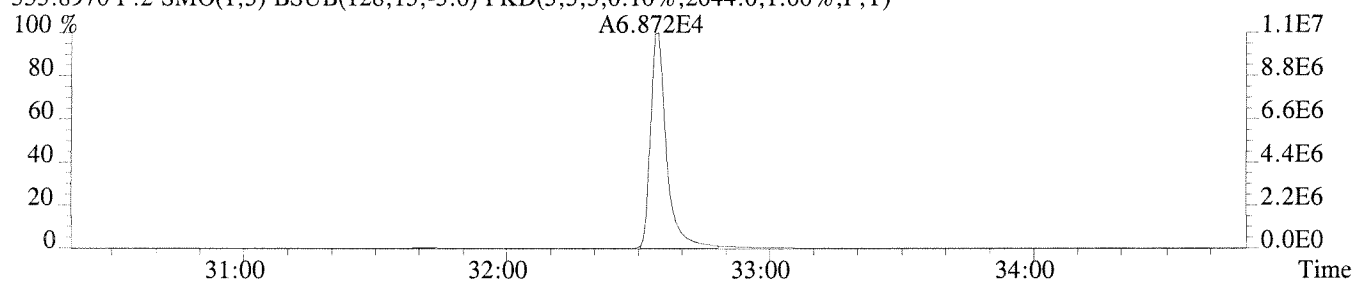
341.8567 F:2 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.10%,1736.0,1.00%,F,T)



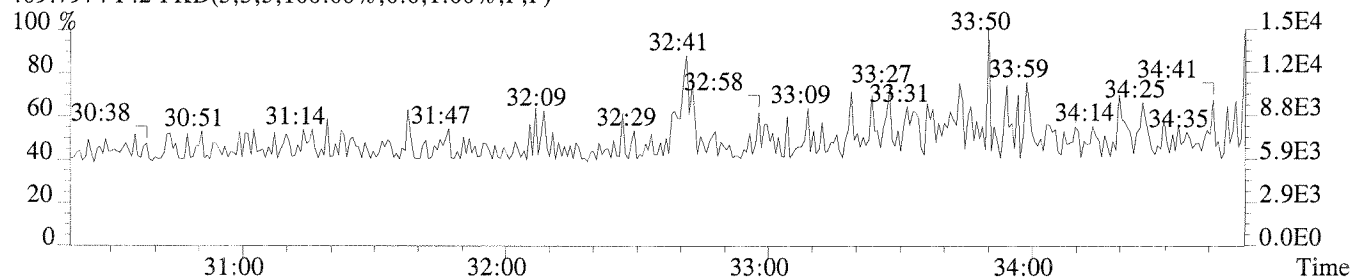
351.9000 F:2 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.10%,640.0,1.00%,F,T)



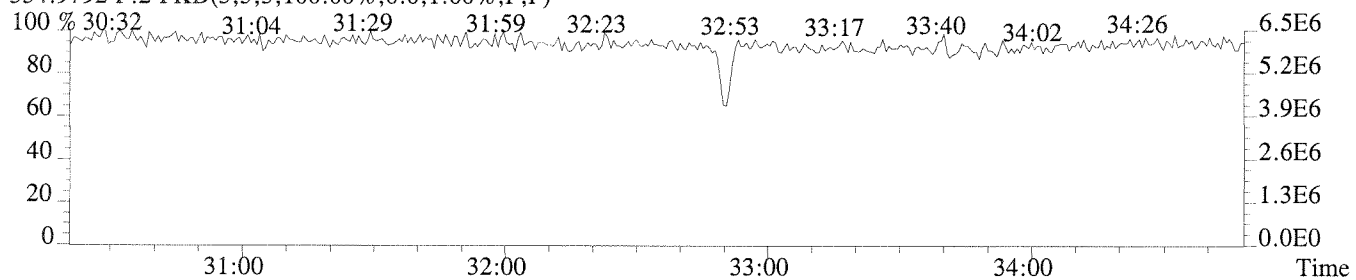
353.8970 F:2 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.10%,2044.0,1.00%,F,T)



409.7974 F:2 PKD(5,3,5,100.00%,0.0,1.00%,F,F)



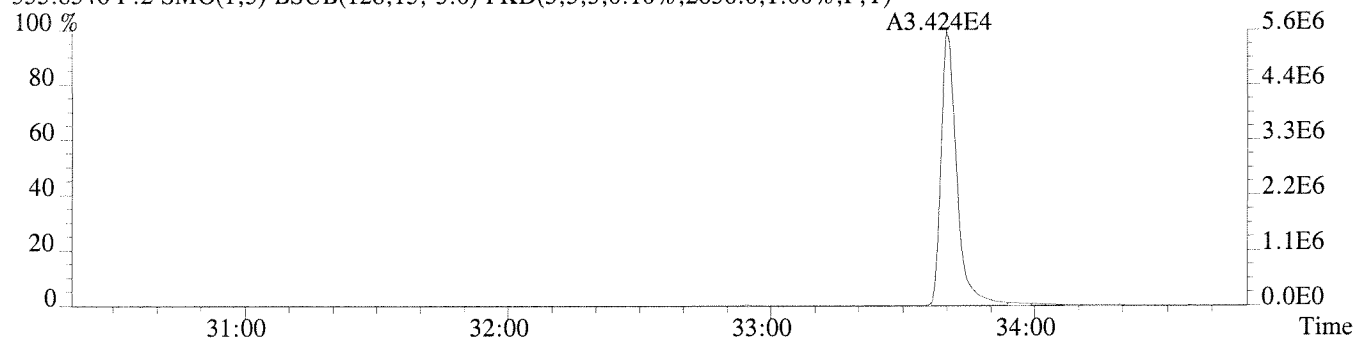
354.9792 F:2 PKD(3,3,3,100.00%,0.0,1.00%,F,F)



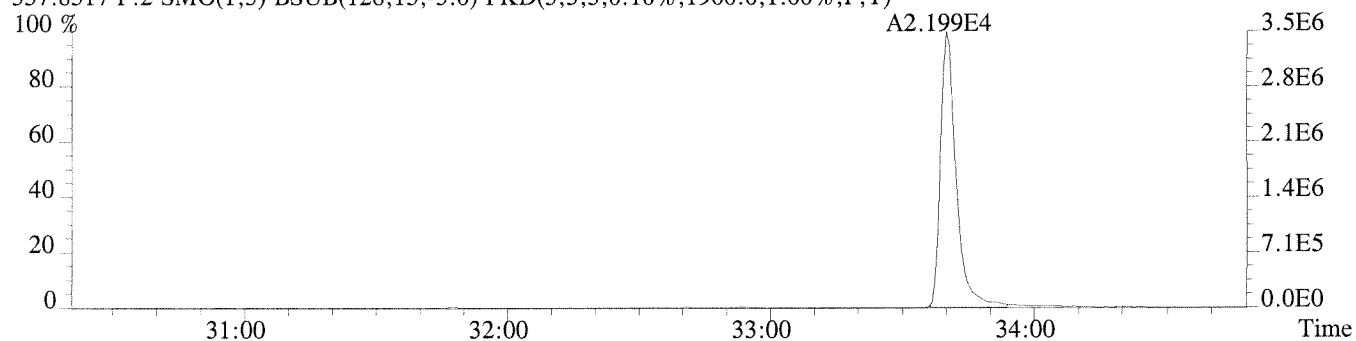
File:P208836 #1-405 Acq:27-JUL-2010 14:57:51 Probe EI+ Magnet SIR VG BioTech Mass spectf

Sample#1 Exp:EQ1000358-02 LCS

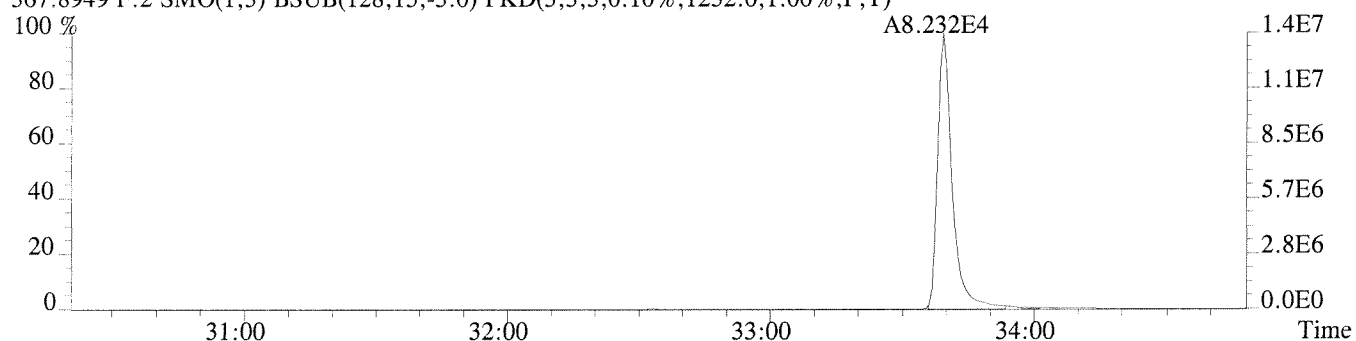
355.8546 F:2 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.10%,2636.0,1.00%,F,T)



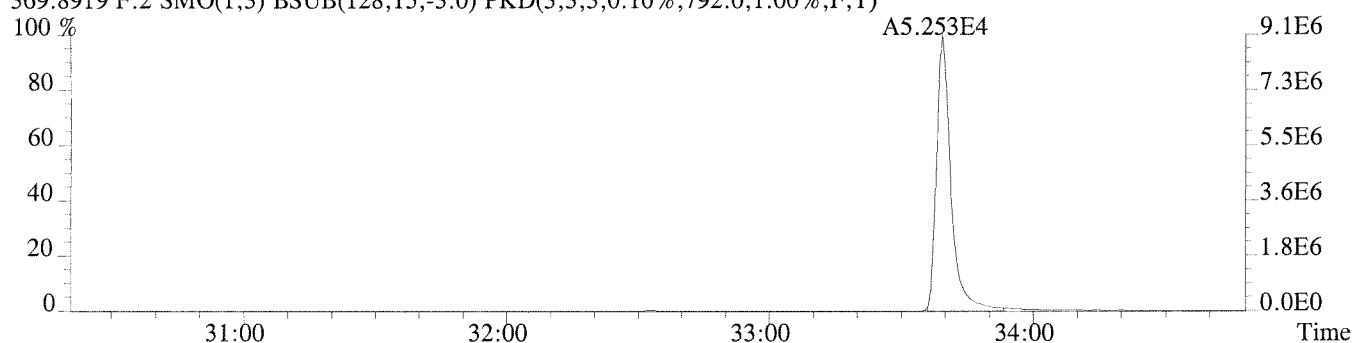
357.8517 F:2 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.10%,1900.0,1.00%,F,T)



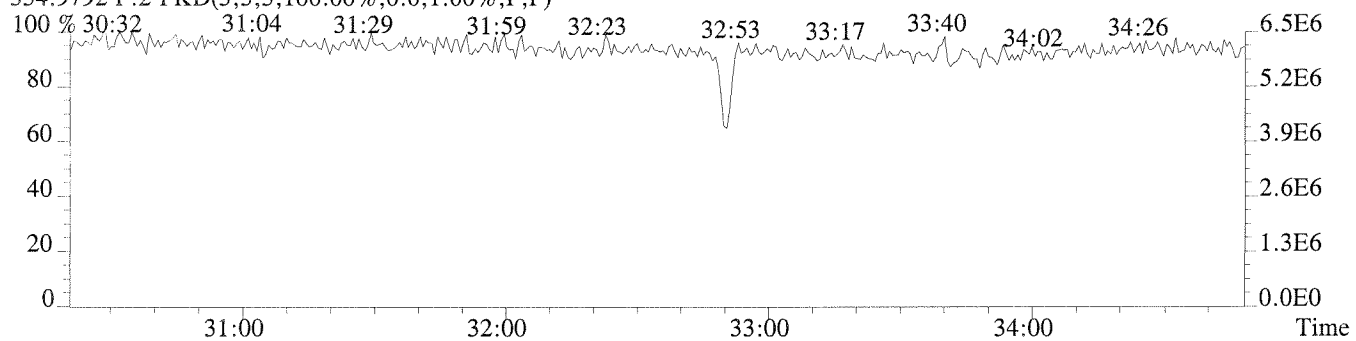
367.8949 F:2 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.10%,1252.0,1.00%,F,T)



369.8919 F:2 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.10%,792.0,1.00%,F,T)



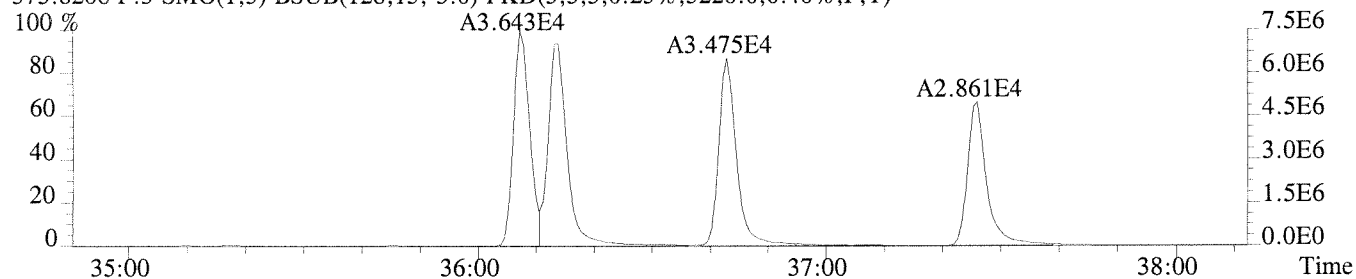
354.9792 F:2 PKD(3,3,3,100.00%,0.0,1.00%,F,F)



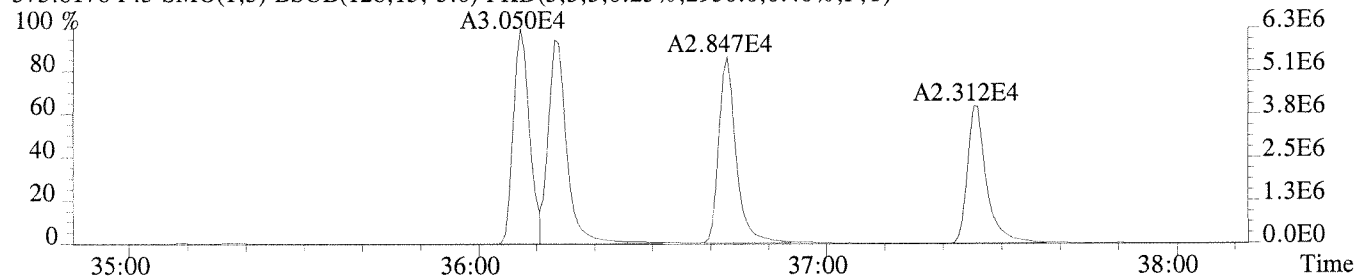
File:P208836 #1-306 Acq:27-JUL-2010 14:57:51 Probe EI+ Magnet SIR VG BioTech Mass spectf

Sample#1 Exp:EQ1000358-02 LCS

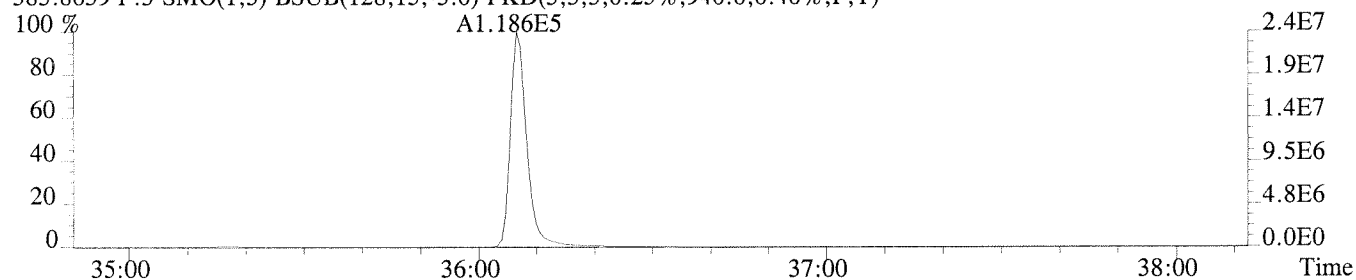
373.8208 F:3 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.25%,5220.0,0.40%,F,T)



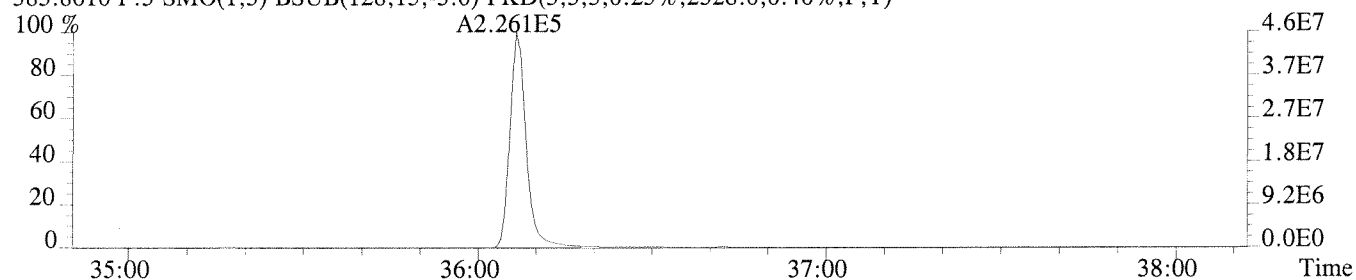
375.8178 F:3 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.25%,2956.0,0.40%,F,T)



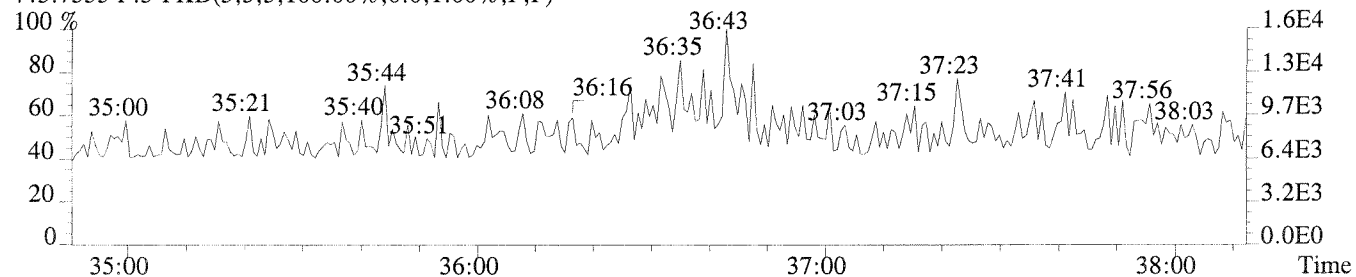
383.8639 F:3 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.25%,940.0,0.40%,F,T)



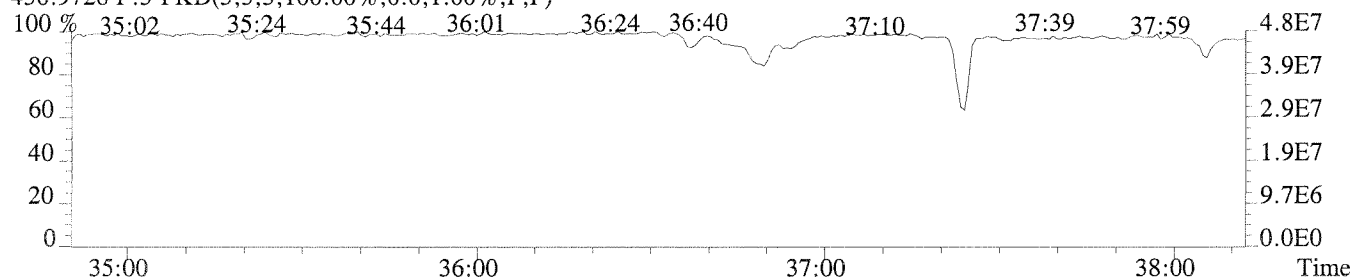
385.8610 F:3 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.25%,2328.0,0.40%,F,T)



445.7555 F:3 PKD(5,3,5,100.00%,0.0,1.00%,F,F)



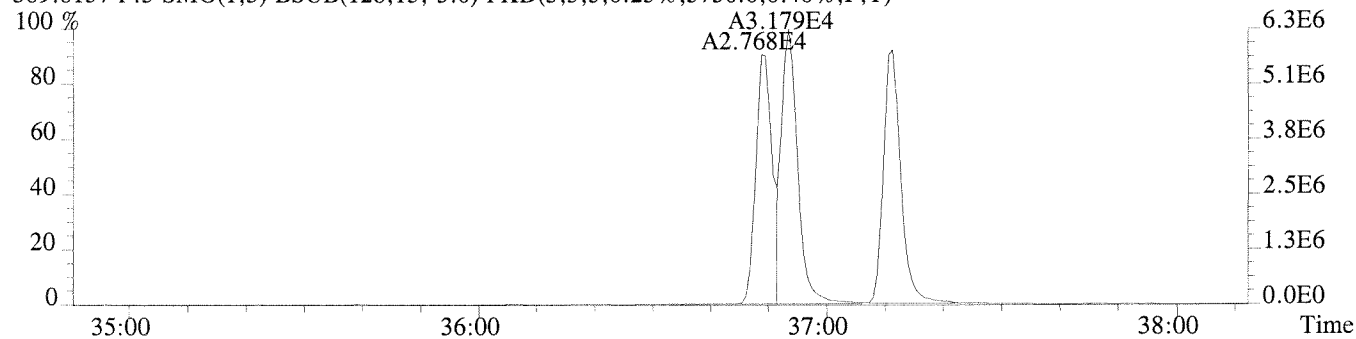
430.9728 F:3 PKD(3,3,3,100.00%,0.0,1.00%,F,F)



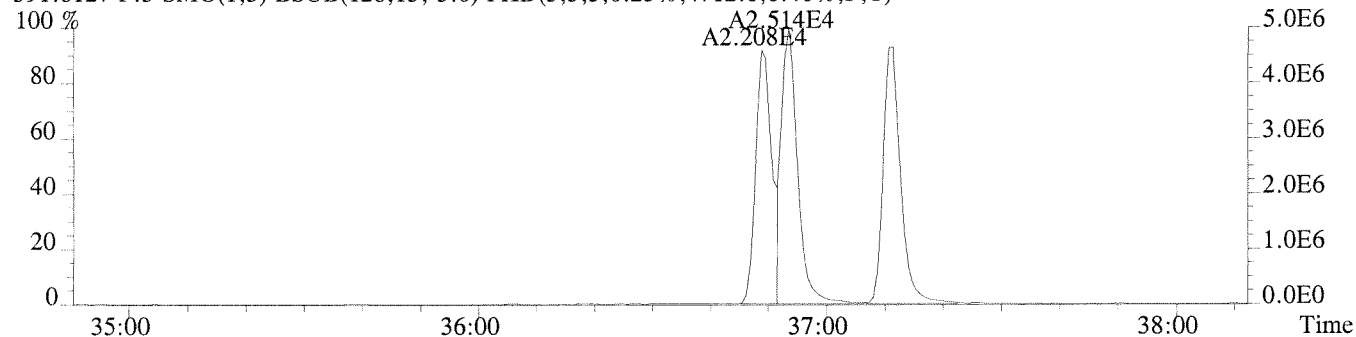
File:P208836 #1-306 Acq:27-JUL-2010 14:57:51 Probe EI+ Magnet SIR VG BioTech Mass spectf

Sample#1 Exp:EQ1000358-02 LCS

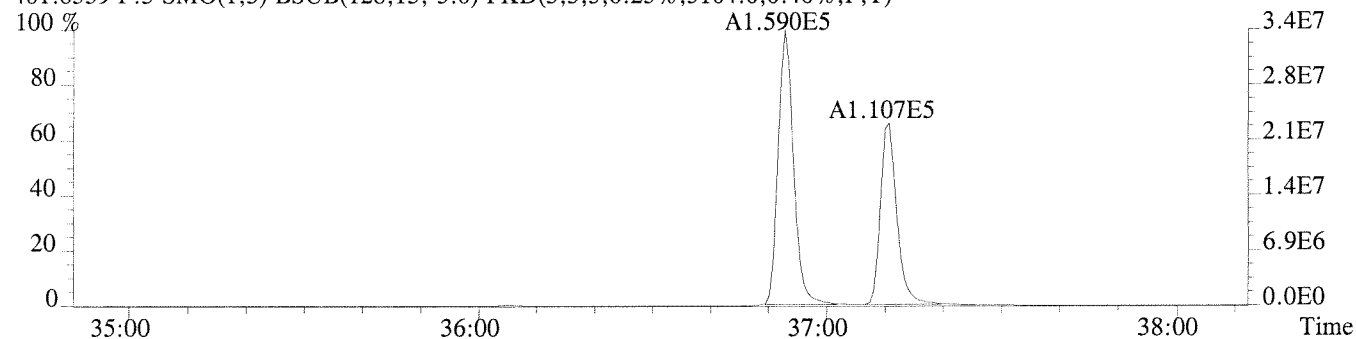
389.8157 F:3 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.25%,5736.0,0.40%,F,T)



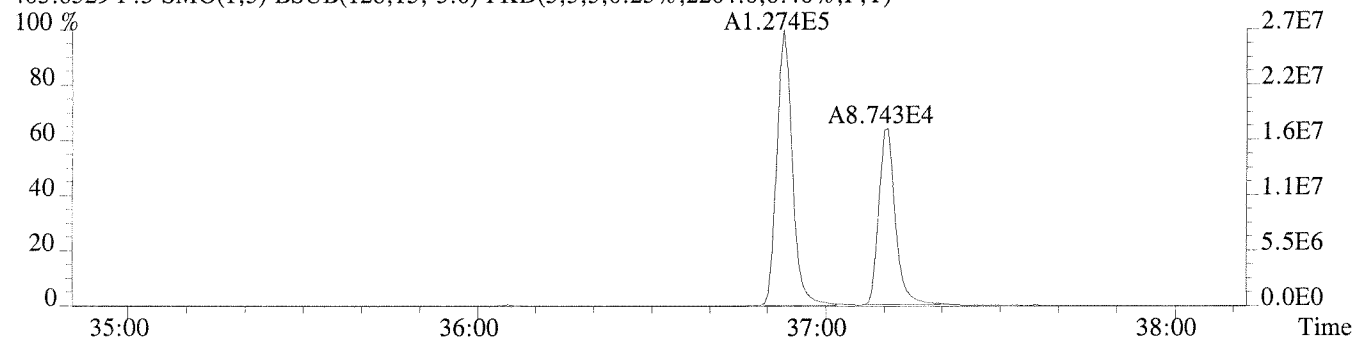
391.8127 F:3 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.25%,4712.0,0.40%,F,T)



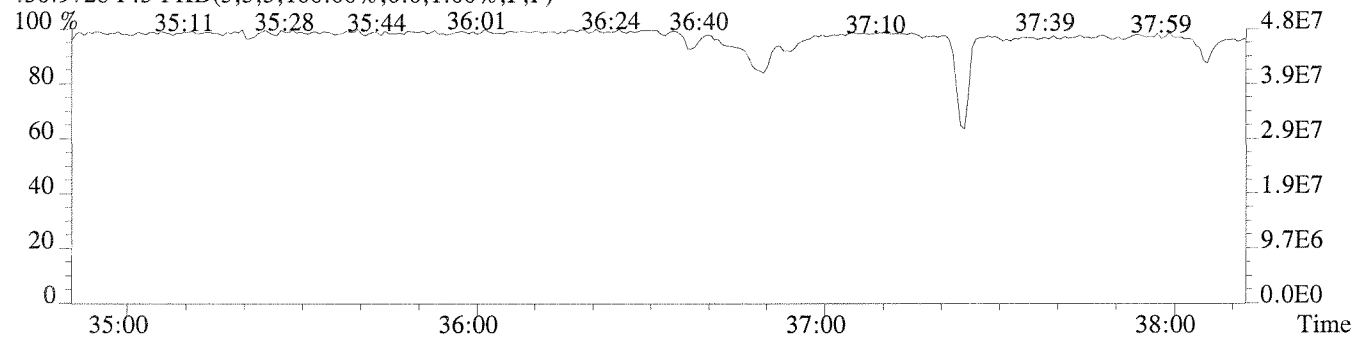
401.8559 F:3 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.25%,3104.0,0.40%,F,T)



403.8529 F:3 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.25%,2204.0,0.40%,F,T)



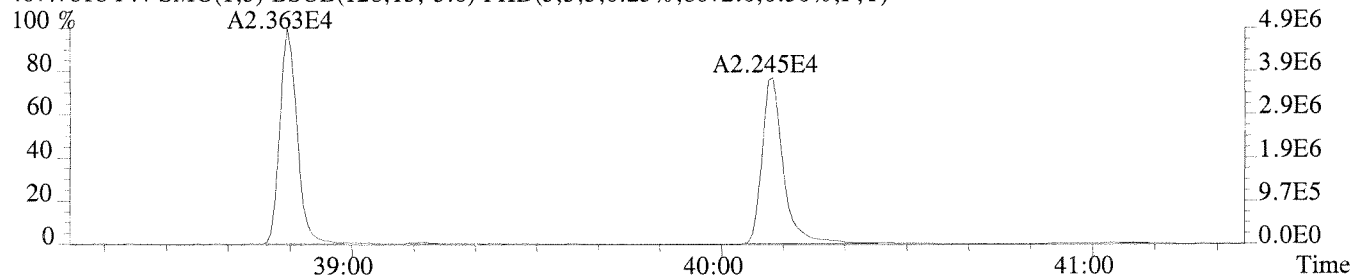
430.9728 F:3 PKD(3,3,3,100.00%,0.0,1.00%,F,F)



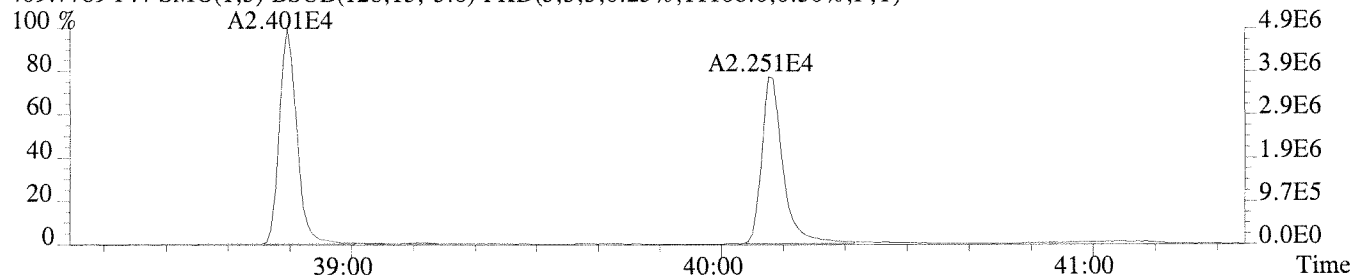
File:P208836 #1-288 Acq:27-JUL-2010 14:57:51 Probe EI+ Magnet SIR VG BioTech Mass spectf

Sample#1 Exp:EQ1000358-02 LCS

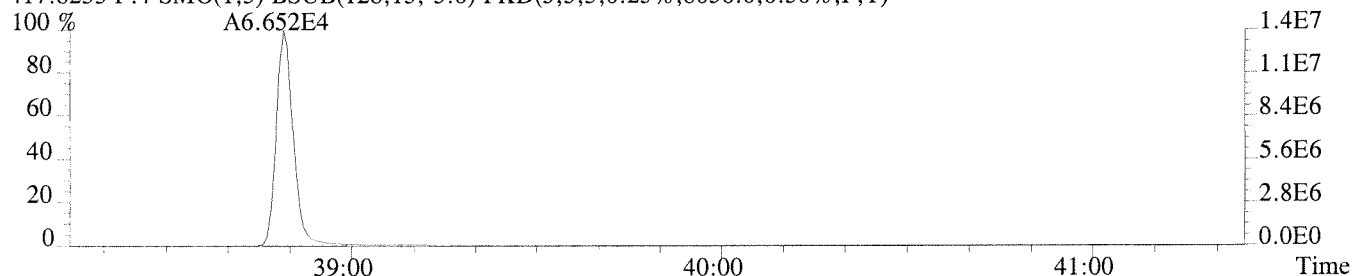
407.7818 F:4 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.25%,8072.0,0.50%,F,T)



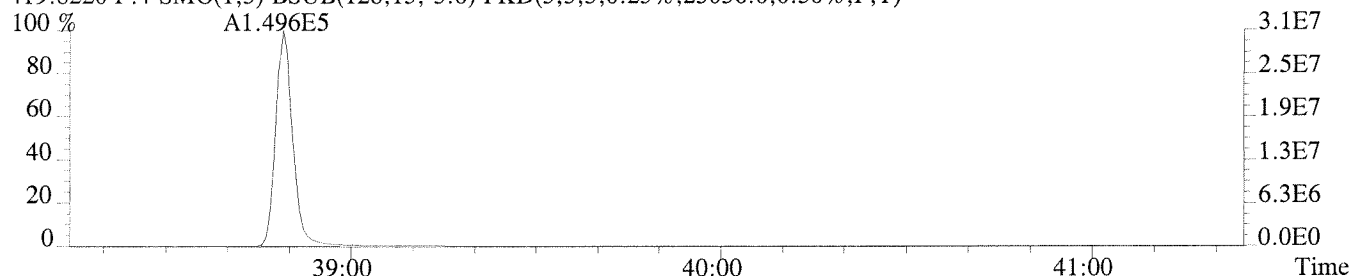
409.7789 F:4 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.25%,11108.0,0.50%,F,T)



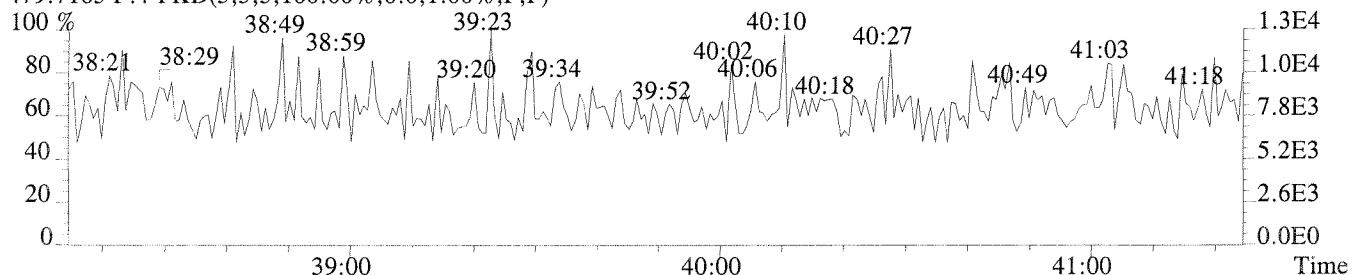
417.8253 F:4 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.25%,8036.0,0.50%,F,T)



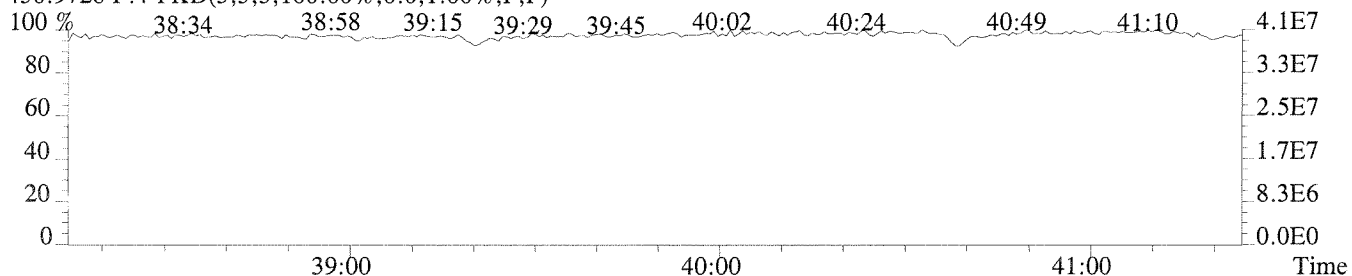
419.8220 F:4 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.25%,23036.0,0.50%,F,T)



479.7165 F:4 PKD(5,3,5,100.00%,0.0,1.00%,F,F)



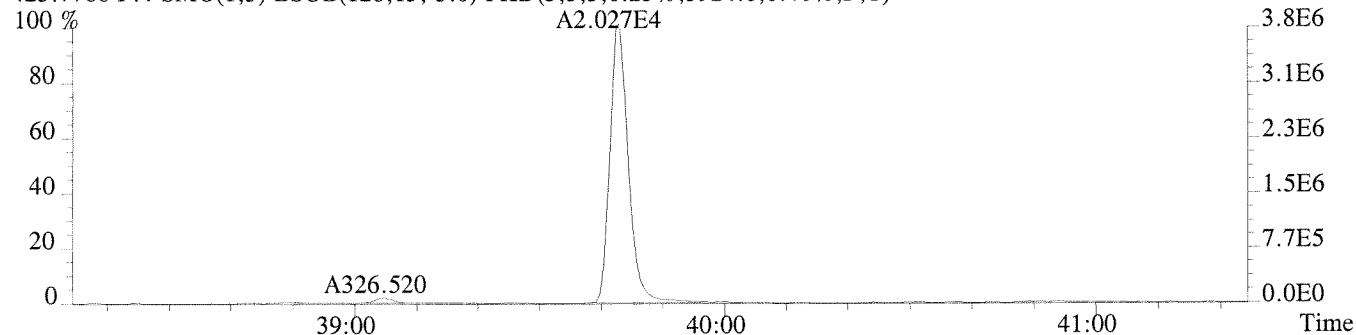
430.9728 F:4 PKD(3,3,3,100.00%,0.0,1.00%,F,F)



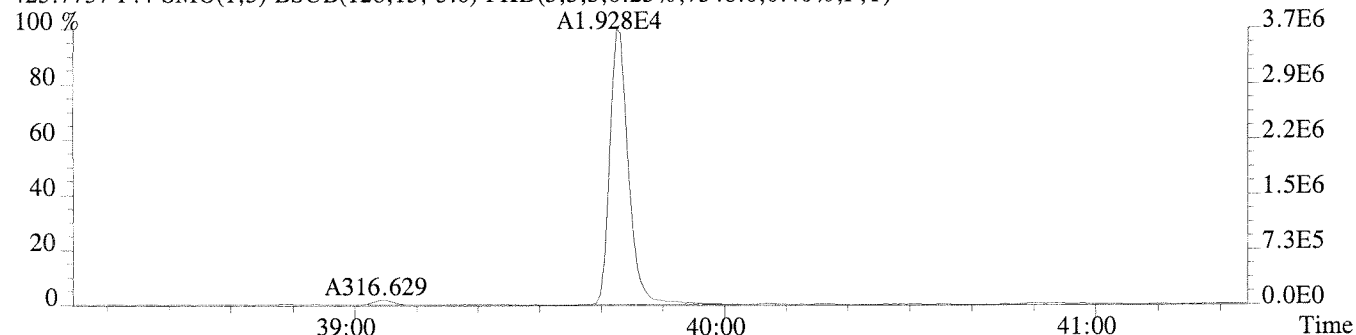
File:P208836 #1-288 Acq:27-JUL-2010 14:57:51 Probe EI+ Magnet SIR VG BioTech Mass spectf

Sample#1 Exp:EQ1000358-02 LCS

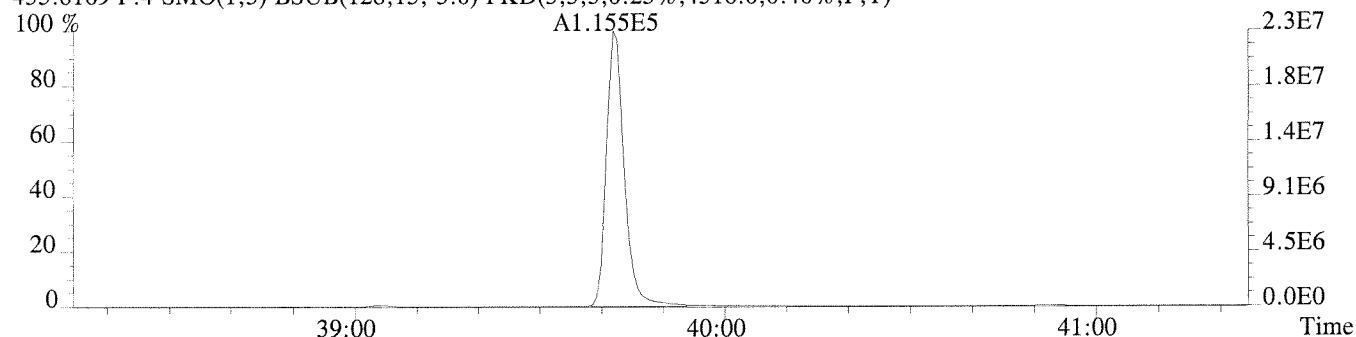
423.7766 F:4 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.25%,3924.0,0.40%,F,T)



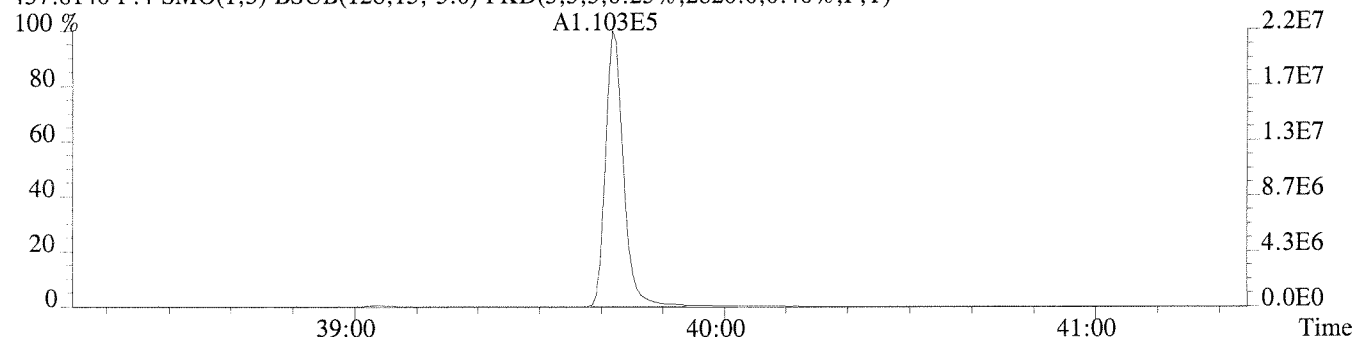
425.7737 F:4 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.25%,7348.0,0.40%,F,T)



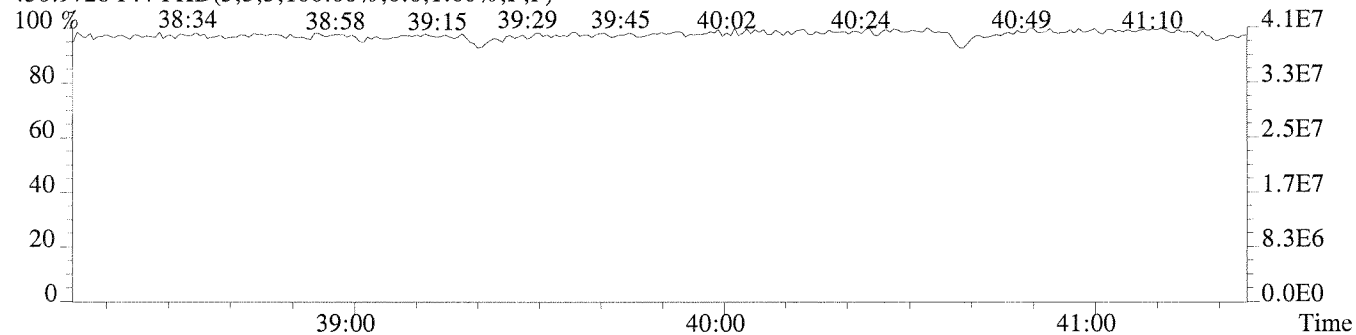
435.8169 F:4 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.25%,4316.0,0.40%,F,T)



437.8140 F:4 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.25%,2820.0,0.40%,F,T)



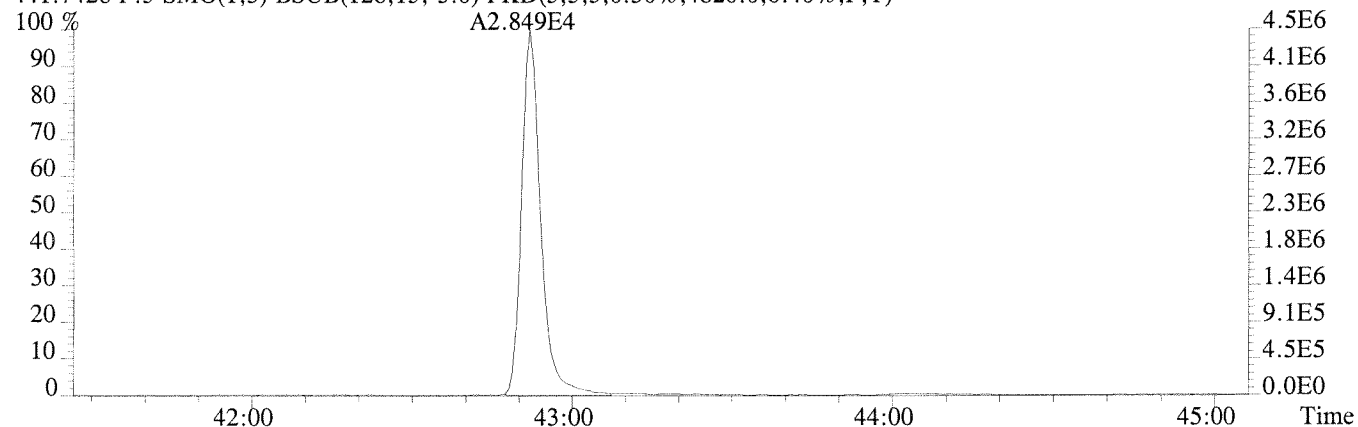
430.9728 F:4 PKD(3,3,3,100.00%,0.0,1.00%,F,F)



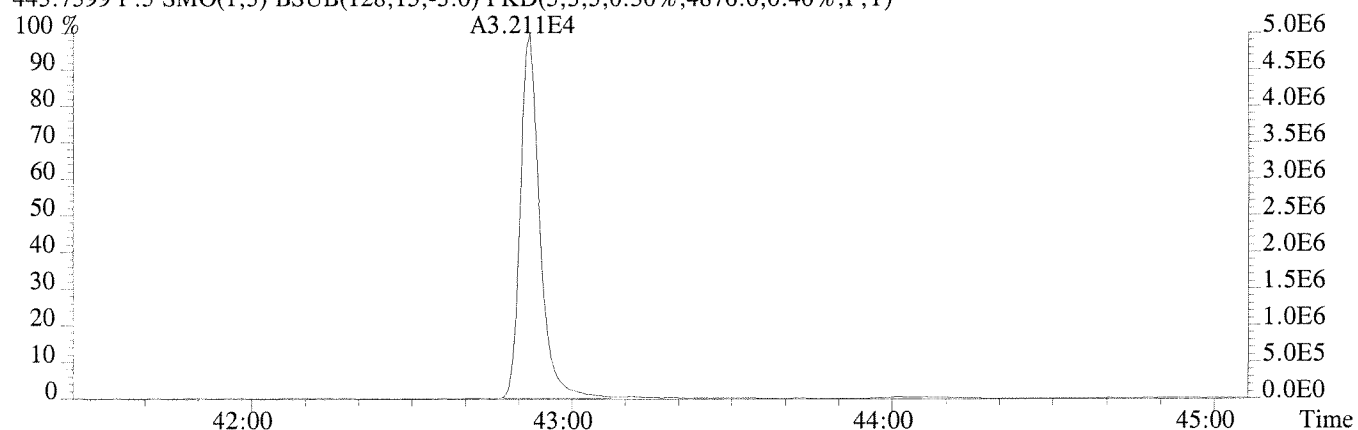
File: P208836 #1-333 Acq: 27-JUL-2010 14:57:51 Probe EI+ Magnet SIR VG BioTech Mass spectf

Sample#1 Exp: EQ1000358-02 LCS

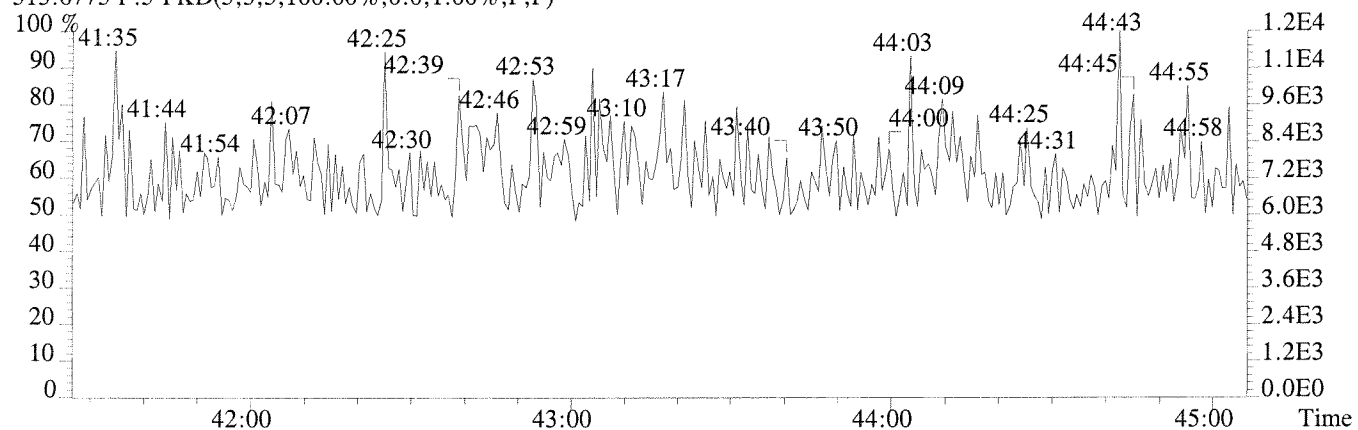
441.7428 F:5 SMO(1,3) BSUB(128,15,-3.0) PKD(5,3,5,0.30%,4820.0,0.40%,F,T)



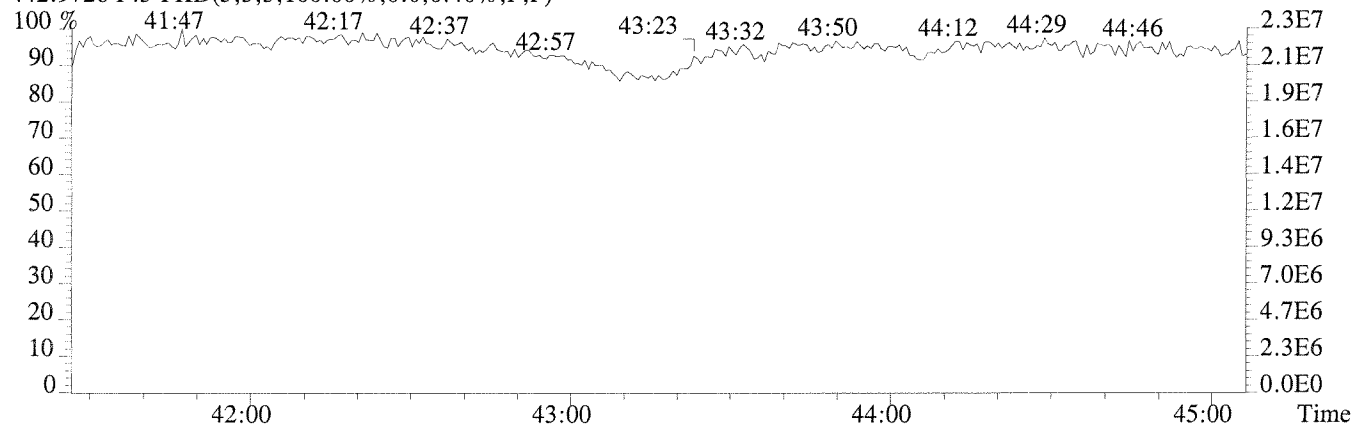
443.7399 F:5 SMO(1,3) BSUB(128,15,-3.0) PKD(5,3,5,0.30%,4876.0,0.40%,F,T)



513.6775 F:5 PKD(5,3,5,100.00%,0.0,1.00%,F,F)



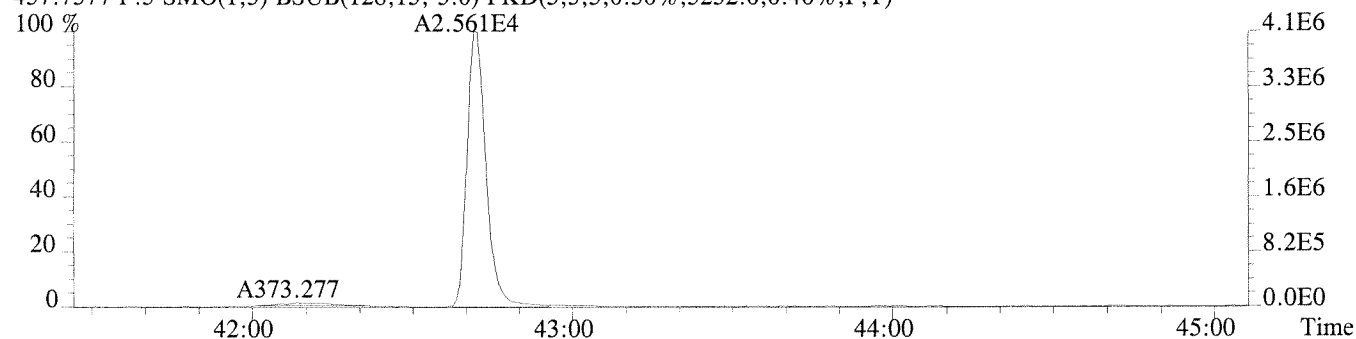
442.9728 F:5 PKD(3,3,3,100.00%,0.0,0.40%,F,F)



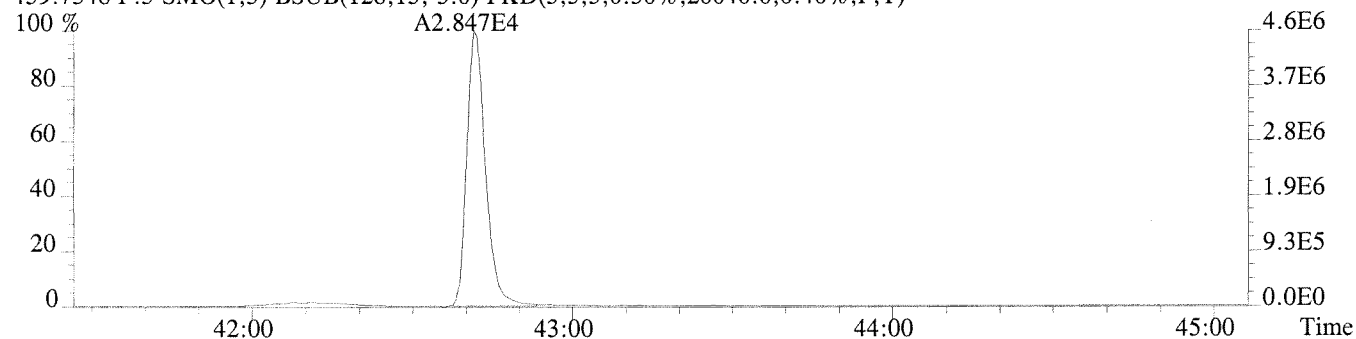
File:P208836 #1-333 Acq:27-JUL-2010 14:57:51 Probe EI+ Magnet SIR VG BioTech Mass spectf

Sample#1 Exp:EQ1000358-02 LCS

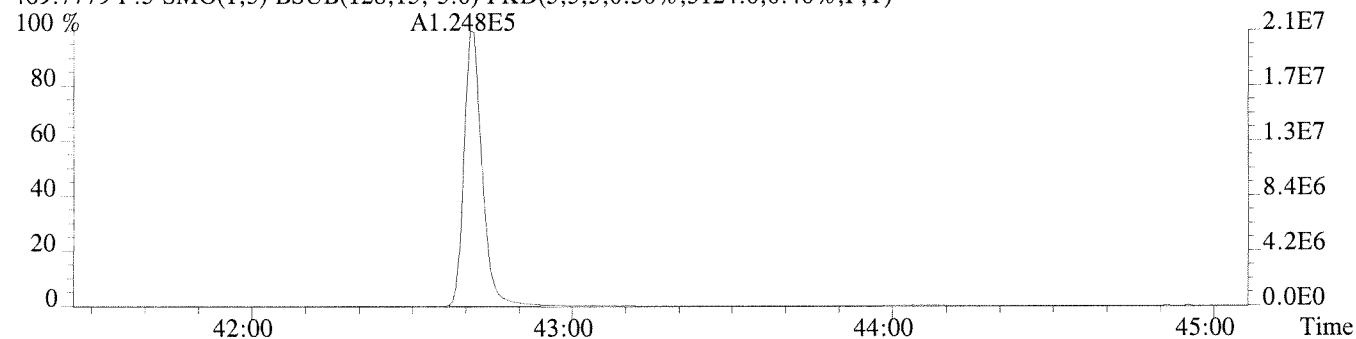
457.7377 F:5 SMO(1,3) BSUB(128,15,-3.0) PKD(5,3,5,0.30%,5252.0,0.40%,F,T)



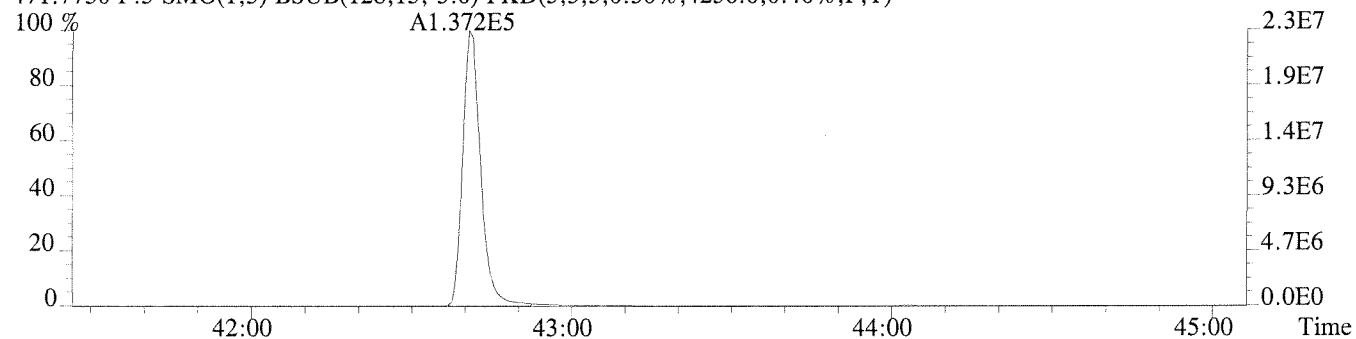
459.7348 F:5 SMO(1,3) BSUB(128,15,-3.0) PKD(5,3,5,0.30%,20040.0,0.40%,F,T)



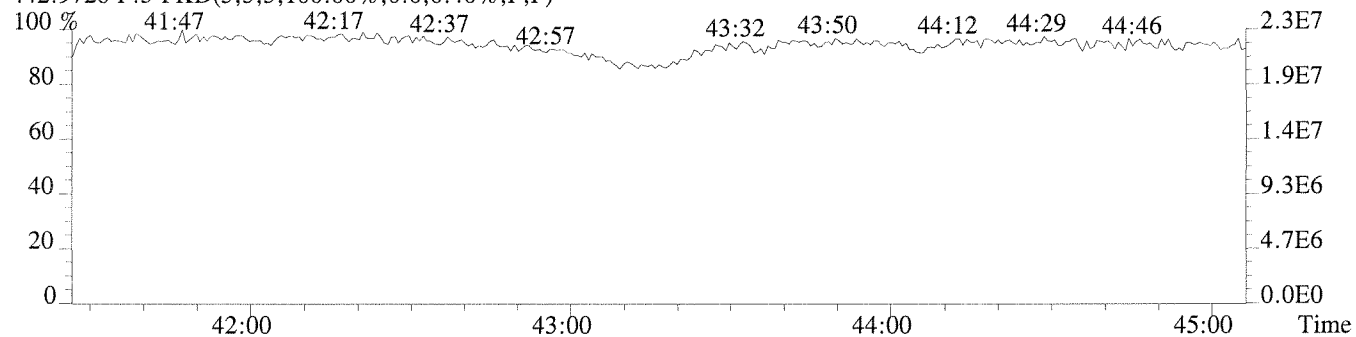
469.7779 F:5 SMO(1,3) BSUB(128,15,-3.0) PKD(5,3,5,0.30%,3124.0,0.40%,F,T)



471.7750 F:5 SMO(1,3) BSUB(128,15,-3.0) PKD(5,3,5,0.30%,4256.0,0.40%,F,T)



442.9728 F:5 PKD(3,3,3,100.00%,0.0,0.40%,F,F)



Columbia Analytical Services, Inc.
Sample Response Summary

CLIENT ID.
DLCS

Run #17 Filename P208837 Samp: 1 Inj: 1 Acquired: 27-JUL-10 15:46:18
Processed: 28-JUL-10 12:29:29 LAB. ID: EQ1000358-03

Typ	Name	RT-1	Resp 1	Resp 2	Ratio	Meet	Mod?	RRF
1 Unk	2,3,7,8-TCDF	28:17	1.380e+04	1.832e+04	0.75	yes	yes	0.831
2 Unk	1,2,3,7,8-PeCDF	32:35	4.268e+04	2.833e+04	1.51	yes	no	0.840
3 Unk	2,3,4,7,8-PeCDF	33:20	4.515e+04	3.046e+04	1.48	yes	no	0.850
4 Unk	1,2,3,4,7,8-HxCDF	36:08	3.895e+04	3.235e+04	1.20	yes	no	1.072
5 Unk	1,2,3,6,7,8-HxCDF	36:14	4.496e+04	3.760e+04	1.20	yes	no	1.128
6 Unk	2,3,4,6,7,8-HxCDF	36:43	3.724e+04	3.027e+04	1.23	yes	no	1.006
7 Unk	1,2,3,7,8,9-HxCDF	37:26	3.217e+04	2.627e+04	1.22	yes	no	0.864
8 Unk	1,2,3,4,6,7,8-HpCDF	38:50	2.724e+04	2.707e+04	1.01	yes	no	1.315
9 Unk	1,2,3,4,7,8,9-HpCDF	40:08	2.634e+04	2.672e+04	0.99	yes	no	0.970
10 Unk	OCDF	42:52	3.547e+04	4.012e+04	0.88	yes	no	1.103
11 Unk	2,3,7,8-TCDD	29:05	1.269e+04	1.661e+04	0.76	yes	yes	0.916
12 Unk	1,2,3,7,8-PeCDD	33:41	3.757e+04	2.393e+04	1.57	yes	no	0.869
13 Unk	1,2,3,4,7,8-HxCDD	36:50	2.744e+04	2.182e+04	1.26	yes	no	0.925
14 Unk	1,2,3,6,7,8-HxCDD	36:53	3.636e+04	2.905e+04	1.25	yes	no	1.054
15 Unk	1,2,3,7,8,9-HxCDD	37:11	3.387e+04	2.718e+04	1.25	yes	no	0.966
16 Unk	1,2,3,4,6,7,8-HpCDD	39:43	2.325e+04	2.219e+04	1.05	yes	no	0.879
17 Unk	OCDD	42:41	3.026e+04	3.417e+04	0.89	yes	no	0.959
18 IS	13C-2,3,7,8-TCDF	28:15	7.793e+04	1.007e+05	0.77	yes	no	1.424
19 IS	13C-1,2,3,7,8-PeCDF	32:35	1.153e+05	7.285e+04	1.58	yes	no	1.263
20 IS	13C-1,2,3,4,7,8-HxCDF	36:07	1.257e+05	2.406e+05	0.52	yes	no	1.279
21 IS	13C-1,2,3,4,6,7,8-HpCDF	38:50	7.384e+04	1.664e+05	0.44	yes	no	0.902
22 IS	13C-2,3,7,8-TCDD	29:04	6.798e+04	8.773e+04	0.77	yes	no	1.057
23 IS	13C-1,2,3,7,8-PeCDD	33:39	8.995e+04	5.695e+04	1.58	yes	no	0.873
24 IS	13C-1,2,3,6,7,8-HxCDD	36:53	1.738e+05	1.392e+05	1.25	yes	no	0.997
25 IS	13C-1,2,3,4,6,7,8-HpCDD	39:42	1.327e+05	1.258e+05	1.05	yes	no	0.833
26 IS	13C-OCDD	42:41	1.497e+05	1.654e+05	0.91	yes	no	0.733
27 RS/RT	13C-1,2,3,4-TCDD	28:49	8.694e+04	1.104e+05	0.79	yes	no	-
28 RS/RT	13C-1,2,3,7,8,9-HxCDD	37:11	1.196e+05	9.461e+04	1.26	yes	no	-
29 C/Up	37Cl-2,3,7,8-TCDD	29:05	1.448e+05				no	0.983
				SUM AREA				
30 Tot	Total Tetra-Furans	28:17		3.212e+04	0.75	yes		0.831
31 Tot	Total Tetra-Dioxins	29:05		2.931e+04	0.76	yes		0.916
32 Tot	Total Penta-Furans	32:35		1.466e+05	1.51	yes		0.845
33 Tot	Total Penta-Dioxins	33:41		6.150e+04	1.57	yes		0.869
34 Tot	Total Hexa-Furans	36:08		2.798e+05	1.20	yes		1.018
35 Tot	Total Hexa-Dioxins	36:50		1.757e+05	1.26	yes		0.982
36 Tot	Total Hepta-Furans	38:50		1.074e+05	1.01	yes		1.143
37 Tot	Total Hepta-Dioxins	39:43		4.545e+04	1.05	yes		0.879

Columbia Analytical Services, Inc.
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Houston, TX 77084
Office (713) 266-1599. Fax (713) 266-0130

Columbia Analytical Services, Inc.
Signal/Noise Height Ratio Summary

CLIENT ID.
DLCS

Run #17 Filename P208837 Samp: 1 Inj: 1 Acquired: 27-JUL-10 15:46:18
Processed: 28-JUL-10 12:29:291 LAB. ID: EQ1000358-03

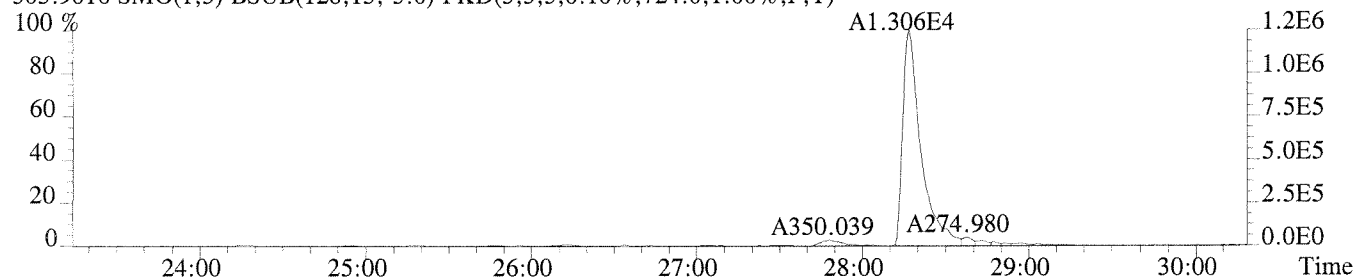
	Name	Signal 1	Noise 1	S/N Rat.1	Signal 2	Noise 2	S/N Rat.2
1	2,3,7,8-TCDF	1.25e+06	7.24e+02	1.7e+03	1.69e+06	1.31e+03	1.3e+03
2	1,2,3,7,8-PeCDF	6.28e+06	1.09e+03	5.8e+03	4.18e+06	1.90e+03	2.2e+03
3	2,3,4,7,8-PeCDF	6.72e+06	1.09e+03	6.2e+03	4.40e+06	1.90e+03	2.3e+03
4	1,2,3,4,7,8-HxCDF	7.78e+06	4.12e+03	1.9e+03	6.51e+06	4.16e+03	1.6e+03
5	1,2,3,6,7,8-HxCDF	7.91e+06	4.12e+03	1.9e+03	6.64e+06	4.16e+03	1.6e+03
6	2,3,4,6,7,8-HxCDF	7.15e+06	4.12e+03	1.7e+03	5.82e+06	4.16e+03	1.4e+03
7	1,2,3,7,8,9-HxCDF	5.72e+06	4.12e+03	1.4e+03	4.69e+06	4.16e+03	1.1e+03
8	1,2,3,4,6,7,8-HpCDF	5.41e+06	1.64e+04	3.3e+02	5.42e+06	2.37e+04	2.3e+02
9	1,2,3,4,7,8,9-HpCDF	4.47e+06	1.64e+04	2.7e+02	4.58e+06	2.37e+04	1.9e+02
10	OCDF	5.49e+06	2.47e+03	2.2e+03	6.12e+06	3.02e+03	2.0e+03
11	2,3,7,8-TCDD	1.53e+06	1.46e+03	1.1e+03	1.96e+06	1.30e+03	1.5e+03
12	1,2,3,7,8-PeCDD	5.96e+06	2.20e+03	2.7e+03	3.80e+06	2.64e+03	1.4e+03
13	1,2,3,4,7,8-HxCDD	6.12e+06	3.32e+03	1.8e+03	4.78e+06	3.09e+03	1.5e+03
14	1,2,3,6,7,8-HxCDD	6.85e+06	3.32e+03	2.1e+03	5.56e+06	3.09e+03	1.8e+03
15	1,2,3,7,8,9-HxCDD	6.62e+06	3.32e+03	2.0e+03	5.24e+06	3.09e+03	1.7e+03
16	1,2,3,4,6,7,8-HpCDD	4.47e+06	6.60e+03	6.8e+02	4.27e+06	4.68e+03	9.1e+02
17	OCDD	4.89e+06	2.57e+03	1.9e+03	5.53e+06	3.47e+03	1.6e+03
18	13C-2,3,7,8-TCDF	8.59e+06	4.19e+03	2.1e+03	1.11e+07	2.91e+03	3.8e+03
19	13C-1,2,3,7,8-PeCDF	1.84e+07	6.72e+02	2.7e+04	1.18e+07	1.45e+03	8.1e+03
20	13C-1,2,3,4,7,8-HxCDF	2.44e+07	1.26e+03	1.9e+04	4.67e+07	1.86e+03	2.5e+04
21	13C-1,2,3,4,6,7,8-HpCDF	1.49e+07	3.71e+03	4.0e+03	3.36e+07	1.24e+04	2.7e+03
22	13C-2,3,7,8-TCDD	9.53e+06	4.07e+03	2.3e+03	1.20e+07	1.44e+03	8.4e+03
23	13C-1,2,3,7,8-PeCDD	1.53e+07	7.88e+02	1.9e+04	9.67e+06	4.88e+02	2.0e+04
24	13C-1,2,3,6,7,8-HxCDD	3.67e+07	5.72e+03	6.4e+03	2.92e+07	2.88e+03	1.0e+04
25	13C-1,2,3,4,6,7,8-HpCDD	2.63e+07	4.17e+03	6.3e+03	2.45e+07	2.35e+03	1.0e+04
26	13C-OCDD	2.53e+07	2.71e+03	9.3e+03	2.82e+07	2.48e+03	1.1e+04
27	13C-1,2,3,4-TCDD	1.29e+07	4.07e+03	3.2e+03	1.64e+07	1.44e+03	1.1e+04
28	13C-1,2,3,7,8,9-HxCDD	2.49e+07	5.72e+03	4.3e+03	1.96e+07	2.88e+03	6.8e+03
29	37Cl-2,3,7,8-TCDD	1.72e+07	1.33e+03	1.3e+04			

Columbia Analytical Services, Inc.
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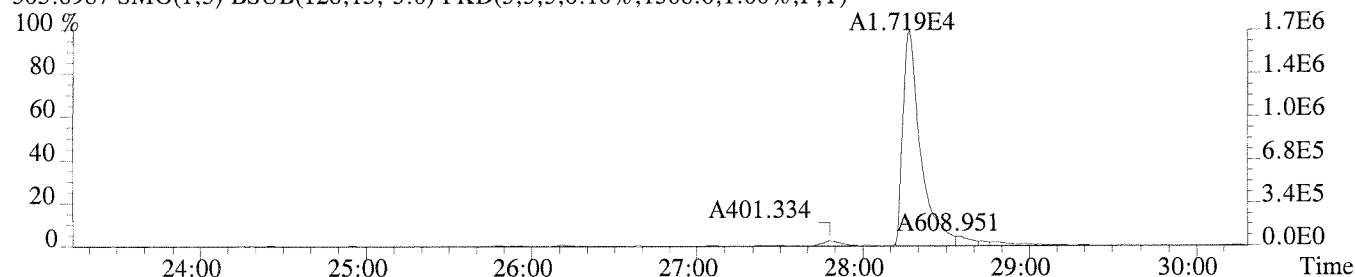
File:P208837 #1-590 Acq:27-JUL-2010 15:46:18 Probe EI+ Magnet SIR VG BioTech Mass spectf

Sample#1 Exp:EQ1000358-03 DLCS

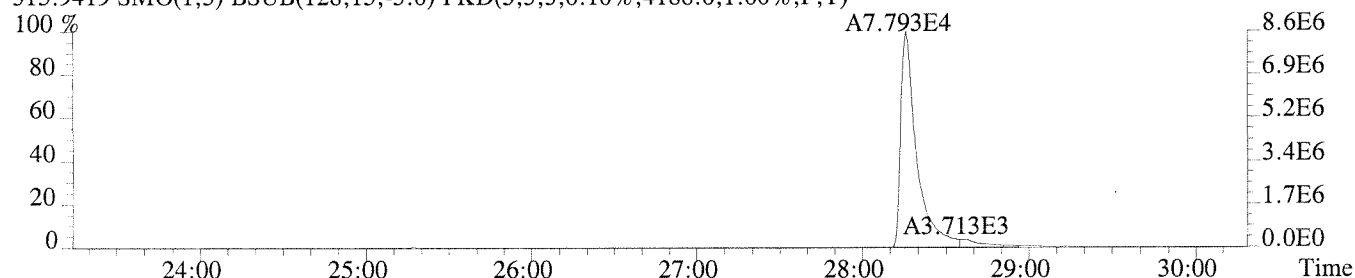
303.9016 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.10%,724.0,1.00%,F,T)



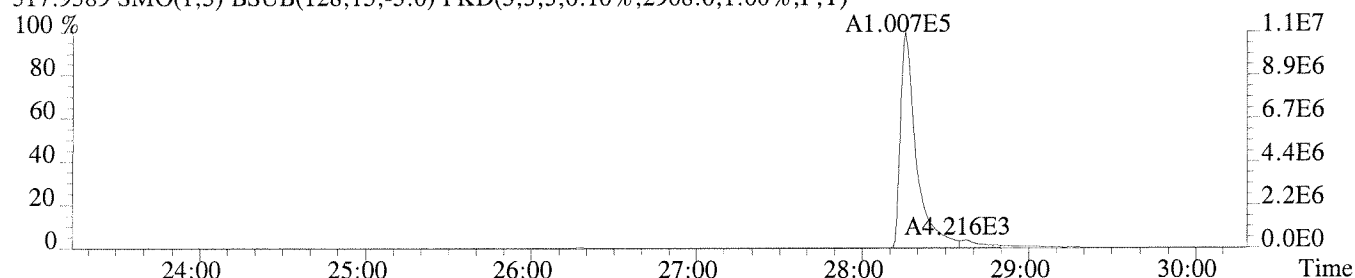
305.8987 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.10%,1308.0,1.00%,F,T)



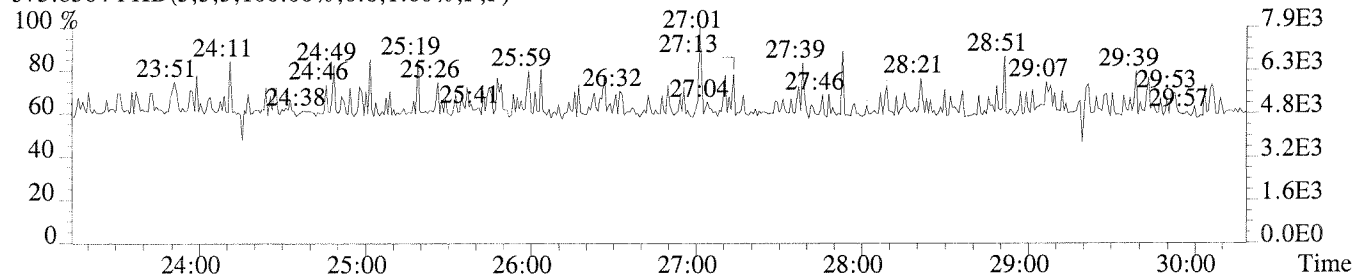
315.9419 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.10%,4188.0,1.00%,F,T)



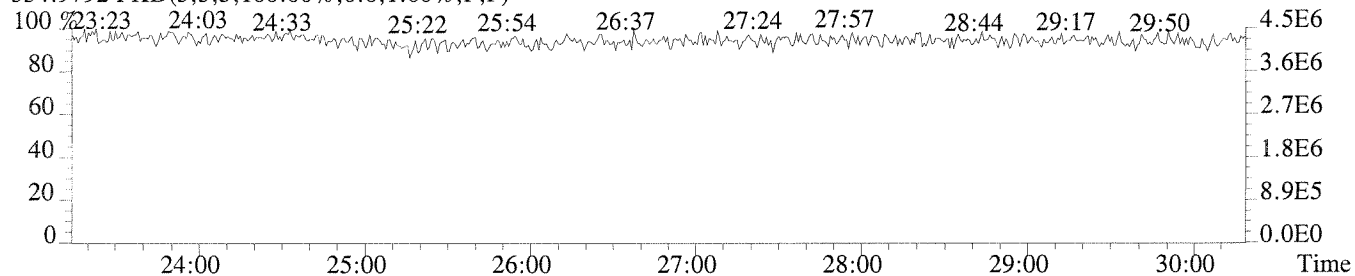
317.9389 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.10%,2908.0,1.00%,F,T)



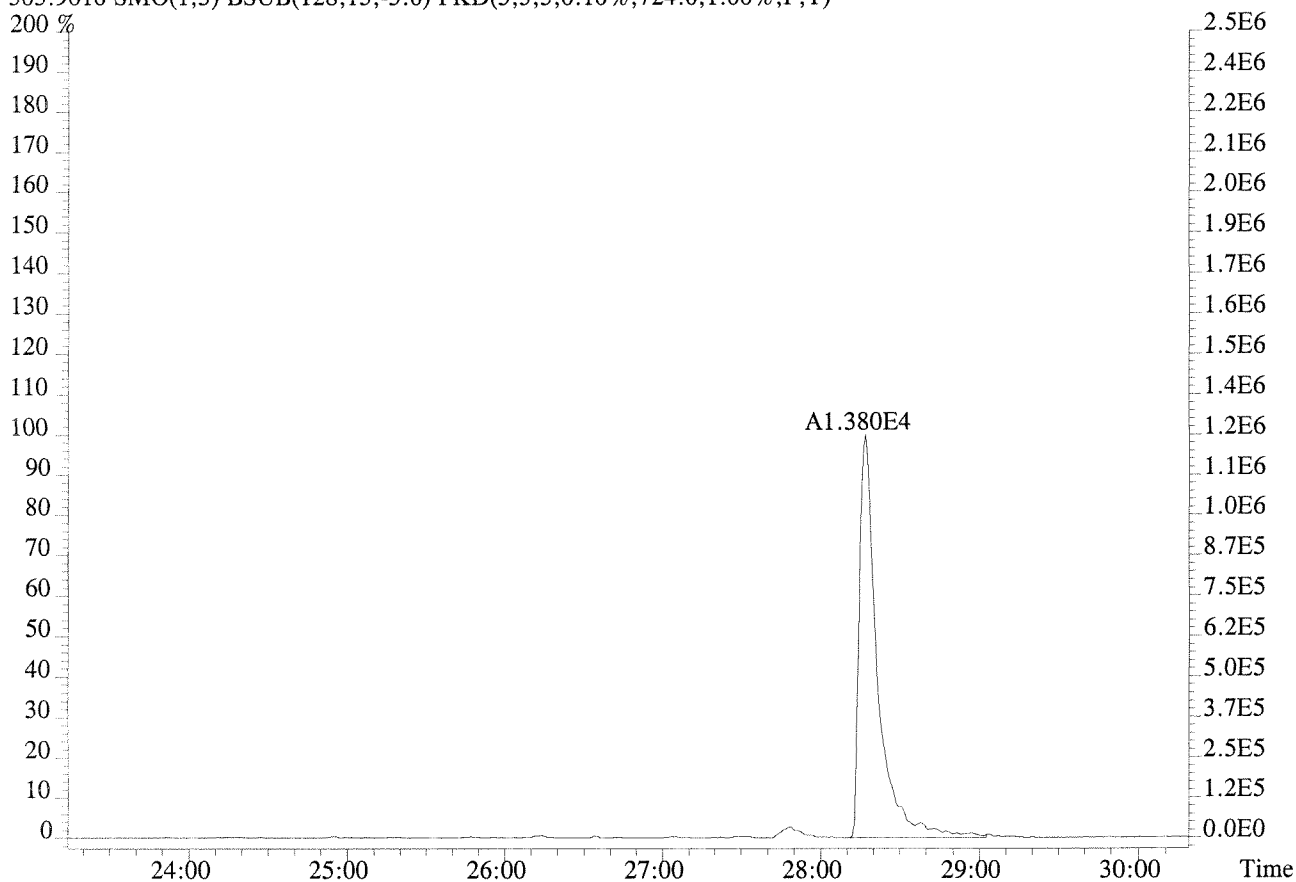
375.8364 PKD(5,3,5,100.00%,0.0,1.00%,F,F)



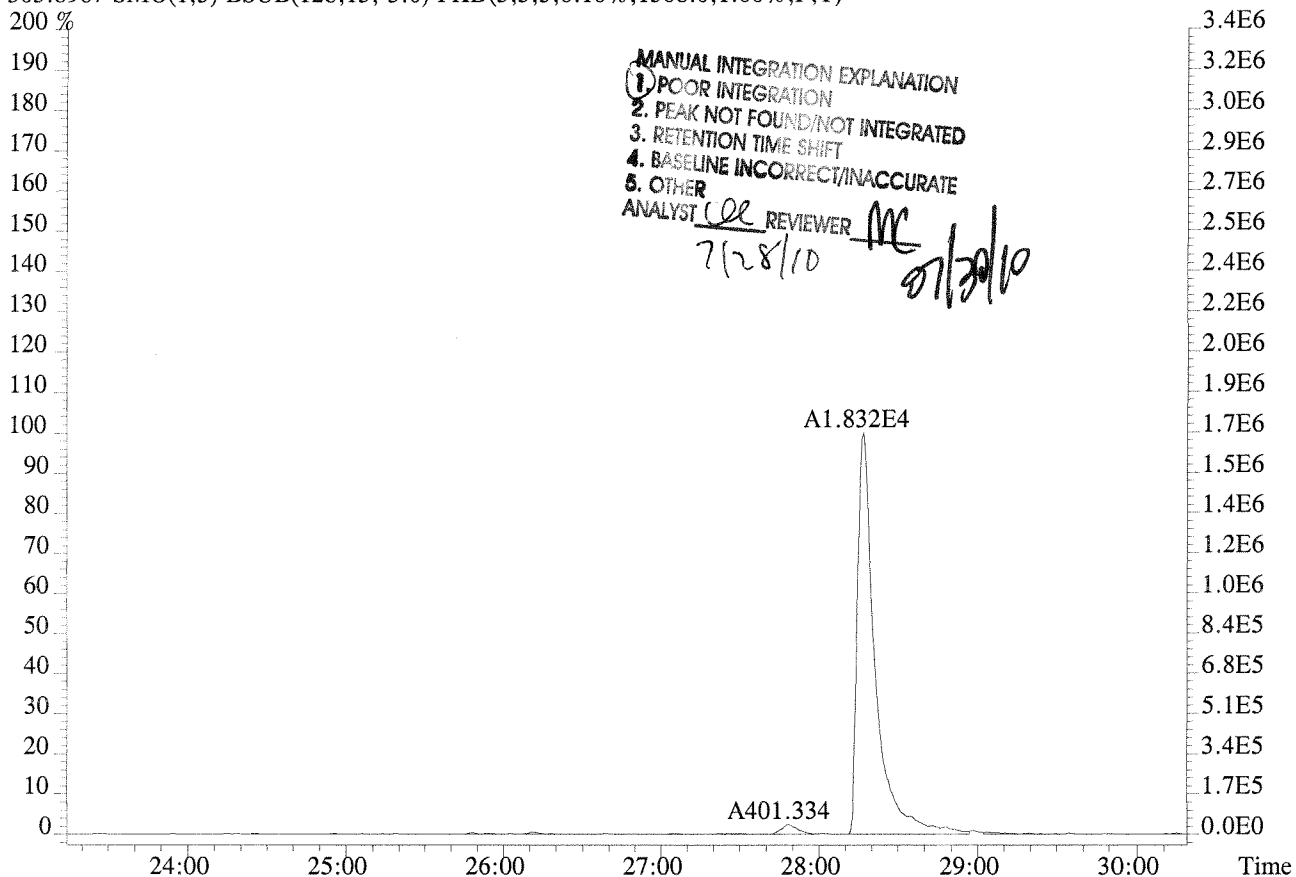
354.9792 PKD(3,3,3,100.00%,0.0,1.00%,F,F)



File:P208837 #1-590 Acq:27-JUL-2010 15:46:18 Probe EI+ Magnet SIR VG BioTech Mass sf
Sample#1 Exp:EQ1000358-03 DLCS
303.9016 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.10%,724.0,1.00%,F,T)



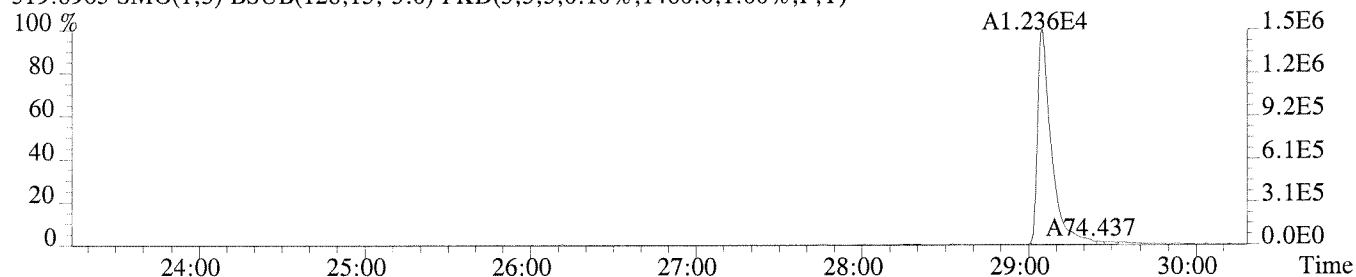
305.8987 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.10%,1308.0,1.00%,F,T)



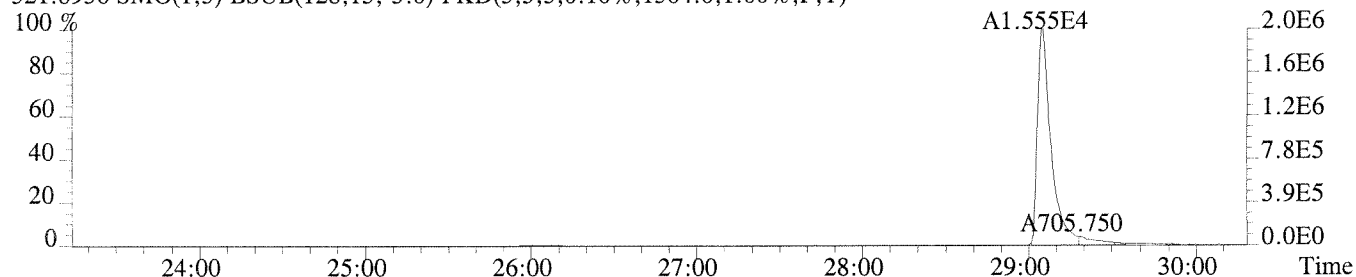
File:P208837 #1-590 Acq:27-JUL-2010 15:46:18 Probe EI+ Magnet SIR VG BioTech Mass spectf

Sample#1 Exp:EQ1000358-03 DLCS

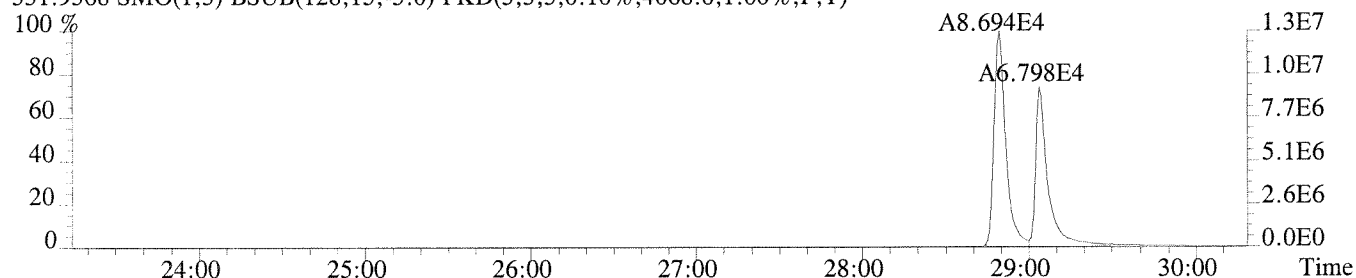
319.8965 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.10%,1460.0,1.00%,F,T)



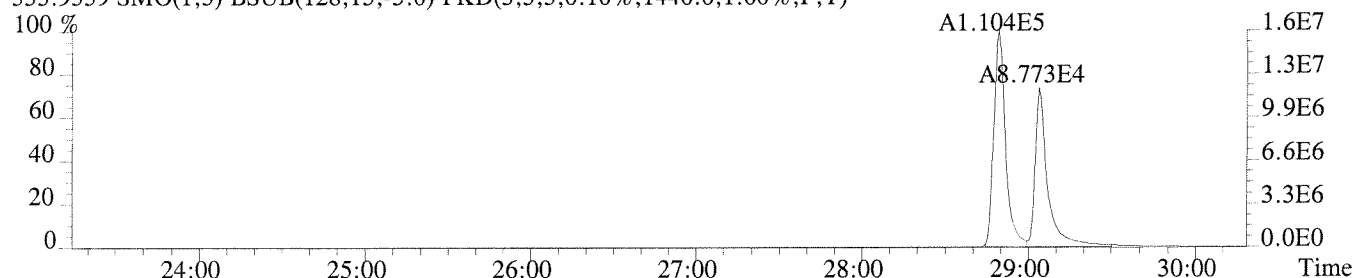
321.8936 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.10%,1304.0,1.00%,F,T)



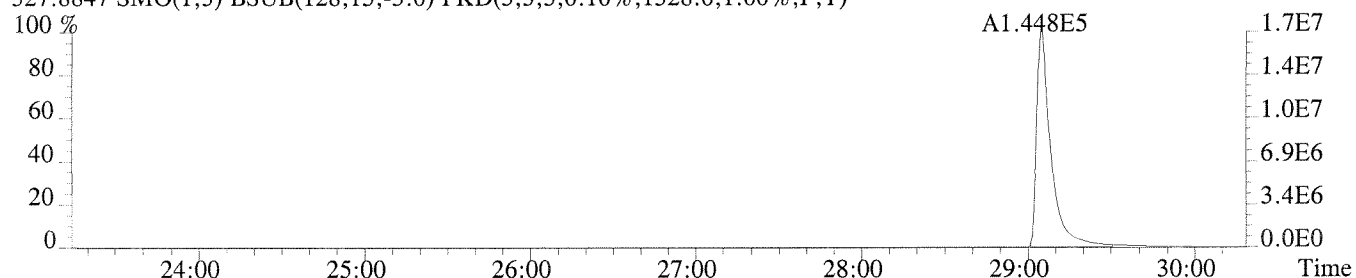
331.9368 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.10%,4068.0,1.00%,F,T)



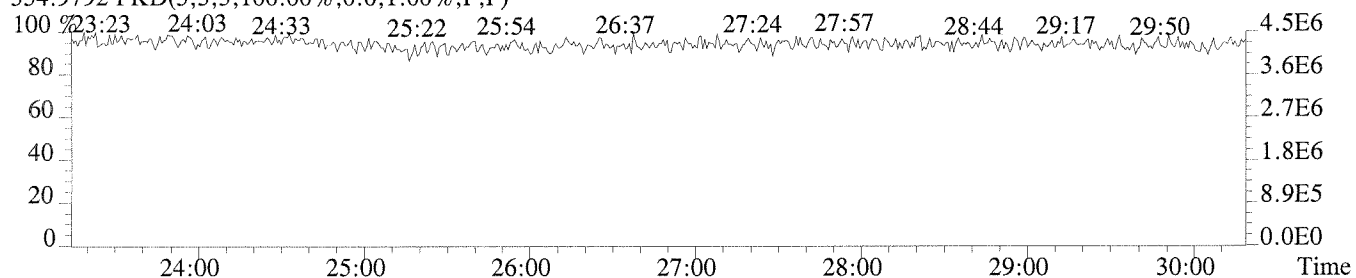
333.9339 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.10%,1440.0,1.00%,F,T)



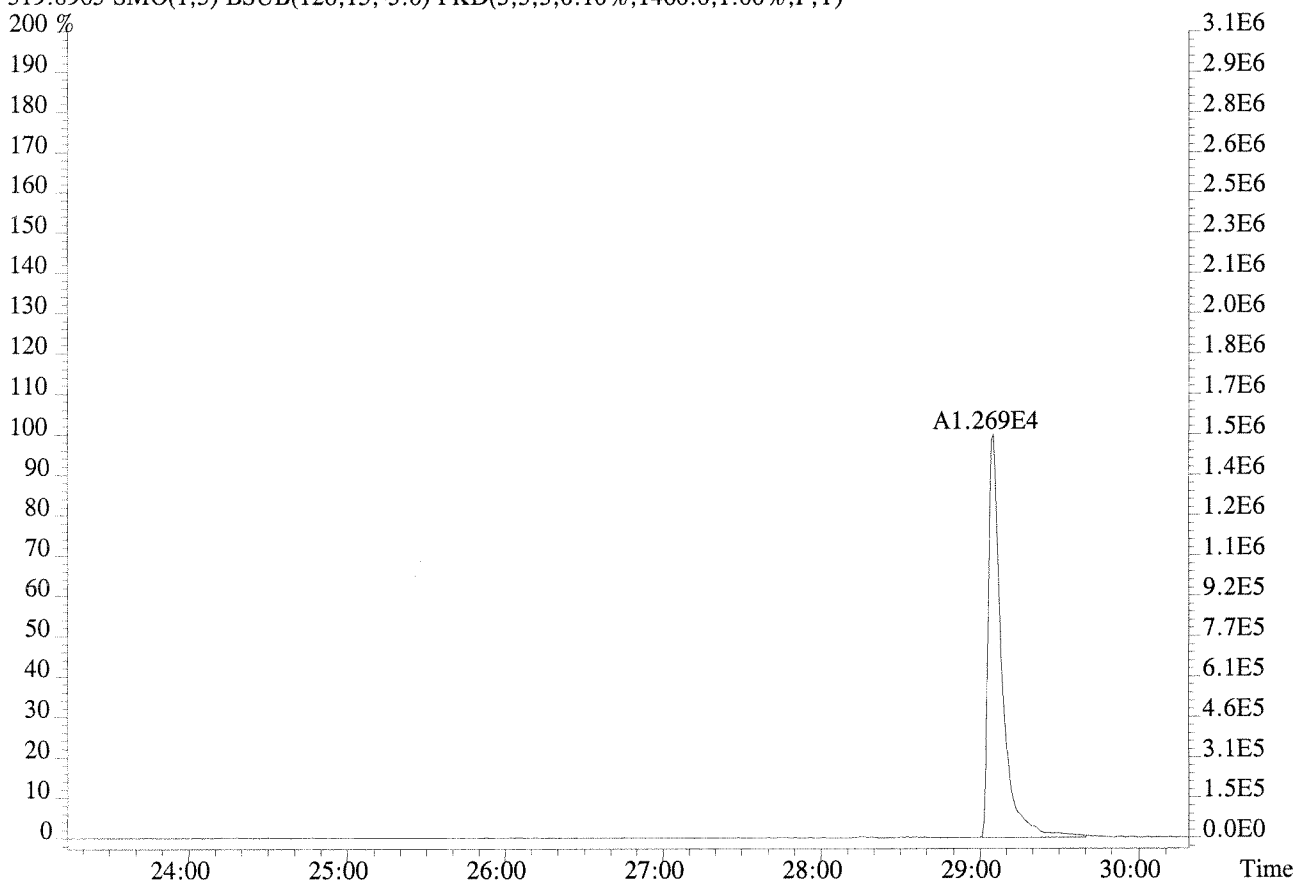
327.8847 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.10%,1328.0,1.00%,F,T)



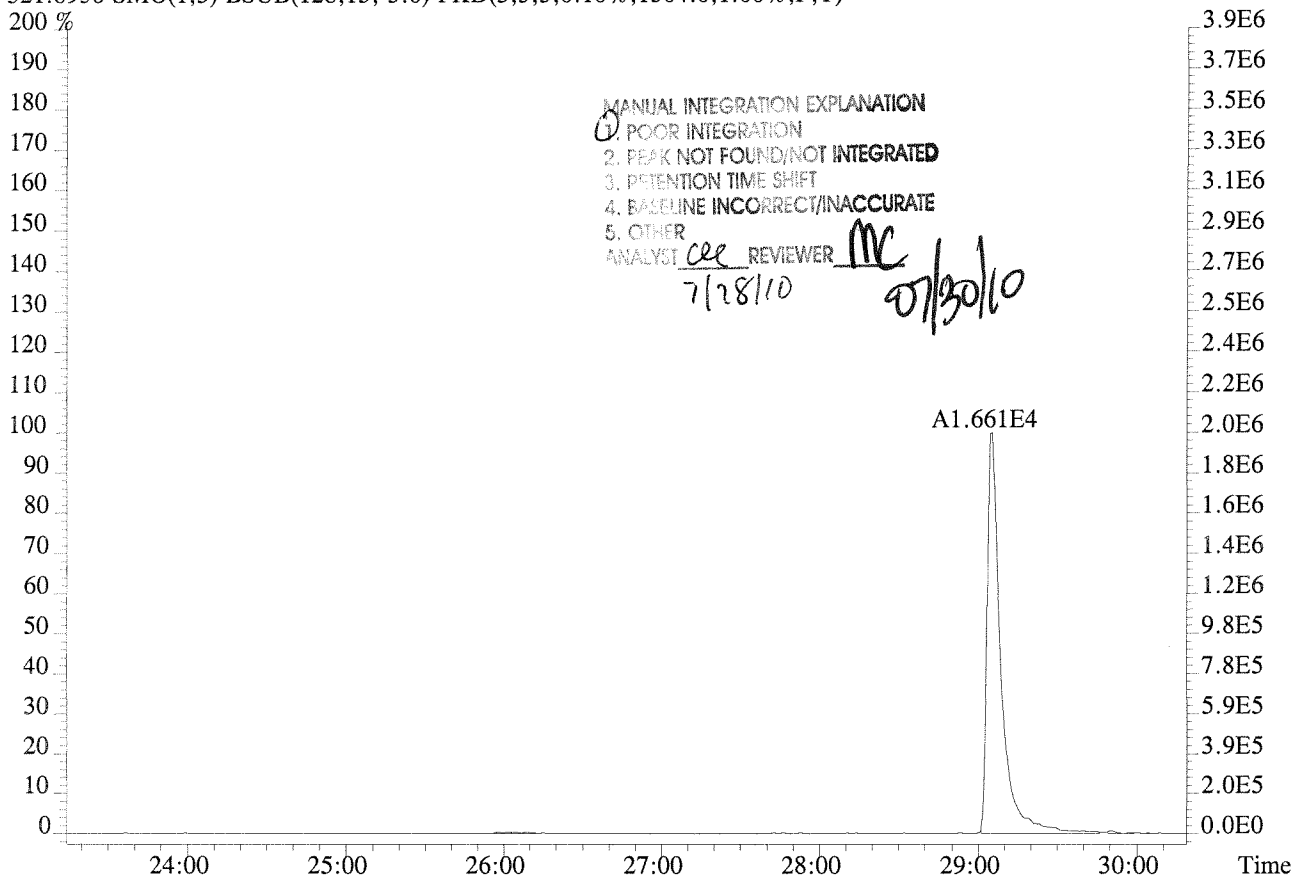
354.9792 PKD(3,3,3,100.00%,0.0,1.00%,F,F)



File:P208837 #1-590 Acq:27-JUL-2010 15:46:18 Probe EI+ Magnet SIR VG BioTech Mass sf
Sample#1 Exp:EQ1000358-03 DLCS
319.8965 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.10%,1460.0,1.00%,F,T)



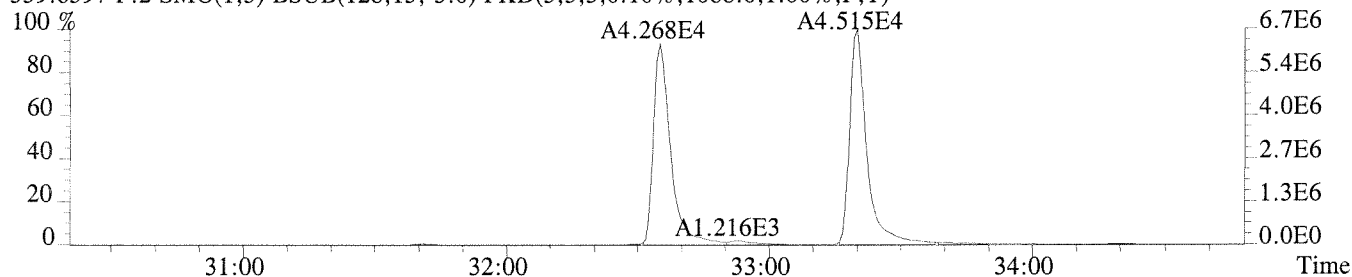
321.8936 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.10%,1304.0,1.00%,F,T)



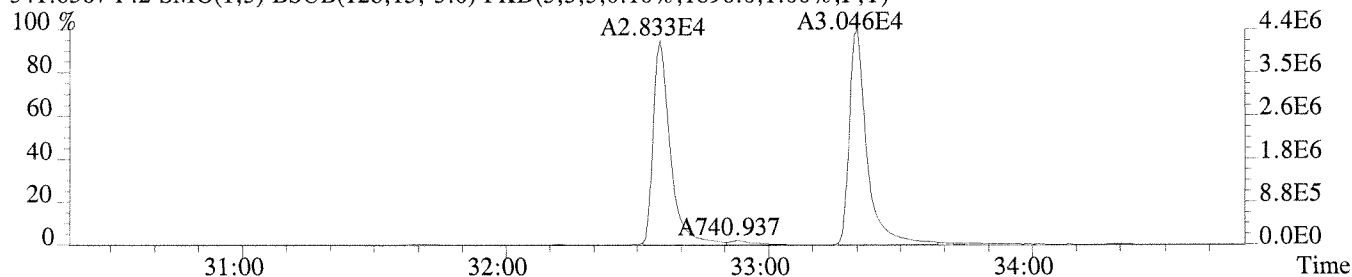
File:P208837 #1-405 Acq:27-JUL-2010 15:46:18 Probe EI+ Magnet SIR VG BioTech Mass spectf

Sample#1 Exp:EQ1000358-03 DLCS

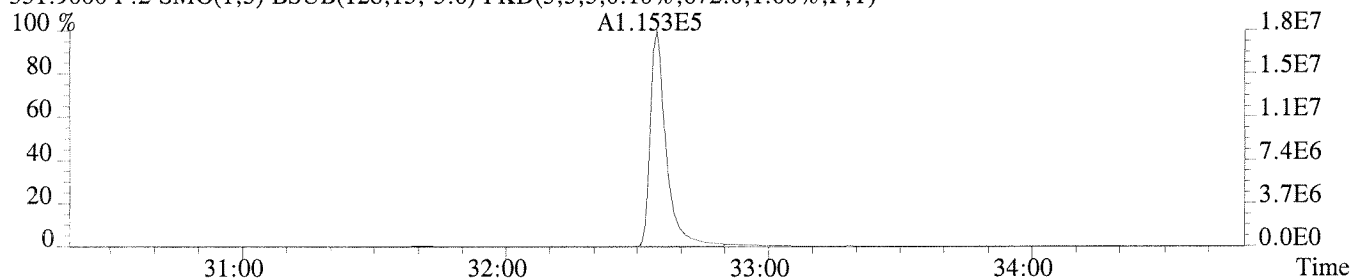
339.8597 F:2 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.10%,1088.0,1.00%,F,T)



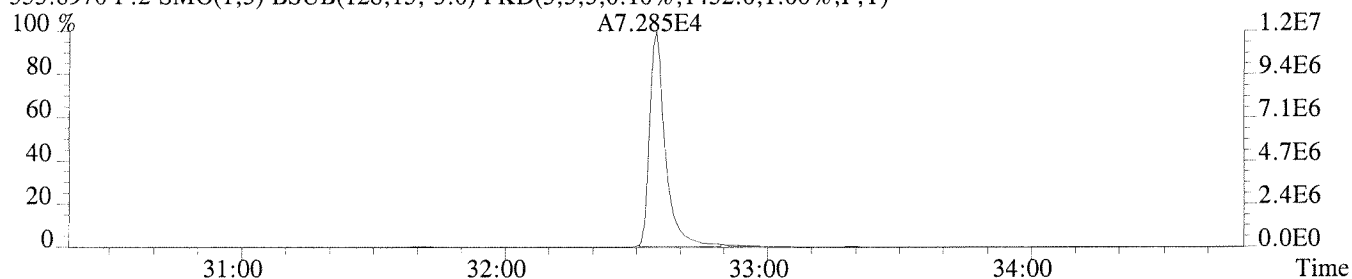
341.8567 F:2 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.10%,1896.0,1.00%,F,T)



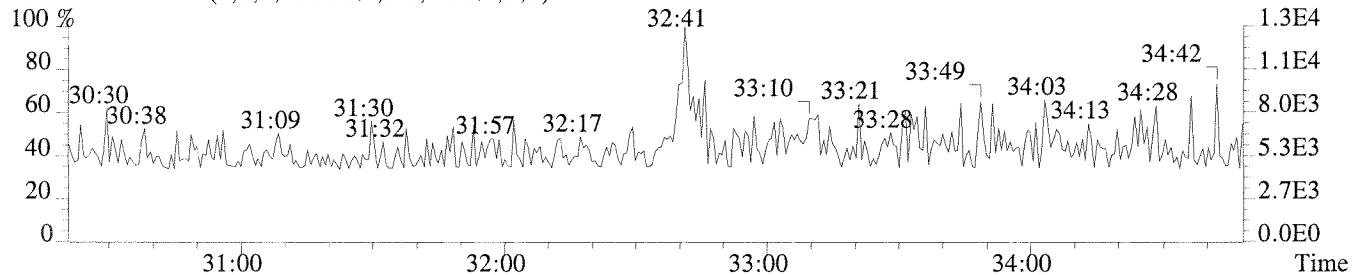
351.9000 F:2 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.10%,672.0,1.00%,F,T)



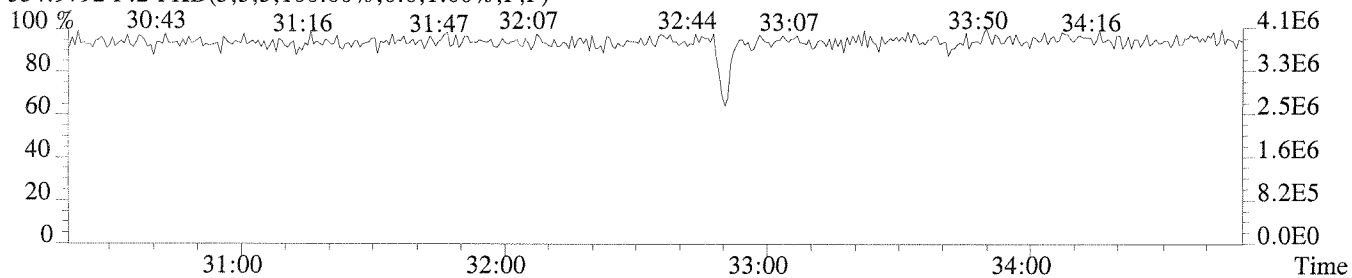
353.8970 F:2 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.10%,1452.0,1.00%,F,T)



409.7974 F:2 PKD(5,3,5,100.00%,0.0,1.00%,F,F)



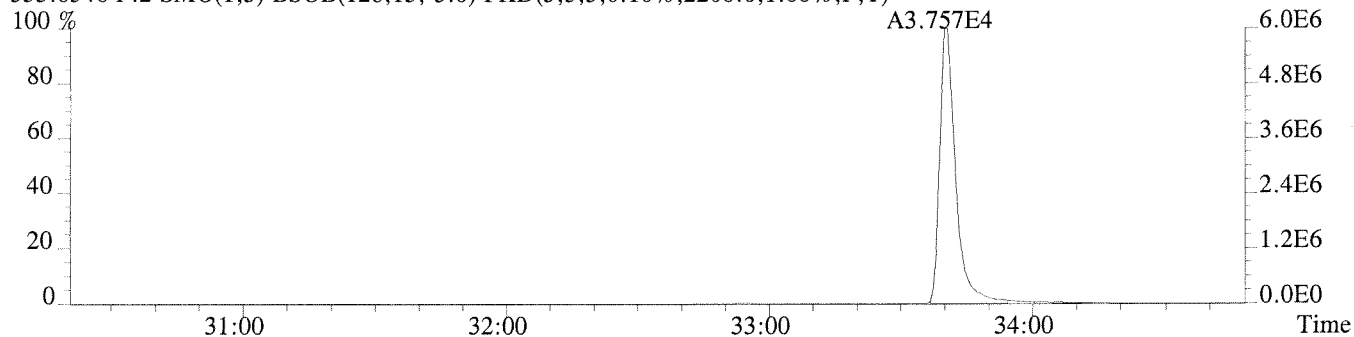
354.9792 F:2 PKD(3,3,3,100.00%,0.0,1.00%,F,F)



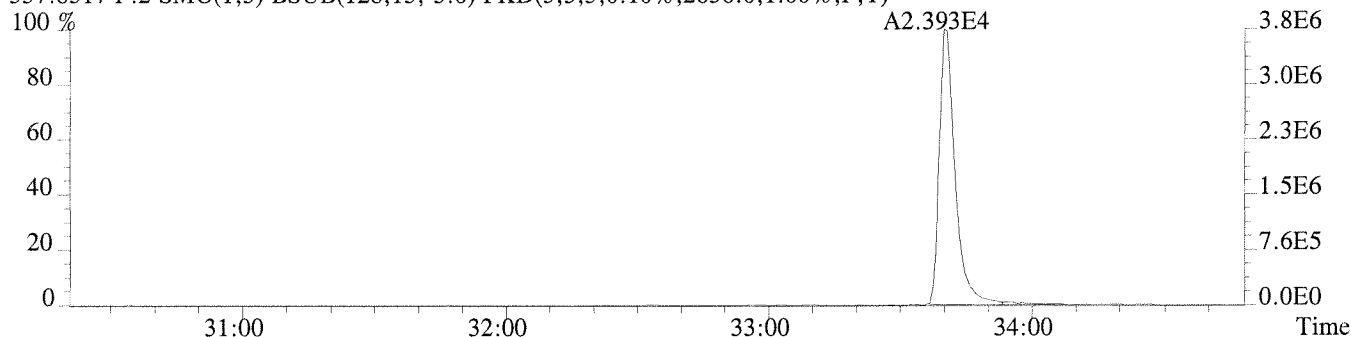
File:P208837 #1-405 Acq:27-JUL-2010 15:46:18 Probe EI+ Magnet SIR VG BioTech Mass spectf

Sample#1 Exp:EQ1000358-03 DLCS

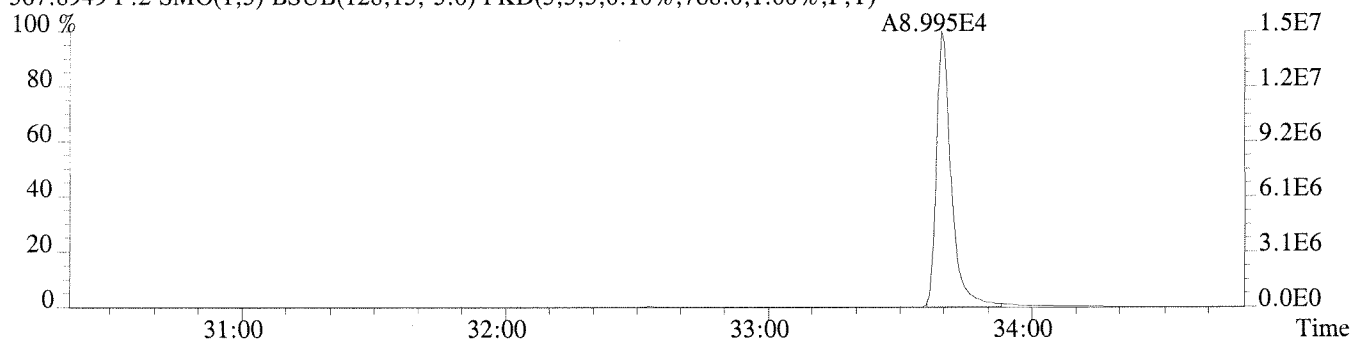
355.8546 F:2 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.10%,2200.0,1.00%,F,T)



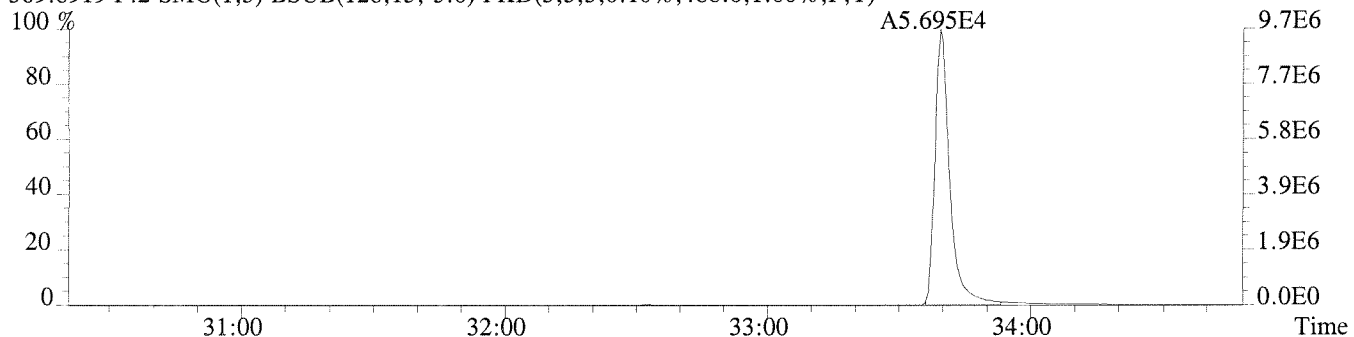
357.8517 F:2 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.10%,2636.0,1.00%,F,T)



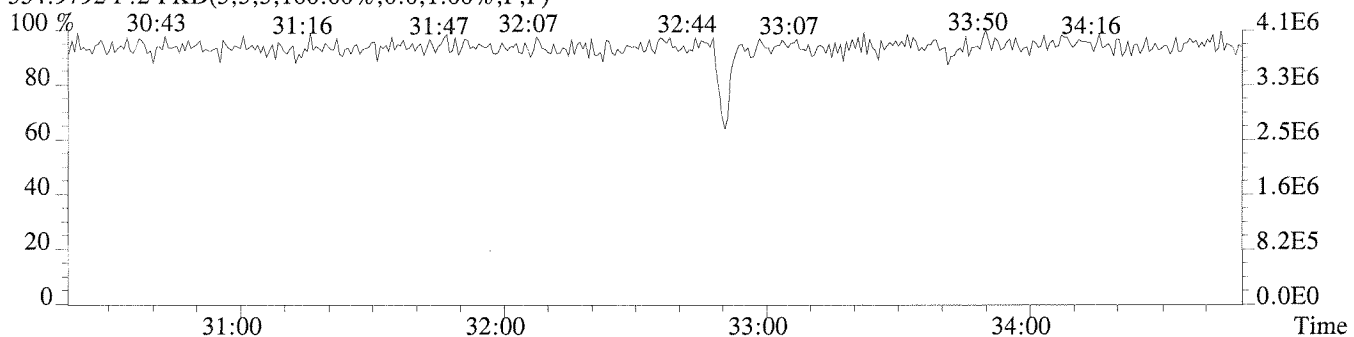
367.8949 F:2 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.10%,788.0,1.00%,F,T)



369.8919 F:2 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.10%,488.0,1.00%,F,T)



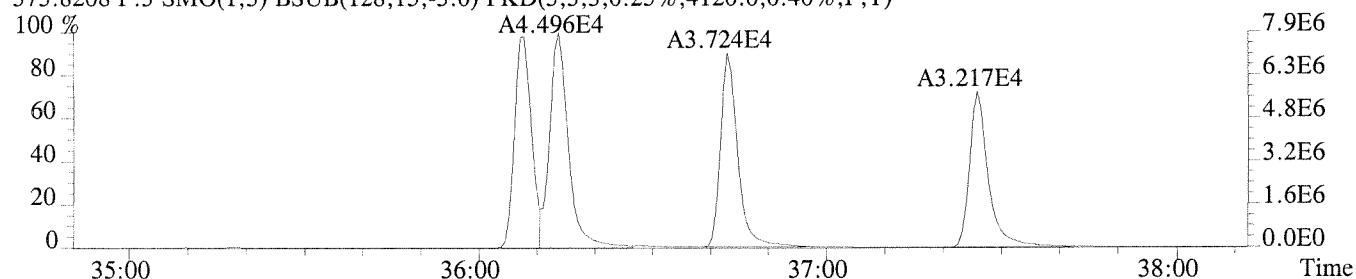
354.9792 F:2 PKD(3,3,3,100.00%,0.0,1.00%,F,F)



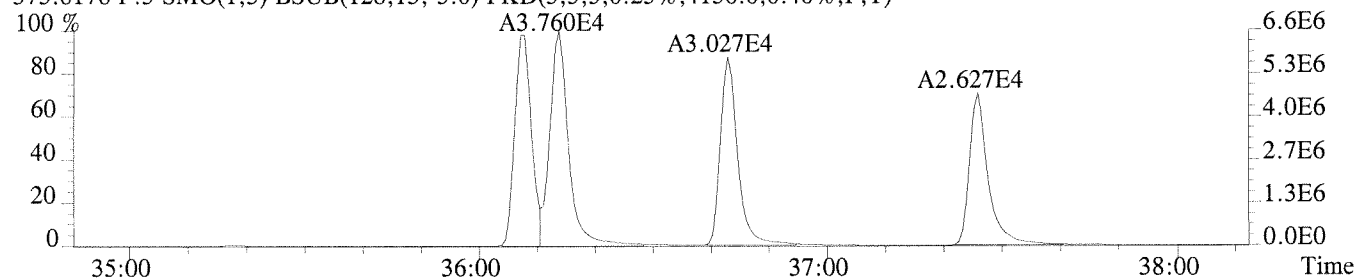
File:P208837 #1-306 Acq:27-JUL-2010 15:46:18 Probe EI+ Magnet SIR VG BioTech Mass spectf

Sample#1 Exp:EQ1000358-03 DLCS

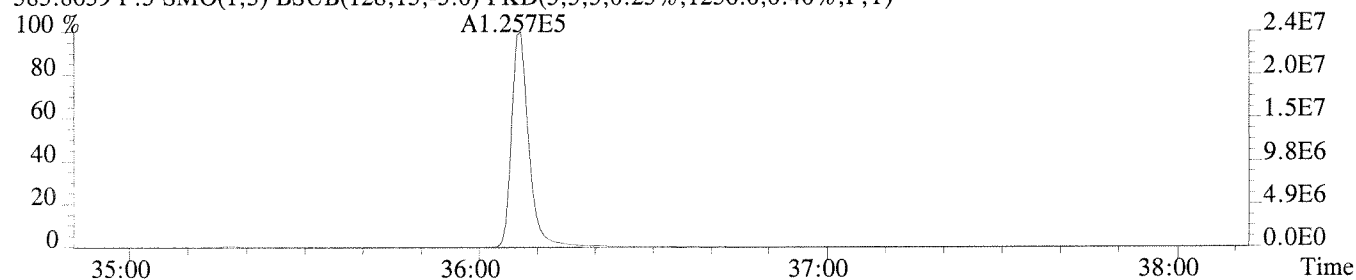
373.8208 F:3 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.25%,4120.0,0.40%,F,T)



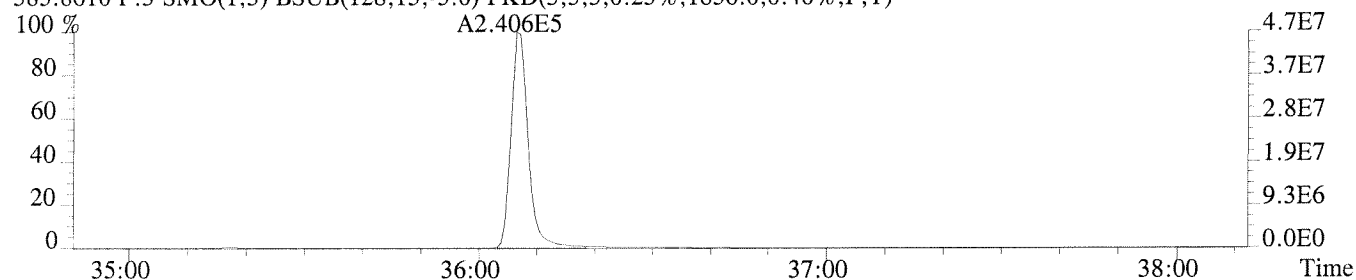
375.8178 F:3 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.25%,4156.0,0.40%,F,T)



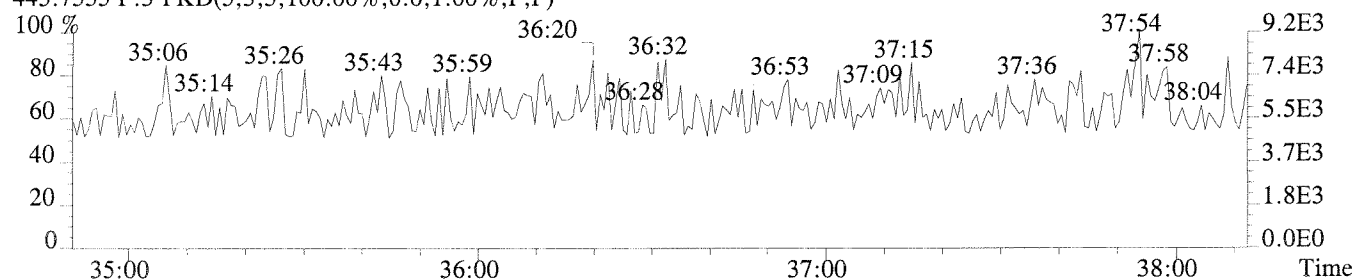
383.8639 F:3 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.25%,1256.0,0.40%,F,T)



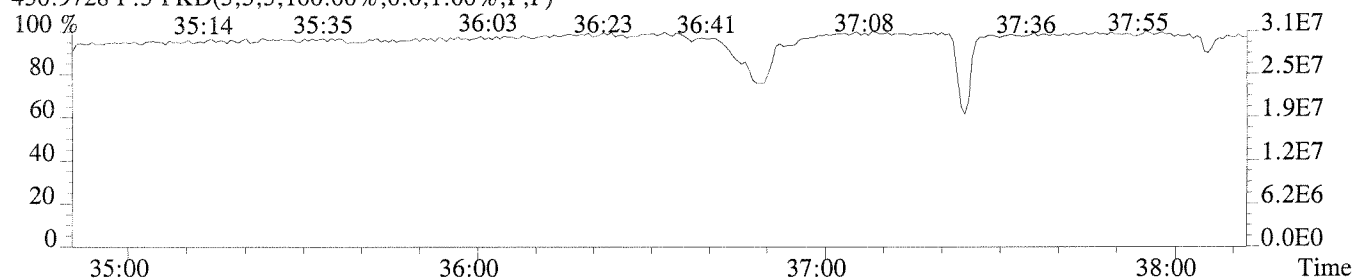
385.8610 F:3 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.25%,1856.0,0.40%,F,T)



445.7555 F:3 PKD(5,3,5,100.00%,0.0,1.00%,F,F)



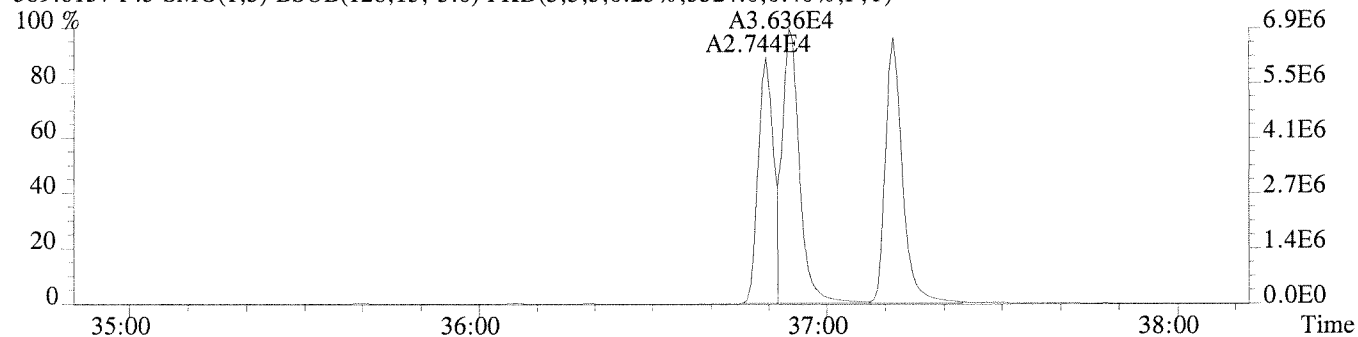
430.9728 F:3 PKD(3,3,3,100.00%,0.0,1.00%,F,F)



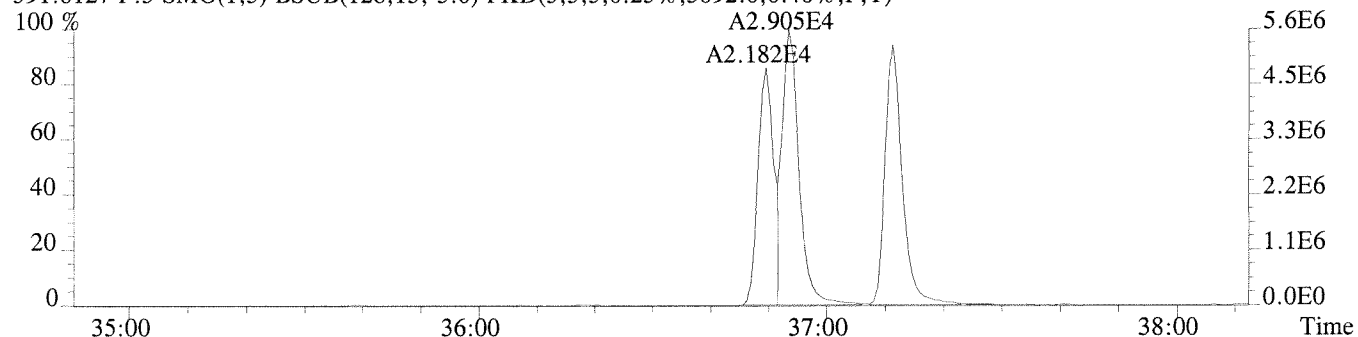
File:P208837 #1-306 Acq:27-JUL-2010 15:46:18 Probe EI+ Magnet SIR VG BioTech Mass spectf

Sample#1 Exp:EQ1000358-03 DLCS

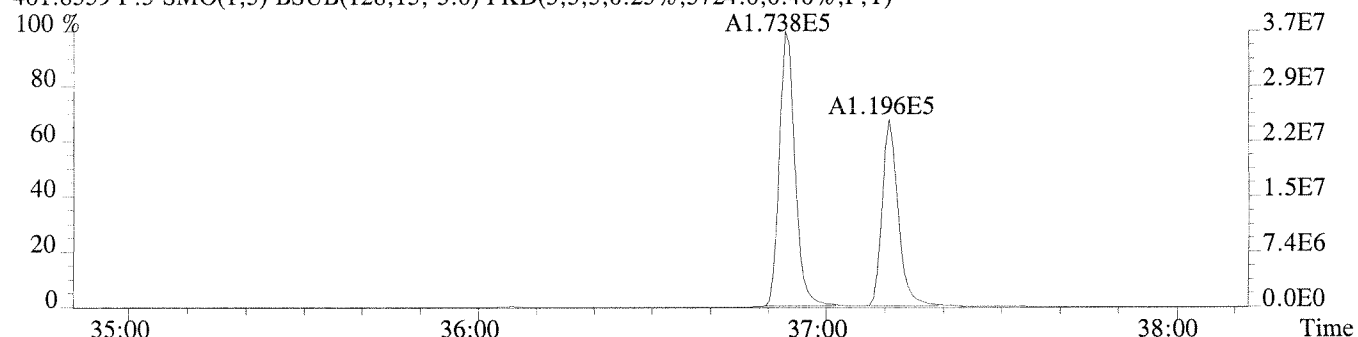
389.8157 F:3 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.25%,3324.0,0.40%,F,T)



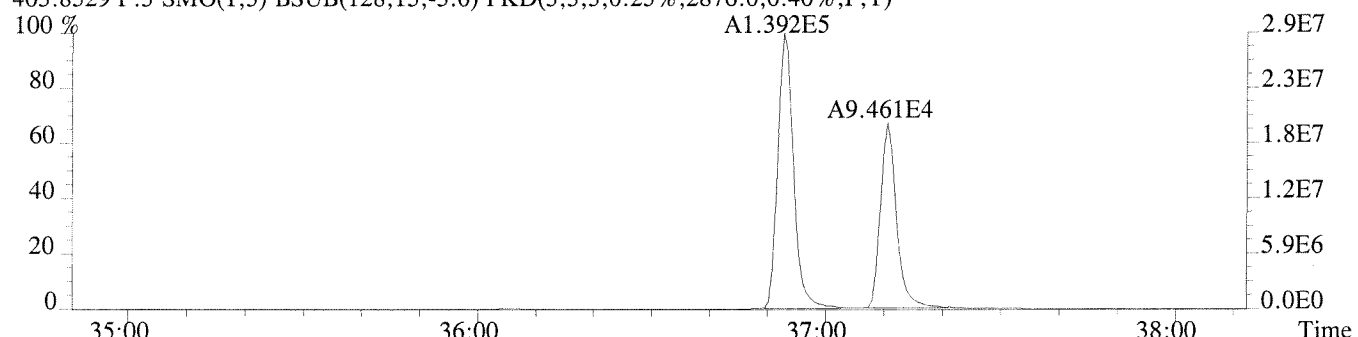
391.8127 F:3 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.25%,3092.0,0.40%,F,T)



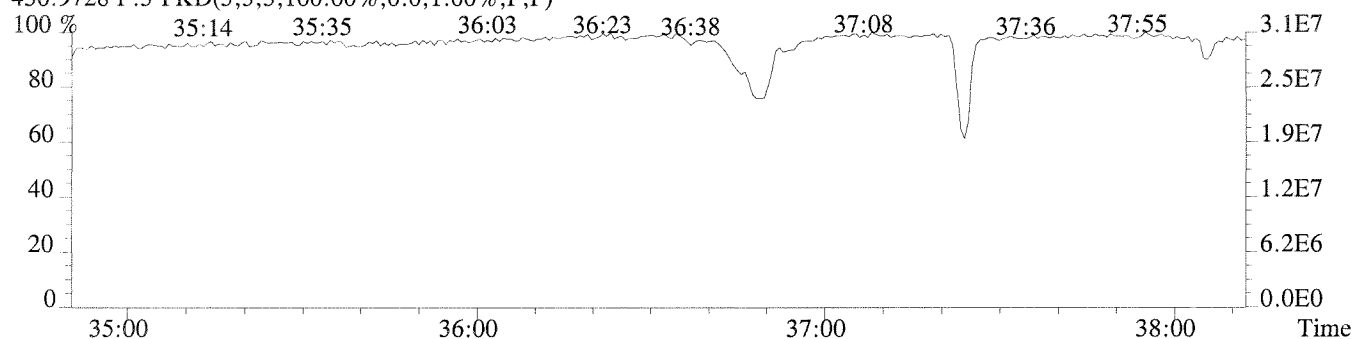
401.8559 F:3 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.25%,5724.0,0.40%,F,T)



403.8529 F:3 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.25%,2876.0,0.40%,F,T)



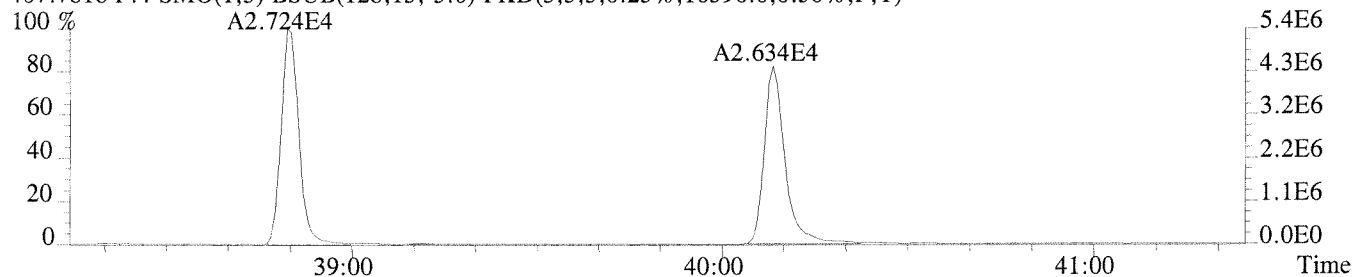
430.9728 F:3 PKD(3,3,3,100.00%,0.0,1.00%,F,F)



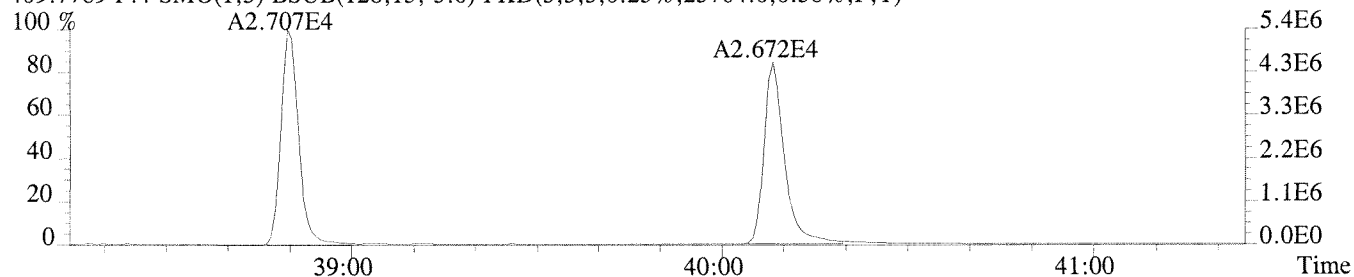
File:P208837 #1-288 Acq:27-JUL-2010 15:46:18 Probe EI+ Magnet SIR VG BioTech Mass spectf

Sample#1 Exp:EQ1000358-03 DLCS

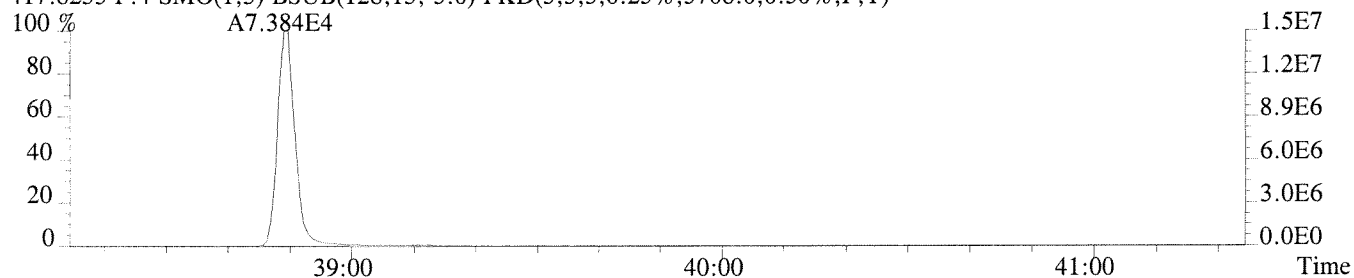
407.7818 F:4 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.25%,16396.0,0.50%,F,T)



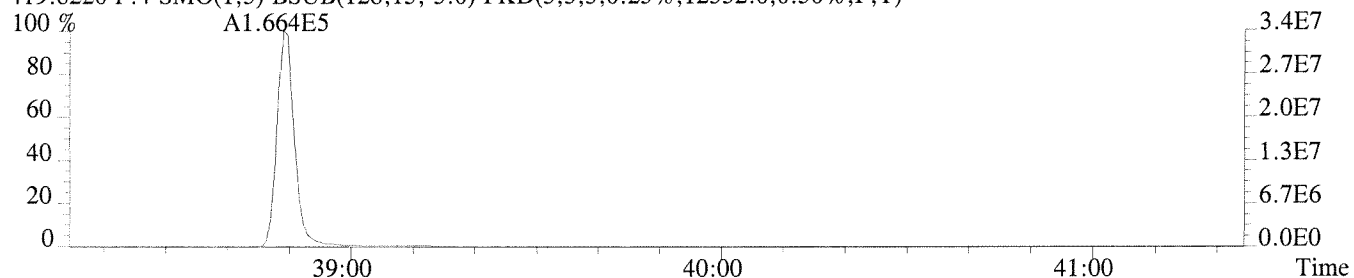
409.7789 F:4 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.25%,23704.0,0.50%,F,T)



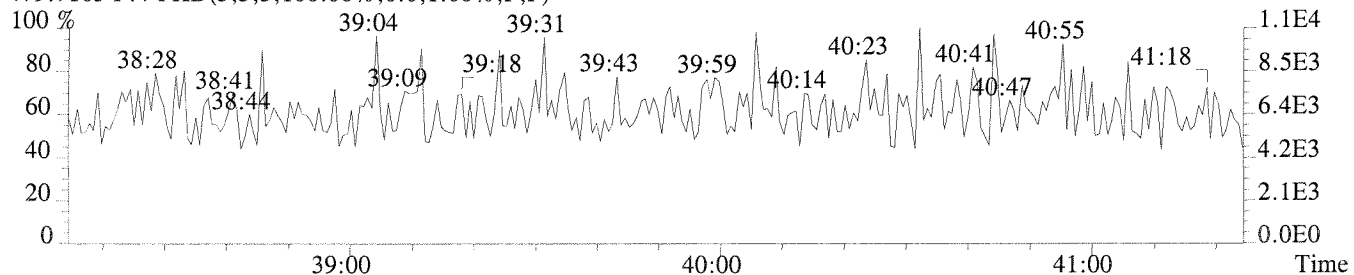
417.8253 F:4 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.25%,3708.0,0.50%,F,T)



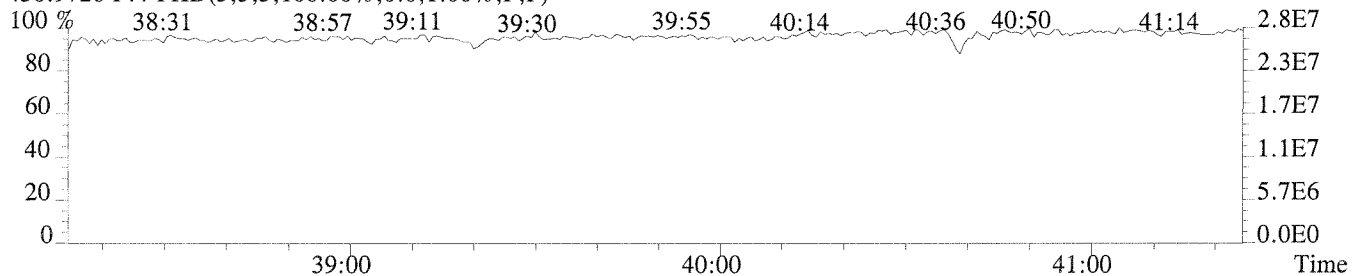
419.8220 F:4 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.25%,12352.0,0.50%,F,T)



479.7165 F:4 PKD(5,3,5,100.00%,0.0,1.00%,F,F)



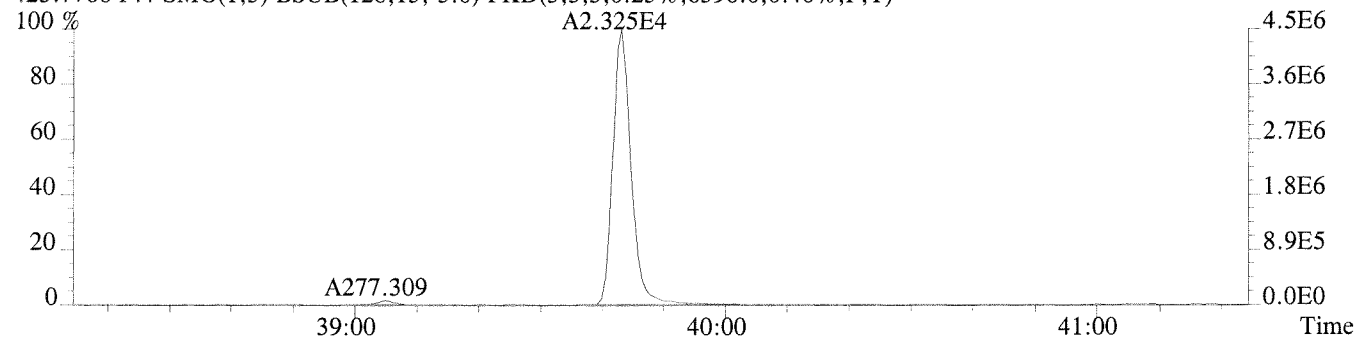
430.9728 F:4 PKD(3,3,3,100.00%,0.0,1.00%,F,F)



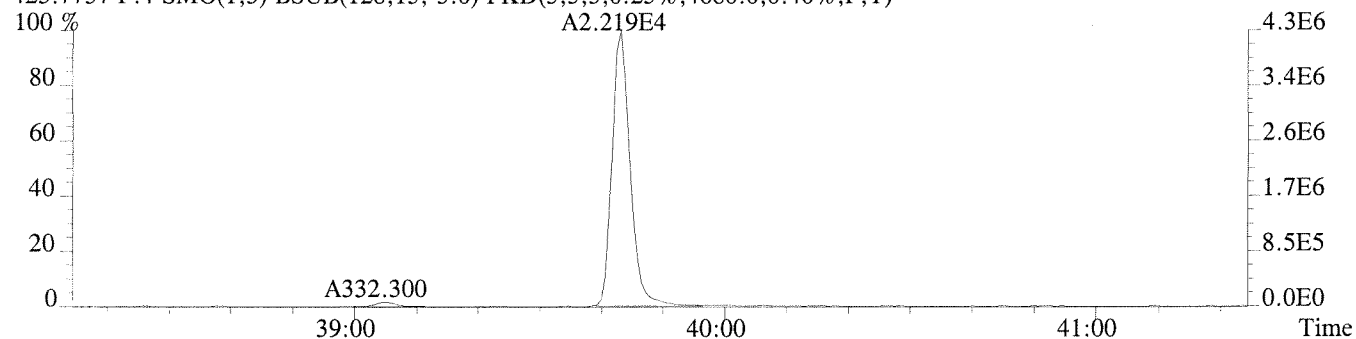
File:P208837 #1-288 Acq:27-JUL-2010 15:46:18 Probe EI+ Magnet SIR VG BioTech Mass spectf

Sample#1 Exp:EQ1000358-03 DLCS

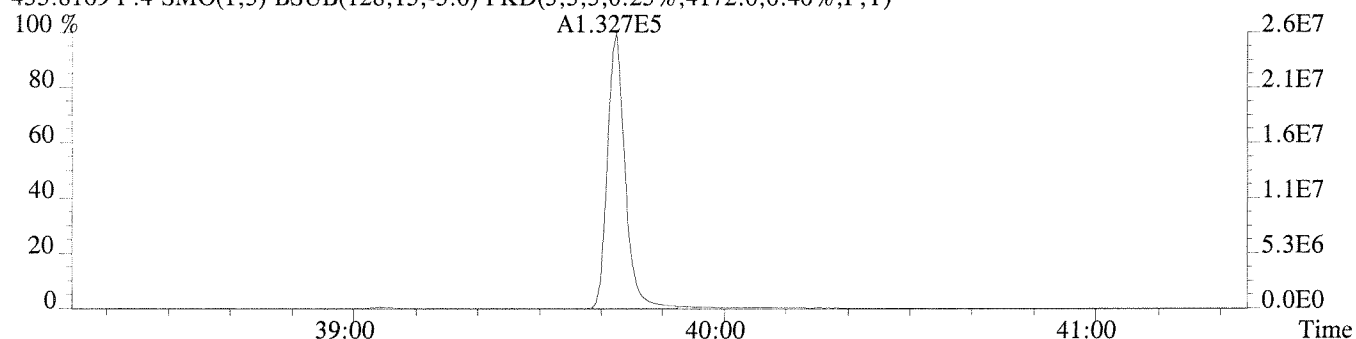
423.7766 F:4 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.25%,6596.0,0.40%,F,T)



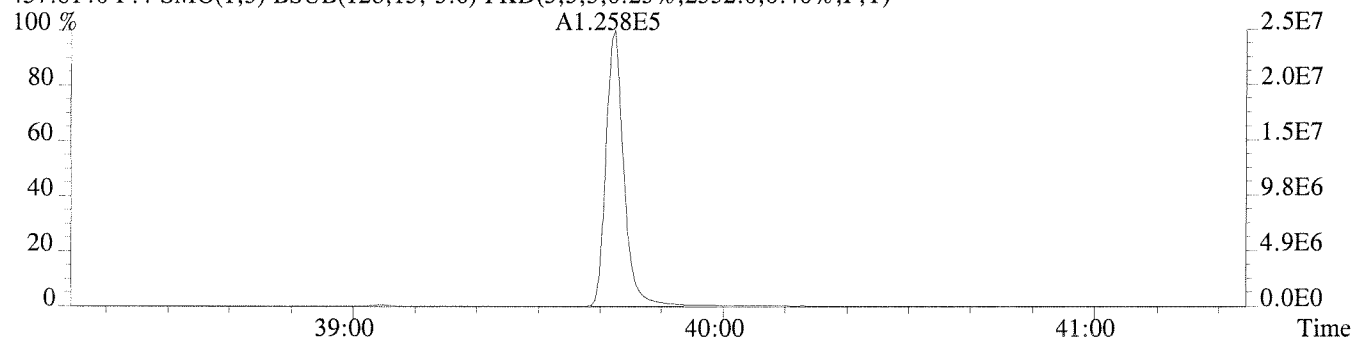
425.7737 F:4 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.25%,4680.0,0.40%,F,T)



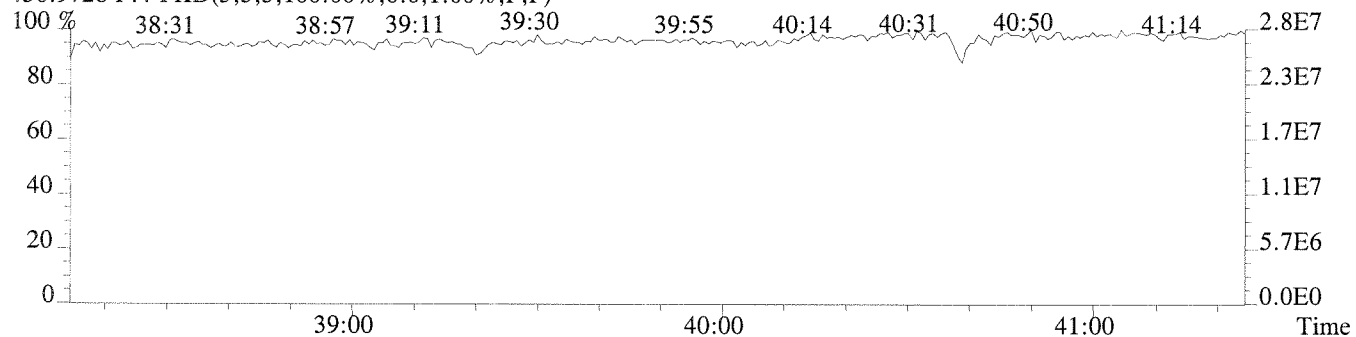
435.8169 F:4 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.25%,4172.0,0.40%,F,T)



437.8140 F:4 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.25%,2352.0,0.40%,F,T)



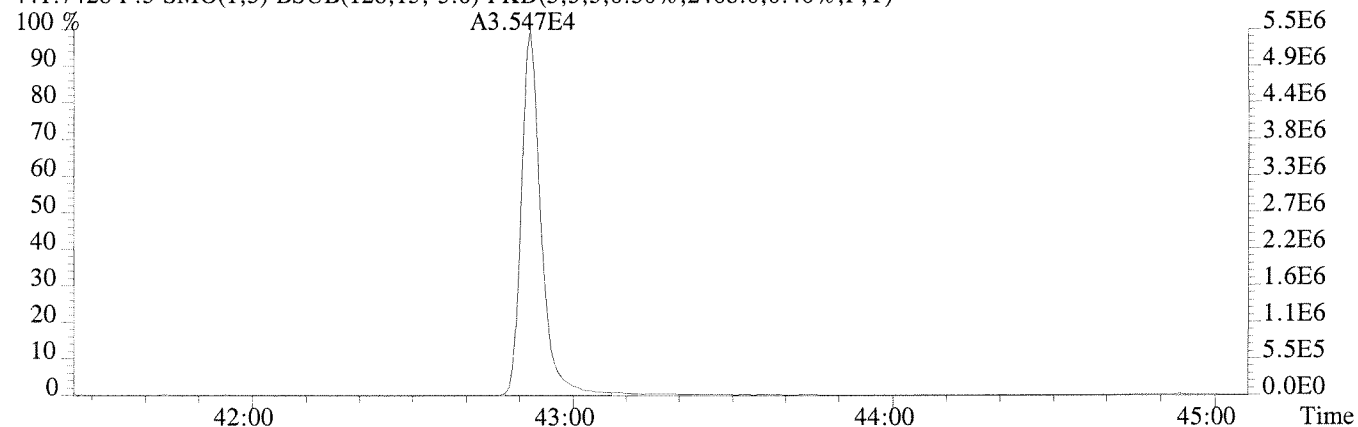
430.9728 F:4 PKD(3,3,3,100.00%,0.0,1.00%,F,F)



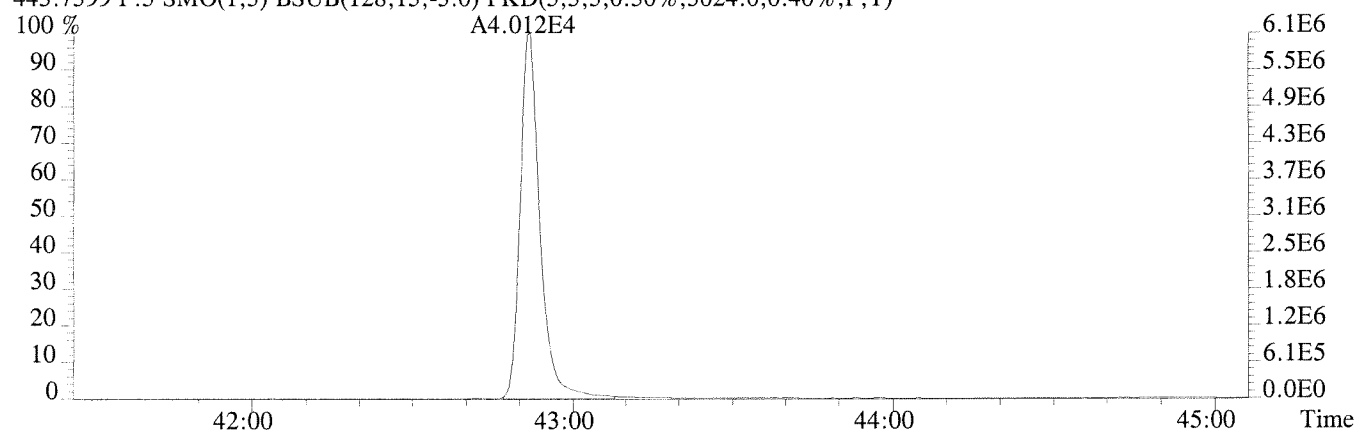
File:P208837 #1-333 Acq:27-JUL-2010 15:46:18 Probe EI+ Magnet SIR VG BioTech Mass spectf

Sample#1 Exp:EQ1000358-03 DLCS

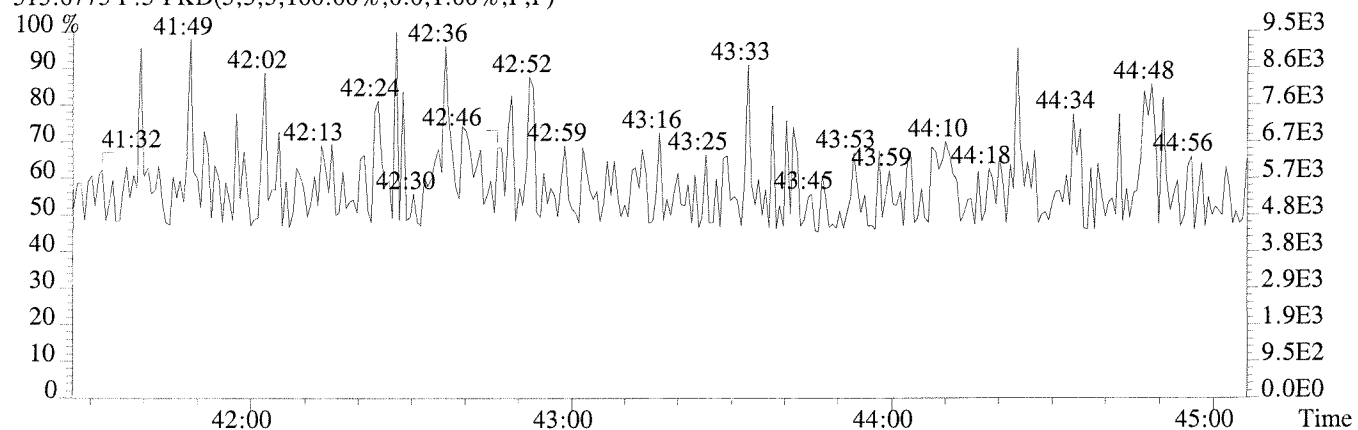
441.7428 F:5 SMO(1,3) BSUB(128,15,-3.0) PKD(5,3,5,0.30%,2468.0,0.40%,F,T)



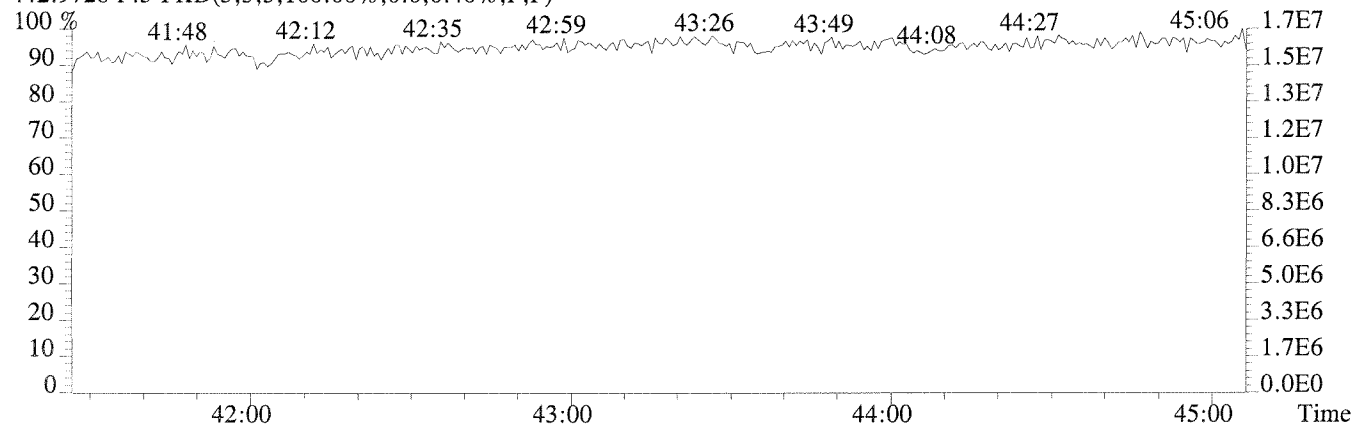
443.7399 F:5 SMO(1,3) BSUB(128,15,-3.0) PKD(5,3,5,0.30%,3024.0,0.40%,F,T)



513.6775 F:5 PKD(5,3,5,100.00%,0.0,1.00%,F,F)



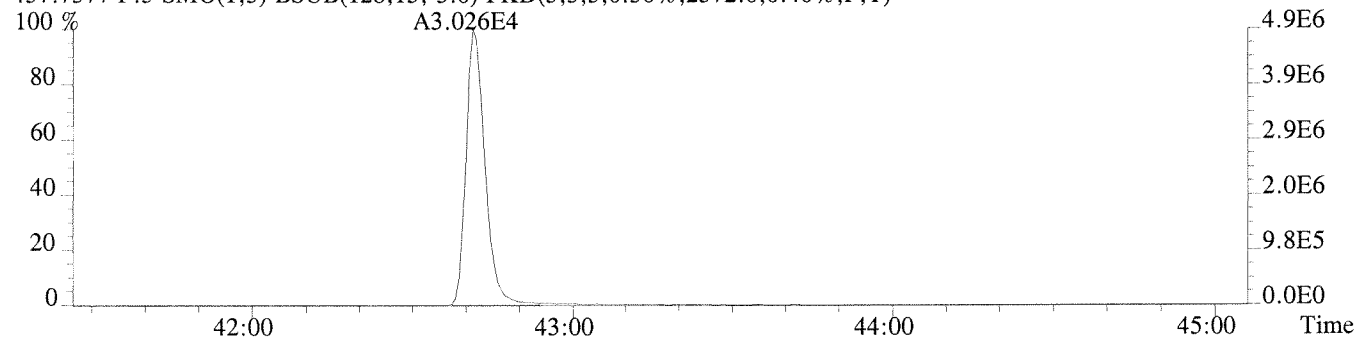
442.9728 F:5 PKD(3,3,3,100.00%,0.0,0.40%,F,F)



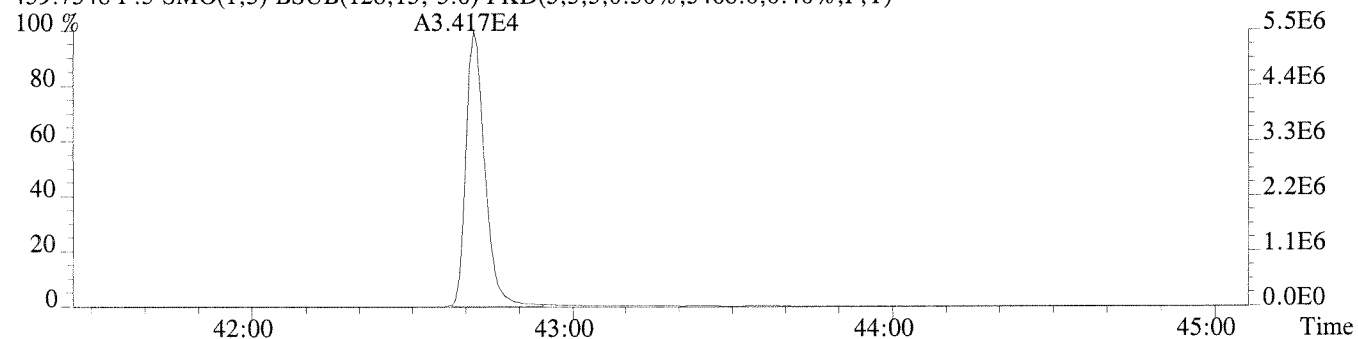
File:P208837 #1-333 Acq:27-JUL-2010 15:46:18 Probe EI+ Magnet SIR VG BioTech Mass spectf

Sample#1 Exp:EQ1000358-03 DLCS

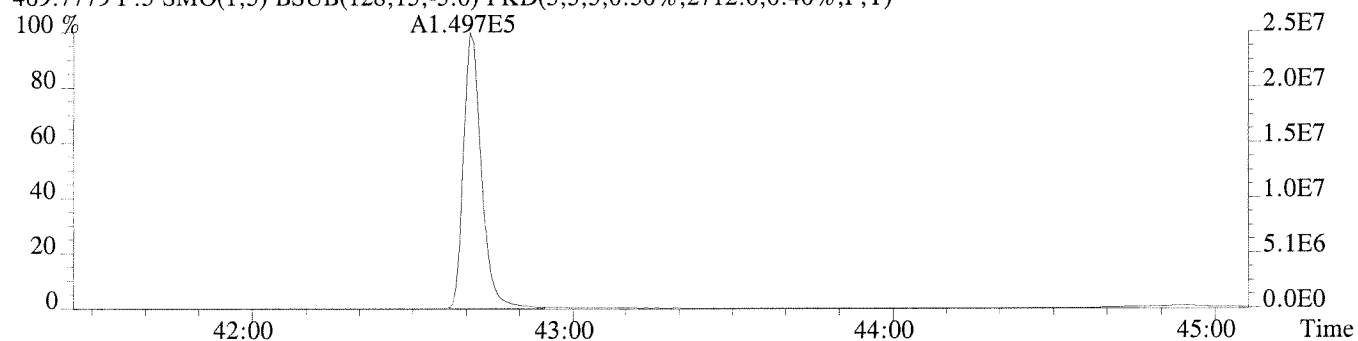
457.7377 F:5 SMO(1,3) BSUB(128,15,-3.0) PKD(5,3,5,0.30%,2572.0,0.40%,F,T)



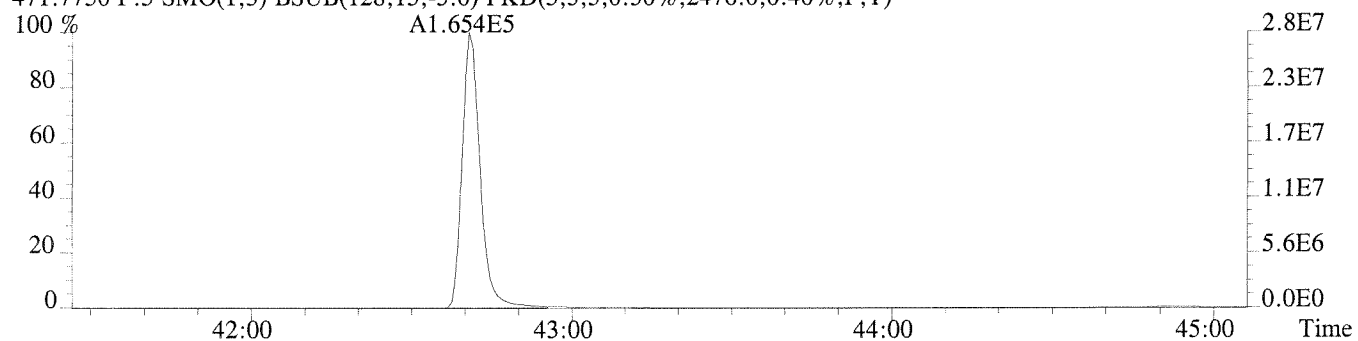
459.7348 F:5 SMO(1,3) BSUB(128,15,-3.0) PKD(5,3,5,0.30%,3468.0,0.40%,F,T)



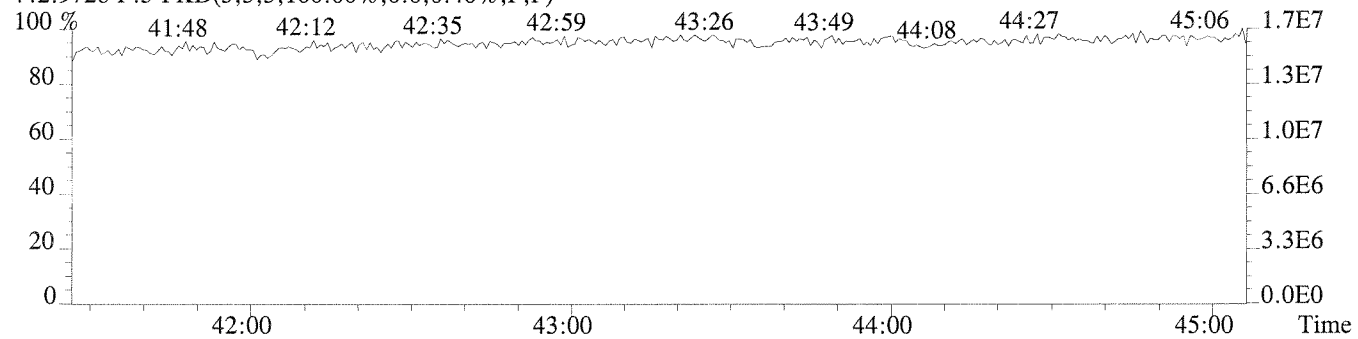
469.7779 F:5 SMO(1,3) BSUB(128,15,-3.0) PKD(5,3,5,0.30%,2712.0,0.40%,F,T)



471.7750 F:5 SMO(1,3) BSUB(128,15,-3.0) PKD(5,3,5,0.30%,2476.0,0.40%,F,T)



442.9728 F:5 PKD(3,3,3,100.00%,0.0,0.40%,F,F)





Continuing Calibration

19408 Park Row, Suite 320, Houston, TX 77084

Phone (713)266-1599 Fax (713)266-0130

www.caslab.com

An Employee Owned Company

RW/ HRCC3 Daily Calibration QC Checklist

Calibration File Name: P208826-P208838

Circle one: Beginning / Ending

Date: 27 Jul 10

Method: 8290 / Tetra / TCDD Only / TCDF Conf

Retention Window/Column Performance Check:

Analyst

Second Check

Windows labeled for first and last eluting compounds	<u>see</u>	✓
Column performance shows less than or equal to 25% valley between column specific 2378 isomer and the closest eluters	✓	✓
No QC ion deflections affect column specific 2378 isomer or the closest eluters	✓	✓

HRCC3 Continuing Calibration

Analyst

Second Check

Percent RSD within method criteria	✓	✓
All relative abundance ratios meet method criteria	✓	✓
No QC ion deflections greater than 20%	✓	✓
Mass spectrometer resolution greater than or equal to 10,000 and documented	✓	✓
Signal-to-noise of all target analytes and associated labeled standards at least 2.5:1	✓	✓
Ending Calibration injected prior to end of 12 hour clock	✓	✓

Analyst: la

Second QC: mc

5DFC
PCDD/PCDF ANALYTICAL SEQUENCE SUMMARY

Lab Name: Columbia Analytical Services

Contract:

Lab Code: TX01411

Case No.:

Client No.:

SDG No.:

GC Column: DB-5

ID: 0.25 (mm)

Instrument ID: AutoSpec-Premier

Init. Calib. Date: 08/01/08

Init. Calib.Times: 14:25

THE ANALYTICAL SEQUENCE OF STANDARDS, SAMPLES, BLANKS, AND LABORATORY CONTROL
SAMPLES (LCSs) IS AS FOLLOWS:

EPA SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
WINDOW DEFINE		P208827	27-JUL-10	06:28:37
CCAL HRCC3		P208826	27-JUL-10	05:07:52
CCAL HRCC3	CCAL HRCC3	P208838	27-JUL-10	17:05:28
METHOD BLANK	EQ1000354-01	P208828	27-JUL-10	07:35:16
60/60/60 4	60/60/60 4	P208829	27-JUL-10	08:21:53
METHOD BLANK	EQ1000358-01	P208830	27-JUL-10	10:03:42
SRC-2010-8-COMP	E1000811-001	P208831	27-JUL-10	10:50:01
SB-20 6-8'	J1003350-009	P208832	27-JUL-10	11:38:33
SB-10 0-2'	J1003407-007	P208833	27-JUL-10	12:27:05
SB-30 14-16'	don't use	P208834	27-JUL-10	13:15:36
SB-30 14-16'	J1003461-013	P208835	27-JUL-10	14:11:13
LCS	EQ1000358-02	P208836	27-JUL-10	14:57:51
DLCS	EQ1000358-03	P208837	27-JUL-10	15:46:18

Sample List:

C:\MassLynx\CASHOUSTON.PRO\SampleDB\E10727.SPL

Last Modified:

Tuesday, July 27, 2010 17:05:25 Central Daylight Time

Printed:

Tuesday, July 27, 2010 18:08:14 Central Daylight Time



**Columbia
Analytical Services™**
19408 Park Row

Suite 320

Houston, Texas 77084

C: P208826 RES

[illegible]

3

Experiment Calibration Report

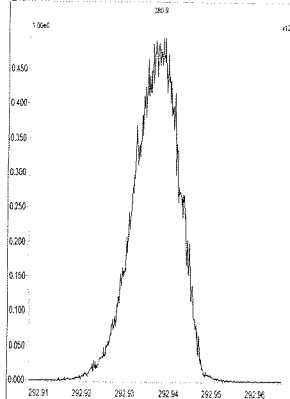
MassLynx 4.1

Page 1 of 1

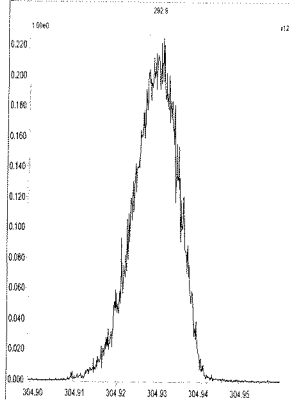
File: Experiment: 8290CAS.exp Reference: pfk.ref Function: 1 @ 200 (ppm)

Printed: Tuesday, July 27, 2010 06:24:38 Central Daylight Time

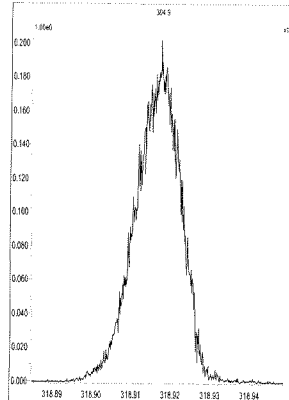
M 292.9824 R 12140



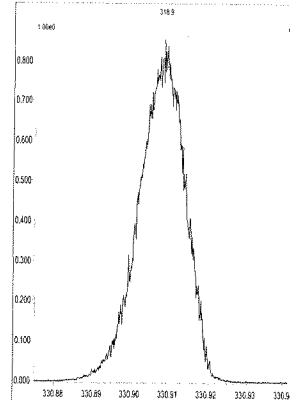
M 304.9824 R 12889



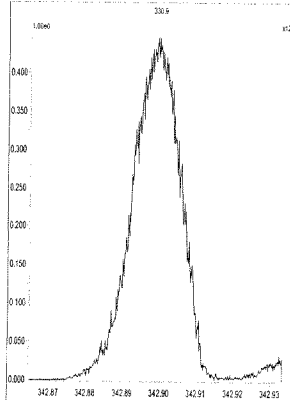
M 318.9792 R 12438



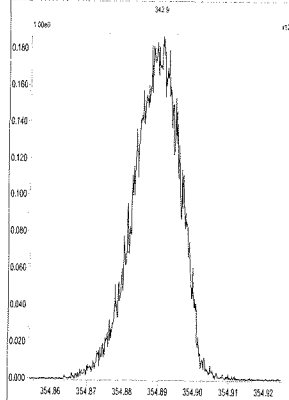
M 330.9792 R 11795



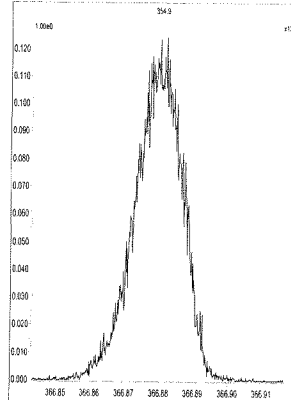
M 342.9792 R 12020



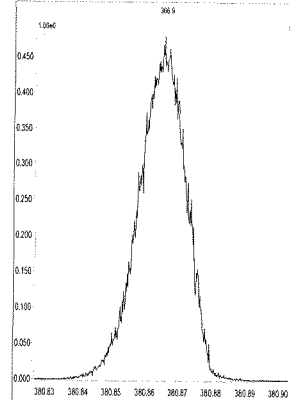
M 354.9792 R 12380



M 366.9792 R 11522



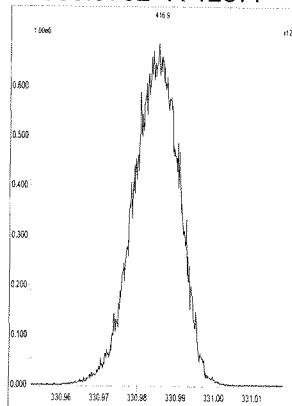
M 380.9760 R 11961



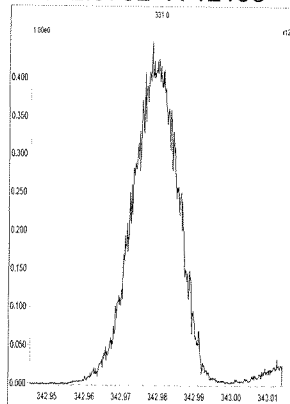
File: Experiment: 8290CAS.exp Reference: pfk.ref Function: 2 @ 200 (ppm)

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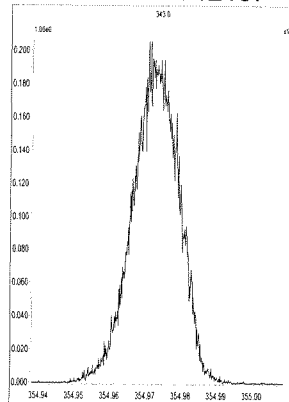
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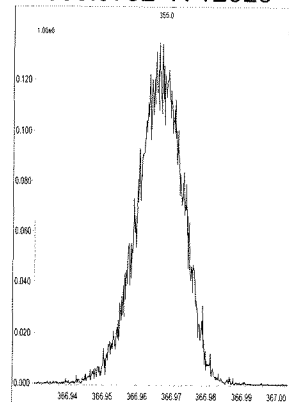
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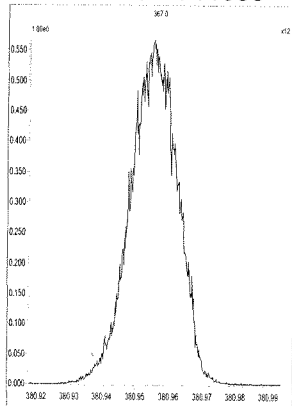
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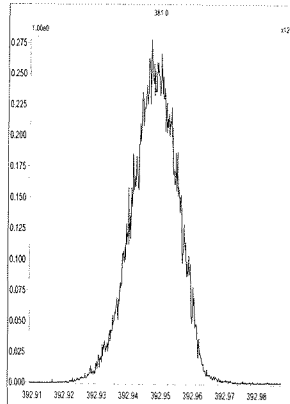
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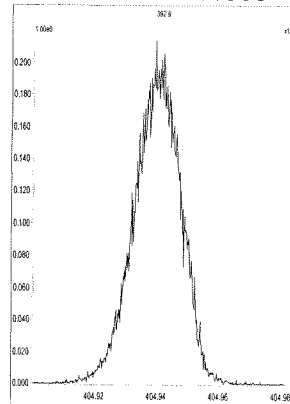
M 380.9760 R 11680



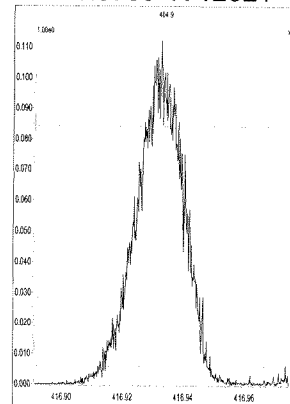
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M 404.9760 R 11908



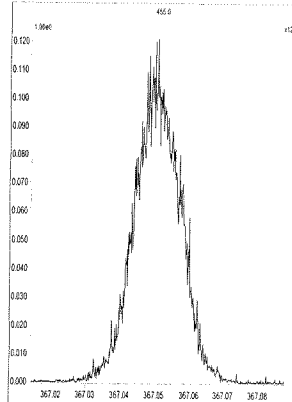
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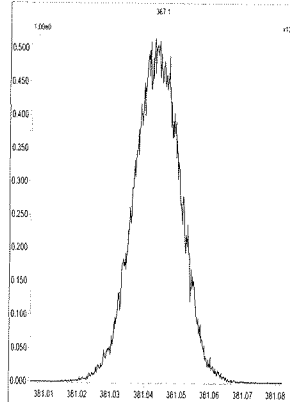
File: Experiment: 8290CAS.exp Reference: pfk.ref Function: 3 @ 200 (ppm)

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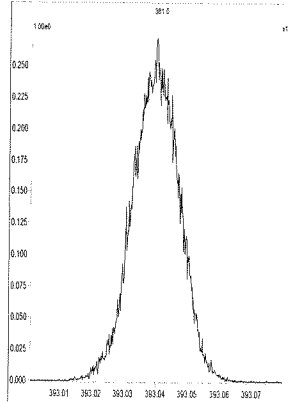
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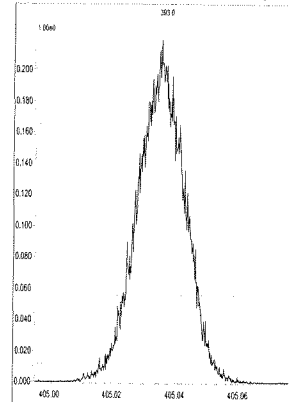
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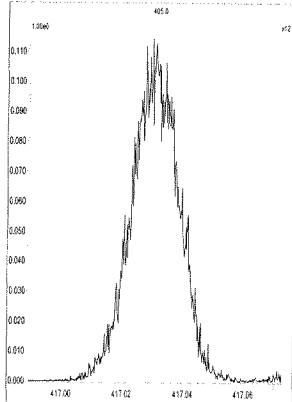
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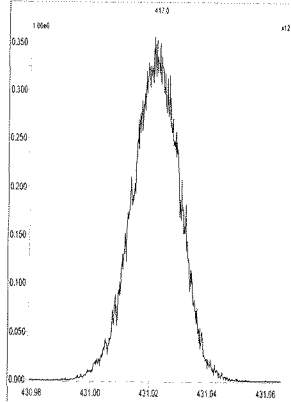
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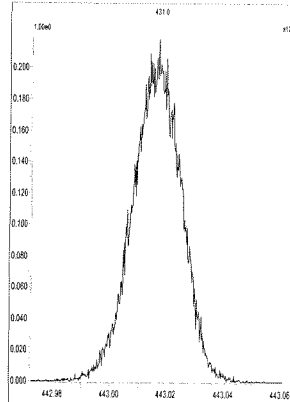
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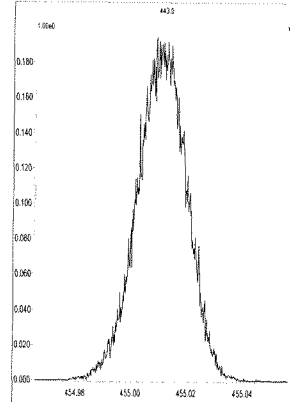
M 430.9728 R 11685



M 442.9728 R 11364



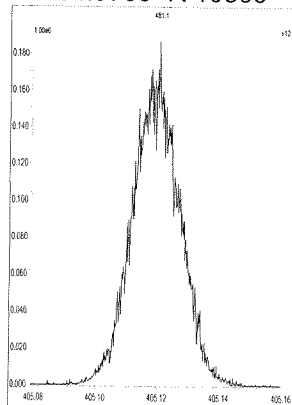
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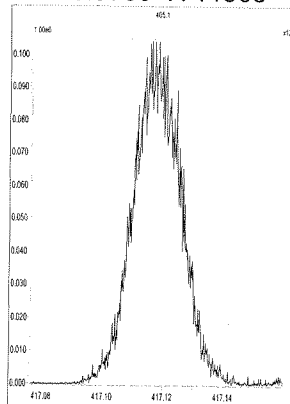
File: Experiment: 8290CAS.exp Reference: pfk.ref Function: 4 @ 200 (ppm)

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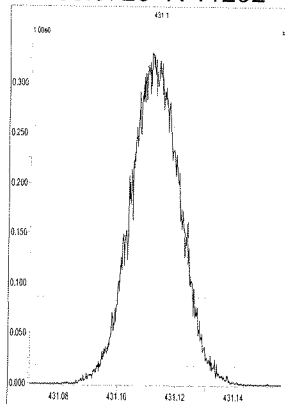
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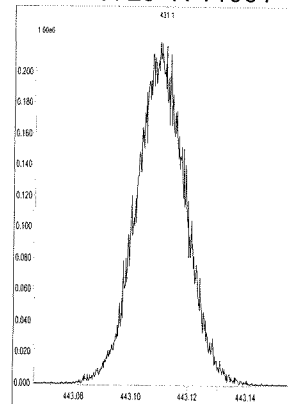
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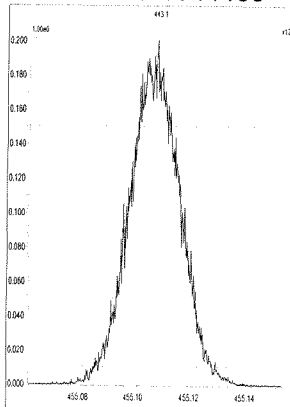
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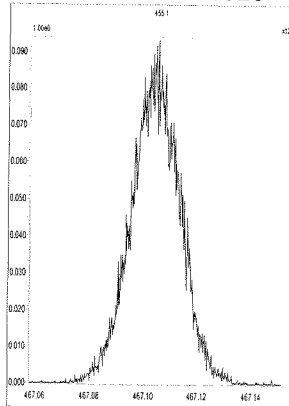
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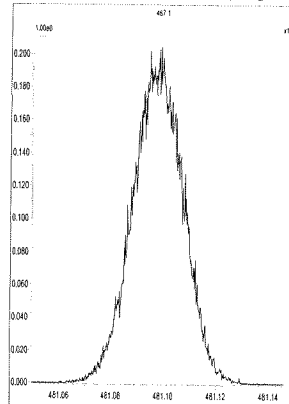
M 454.9728 R 11159



M 466.9728 R 11628



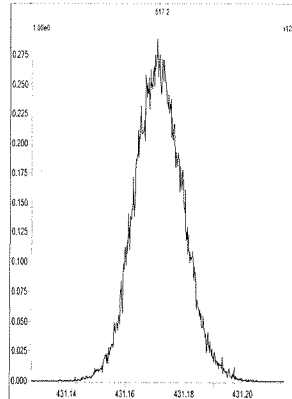
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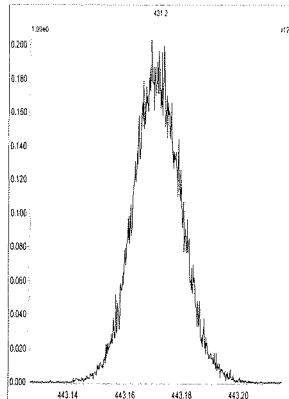
File: Experiment: 8290CAS.exp Reference: pfk.ref Function: 5 @ 200 (ppm)

Printed: Tuesday, July 27, 2010 06:27:38 Central Daylight Time

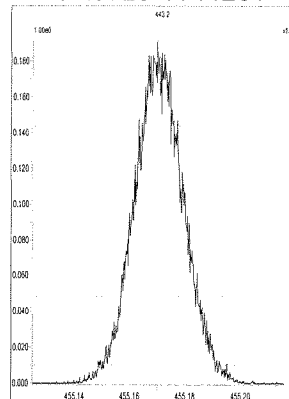
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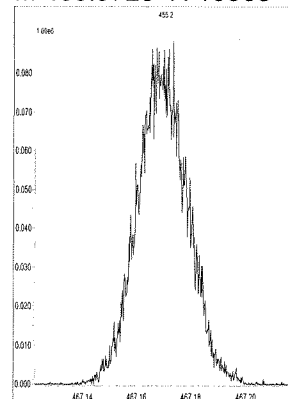
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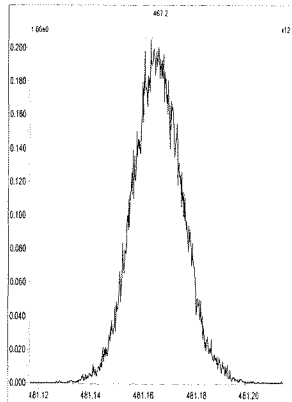
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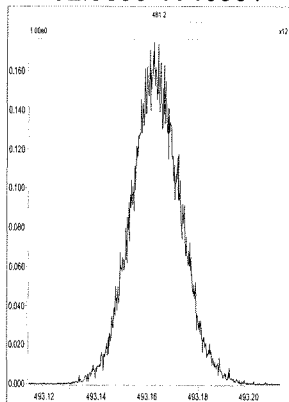
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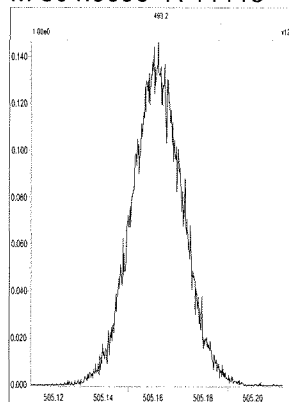
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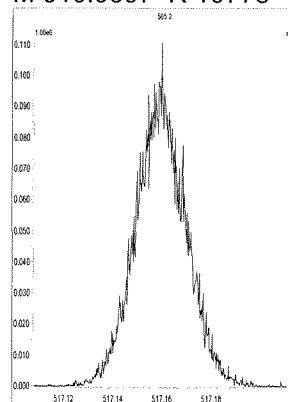
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M 504.9696 R 11113



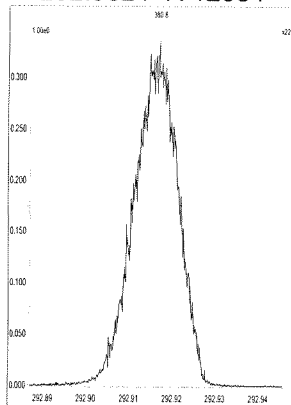
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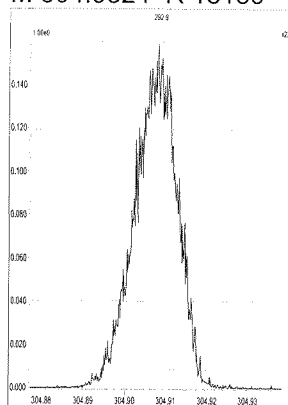
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Printed: Tuesday, July 27, 2010 17:56:37 Central Daylight Time

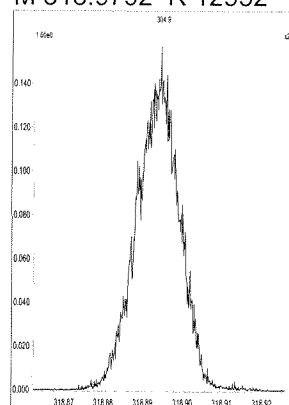
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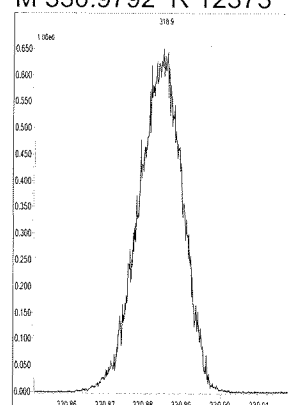
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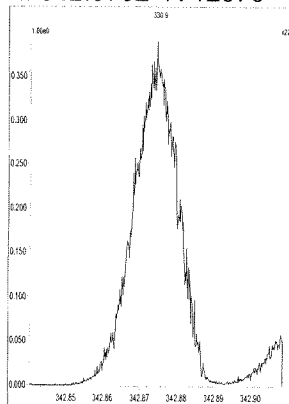
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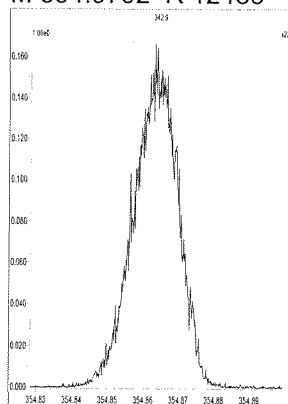
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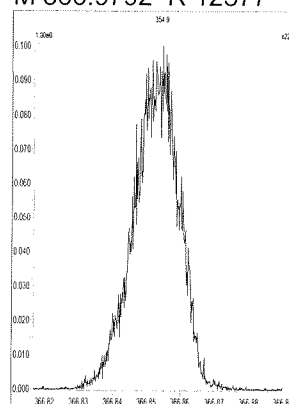
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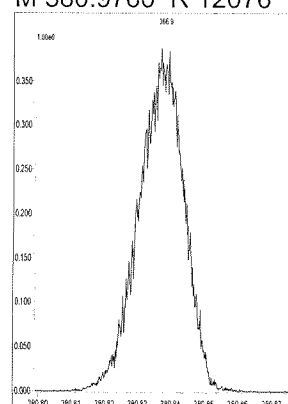
M 354.9792 R 12435



M 366.9792 R 12377



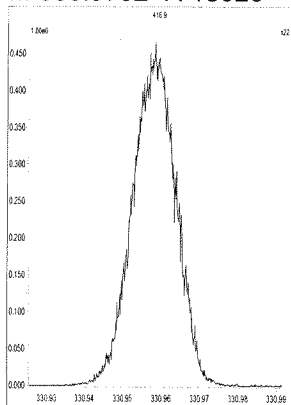
M 380.9760 R 12076



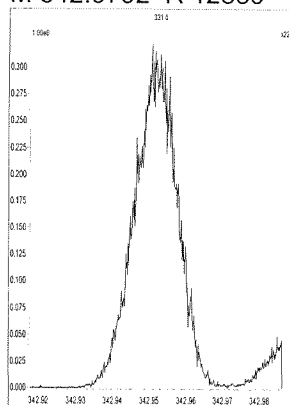
File: Experiment: 8290CAS.exp Reference: pfk.ref Function: 2 @ 200 (ppm)

Printed: Tuesday, July 27, 2010 17:56:55 Central Daylight Time

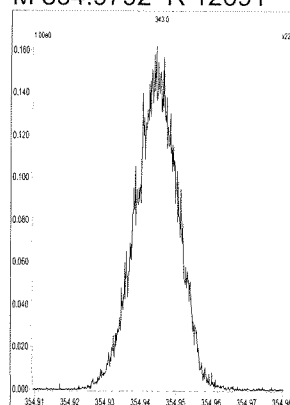
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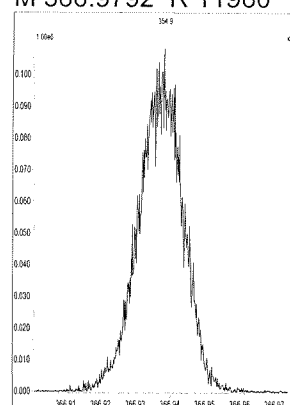
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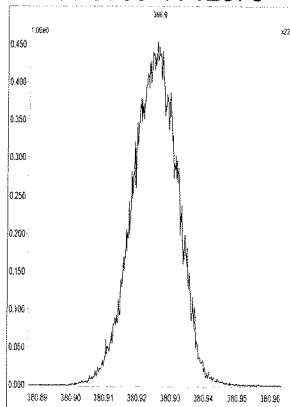
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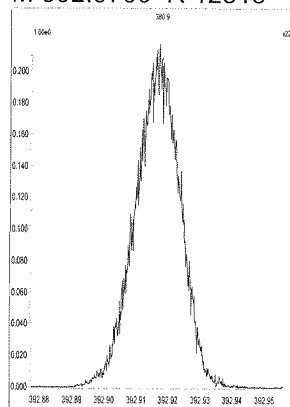
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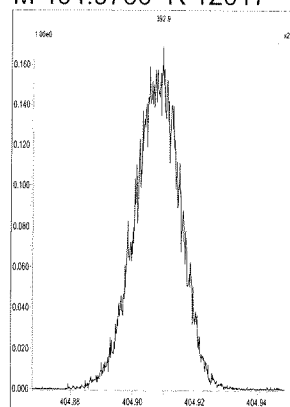
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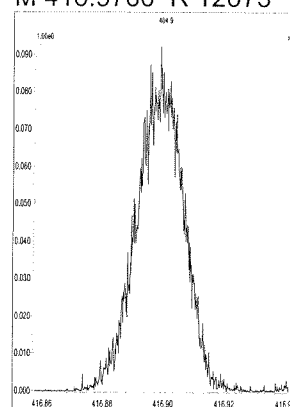
M 392.9760 R 12315



M 404.9760 R 12017



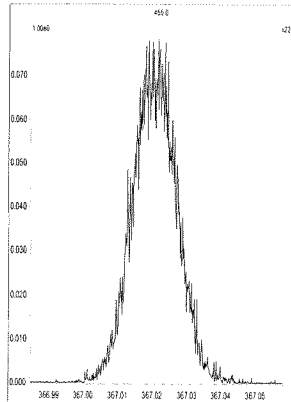
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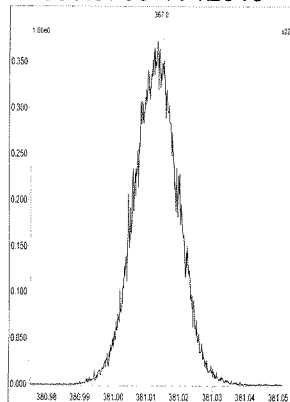
File: Experiment: 8290CAS.exp Reference: pfk.ref Function: 3 @ 200 (ppm)

Printed: Tuesday, July 27, 2010 17:57:26 Central Daylight Time

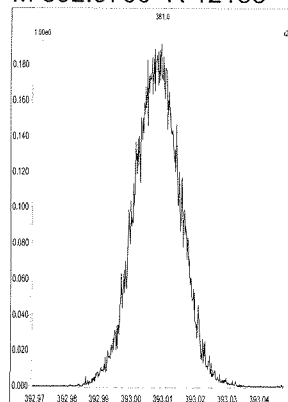
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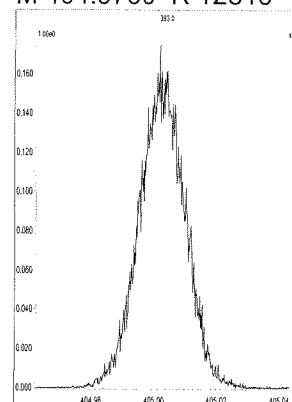
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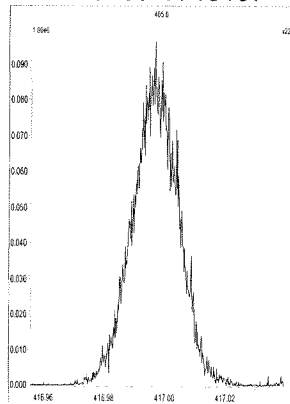
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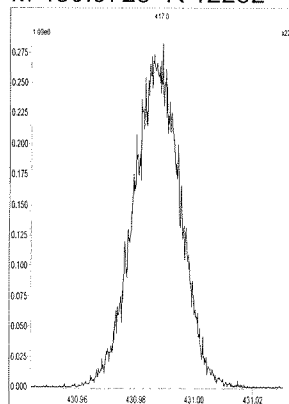
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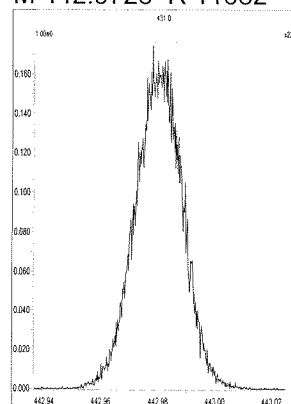
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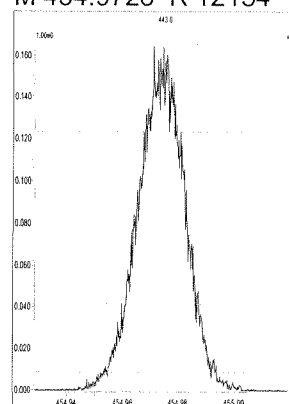
M 430.9728 R 12252



M 442.9728 R 11682



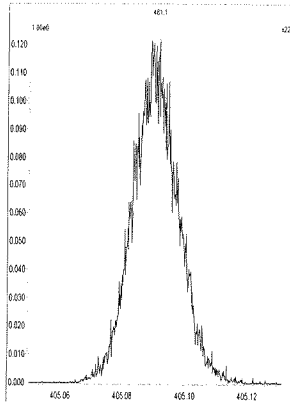
M 454.9728 R 12134



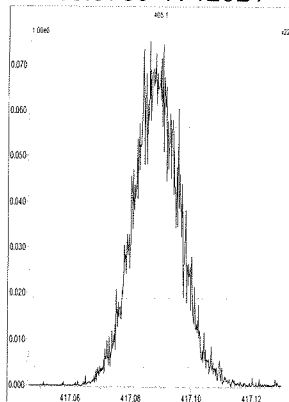
File: Experiment: 8290CAS.exp Reference: pfk.ref Function: 4 @ 200 (ppm)

Printed: Tuesday, July 27, 2010 17:57:56 Central Daylight Time

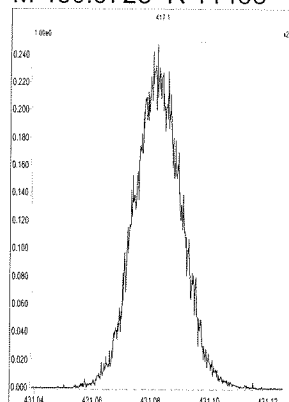
M 404.9760 R 11627



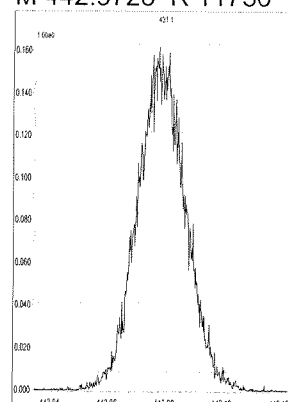
M 416.9760 R 12021



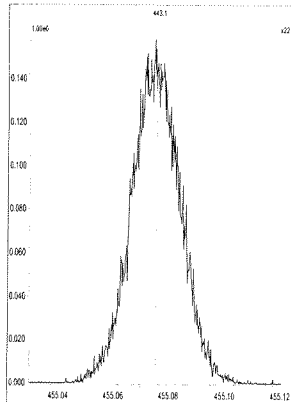
M 430.9728 R 11468



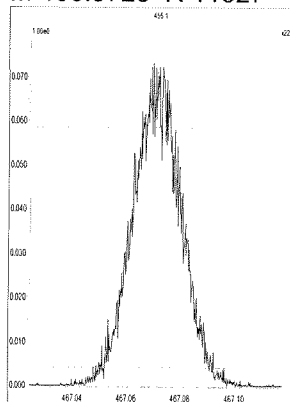
M 442.9728 R 11736



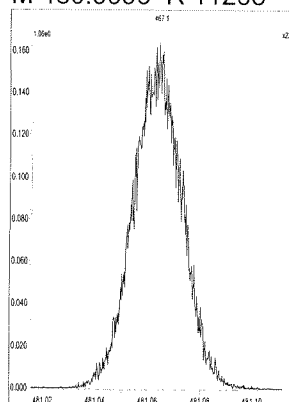
M 454.9728 R 11162



M 466.9728 R 11627



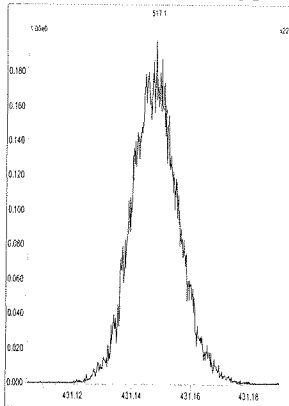
M 480.9696 R 11263



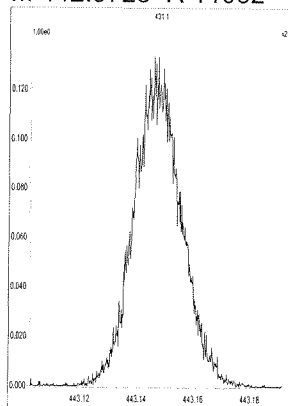
File: Experiment: 8290CAS.exp Reference: pfk.ref Function: 5 @ 200 (ppm)

Printed: Tuesday, July 27, 2010 17:58:14 Central Daylight Time

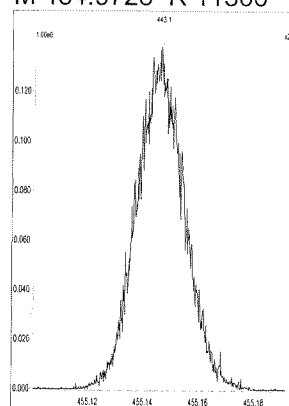
M 430.9728 R 11159



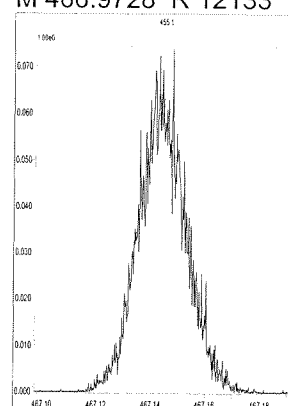
M 442.9728 R 11062



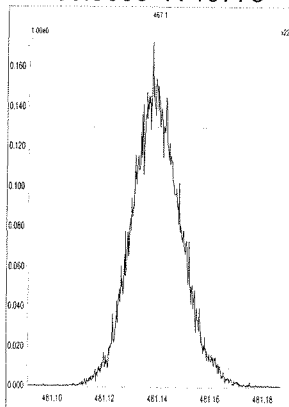
M 454.9728 R 11366



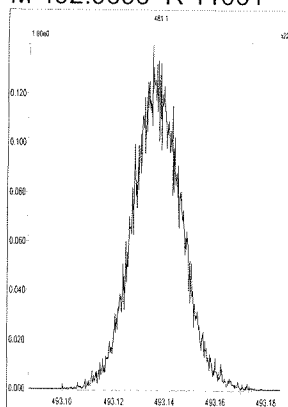
M 466.9728 R 12133



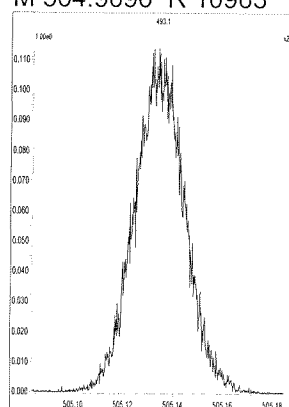
M 480.9696 R 10776



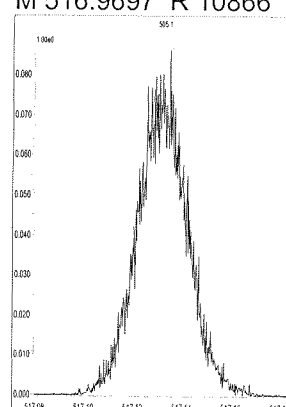
M 492.9696 R 11061



M 504.9696 R 10963



M 516.9697 R 10866



5DFA

WINDOW DEFINING MIX SUMMARY

CLIENT ID:

WDM

Lab Name: COLUMBIA ANALYTICAL SERVICES

Lab Code: CAS

Case No.:

SDG No.:

GC Column: DB-5

ID: 0.25 (mm)

Lab File ID: P208827

Date Analyzed: 27-JUL-2010

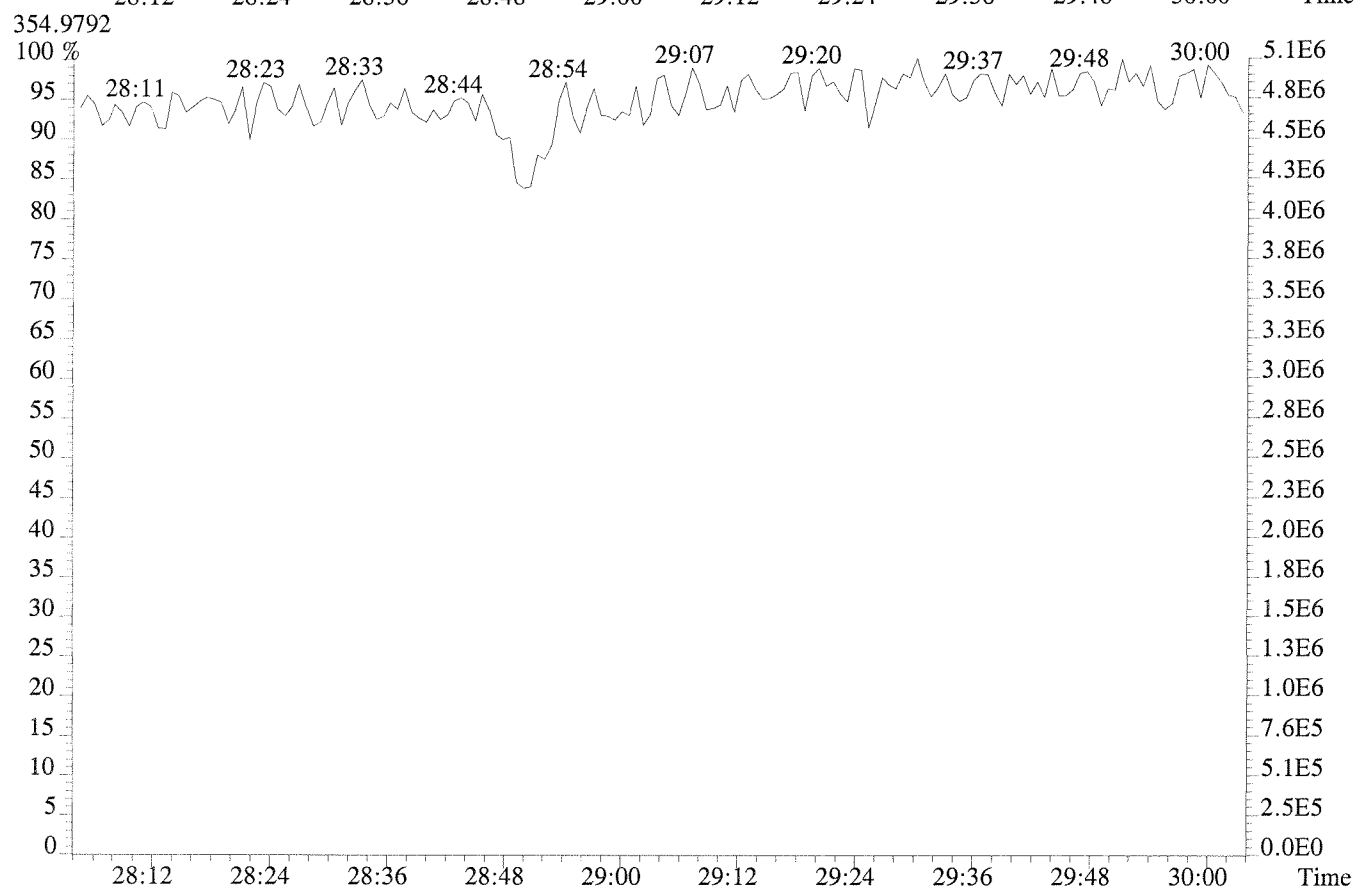
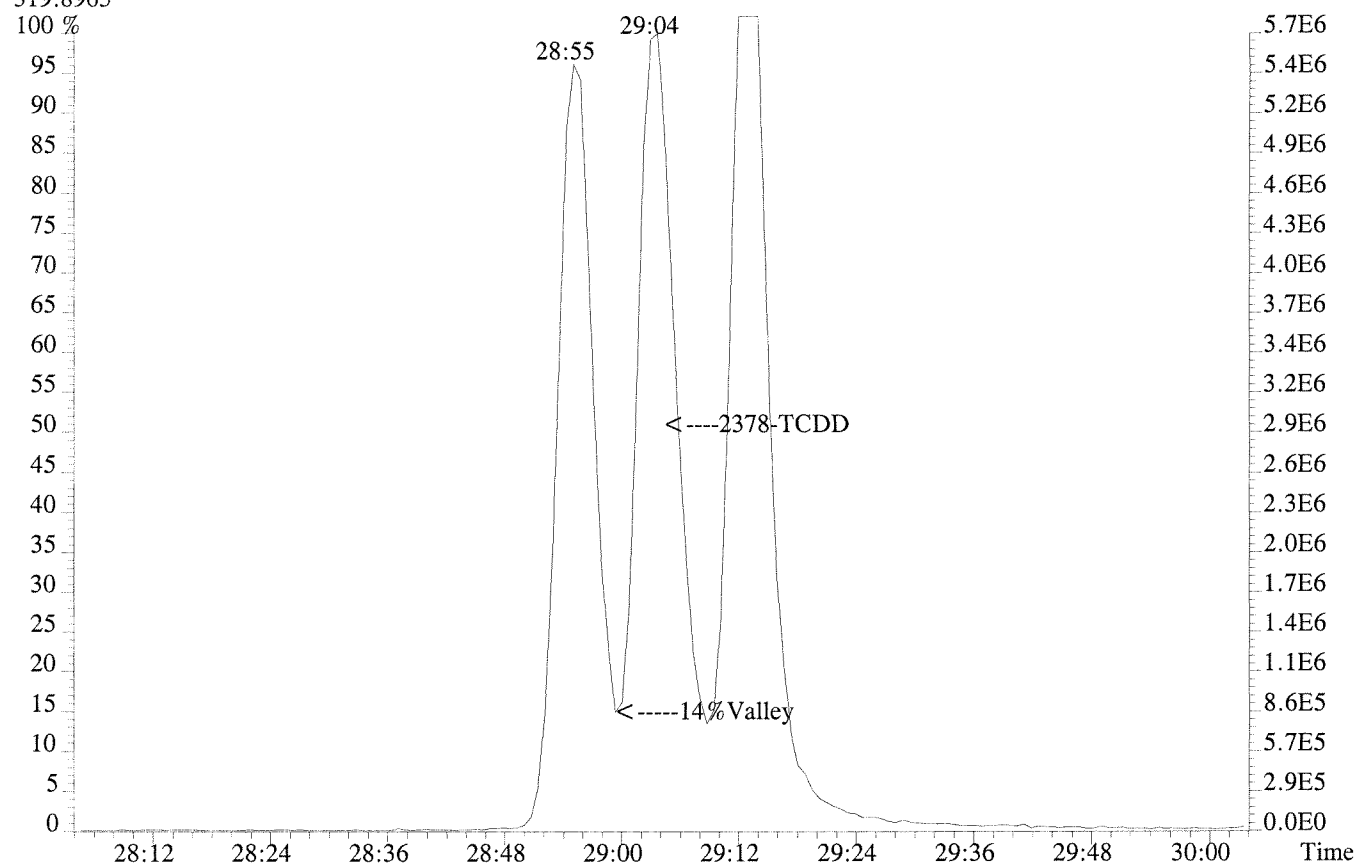
Time Analyzed: 06:28:37

Congener	Retention Time	Retention Time
	First Eluting	Last Eluting
TCDF	24:13	30:10
TCDD	25:59	30:08
PeCDF	30:25	34:17
PeCDD	31:46	34:08
HxCDF	35:08	37:28
HxCDD	35:39	37:08
HpCDF	38:49	40:07
HpCDD	39:04	39:43

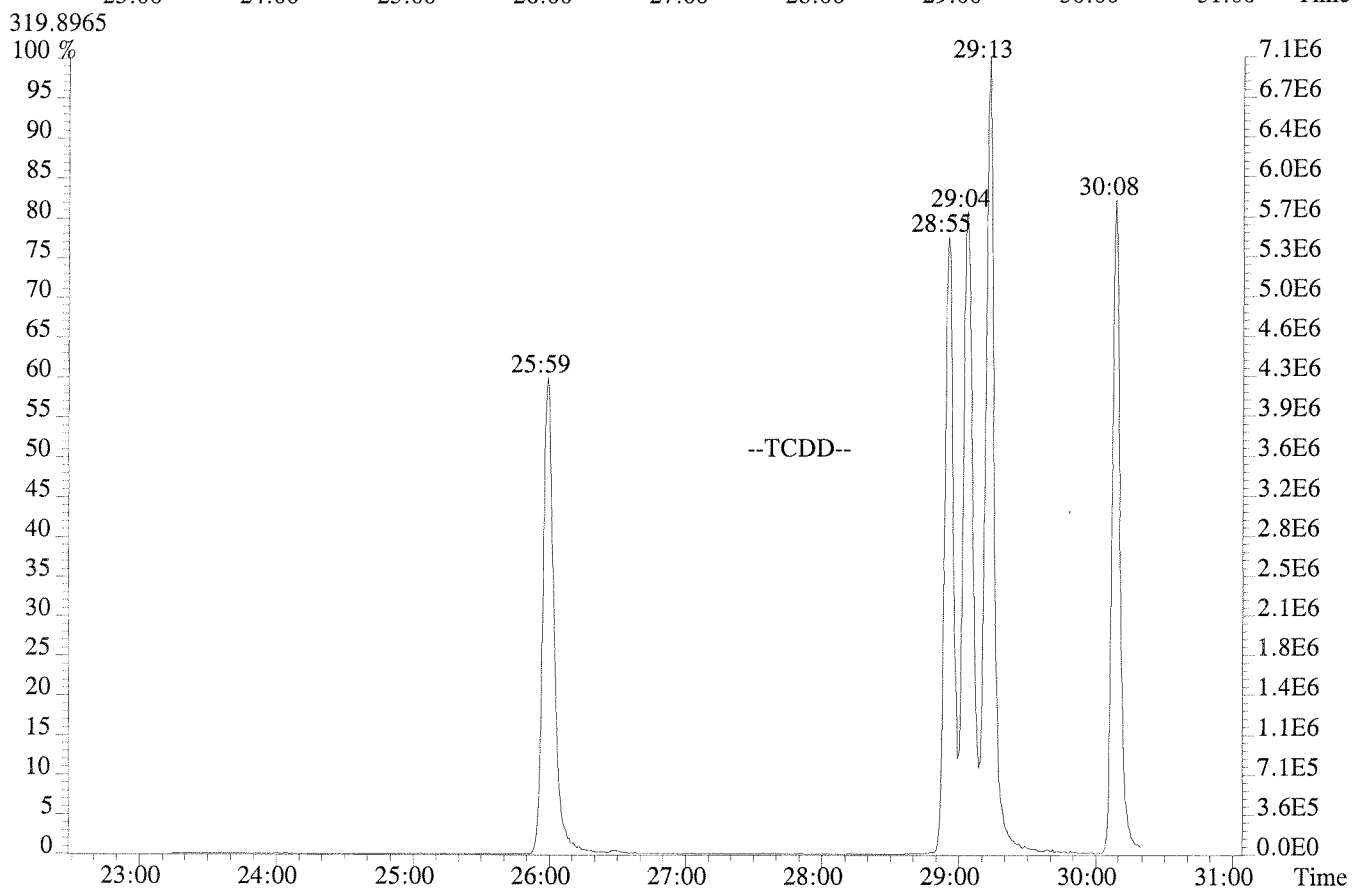
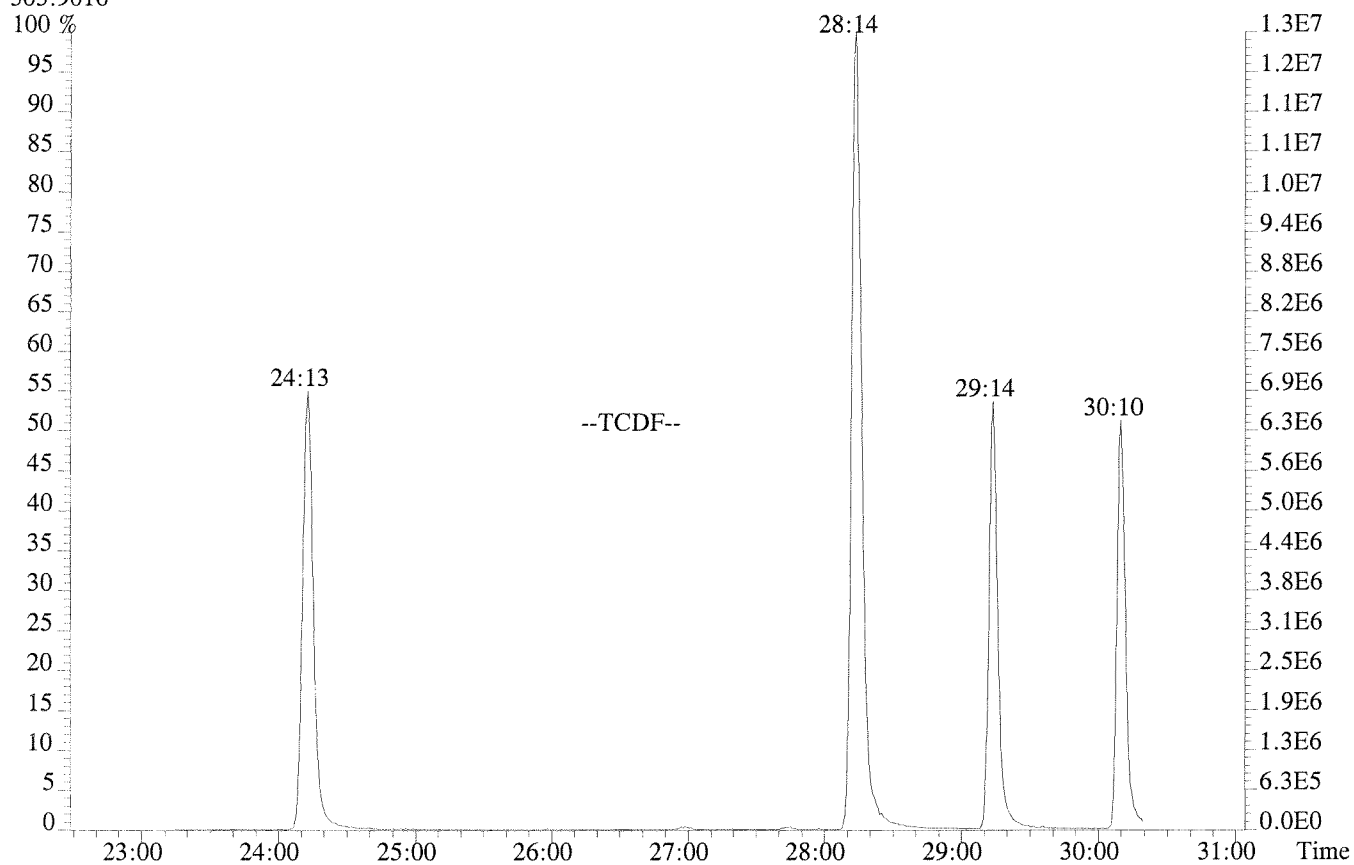
% Valley 2378-TCDD:

14 %

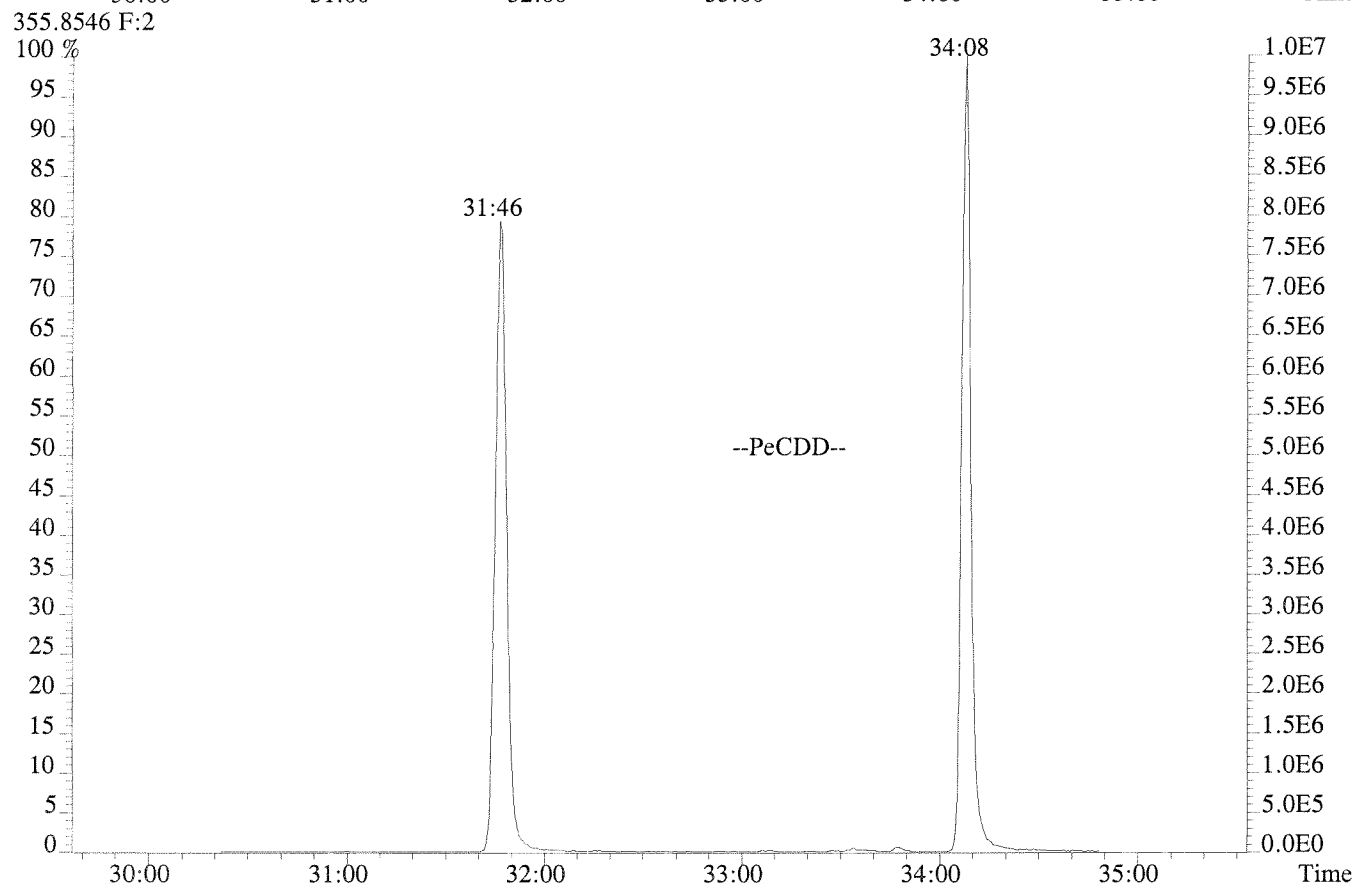
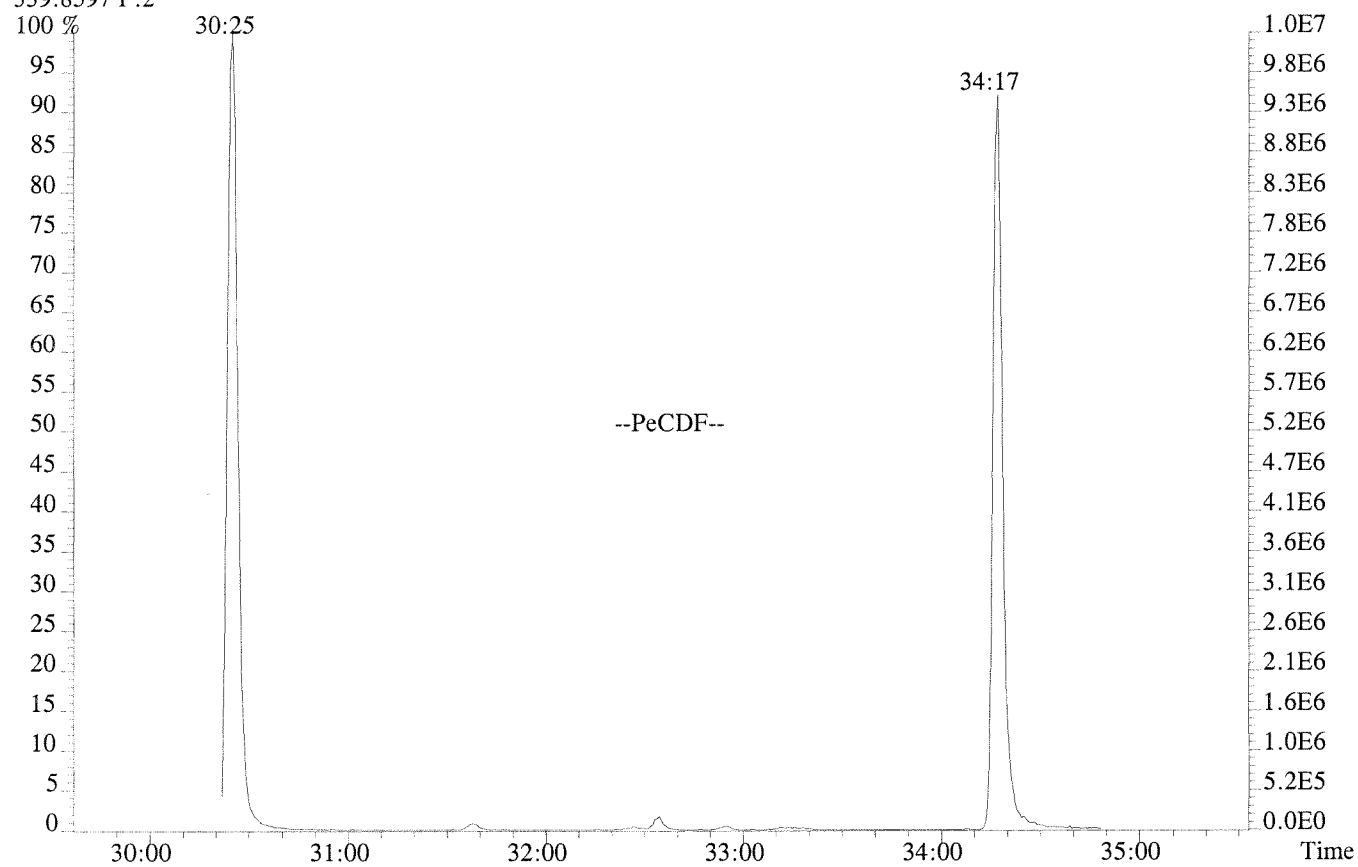
File:P208827 #1-591 Acq:27-JUL-2010 06:28:37 Probe EI+ Magnet SIR VG BioTech Mass spectf
Sample#1 Exp:WINDOW DEFINE
319.8965



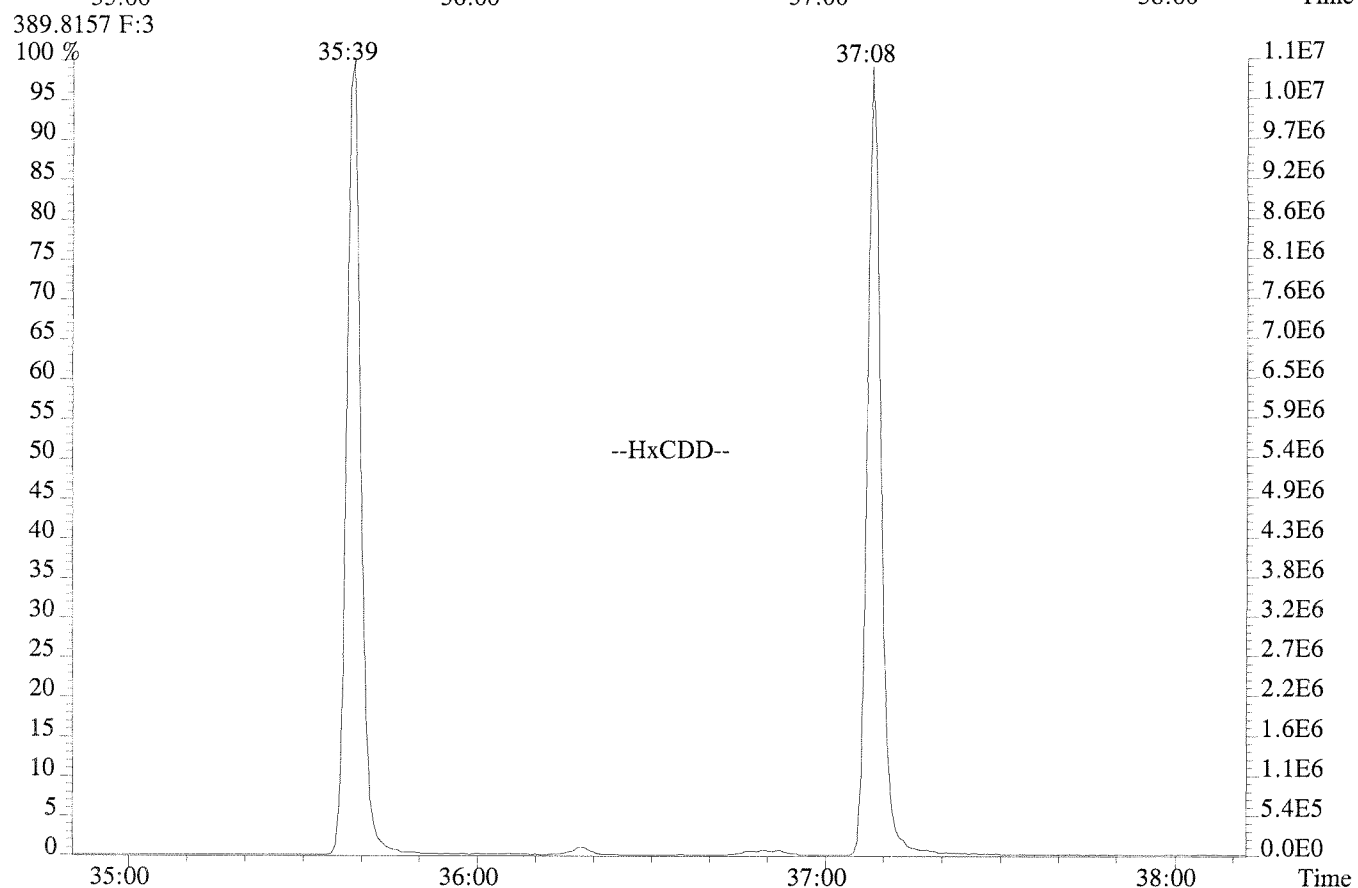
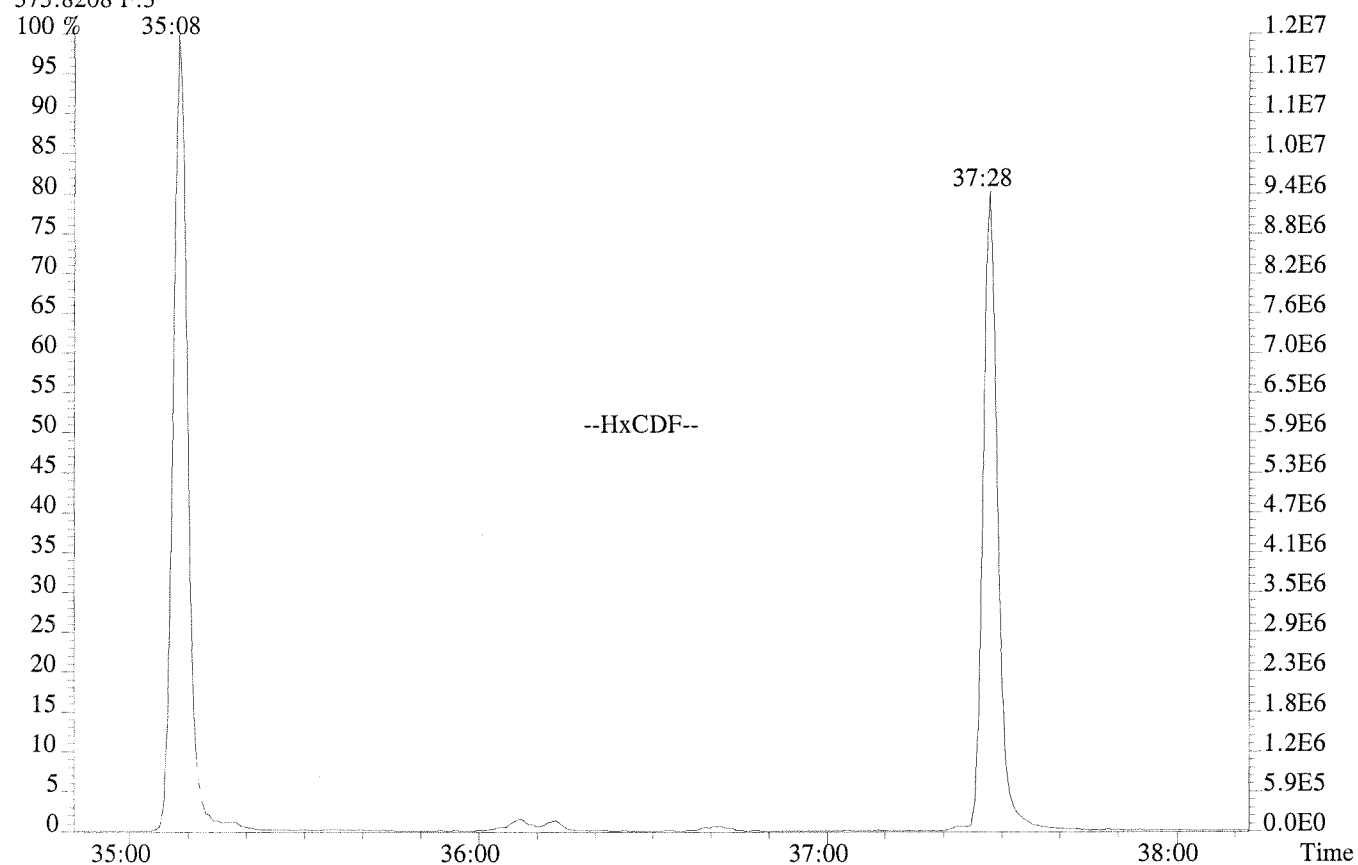
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Sample#1 Exp:WINDOW DEFINE
303.9016



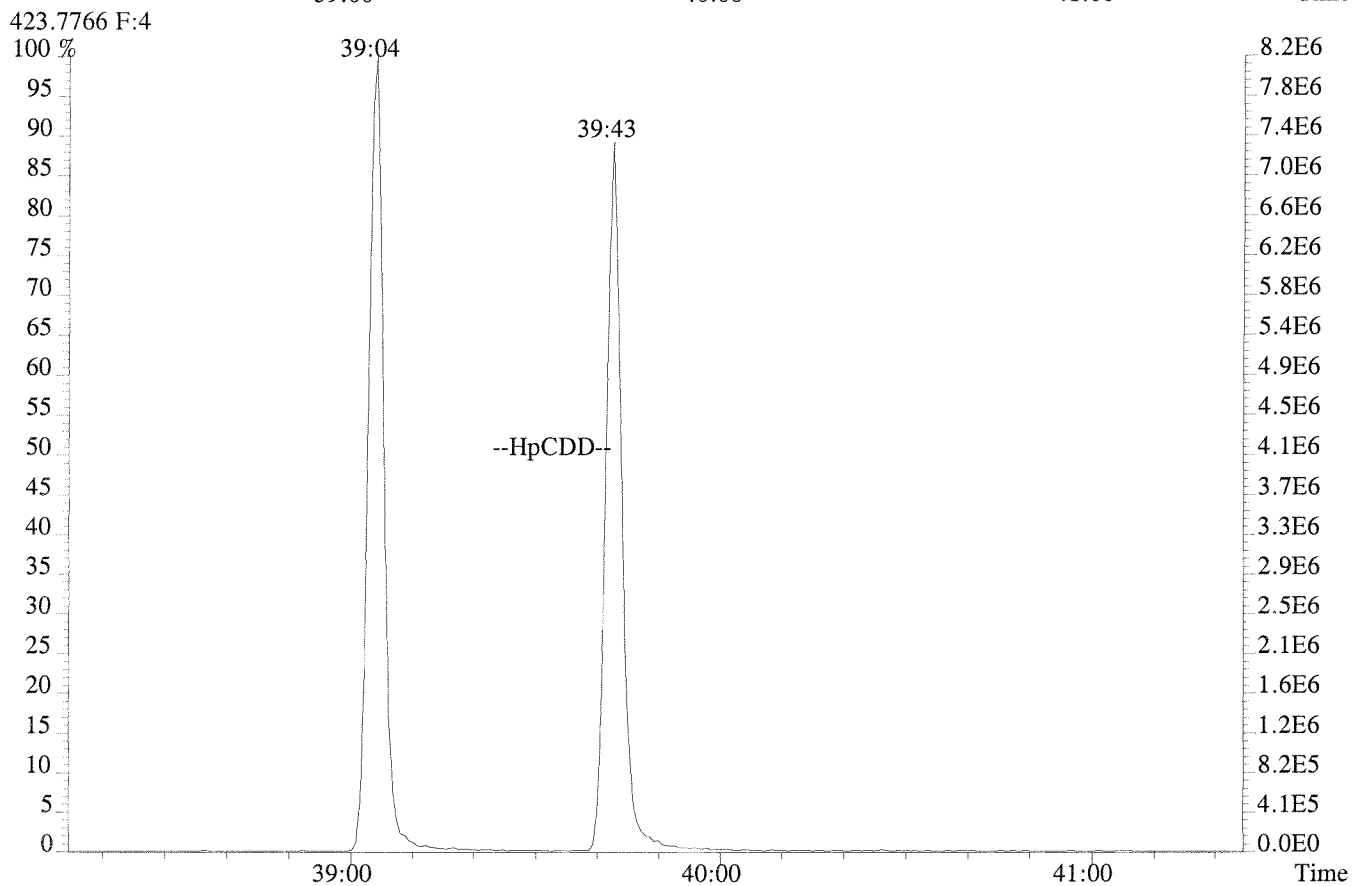
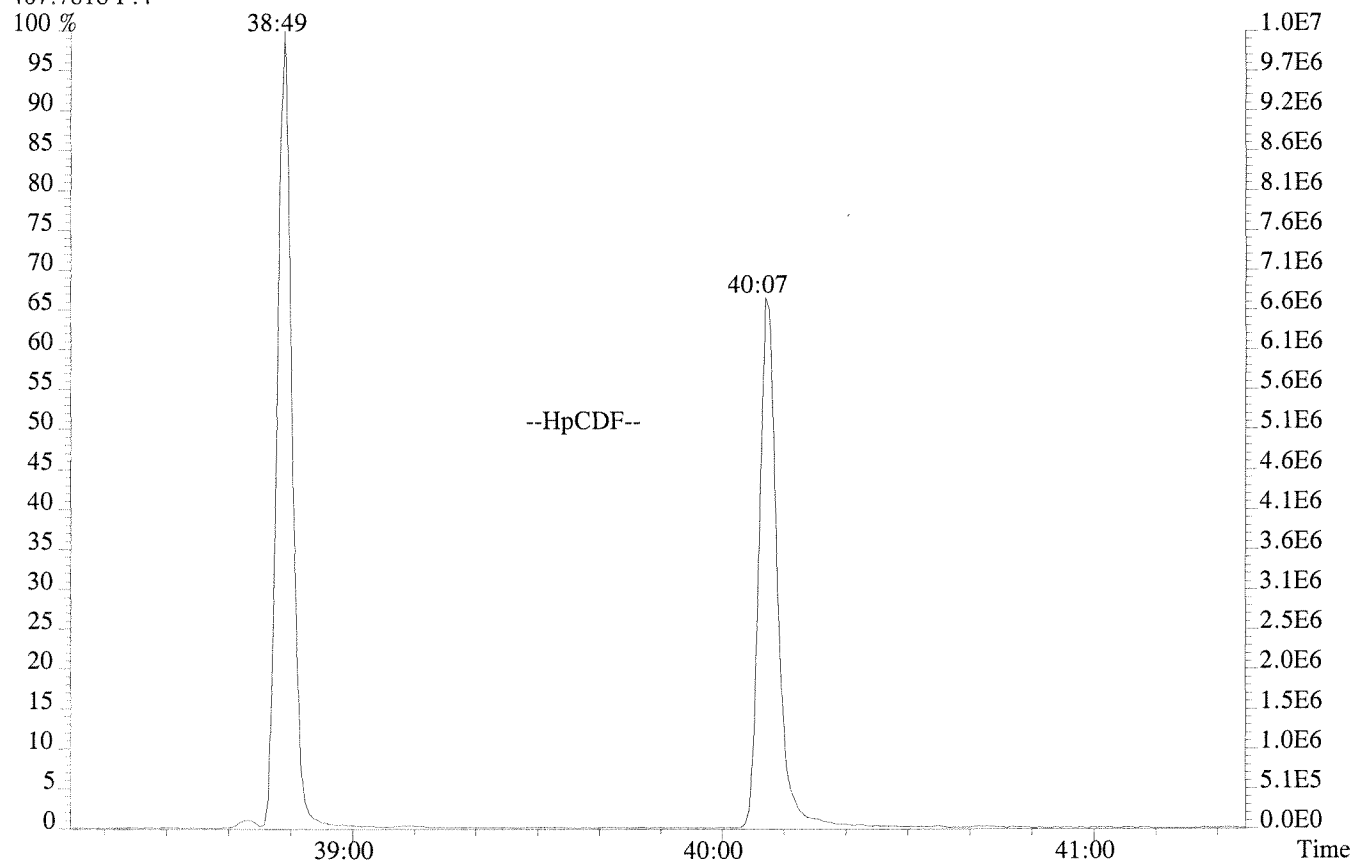
File:P208827 #1-404 Acq:27-JUL-2010 06:28:37 Probe EI+ Magnet SIR VG BioTech Mass spectf
Sample#1 Exp:WINDOW DEFINE
339.8597 F:2



File:P208827 #1-306 Acq:27-JUL-2010 06:28:37 Probe EI+ Magnet SIR VG BioTech Mass spectf
Sample#1 Exp:WINDOW DEFINE
373.8208 F:3



File:P208827 #1-288 Acq:27-JUL-2010 06:28:37 Probe EI+ Magnet SIR VG BioTech Mass spectf
Sample#1 Exp:WINDOW DEFINE
407.7818 F:4



USEPA - ITD

FORM 4A
PCDD/PCDF CALIBRATION VERIFICATION

Lab Name: Columbia Analytical Services Episode No.:

Contract No.: SDG No.:

Initial Calibration Date: 08/01/08

Instrument ID: AutoSpec-Premier GC Column ID: DB-5

VER Data Filename: P208826 Analysis Date: 27-JUL-10 Time: 05:07:52

	M/Z'S FORMING RATIO (1)	ION ABUND. RATIO	QC LIMITS (2)	CCAL. RRF	MEAN RRF	%D (3)
NATIVE ANALYTES						
2,3,7,8-TCDD	M/M+2	0.77	0.65-0.89	0.87	0.92	-5.24
1,2,3,7,8-PeCDD	M+2/M+4	1.55	1.32-1.78	0.81	0.87	-6.63
1,2,3,4,7,8-HxCDD	M+2/M+4	1.23	1.05-1.43	0.88	0.93	-4.81
1,2,3,6,7,8-HxCDD	M+2/M+4	1.28	1.05-1.43	1.08	1.05	2.66
1,2,3,7,8,9-HxCDD	M+2/M+4	1.29	1.05-1.43	0.96	0.97	-0.78
1,2,3,4,6,7,8-HpCDD	M+2/M+4	1.06	0.88-1.20	0.86	0.88	-1.62
OCDD	M+2/M+4	0.90	0.76-1.02	1.01	0.96	5.53
2,3,7,8-TCDF	M/M+2	0.75	0.65-0.89	0.83	0.83	-0.23
1,2,3,7,8-PeCDF	M+2/M+4	1.51	1.32-1.78	0.83	0.84	-1.10
2,3,4,7,8-PeCDF	M+2/M+4	1.50	1.32-1.78	0.84	0.85	-1.17
1,2,3,4,7,8-HxCDF	M+2/M+4	1.20	1.05-1.43	0.95	1.07	-11.58
1,2,3,6,7,8-HxCDF	M+2/M+4	1.22	1.05-1.43	1.19	1.13	5.17
1,2,3,7,8,9-HxCDF	M+2/M+4	1.21	1.05-1.43	0.84	0.86	-2.35
2,3,4,6,7,8-HxCDF	M+2/M+4	1.22	1.05-1.43	1.05	1.01	4.28
1,2,3,4,6,7,8-HpCDF	M+2/M+4	1.00	0.88-1.20	1.18	1.32	-10.15
1,2,3,4,7,8,9-HpCDF	M+2/M+4	1.00	0.88-1.20	0.89	0.97	-8.03
OCDF	M+2/M+4	0.88	0.76-1.02	1.05	1.10	-4.61

(1) See Table 6, Method 8290, for m/z specifications.

(2) Ion Abundance Ratio Control Limits as specified in Table 8, Method 8290.

(3) The beginning CCAL %RSD for the 17 unlabeled standard must not exceed +/- 20%, Section 7.7.4.1. The ending CCAL must not exceed +/-25%. Section 8.3.2.4.

8290F4Ap

USEPA - ITD

FORM 4B
PCDD/PCDF CALIBRATION VERIFICATION

Lab Name: Columbia Analytical Services Episode No.:

Contract No.: SDG No.:

Initial Calibration Date: 08/01/08

Instrument ID: AutoSpec-Premier GC Column ID: DB-5

VER Data Filename: P208826 Analysis Date: 27-JUL-10 Time: 05:07:52

	M/Z'S FORMING RATIO (1)	ION ABUND. RATIO	QC LIMITS (2)	CCAL. RRF	MEAN RRF	%D (3)
LABELED COMPOUNDS						
13C-2,3,7,8-TCDD	M/M+2	0.78	0.65-0.89	1.10	1.06	3.76
13C-1,2,3,7,8-PeCDD	M+2/M+4	1.58	1.32-1.78	1.13	0.87	29.72
13C-1,2,3,6,7,8-HxCDD	M+2/M+4	1.25	1.05-1.43	0.92	1.00	-8.18
13C-1,2,3,4,6,7,8-HpCDD	M+2/M+4	1.05	0.88-1.20	0.83	0.83	-0.40
13C-OCDD	M+2/M+4	0.90	0.76-1.02	0.66	0.73	-10.28
13C-2,3,7,8-TCDF	M/M+2	0.80	0.65-0.89	1.23	1.42	-13.74
13C-1,2,3,7,8-PeCDF	M+2/M+4	1.58	1.32-1.78	1.31	1.26	3.58
13C-1,2,3,4,7,8-HxCDF	M/M+2	0.52	0.43-0.59	1.02	1.28	-19.85
13C-1,2,3,4,6,7,8-HpCDF	M/M+2	0.44	0.37-0.51	0.83	0.90	-7.75
CLEANUP STANDARD						
37Cl-2,3,7,8-TCDD				0.98	0.98	-0.71

(1) See Table 6, Method 8290, for m/z specifications.

(2) Ion Abundance Ratio Control Limits as specified in Table 8, Method 8290.

(3) The beginning CCAL %RSD for the labeled standard must not exceed +/- 30%,
Section 7.7.4.2. The ending CCAL must not exceed +/- 35%, Section 8.3.2.4.

8290F4B

Columbia Analytical Services, Inc.

Sample Response Summary

CLIENT ID.

CCAL HRCC3

Run #6 Filename P208826 Samp: 1 Inj: 1 Acquired: 27-JUL-10 05:07:52
 Processed: 28-JUL-10 10:16:54 LAB. ID: CCAL HRCC3

Typ	Name	RT-1	Resp 1	Resp 2	Ratio	Meet	Mod?	RRF
1 Unk	2,3,7,8-TCDF	28:18	2.181e+04	2.915e+04	0.75	yes	yes	0.831
2 Unk	1,2,3,7,8-PeCDF	32:35	8.171e+04	5.420e+04	1.51	yes	yes	0.840
3 Unk	2,3,4,7,8-PeCDF	33:20	8.257e+04	5.488e+04	1.50	yes	no	0.850
4 Unk	1,2,3,4,7,8-HxCDF	36:07	6.834e+04	5.678e+04	1.20	yes	no	1.072
5 Unk	1,2,3,6,7,8-HxCDF	36:13	8.605e+04	7.048e+04	1.22	yes	no	1.128
6 Unk	2,3,4,6,7,8-HxCDF	36:42	7.623e+04	6.225e+04	1.22	yes	no	1.006
7 Unk	1,2,3,7,8,9-HxCDF	37:25	6.093e+04	5.039e+04	1.21	yes	no	0.864
8 Unk	1,2,3,4,6,7,8-HpCDF	38:49	6.332e+04	6.327e+04	1.00	yes	no	1.315
9 Unk	1,2,3,4,7,8,9-HpCDF	40:08	4.789e+04	4.770e+04	1.00	yes	no	0.970
10 Unk	OCDF	42:51	8.346e+04	9.483e+04	0.88	yes	no	1.103
11 Unk	2,3,7,8-TCDD	29:05	2.070e+04	2.696e+04	0.77	yes	yes	0.916
12 Unk	1,2,3,7,8-PeCDD	33:40	6.993e+04	4.501e+04	1.55	yes	no	0.869
13 Unk	1,2,3,4,7,8-HxCDD	36:49	5.729e+04	4.659e+04	1.23	yes	no	0.925
14 Unk	1,2,3,6,7,8-HxCDD	36:53	7.155e+04	5.611e+04	1.28	yes	no	1.054
15 Unk	1,2,3,7,8,9-HxCDD	37:11	6.358e+04	4.942e+04	1.29	yes	no	0.966
16 Unk	1,2,3,4,6,7,8-HpCDD	39:42	4.742e+04	4.494e+04	1.06	yes	no	0.879
17 Unk	OCDD	42:40	8.124e+04	9.024e+04	0.90	yes	no	0.959
18 IS	13C-2,3,7,8-TCDF	28:16	1.364e+05	1.709e+05	0.80	yes	no	1.424
19 IS	13C-1,2,3,7,8-PeCDF	32:34	2.005e+05	1.268e+05	1.58	yes	no	1.263
20 IS	13C-1,2,3,4,7,8-HxCDF	36:06	2.249e+05	4.349e+05	0.52	yes	no	1.279
21 IS	13C-1,2,3,4,6,7,8-HpCDF	38:48	1.643e+05	3.713e+05	0.44	yes	no	0.902
22 IS	13C-2,3,7,8-TCDD	29:04	1.201e+05	1.543e+05	0.78	yes	no	1.057
23 IS	13C-1,2,3,7,8-PeCDD	33:39	1.734e+05	1.099e+05	1.58	yes	yes	0.873
24 IS	13C-1,2,3,6,7,8-HxCDD	36:52	3.274e+05	2.623e+05	1.25	yes	no	0.997
25 IS	13C-1,2,3,4,6,7,8-HpCDD	39:41	2.730e+05	2.612e+05	1.05	yes	no	0.833
26 IS	13C-OCDD	42:40	4.021e+05	4.449e+05	0.90	yes	no	0.733
27 RS/RT	13C-1,2,3,4-TCDD	28:49	1.103e+05	1.399e+05	0.79	yes	no	-
28 RS/RT	13C-1,2,3,7,8,9-HxCDD	37:10	3.586e+05	2.853e+05	1.26	yes	no	-
29 C/Up	37Cl-2,3,7,8-TCDD	29:05	4.884e+04				no	0.983
				SUM AREA				
30 Tot	Total Tetra-Furans	28:18		5.096e+04	0.75	yes		0.831
31 Tot	Total Tetra-Dioxins	29:05		4.766e+04	0.77	yes		0.916
32 Tot	Total Penta-Furans	32:35		2.733e+05	1.51	yes		0.845
33 Tot	Total Penta-Dioxins	33:40		1.149e+05	1.55	yes		0.869
34 Tot	Total Hexa-Furans	36:07		5.315e+05	1.20	yes		1.018
35 Tot	Total Hexa-Dioxins	36:49		3.445e+05	1.23	yes		0.982
36 Tot	Total Hepta-Furans	38:49		2.222e+05	1.00	yes		1.143
37 Tot	Total Hepta-Dioxins	39:04		9.275e+04	1.07	yes		0.879

Columbia Analytical Services, Inc.

19408 Park Row., Suite 320

Houston, TX 77084

Office (713) 266-1599. Fax (713) 266-0130

Columbia Analytical Services, Inc.
Signal/Noise Height Ratio Summary

CLIENT ID.
CCAL HRCC3

Run #6 Filename P208826 Samp: 1 Inj: 1 Acquired: 27-JUL-10 05:07:52
Processed: 28-JUL-10 10:16:541 LAB. ID: CCAL HRCC3

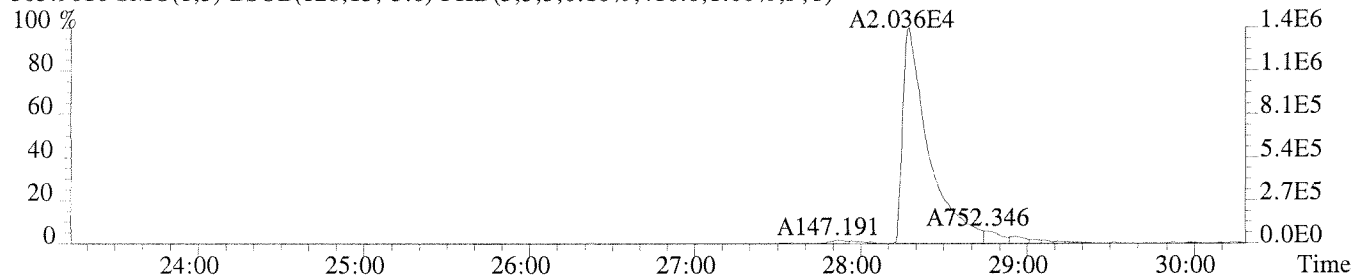
	Name	Signal 1	Noise 1	S/N Rat.1	Signal 2	Noise 2	S/N Rat.2
1	2,3,7,8-TCDF	1.35e+06	4.16e+02	3.3e+03	1.84e+06	7.40e+02	2.5e+03
2	1,2,3,7,8-PeCDF	9.35e+06	7.32e+02	1.3e+04	6.09e+06	1.24e+03	4.9e+03
3	2,3,4,7,8-PeCDF	9.63e+06	7.32e+02	1.3e+04	6.45e+06	1.24e+03	5.2e+03
4	1,2,3,4,7,8-HxCDF	1.31e+07	1.73e+03	7.6e+03	1.08e+07	1.13e+03	9.6e+03
5	1,2,3,6,7,8-HxCDF	1.27e+07	1.73e+03	7.3e+03	1.04e+07	1.13e+03	9.2e+03
6	2,3,4,6,7,8-HxCDF	1.26e+07	1.73e+03	7.3e+03	1.06e+07	1.13e+03	9.4e+03
7	1,2,3,7,8,9-HxCDF	8.97e+06	1.73e+03	5.2e+03	7.41e+06	1.13e+03	6.6e+03
8	1,2,3,4,6,7,8-HpCDF	1.18e+07	1.38e+04	8.5e+02	1.17e+07	8.26e+03	1.4e+03
9	1,2,3,4,7,8,9-HpCDF	7.19e+06	1.38e+04	5.2e+02	7.15e+06	8.26e+03	8.7e+02
10	OCDF	1.21e+07	6.36e+02	1.9e+04	1.38e+07	1.47e+03	9.4e+03
11	2,3,7,8-TCDD	1.66e+06	6.92e+02	2.4e+03	2.18e+06	4.04e+02	5.4e+03
12	1,2,3,7,8-PeCDD	9.15e+06	7.28e+02	1.3e+04	5.81e+06	7.36e+02	7.9e+03
13	1,2,3,4,7,8-HxCDD	1.22e+07	2.10e+03	5.8e+03	9.82e+06	1.50e+03	6.6e+03
14	1,2,3,6,7,8-HxCDD	1.25e+07	2.10e+03	5.9e+03	9.74e+06	1.50e+03	6.5e+03
15	1,2,3,7,8,9-HxCDD	1.05e+07	2.10e+03	5.0e+03	8.36e+06	1.50e+03	5.6e+03
16	1,2,3,4,6,7,8-HpCDD	8.27e+06	1.91e+03	4.3e+03	7.86e+06	1.24e+03	6.3e+03
17	OCDD	1.23e+07	1.13e+03	1.1e+04	1.36e+07	1.46e+03	9.4e+03
18	13C-2,3,7,8-TCDF	1.04e+07	3.26e+03	3.2e+03	1.33e+07	1.33e+03	1.0e+04
19	13C-1,2,3,7,8-PeCDF	2.60e+07	6.48e+02	4.0e+04	1.66e+07	5.40e+02	3.1e+04
20	13C-1,2,3,4,7,8-HxCDF	4.05e+07	7.00e+02	5.8e+04	7.82e+07	8.40e+02	9.3e+04
21	13C-1,2,3,4,6,7,8-HpCDF	3.24e+07	1.37e+04	2.4e+03	7.27e+07	3.07e+04	2.4e+03
22	13C-2,3,7,8-TCDD	1.11e+07	3.32e+03	3.3e+03	1.44e+07	1.78e+03	8.1e+03
23	13C-1,2,3,7,8-PeCDD	2.49e+07	6.32e+02	3.9e+04	1.60e+07	6.92e+02	2.3e+04
24	13C-1,2,3,6,7,8-HxCDD	6.33e+07	3.96e+03	1.6e+04	5.08e+07	1.70e+03	3.0e+04
25	13C-1,2,3,4,6,7,8-HpCDD	5.02e+07	1.29e+03	3.9e+04	4.83e+07	1.40e+03	3.4e+04
26	13C-OCDD	6.41e+07	9.68e+02	6.6e+04	7.16e+07	9.16e+02	7.8e+04
27	13C-1,2,3,4-TCDD	1.41e+07	3.32e+03	4.2e+03	1.79e+07	1.78e+03	1.0e+04
28	13C-1,2,3,7,8,9-HxCDD	6.58e+07	3.96e+03	1.7e+04	5.18e+07	1.70e+03	3.0e+04
29	37Cl-2,3,7,8-TCDD	3.98e+06	1.27e+03	3.1e+03			

Columbia Analytical Services, Inc.
19408 Park Row, Suite 320
Houston, TX 77084
Office: (713) 266-1599. Fax: (713) 266-0130

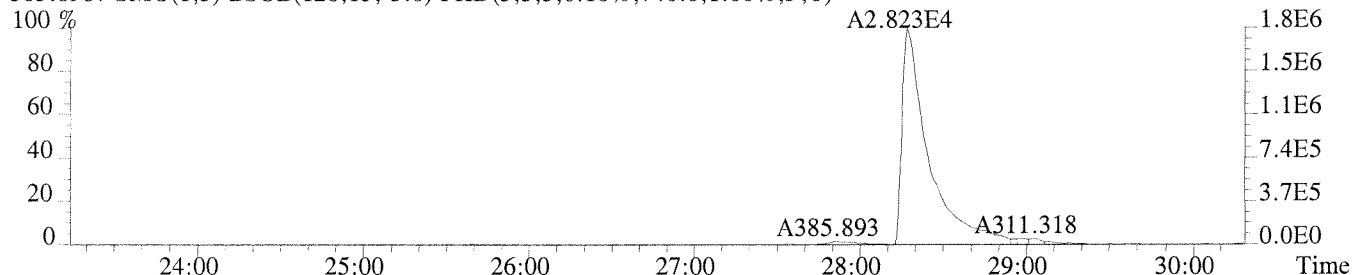
File:P208826 #1-590 Acq:27-JUL-2010 05:07:52 Probe EI+ Magnet SIR VG BioTech Mass spectf

Sample#1 Exp:CCAL HRCC3

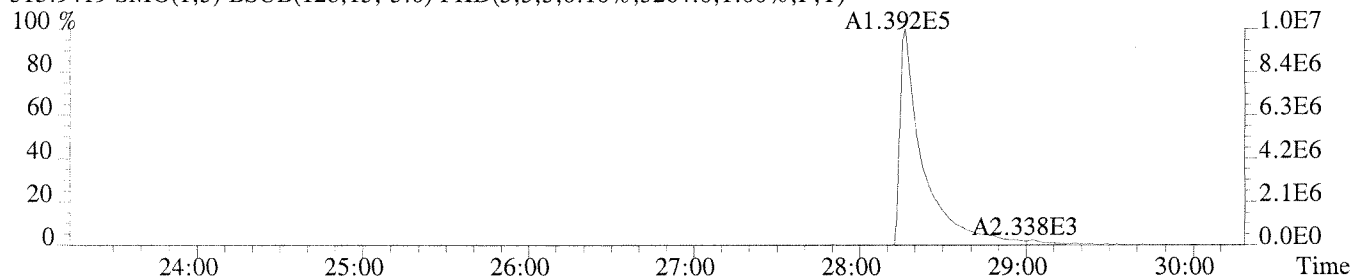
303.9016 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.10%,416.0,1.00%,F,T)



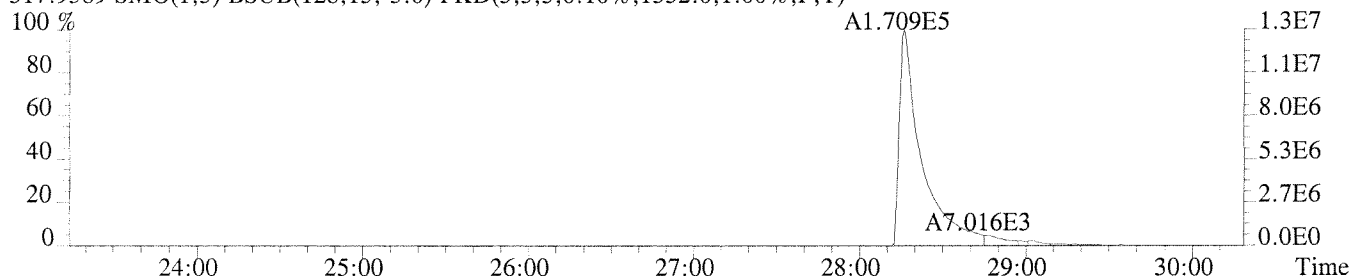
305.8987 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.10%,740.0,1.00%,F,T)



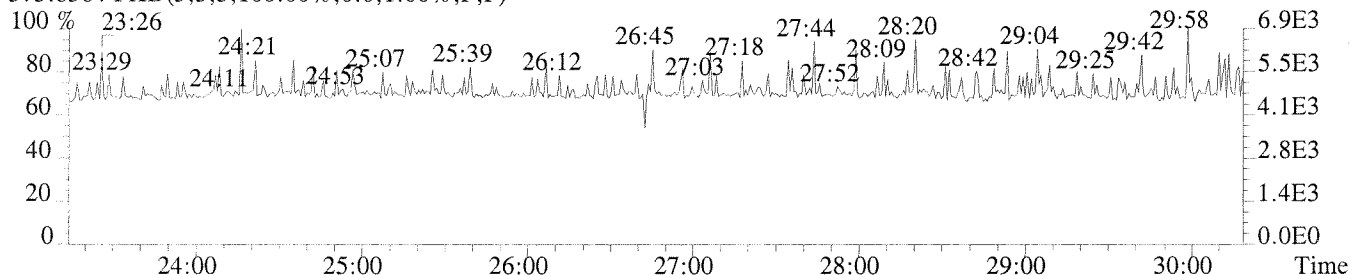
315.9419 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.10%,3264.0,1.00%,F,T)



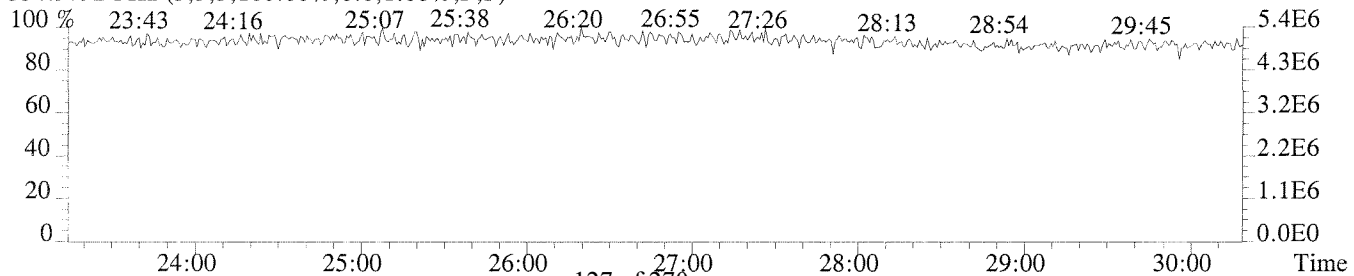
317.9389 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.10%,1332.0,1.00%,F,T)



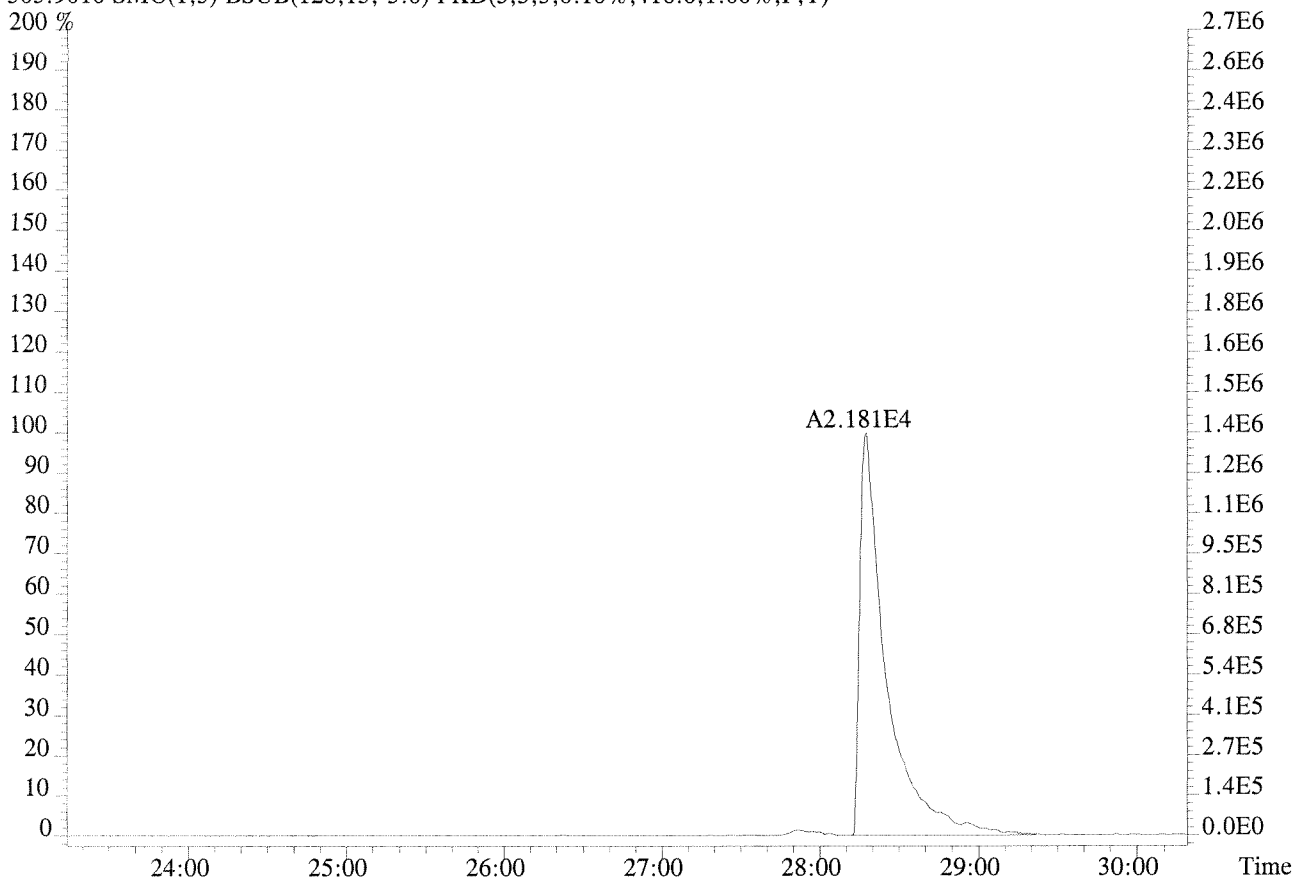
375.8364 PKD(5,3,5,100.00%,0.0,1.00%,F,F)



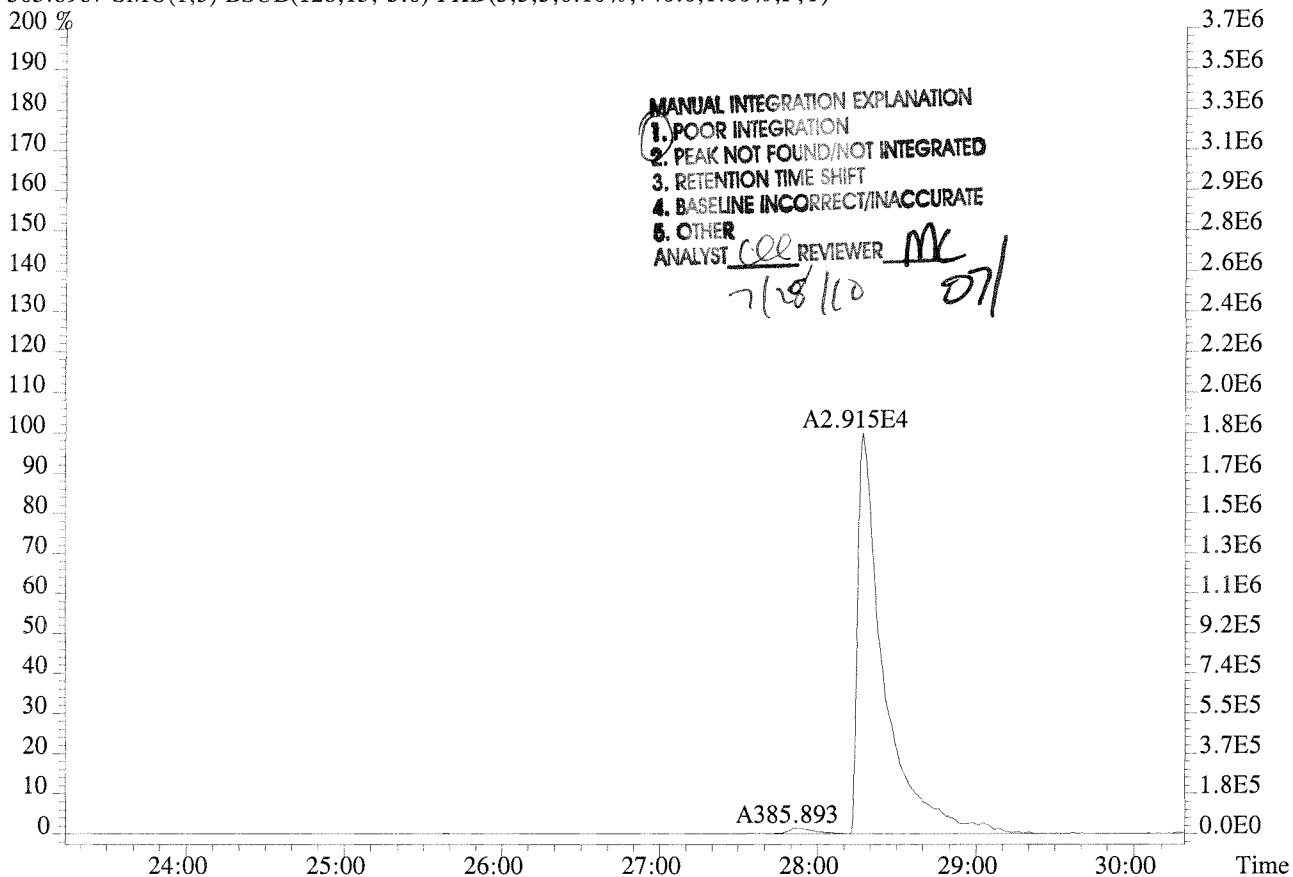
354.9792 PKD(3,3,3,100.00%,0.0,1.00%,F,F)



File:P208826 #1-590 Acq:27-JUL-2010 05:07:52 Probe EI+ Magnet SIR VG BioTech Mass sf
Sample#1 Exp:CCAL HRCC3
303.9016 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.10%,416.0,1.00%,F,T)



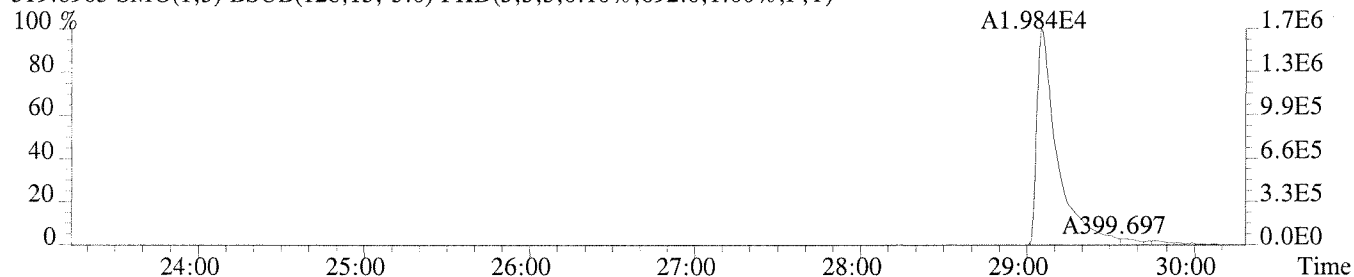
305.8987 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.10%,740.0,1.00%,F,T)



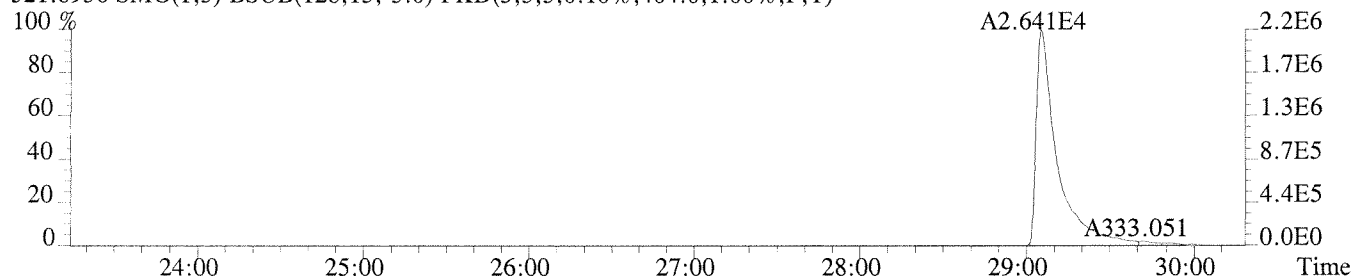
File:P208826 #1-590 Acq:27-JUL-2010 05:07:52 Probe EI+ Magnet SIR VG BioTech Mass spectf

Sample#1 Exp:CCAL HRCC3

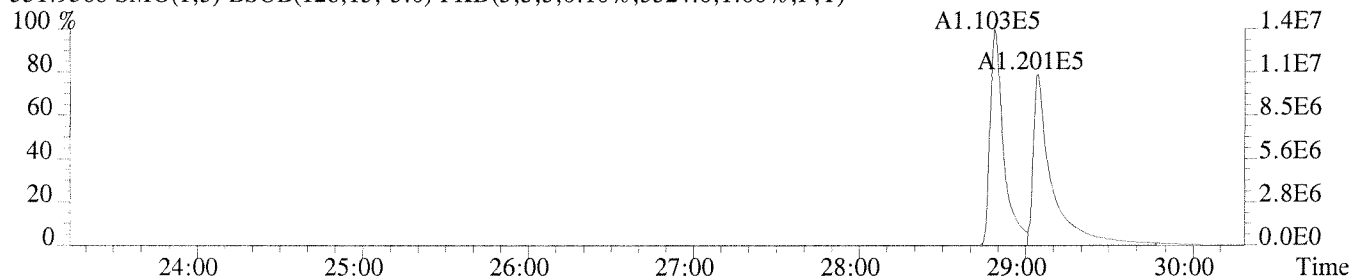
319.8965 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.10%,692.0,1.00%,F,T)



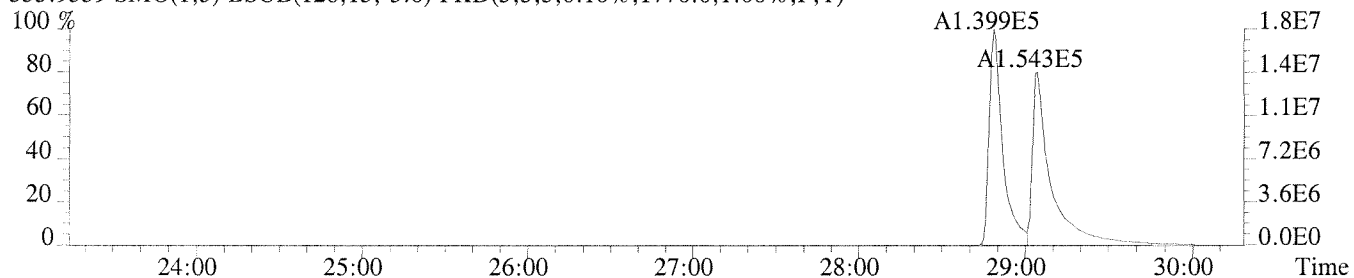
321.8936 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.10%,404.0,1.00%,F,T)



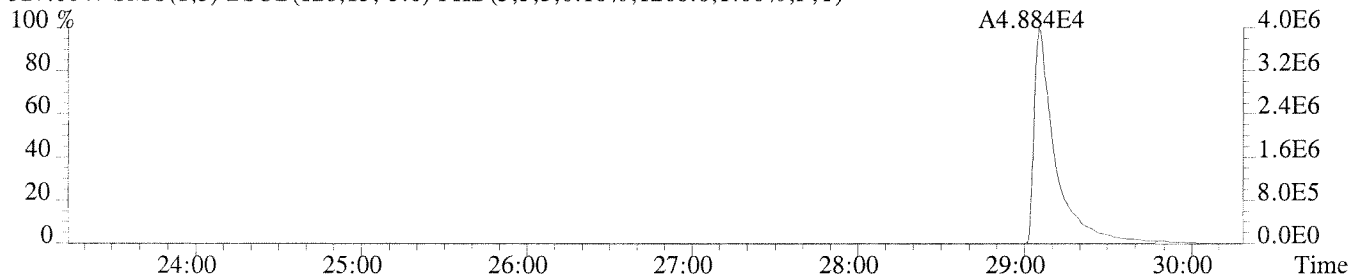
331.9368 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.10%,3324.0,1.00%,F,T)



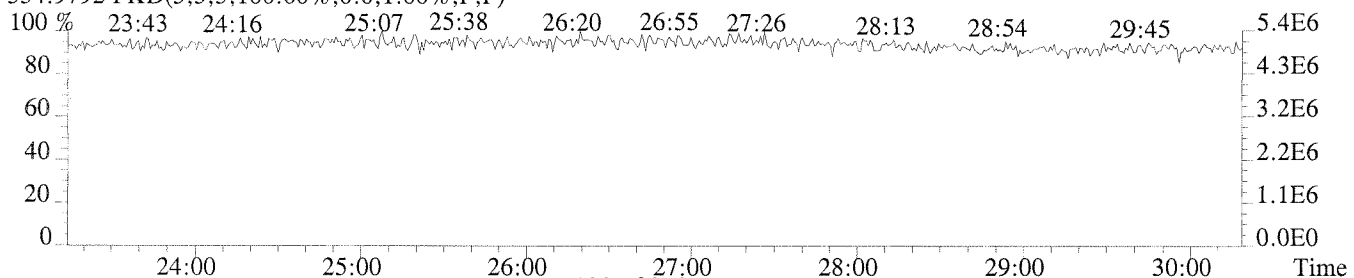
333.9339 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.10%,1776.0,1.00%,F,T)



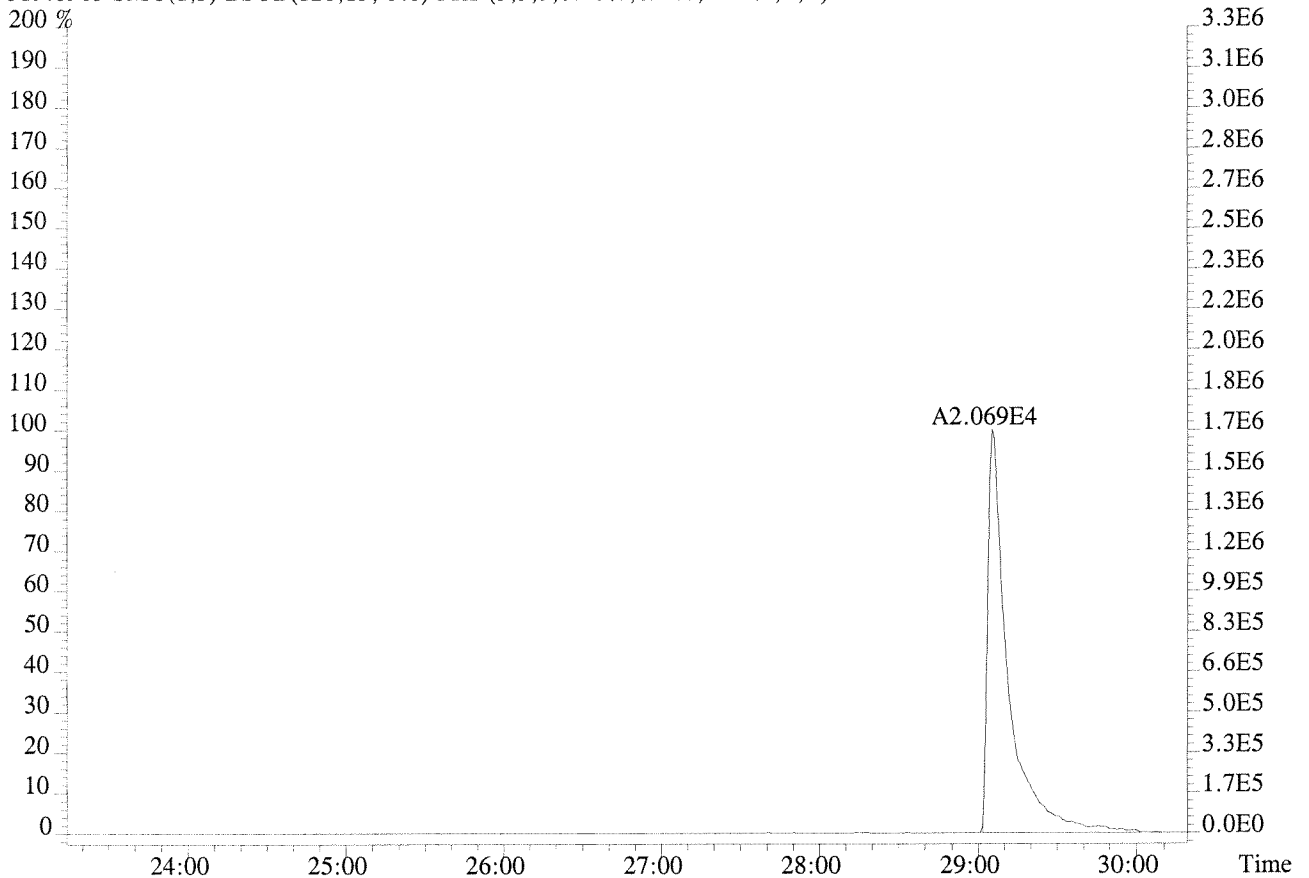
327.8847 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.10%,1268.0,1.00%,F,T)



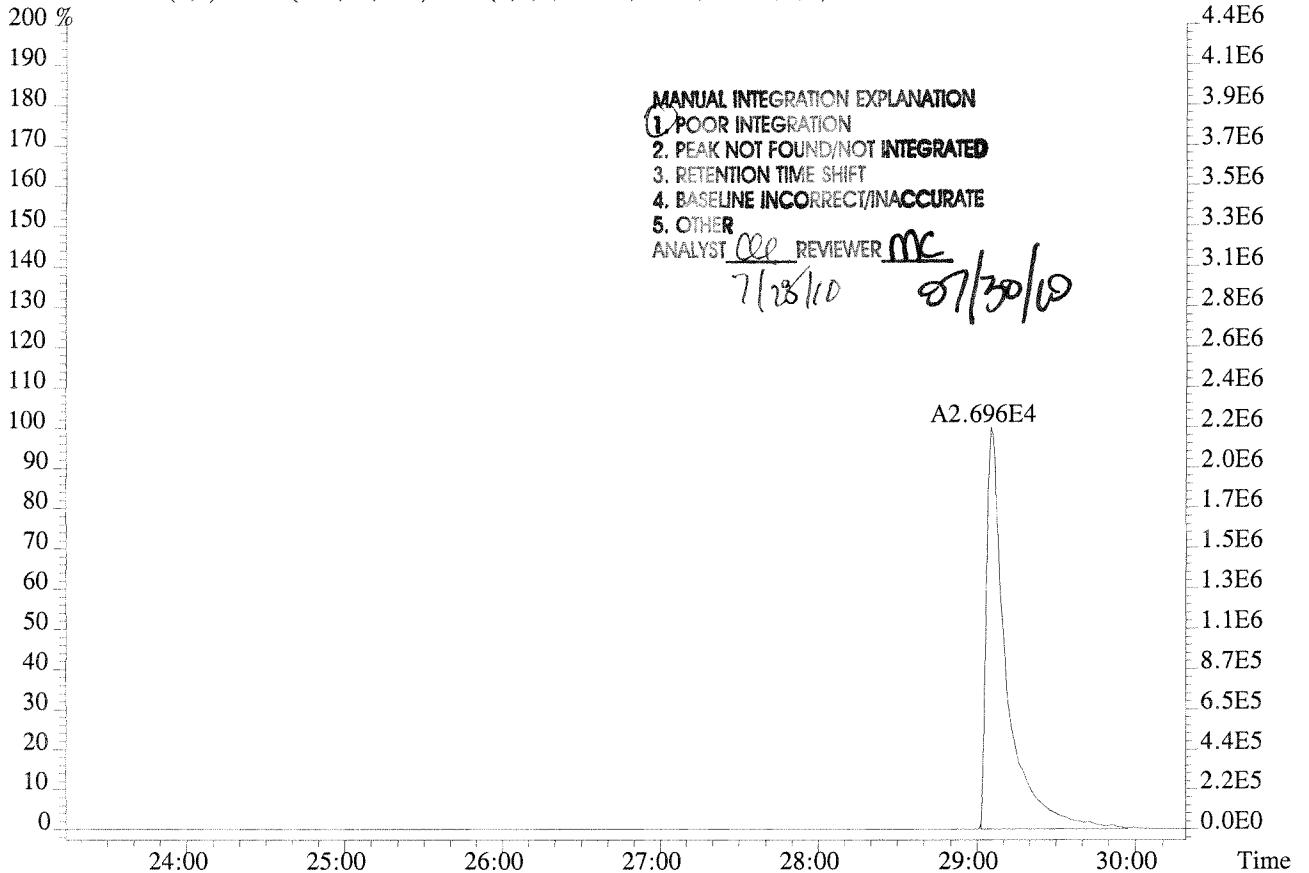
354.9792 PKD(3,3,3,100.00%,0.0,1.00%,F,F)



File:P208826 #1-590 Acq:27-JUL-2010 05:07:52 Probe EI+ Magnet SIR VG BioTech Mass sf
Sample#1 Exp:CCAL HRCC3
319.8965 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.10%,692.0,1.00%,F,T)



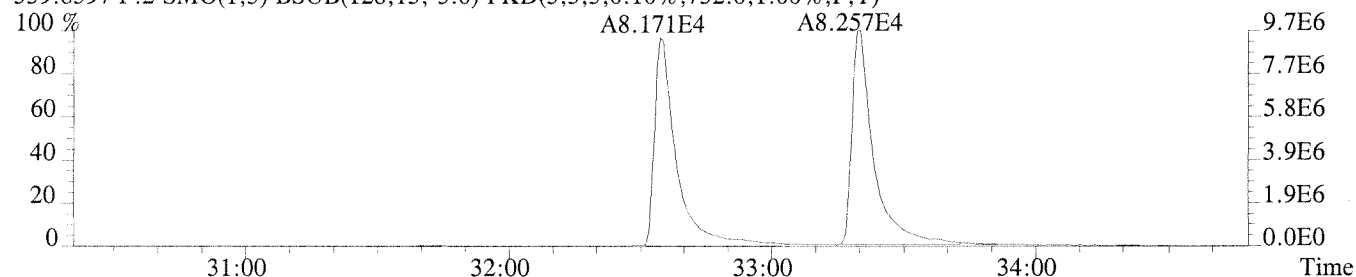
321.8936 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.10%,404.0,1.00%,F,T)



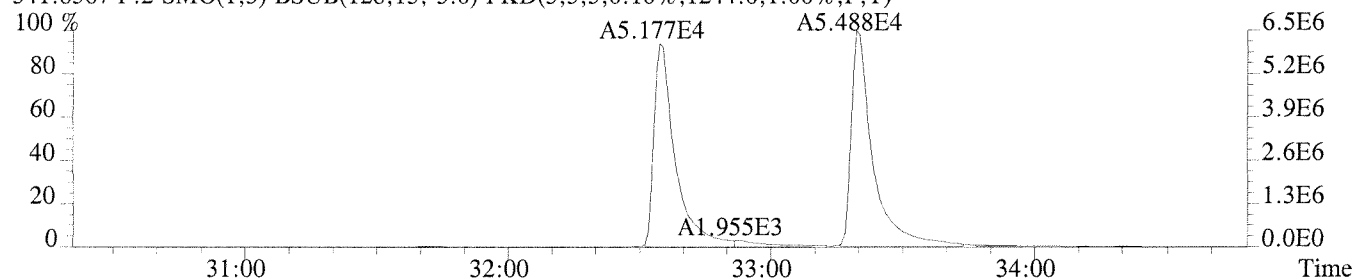
File:P208826 #1-405 Acq:27-JUL-2010 05:07:52 Probe EI+ Magnet SIR VG BioTech Mass spectf

Sample#1 Exp:CCAL HRCC3

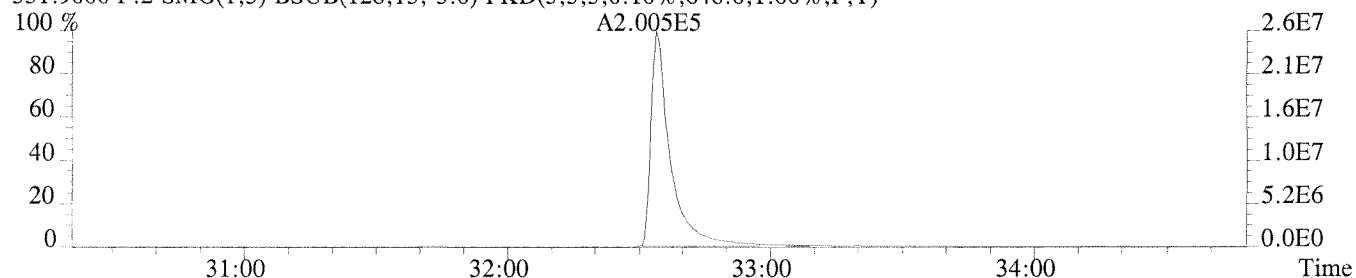
339.8597 F:2 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.10%,732.0,1.00%,F,T)



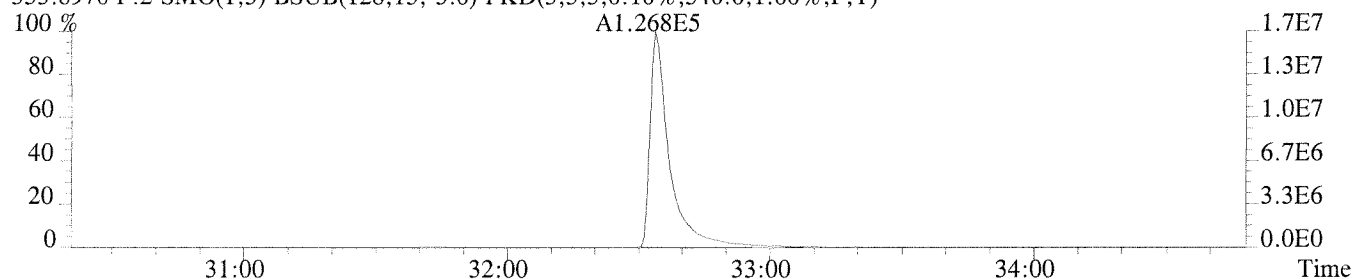
341.8567 F:2 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.10%,1244.0,1.00%,F,T)



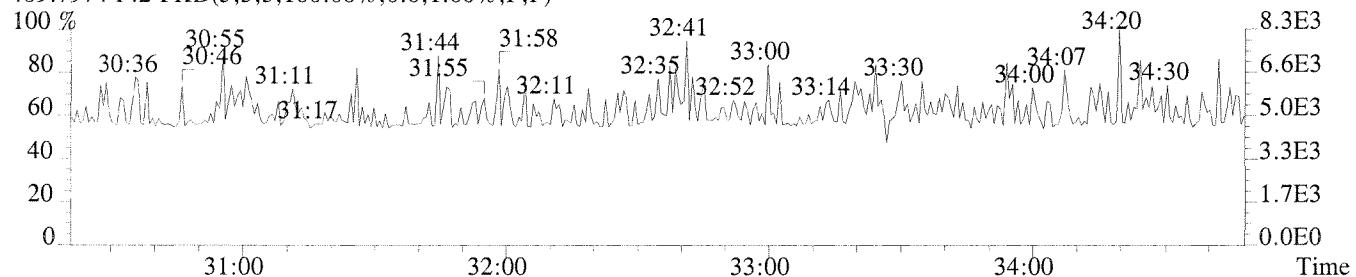
351.9000 F:2 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.10%,648.0,1.00%,F,T)



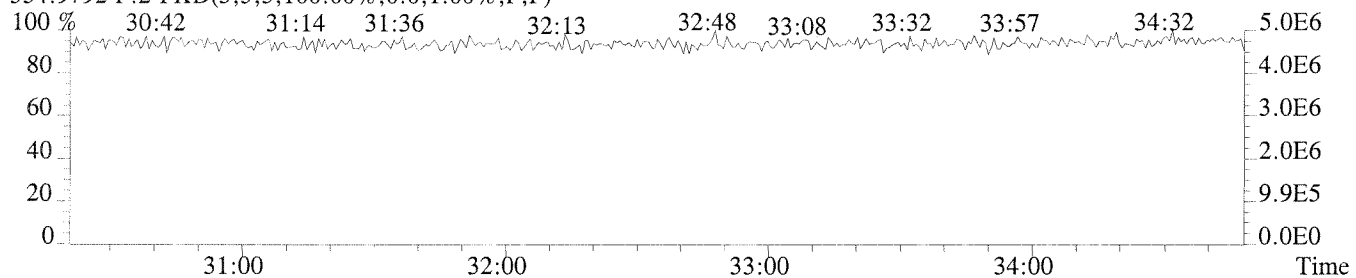
353.8970 F:2 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.10%,540.0,1.00%,F,T)



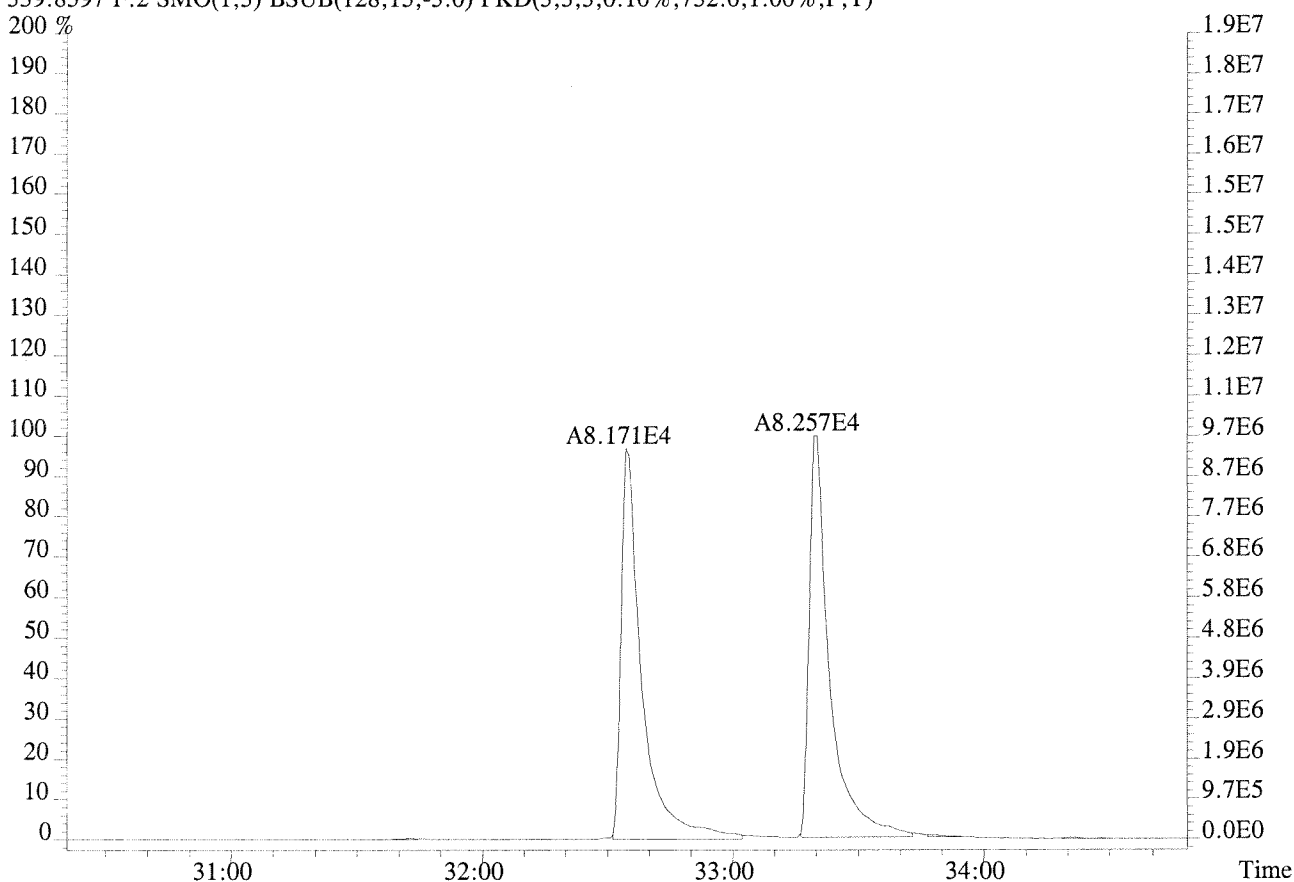
409.7974 F:2 PKD(5,3,5,100.00%,0.0,1.00%,F,F)



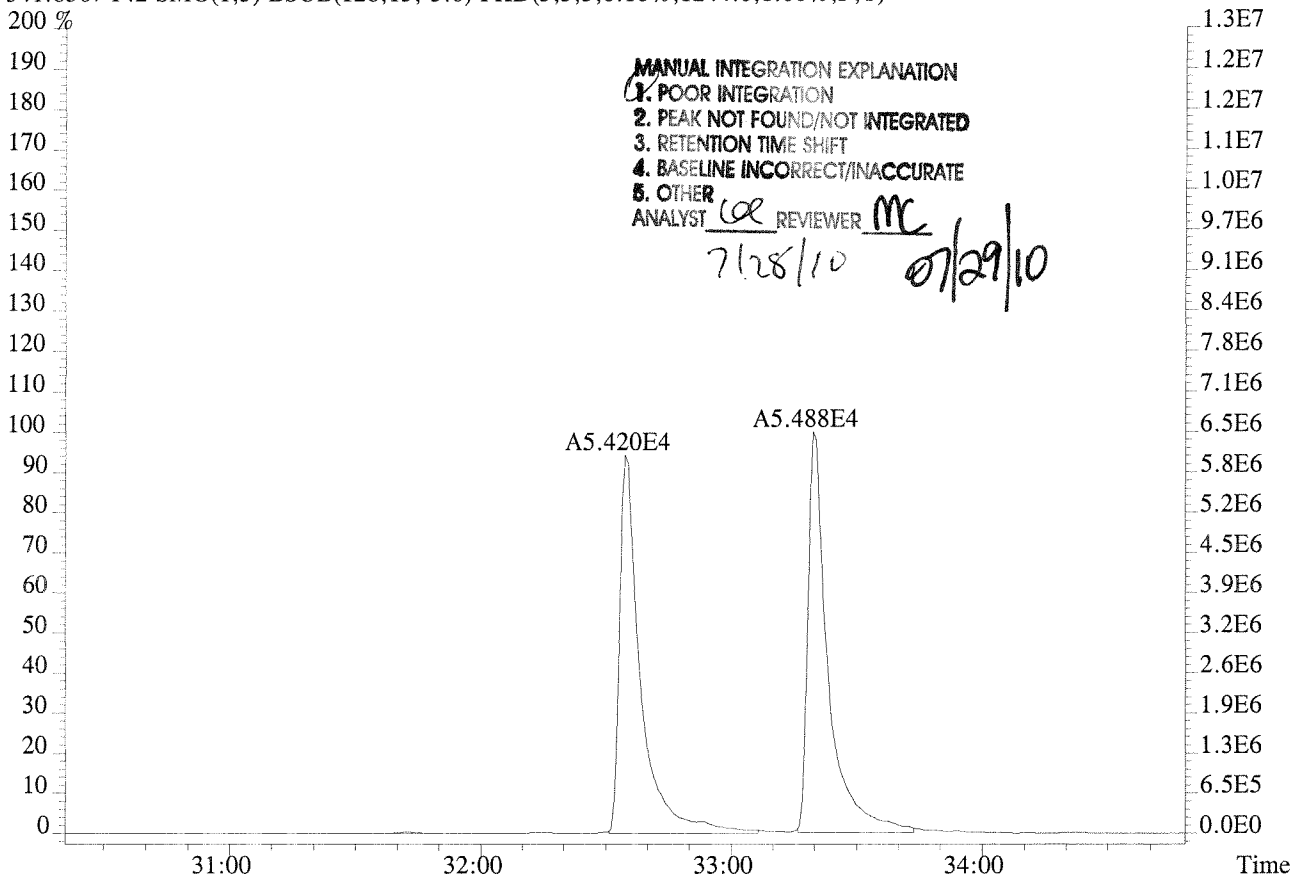
354.9792 F:2 PKD(3,3,3,100.00%,0.0,1.00%,F,F)



File:P208826 #1-405 Acq:27-JUL-2010 05:07:52 Probe EI+ Magnet SIR VG BioTech Mass sf
Sample#1 Exp:CCAL HRCC3
339.8597 F:2 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.10%,732.0,1.00%,F,T)



341.8567 F:2 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.10%,1244.0,1.00%,F,T)



MANUAL INTEGRATION EXPLANATION

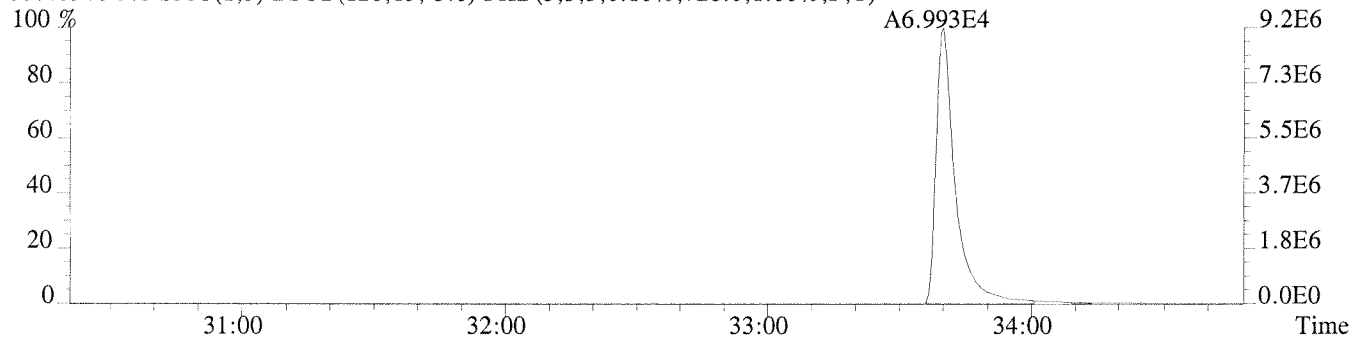
1. POOR INTEGRATION
2. PEAK NOT FOUND/NOT INTEGRATED
3. RETENTION TIME SHIFT
4. BASELINE INCORRECT/INACCURATE
5. OTHER

ANALYST W REVIEWER MC
7/28/10 07/29/10

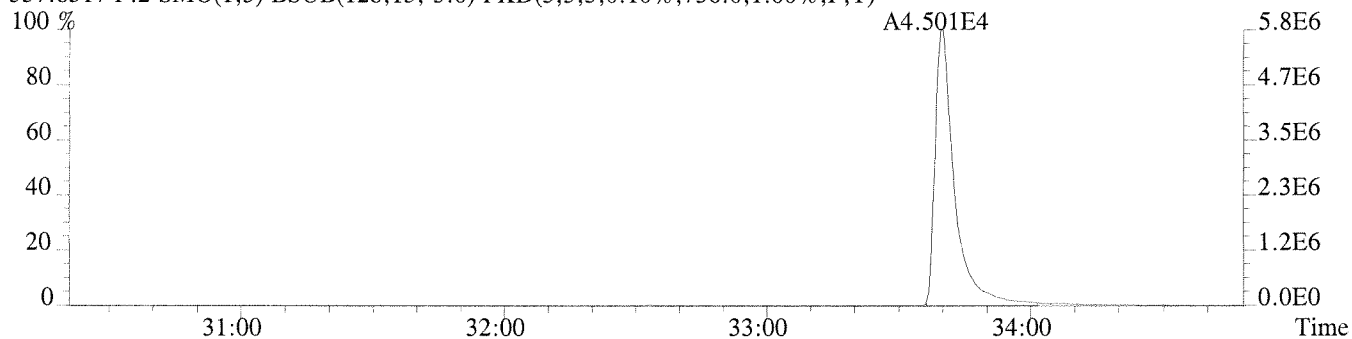
File:P208826 #1-405 Acq:27-JUL-2010 05:07:52 Probe EI+ Magnet SIR VG BioTech Mass spectf

Sample#1 Exp:CCAL HRCC3

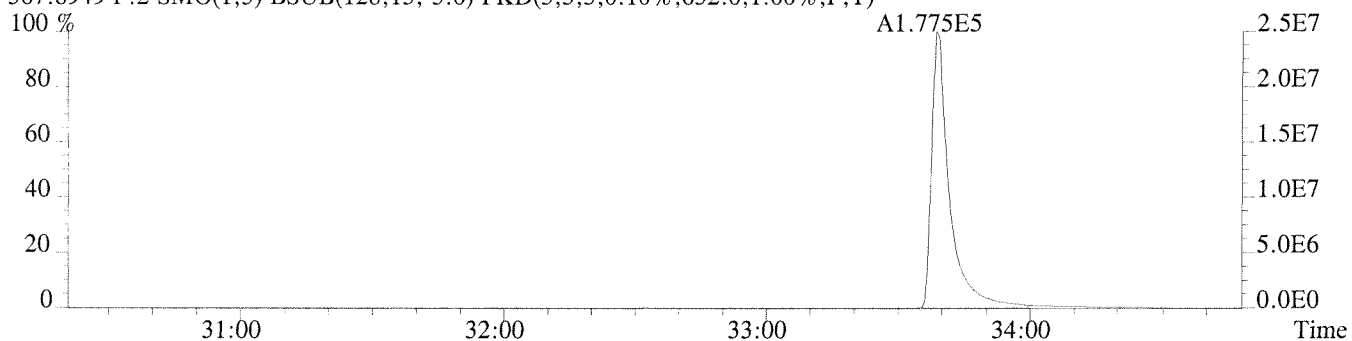
355.8546 F:2 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.10%,728.0,1.00%,F,T)



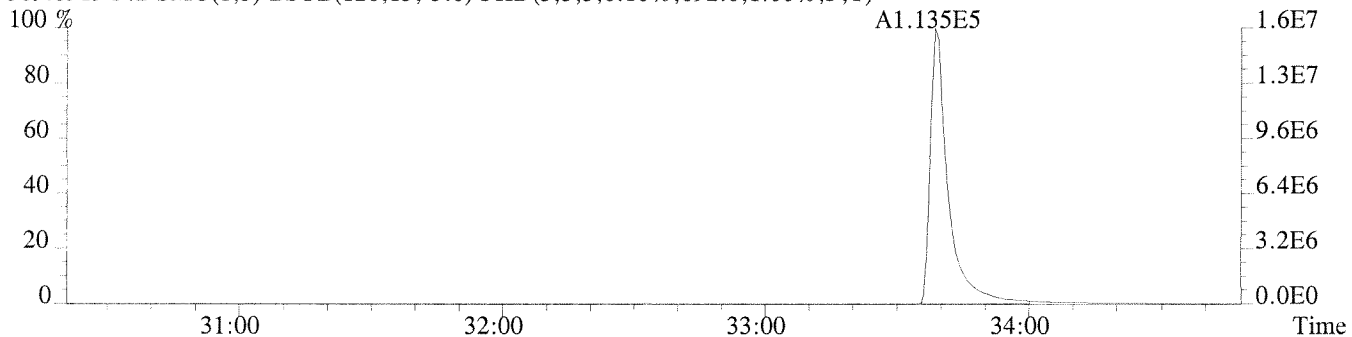
357.8517 F:2 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.10%,736.0,1.00%,F,T)



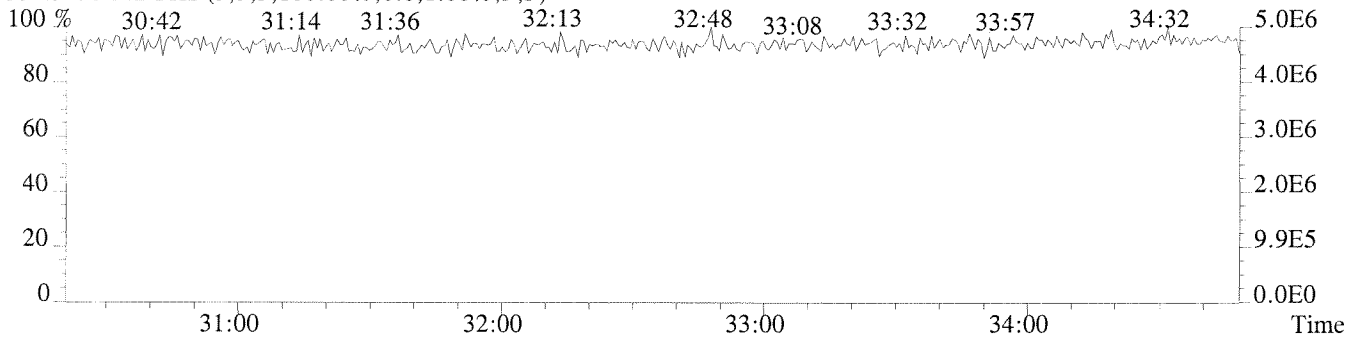
367.8949 F:2 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.10%,632.0,1.00%,F,T)



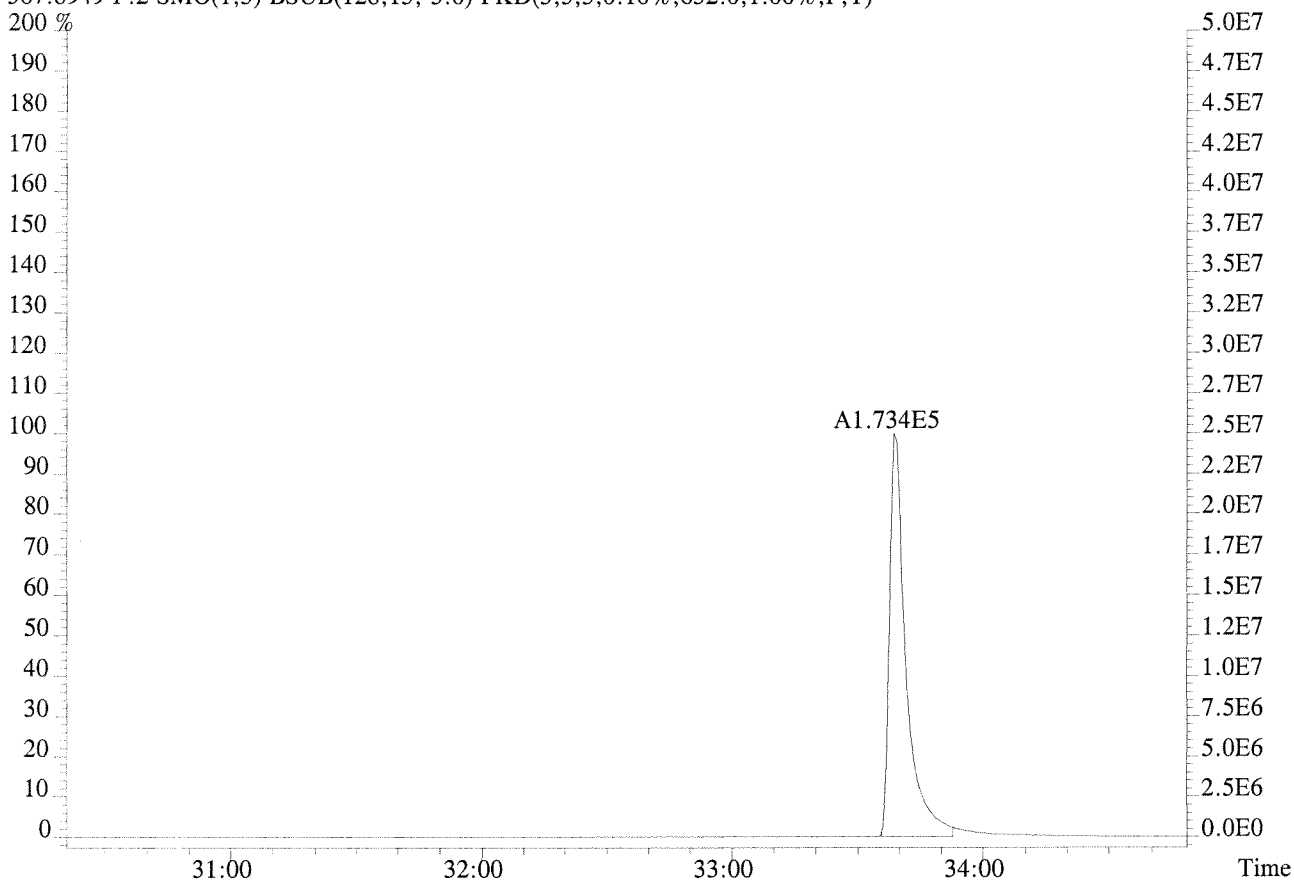
369.8919 F:2 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.10%,692.0,1.00%,F,T)



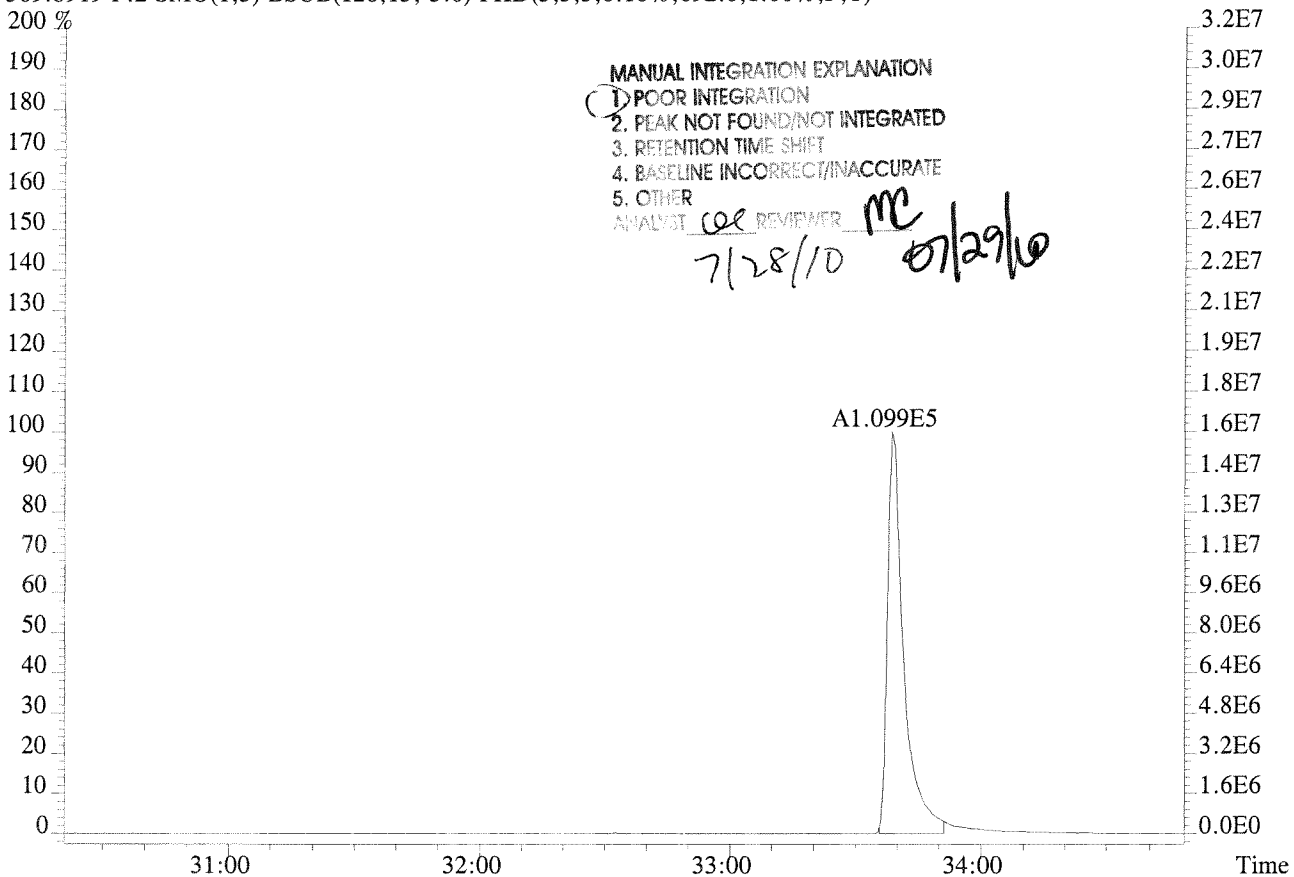
354.9792 F:2 PKD(3,3,3,100.00%,0.0,1.00%,F,F)



File:P208826 #1-405 Acq:27-JUL-2010 05:07:52 Probe EI+ Magnet SIR VG BioTech Mass sf
Sample#1 Exp:CCAL HRCC3
367.8949 F:2 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.10%,632.0,1.00%,F,T)



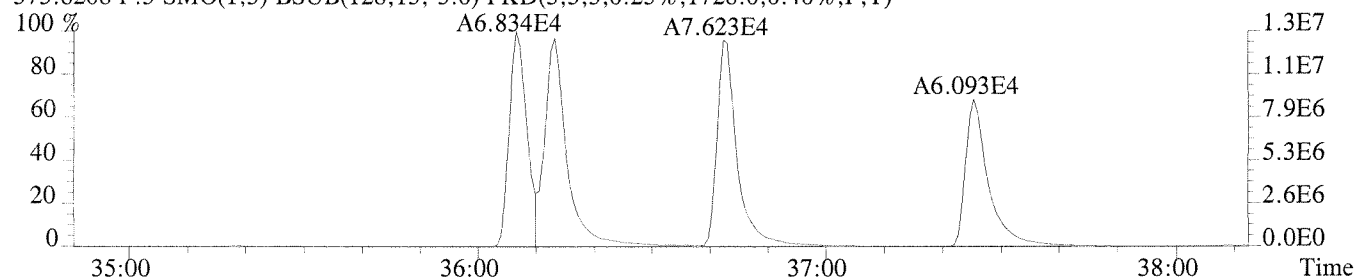
369.8919 F:2 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.10%,692.0,1.00%,F,T)



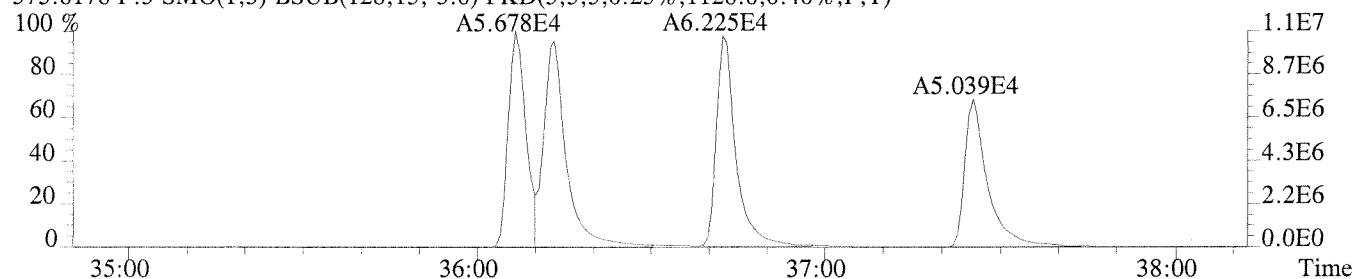
File:P208826 #1-306 Acq:27-JUL-2010 05:07:52 Probe EI+ Magnet SIR VG BioTech Mass spectf

Sample#1 Exp:CCAL HRCC3

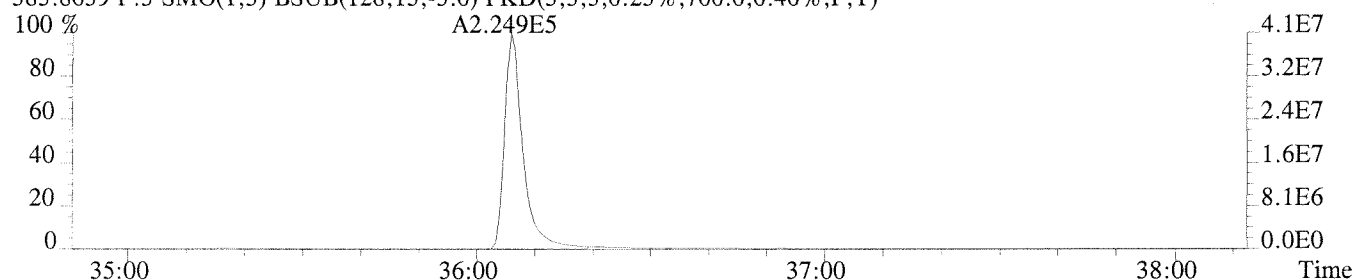
373.8208 F:3 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.25%,1728.0,0.40%,F,T)



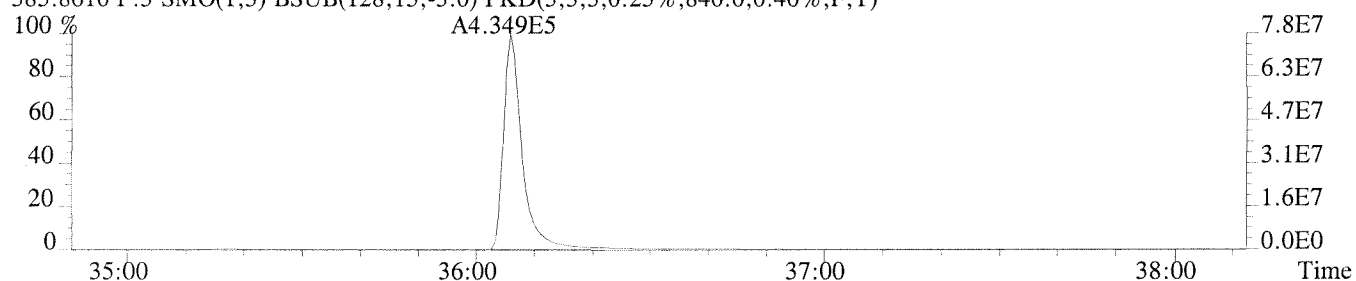
375.8178 F:3 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.25%,1128.0,0.40%,F,T)



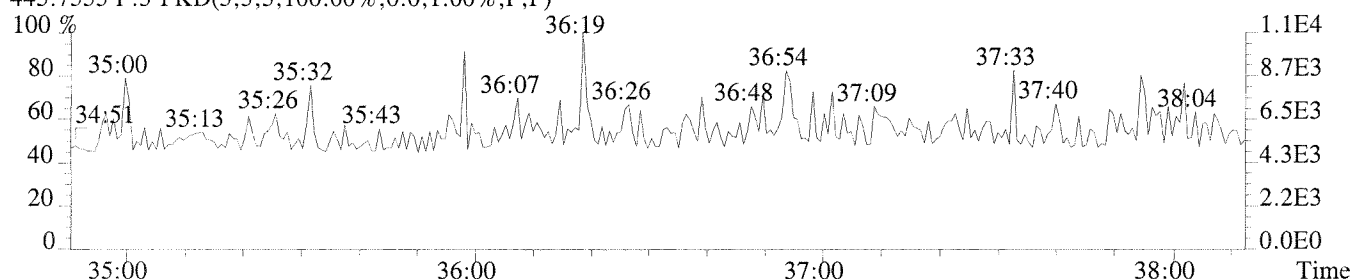
383.8639 F:3 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.25%,700.0,0.40%,F,T)



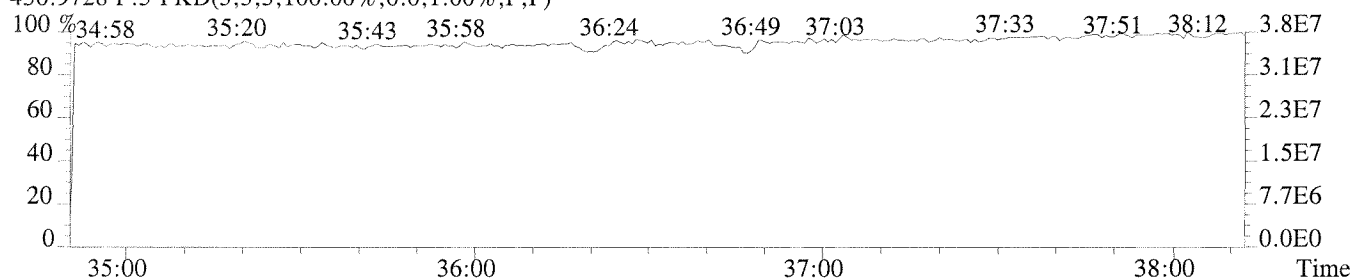
385.8610 F:3 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.25%,840.0,0.40%,F,T)



445.7555 F:3 PKD(5,3,5,100.00%,0.0,1.00%,F,F)



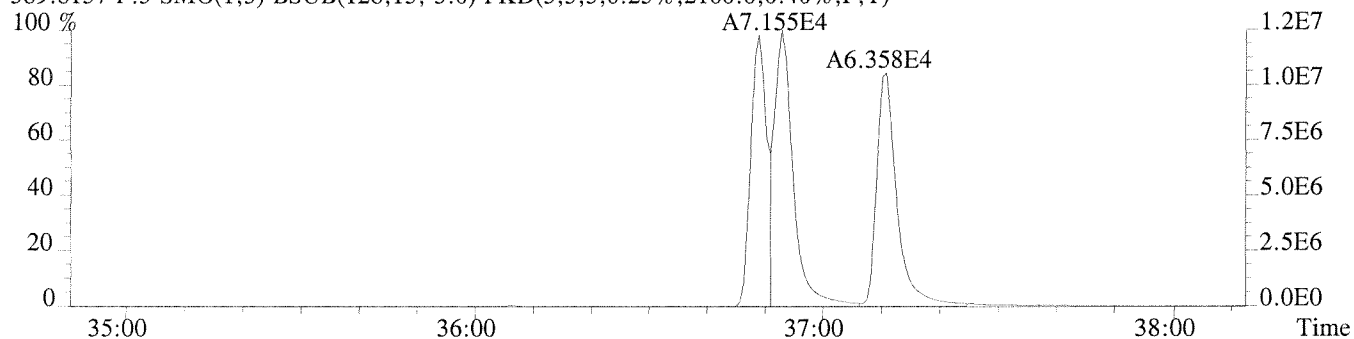
430.9728 F:3 PKD(3,3,3,100.00%,0.0,1.00%,F,F)



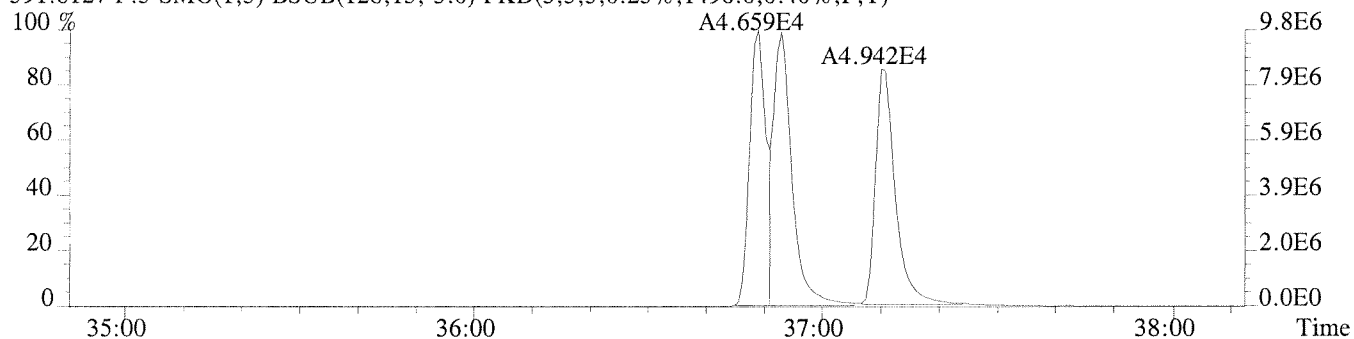
File:P208826 #1-306 Acq:27-JUL-2010 05:07:52 Probe EI+ Magnet SIR VG BioTech Mass spectf

Sample#1 Exp:CCAL HRCC3

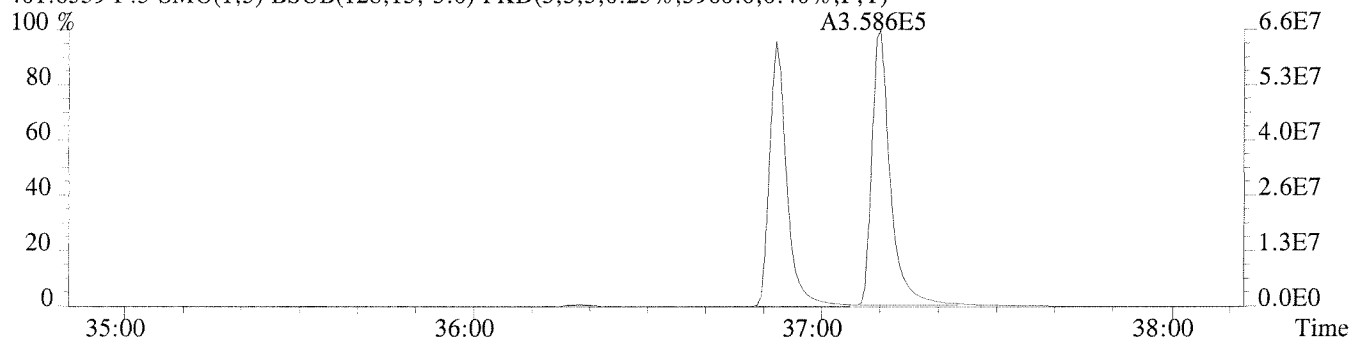
389.8157 F:3 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.25%,2100.0,0.40%,F,T)



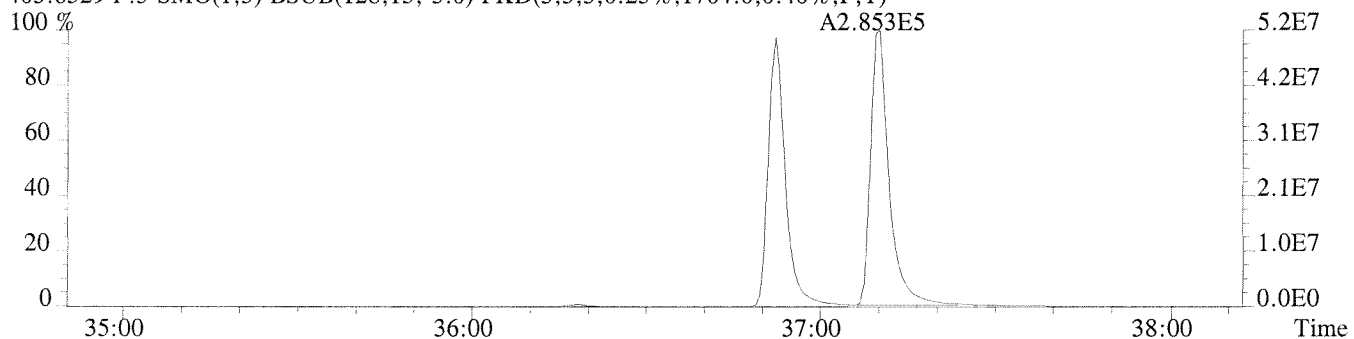
391.8127 F:3 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.25%,1496.0,0.40%,F,T)



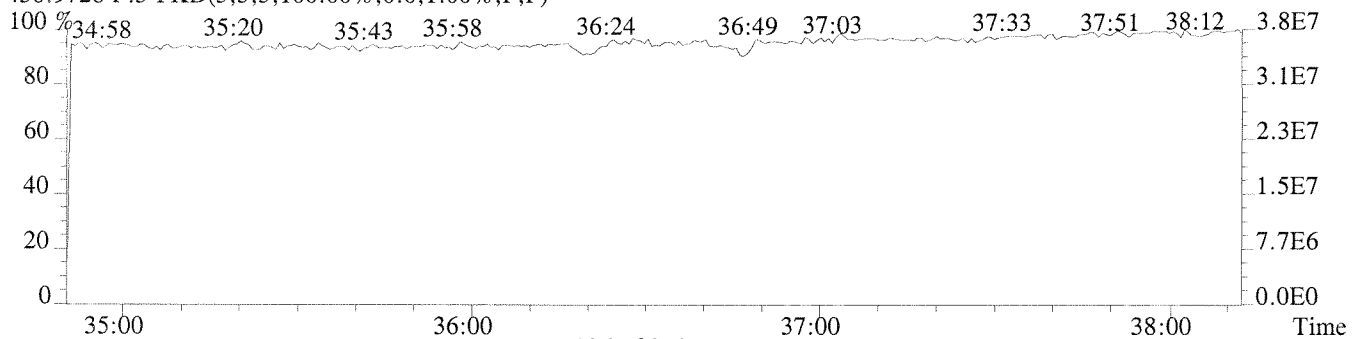
401.8559 F:3 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.25%,3960.0,0.40%,F,T)



403.8529 F:3 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.25%,1704.0,0.40%,F,T)



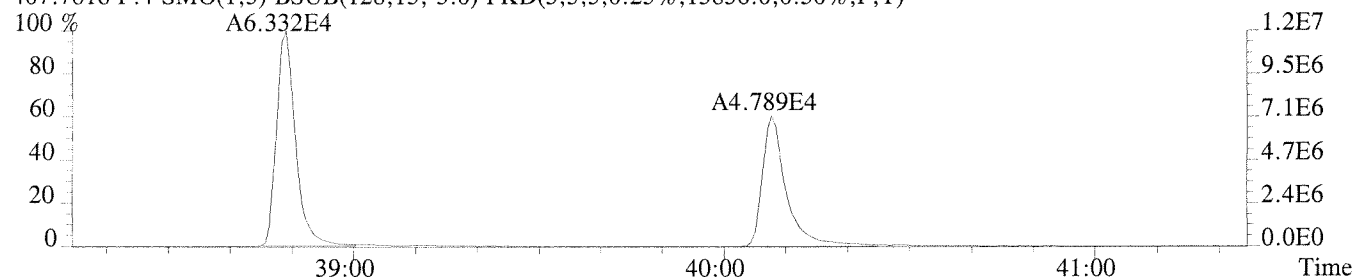
430.9728 F:3 PKD(3,3,3,100.00%,0.0,1.00%,F,F)



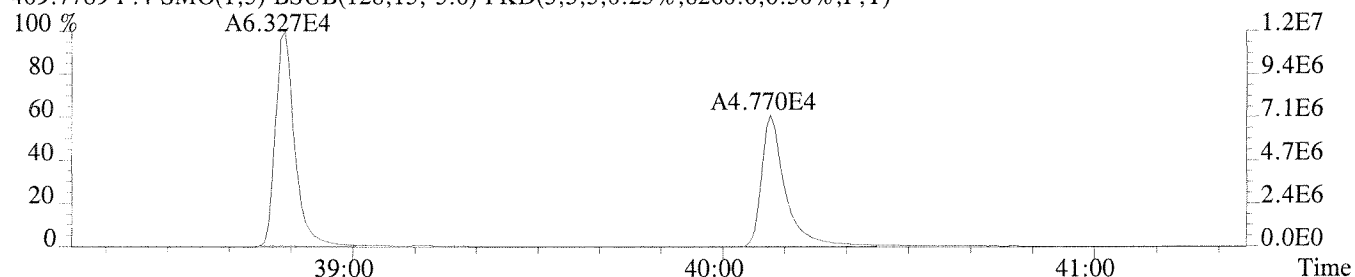
File:P208826 #1-288 Acq:27-JUL-2010 05:07:52 Probe EI+ Magnet SIR VG BioTech Mass spectf

Sample#1 Exp:CCAL HRCC3

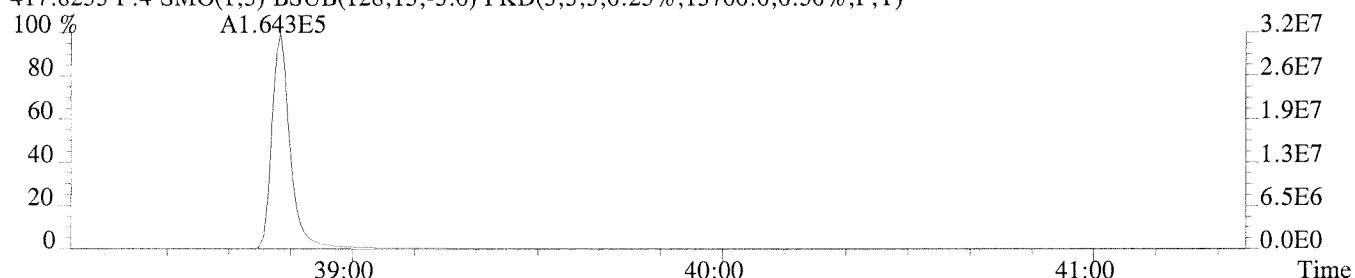
407.7818 F:4 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.25%,13836.0,0.50%,F,T)



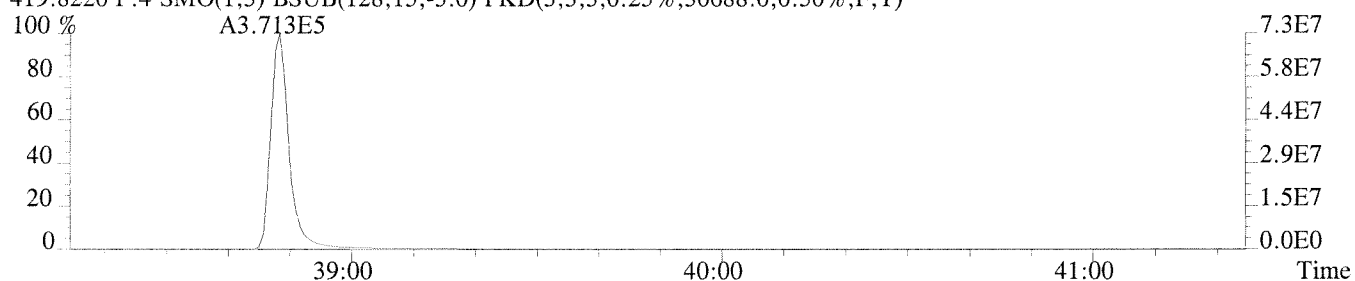
409.7789 F:4 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.25%,8260.0,0.50%,F,T)



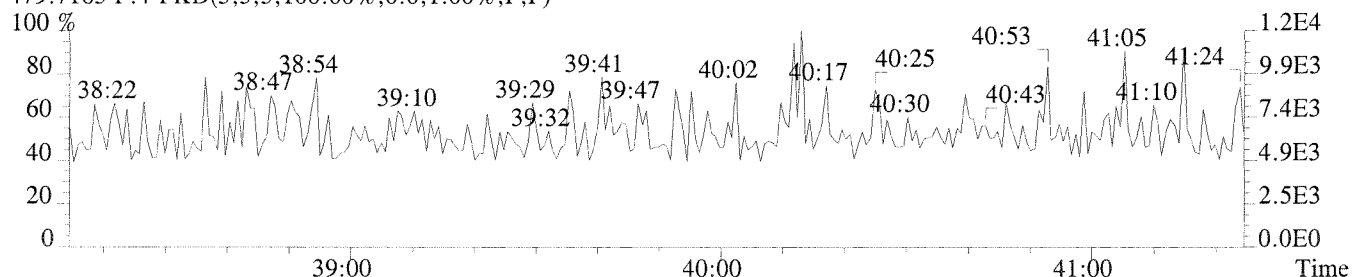
417.8253 F:4 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.25%,13700.0,0.50%,F,T)



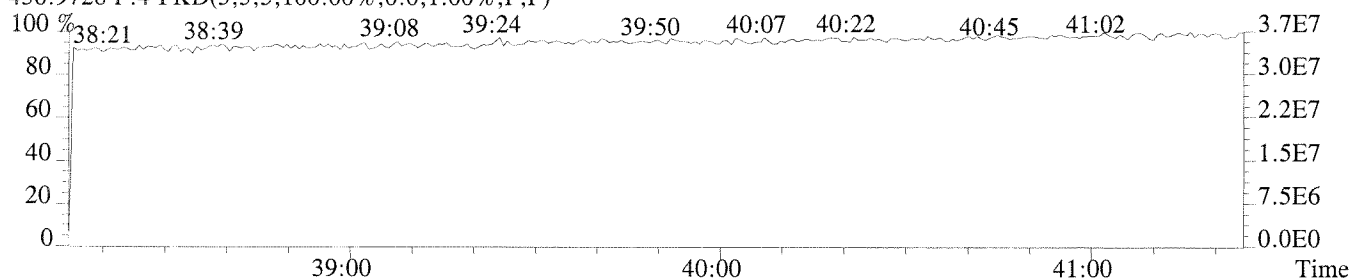
419.8220 F:4 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.25%,30688.0,0.50%,F,T)



479.7165 F:4 PKD(5,3,5,100.00%,0.0,1.00%,F,F)



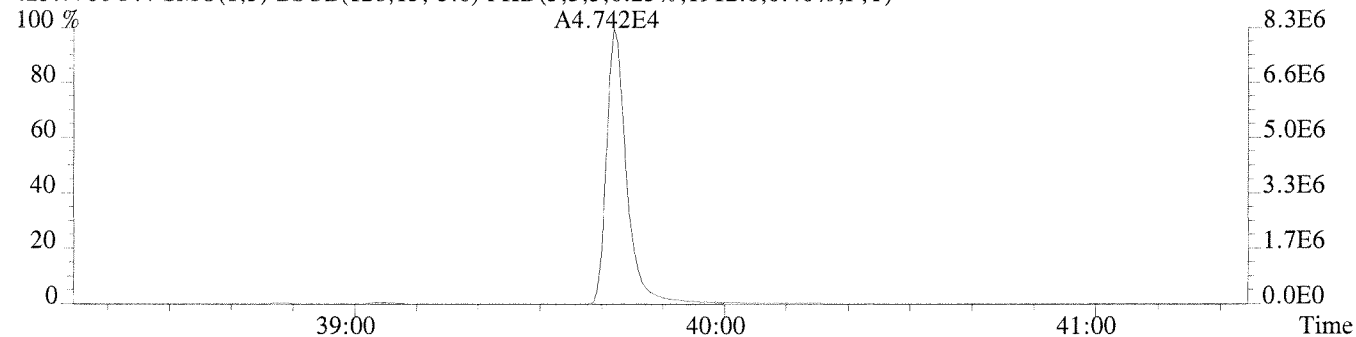
430.9728 F:4 PKD(3,3,3,100.00%,0.0,1.00%,F,F)



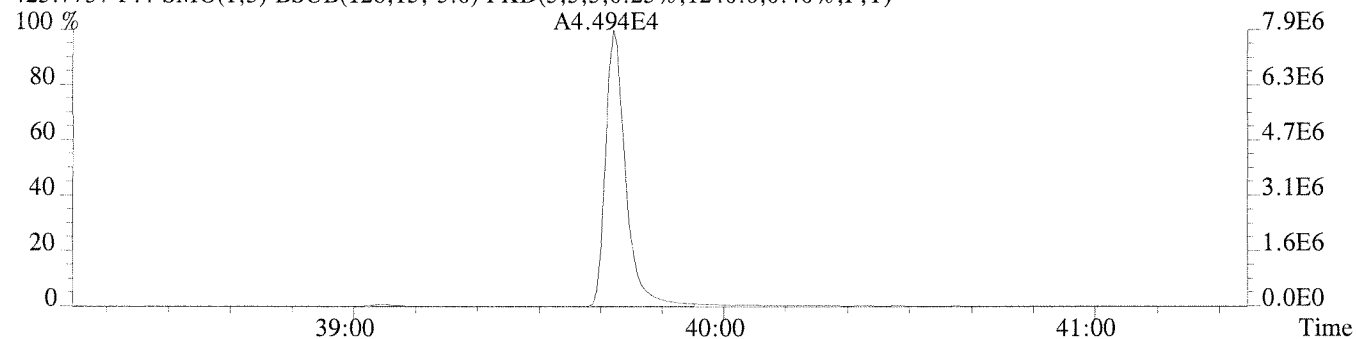
File:P208826 #1-288 Acq:27-JUL-2010 05:07:52 Probe EI+ Magnet SIR VG BioTech Mass spectf

Sample#1 Exp:CCAL HRCC3

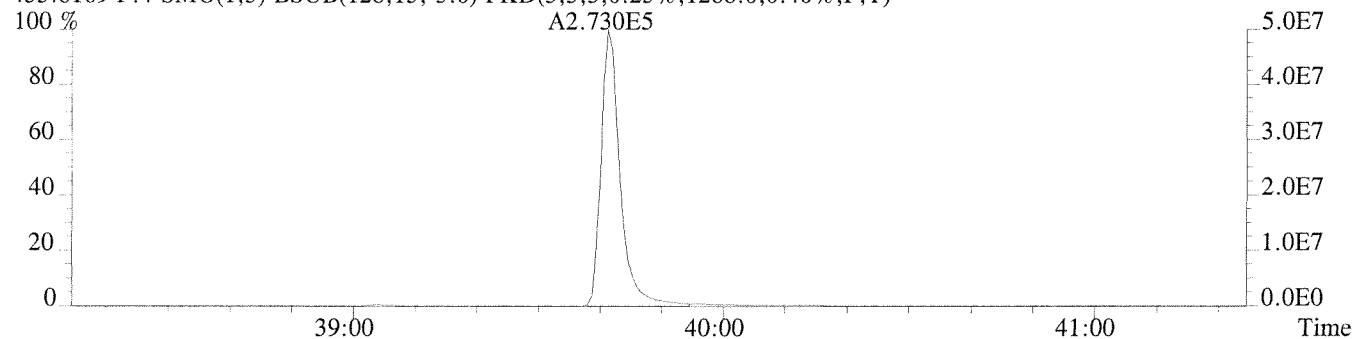
423.7766 F:4 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.25%,1912.0,0.40%,F,T)



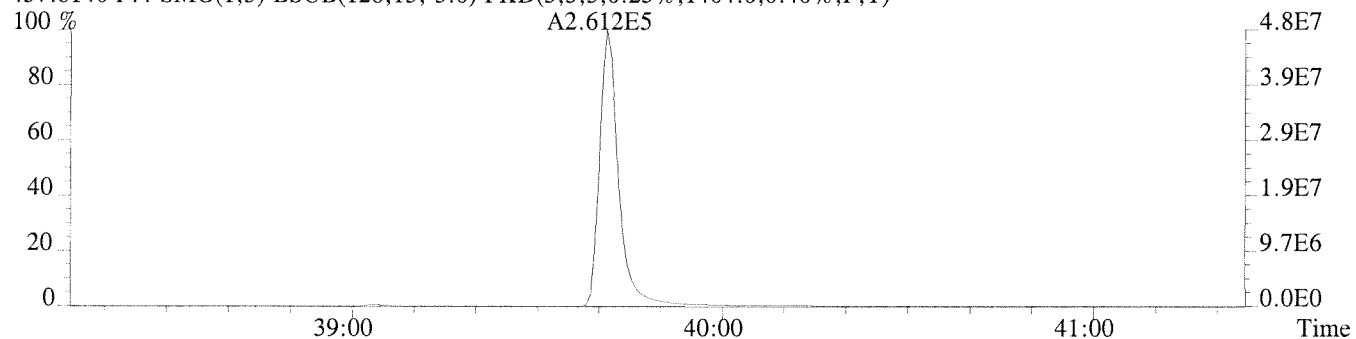
425.7737 F:4 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.25%,1240.0,0.40%,F,T)



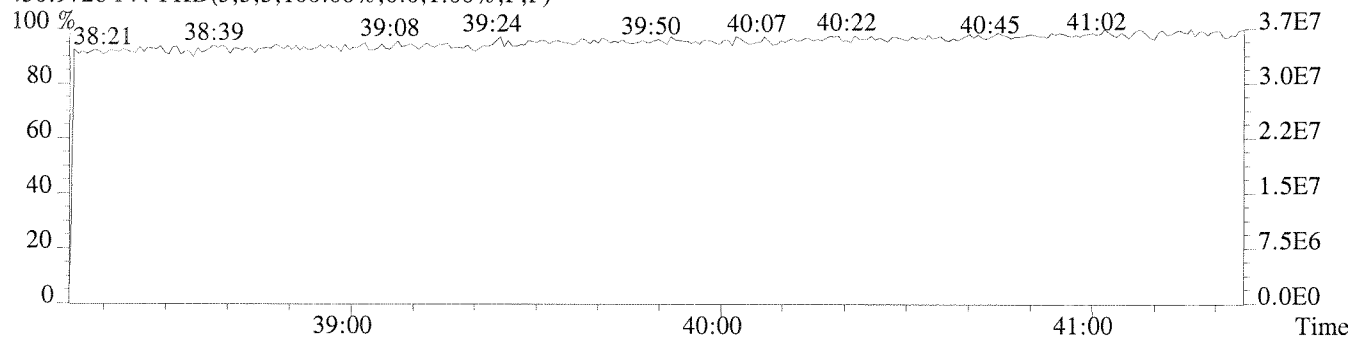
435.8169 F:4 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.25%,1288.0,0.40%,F,T)



437.8140 F:4 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.25%,1404.0,0.40%,F,T)



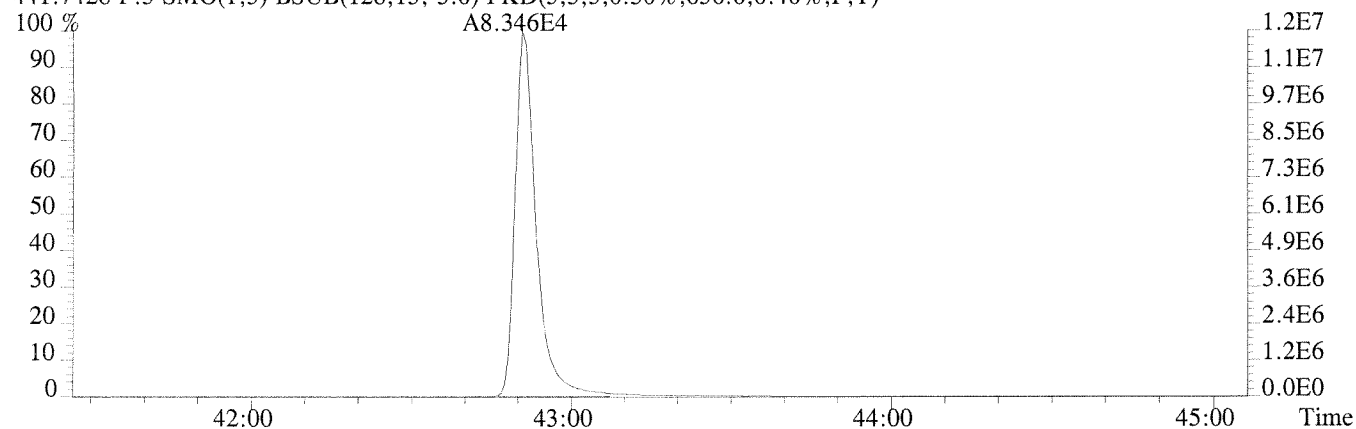
430.9728 F:4 PKD(3,3,3,100.00%,0.0,1.00%,F,F)



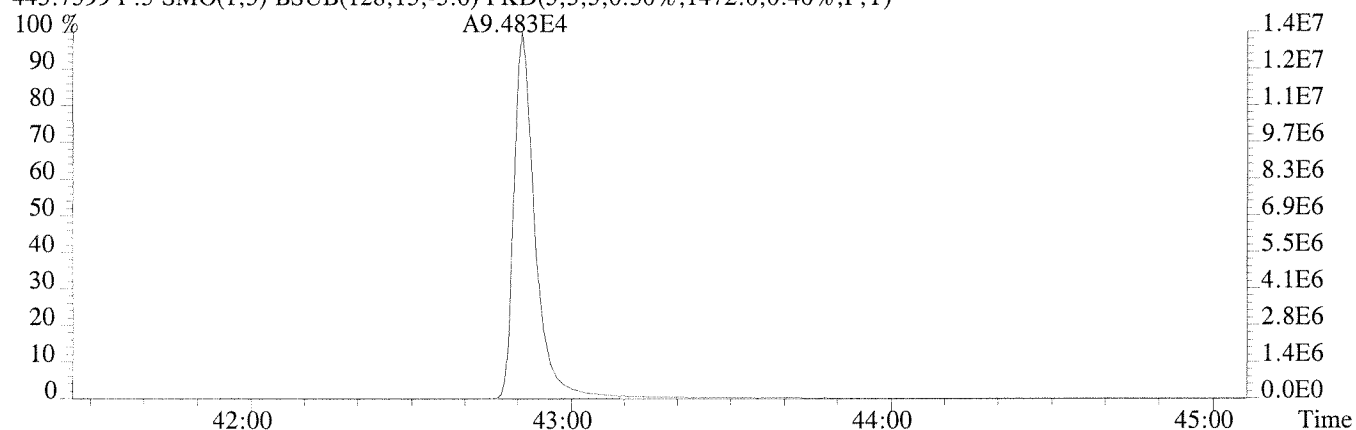
File:P208826 #1-333 Acq:27-JUL-2010 05:07:52 Probe EI+ Magnet SIR VG BioTech Mass spectf

Sample#1 Exp:CCAL HRCC3

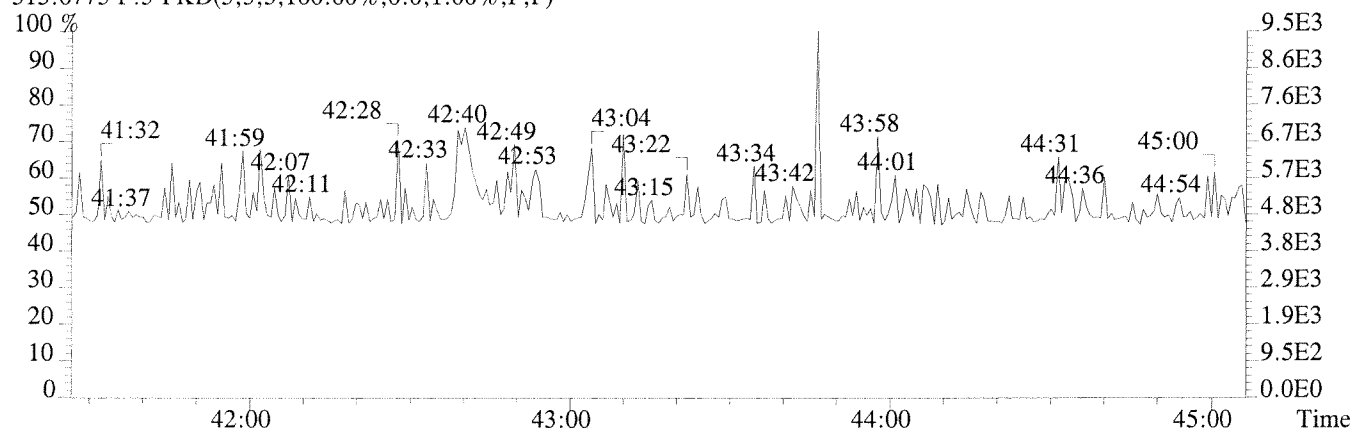
441.7428 F:5 SMO(1,3) BSUB(128,15,-3.0) PKD(5,3,5,0.30%,636.0,0.40%,F,T)



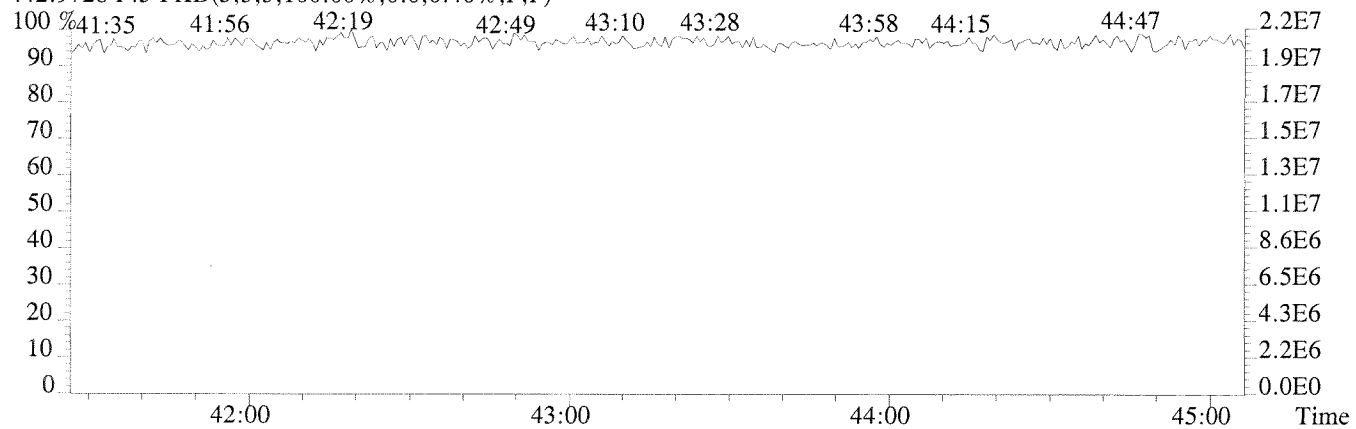
443.7399 F:5 SMO(1,3) BSUB(128,15,-3.0) PKD(5,3,5,0.30%,1472.0,0.40%,F,T)



513.6775 F:5 PKD(5,3,5,100.00%,0.0,1.00%,F,F)



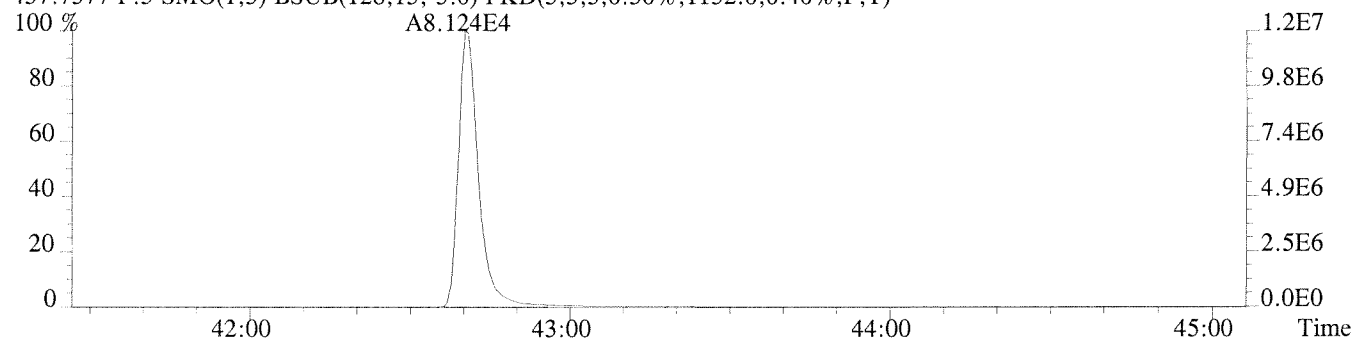
442.9728 F:5 PKD(3,3,3,100.00%,0.0,0.40%,F,F)



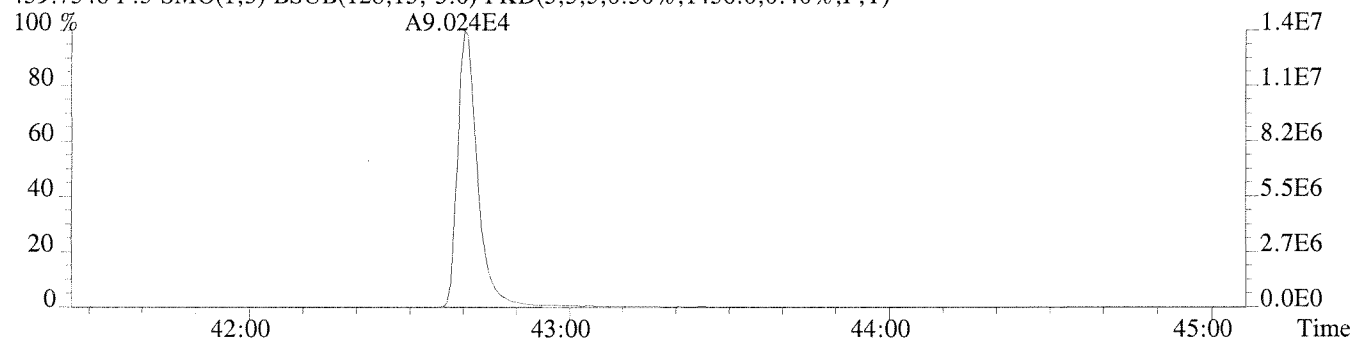
File:P208826 #1-333 Acq:27-JUL-2010 05:07:52 Probe EI+ Magnet SIR VG BioTech Mass spectf

Sample#1 Exp:CCAL HRCC3

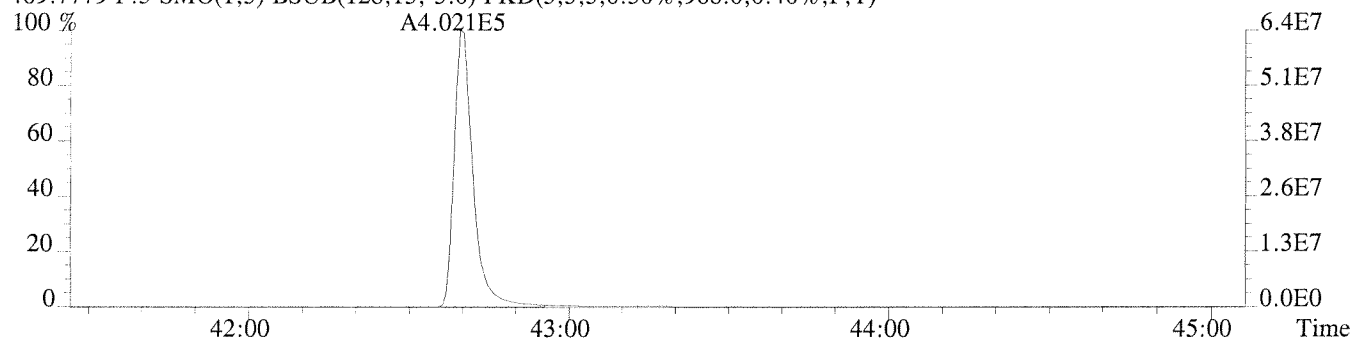
457.7377 F:5 SMO(1,3) BSUB(128,15,-3.0) PKD(5,3,5,0.30%,1132.0,0.40%,F,T)



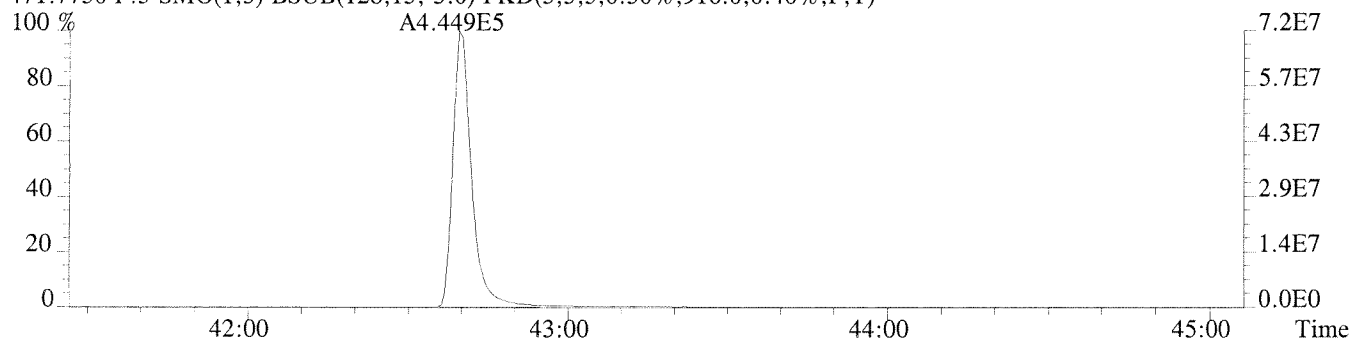
459.7348 F:5 SMO(1,3) BSUB(128,15,-3.0) PKD(5,3,5,0.30%,1456.0,0.40%,F,T)



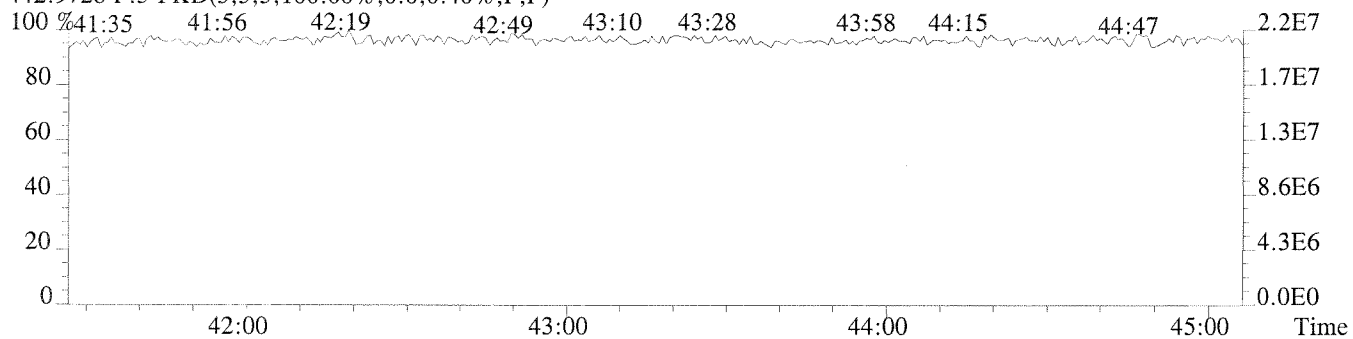
469.7779 F:5 SMO(1,3) BSUB(128,15,-3.0) PKD(5,3,5,0.30%,968.0,0.40%,F,T)



471.7750 F:5 SMO(1,3) BSUB(128,15,-3.0) PKD(5,3,5,0.30%,916.0,0.40%,F,T)



442.9728 F:5 PKD(3,3,3,100.00%,0.0,0.40%,F,F)



USEPA - ITD

FORM 4A
PCDD/PCDF CALIBRATION VERIFICATION

Lab Name: Columbia Analytical Services Episode No.:

Contract No.: SDG No.:

Initial Calibration Date: 08/01/08

Instrument ID: AutoSpec-Premier GC Column ID: DB-5

VER Data Filename: P208838 Analysis Date: 27-JUL-10 Time: 17:05:28

NATIVE ANALYTES	M/Z'S FORMING RATIO (1)	ION ABUND. RATIO	QC LIMITS (2)	CCAL. RRF	MEAN RRF	%D (3)
2,3,7,8-TCDD	M/M+2	0.77	0.65-0.89	0.97	0.92	5.84
1,2,3,7,8-PeCDD	M+2/M+4	1.56	1.32-1.78	0.81	0.87	-6.55
1,2,3,4,7,8-HxCDD	M+2/M+4	1.24	1.05-1.43	0.97	0.93	5.12
1,2,3,6,7,8-HxCDD	M+2/M+4	1.27	1.05-1.43	1.09	1.05	3.43
1,2,3,7,8,9-HxCDD	M+2/M+4	1.26	1.05-1.43	1.03	0.97	6.51
1,2,3,4,6,7,8-HpCDD	M+2/M+4	1.04	0.88-1.20	0.91	0.88	3.12
OCDD	M+2/M+4	0.89	0.76-1.02	1.11	0.96	15.40
2,3,7,8-TCDF	M/M+2	0.77	0.65-0.89	0.87	0.83	4.37
1,2,3,7,8-PeCDF	M+2/M+4	1.55	1.32-1.78	0.87	0.84	3.20
2,3,4,7,8-PeCDF	M+2/M+4	1.54	1.32-1.78	0.90	0.85	5.90
1,2,3,4,7,8-HxCDF	M+2/M+4	1.25	1.05-1.43	1.10	1.07	2.92
1,2,3,6,7,8-HxCDF	M+2/M+4	1.17	1.05-1.43	1.11	1.13	-1.96
1,2,3,7,8,9-HxCDF	M+2/M+4	1.23	1.05-1.43	0.91	0.86	5.67
2,3,4,6,7,8-HxCDF	M+2/M+4	1.23	1.05-1.43	1.05	1.01	4.13
1,2,3,4,6,7,8-HpCDF	M+2/M+4	1.00	0.88-1.20	1.25	1.32	-4.85
1,2,3,4,7,8,9-HpCDF	M+2/M+4	1.02	0.88-1.20	0.97	0.97	0.16
OCDF	M+2/M+4	0.89	0.76-1.02	1.15	1.10	3.84

(1) See Table 6, Method 8290, for m/z specifications.

(2) Ion Abundance Ratio Control Limits as specified in Table 8, Method 8290.

(3) The beginning CCAL %RSD for the 17 unlabeled standard must not exceed +/- 20%, Section 7.7.4.1. The ending CCAL must not exceed +/-25%. Section 8.3.2.4.

8290F4Ap

USEPA - ITD

FORM 4B
PCDD/PCDF CALIBRATION VERIFICATION

Lab Name: Columbia Analytical Services Episode No.:

Contract No.: SDG No.:

Initial Calibration Date: 08/01/08

Instrument ID: AutoSpec-Premier GC Column ID: DB-5

VER Data Filename: P208838 Analysis Date: 27-JUL-10 Time: 17:05:28

LABELED COMPOUNDS	M/Z'S FORMING RATIO (1)	ION ABUND. RATIO	QC LIMITS (2)	CCAL. RRF	MEAN RRF	%D (3)
13C-2,3,7,8-TCDD	M/M+2	0.78	0.65-0.89	1.04	1.06	-1.53
13C-1,2,3,7,8-PeCDD	M+2/M+4	1.56	1.32-1.78	1.10	0.87	26.31
13C-1,2,3,6,7,8-HxCDD	M+2/M+4	1.26	1.05-1.43	0.88	1.00	-11.94
13C-1,2,3,4,6,7,8-HpCDD	M+2/M+4	1.04	0.88-1.20	0.82	0.83	-2.09
13C-OCDD	M+2/M+4	0.91	0.76-1.02	0.60	0.73	-17.86
13C-2,3,7,8-TCDF	M/M+2	0.78	0.65-0.89	1.36	1.42	-4.36
13C-1,2,3,7,8-PeCDF	M+2/M+4	1.55	1.32-1.78	1.32	1.26	4.63
13C-1,2,3,4,7,8-HxCDF	M/M+2	0.52	0.43-0.59	1.08	1.28	-15.54
13C-1,2,3,4,6,7,8-HpCDF	M/M+2	0.44	0.37-0.51	0.83	0.90	-7.66
CLEANUP STANDARD						
37Cl-2,3,7,8-TCDD				1.01	0.98	2.49

(1) See Table 6, Method 8290, for m/z specifications.

(2) Ion Abundance Ratio Control Limits as specified in Table 8, Method 8290.

(3) The beginning CCAL %RSD for the labeled standard must not exceed +/- 30%, Section 7.7.4.2. The ending CCAL must not exceed +/- 35%, Section 8.3.2.4.

8290F4B

Columbia Analytical Services, Inc.

Sample Response Summary

CLIENT ID.

CCAL HRCC3

Run #7 Filename P208838 Samp: 1 Inj: 1 Acquired: 27-JUL-10 17:05:28
 Processed: 28-JUL-10 10:23:12 LAB. ID: CCAL HRCC3

Typ	Name	RT-1	Resp 1	Resp 2	Ratio	Meet	Mod?	RRF
1 Unk	2,3,7,8-TCDF	28:15	4.716e+04	6.108e+04	0.77	yes	no	0.831
2 Unk	1,2,3,7,8-PeCDF	32:35	1.594e+05	1.030e+05	1.55	yes	no	0.840
3 Unk	2,3,4,7,8-PeCDF	33:20	1.650e+05	1.074e+05	1.54	yes	no	0.850
4 Unk	1,2,3,4,7,8-HxCDF	36:08	1.427e+05	1.145e+05	1.25	yes	no	1.072
5 Unk	1,2,3,6,7,8-HxCDF	36:14	1.392e+05	1.185e+05	1.17	yes	no	1.128
6 Unk	2,3,4,6,7,8-HxCDF	36:43	1.345e+05	1.097e+05	1.23	yes	no	1.006
7 Unk	1,2,3,7,8,9-HxCDF	37:25	1.175e+05	9.522e+04	1.23	yes	no	0.864
8 Unk	1,2,3,4,6,7,8-HpCDF	38:50	1.126e+05	1.123e+05	1.00	yes	no	1.315
9 Unk	1,2,3,4,7,8,9-HpCDF	40:08	8.797e+04	8.665e+04	1.02	yes	no	0.970
10 Unk	OCDF	42:52	1.405e+05	1.573e+05	0.89	yes	no	1.103
11 Unk	2,3,7,8-TCDD	29:04	4.036e+04	5.215e+04	0.77	yes	no	0.916
12 Unk	1,2,3,7,8-PeCDD	33:40	1.251e+05	8.007e+04	1.56	yes	no	0.869
13 Unk	1,2,3,4,7,8-HxCDD	36:50	1.022e+05	8.224e+04	1.24	yes	no	0.925
14 Unk	1,2,3,6,7,8-HxCDD	36:54	1.155e+05	9.127e+04	1.27	yes	no	1.054
15 Unk	1,2,3,7,8,9-HxCDD	37:11	1.086e+05	8.639e+04	1.26	yes	no	0.966
16 Unk	1,2,3,4,6,7,8-HpCDD	39:43	8.131e+04	7.818e+04	1.04	yes	no	0.879
17 Unk	OCDD	42:42	1.358e+05	1.519e+05	0.89	yes	no	0.959
18 IS	13C-2,3,7,8-TCDF	28:13	2.728e+05	3.512e+05	0.78	yes	no	1.424
19 IS	13C-1,2,3,7,8-PeCDF	32:34	3.683e+05	2.372e+05	1.55	yes	no	1.263
20 IS	13C-1,2,3,4,7,8-HxCDF	36:07	3.986e+05	7.667e+05	0.52	yes	no	1.279
21 IS	13C-1,2,3,4,6,7,8-HpCDF	38:49	2.747e+05	6.237e+05	0.44	yes	no	0.902
22 IS	13C-2,3,7,8-TCDD	29:03	2.096e+05	2.673e+05	0.78	yes	no	1.057
23 IS	13C-1,2,3,7,8-PeCDD	33:39	3.081e+05	1.970e+05	1.56	yes	no	0.873
24 IS	13C-1,2,3,6,7,8-HxCDD	36:54	5.289e+05	4.188e+05	1.26	yes	no	0.997
25 IS	13C-1,2,3,4,6,7,8-HpCDD	39:42	4.489e+05	4.311e+05	1.04	yes	no	0.833
26 IS	13C-OCDD	42:41	6.174e+05	6.820e+05	0.91	yes	no	0.733
27 RS/RT	13C-1,2,3,4-TCDD	28:49	2.026e+05	2.556e+05	0.79	yes	no	-
28 RS/RT	13C-1,2,3,7,8,9-HxCDD	37:11	6.003e+05	4.788e+05	1.25	yes	no	-
29 C/Up	37Cl-2,3,7,8-TCDD	29:04	9.233e+04				no	0.983
				SUM AREA				
30 Tot	Total Tetra-Furans	28:15		1.082e+05	0.77	yes		0.831
31 Tot	Total Tetra-Dioxins	29:04		9.251e+04	0.77	yes		0.916
32 Tot	Total Penta-Furans	32:35		5.348e+05	1.55	yes		0.845
33 Tot	Total Penta-Dioxins	33:40		2.051e+05	1.56	yes		0.869
34 Tot	Total Hexa-Furans	36:08		9.719e+05	1.25	yes		1.018
35 Tot	Total Hexa-Dioxins	36:50		5.861e+05	1.24	yes		0.982
36 Tot	Total Hepta-Furans	38:50		3.995e+05	1.00	yes		1.143
37 Tot	Total Hepta-Dioxins	39:43		1.595e+05	1.04	yes		0.879

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Columbia Analytical Services, Inc.
Signal/Noise Height Ratio Summary

CLIENT ID.
CCAL HRCC3

Run #7 Filename P208838 Samp: 1 Inj: 1 Acquired: 27-JUL-10 17:05:28
Processed: 28-JUL-10 10:23:121 LAB. ID: CCAL HRCC3

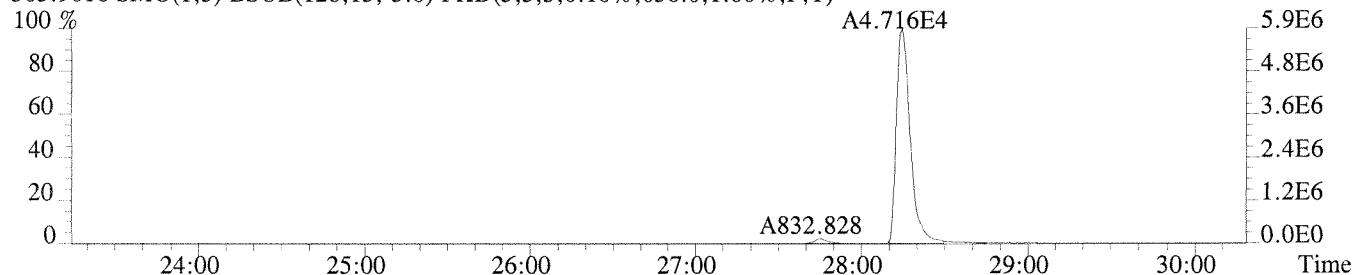
	Name	Signal 1	Noise 1	S/N Rat.1	Signal 2	Noise 2	S/N Rat.2
1	2,3,7,8-TCDF	5.94e+06	6.36e+02	9.3e+03	7.80e+06	7.44e+02	1.0e+04
2	1,2,3,7,8-PeCDF	2.67e+07	1.62e+03	1.6e+04	1.75e+07	1.52e+03	1.2e+04
3	2,3,4,7,8-PeCDF	2.97e+07	1.62e+03	1.8e+04	1.92e+07	1.52e+03	1.3e+04
4	1,2,3,4,7,8-HxCDF	2.92e+07	6.04e+03	4.8e+03	2.38e+07	3.78e+03	6.3e+03
5	1,2,3,6,7,8-HxCDF	2.85e+07	6.04e+03	4.7e+03	2.33e+07	3.78e+03	6.2e+03
6	2,3,4,6,7,8-HxCDF	2.84e+07	6.04e+03	4.7e+03	2.34e+07	3.78e+03	6.2e+03
7	1,2,3,7,8,9-HxCDF	2.33e+07	6.04e+03	3.9e+03	1.90e+07	3.78e+03	5.0e+03
8	1,2,3,4,6,7,8-HpCDF	2.41e+07	4.56e+03	5.3e+03	2.35e+07	8.14e+03	2.9e+03
9	1,2,3,4,7,8,9-HpCDF	1.61e+07	4.56e+03	3.5e+03	1.61e+07	8.14e+03	2.0e+03
10	OCDF	2.36e+07	1.48e+03	1.6e+04	2.59e+07	1.71e+03	1.5e+04
11	2,3,7,8-TCDD	5.87e+06	7.00e+02	8.4e+03	7.54e+06	9.96e+02	7.6e+03
12	1,2,3,7,8-PeCDD	2.29e+07	2.65e+03	8.6e+03	1.47e+07	1.96e+03	7.5e+03
13	1,2,3,4,7,8-HxCDD	2.35e+07	5.08e+03	4.6e+03	1.86e+07	5.24e+03	3.6e+03
14	1,2,3,6,7,8-HxCDD	2.30e+07	5.08e+03	4.5e+03	1.85e+07	5.24e+03	3.5e+03
15	1,2,3,7,8,9-HxCDD	2.24e+07	5.08e+03	4.4e+03	1.77e+07	5.24e+03	3.4e+03
16	1,2,3,4,6,7,8-HpCDD	1.60e+07	6.44e+03	2.5e+03	1.55e+07	6.42e+03	2.4e+03
17	OCDD	2.28e+07	5.65e+03	4.0e+03	2.54e+07	6.83e+03	3.7e+03
18	13C-2,3,7,8-TCDF	3.97e+07	2.15e+03	1.8e+04	5.10e+07	9.28e+02	5.5e+04
19	13C-1,2,3,7,8-PeCDF	6.87e+07	8.28e+02	8.3e+04	4.44e+07	8.04e+02	5.5e+04
20	13C-1,2,3,4,7,8-HxCDF	8.40e+07	1.48e+03	5.7e+04	1.61e+08	3.74e+03	4.3e+04
21	13C-1,2,3,4,6,7,8-HpCDF	5.97e+07	1.60e+04	3.7e+03	1.35e+08	1.46e+04	9.3e+03
22	13C-2,3,7,8-TCDD	3.49e+07	3.09e+03	1.1e+04	4.47e+07	1.64e+03	2.7e+04
23	13C-1,2,3,7,8-PeCDD	6.02e+07	9.92e+02	6.1e+04	3.82e+07	6.36e+02	6.0e+04
24	13C-1,2,3,6,7,8-HxCDD	1.15e+08	3.84e+03	3.0e+04	9.19e+07	3.27e+03	2.8e+04
25	13C-1,2,3,4,6,7,8-HpCDD	9.25e+07	2.61e+03	3.5e+04	9.00e+07	2.32e+03	3.9e+04
26	13C-OCDD	1.11e+08	1.92e+03	5.8e+04	1.23e+08	1.74e+03	7.1e+04
27	13C-1,2,3,4-TCDD	3.27e+07	3.09e+03	1.1e+04	4.10e+07	1.64e+03	2.5e+04
28	13C-1,2,3,7,8,9-HxCDD	1.31e+08	3.84e+03	3.4e+04	1.04e+08	3.27e+03	3.2e+04
29	37Cl-2,3,7,8-TCDD	1.32e+07	1.04e+03	1.3e+04			

Columbia Analytical Services, Inc.
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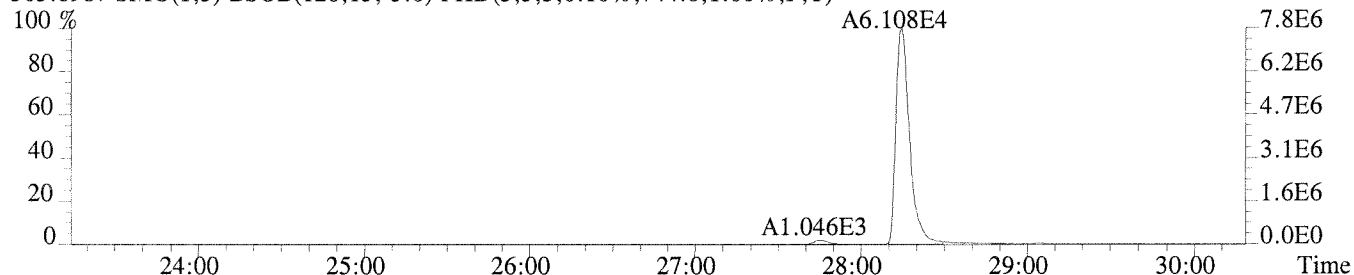
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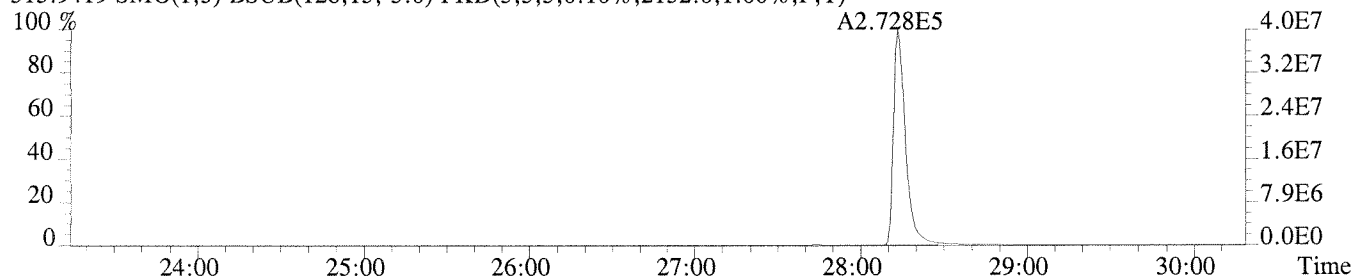
303.9016 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.10%,636.0,1.00%,F,T)



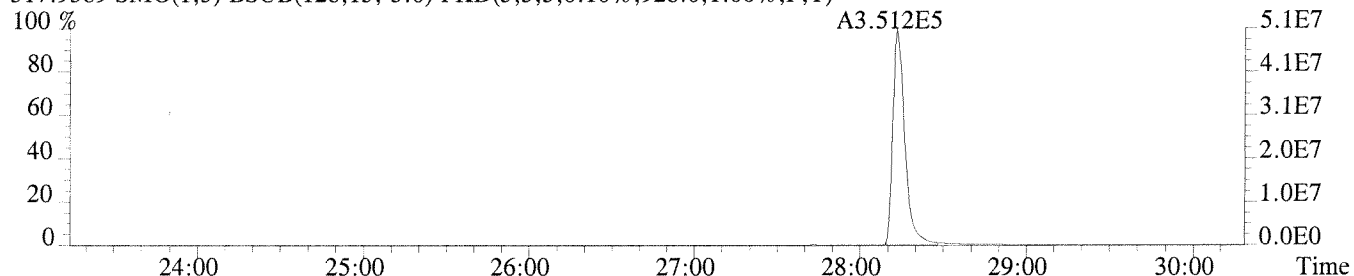
305.8987 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.10%,744.0,1.00%,F,T)



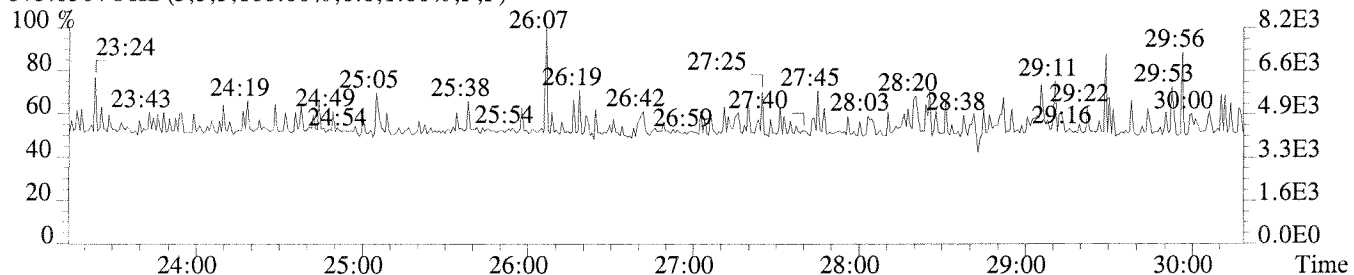
315.9419 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.10%,2152.0,1.00%,F,T)



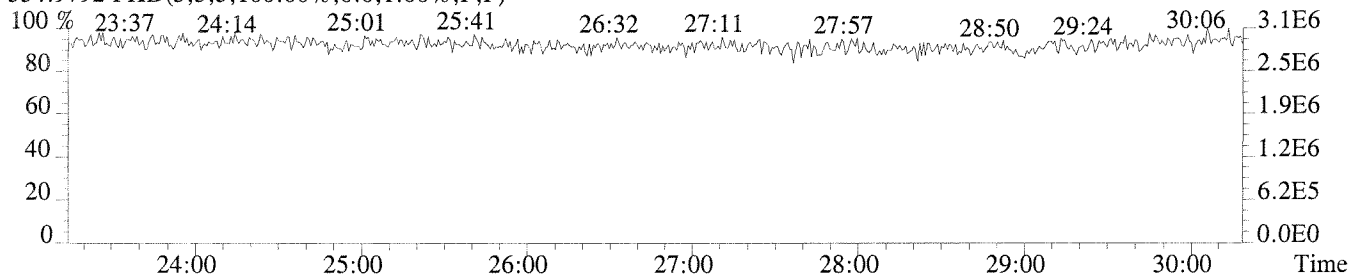
317.9389 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.10%,928.0,1.00%,F,T)



375.8364 PKD(5,3,5,100.00%,0.0,1.00%,F,F)



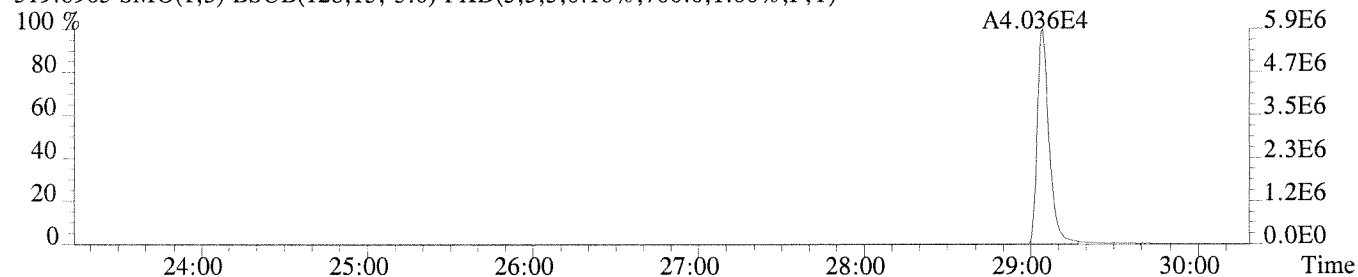
354.9792 PKD(3,3,3,100.00%,0.0,1.00%,F,F)



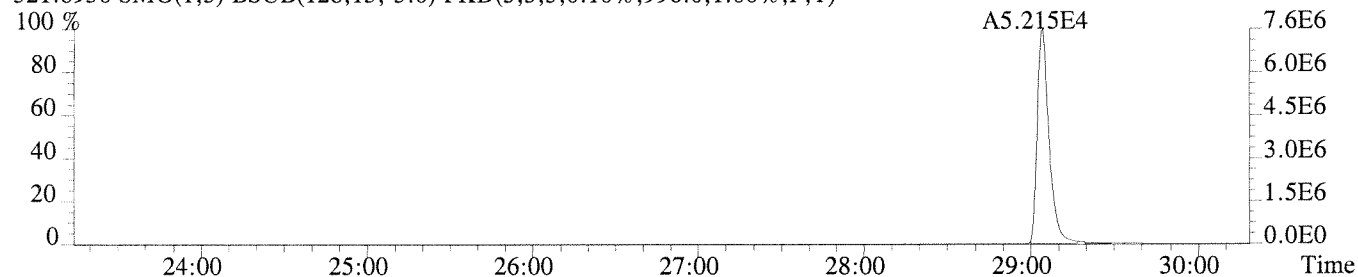
File:P208838 #1-590 Acq:27-JUL-2010 17:05:28 Probe EI+ Magnet SIR VG BioTech Mass spectf

Sample#1 Exp:CCAL HRCC3

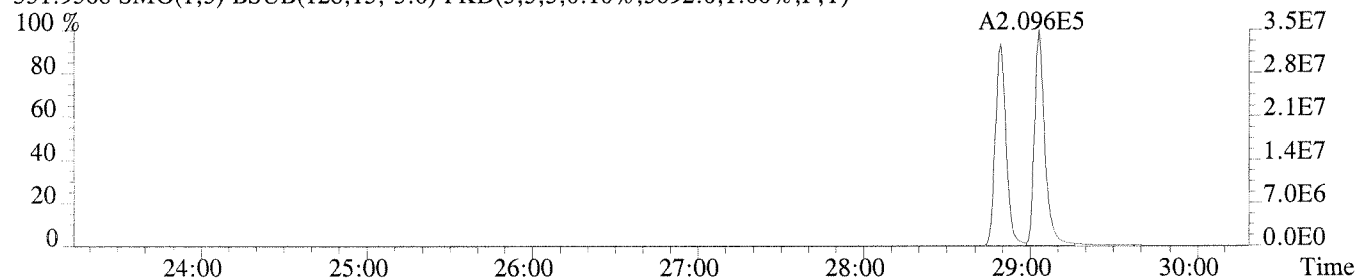
319.8965 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.10%,700.0,1.00%,F,T)



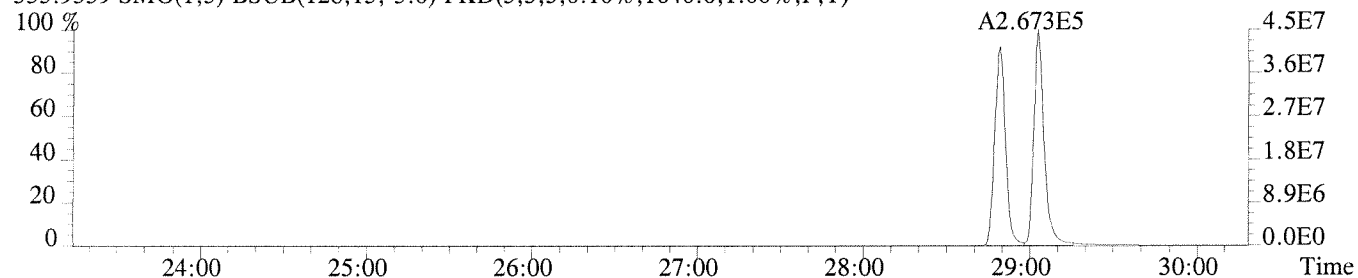
321.8936 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.10%,996.0,1.00%,F,T)



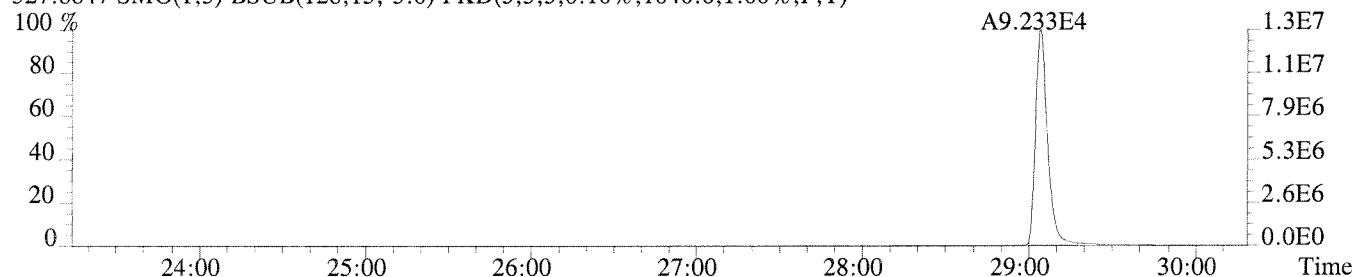
331.9368 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.10%,3092.0,1.00%,F,T)



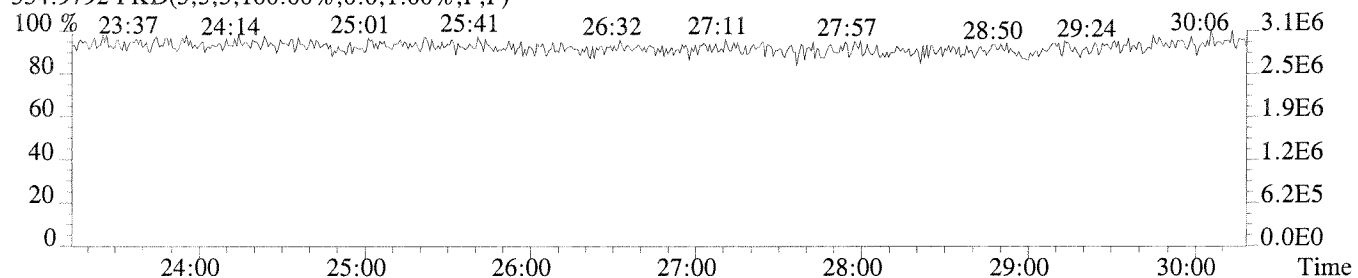
333.9339 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.10%,1640.0,1.00%,F,T)



327.8847 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.10%,1040.0,1.00%,F,T)



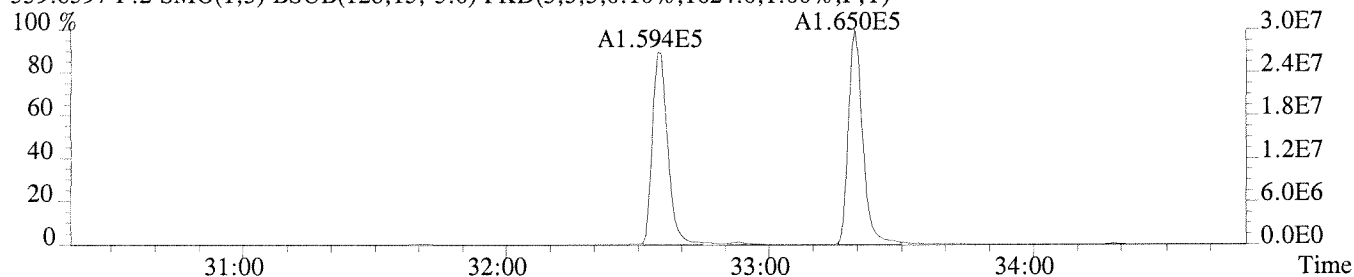
354.9792 PKD(3,3,3,100.00%,0.0,1.00%,F,F)



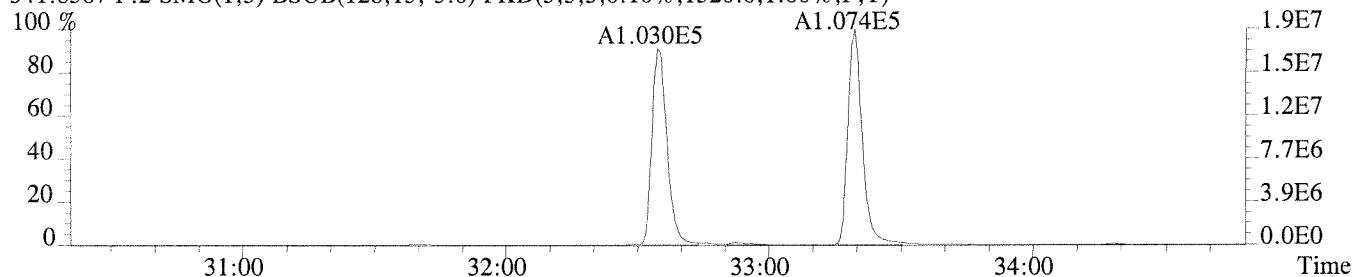
File:P208838 #1-405 Acq:27-JUL-2010 17:05:28 Probe EI+ Magnet SIR VG BioTech Mass spectf

Sample#1 Exp:CCAL HRCC3

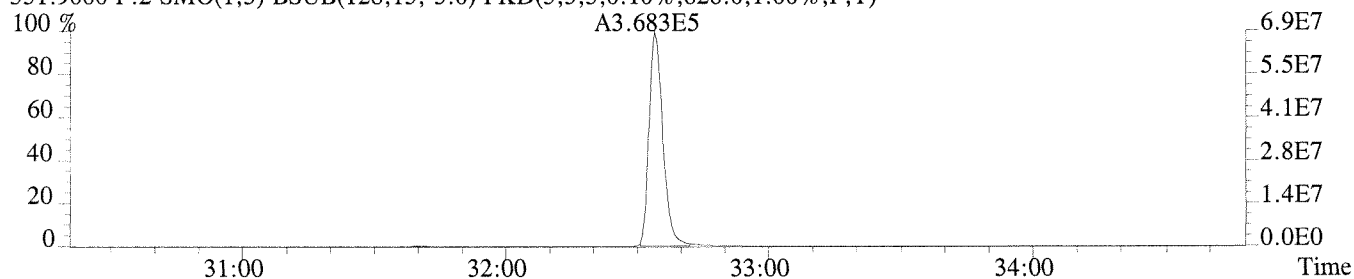
339.8597 F:2 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.10%,1624.0,1.00%,F,T)



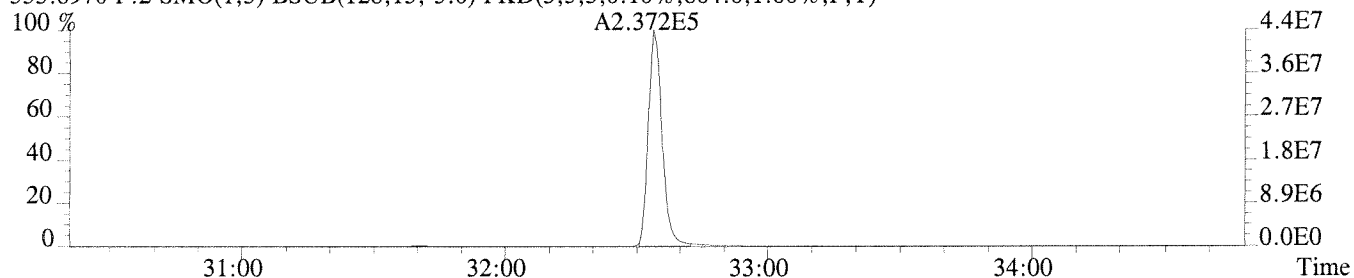
341.8567 F:2 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.10%,1520.0,1.00%,F,T)



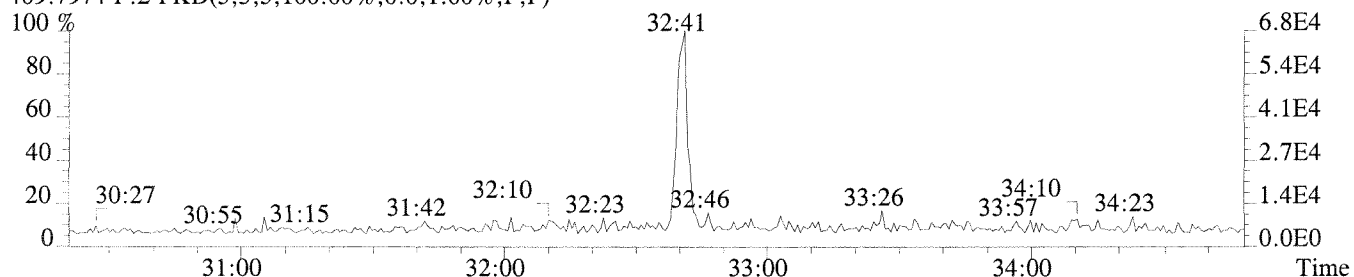
351.9000 F:2 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.10%,828.0,1.00%,F,T)



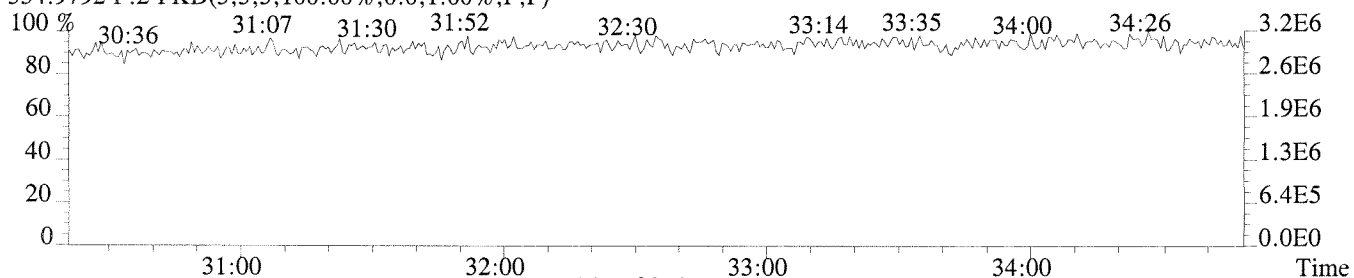
353.8970 F:2 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.10%,804.0,1.00%,F,T)



409.7974 F:2 PKD(5,3,5,100.00%,0.0,1.00%,F,F)



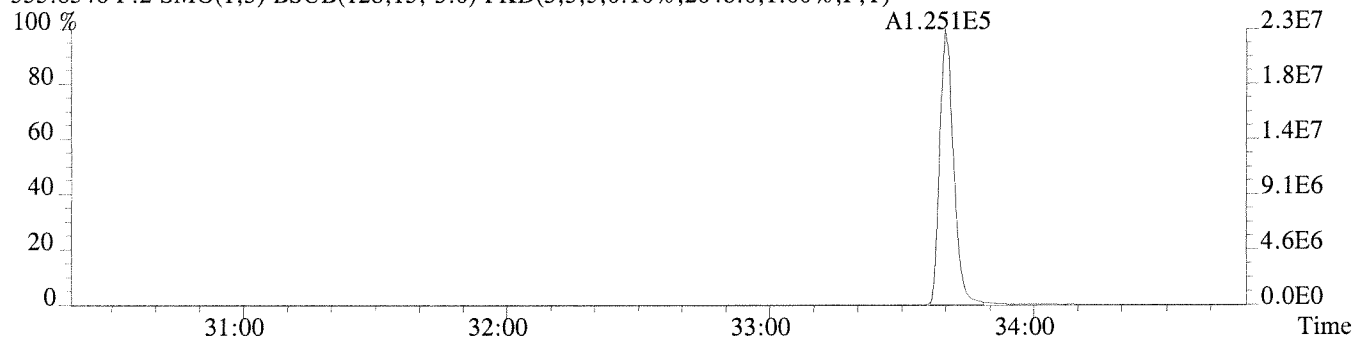
354.9792 F:2 PKD(3,3,3,100.00%,0.0,1.00%,F,F)



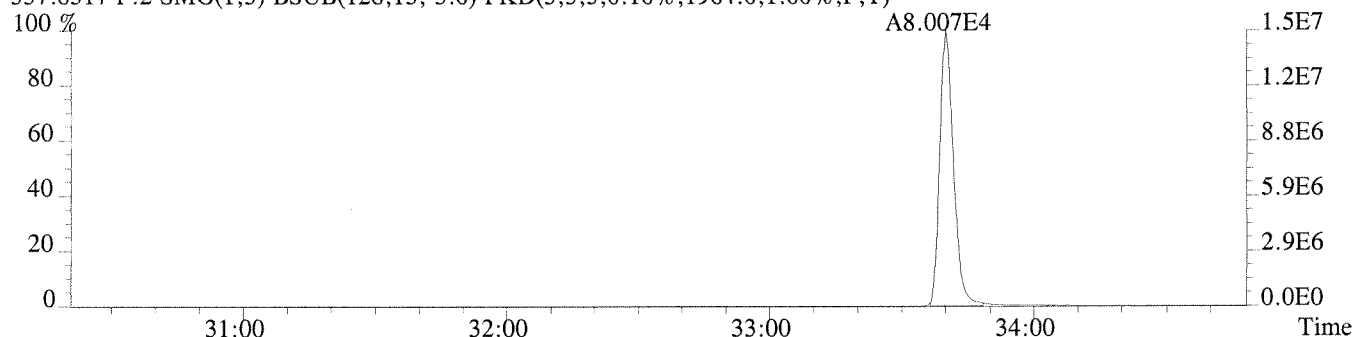
File:P208838 #1-405 Acq:27-JUL-2010 17:05:28 Probe EI+ Magnet SIR VG BioTech Mass spectf

Sample#1 Exp:CCAL HRCC3

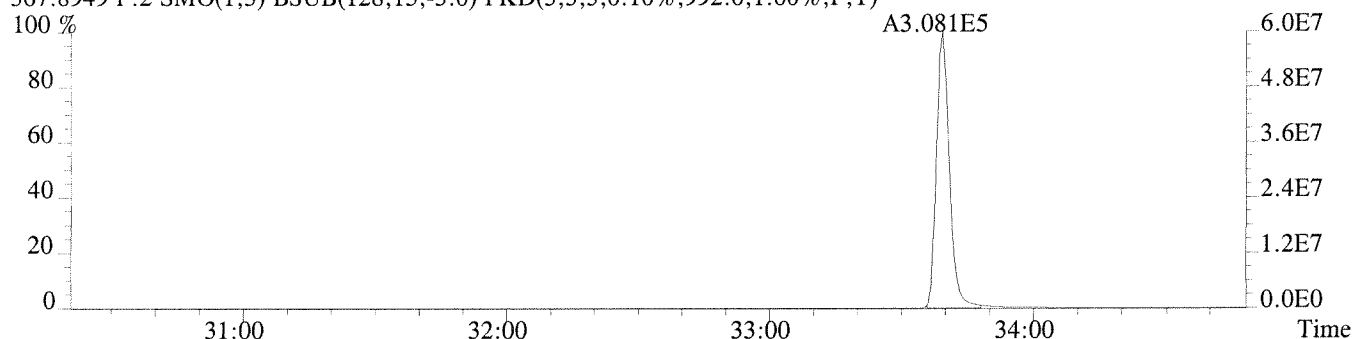
355.8546 F:2 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.10%,2648.0,1.00%,F,T)



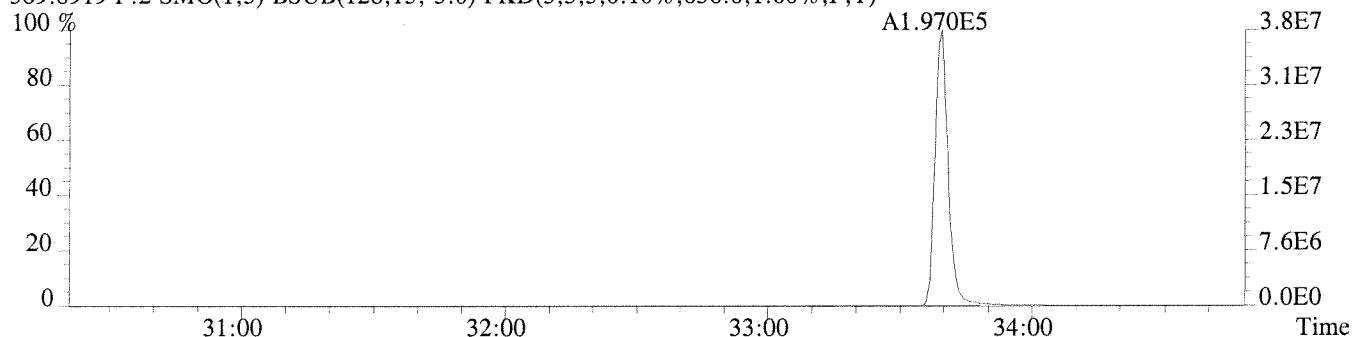
357.8517 F:2 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.10%,1964.0,1.00%,F,T)



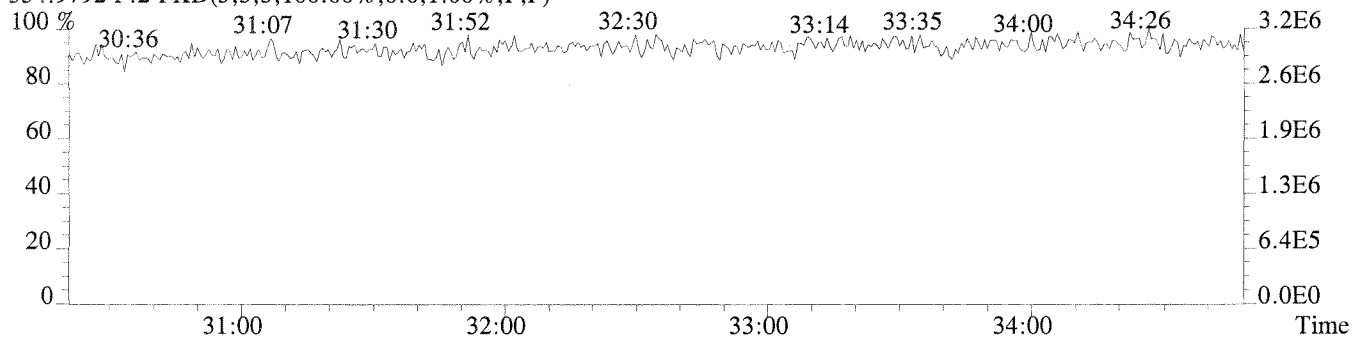
367.8949 F:2 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.10%,992.0,1.00%,F,T)



369.8919 F:2 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.10%,636.0,1.00%,F,T)



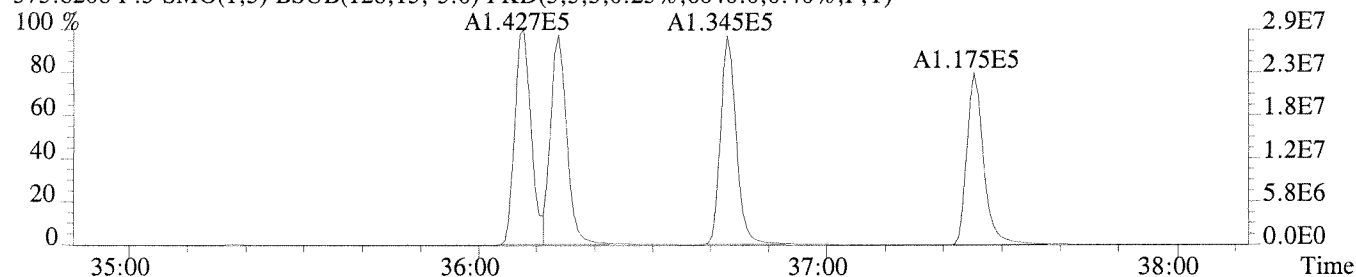
354.9792 F:2 PKD(3,3,3,100.00%,0.0,1.00%,F,F)



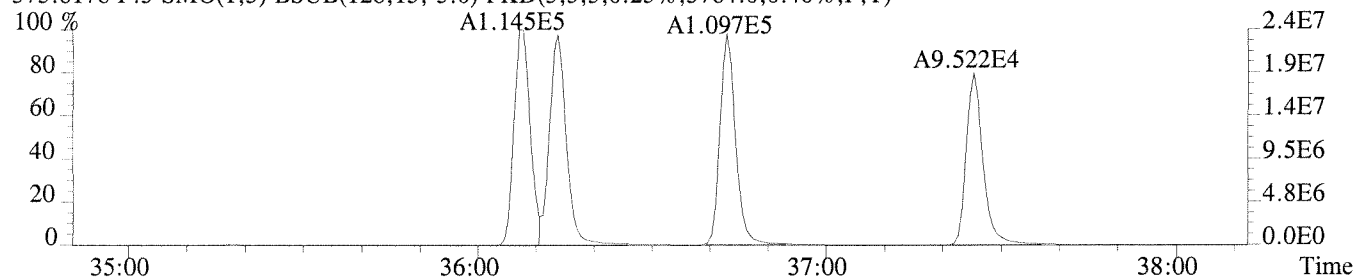
File:P208838 #1-306 Acq:27-JUL-2010 17:05:28 Probe EI+ Magnet SIR VG BioTech Mass spectf

Sample#1 Exp:CCAL HRCC3

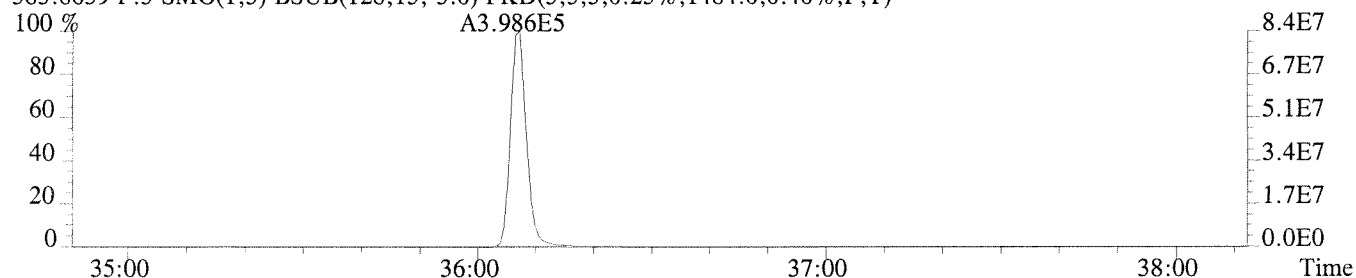
373.8208 F:3 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.25%,6040.0,0.40%,F,T)



375.8178 F:3 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.25%,3784.0,0.40%,F,T)



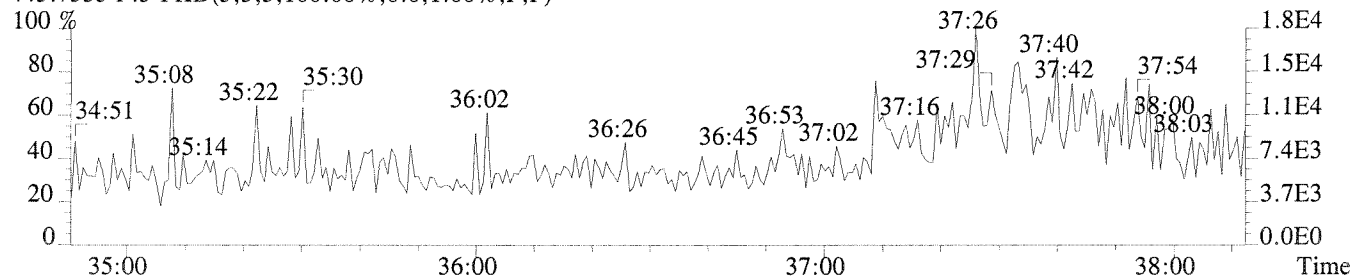
383.8639 F:3 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.25%,1484.0,0.40%,F,T)



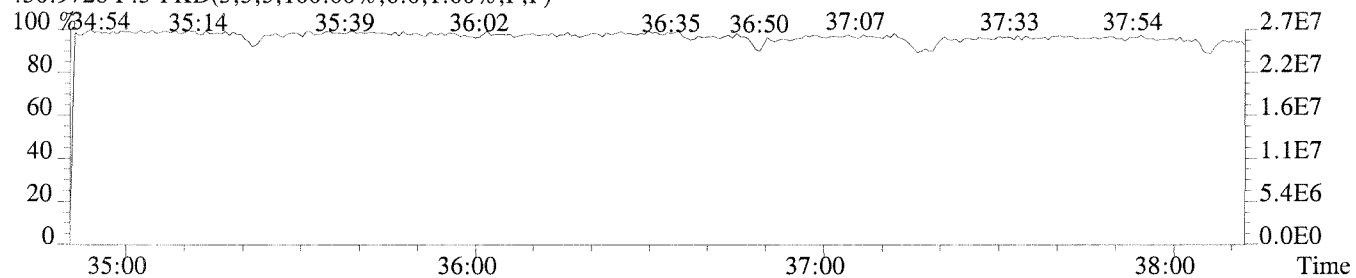
385.8610 F:3 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.25%,3736.0,0.40%,F,T)



445.7555 F:3 PKD(5,3,5,100.00%,0.0,1.00%,F,F)



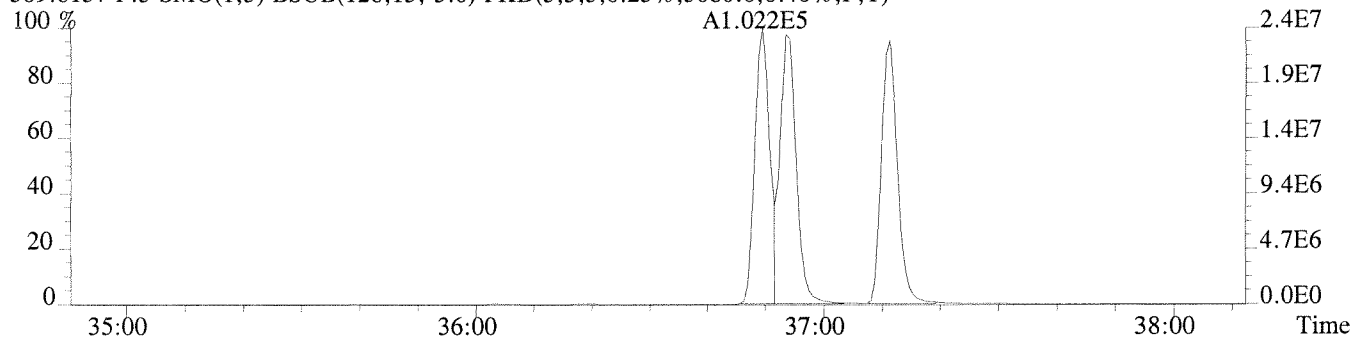
430.9728 F:3 PKD(3,3,3,100.00%,0.0,1.00%,F,F)



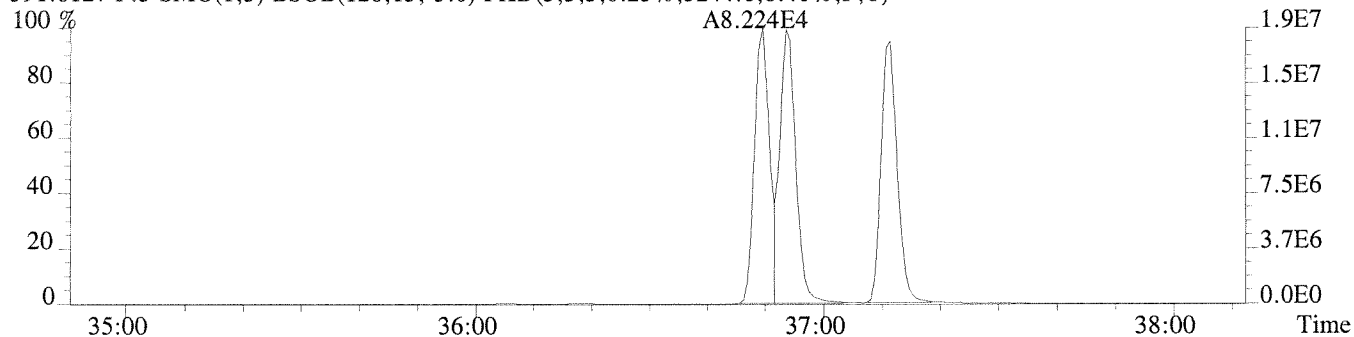
File:P208838 #1-306 Acq:27-JUL-2010 17:05:28 Probe EI+ Magnet SIR VG BioTech Mass spectf

Sample#1 Exp:CCAL HRCC3

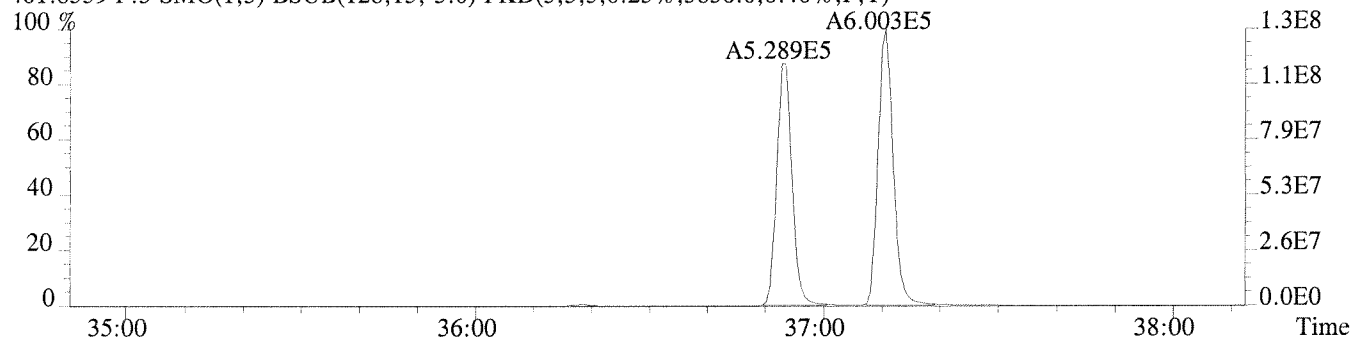
389.8157 F:3 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.25%,5080.0,0.40%,F,T)



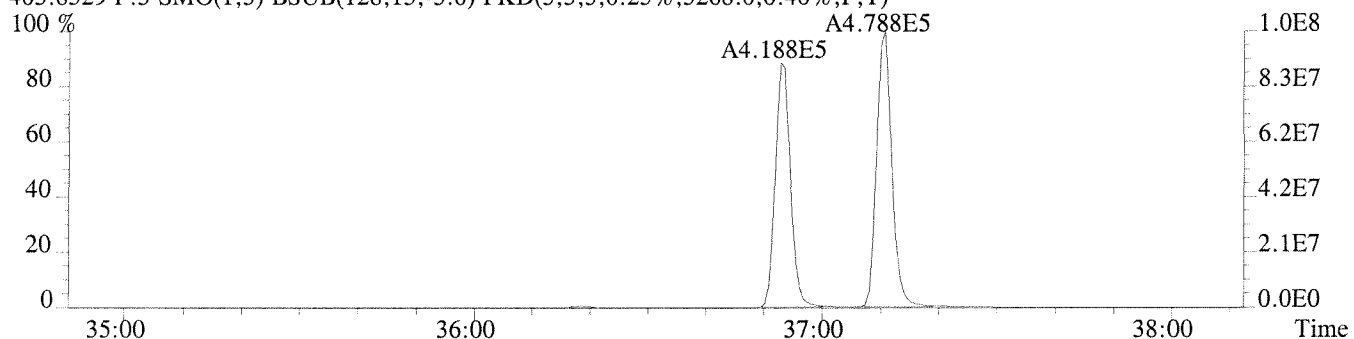
391.8127 F:3 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.25%,5244.0,0.40%,F,T)



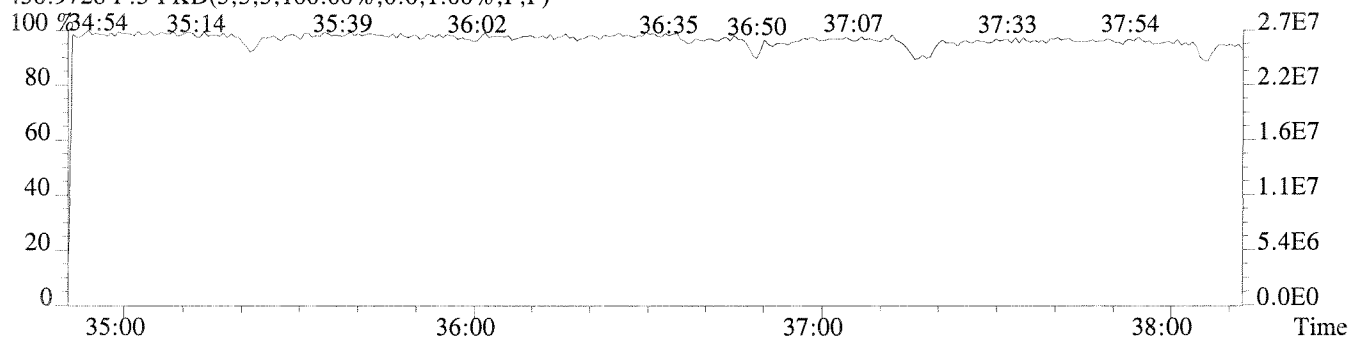
401.8559 F:3 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.25%,3836.0,0.40%,F,T)



403.8529 F:3 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.25%,3268.0,0.40%,F,T)



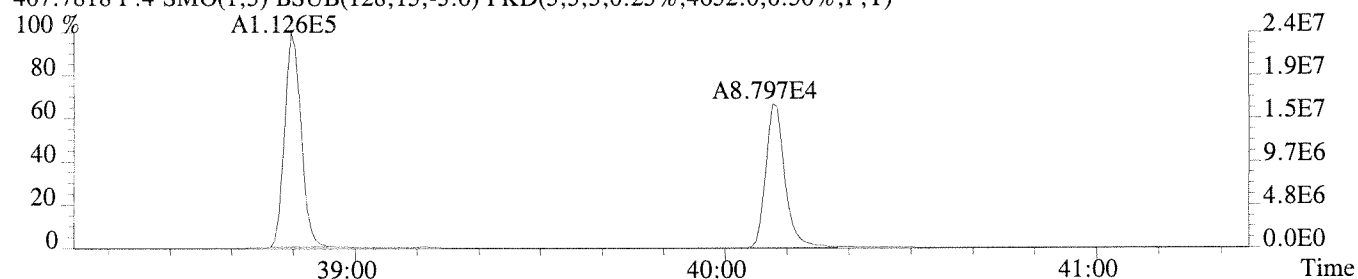
430.9728 F:3 PKD(3,3,3,100.00%,0.0,1.00%,F,F)



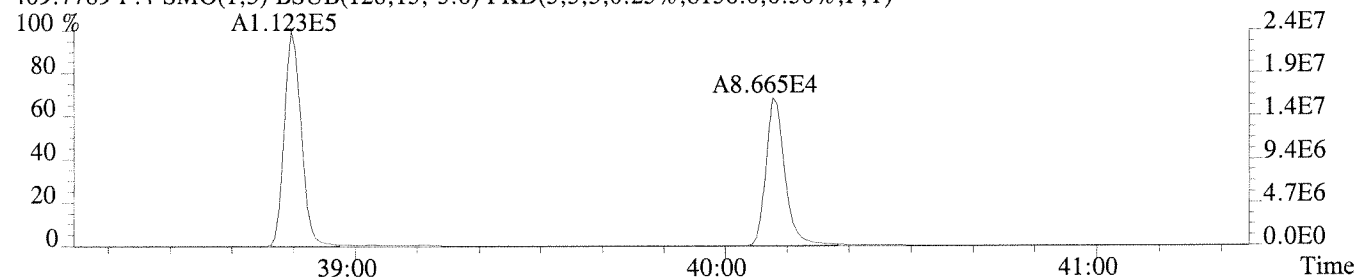
File:P208838 #1-288 Acq:27-JUL-2010 17:05:28 Probe EI+ Magnet SIR VG BioTech Mass spectf

Sample#1 Exp:CCAL HRCC3

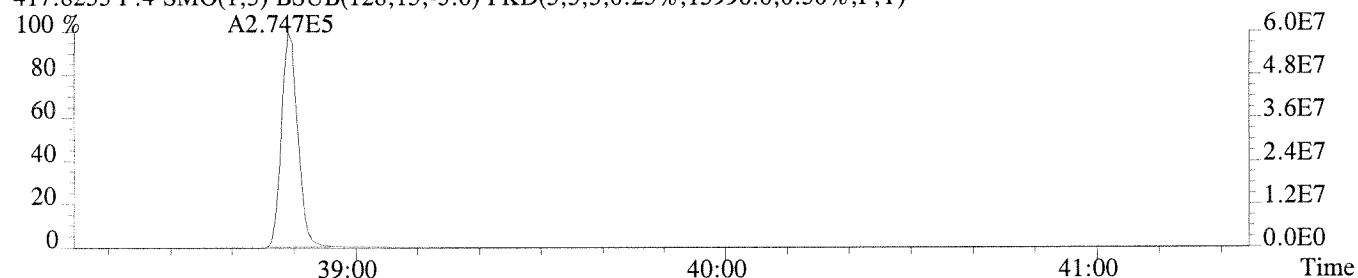
407.7818 F:4 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.25%,4652.0,0.50%,F,T)



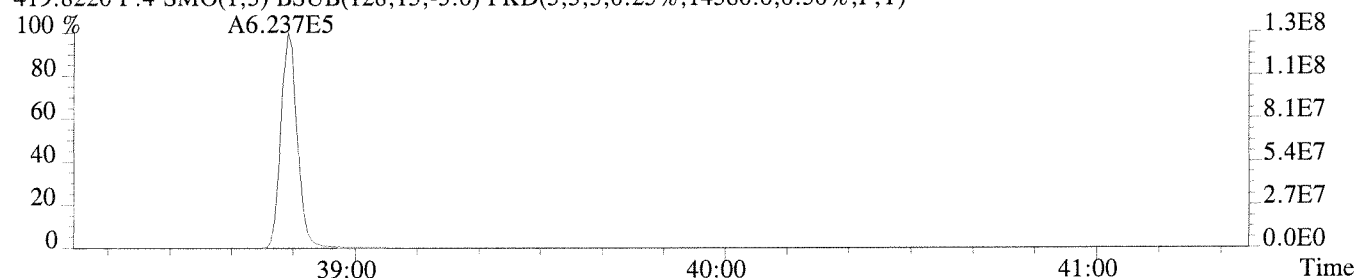
409.7789 F:4 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.25%,8136.0,0.50%,F,T)



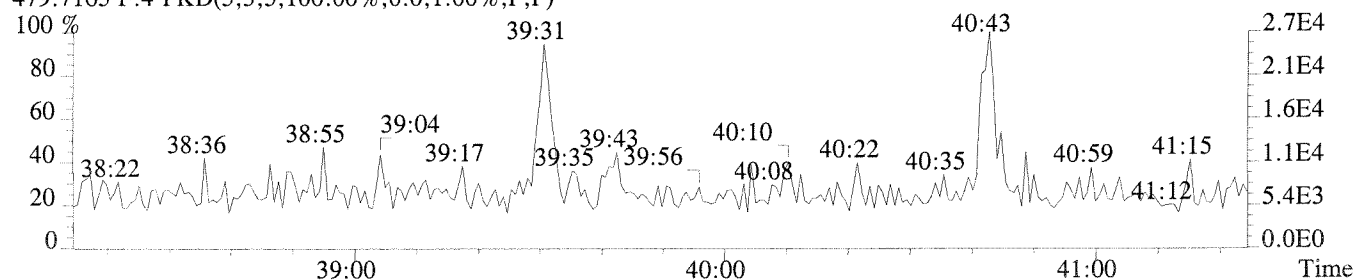
417.8253 F:4 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.25%,15996.0,0.50%,F,T)



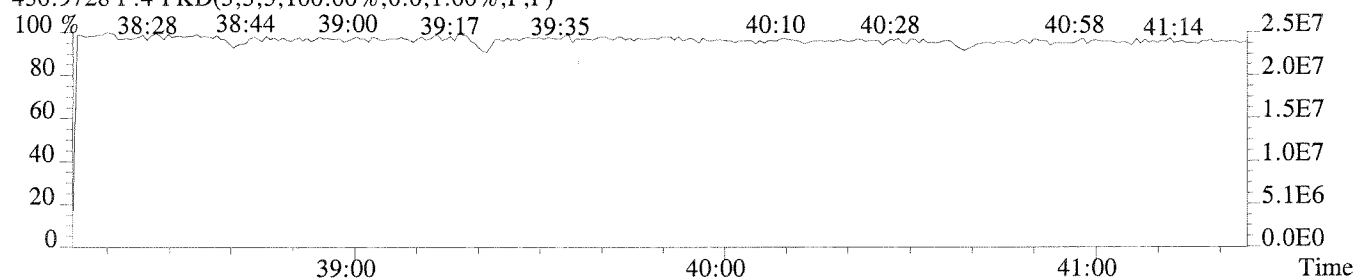
419.8220 F:4 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.25%,14580.0,0.50%,F,T)



479.7165 F:4 PKD(5,3,5,100.00%,0.0,1.00%,F,F)



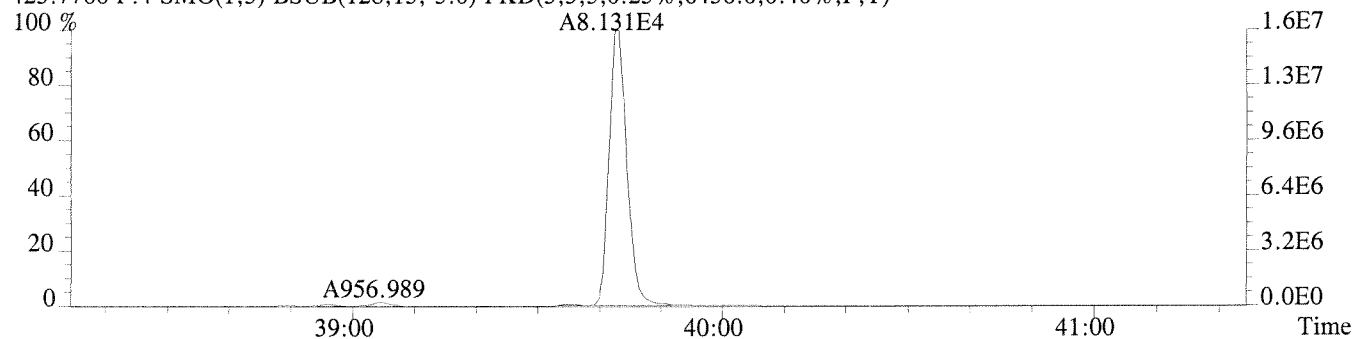
430.9728 F:4 PKD(3,3,3,100.00%,0.0,1.00%,F,F)



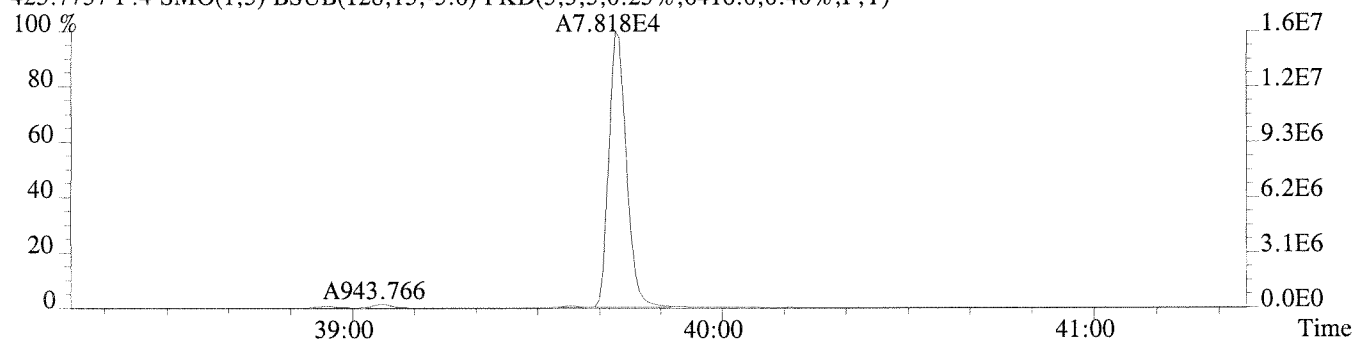
File:P208838 #1-288 Acq:27-JUL-2010 17:05:28 Probe EI+ Magnet SIR VG BioTech Mass spectf

Sample#1 Exp:CCAL HRCC3

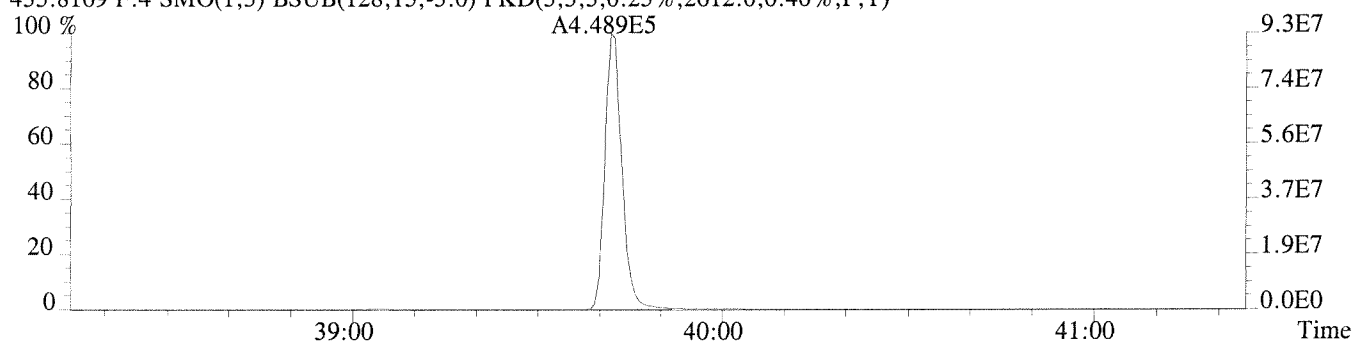
423.7766 F:4 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.25%,6436.0,0.40%,F,T)



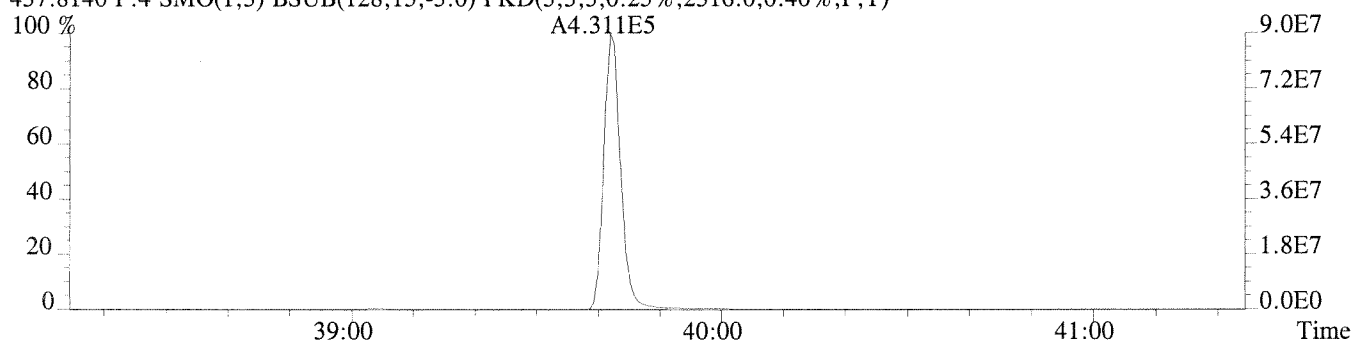
425.7737 F:4 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.25%,6416.0,0.40%,F,T)



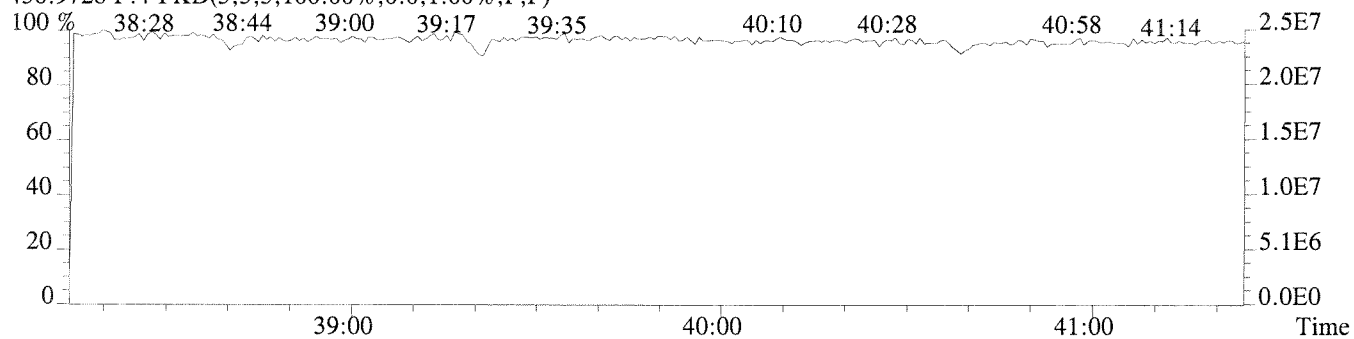
435.8169 F:4 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.25%,2612.0,0.40%,F,T)



437.8140 F:4 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.25%,2316.0,0.40%,F,T)

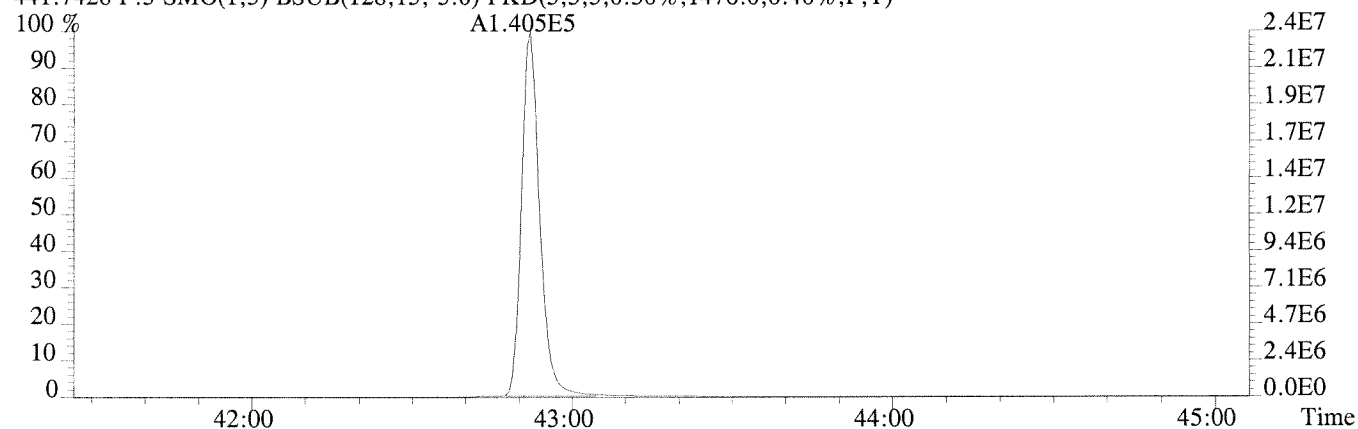


430.9728 F:4 PKD(3,3,3,100.00%,0.0,1.00%,F,F)

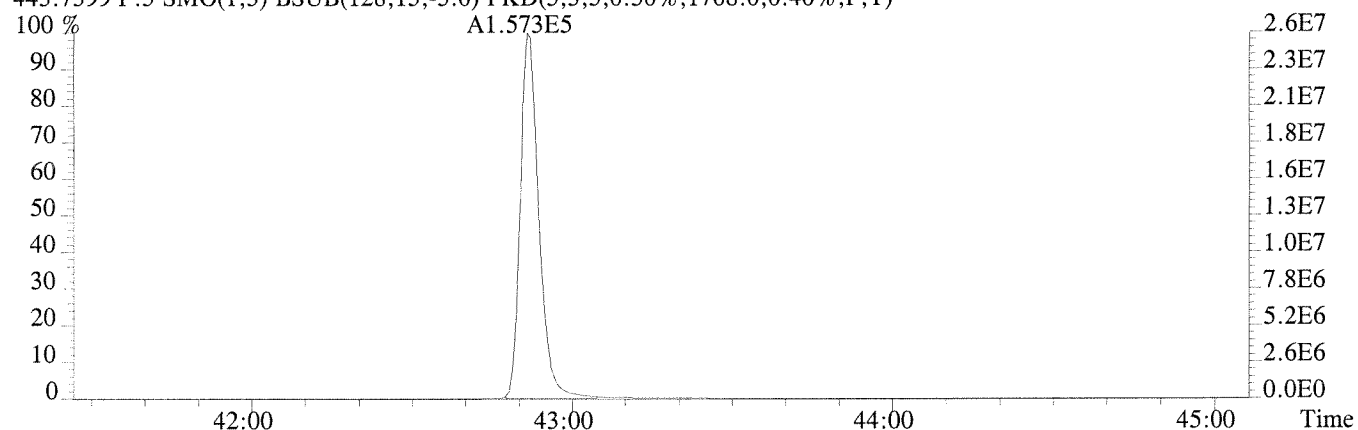


File:P208838 #1-333 Acq:27-JUL-2010 17:05:28 Probe EI+ Magnet SIR VG BioTech Mass spectf
Sample#1 Exp:CCAL HRCC3

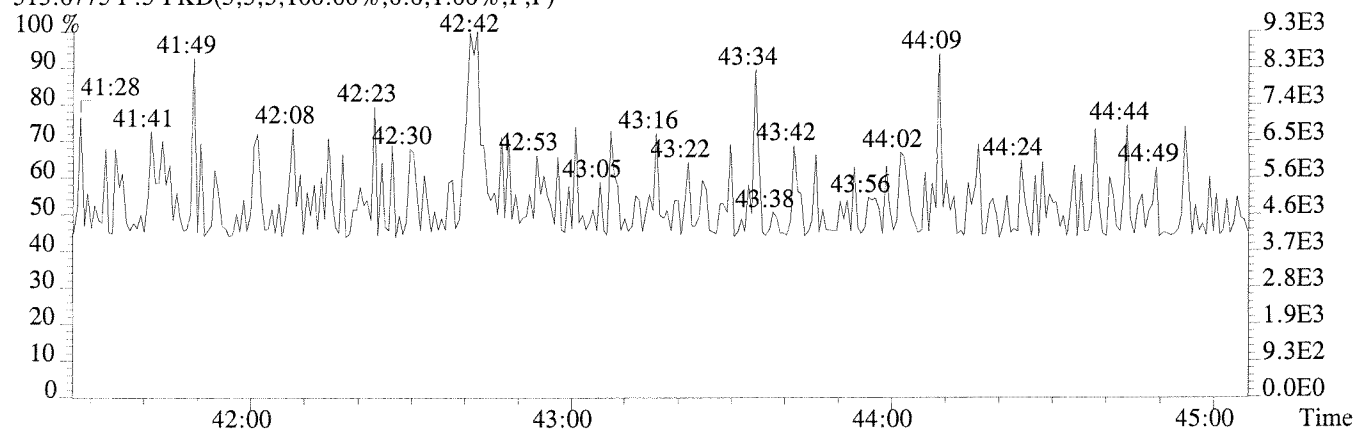
441.7428 F:5 SMO(1,3) BSUB(128,15,-3.0) PKD(5,3,5,0.30%,1476.0,0.40%,F,T)



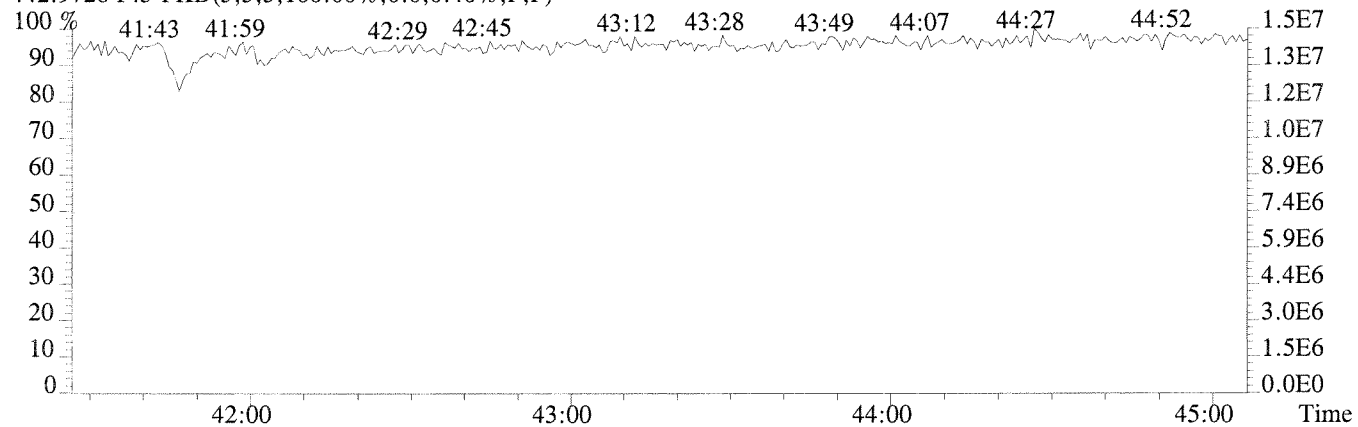
443.7399 F:5 SMO(1,3) BSUB(128,15,-3.0) PKD(5,3,5,0.30%,1708.0,0.40%,F,T)



513.6775 F:5 PKD(5,3,5,100.00%,0.0,1.00%,F,F)



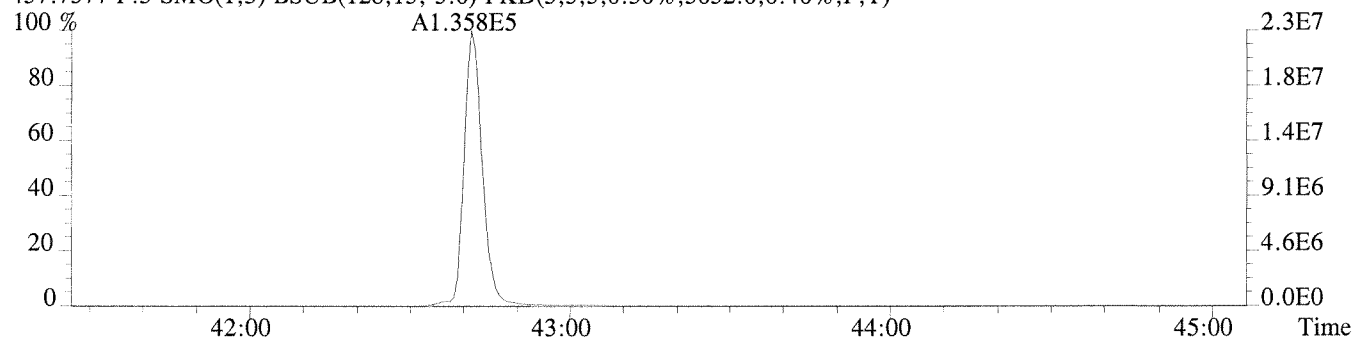
442.9728 F:5 PKD(3,3,3,100.00%,0.0,0.40%,F,F)



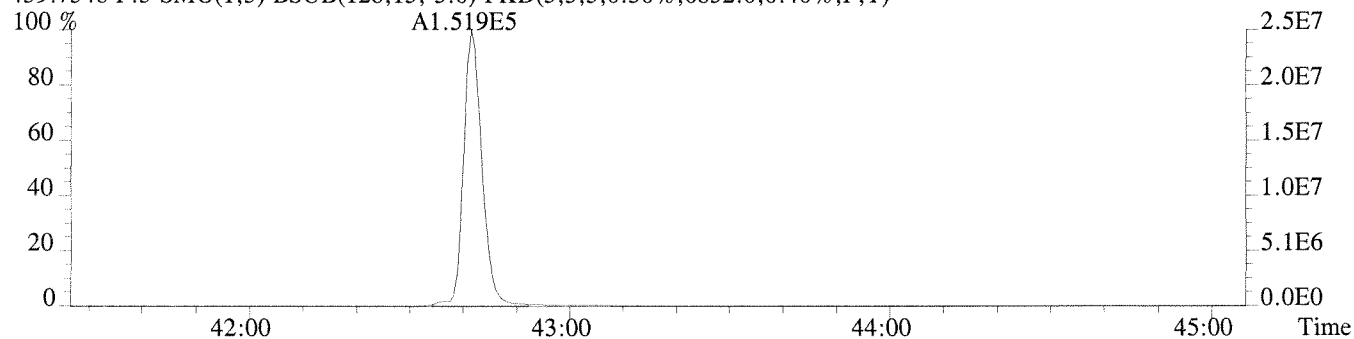
File:P208838 #1-333 Acq:27-JUL-2010 17:05:28 Probe EI+ Magnet SIR VG BioTech Mass spectf

Sample#1 Exp:CCAL HRCC3

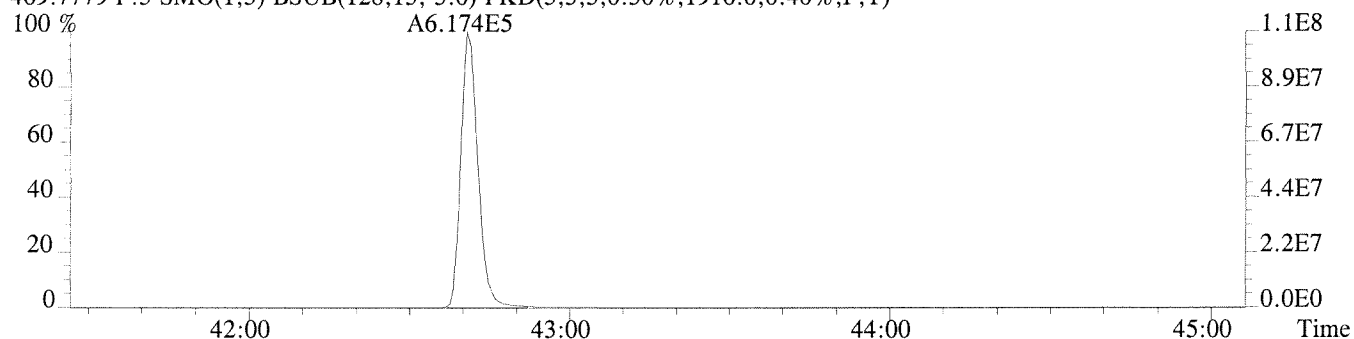
457.7377 F:5 SMO(1,3) BSUB(128,15,-3.0) PKD(5,3,5,0.30%,5652.0,0.40%,F,T)



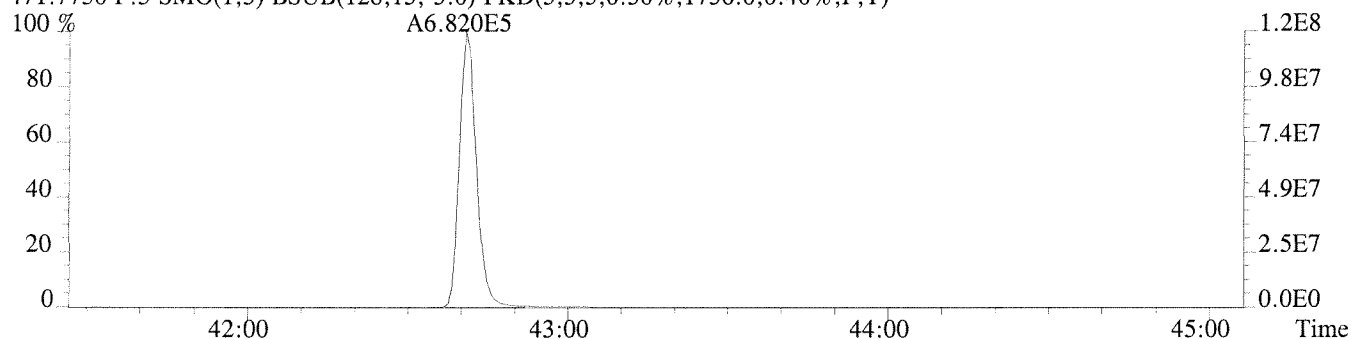
459.7348 F:5 SMO(1,3) BSUB(128,15,-3.0) PKD(5,3,5,0.30%,6832.0,0.40%,F,T)



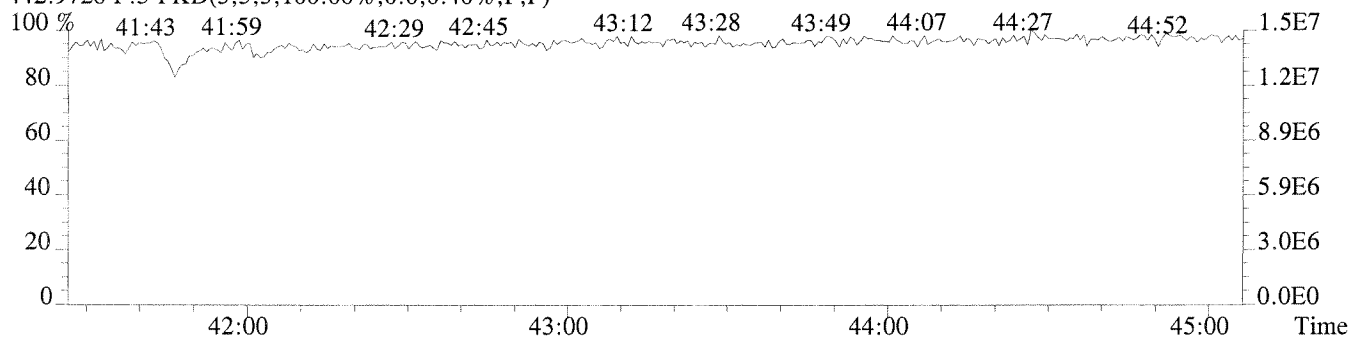
469.7779 F:5 SMO(1,3) BSUB(128,15,-3.0) PKD(5,3,5,0.30%,1916.0,0.40%,F,T)



471.7750 F:5 SMO(1,3) BSUB(128,15,-3.0) PKD(5,3,5,0.30%,1736.0,0.40%,F,T)



442.9728 F:5 PKD(3,3,3,100.00%,0.0,0.40%,F,F)



RW/CS3 Daily Calibration QC Checklist

Calibration File Name: 4137248-4137255 Circle one: Beginning / Ending

Date: 7/27/10

Method: 1613 / 1613E / VCP / Tetra / TCDD Only / TCDF Conf / VCP Conf / 8280 / M23 / TO-9A

Retention Window/Column Performance Check:

Analyst

Second Check

Windows in and first and last eluters labeled	NA	N/A
Column Performance shows less than or equal to 25% valley between column specific 2378 isomer and its closest eluters	/	✓
No QC ion deflections affect column specific 2378 isomer or its closest eluters (HRMS Only)	/	✓

CS3 Continuing Calibration

Analyst

Second Check

Percent RSD within method criteria	/	✓
All relative abundance ratios meet method criteria	/	✓
No QC ion deflections of greater than 20% (HRMS Only)	/	✓
Mass spectrometer resolution greater than or equal to 10,000 and documented (HRMS Only)	/	✓
2378-TCDD elutes at 25 minutes or later on the DB-5 column	NA	N/A
Signal-to-noise of all target analytes and their labeled standards at least 10:1	/	✓
Valley between labeled 123478 and 123678 HxCDD peaks less than or equal to 50% (LRMS Only)	NA	N/A
Ending Calibration injected prior to end of 12 hour clock	/	✓

Analyst: gc

Second QC: mc

5DFC
PCDD/PCDF ANALYTICAL SEQUENCE SUMMARY

Lab Name: Columbia Analytical Services

Contract:

Lab Code: TX01411

Case No.:

Client No.:

SDG No.:

GC Column: DB-225

ID: 0.25 (mm)

Instrument ID: AutoSpec-Ultima

Init. Calib. Date: 12/17/07

Init. Calib.Times: 16:11

THE ANALYTICAL SEQUENCE OF STANDARDS, SAMPLES, BLANKS, AND LABORATORY CONTROL
SAMPLES (LCSS) IS AS FOLLOWS:

EPA SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
COLUMN PERFORMANCE		U137247	27-JUL-10	11:58:48
CCAL CS3		U137248	27-JUL-10	12:24:48
INST BLANK	INST BLANK	U137250	27-JUL-10	14:15:28
SRC-2010-8-COMP	E1000811-001	U137251	27-JUL-10	14:53:12
SB-20 6-8'	DO NOT USE	U137252	27-JUL-10	15:30:12
SB-10 0-2'	J1003407-007	U137253	27-JUL-10	16:07:13
SB-30 14-16'	J1003461-013	U137254	27-JUL-10	16:44:15
CCAL CS3	CCAL CS3	U137255	27-JUL-10	17:30:33
SB-20 6-8'	J1003350-009	U137252	27-JUL-10	15:30:12

HRGC/HRMS RUN LOG

CAS HOUSTON 19408 Park Row, Suite 320 Houston, TX 77084

Acq Method: TCD/FAS

GC Method: TCD/FAS

Result File: e:\137248.res

EDD File:



An Employee Owned Company

Date	Time	File	CAS ID	Client ID	Batch #	Analyst	Comments	RE
07/23/10	23:55	0137238	4007017-010	DU23-0.2-0.5		✓	1613	
07/24/10	00:32	0137239	-011	DU33-0.0-0.2			..	
	01:09	0137240	-012	DU33-0.2-0.5			..	
	01:46	0137241	-013	DU35-0.0-0.2			..	
	02:23	0137242	-014	DU35-0.2-0.5			..	
	03:00	0137243	-015	DU36-0.0-0.2			..	
	03:37	0137244	-016	DU36-0.2-0.5			..	
	04:14	0137245	-017	DU37-0.0-0.2			..	
	04:53		HRMS CHECK			↓		
07/24/10	06:50		HRMS CHECK			↓		
	06:51	0137246	COLUMN PERFORMANCE	D4-51-1		↓	NEEDS RE-INJECTION; CHANGES	
07/27/10	11:56		HRMS CHECK			↓	8290	
	11:58	0137247	COLUMN PERFORMANCE	D4-51-1				
	12:24	0137248	OCAL CS3	D11-34-2				
	13:49	0137249	TEST. BLANK					
	14:15	0137250	TEST. BLANK			↓		

CHANGES 8290
COLUMN

Reviewed by: MR

URG/IRMS RUN LOG

CAS HOUSTON 19408 Park Row, Suite 320 Houston, TX 77084

Acq Method: TCDEAS

GC Method: TCDEAS

Result File: _____

EDD File: _____



An Employee Owned Company

Date	Time	File	CAS ID	Client ID	Batch #	Analyst	Comments	RE
07/27/10	14:53	U137251	E1000811-001	SAC-2010-8-Comp		KC	8290	
	15:30	U137252	J1003350-009	SB-20 6-8'			"	
	16:07	U137253	J1003407-007	SB-10 0-2'			"	
	16:44	U137254	J1003461-013	SB-30 14-16'			"	
	17:30	U137255	CCAL CS3	D11-34-2				
	18:17		IRMS CHECK					
		U137256	COLUMN PERFORMANCE	N4-5A-1				
	18:45	U137257	TEST					
		U137258	INST. BLANK					
		U137259	K1007017-018				1613	
		U137260	↓ -019				..	
		U137261	↓ -020				..	
		U137262	E1000735-001				M23	
		U137263	↓ -002				..	
		U137264	↓ -003				..	
		U137265	↓ -004				..	

Reviewed by: mc

USEPA - CLP
5DFB

PCDD/PCDF WINDOW DEFINING MIX SUMMARY

EPA SAMPLE NO.

Column Perform

Lab Name: Columbia Analytical Services Contract: _____

Lab Code: TX01411 Case No.: _____ Client No.: _____ SDG No.: _____

GC Column: 30m DB-225 ID: 0.25 (mm) Lab File ID: U137247

Instrument ID: Ultima AutoSpec Date Analyzed: 07/27/2010

Time Analyzed: 11:58:48

Percent Valley determination for DB-5 (or equivalent) Column -
For the Column Performance Solution beginning the 12-hour period:

1478-TCDD/2378-TCDD: _____

QUALITY CONTROL (QC) LIMITS: _____

Percent Valley between the TCDD isomers must be less than or equal to 25%.

Percent Valley determination for DB-225 (or equivalent) Column -
For the Column Performance Solution beginning the 12-hour period:

2347-TCDF/2378-TCDF: 15 %

QUALITY COTROL (QC) LIMITS:

Percent Valley between the TCDF/TCDF isomers must be less than or equal to 25%.

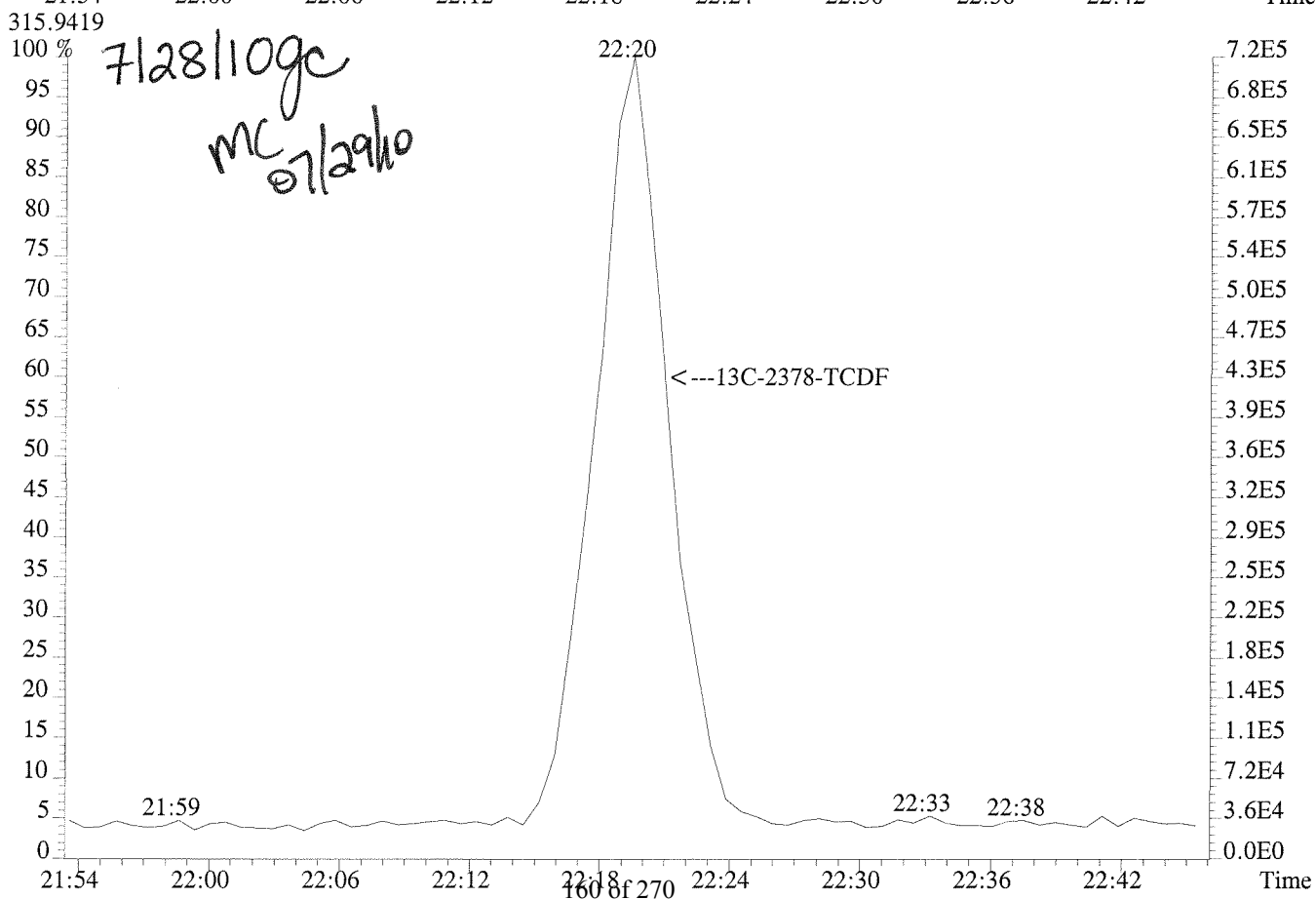
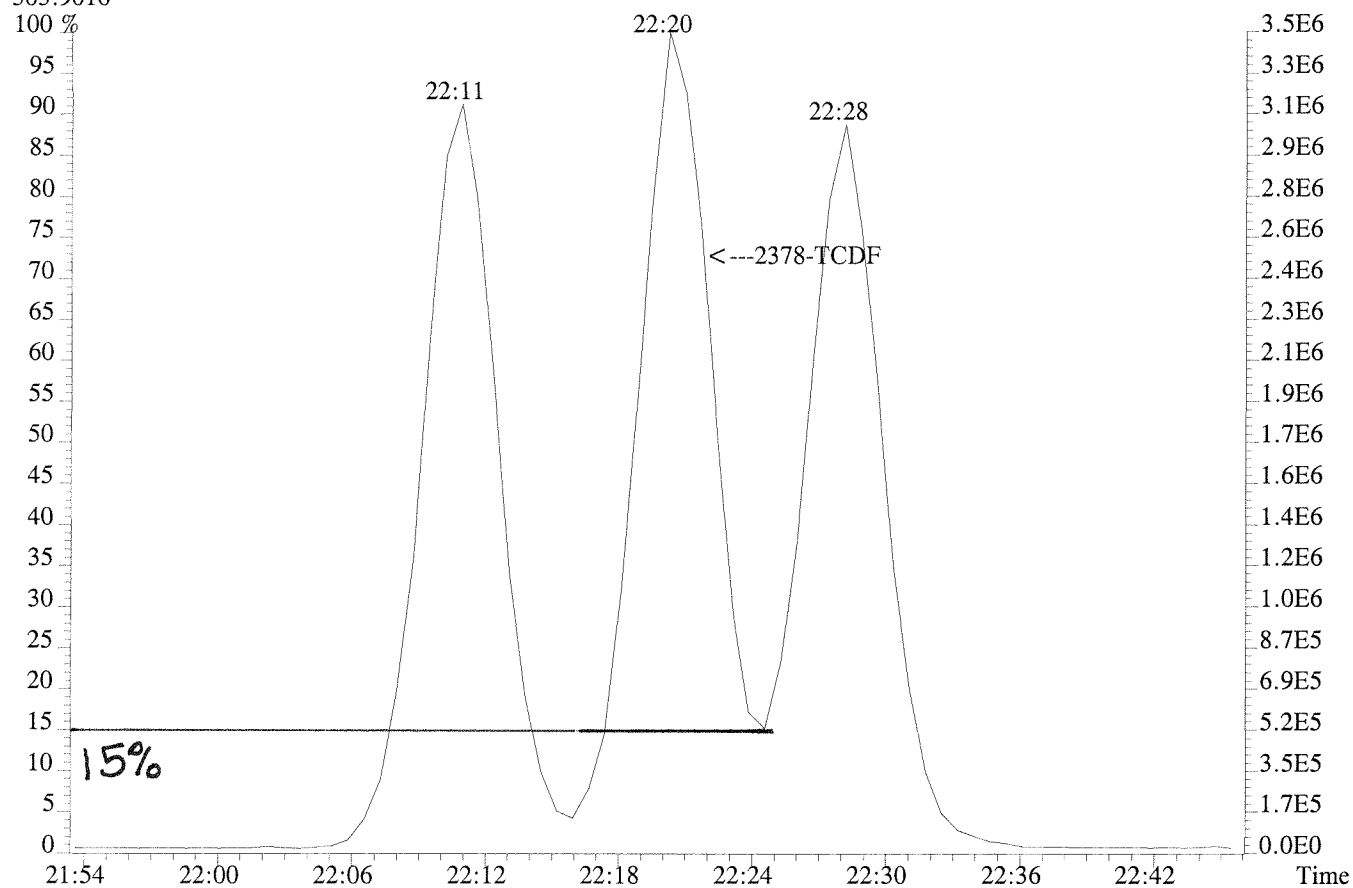
Analyst Init: _____



FORM V-HR CDD-2

DLM02.0

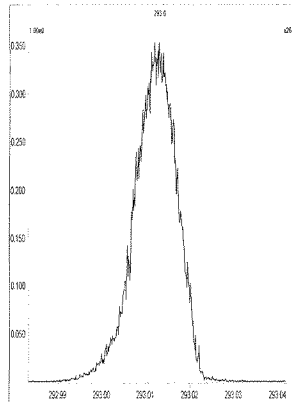
File:U137247 #1-750 Acq:27-JUL-2010 11:58:48 Probe EI+ Magnet SIR VG BioTech Mass spectf
Sample#1 Exp:COLUMN PERFORMANCE
303.9016



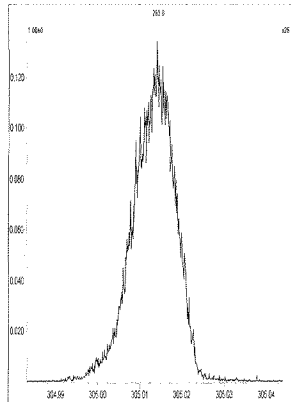
File: Experiment: TCDFCAS.exp Reference: pfk.ref Function: 1 @ 200 (ppm)

Printed: Tuesday, July 27, 2010 11:56:31 Central Daylight Time

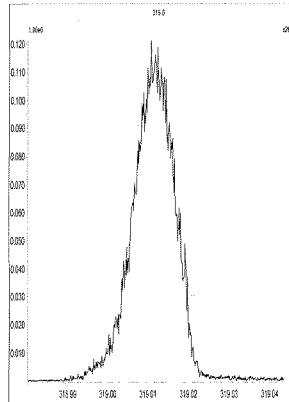
M 292.9824 R 12501



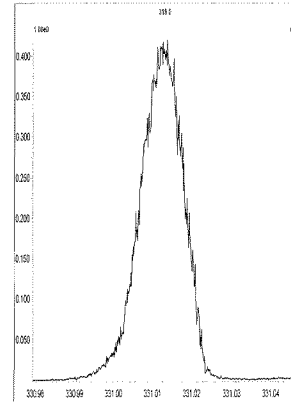
M 304.9824 R 13095



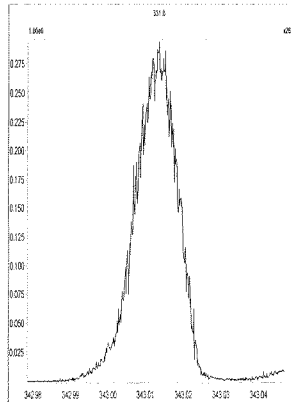
M 318.9792 R 13373



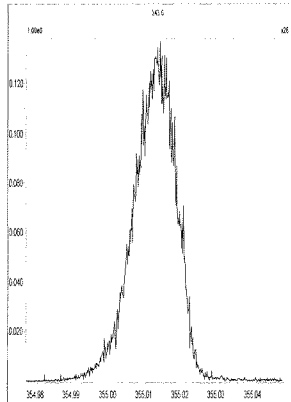
M 330.9792 R 13090



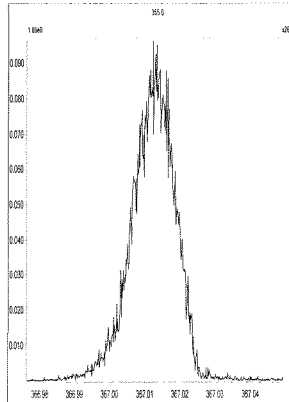
M 342.9792 R 13020



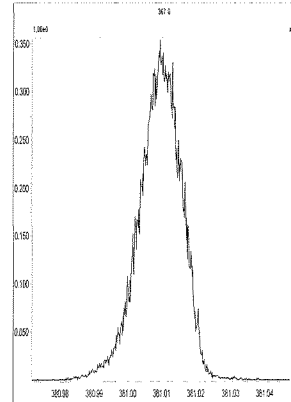
M 354.9792 R 13225



M 366.9792 R 13514



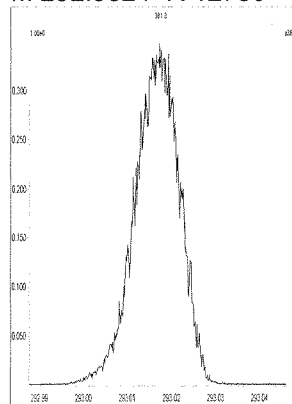
M 380.9760 R 13440



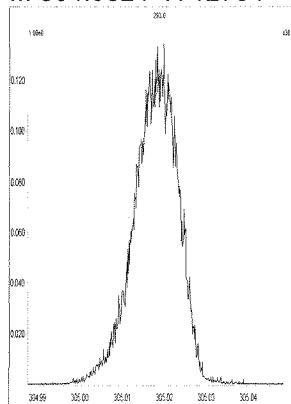
File: Experiment: TCDFCAS.exp Reference: pfk.ref Function: 1 @ 200 (ppm)

Printed: Tuesday, July 27, 2010 18:17:23 Central Daylight Time

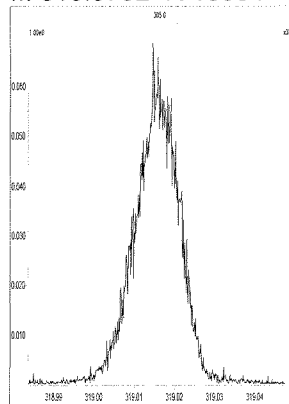
M 292.9824 R 12750



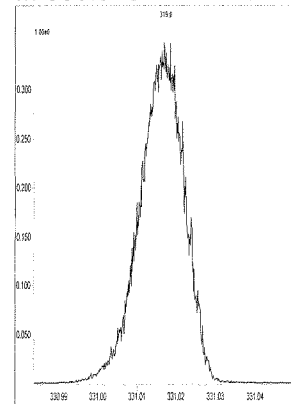
M 304.9824 R 12754



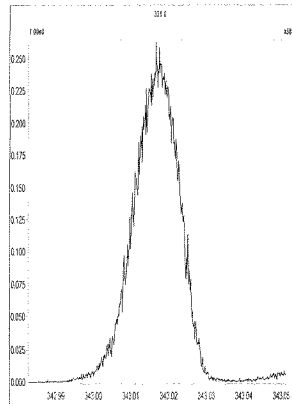
M 318.9792 R 13584



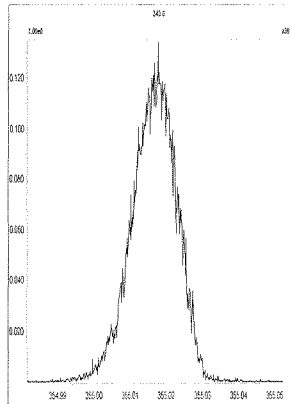
M 330.9792 R 12434



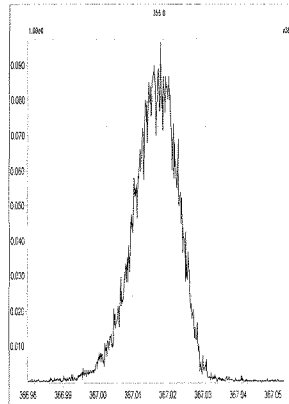
M 342.9792 R 12690



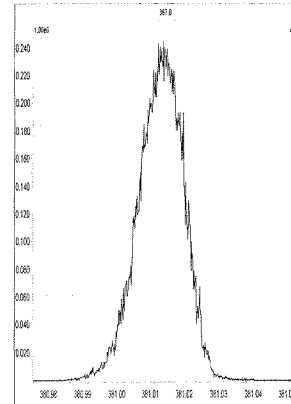
M 354.9792 R 12198



M 366.9792 R 12558



M 380.9760 R 12315



FORM 4A
TCDF CALIBRATION VERIFICATION

Lab Name: Columbia Analytical Services Contract No.:

Lab Code: TX01411 Case No.: Client No: SDG No.:

Initial Calibration Date: 12/17/07

Instrument ID.: AutoSpec_Ultima

GC COLUMN ID: DB-225

VER Data Filename: U137248

Analysis Date: 27-JUL-10 Time: 12:24:48

	M/Z'S FORMING RATIO (1)	ION ABUND. RATIO	QC LIMITS (2)	CCAL. RRF	MEAN RRF	%D (3)
NATIVE ANALYTES						
2,3,7,8-TCDF	M/M+2	0.79	0.65-0.89	1.03	1.02	0.49
Labeled Compounds						
13C-2,3,7,8-TCDF	M/M+2	0.79	0.65-0.89	1.33	1.25	6.69
Cleanup Standard						
37Cl-2,3,7,8-TCDD				1.02	0.94	7.50

Columbia Analytical Services, Inc.
Sample Response Summary

Page 6 of 13
EPA SAMPLE NO.
CCAL CS3

Run #6 Filename U137248 Samp: 1 Inj: 1 Acquired: 27-JUL-10 12:24:48
Processed: 28-JUL-10 11:40:58 Sample ID: CCAL CS3

Typ	Name	RT-1	Resp 1	Resp 2	Ratio	Meet	Mod?
1 Unk	2,3,7,8-TCDF	22:20	5.243e+03	6.673e+03	0.79	yes	no
2 IS	13C-2,3,7,8-TCDF	22:19	5.103e+04	6.471e+04	0.79	yes	no
3 RS/RT	13C-1,2,3,4-TCDD	21:02	3.818e+04	4.853e+04	0.79	yes	no
4 C/Up	37Cl-2,3,7,8-TCDD	20:47	8.803e+03				no

Signal/Noise Height Ratio Summary

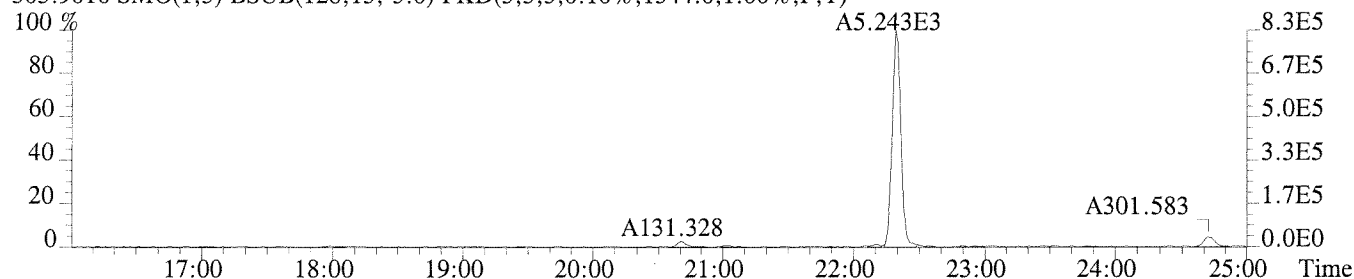
		Signal 1	Noise 1	S/N Rat.1	Signal 2	Noise 2	S/N
	Name						
1	2,3,7,8-TCDF	8.33e+05	1.34e+03	6.2e+02	1.08e+06	1.50e+03	7.2e+02
2	13C-2,3,7,8-TCDF	7.40e+06	4.16e+03	1.8e+03	9.36e+06	4.22e+03	2.2e+03
3	13C-1,2,3,4-TCDD	6.34e+06	2.94e+03	2.2e+03	7.99e+06	2.36e+03	3.4e+03
4	37Cl-2,3,7,8-TCDD	1.43e+06	1.61e+03	8.9e+02			

Columbia Analytical Services, Inc.
19408 Park Row, Suite 320
Houston, TX 77084
Office (713) 266-1599. Fax (713) 266-0130

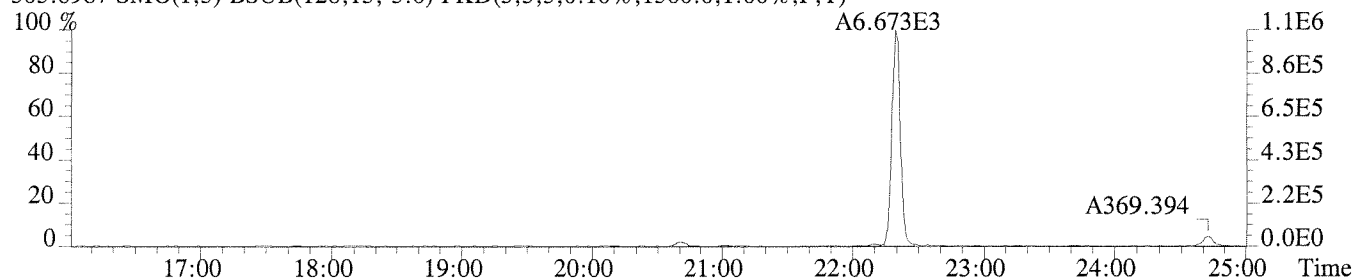
File:U137248 #1-750 Acq:27-JUL-2010 12:24:48 Probe EI+ Magnet SIR VG BioTech Mass spectf

Sample#1 Exp:CCAL CS3

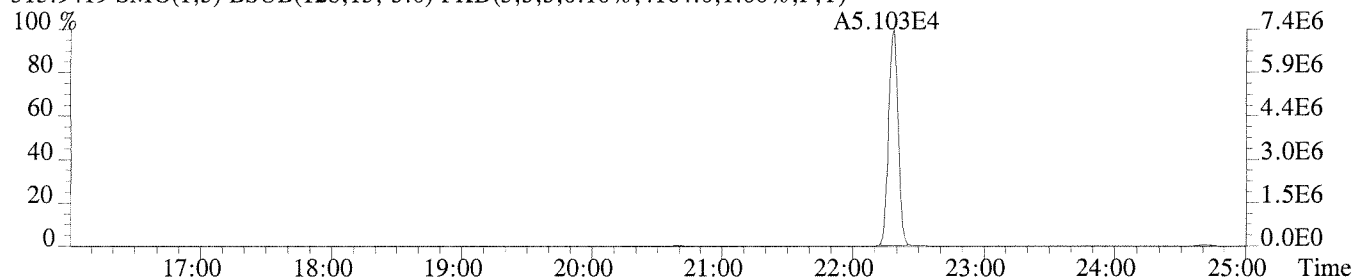
303.9016 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.10%,1344.0,1.00%,F,T)



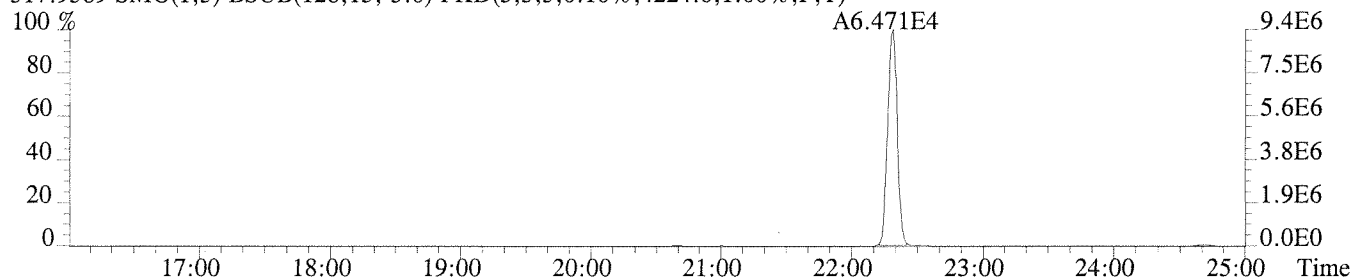
305.8987 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.10%,1500.0,1.00%,F,T)



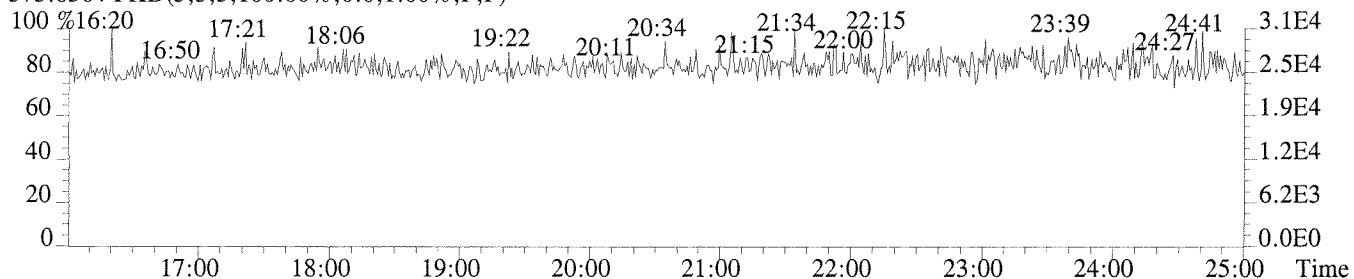
315.9419 SMO(1,5) BSUB(128,15,-3.0) PKD(3,3,3,0.10%,4164.0,1.00%,F,T)



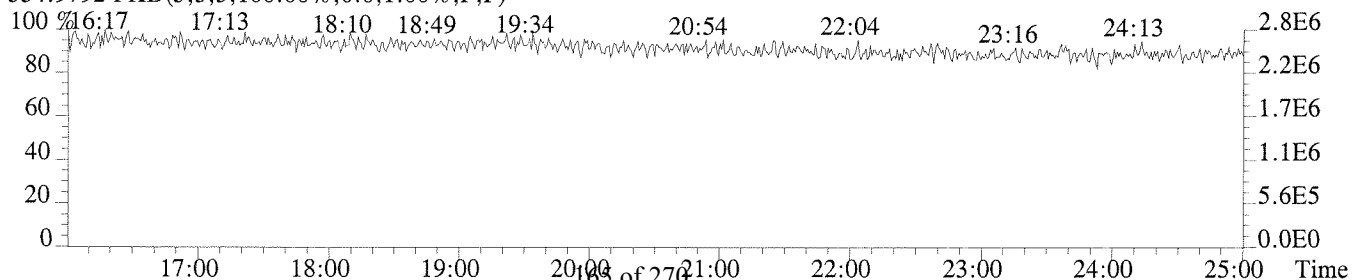
317.9389 SMO(1,5) BSUB(128,15,-3.0) PKD(3,3,3,0.10%,4224.0,1.00%,F,T)



375.8364 PKD(5,3,5,100.00%,0.0,1.00%,F,F)



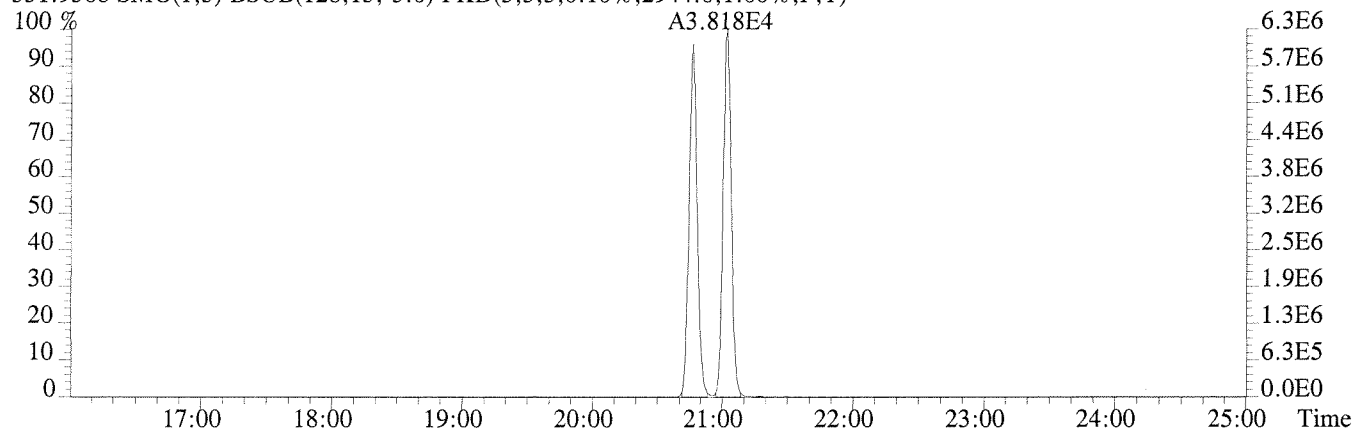
354.9792 PKD(3,3,3,100.00%,0.0,1.00%,F,F)



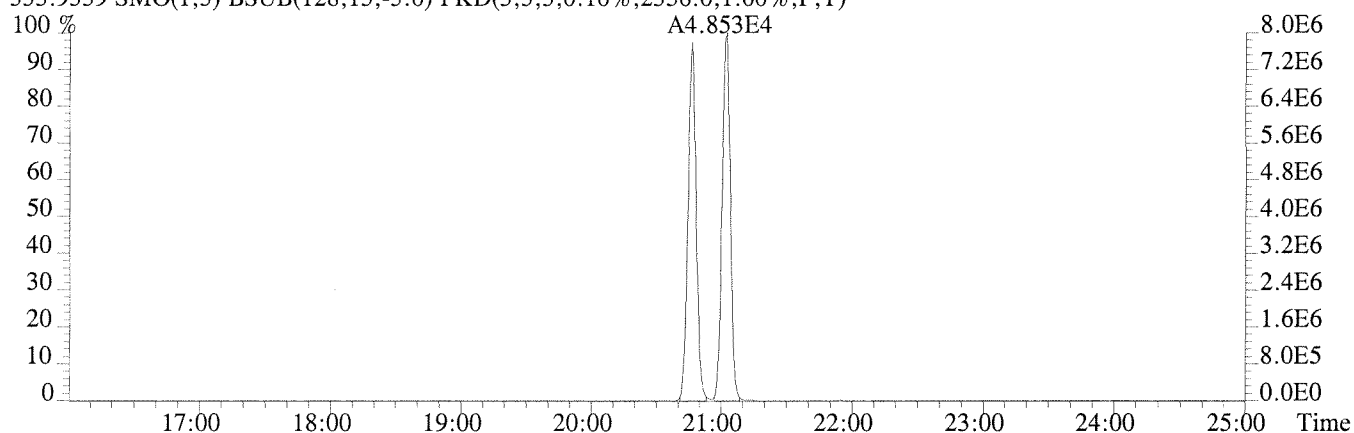
File:U137248 #1-750 Acq:27-JUL-2010 12:24:48 Probe EI+ Magnet SIR VG BioTech Mass spectf

Sample#1 Exp:CCAL CS3

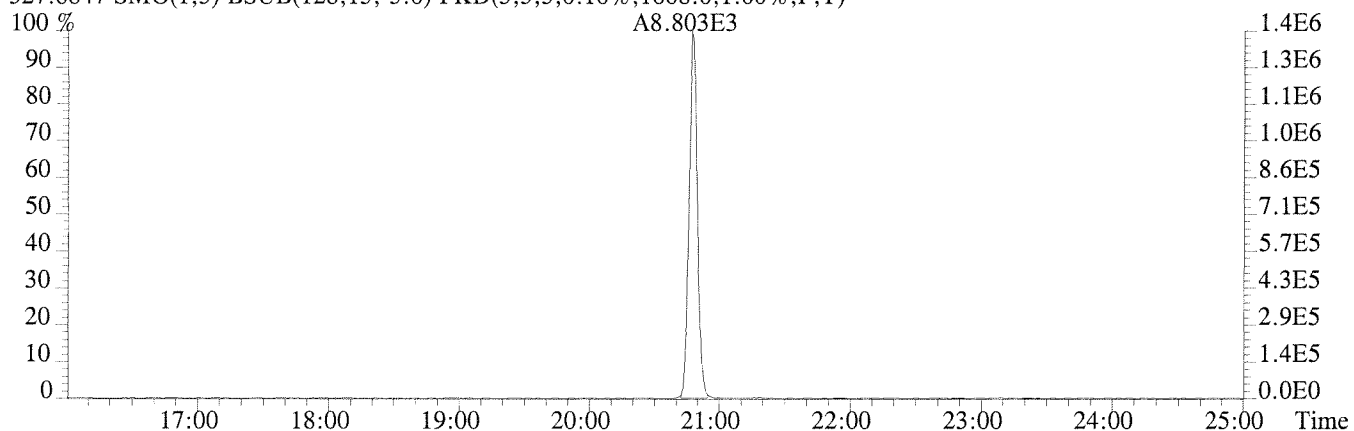
331.9368 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.10%,2944.0,1.00%,F,T)



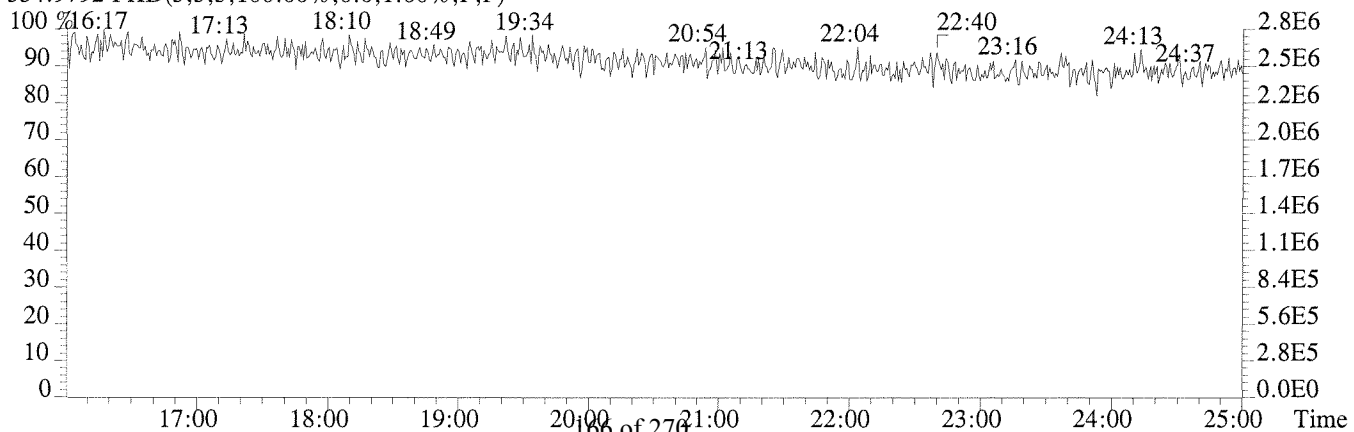
333.9339 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.10%,2356.0,1.00%,F,T)



327.8847 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.10%,1608.0,1.00%,F,T)



354.9792 PKD(3,3,3,100.00%,0.0,1.00%,F,F)



FORM 4A
TCDF CALIBRATION VERIFICATION

Lab Name: Columbia Analytical Services Contract No.:

Lab Code: TX01411 Case No.: Client No: SDG No.:

Initial Calibration Date: 12/17/07

Instrument ID.: AutoSpec_Ultima

GC COLUMN ID: DB-225

VER Data Filename: U137255

Analysis Date: 27-JUL-10 Time: 17:30:33

	M/Z'S FORMING RATIO (1)	ION ABUND. RATIO	QC LIMITS (2)	CCAL. RRF	MEAN RRF	%D (3)
NATIVE ANALYTES						
2,3,7,8-TCDF	M/M+2	0.75	0.65-0.89	0.99	1.02	-3.34
Labeled Compounds						
13C-2,3,7,8-TCDF	M/M+2	0.78	0.65-0.89	1.40	1.25	12.28
Cleanup Standard						
37Cl-2,3,7,8-TCDD				1.06	0.94	12.29

Columbia Analytical Services, Inc.
Sample Response Summary

Page 12 of 13
EPA SAMPLE NO.
CCAL CS3

Run #12 Filename U137255 Samp: 1 Inj: 1 Acquired: 27-JUL-10 17:30:33
Processed: 28-JUL-10 11:41:03 Sample ID: CCAL CS3

Typ	Name	RT-1	Resp 1	Resp 2	Ratio	Meet	Mod?
1 Unk	2,3,7,8-TCDF	22:22	4.486e+03	5.948e+03	0.75	yes	no
2 IS	13C-2,3,7,8-TCDF	22:21	4.631e+04	5.906e+04	0.78	yes	no
3 RS/RT	13C-1,2,3,4-TCDD	21:05	3.316e+04	4.185e+04	0.79	yes	no
4 C/Up	37Cl-2,3,7,8-TCDD	20:50	7.954e+03				no

Signal/Noise Height Ratio Summary

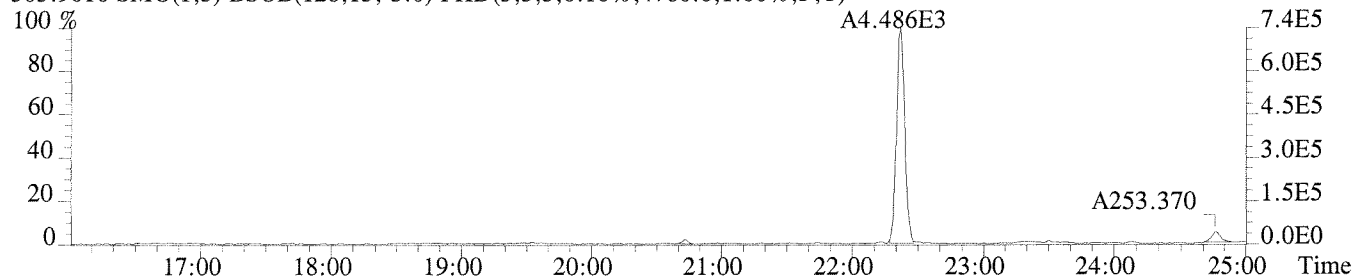
	Name	Signal 1	Noise 1	S/N Rat.1	Signal 2	Noise 2	S/N
1	2,3,7,8-TCDF	7.40e+05	4.78e+03	1.5e+02	9.90e+05	2.76e+03	3.6e+02
2	13C-2,3,7,8-TCDF	6.67e+06	3.72e+03	1.8e+03	8.55e+06	5.07e+03	1.7e+03
3	13C-1,2,3,4-TCDD	5.57e+06	3.70e+03	1.5e+03	7.03e+06	2.63e+03	2.7e+03
4	37Cl-2,3,7,8-TCDD	1.28e+06	2.35e+03	5.4e+02			

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19408 Park Row, Suite 320
Houston, TX 77084
Office(713)266-1599. Fax(713)266-0130

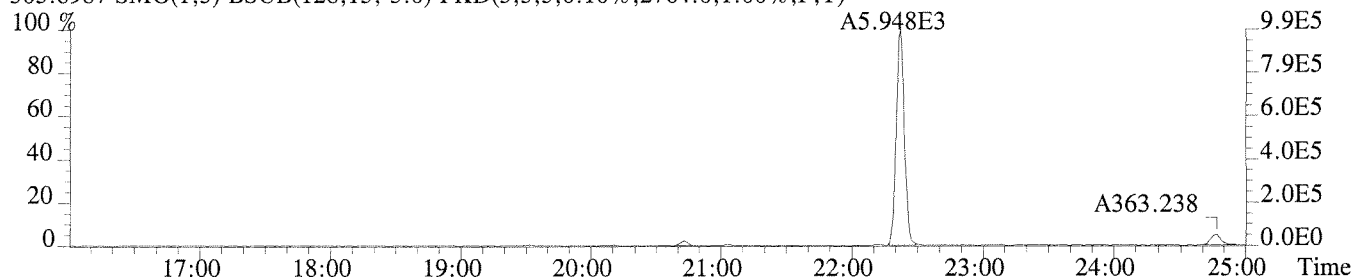
File:U137255 #1-750 Acq:27-JUL-2010 17:30:33 Probe EI+ Magnet SIR VG BioTech Mass spectf

Sample#1 Exp:CCAL CS3

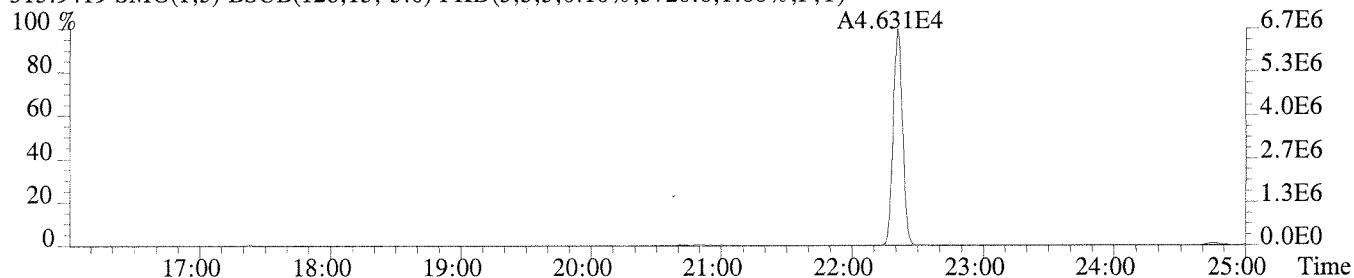
303.9016 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.10%,4780.0,1.00%,F,T)



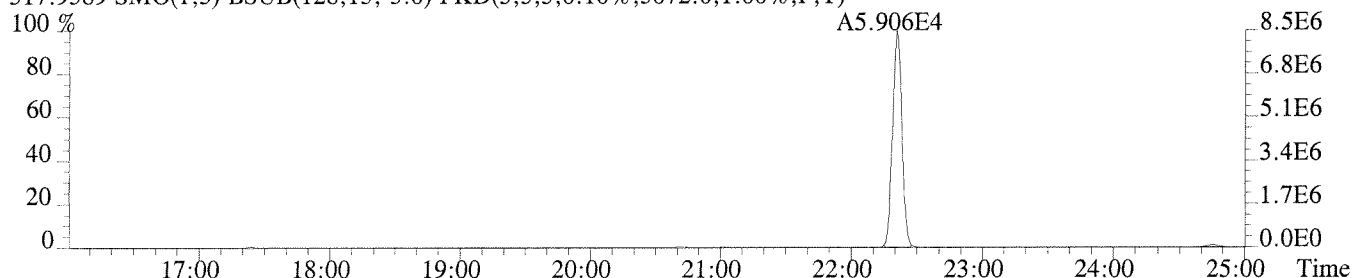
305.8987 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.10%,2764.0,1.00%,F,T)



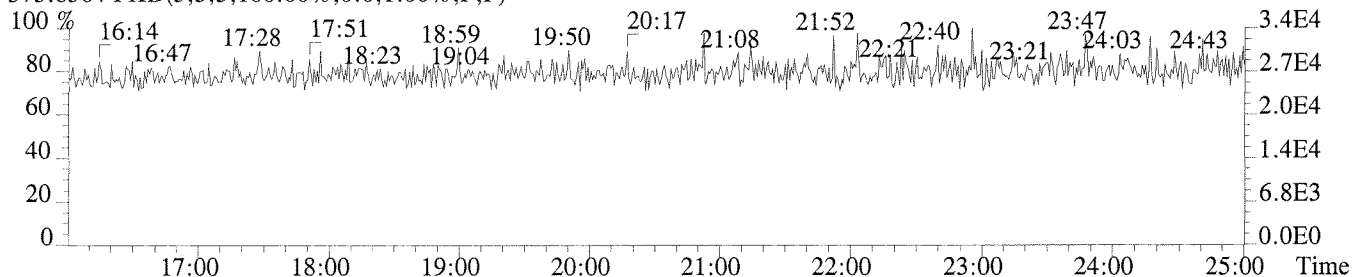
315.9419 SMO(1,5) BSUB(128,15,-3.0) PKD(3,3,3,0.10%,3720.0,1.00%,F,T)



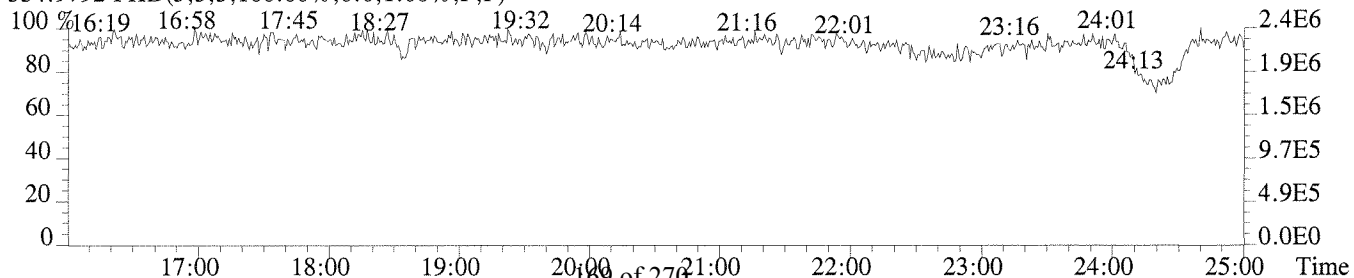
317.9389 SMO(1,5) BSUB(128,15,-3.0) PKD(3,3,3,0.10%,5072.0,1.00%,F,T)



375.8364 PKD(5,3,5,100.00%,0.0,1.00%,F,F)



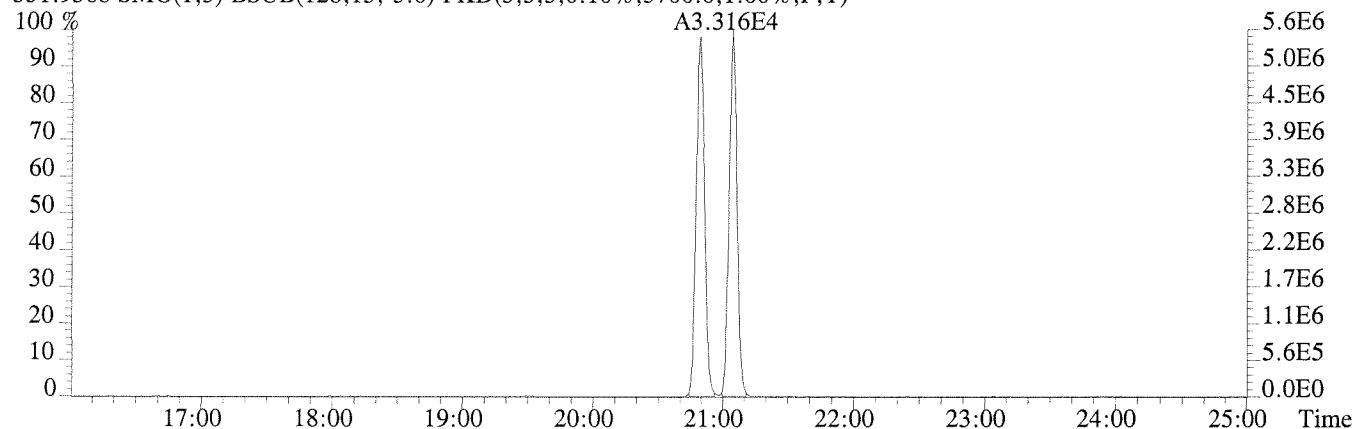
354.9792 PKD(3,3,3,100.00%,0.0,1.00%,F,F)



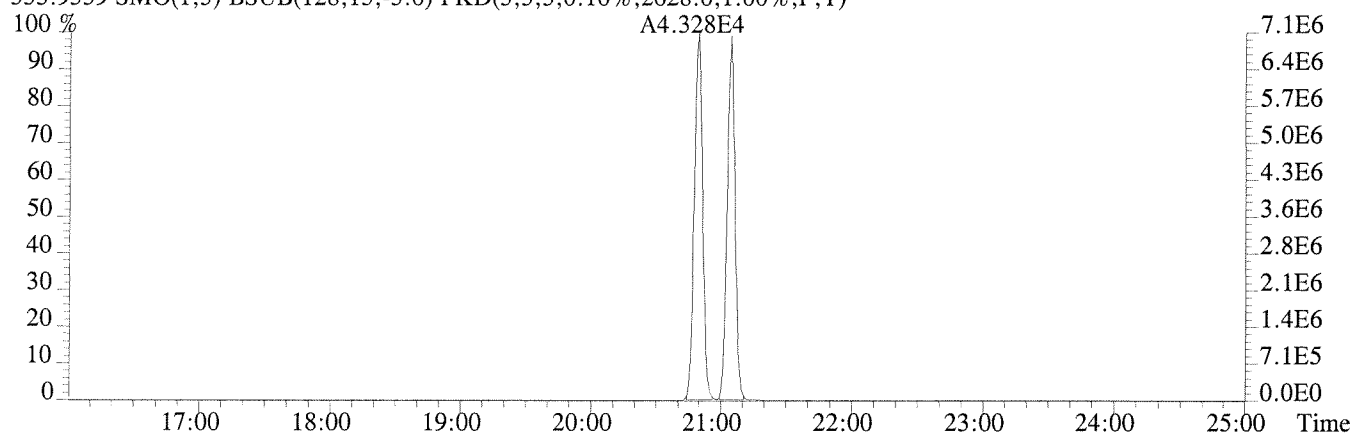
File:U137255 #1-750 Acq:27-JUL-2010 17:30:33 Probe EI+ Magnet SIR VG BioTech Mass spectf

Sample#1 Exp:CCAL CS3

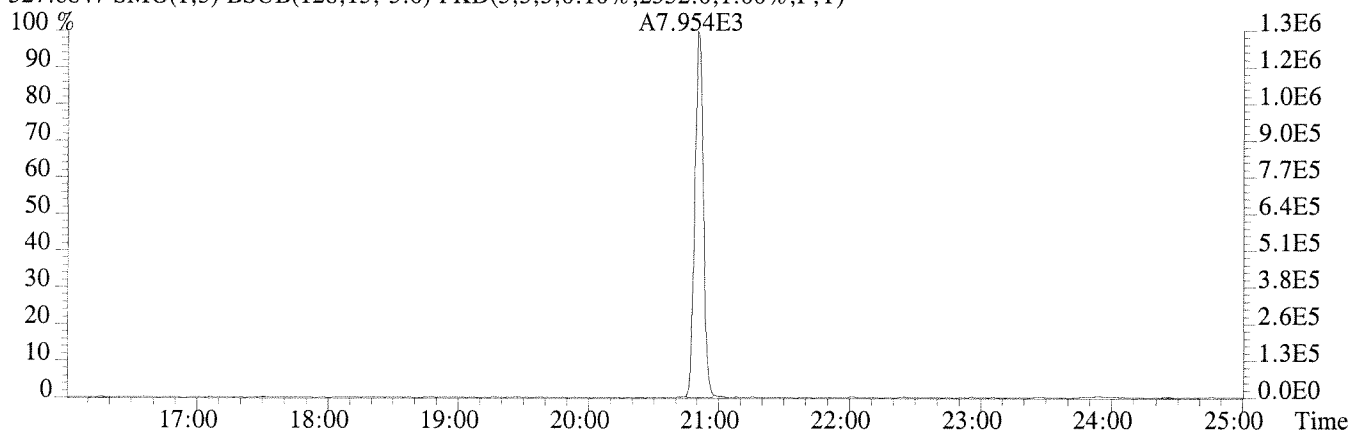
331.9368 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.10%,3700.0,1.00%,F,T)



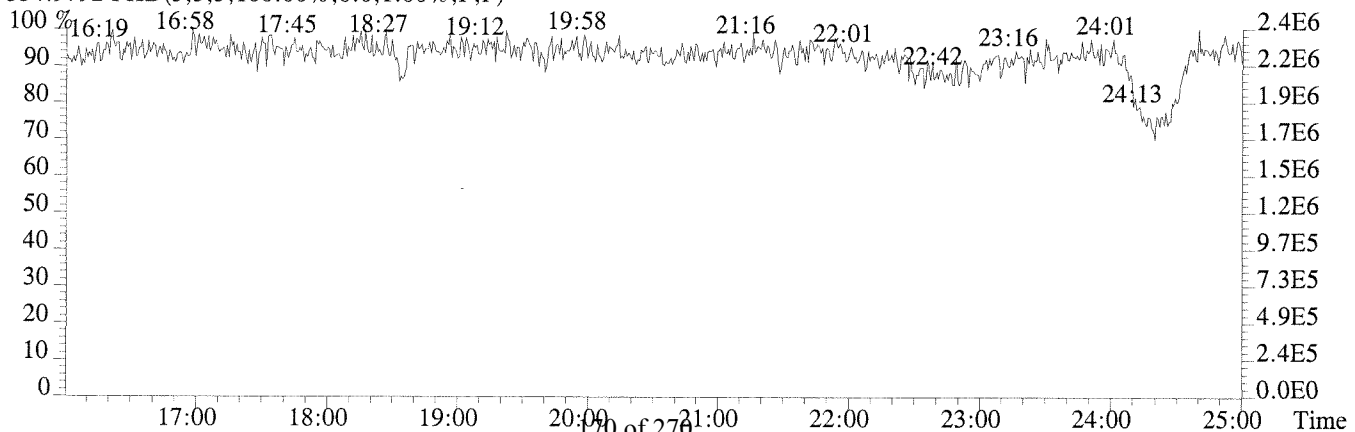
333.9339 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.10%,2628.0,1.00%,F,T)



327.8847 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.10%,2352.0,1.00%,F,T)



354.9792 PKD(3,3,3,100.00%,0.0,1.00%,F,F)



Initial Calibration

19408 Park Row, Suite 320, Houston, TX 77084

Phone (713)266-1599 Fax (713)266-0130

www.caslab.com

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Initial Calibration QC Checklist

ICAL Name: P808018290IN

Date: 01 AUG '08

Method: 1613 / 8290 Tetra / TCDD Only / TCDF Conf / 8280 / 613 / M23 / TO-9

Retention Window/Column Performance Check

Analyst

Second Check

Windows in and first and last eluters labeled	✓	✓
Column Performance shows less than or equal to 25% valley between column specific 2378 isomer and it's closest eluters	✓	✓
No QC ion deflections affect column specific 2378 isomer or it's closest eluters	✓	✓

Initial Calibration

Analyst

Second Check

Percent RSD within method criteria	✓	✓
All relative abundance ratios meet method criteria	✓	✓
No QC ion deflections of greater than 20%	✓	✓
Mass spectrometer resolution greater than or equal to 10,000 and documented	✓	✓
2378-TCDD elutes at 25 minutes or later on the DB-5 column	✓	✓
Signal-to-noise of all target analytes and their labeled standards at least 10:1	✓	✓
Valley between labeled 123478 and 123678 HxCDD peaks less than or equal to 50%	✓	✓
All Manual Intergrations signed and dated and first and final copies of ical summary included	✓	✓

Analyst: JP

Second QC: mc

CAS HOUSTON INC.
5DFC
PCDD/PCDF ANALYTICAL SEQUENCE SUMMARY
HIGH RESOLUTION

Page 1 of 1

Name: Columbia Analytical Services, Houston Contract

Lab Code: TX01411 CASE No.: Client No: SDG No.:

GC Column: DB-5 ID: 0.25 (mm) Instrument ID: AutoSpec-Premier

Init. Calib. Date: 08/01/08

Init. Calib.Times: 14:25

THE ANALYTICAL SEQUENCE OF STANDARDS, SAMPLES, BLANKS, SPIKES AND
DUPLICATES IS AS FOLLOWS:

EPA SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
WINDOW DEFINE		P200030	1-AUG-08	14:25:10
ICAL HRCC1		P200033	1-AUG-08	17:11:30
ICAL HRCC2		P200032	1-AUG-08	16:23:43
ICAL HRCC3		P200031	1-AUG-08	15:21:27
ICAL HRCC4		P200034	1-AUG-08	18:16:07
ICAL HRCC5		P200035	1-AUG-08	19:02:53

D: P200036 RES-1AEN
 D: P200018290I

04/14/10

HRGC/HRMS RUN LOG

CAS HOUSTON 19408 Park Row, Suite 320 Houston, TX 77084

Acq Method: 8290CAS/1613

Result File: P80P200036RES

GC Method: 8290CAS/1613

EDD File: F P808018290I



Columbia
Analytical
Services inc.

An Employee Owned Company

Date	Time	File	CAS ID	Client ID	Batch #	Analyst	Comments	RE
		P200027	CCAL HRCC3	DS-2-2A		h	Use Any	
07/2/08	18:41		HRMS Check					
08/01/08	14:22							
	07:25	P200028	Window Define					
	08:11	P200029	CCAL HRCC3	DS-2-2A			14:22 HRMS Check	
	14:25	P200030	Window Define	04-90-2				
	15:21	P200031	ICAL HRCC3	DS-2-2A				
	16:23	P200032	ICAL HRCC2	DS-49-4				
	17:11	P200033	ICAL HRCC3	DS-49-5				
	18:16	P200034	ICAL HRCC4	DS-49-2				
	19:02	P200035	ICAL HRCC5	DS-49-1				
		P200036	HRCC3 CSU	h 08/07/09			19:57 HRMS Check	
	14:57		HRMS check				08:58	
08/04/08	08:58						P200036 HRCC3 CSU	04-611
		P200037	Window Define					
		P200038	CCAL HRCC3			h		

Reviewed by:

[Signature]

5DFA

WINDOW DEFINING MIX SUMMARY

CLIENT ID:

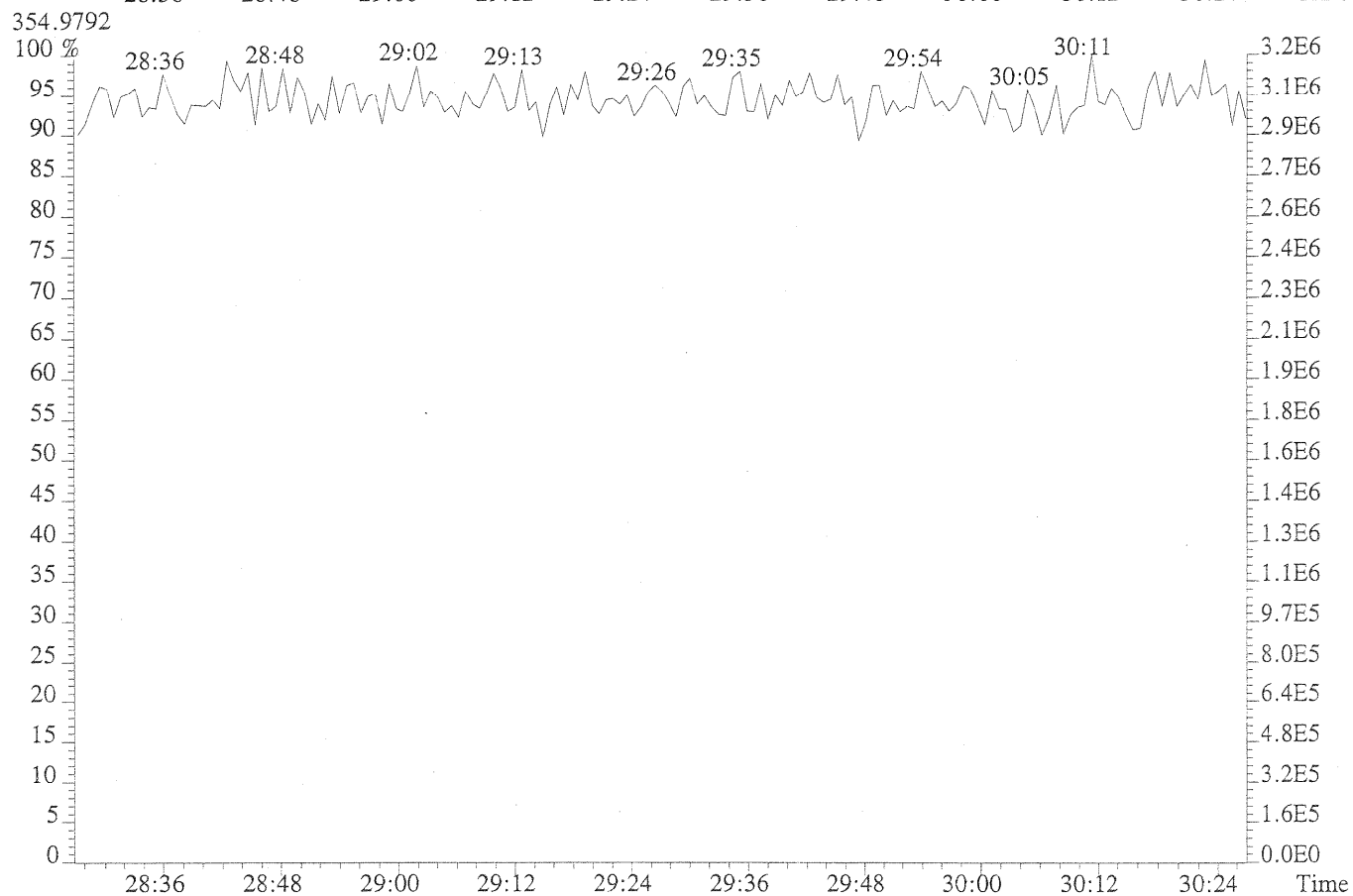
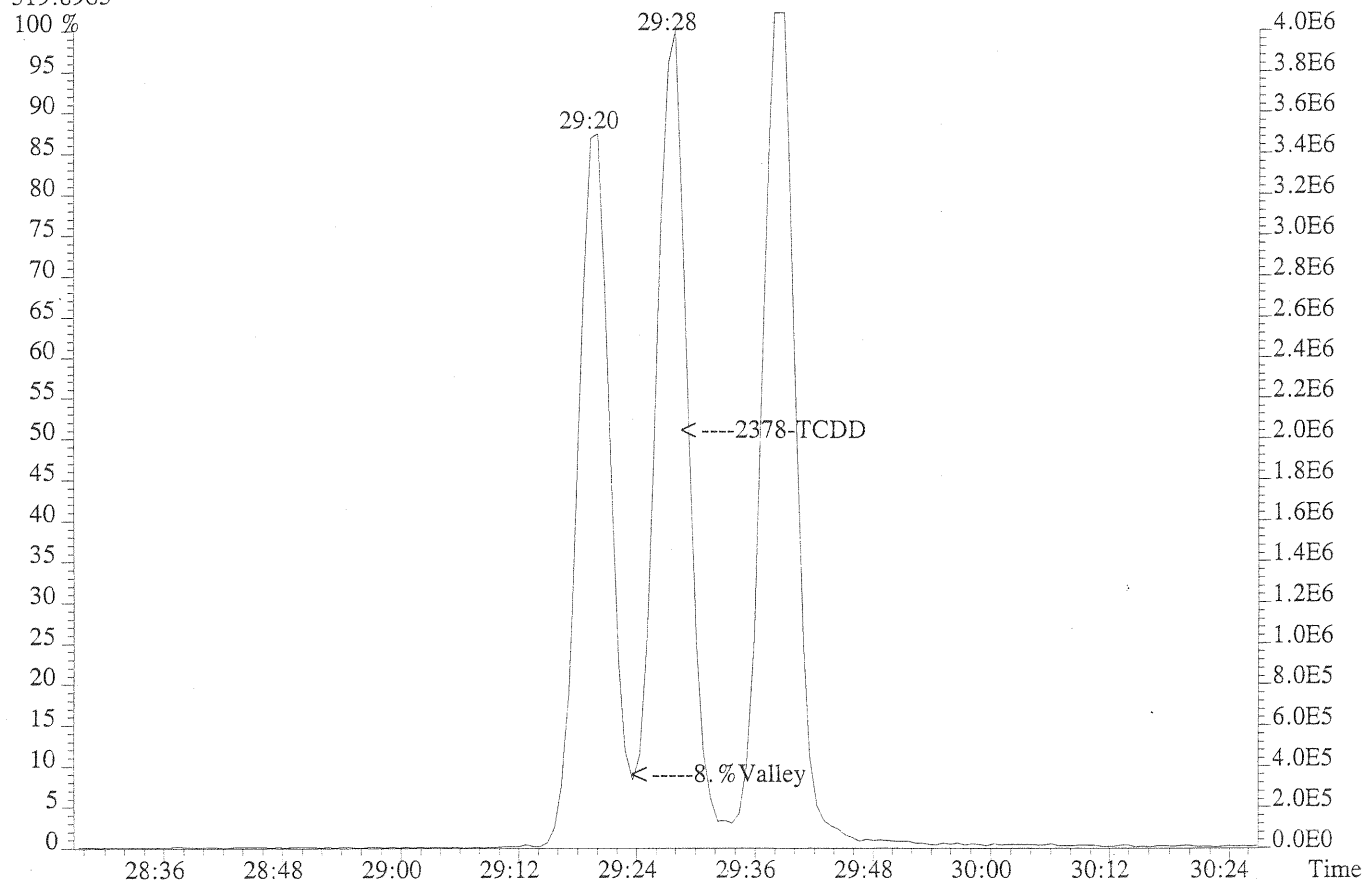
WDM

Lab Name: COLUMBIA ANALYTICAL SERVICES
Lab Code: CAS Case No.: SDG No.:
GC Column: DB-5 ID: 0.25 (mm) Lab File ID: P200030
Date Analyzed: 1-AUG-2008
Time Analyzed: 14:25:15

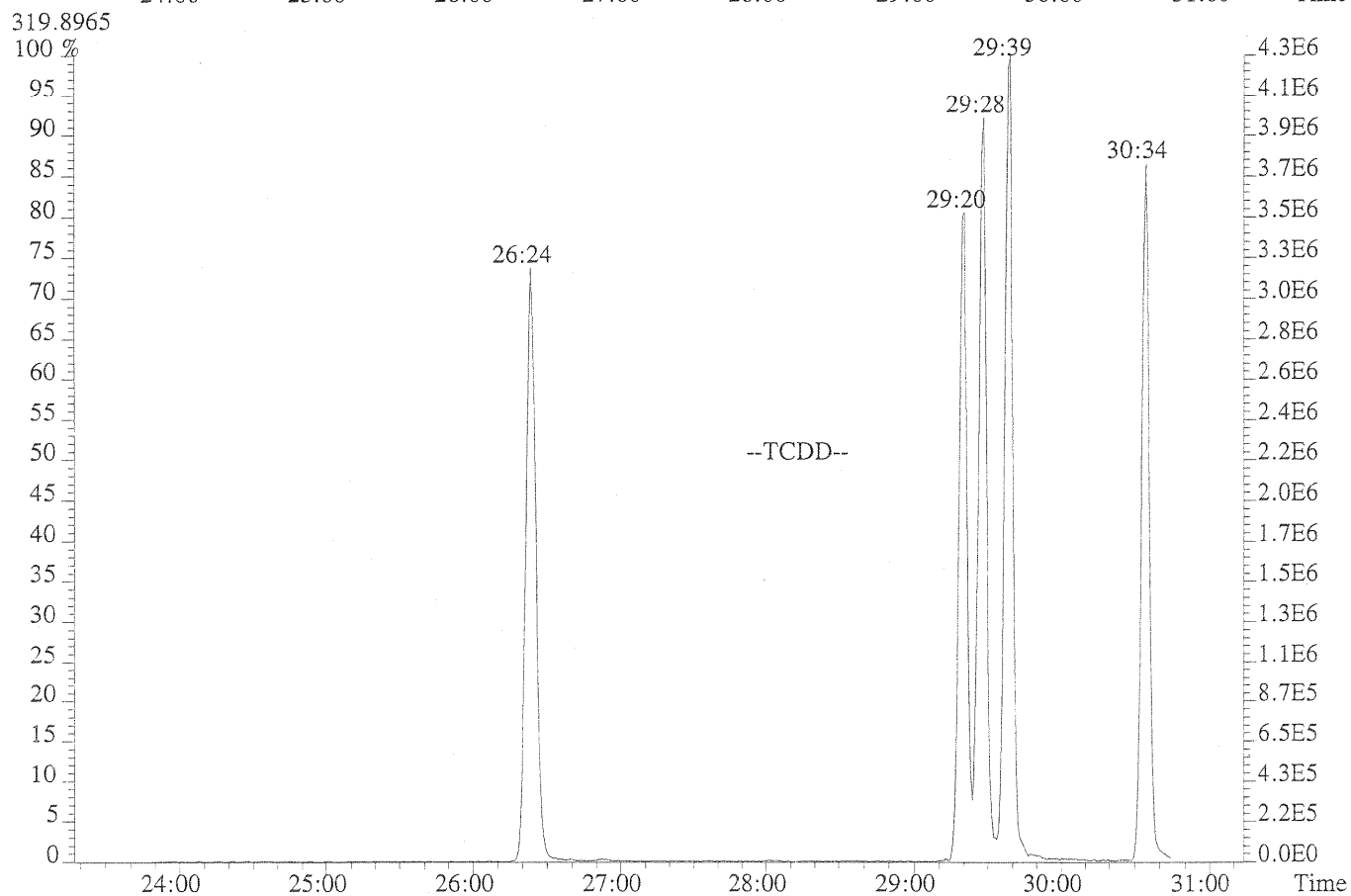
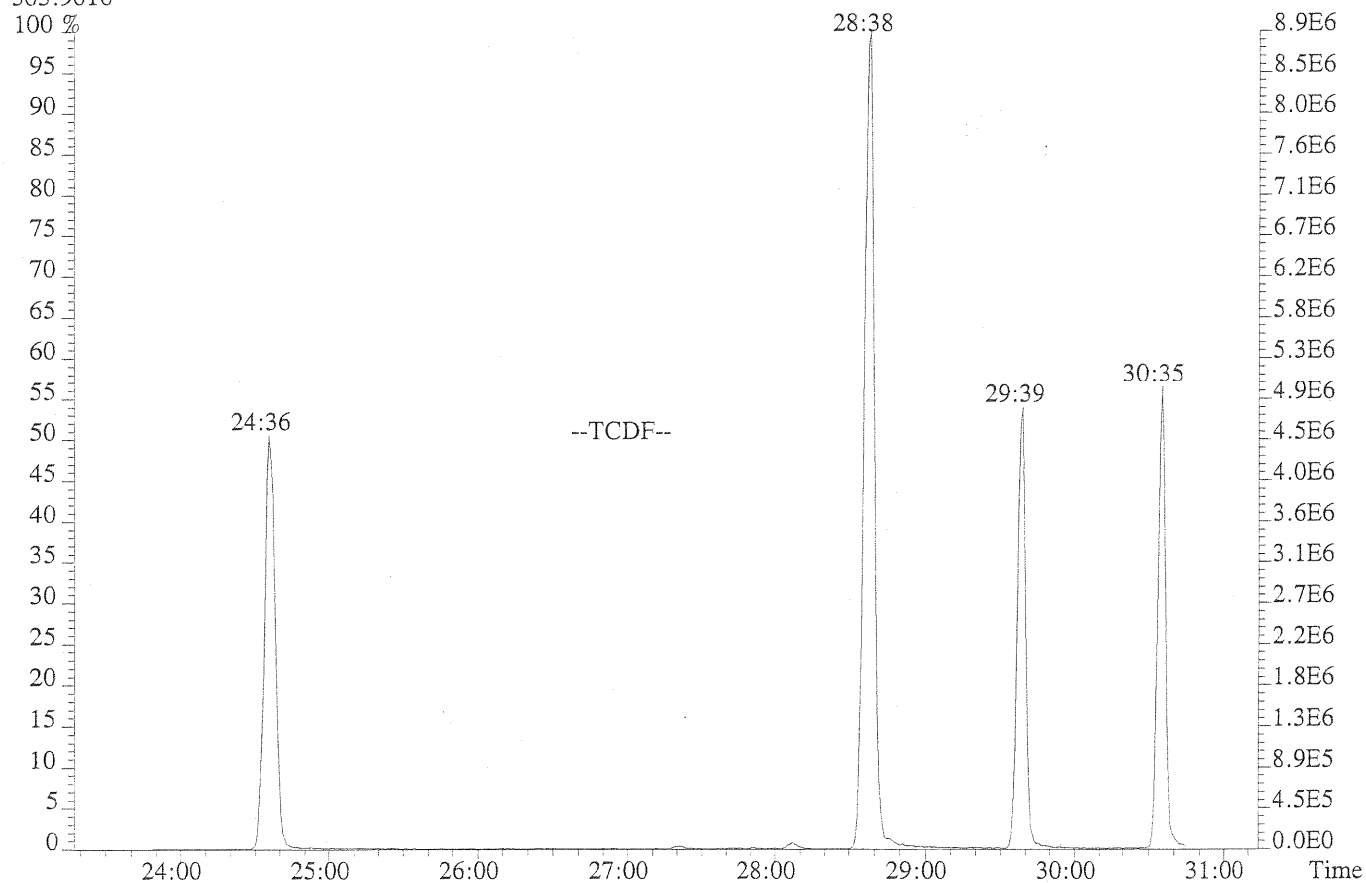
Congener	Retention Time First Eluting	Retention Time Last Eluting
TCDF	24:36	30:35
TCDD	26:24	30:34
PeCDF	30:51	34:42
PeCDD	32:13	34:34
HxCDF	35:35	37:53
HxCDD	36:05	37:34
HpCDF	39:16	40:35
HpCDD	39:31	40:10

% Valley 2378-TCDD: 8. %

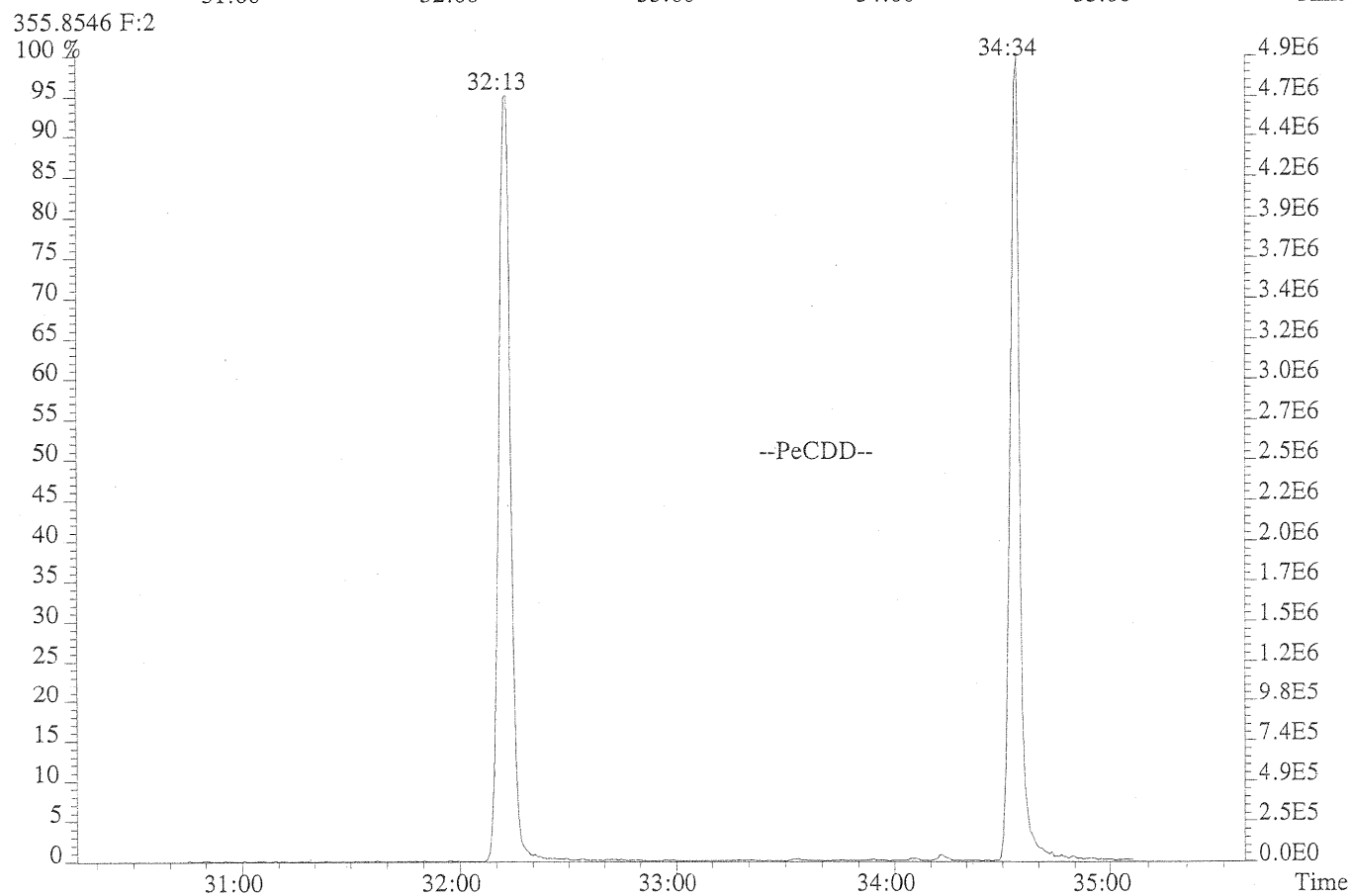
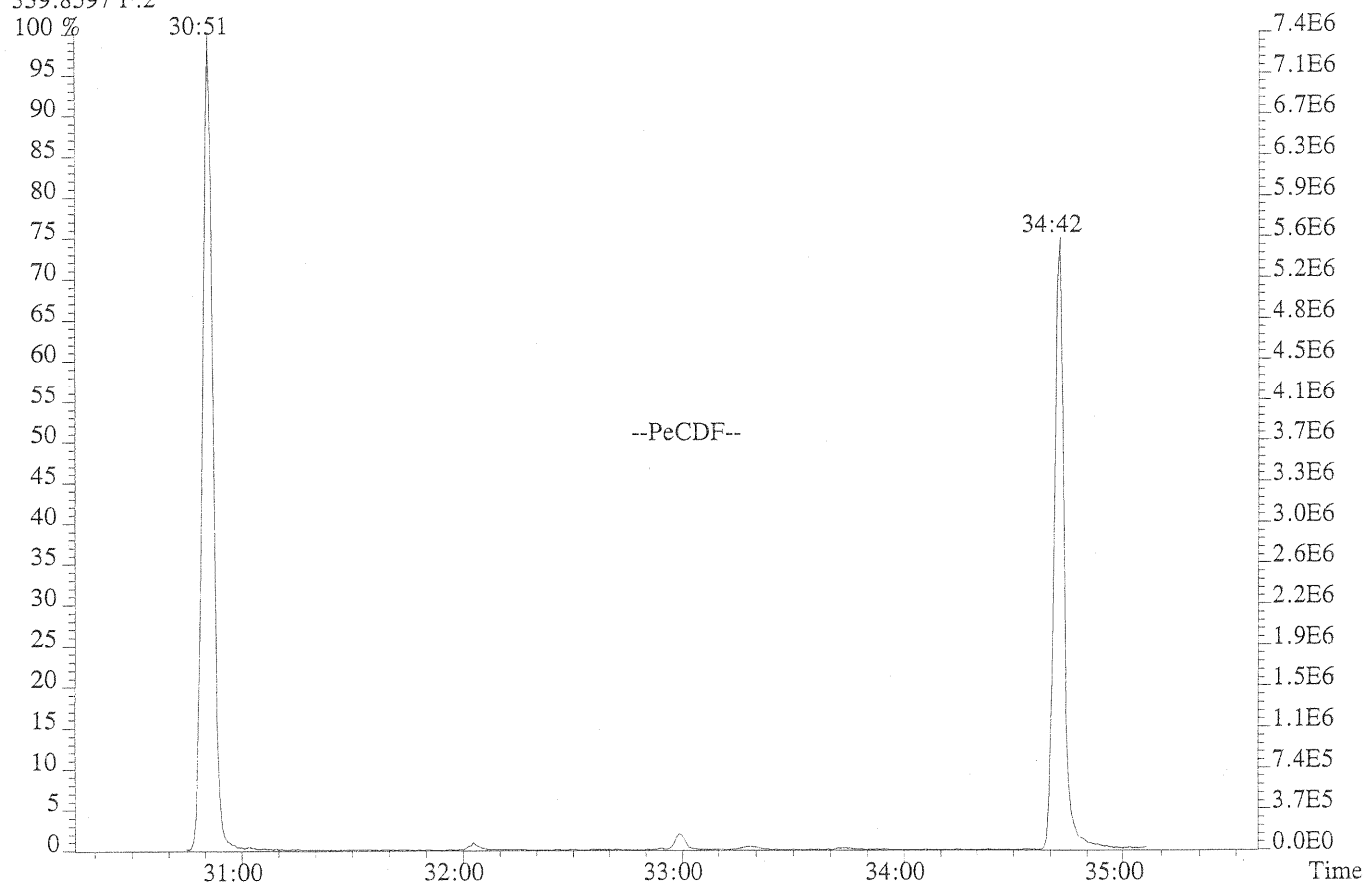
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Sample#1 Exp:WINDOW DEFINE
319.8965



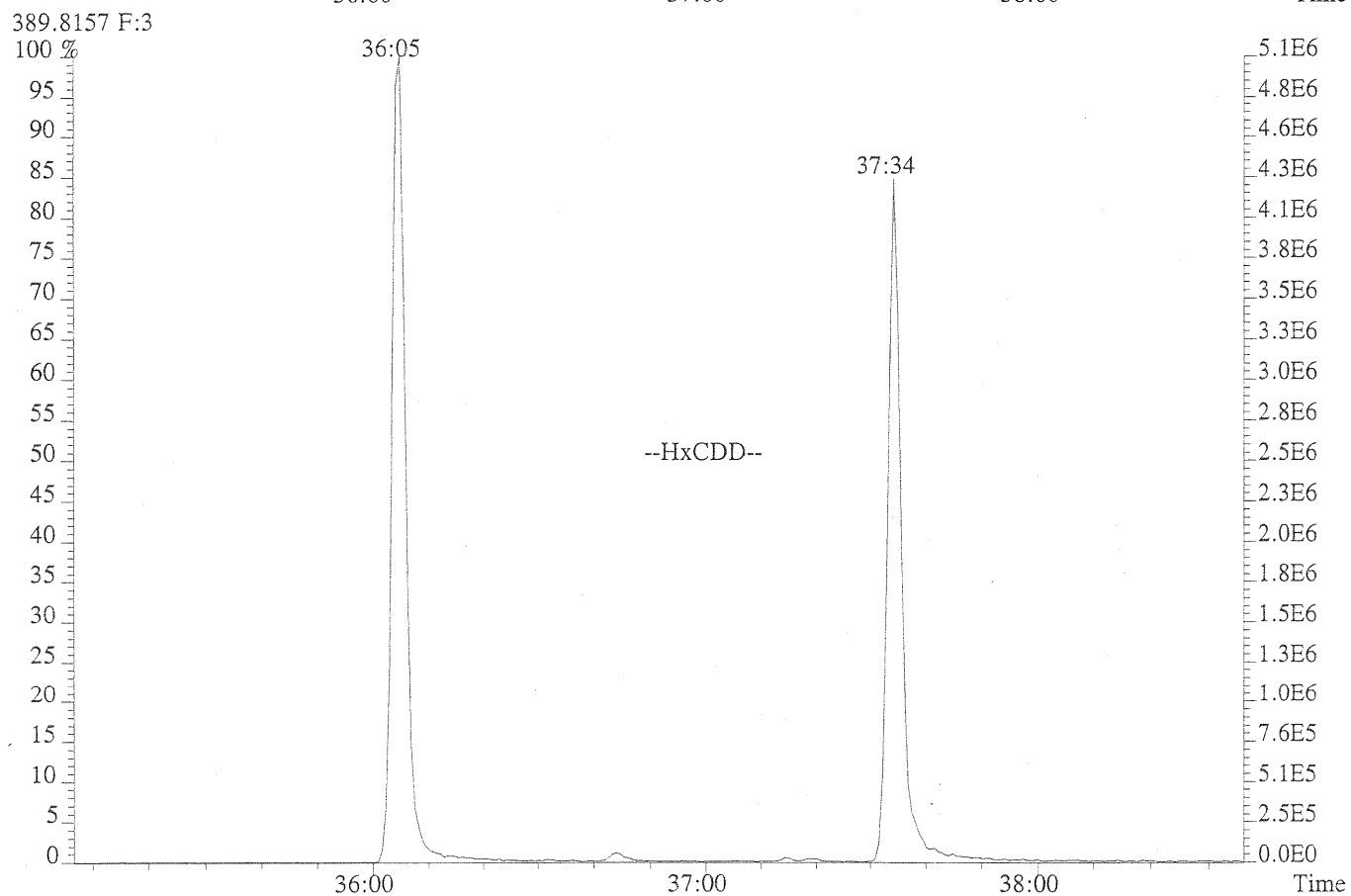
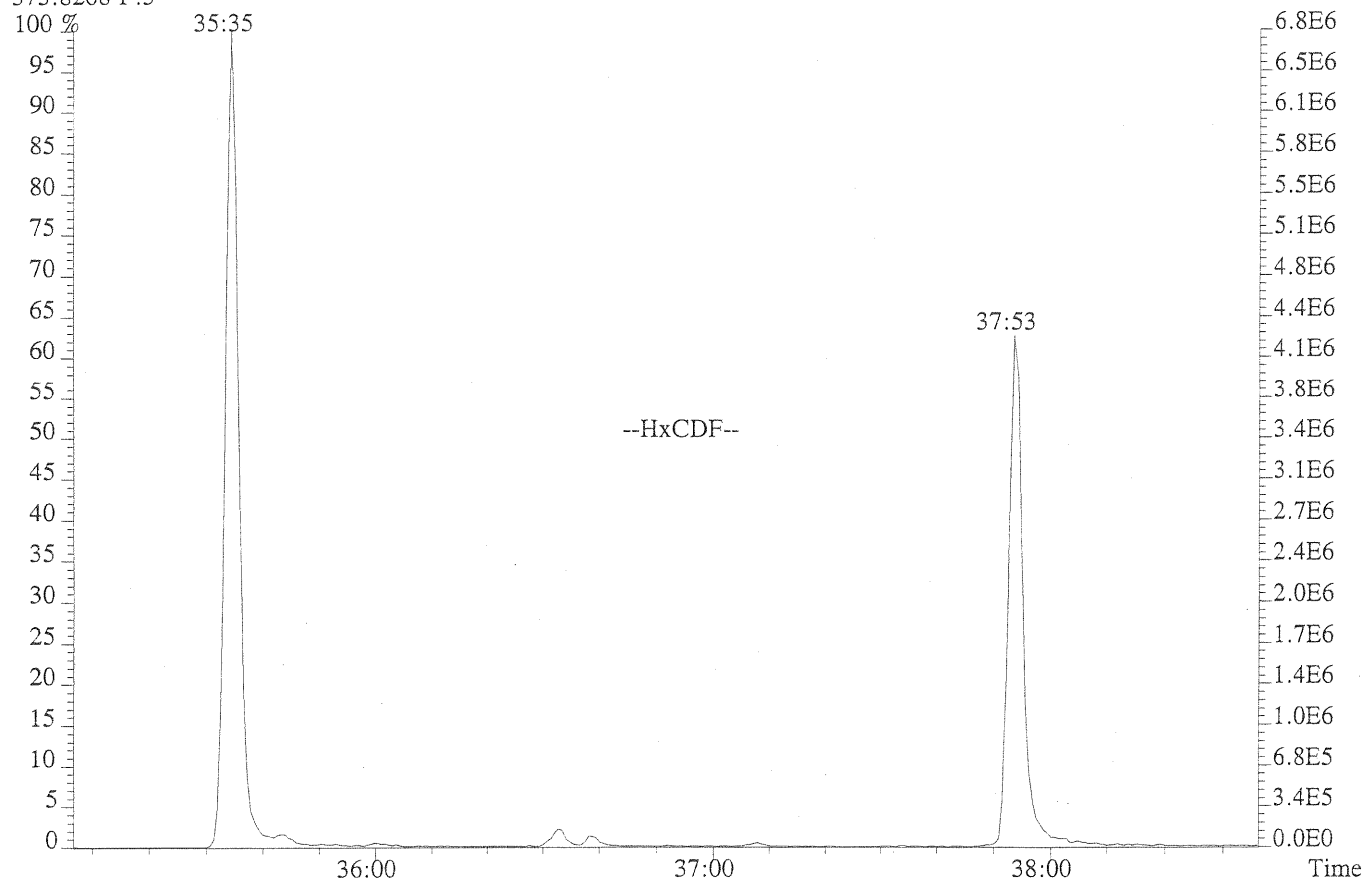
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Sample#1 Exp:WINDOW DEFINE
303.9016



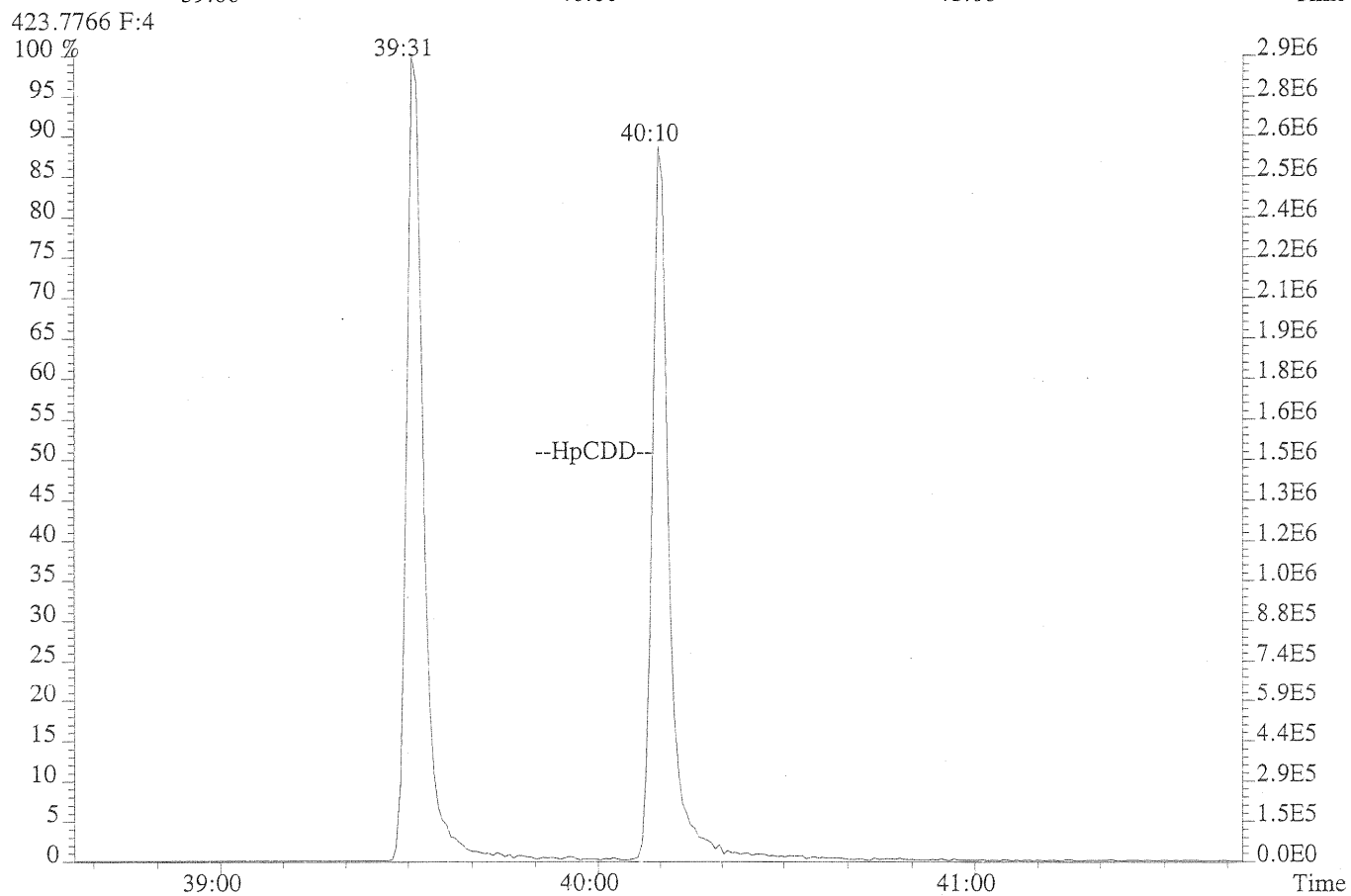
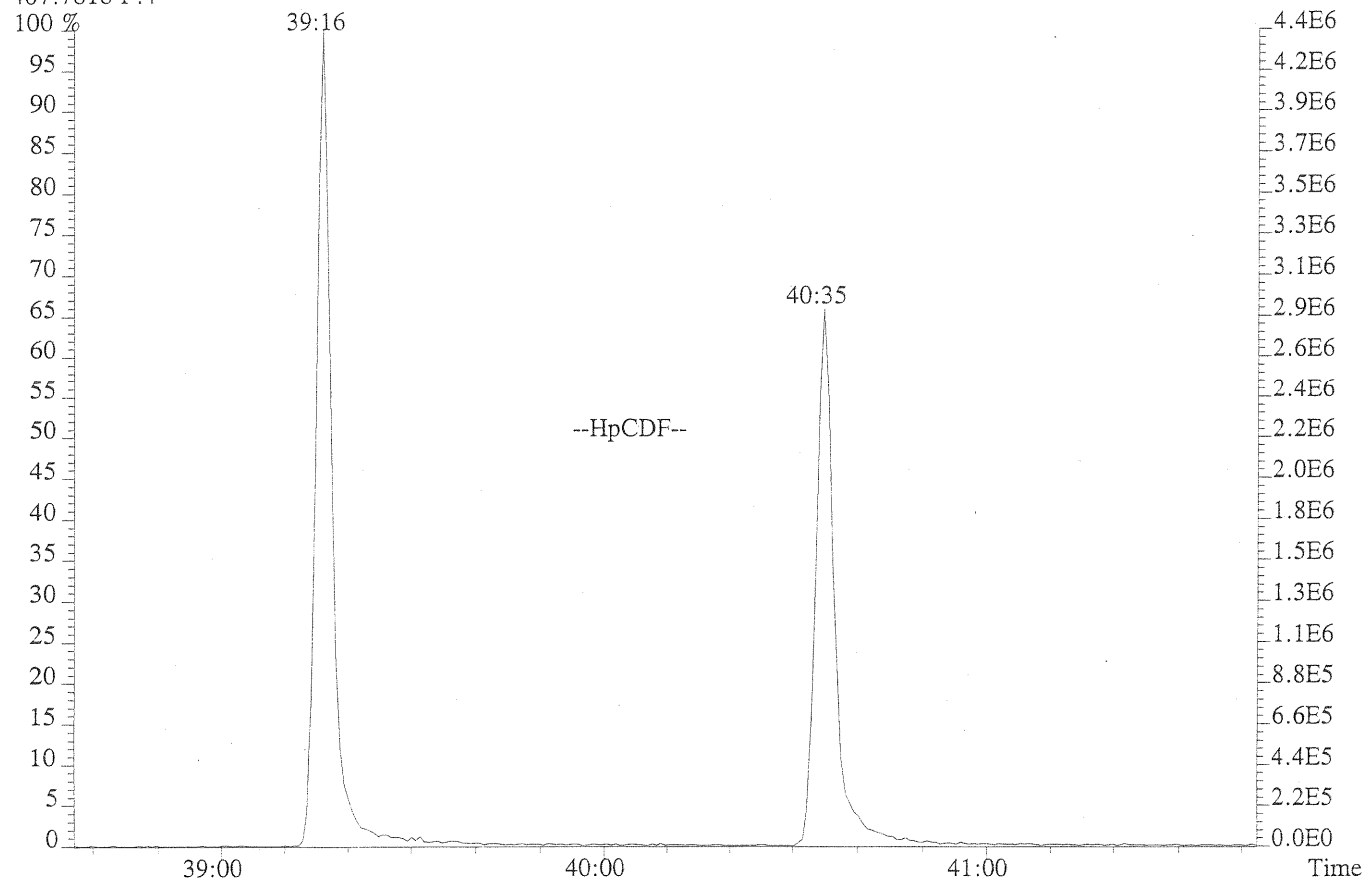
File:P200030 #1-396 Acq: 1-AUG-2008 14:25:15 Probe EI+ Magnet SIR VG BioTech Mass spectf
Sample#1 Exp:WINDOW DEFINE
339.8597 F:2



File:P200030 #1-318 Acq: 1-AUG-2008 14:25:15 Probe EI+ Magnet SIR VG BioTech Mass spectf
Sample#1 Exp:WINDOW DEFINE
373.8208 F:3



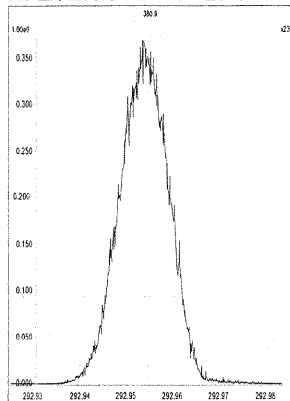
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Sample#1 Exp:WINDOW DEFINE
407.7818 F:4



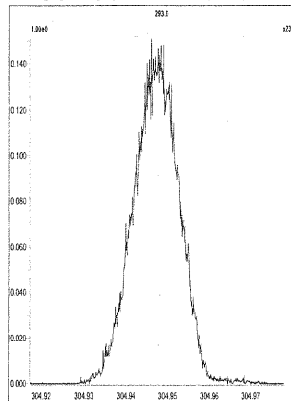
File: Experiment: 8290CAS.exp Reference: pfk.ref Function: 1 @ 200 (ppm)

Printed: Friday, August 01, 2008 14:22:07 Central Daylight Time

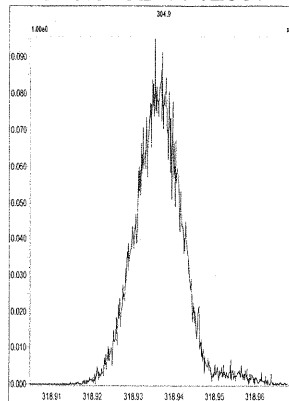
M 292.9824 R 12254



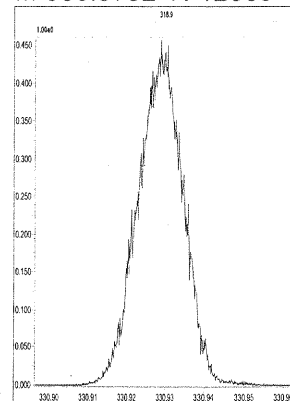
M 304.9824 R 12434



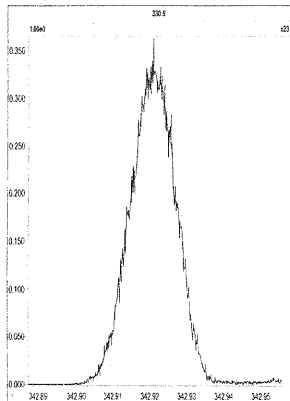
M 318.9792 R 12887



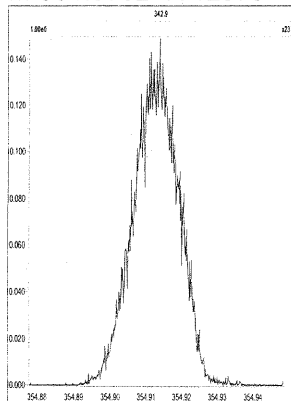
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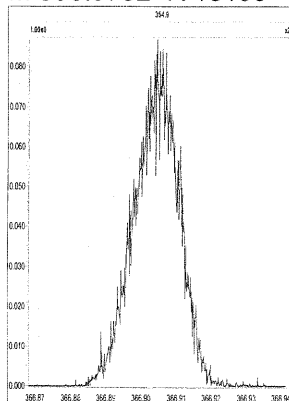
M 342.9792 R 12191



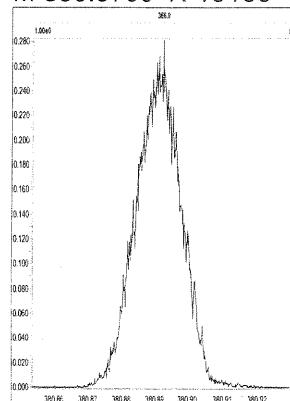
M 354.9792 R 12375



M 366.9792 R 13155



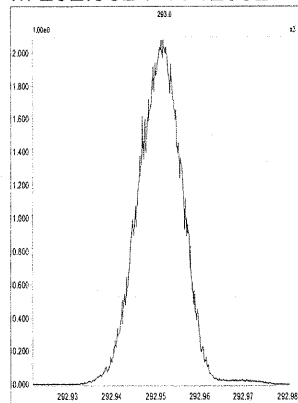
M 380.9760 R 13158



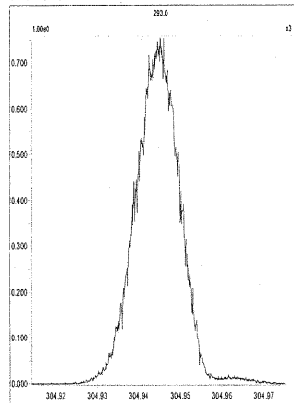
File: Experiment: 8290CAS.exp Reference: pfk.ref Function: 1 @ 200 (ppm)

Printed: Friday, August 01, 2008 19:57:10 Central Daylight Time

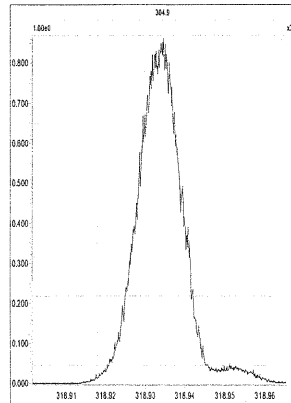
M 292.9824 R 12952



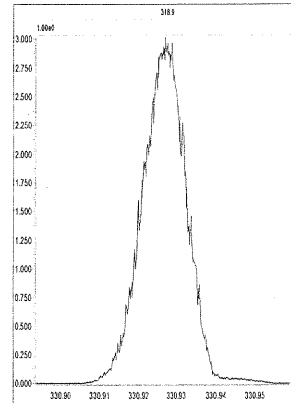
M 304.9824 R 12889



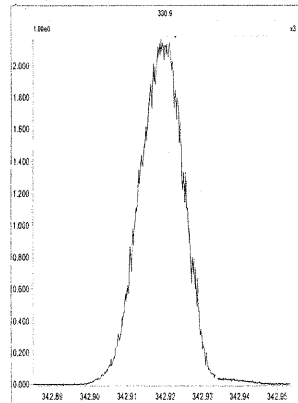
M 318.9792 R 12627



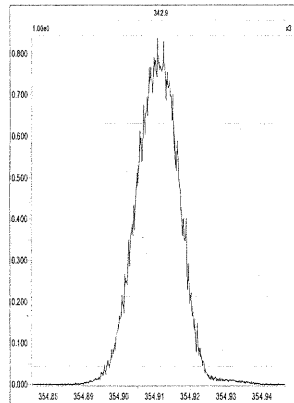
M 330.9792 R 12753



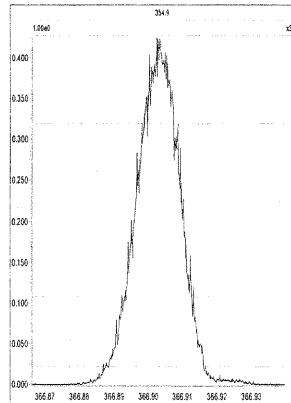
M 342.9792 R 12822



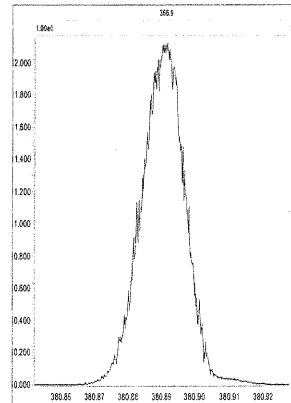
M 354.9792 R 13297



M 366.9792 R 12752



M 380.9760 R 12887



FORM 3A
PCDD/PCDF INITIAL CALIBRATION RELATIVE RESPONSES

Lab Name: Columbia Analytical Services Episode No.:

Contract No.: SDG No.:

Initial Calibration Date: 08/01/08

Instrument ID: AutoSpec-Premier GC Column ID: DB-5

HRCC1 Data Filename: P200033 HRCC4 Data Filename: P200034

HRCC2 Data Filename: P200032 HRCC5 Data Filename: P200035

HRCC3 Data Filename: P200031

NATIVE ANALYTES	RELATIVE RESPONSE (RR)					MEAN RR	Cv (RSD) (1)
	HRCC1	HRCC2	HRCC3	HRCC4	HRCC5		
2,3,7,8-TCDD	0.91	0.89	0.95	0.92	0.92	0.92	2.66
1,2,3,7,8-PeCDD	0.86	0.85	0.87	0.87	0.89	0.87	1.89
1,2,3,4,7,8-HxCDD	0.94	0.90	0.90	0.93	0.96	0.93	2.87
1,2,3,6,7,8-HxCDD	1.07	1.06	0.99	1.08	1.08	1.05	3.77
1,2,3,7,8,9-HxCDD	0.98	0.97	0.92	0.97	1.00	0.97	3.15
1,2,3,4,6,7,8-HpCDD	0.86	0.86	0.88	0.89	0.90	0.88	1.87
OCDD	0.95	0.94	0.97	0.96	0.98	0.96	1.44
2,3,7,8-TCDF	0.79	0.80	0.87	0.84	0.85	0.83	3.95
1,2,3,7,8-PeCDF	0.81	0.82	0.87	0.84	0.85	0.84	2.85
2,3,4,7,8-PeCDF	0.81	0.82	0.88	0.87	0.87	0.85	3.86
1,2,3,4,7,8-HxCDF	1.06	1.07	1.08	1.06	1.09	1.07	1.17
1,2,3,6,7,8-HxCDF	1.09	1.10	1.18	1.13	1.13	1.13	3.29
1,2,3,7,8,9-HxCDF	0.84	0.84	0.89	0.85	0.89	0.86	3.20
2,3,4,6,7,8-HxCDF	0.96	0.99	1.05	1.00	1.03	1.01	3.54
1,2,3,4,6,7,8-HpCDF	1.27	1.30	1.35	1.33	1.33	1.32	2.31
1,2,3,4,7,8,9-HpCDF	0.95	0.93	0.97	1.00	1.00	0.97	3.17
OCDF	1.12	1.09	1.11	1.14	1.05	1.10	3.10

(1) The %RSD for the 17 unlabeled standard must not exceed +/- 20%, see Section 7.7.2.1, Method 8290.

8290F3A

HCC3 Data Filename: P200031

(1) The %RSD for the nine labeled reference compounds must not exceed +/- 30%, see Section 7.7.2.1, Method 8290.

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FORM 3C
PCDD/PCDF INITIAL CALIBRATION ION ABUNDANCE RATIOS

Lab Name: Columbia Analytical Services Episode No.:

Contract No.: SDG No.:

Initial Calibration Date: 08/01/08

Instrument ID: AutoSpec-Premier GC Column ID: DB-5

HCC1 Data Filename: P200033 HCC4 Data Filename: P200034

HCC2 Data Filename: P200032 HCC5 Data Filename: P200035

HCC3 Data Filename: P200031

NATIVE ANALYTES	M/Z'S FORMING RATIO	ION ABUNDANCE RATIO					QC LIMITS (2)
		HRCC1	HRCC2	HRCC3	HRCC4	HRCC5	
2,3,7,8-TCDD	M/M+2	0.81	0.79	0.77	0.77	0.78	0.65-0.89
1,2,3,7,8-PeCDD	M+2/M+4	1.42	1.53	1.54	1.55	1.55	1.32-1.78
1,2,3,4,7,8-HxCDD	M+2/M+4	1.35	1.24	1.23	1.24	1.26	1.05-1.43
1,2,3,6,7,8-HxCDD	M+2/M+4	1.08	1.25	1.25	1.26	1.26	1.05-1.43
1,2,3,7,8,9-HxCDD	M+2/M+4	1.27	1.23	1.29	1.25	1.24	1.05-1.43
1,2,3,4,6,7,8-HpCDD	M+2/M+4	1.06	1.04	1.03	1.04	1.04	0.88-1.20
OCDD	M+2/M+4	0.92	0.89	0.90	0.89	0.89	0.76-1.02
2,3,7,8-TCDF	M/M+2	0.74	0.72	0.75	0.77	0.77	0.65-0.89
1,2,3,7,8-PeCDF	M+2/M+4	1.58	1.54	1.55	1.53	1.55	1.32-1.78
2,3,4,7,8-PeCDF	M+2/M+4	1.47	1.57	1.52	1.54	1.54	1.32-1.78
1,2,3,4,7,8-HxCDF	M+2/M+4	1.27	1.23	1.24	1.22	1.22	1.05-1.43
1,2,3,6,7,8-HxCDF	M+2/M+4	1.23	1.26	1.21	1.22	1.23	1.05-1.43
1,2,3,7,8,9-HxCDF	M+2/M+4	1.32	1.21	1.23	1.19	1.23	1.05-1.43
2,3,4,6,7,8-HxCDF	M+2/M+4	1.27	1.22	1.23	1.23	1.23	1.05-1.43
1,2,3,4,6,7,8-HpCDF	M+2/M+4	1.05	0.99	1.03	1.01	1.02	0.88-1.20
1,2,3,4,7,8,9-HpCDF	M+2/M+4	1.00	0.97	1.03	1.02	1.02	0.88-1.20
OCDF	M+2/M+4	0.88	0.90	0.90	0.89	0.90	0.76-1.02

(1) See Table 6, Method 8290, for m/z specifications.

(2) Ion Abundance Ratio Control Limits from Table 8, Method 8290.

8290F3C

FORM 3D
PCDD/PCDF INITIAL CALIBRATION ION ABUNDANCE RATIOS

Lab Name: Columbia Analytical Services Episode No.:

Contract No.: SDG No.:

Initial Calibration Date: 08/01/08

Instrument ID: AutoSpec-Premier GC Column ID: DB-5

HRCC1 Data Filename: P200033 HRCC4 Data Filename: P200034

HRCC2 Data Filename: P200032 HRCC5 Data Filename: P200035

HRCC3 Data Filename: P200031

Labeled Compounds	M/Z'S FORMING RATIO	ION ABUNDANCE RATIO					QC LIMITS (2)
		HRCC1	HRCC2	HRCC3	HRCC4	HRCC5	
13C-2,3,7,8-TCDD	M/M+2	0.77	0.78	0.79	0.78	0.77	0.65-0.89
13C-1,2,3,7,8-PeCDD	M+2/M+4	1.58	1.58	1.58	1.54	1.56	1.32-1.78
13C-1,2,3,6,7,8-HxCDD	M+2/M+4	1.26	1.26	1.26	1.25	1.26	1.05-1.43
13C-1,2,3,4,6,7,8-HpCDD	M+2/M+4	1.05	1.04	1.05	1.05	1.04	0.88-1.20
13C-OCDD	M+2/M+4	0.90	0.90	0.91	0.89	0.89	0.76-1.02
13C-2,3,7,8-TCDF	M/M+2	0.79	0.78	0.78	0.78	0.78	0.65-0.89
13C-1,2,3,7,8-PeCDF	M+2/M+4	1.55	1.57	1.58	1.57	1.55	1.32-1.78
13C-1,2,3,4,7,8-HxCDF	M/M+2	0.52	0.52	0.52	0.52	0.52	0.43-0.59
13C-1,2,3,4,6,7,8-HpCDF	M/M+2	0.45	0.44	0.44	0.44	0.44	0.37-0.51

(1) See Table 6, Method 8290, for m/z specifications. Method 8290.

(2) Ion Abundance Ratio Control Limits from Table 8,

8290F3D

Columbia Analytical Services, Inc.
Sample Response Summary

CLIENT ID.
ICAL HRCC1

Run #1 Filename P200033 #1 Samp: 1 Inj: 1 Acquired: 1-AUG-08 17:11:30
Processed: 14-APR-10 10:16:04 LAB. ID: ICAL HRCC1

Typ	Name	RT-1	Resp 1	Resp 2	Ratio	Meet	Mod?	RRT
1	Unk	2,3,7,8-TCDF	28:37	1.113e+03	1.514e+03	0.74	yes	no 1.001
2	Unk	1,2,3,7,8-PeCDF	32:59	3.561e+03	2.247e+03	1.58	yes	no 1.000
3	Unk	2,3,4,7,8-PeCDF	33:43	3.436e+03	2.334e+03	1.47	yes	no 1.022
4	Unk	1,2,3,4,7,8-HxCDF	36:33	3.007e+03	2.365e+03	1.27	yes	no 1.000
5	Unk	1,2,3,6,7,8-HxCDF	36:39	3.032e+03	2.468e+03	1.23	yes	no 1.003
6	Unk	2,3,4,6,7,8-HxCDF	37:08	2.726e+03	2.153e+03	1.27	yes	no 1.016
7	Unk	1,2,3,7,8,9-HxCDF	37:50	2.412e+03	1.827e+03	1.32	yes	no 1.036
8	Unk	1,2,3,4,6,7,8-HpCDF	39:16	2.267e+03	2.158e+03	1.05	yes	no 1.000
9	Unk	1,2,3,4,7,8,9-HpCDF	40:35	1.657e+03	1.651e+03	1.00	yes	no 1.034
10	Unk	OCDF	43:22	2.963e+03	3.362e+03	0.88	yes	no 1.004
11	Unk	2,3,7,8-TCDD	29:27	1.005e+03	1.244e+03	0.81	yes	no 1.001
12	Unk	1,2,3,7,8-PeCDD	34:05	2.397e+03	1.686e+03	1.42	yes	no 1.000
13	Unk	1,2,3,4,7,8-HxCDD	37:14	1.996e+03	1.475e+03	1.35	yes	no 0.998
14	Unk	1,2,3,6,7,8-HxCDD	37:19	2.046e+03	1.902e+03	1.08	yes	no 1.000
15	Unk	1,2,3,7,8,9-HxCDD	37:36	2.009e+03	1.585e+03	1.27	yes	no 1.008
16	Unk	1,2,3,4,6,7,8-HpCDD	40:10	1.398e+03	1.317e+03	1.06	yes	no 1.000
17	Unk	OCDD	43:12	2.575e+03	2.798e+03	0.92	yes	no 1.000
18	IS	13C-2,3,7,8-TCDF	28:35	7.306e+04	9.291e+04	0.79	yes	no 0.978
19	IS	13C-1,2,3,7,8-PeCDF	32:59	8.693e+04	5.591e+04	1.55	yes	no 1.128
20	IS	13C-1,2,3,4,7,8-HxCDF	36:32	8.684e+04	1.664e+05	0.52	yes	no 0.972
21	IS	13C-1,2,3,4,6,7,8-HpCDF	39:15	5.370e+04	1.204e+05	0.45	yes	no 1.044
22	IS	13C-2,3,7,8-TCDD	29:26	5.409e+04	6.989e+04	0.77	yes	no 1.007
23	IS	13C-1,2,3,7,8-PeCDD	34:04	5.838e+04	3.701e+04	1.58	yes	no 1.165
24	IS	13C-1,2,3,6,7,8-HxCDD	37:18	1.029e+05	8.145e+04	1.26	yes	no 0.992
25	IS	13C-1,2,3,4,6,7,8-HpCDD	40:09	8.037e+04	7.678e+04	1.05	yes	no 1.068
26	IS	13C-OCDD	43:12	1.337e+05	1.488e+05	0.90	yes	no 1.149
27	RS/RT	13C-1,2,3,4-TCDD	29:14	5.144e+04	6.531e+04	0.79	yes	no *
28	RS/RT	13C-1,2,3,7,8,9-HxCDD	37:36	1.006e+05	8.105e+04	1.24	yes	no *
29	C/Up	37Cl-2,3,7,8-TCDD	29:27	2.216e+03				no 1.007

Columbia Analytical Services, Inc.
19408 Park Row, Suite 320
Houston, TX 77084
Office (713) 266-1599. Fax (713) 266-0130

Columbia Analytical Services, Inc.
Signal/Noise Height Ratio Summary

CLIENT ID.
ICAL HRCC1

Run #1 Filename P200033 Samp: 1 Inj: 1 Acquired: 1-AUG-08 17:11:30
Processed: 14-APR-10 10:16:041 LAB. ID: ICAL HRCC1

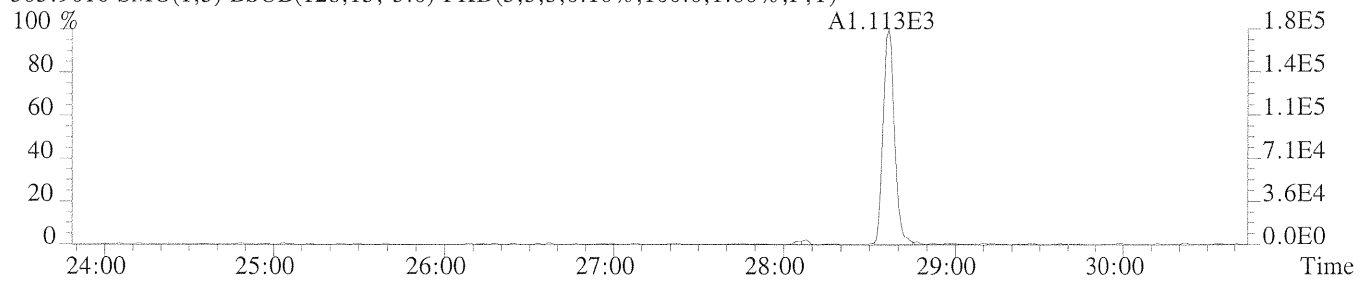
	Name	Signal 1	Noise 1	S/N Rat.1	Signal 2	Noise 2	S/N Rat.2
1	2,3,7,8-TCDF	1.78e+05	1.00e+02	1.8e+03	2.26e+05	4.76e+02	4.8e+02
2	1,2,3,7,8-PeCDF	6.75e+05	1.20e+02	5.6e+03	4.41e+05	8.12e+02	5.4e+02
3	2,3,4,7,8-PeCDF	6.51e+05	1.20e+02	5.4e+03	4.42e+05	8.12e+02	5.4e+02
4	1,2,3,4,7,8-HxCDF	6.36e+05	1.80e+02	3.5e+03	5.17e+05	1.28e+02	4.0e+03
5	1,2,3,6,7,8-HxCDF	6.02e+05	1.80e+02	3.3e+03	4.66e+05	1.28e+02	3.6e+03
6	2,3,4,6,7,8-HxCDF	5.47e+05	1.80e+02	3.0e+03	4.34e+05	1.28e+02	3.4e+03
7	1,2,3,7,8,9-HxCDF	4.51e+05	1.80e+02	2.5e+03	3.45e+05	1.28e+02	2.7e+03
8	1,2,3,4,6,7,8-HpCDF	4.71e+05	1.16e+03	4.1e+02	4.40e+05	4.76e+02	9.2e+02
9	1,2,3,4,7,8,9-HpCDF	2.92e+05	1.16e+03	2.5e+02	3.03e+05	4.76e+02	6.4e+02
10	OCDF	3.86e+05	1.60e+02	2.4e+03	4.51e+05	3.92e+02	1.2e+03
11	2,3,7,8-TCDD	1.74e+05	1.52e+02	1.1e+03	2.17e+05	1.32e+02	1.6e+03
12	1,2,3,7,8-PeCDD	4.78e+05	6.44e+02	7.4e+02	3.39e+05	1.48e+02	2.3e+03
13	1,2,3,4,7,8-HxCDD	4.40e+05	1.28e+02	3.4e+03	3.48e+05	6.80e+01	5.1e+03
14	1,2,3,6,7,8-HxCDD	4.34e+05	1.28e+02	3.4e+03	3.63e+05	6.80e+01	5.3e+03
15	1,2,3,7,8,9-HxCDD	4.06e+05	1.28e+02	3.2e+03	3.24e+05	6.80e+01	4.8e+03
16	1,2,3,4,6,7,8-HpCDD	2.59e+05	1.24e+02	2.1e+03	2.49e+05	1.16e+02	2.1e+03
17	OCDD	3.54e+05	1.16e+02	3.1e+03	3.93e+05	9.60e+01	4.1e+03
18	13C-2,3,7,8-TCDF	1.19e+07	9.16e+02	1.3e+04	1.52e+07	8.68e+02	1.8e+04
19	13C-1,2,3,7,8-PeCDF	1.68e+07	1.12e+02	1.5e+05	1.07e+07	1.96e+02	5.5e+04
20	13C-1,2,3,4,7,8-HxCDF	1.80e+07	2.84e+02	6.3e+04	3.45e+07	4.24e+02	8.1e+04
21	13C-1,2,3,4,6,7,8-HpCDF	1.10e+07	5.33e+03	2.1e+03	2.45e+07	7.77e+03	3.2e+03
22	13C-2,3,7,8-TCDD	9.42e+06	1.58e+03	6.0e+03	1.22e+07	5.60e+02	2.2e+04
23	13C-1,2,3,7,8-PeCDD	1.15e+07	4.68e+02	2.5e+04	7.23e+06	1.52e+02	4.8e+04
24	13C-1,2,3,6,7,8-HxCDD	2.20e+07	4.52e+02	4.9e+04	1.75e+07	3.00e+02	5.8e+04
25	13C-1,2,3,4,6,7,8-HpCDD	1.49e+07	4.20e+02	3.6e+04	1.44e+07	1.60e+02	9.0e+04
26	13C-OCDD	1.83e+07	1.12e+02	1.6e+05	2.02e+07	1.08e+02	1.9e+05
27	13C-1,2,3,4-TCDD	8.91e+06	1.58e+03	5.7e+03	1.13e+07	5.60e+02	2.0e+04
28	13C-1,2,3,7,8,9-HxCDD	2.08e+07	4.52e+02	4.6e+04	1.67e+07	3.00e+02	5.6e+04
29	37Cl-2,3,7,8-TCDD	3.87e+05	1.44e+02	2.7e+03			

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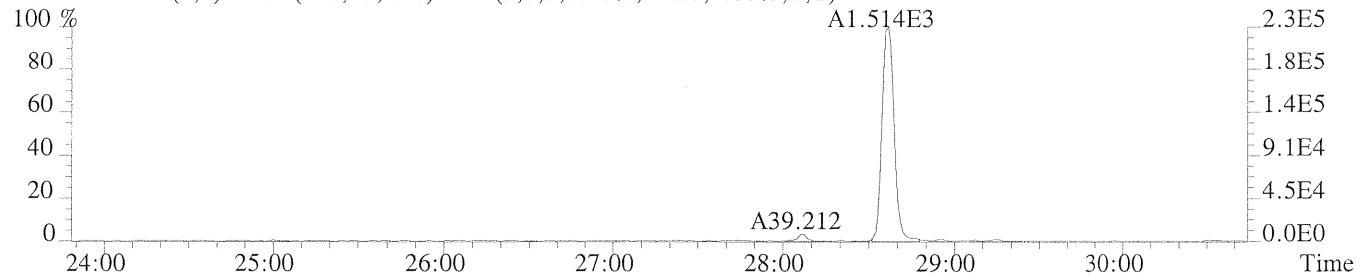
File:P200033 #1-578 Acq: 1-AUG-2008 17:11:30 Probe EI+ Magnet SIR VG BioTech Mass spectf

Sample#1 Exp:ICAL HRCC1

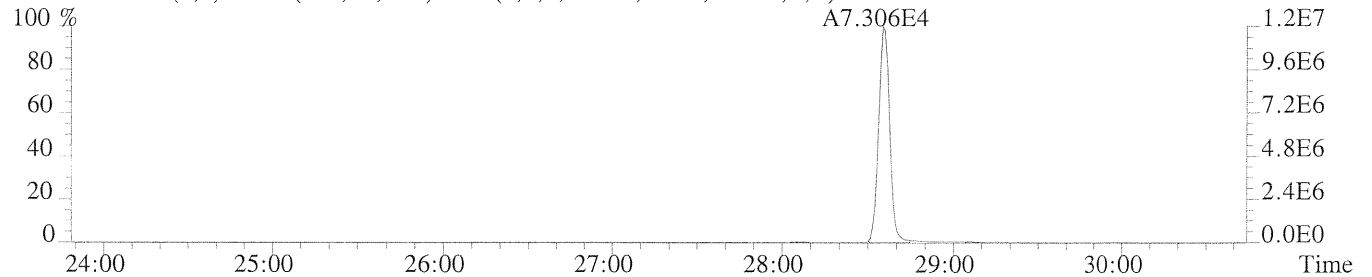
303.9016 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.10%,100.0,1.00%,F,T)



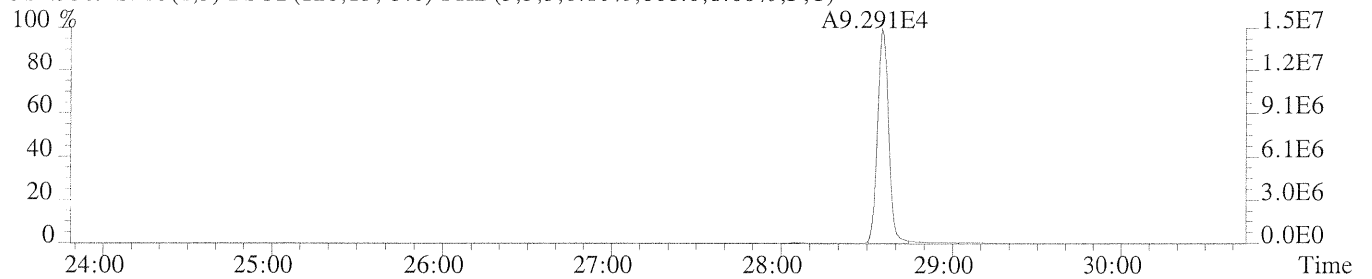
305.8987 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.10%,476.0,1.00%,F,T)



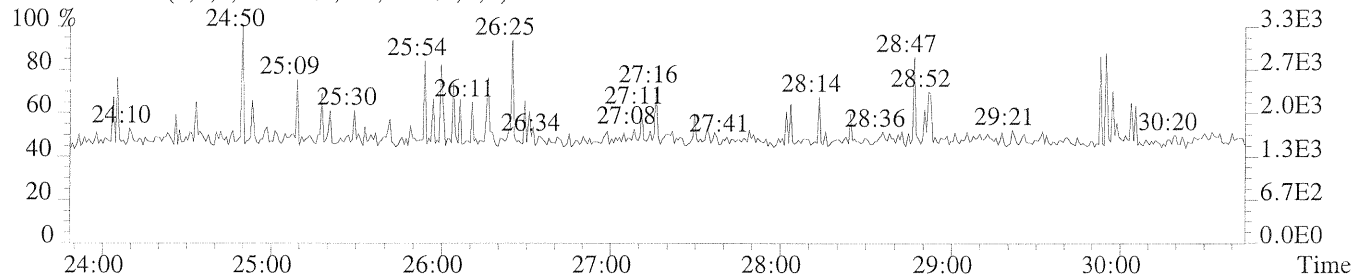
315.9419 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.10%,916.0,1.00%,F,T)



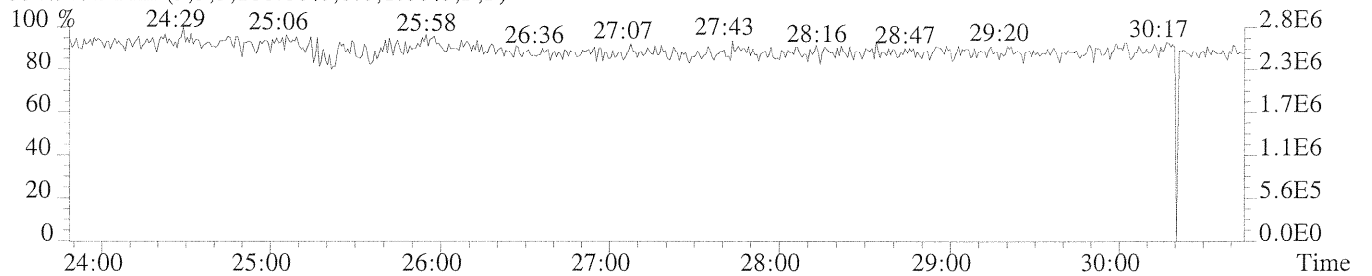
317.9389 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.10%,868.0,1.00%,F,T)



375.8364 PKD(5,3,5,100.00%,0.0,1.00%,F,F)



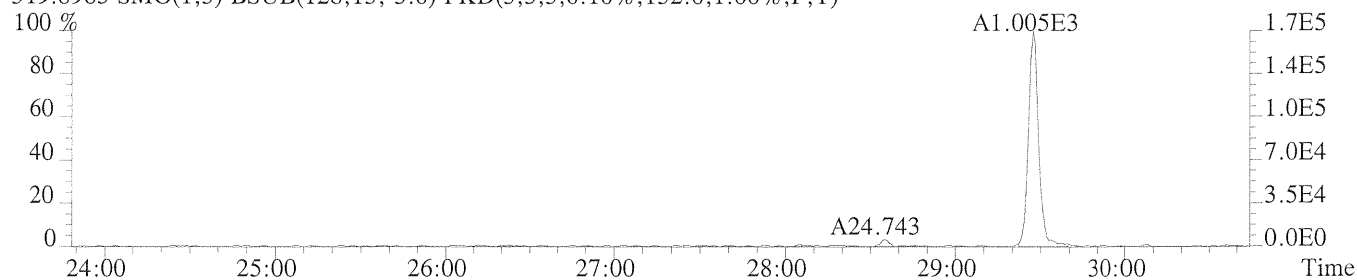
354.9792 PKD(3,3,3,100.00%,0.0,1.00%,F,F)



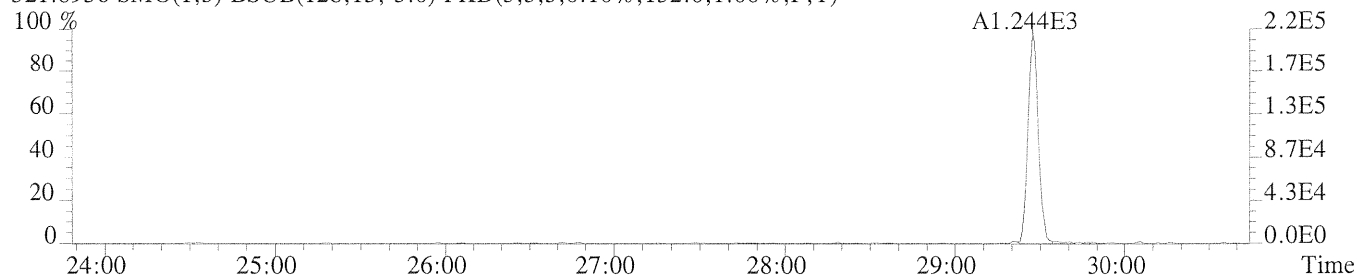
File:P200033 #1-578 Acq: 1-AUG-2008 17:11:30 Probe EI+ Magnet SIR VG BioTech Mass spectf

Sample#1 Exp:ICAL HRCC1

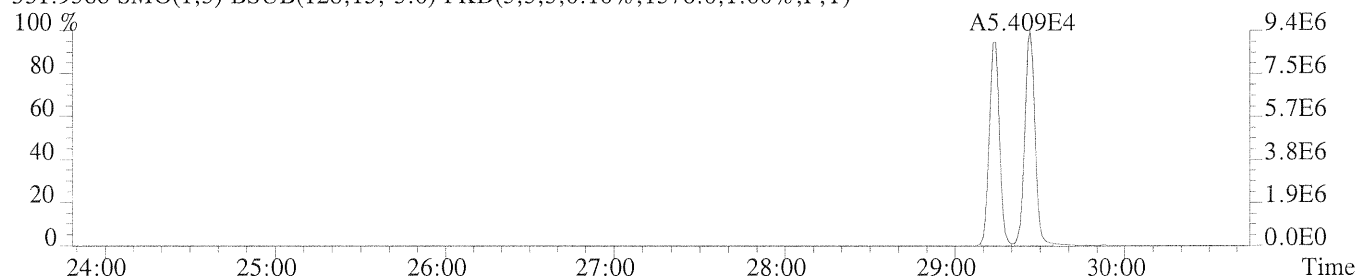
319.8965 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.10%,152.0,1.00%,F,T)



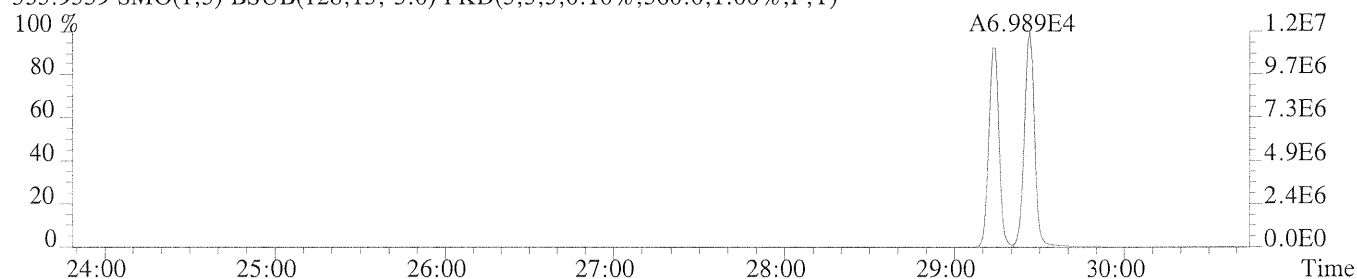
321.8936 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.10%,132.0,1.00%,F,T)



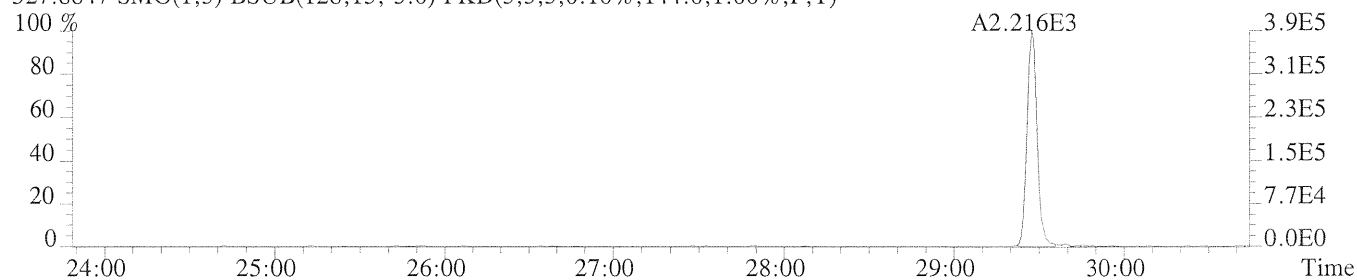
331.9368 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.10%,1576.0,1.00%,F,T)



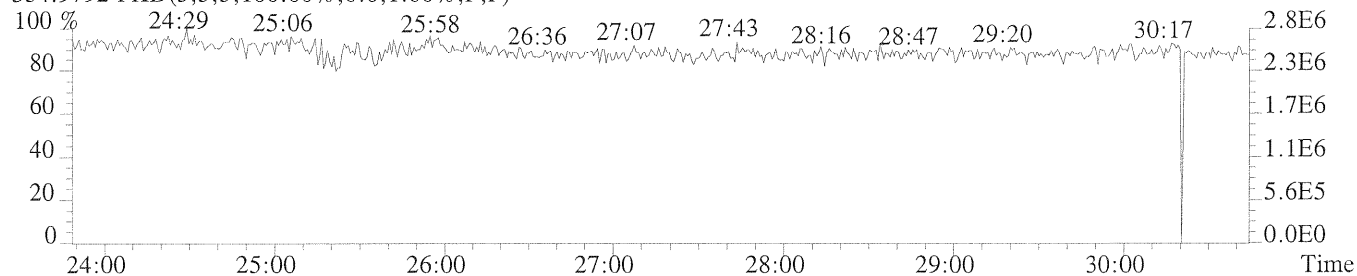
333.9339 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.10%,560.0,1.00%,F,T)



327.8847 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.10%,144.0,1.00%,F,T)



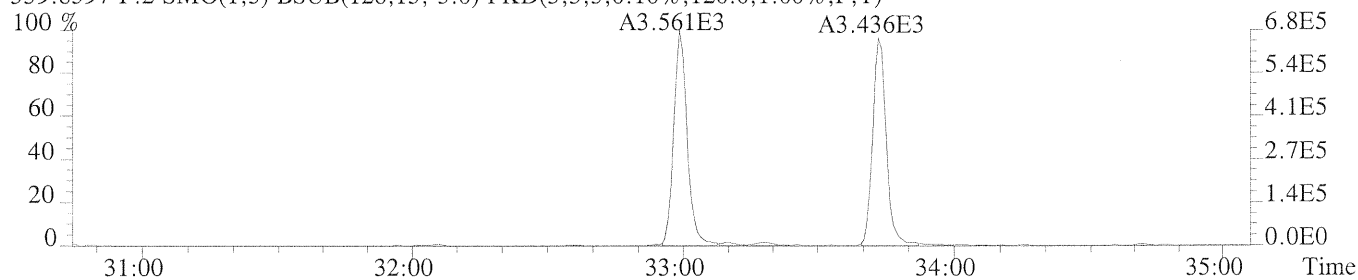
354.9792 PKD(3,3,3,100.00%,0.0,1.00%,F,F)



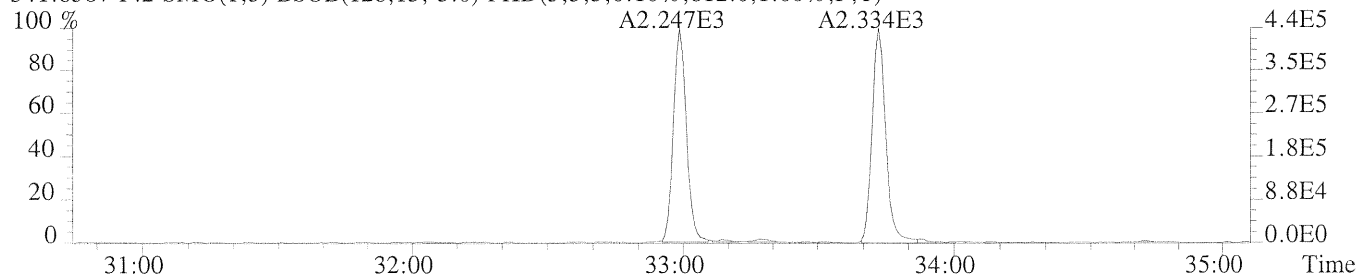
File:P200033 #1-396 Acq: 1-AUG-2008 17:11:30 Probe EI+ Magnet SIR VG BioTech Mass spectf

Sample#1 Exp:ICAL HRCC1

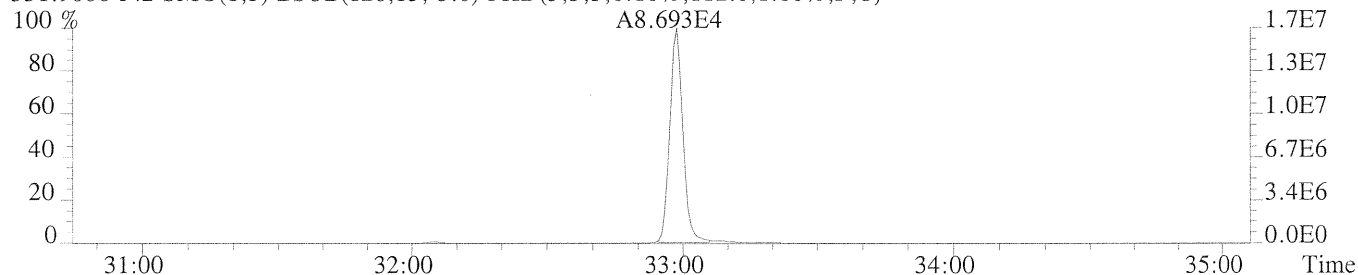
339.8597 F:2 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.10%,120.0,1.00%,F,T)



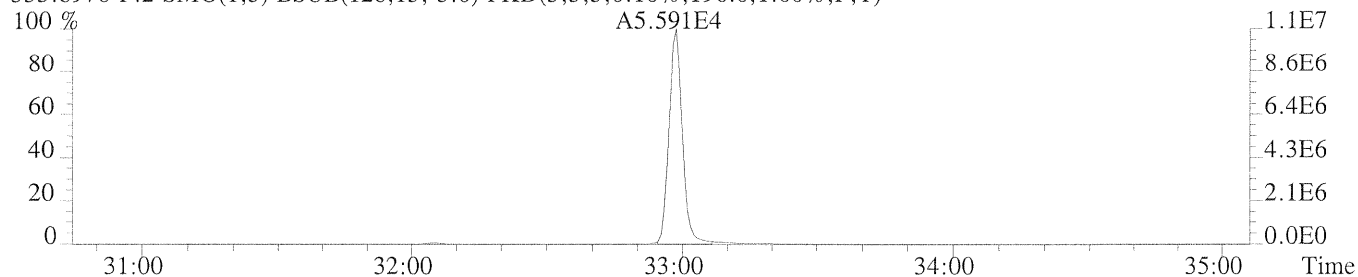
341.8567 F:2 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.10%,812.0,1.00%,F,T)



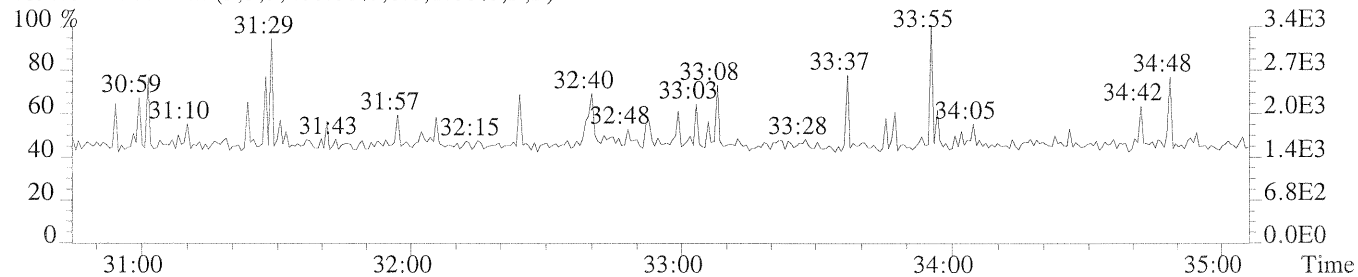
351.9000 F:2 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.10%,112.0,1.00%,F,T)



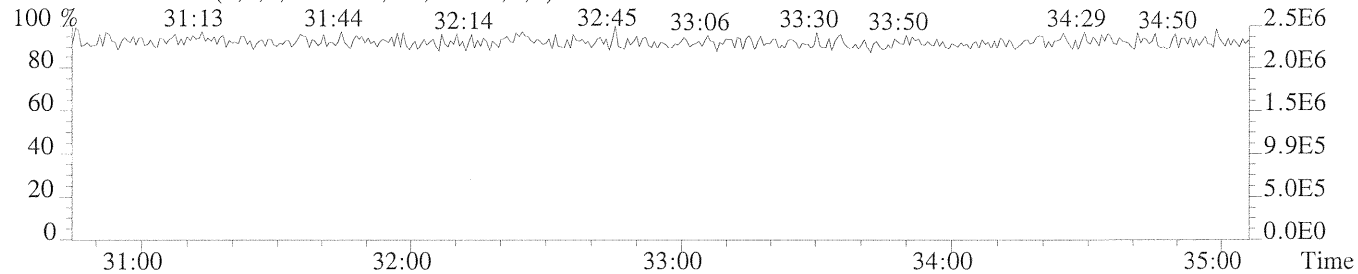
353.8970 F:2 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.10%,196.0,1.00%,F,T)



409.7974 F:2 PKD(5,3,5,100.00%,0.0,1.00%,F,F)



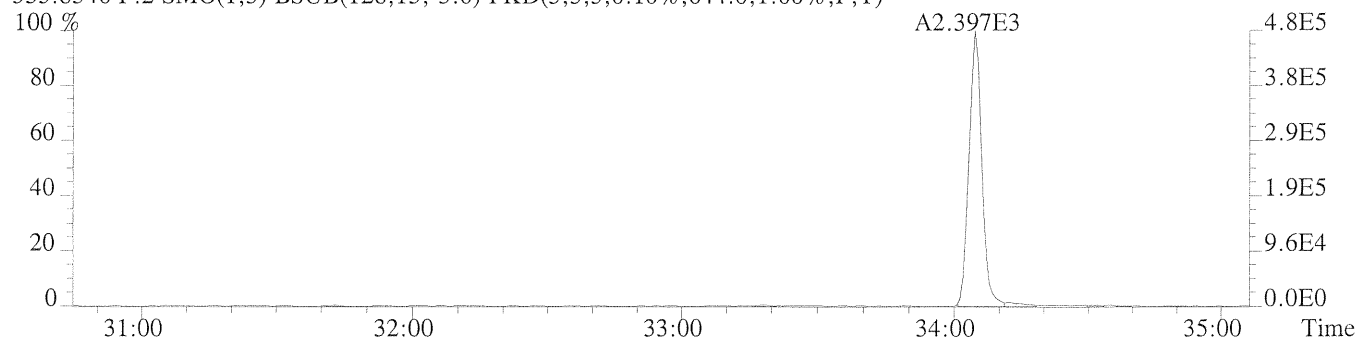
354.9792 F:2 PKD(3,3,3,100.00%,0.0,1.00%,F,F)



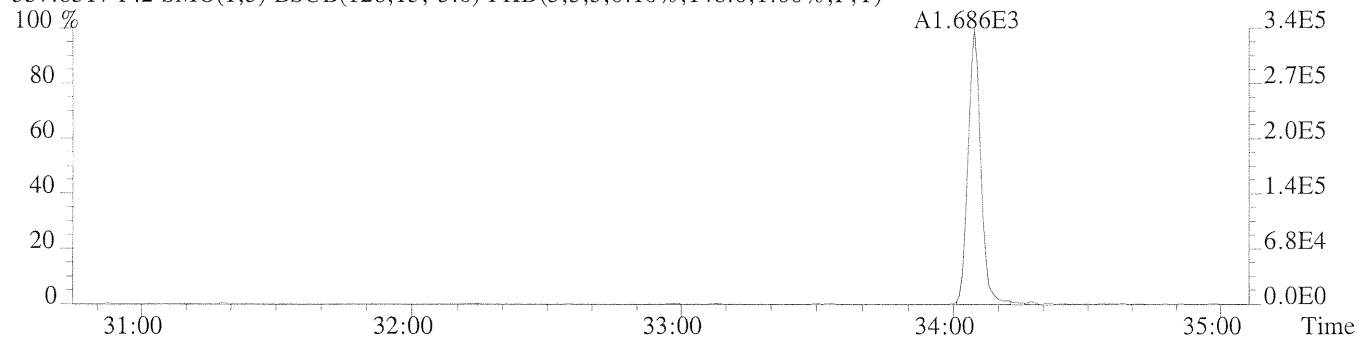
File:P200033 #1-396 Acq: 1-AUG-2008 17:11:30 Probe EI+ Magnet SIR VG BioTech Mass spectf

Sample#1 Exp:ICAL HRCC1

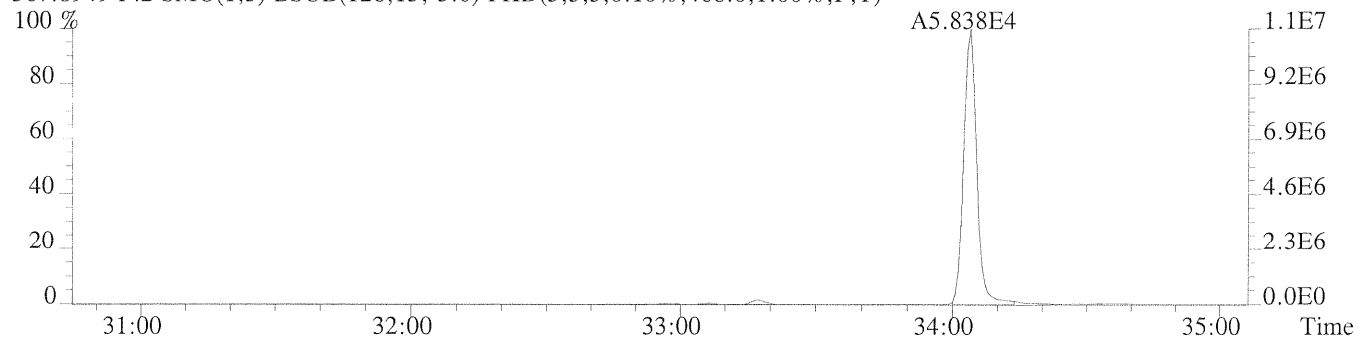
355.8546 F:2 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.10%,644.0,1.00%,F,T)



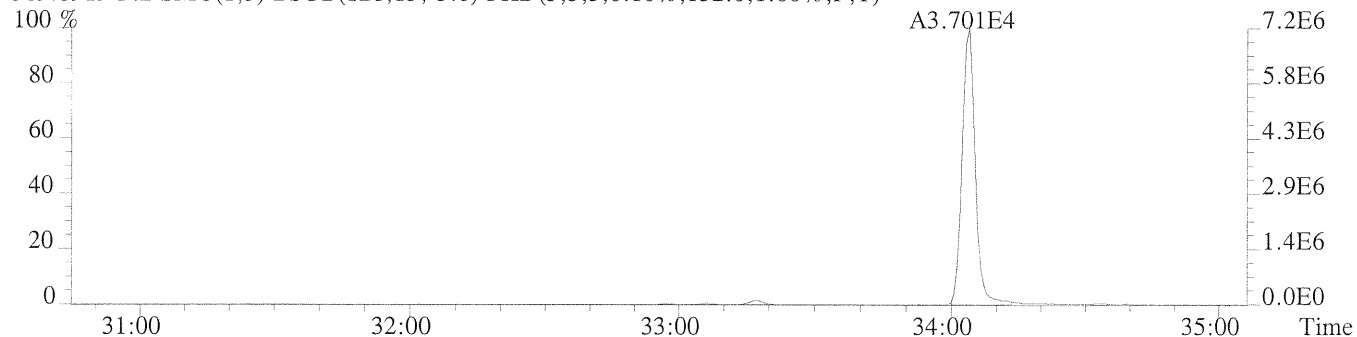
357.8517 F:2 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.10%,148.0,1.00%,F,T)



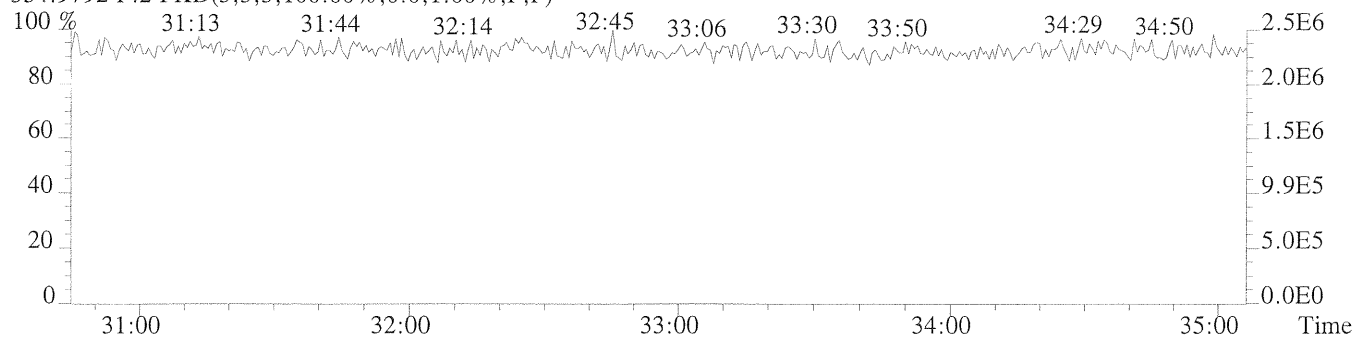
367.8949 F:2 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.10%,468.0,1.00%,F,T)



369.8919 F:2 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.10%,152.0,1.00%,F,T)



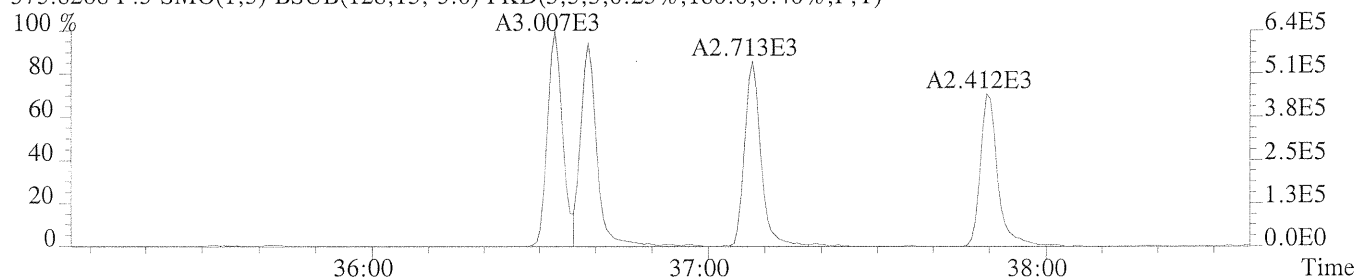
354.9792 F:2 PKD(3,3,3,100.00%,0.0,1.00%,F,F)



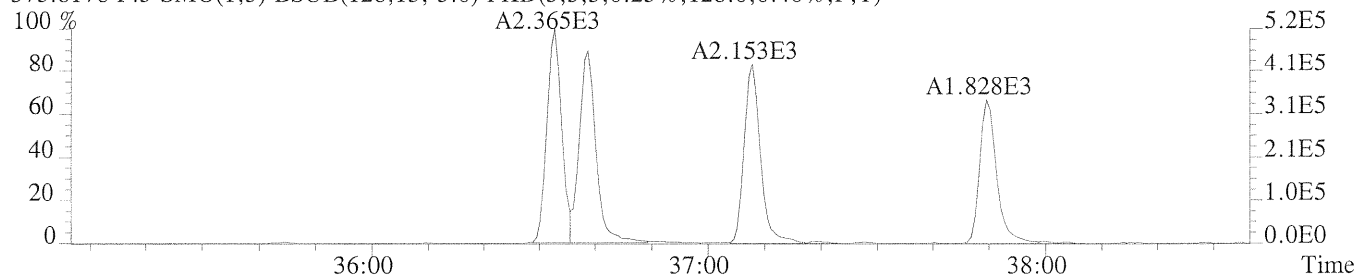
File:P200033 #1-318 Acq: 1-AUG-2008 17:11:30 Probe EI+ Magnet SIR VG BioTech Mass spectf

Sample#1 Exp:ICAL HRCC1

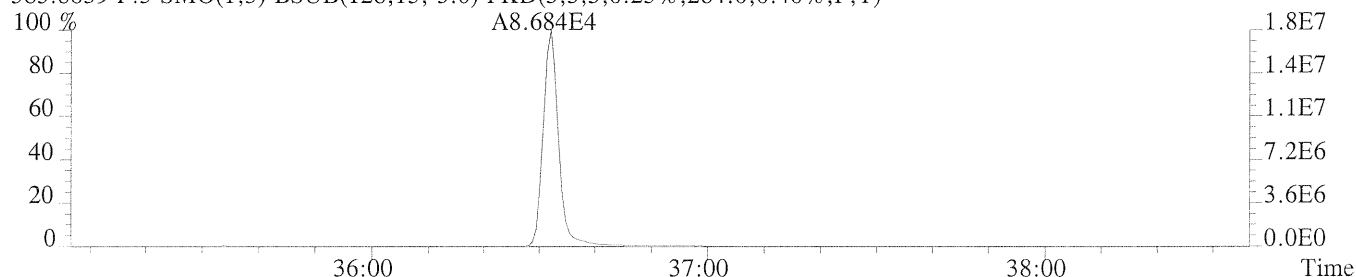
373.8208 F:3 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.25%,180.0,0.40%,F,T)



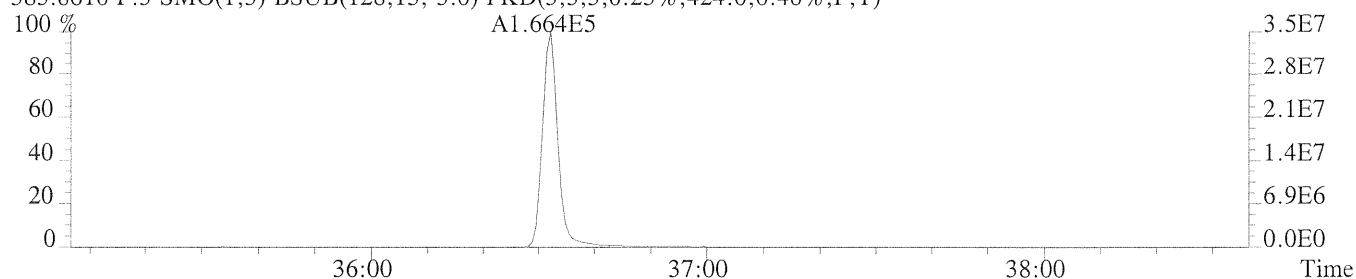
375.8178 F:3 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.25%,128.0,0.40%,F,T)



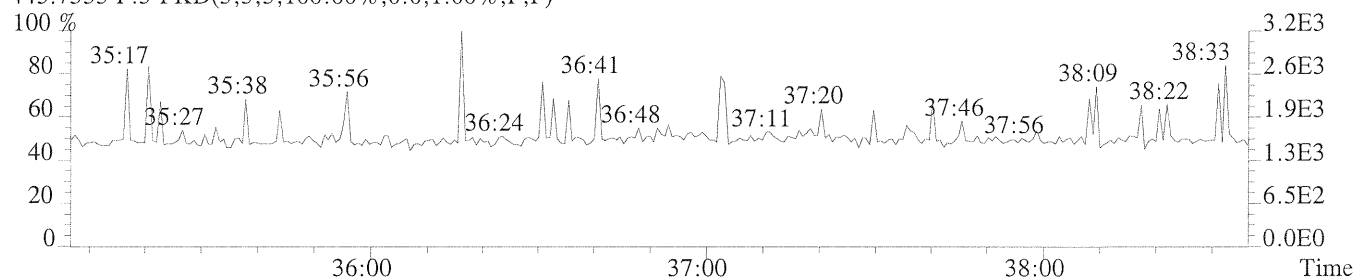
383.8639 F:3 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.25%,284.0,0.40%,F,T)



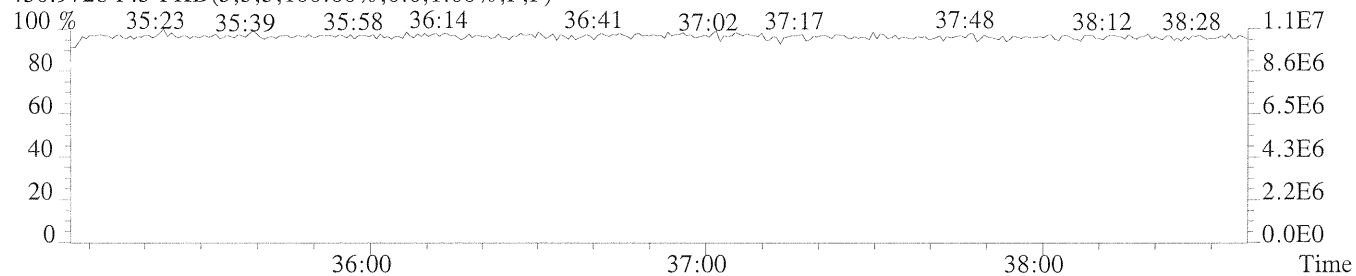
385.8610 F:3 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.25%,424.0,0.40%,F,T)



445.7555 F:3 PKD(5,3,5,100.00%,0.0,1.00%,F,F)



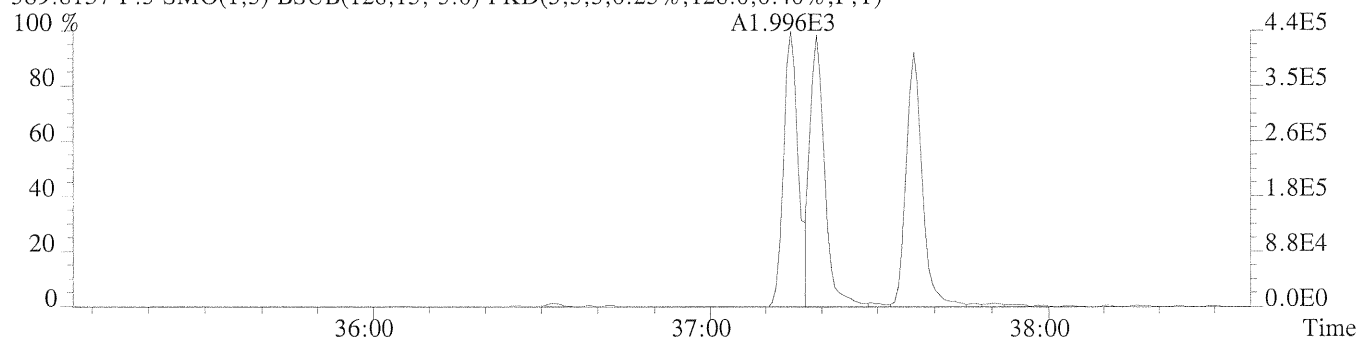
430.9728 F:3 PKD(3,3,3,100.00%,0.0,1.00%,F,F)



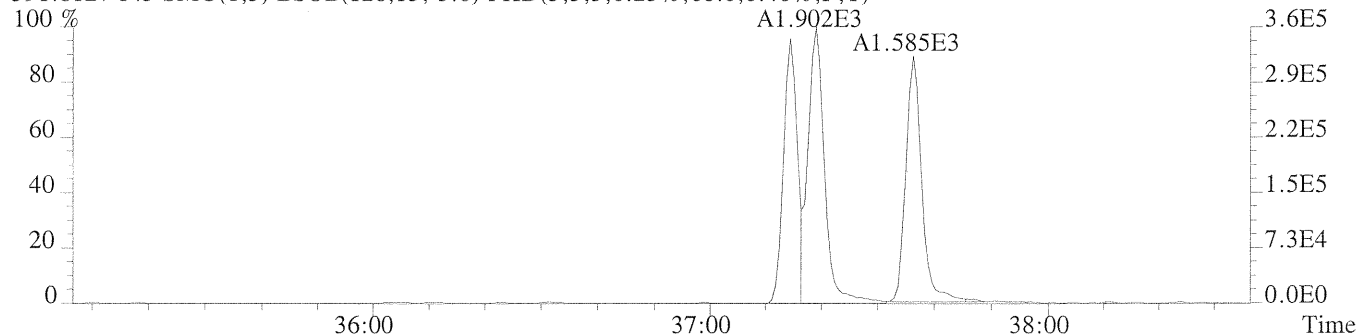
File:P200033 #1-318 Acq: 1-AUG-2008 17:11:30 Probe EI+ Magnet SIR VG BioTech Mass spectf

Sample#1 Exp:ICAL HRCC1

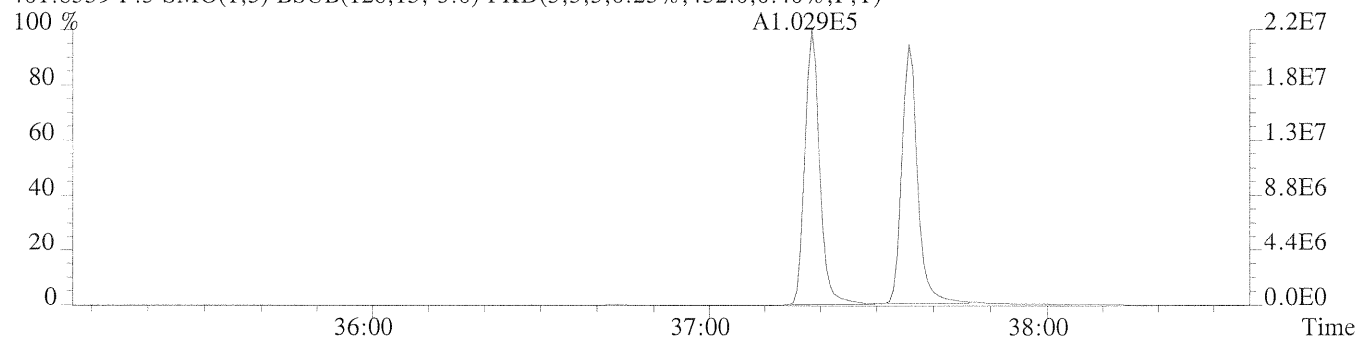
389.8157 F:3 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.25%,128.0,0.40%,F,T)



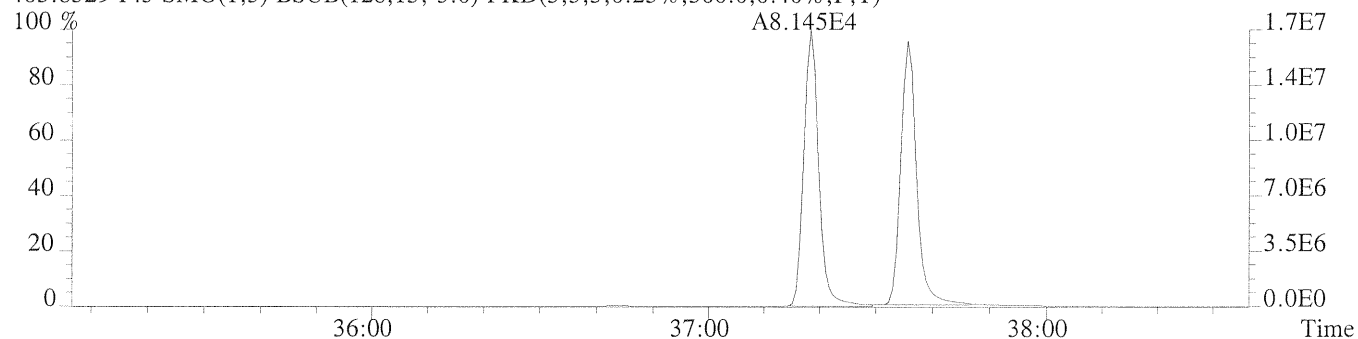
391.8127 F:3 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.25%,68.0,0.40%,F,T)



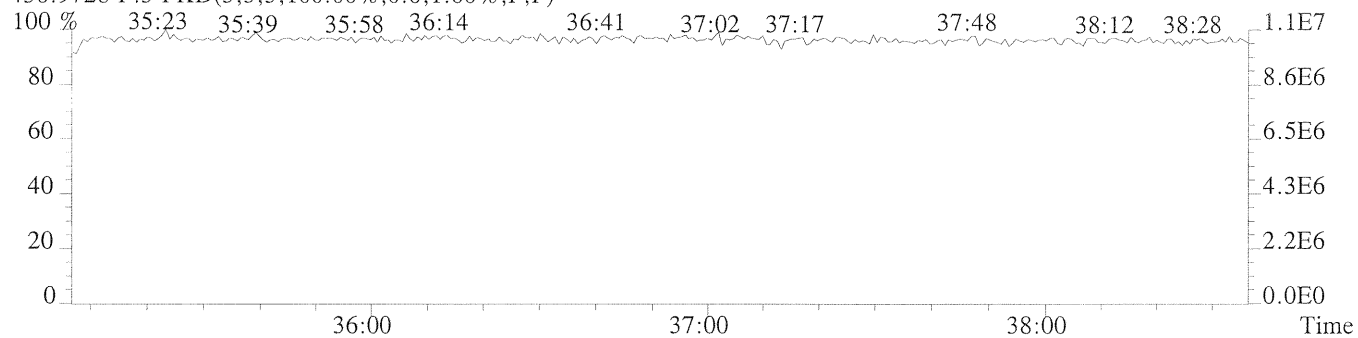
401.8559 F:3 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.25%,452.0,0.40%,F,T)



403.8529 F:3 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.25%,300.0,0.40%,F,T)



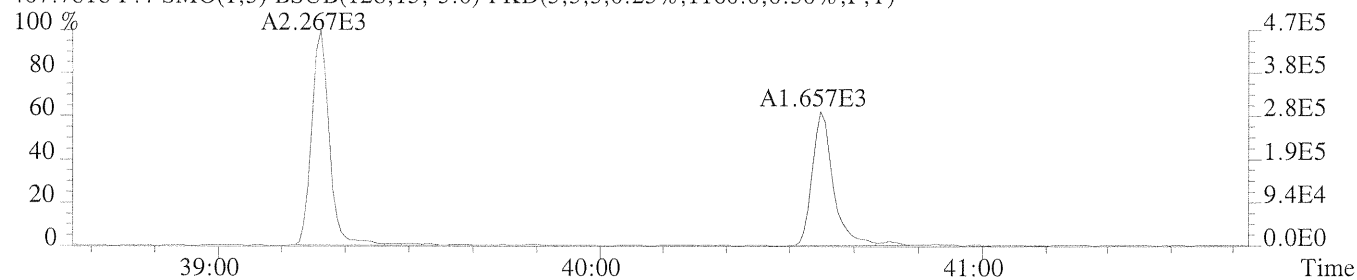
430.9728 F:3 PKD(3,3,3,100.00%,0.0,1.00%,F,F)



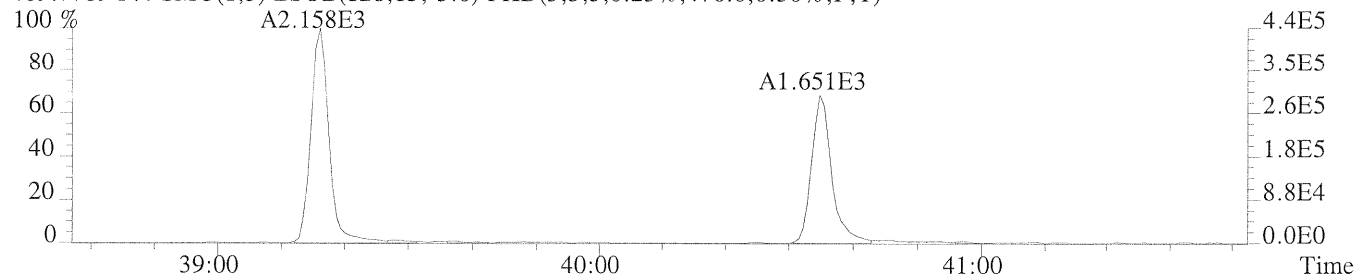
File:P200033 #1-281 Acq: 1-AUG-2008 17:11:30 Probe EI+ Magnet SIR VG BioTech Mass spectf

Sample#1 Exp:ICAL HRCC1

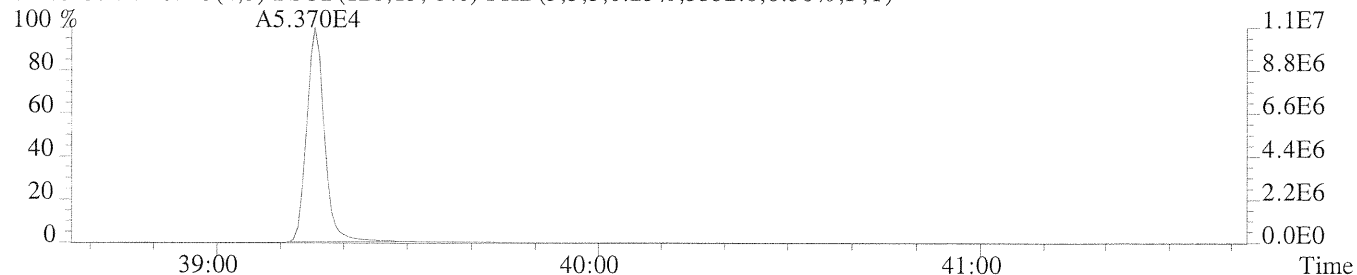
407.7818 F:4 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.25%,1160.0,0.50%,F,T)



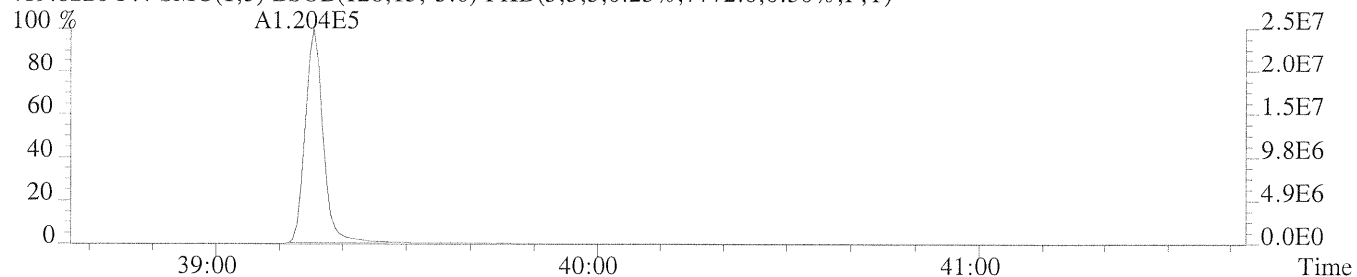
409.7789 F:4 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.25%,476.0,0.50%,F,T)



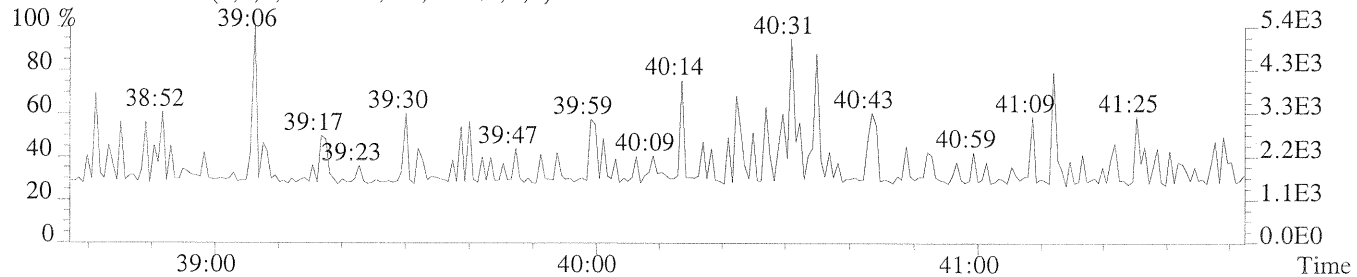
417.8253 F:4 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.25%,5332.0,0.50%,F,T)



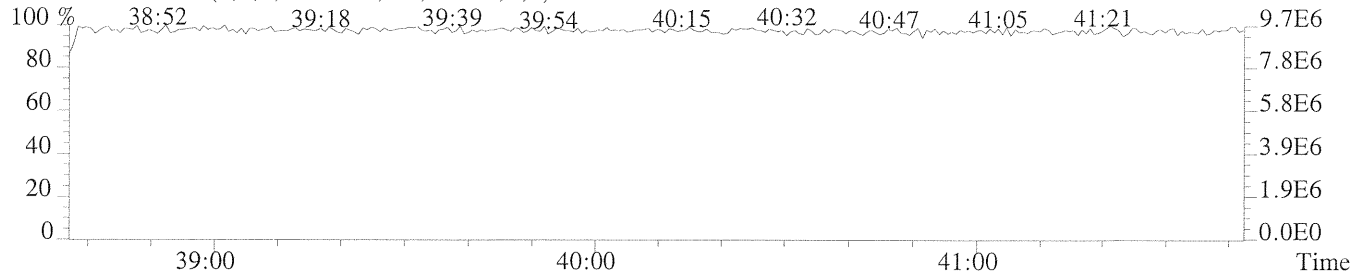
419.8220 F:4 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.25%,7772.0,0.50%,F,T)



479.7165 F:4 PKD(5,3,5,100.00%,0.0,1.00%,F,F)



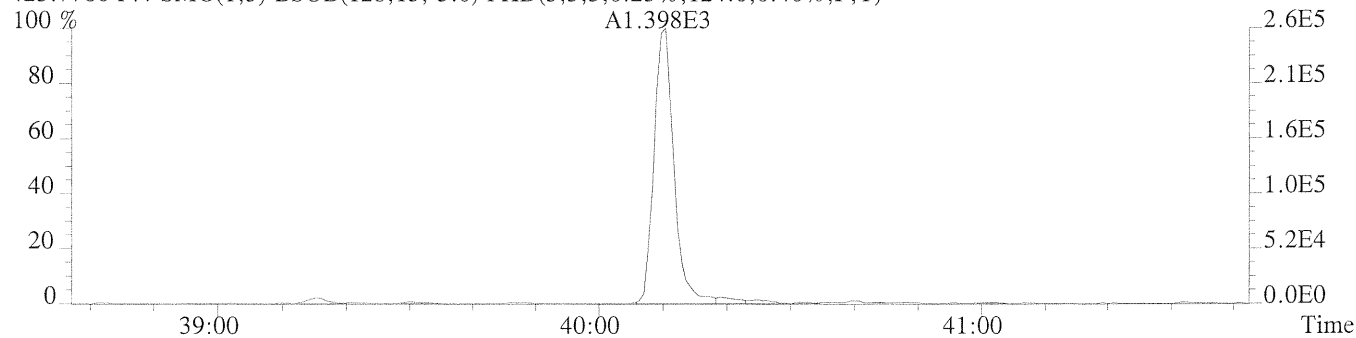
430.9728 F:4 PKD(3,3,3,100.00%,0.0,1.00%,F,F)



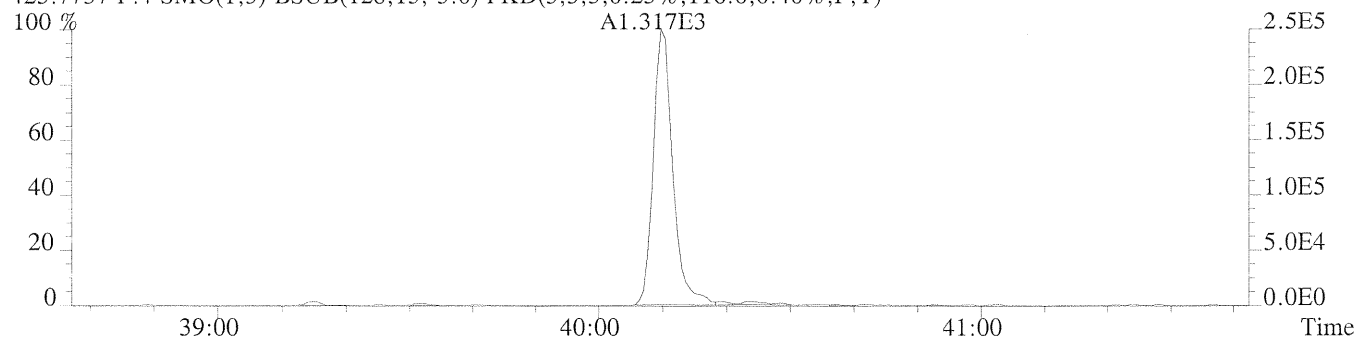
File:P200033 #1-281 Acq: 1-AUG-2008 17:11:30 Probe EI+ Magnet SIR VG BioTech Mass spectf

Sample#1 Exp:ICAL HRCC1

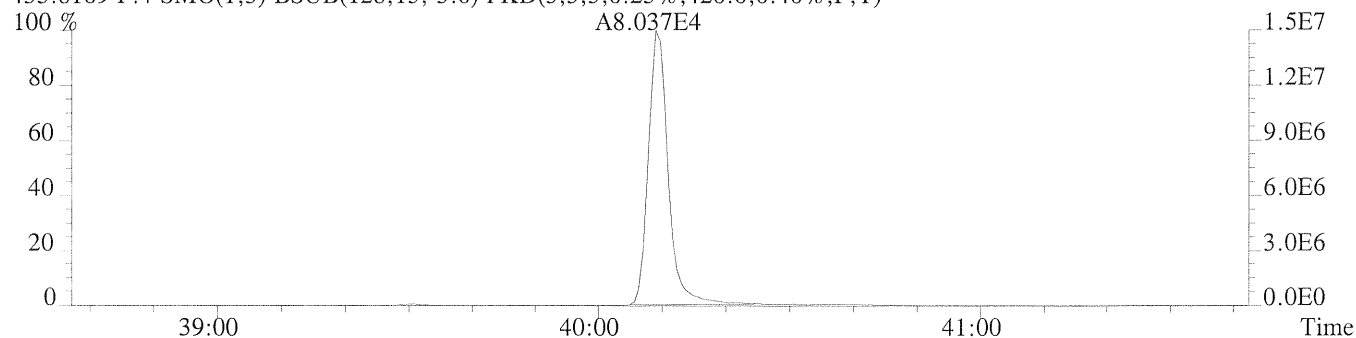
423.7766 F:4 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.25%,124.0,0.40%,F,T)



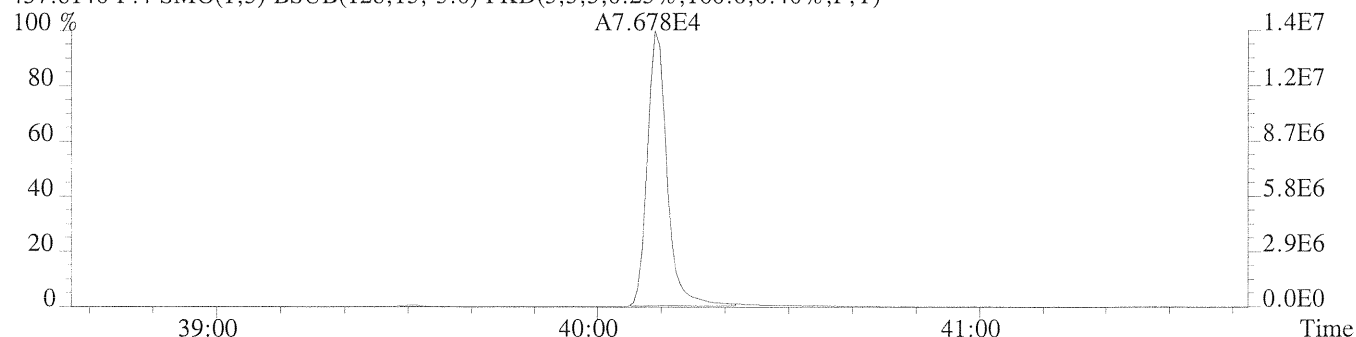
425.7737 F:4 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.25%,116.0,0.40%,F,T)



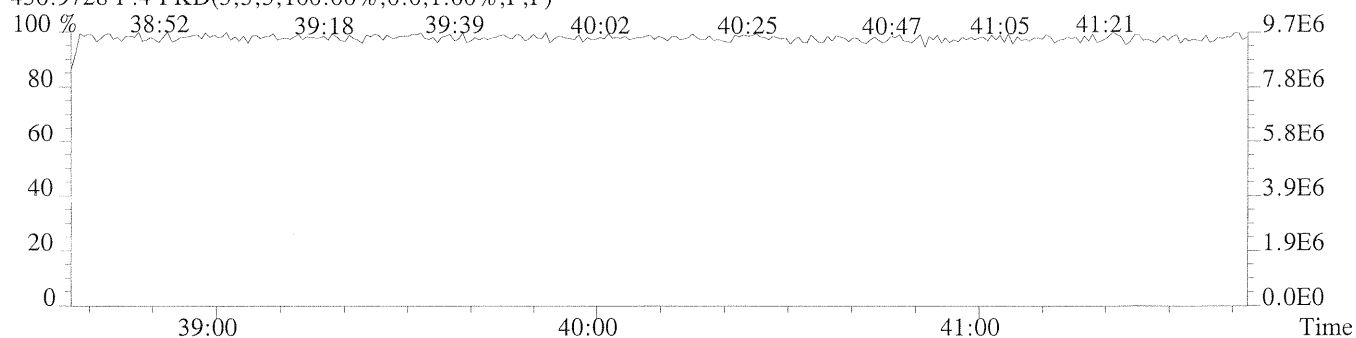
435.8169 F:4 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.25%,420.0,0.40%,F,T)



437.8140 F:4 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.25%,160.0,0.40%,F,T)



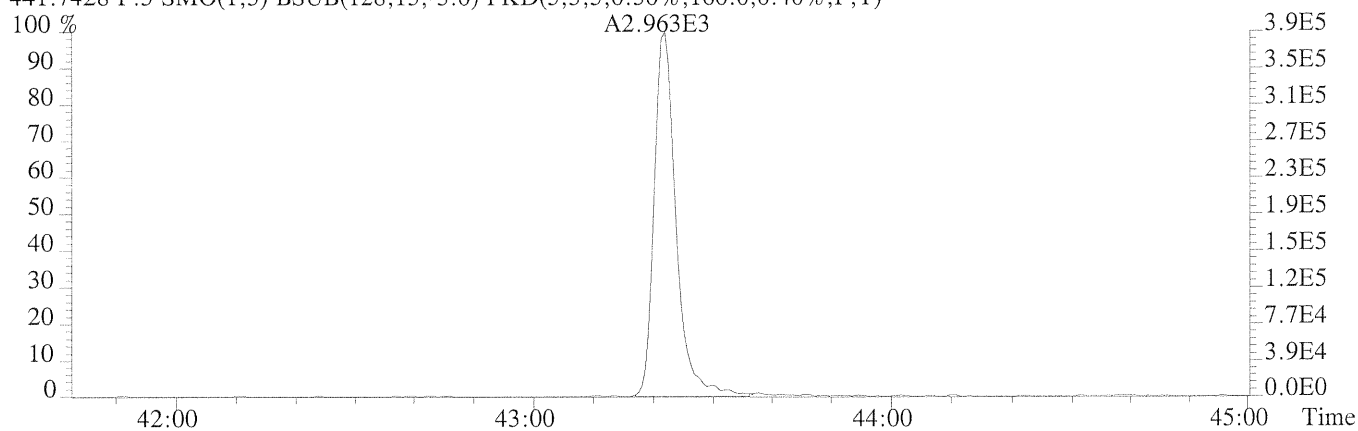
430.9728 F:4 PKD(3,3,3,100.00%,0.0,1.00%,F,F)



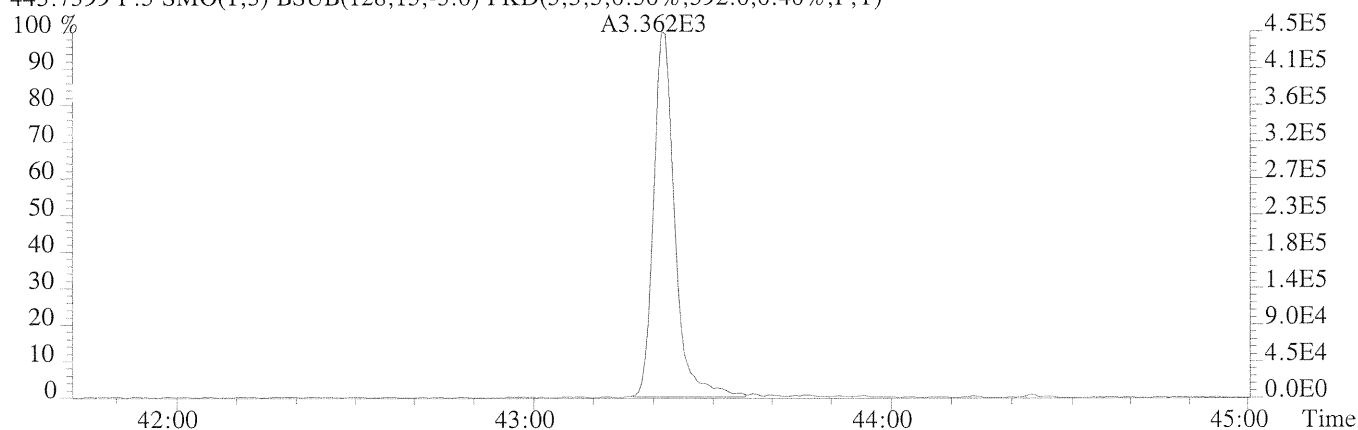
File:P200033 #1-364 Acq: 1-AUG-2008 17:11:30 Probe EI+ Magnet SIR VG BioTech Mass spectf

Sample#1 Exp:ICAL HRCC1

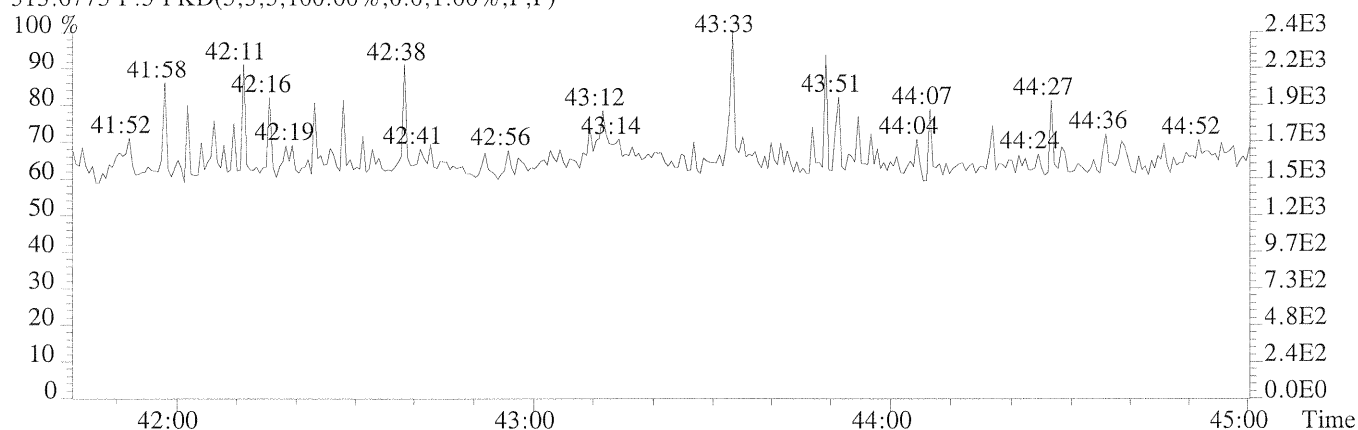
441.7428 F:5 SMO(1,3) BSUB(128,15,-3.0) PKD(5,3,5,0.30%,160.0,0.40%,F,T)



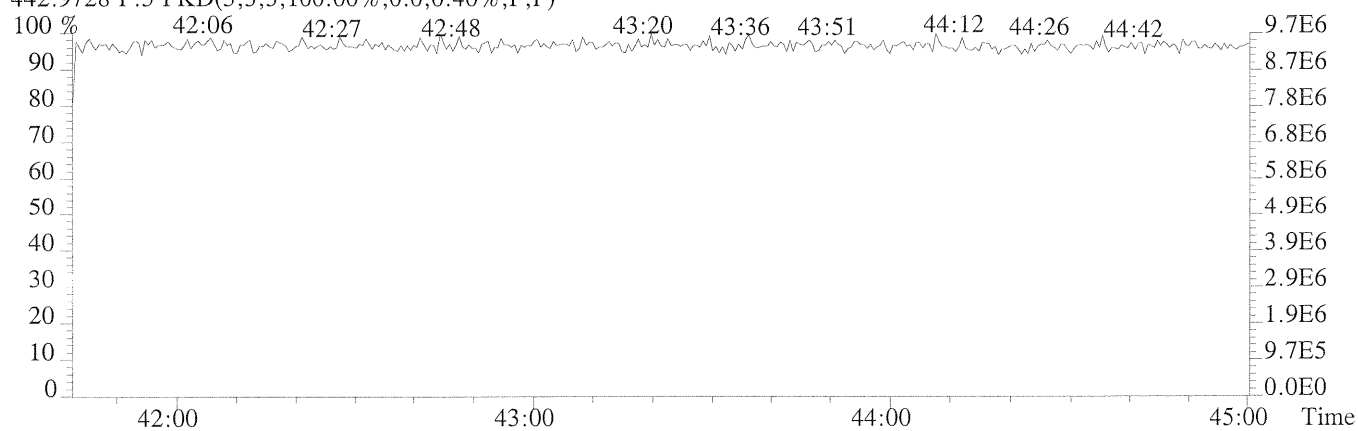
443.7399 F:5 SMO(1,3) BSUB(128,15,-3.0) PKD(5,3,5,0.30%,392.0,0.40%,F,T)



513.6775 F:5 PKD(5,3,5,100.00%,0.0,1.00%,F,F)



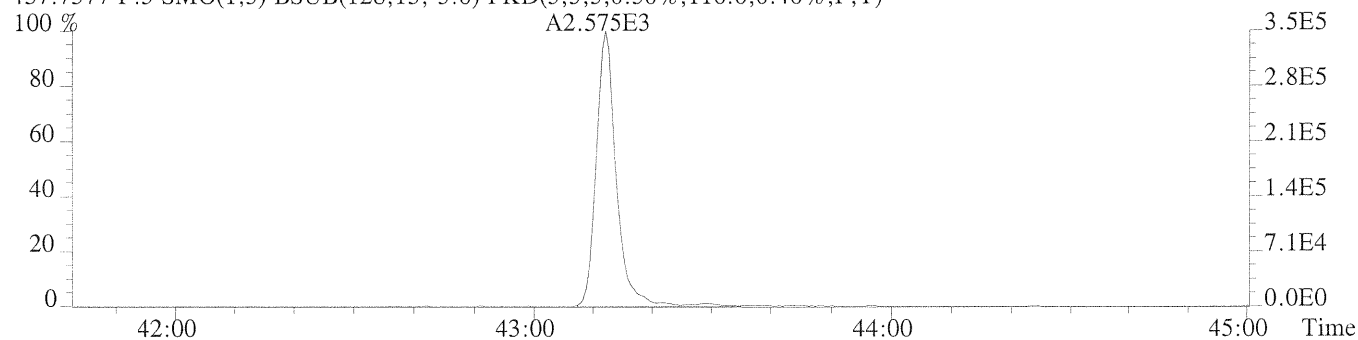
442.9728 F:5 PKD(3,3,3,100.00%,0.0,0.40%,F,F)



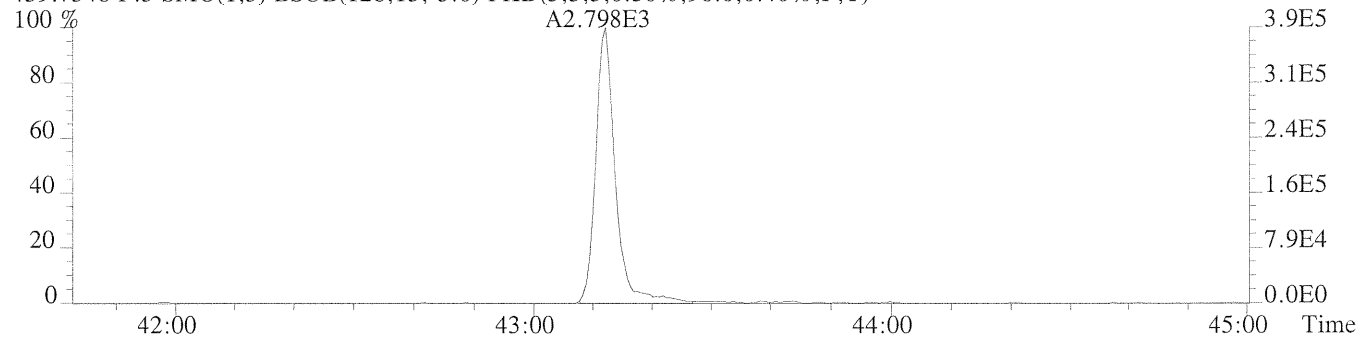
File:P200033 #1-364 Acq: 1-AUG-2008 17:11:30 Probe EI+ Magnet SIR VG BioTech Mass spectf

Sample#1 Exp:ICAL HRCC1

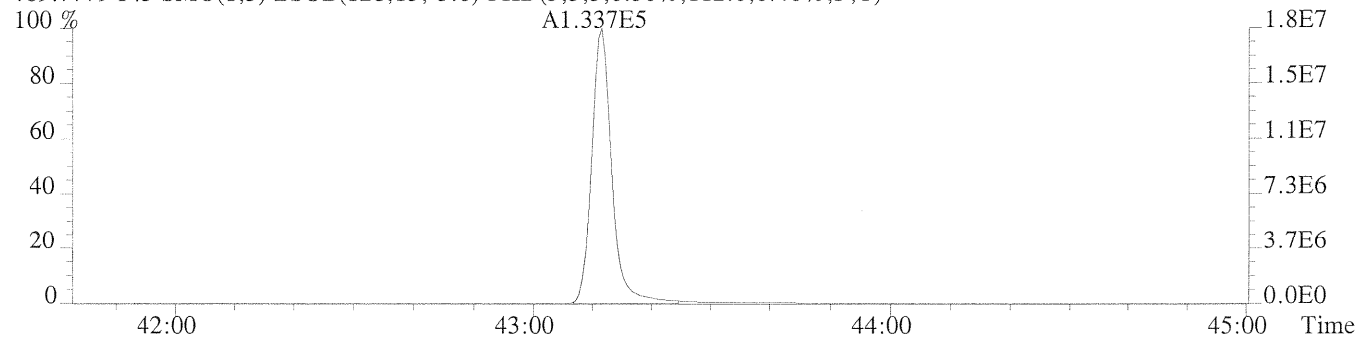
457.7377 F:5 SMO(1,3) BSUB(128,15,-3.0) PKD(5,3,5,0.30%,116.0,0.40%,F,T)



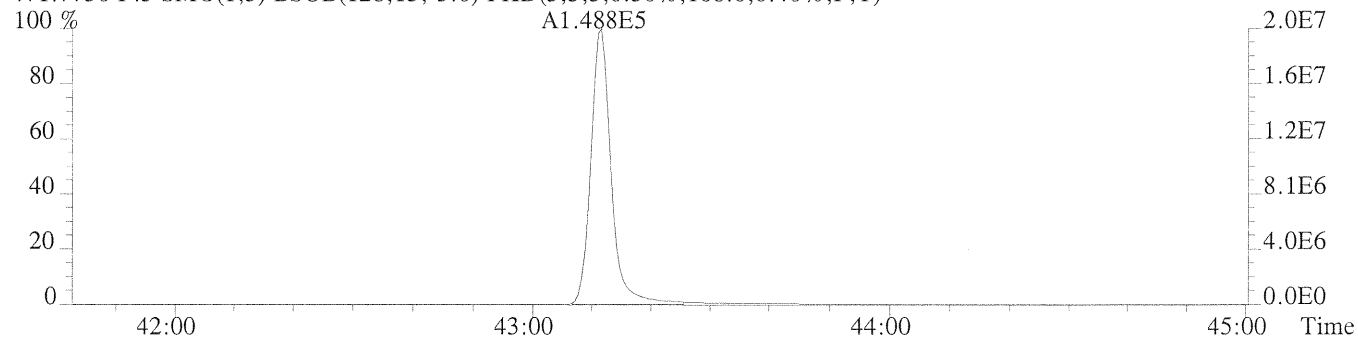
459.7348 F:5 SMO(1,3) BSUB(128,15,-3.0) PKD(5,3,5,0.30%,96.0,0.40%,F,T)



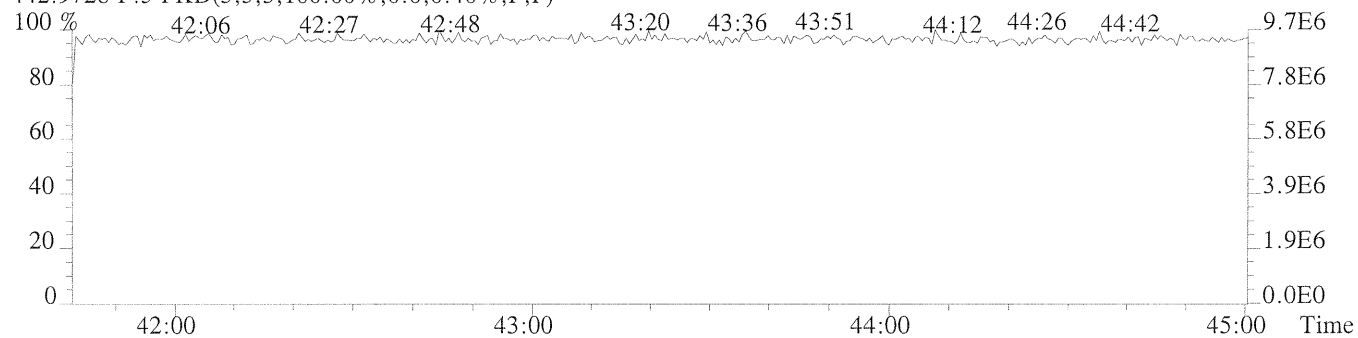
469.7779 F:5 SMO(1,3) BSUB(128,15,-3.0) PKD(5,3,5,0.30%,112.0,0.40%,F,T)



471.7750 F:5 SMO(1,3) BSUB(128,15,-3.0) PKD(5,3,5,0.30%,108.0,0.40%,F,T)



442.9728 F:5 PKD(3,3,3,100.00%,0.0,0.40%,F,F)



Columbia Analytical Services, Inc.
Sample Response Summary

CLIENT ID.
ICAL HRCC2

Run #2 Filename P200032 #1 Samp: 1 Inj: 1 Acquired: 1-AUG-08 16:23:43
Processed: 14-APR-10 10:16:05 LAB. ID: ICAL HRCC2

	Typ	Name	RT-1	Resp 1	Resp 2	Ratio	Meet	Mod?	RRT
1	Unk	2,3,7,8-TCDF	28:37	3.144e+03	4.338e+03	0.72	yes	no	1.001
2	Unk	1,2,3,7,8-PeCDF	33:00	9.742e+03	6.318e+03	1.54	yes	no	1.001
3	Unk	2,3,4,7,8-PeCDF	33:44	9.835e+03	6.271e+03	1.57	yes	no	1.023
4	Unk	1,2,3,4,7,8-HxCDF	36:33	8.041e+03	6.559e+03	1.23	yes	no	1.000
5	Unk	1,2,3,6,7,8-HxCDF	36:39	8.405e+03	6.664e+03	1.26	yes	no	1.003
6	Unk	2,3,4,6,7,8-HxCDF	37:08	7.397e+03	6.076e+03	1.22	yes	no	1.016
7	Unk	1,2,3,7,8,9-HxCDF	37:50	6.292e+03	5.220e+03	1.21	yes	no	1.036
8	Unk	1,2,3,4,6,7,8-HpCDF	39:16	6.178e+03	6.250e+03	0.99	yes	no	1.000
9	Unk	1,2,3,4,7,8,9-HpCDF	40:35	4.362e+03	4.515e+03	0.97	yes	no	1.034
10	Unk	OCDF	43:22	7.938e+03	8.840e+03	0.90	yes	no	1.004
11	Unk	2,3,7,8-TCDD	29:28	2.723e+03	3.460e+03	0.79	yes	no	1.001
12	Unk	1,2,3,7,8-PeCDD	34:05	6.758e+03	4.411e+03	1.53	yes	no	1.000
13	Unk	1,2,3,4,7,8-HxCDD	37:15	5.127e+03	4.119e+03	1.24	yes	no	0.998
14	Unk	1,2,3,6,7,8-HxCDD	37:20	6.059e+03	4.831e+03	1.25	yes	no	1.000
15	Unk	1,2,3,7,8,9-HxCDD	37:37	5.539e+03	4.491e+03	1.23	yes	no	1.008
16	Unk	1,2,3,4,6,7,8-HpCDD	40:10	3.782e+03	3.637e+03	1.04	yes	no	1.000
17	Unk	OCDD	43:13	6.836e+03	7.662e+03	0.89	yes	no	1.000
18	IS	13C-2,3,7,8-TCDF	28:36	8.147e+04	1.048e+05	0.78	yes	no	0.978
19	IS	13C-1,2,3,7,8-PeCDF	32:58	9.568e+04	6.102e+04	1.57	yes	no	1.128
20	IS	13C-1,2,3,4,7,8-HxCDF	36:32	9.339e+04	1.796e+05	0.52	yes	no	0.972
21	IS	13C-1,2,3,4,6,7,8-HpCDF	39:16	5.838e+04	1.327e+05	0.44	yes	no	1.044
22	IS	13C-2,3,7,8-TCDD	29:26	6.122e+04	7.845e+04	0.78	yes	no	1.007
23	IS	13C-1,2,3,7,8-PeCDD	34:04	6.422e+04	4.069e+04	1.58	yes	no	1.165
24	IS	13C-1,2,3,6,7,8-HxCDD	37:19	1.152e+05	9.112e+04	1.26	yes	no	0.992
25	IS	13C-1,2,3,4,6,7,8-HpCDD	40:10	8.794e+04	8.432e+04	1.04	yes	no	1.068
26	IS	13C-OCDD	43:12	1.452e+05	1.620e+05	0.90	yes	no	1.149
27	RS/RT	13C-1,2,3,4-TCDD	29:14	5.803e+04	7.263e+04	0.80	yes	no	*
28	RS/RT	13C-1,2,3,7,8,9-HxCDD	37:36	1.169e+05	9.122e+04	1.28	yes	no	*
29	C/Up	37Cl-2,3,7,8-TCDD	29:28	6.359e+03				no	1.008

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Columbia Analytical Services, Inc.
Signal/Noise Height Ratio Summary

CLIENT ID.
ICAL HRCC2

Run #2 Filename P200032 Samp: 1 Inj: 1 Acquired: 1-AUG-08 16:23:43
Processed: 14-APR-10 10:16:051 LAB. ID: ICAL HRCC2

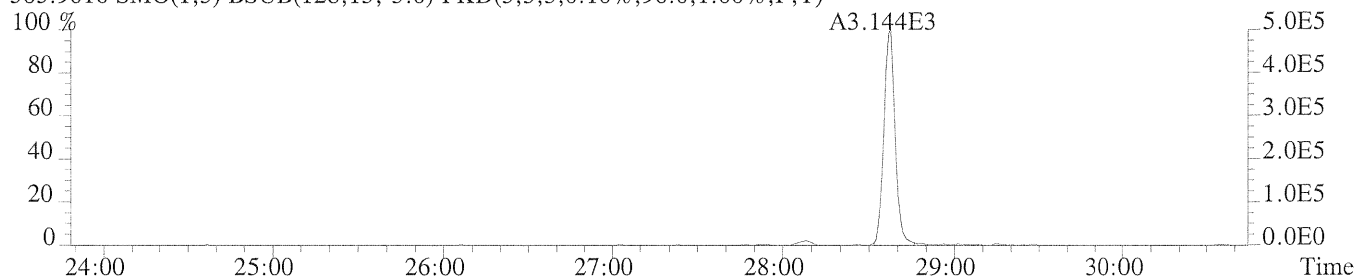
	Name	Signal 1	Noise 1	S/N Rat.1	Signal 2	Noise 2	S/N Rat.2
1	2,3,7,8-TCDF	5.00e+05	9.60e+01	5.2e+03	7.03e+05	2.84e+02	2.5e+03
2	1,2,3,7,8-PeCDF	1.79e+06	1.24e+02	1.4e+04	1.18e+06	4.88e+02	2.4e+03
3	2,3,4,7,8-PeCDF	1.84e+06	1.24e+02	1.5e+04	1.17e+06	4.88e+02	2.4e+03
4	1,2,3,4,7,8-HxCDF	1.70e+06	2.36e+02	7.2e+03	1.37e+06	1.16e+02	1.2e+04
5	1,2,3,6,7,8-HxCDF	1.59e+06	2.36e+02	6.7e+03	1.30e+06	1.16e+02	1.1e+04
6	2,3,4,6,7,8-HxCDF	1.43e+06	2.36e+02	6.0e+03	1.19e+06	1.16e+02	1.0e+04
7	1,2,3,7,8,9-HxCDF	1.23e+06	2.36e+02	5.2e+03	9.87e+05	1.16e+02	8.5e+03
8	1,2,3,4,6,7,8-HpCDF	1.19e+06	2.39e+03	5.0e+02	1.24e+06	5.00e+02	2.5e+03
9	1,2,3,4,7,8,9-HpCDF	7.69e+05	2.39e+03	3.2e+02	7.72e+05	5.00e+02	1.5e+03
10	OCDF	1.05e+06	1.80e+02	5.8e+03	1.18e+06	3.76e+02	3.1e+03
11	2,3,7,8-TCDD	4.64e+05	5.12e+02	9.1e+02	5.91e+05	1.08e+02	5.5e+03
12	1,2,3,7,8-PeCDD	1.33e+06	4.00e+02	3.3e+03	8.48e+05	8.40e+01	1.0e+04
13	1,2,3,4,7,8-HxCDD	1.13e+06	9.60e+01	1.2e+04	9.03e+05	1.04e+02	8.7e+03
14	1,2,3,6,7,8-HxCDD	1.21e+06	9.60e+01	1.3e+04	9.45e+05	1.04e+02	9.1e+03
15	1,2,3,7,8,9-HxCDD	1.09e+06	9.60e+01	1.1e+04	8.67e+05	1.04e+02	8.3e+03
16	1,2,3,4,6,7,8-HpCDD	7.32e+05	1.20e+02	6.1e+03	6.92e+05	8.80e+01	7.9e+03
17	OCDD	9.36e+05	1.08e+02	8.7e+03	1.05e+06	1.28e+02	8.2e+03
18	13C-2,3,7,8-TCDF	1.32e+07	1.02e+03	1.3e+04	1.71e+07	9.28e+02	1.8e+04
19	13C-1,2,3,7,8-PeCDF	1.71e+07	1.60e+02	1.1e+05	1.10e+07	1.32e+02	8.3e+04
20	13C-1,2,3,4,7,8-HxCDF	1.84e+07	2.00e+02	9.2e+04	3.58e+07	4.60e+02	7.8e+04
21	13C-1,2,3,4,6,7,8-HpCDF	1.15e+07	5.46e+03	2.1e+03	2.60e+07	1.32e+04	2.0e+03
22	13C-2,3,7,8-TCDD	1.02e+07	1.72e+03	5.9e+03	1.33e+07	5.08e+02	2.6e+04
23	13C-1,2,3,7,8-PeCDD	1.21e+07	8.80e+01	1.4e+05	7.82e+06	1.32e+02	5.9e+04
24	13C-1,2,3,6,7,8-HxCDD	2.39e+07	1.16e+02	2.1e+05	1.88e+07	5.80e+02	3.2e+04
25	13C-1,2,3,4,6,7,8-HpCDD	1.64e+07	1.48e+02	1.1e+05	1.57e+07	6.96e+02	2.3e+04
26	13C-OCDD	1.99e+07	1.24e+02	1.6e+05	2.22e+07	1.44e+02	1.5e+05
27	13C-1,2,3,4-TCDD	9.88e+06	1.72e+03	5.7e+03	1.24e+07	5.08e+02	2.4e+04
28	13C-1,2,3,7,8,9-HxCDD	2.33e+07	1.16e+02	2.0e+05	1.84e+07	5.80e+02	3.2e+04
29	37Cl-2,3,7,8-TCDD	1.13e+06	1.16e+02	9.7e+03			

Columbia Analytical Services, Inc.
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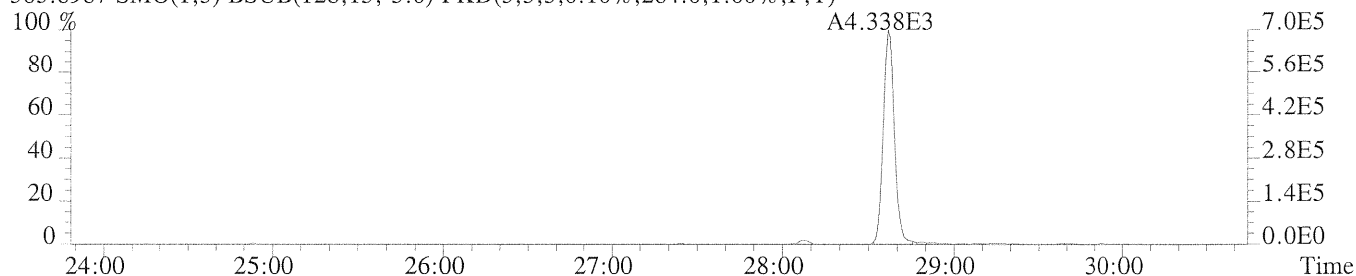
File:P200032 #1-578 Acq: 1-AUG-2008 16:23:43 Probe EI+ Magnet SIR VG BioTech Mass spectf

Sample#1 Exp:ICAL HRCC2

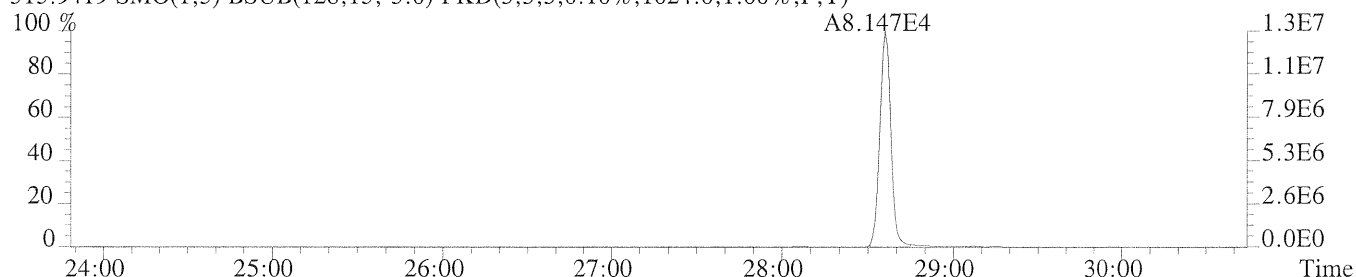
303.9016 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.10%,96.0,1.00%,F,T)



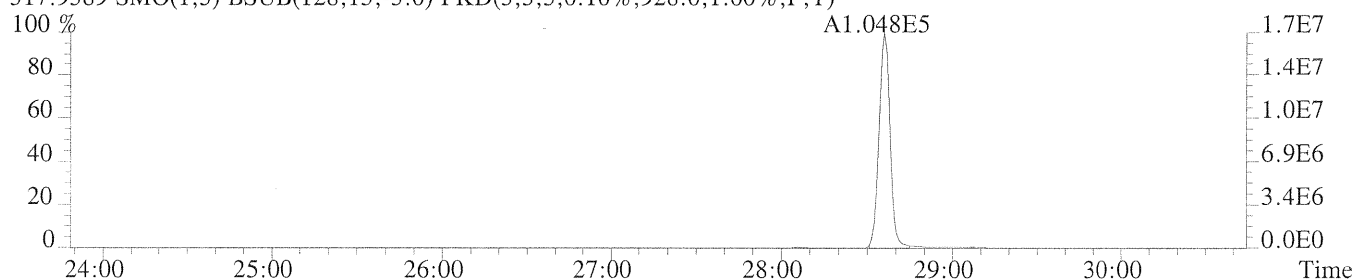
305.8987 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.10%,284.0,1.00%,F,T)



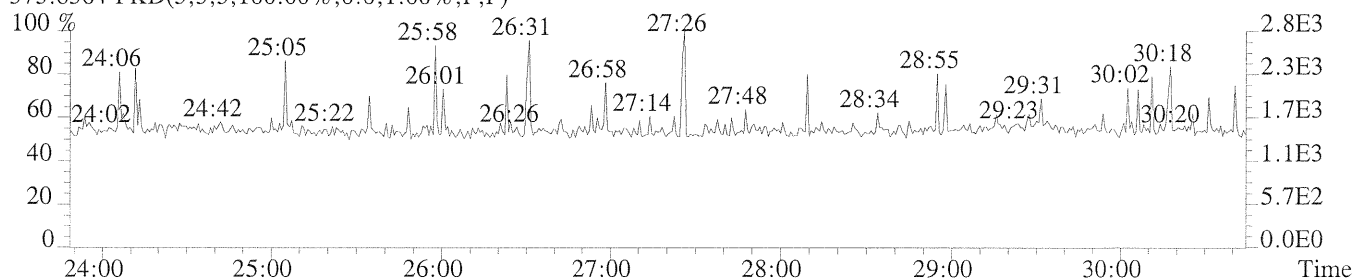
315.8919 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.10%,1024.0,1.00%,F,T)



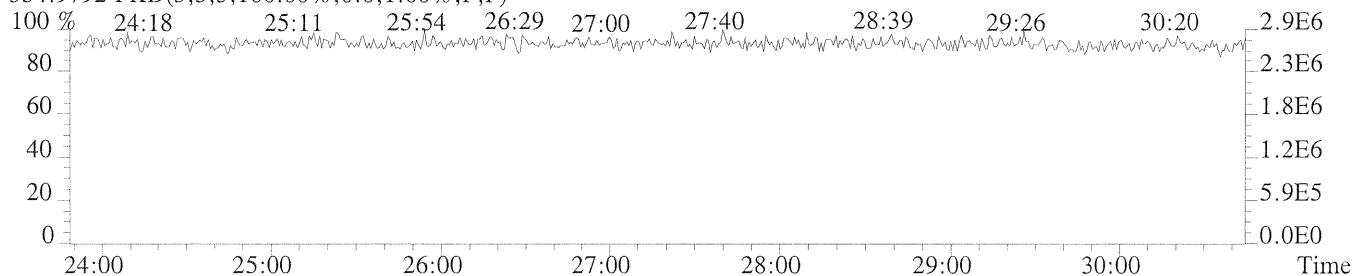
317.9389 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.10%,928.0,1.00%,F,T)



375.8364 PKD(5,3,5,100.00%,0.0,1.00%,F,F)



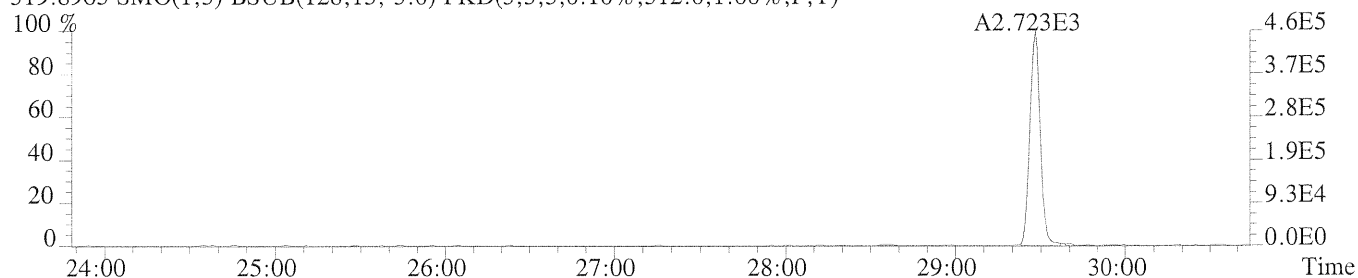
354.9792 PKD(3,3,3,100.00%,0.0,1.00%,F,F)



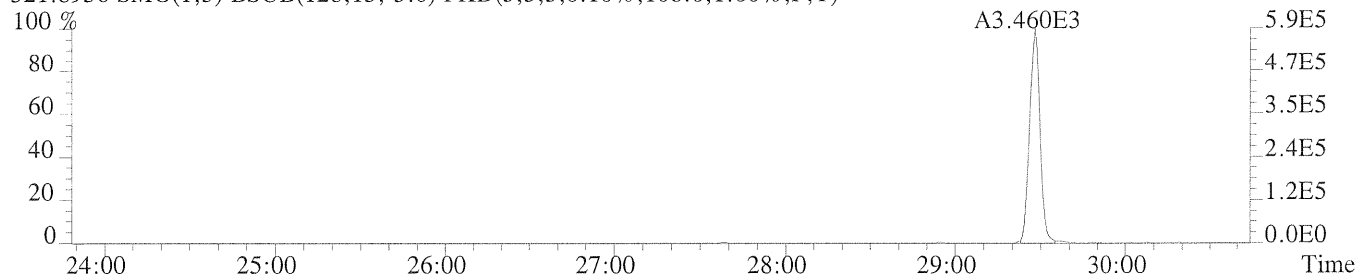
File:P200032 #1-578 Acq: 1-AUG-2008 16:23:43 Probe EI+ Magnet SIR VG BioTech Mass spectf

Sample#1 Exp:ICAL HRCC2

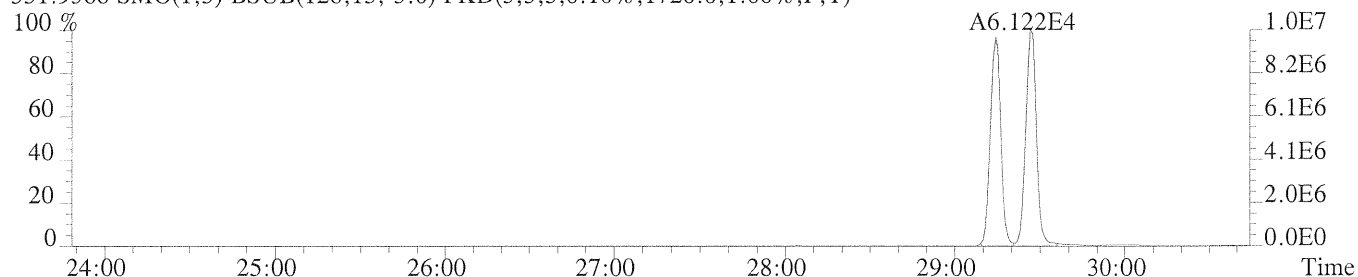
319.8965 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.10%,512.0,1.00%,F,T)



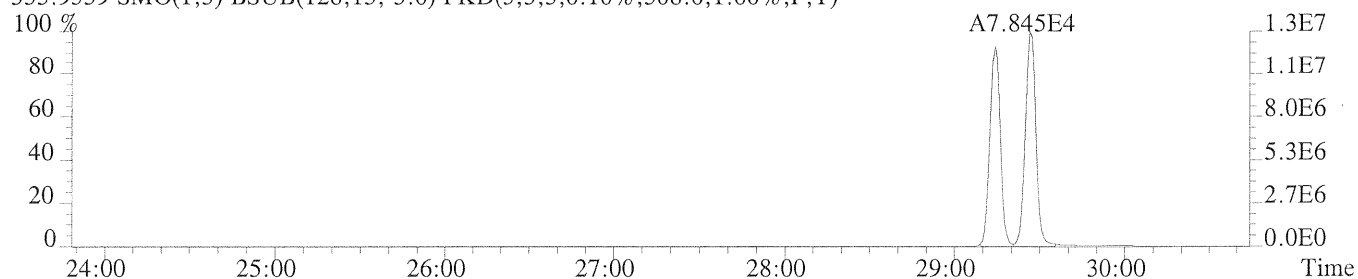
321.8936 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.10%,108.0,1.00%,F,T)



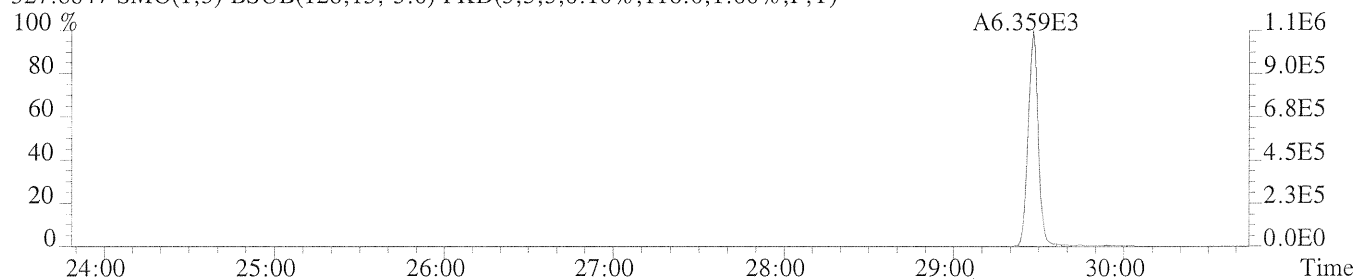
331.8936 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.10%,1720.0,1.00%,F,T)



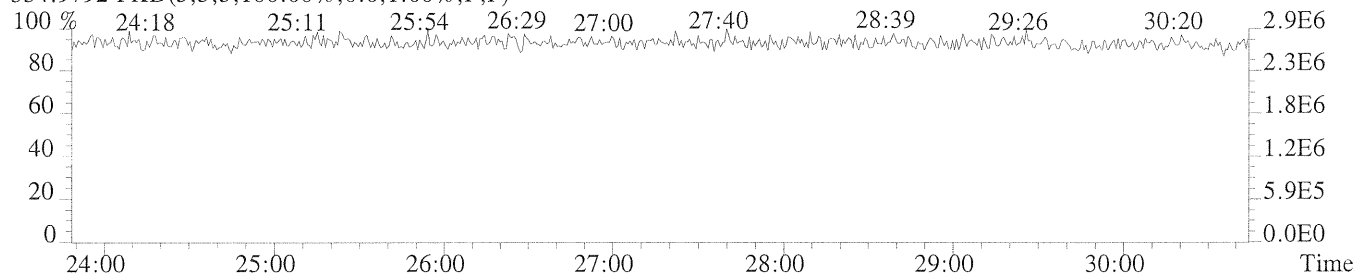
333.9339 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.10%,508.0,1.00%,F,T)



327.8847 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.10%,116.0,1.00%,F,T)



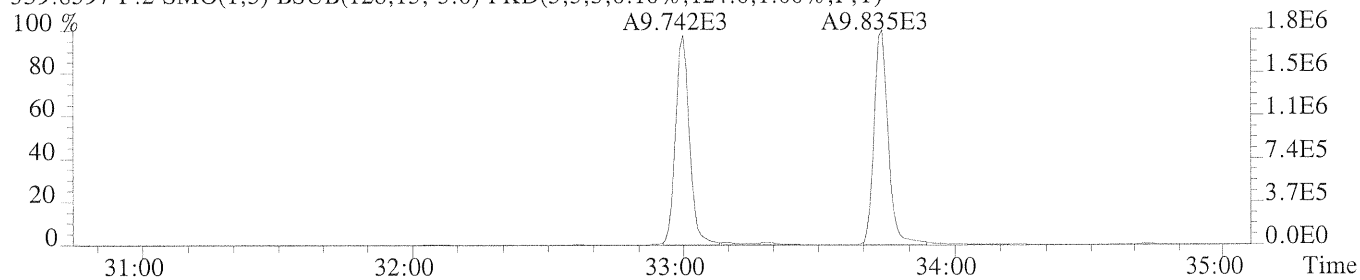
354.9792 PKD(3,3,3,100.00%,0.0,1.00%,F,F)



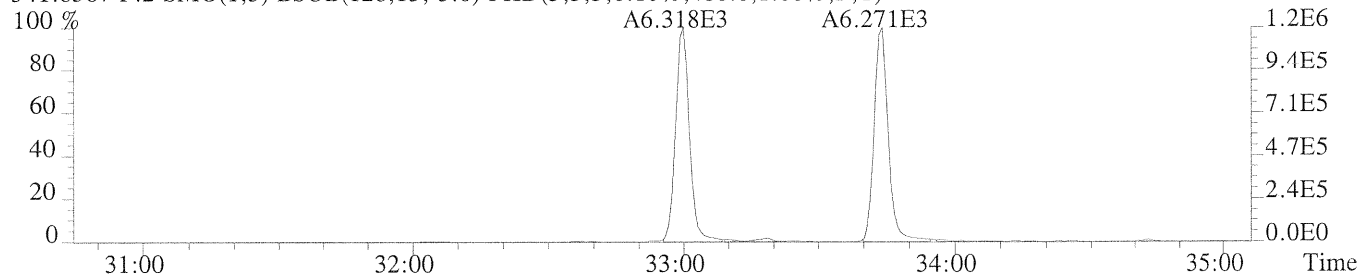
File:P200032 #1-396 Acq: 1-AUG-2008 16:23:43 Probe EI+ Magnet SIR VG BioTech Mass spectf

Sample#1 Exp:ICAL HRCC2

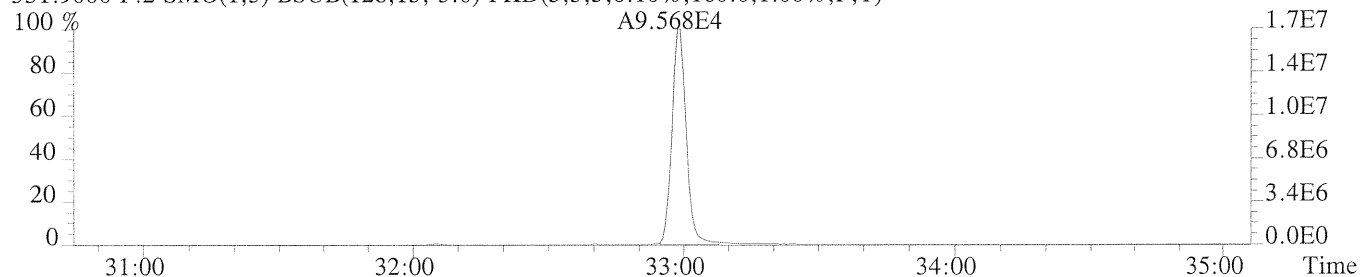
339.8597 F:2 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.10%,124.0,1.00%,F,T)



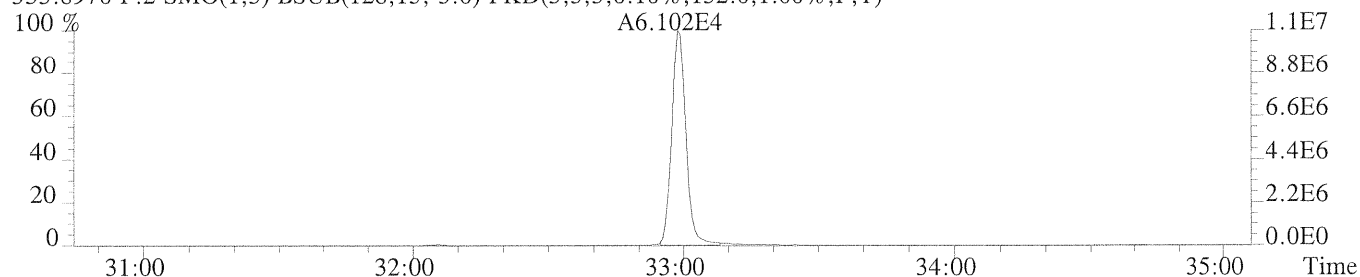
341.8567 F:2 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.10%,488.0,1.00%,F,T)



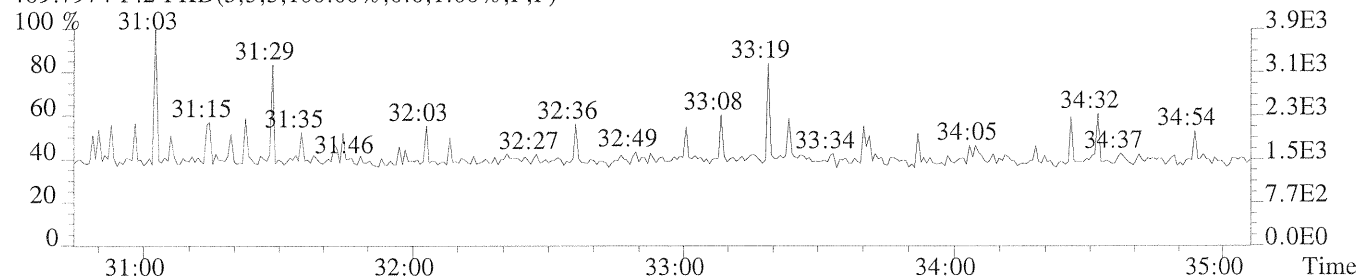
351.9000 F:2 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.10%,160.0,1.00%,F,T)



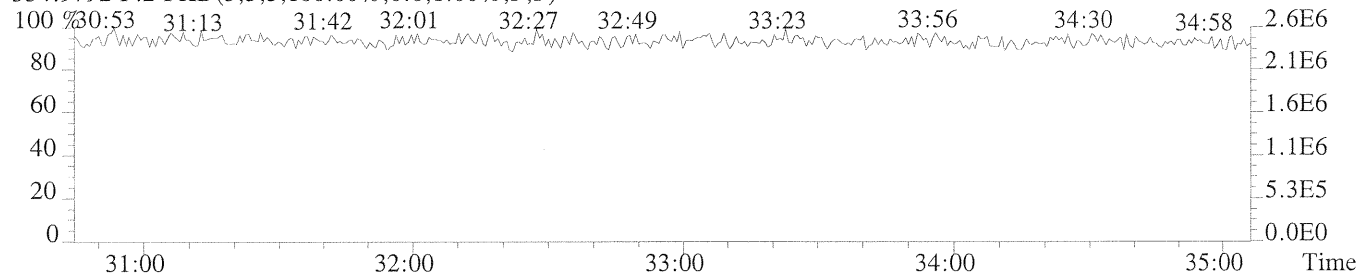
353.8970 F:2 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.10%,132.0,1.00%,F,T)



409.7974 F:2 PKD(5,3,5,100.00%,0.0,1.00%,F,F)



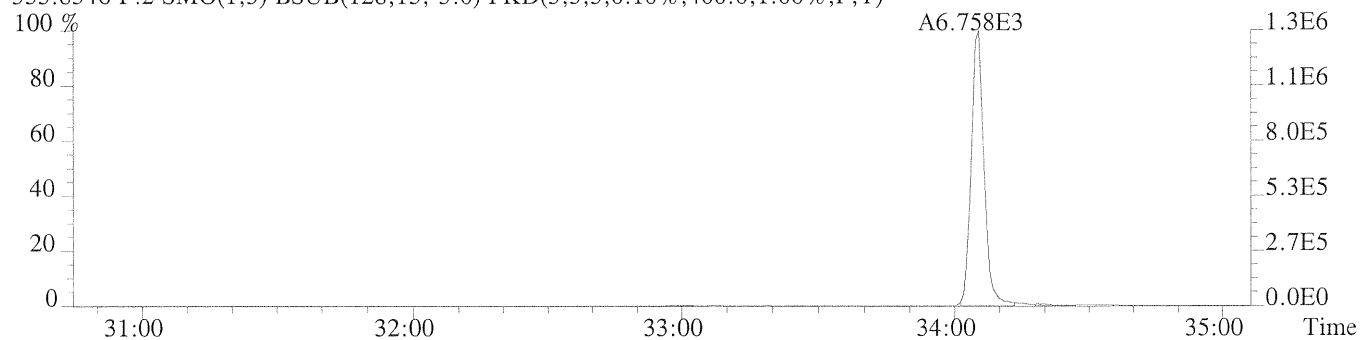
354.9792 F:2 PKD(3,3,3,100.00%,0.0,1.00%,F,F)



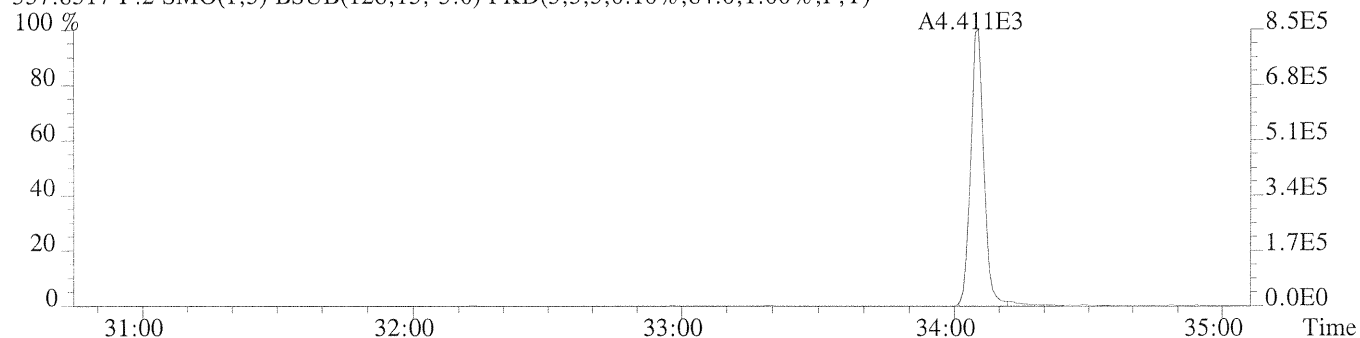
File:P200032 #1-396 Acq: 1-AUG-2008 16:23:43 Probe EI+ Magnet SIR VG BioTech Mass spectf

Sample#1 Exp:ICAL HRCC2

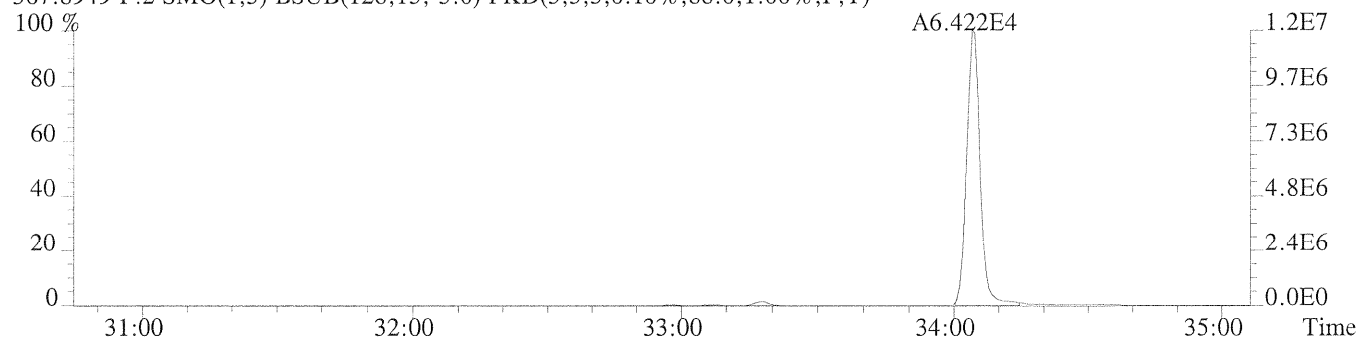
355.8546 F:2 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.10%,400.0,1.00%,F,T)



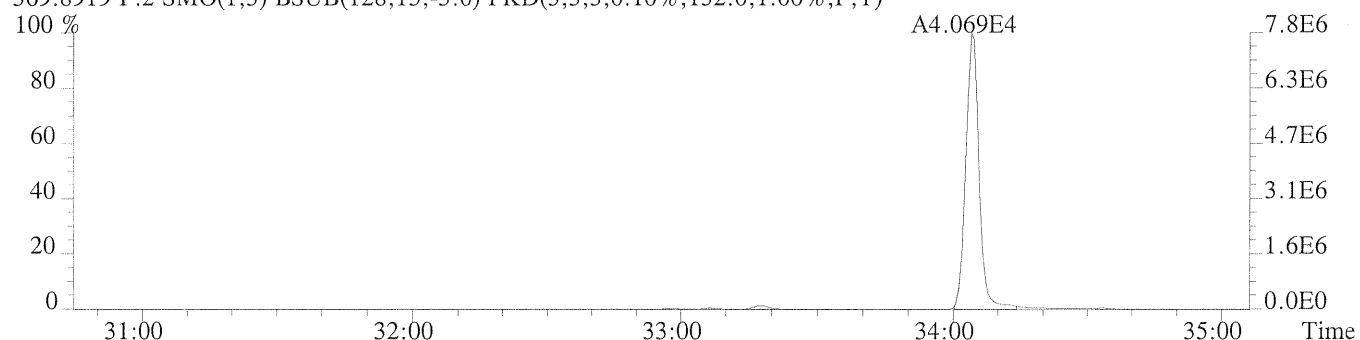
357.8517 F:2 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.10%,84.0,1.00%,F,T)



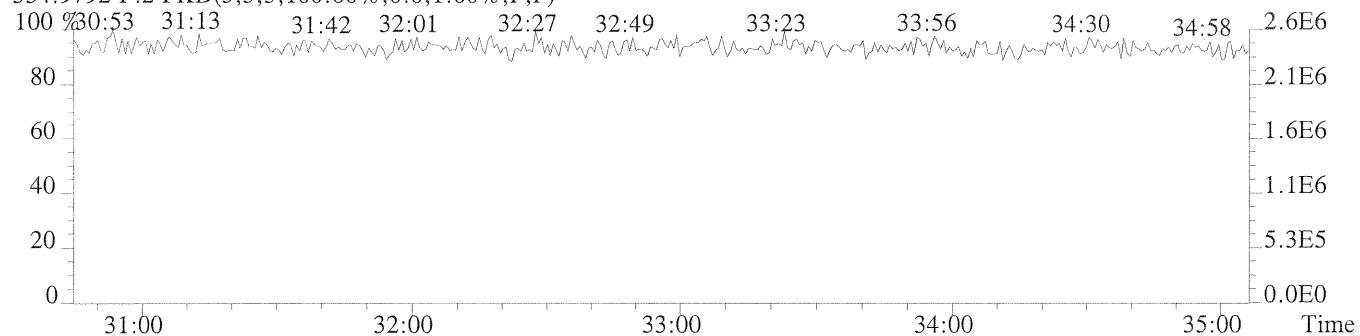
367.8949 F:2 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.10%,88.0,1.00%,F,T)



369.8919 F:2 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.10%,132.0,1.00%,F,T)



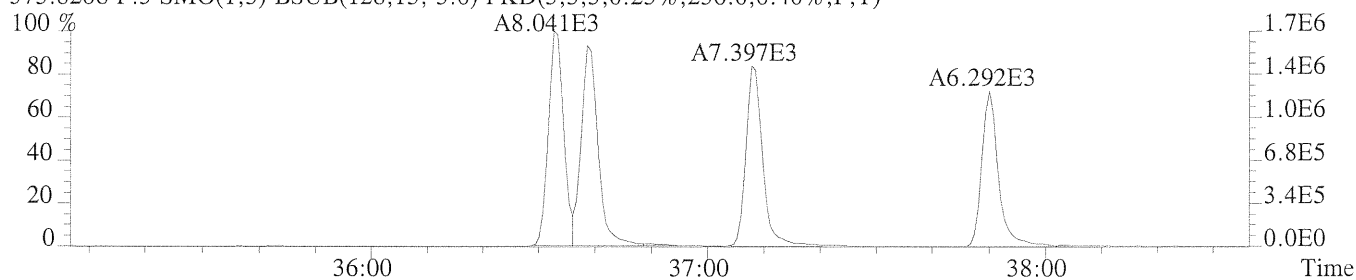
354.9792 F:2 PKD(3,3,3,100.00%,0.0,1.00%,F,F)



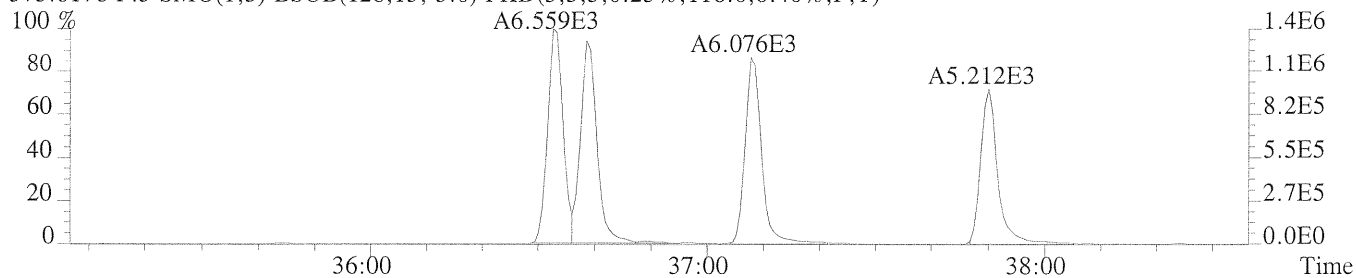
File:P200032 #1-318 Acq: 1-AUG-2008 16:23:43 Probe EI+ Magnet SIR VG BioTech Mass spectf

Sample#1 Exp:ICAL HRCC2

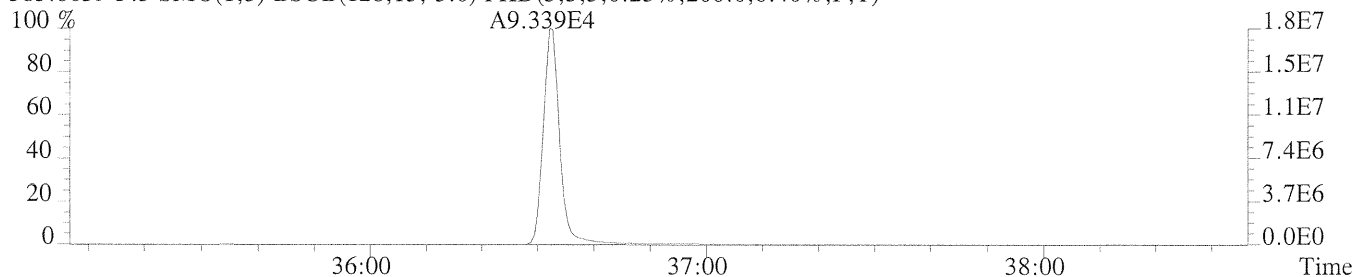
373.8208 F:3 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.25%,236.0,0.40%,F,T)



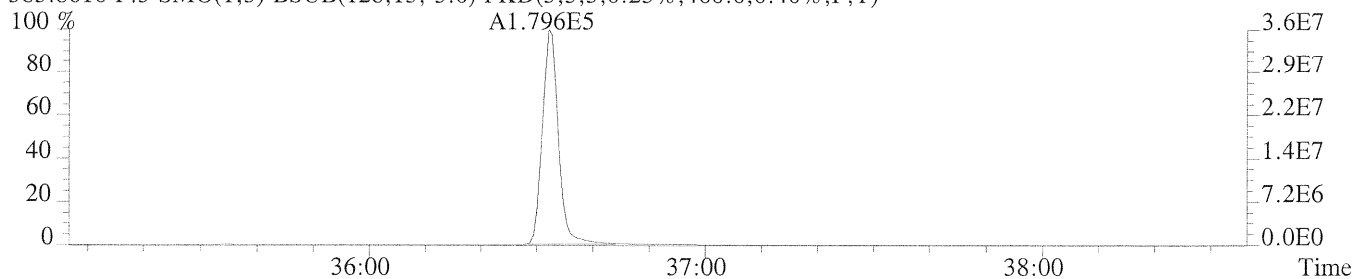
375.8178 F:3 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.25%,116.0,0.40%,F,T)



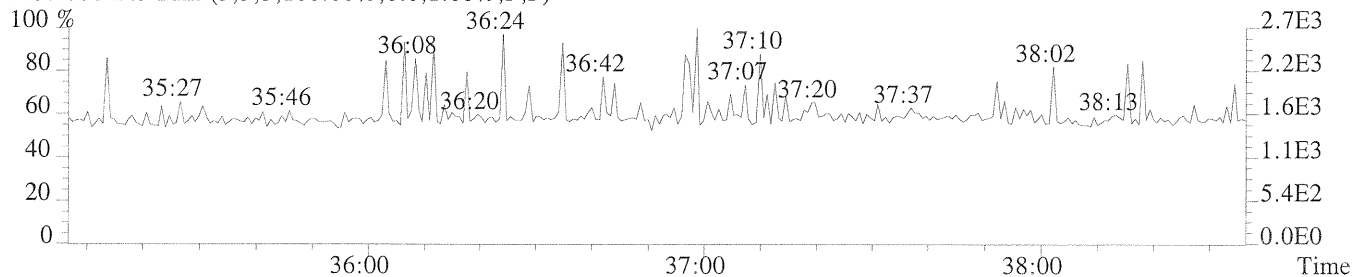
383.8639 F:3 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.25%,200.0,0.40%,F,T)



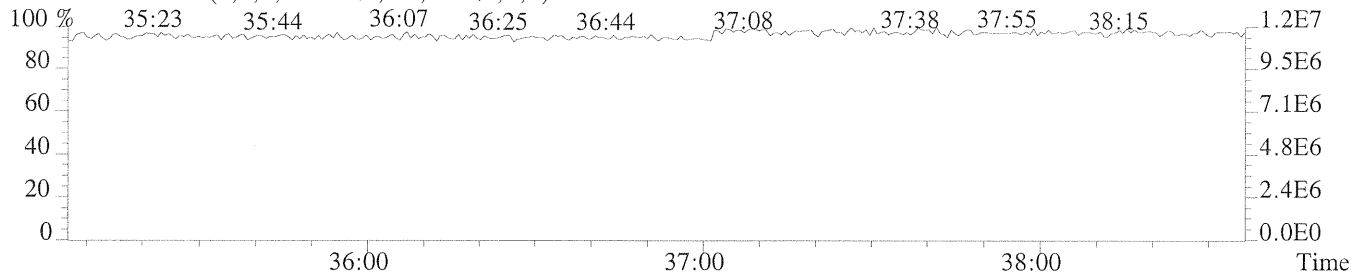
385.8610 F:3 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.25%,460.0,0.40%,F,T)



445.7555 F:3 PKD(5,3,5,100.00%,0.0,1.00%,F,F)



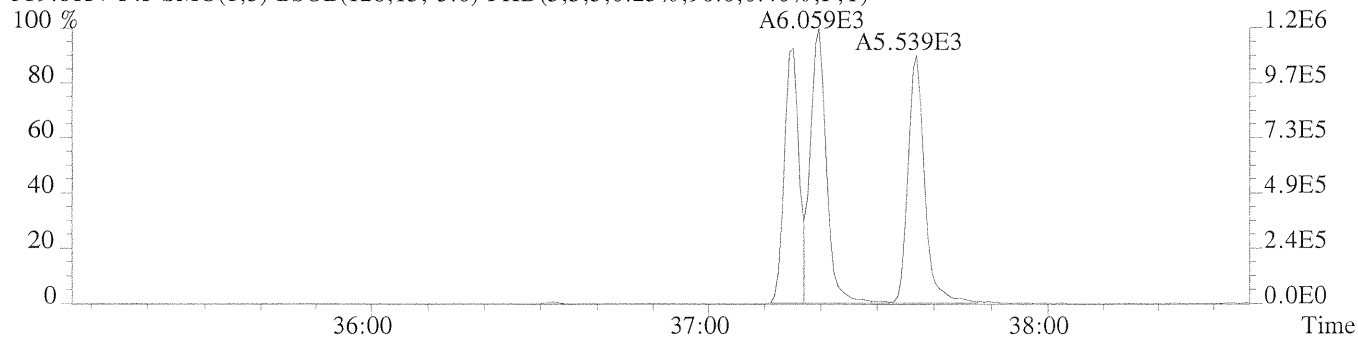
430.9728 F:3 PKD(3,3,3,100.00%,0.0,1.00%,F,F)



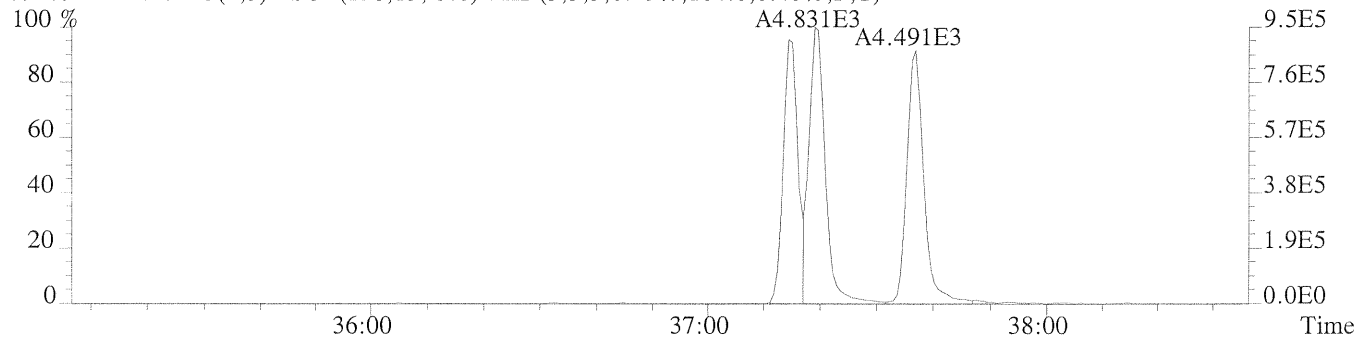
File:P200032 #1-318 Acq: 1-AUG-2008 16:23:43 Probe EI+ Magnet SIR VG BioTech Mass spectf

Sample#1 Exp:ICAL HRCC2

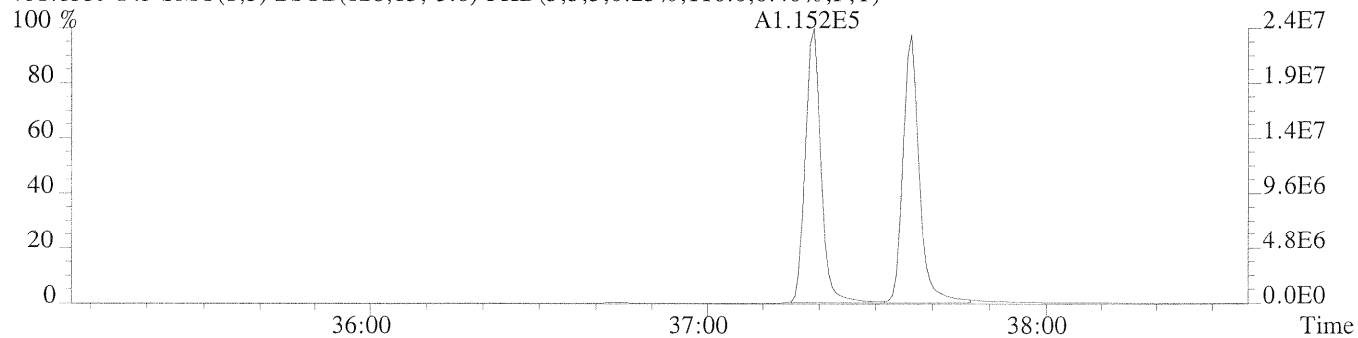
389.8157 F:3 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.25%,96.0,0.40%,F,T)



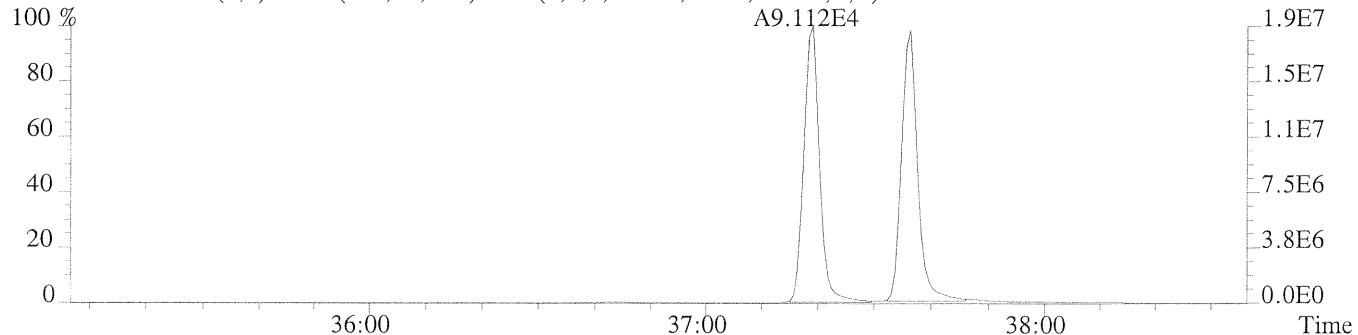
391.8127 F:3 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.25%,104.0,0.40%,F,T)



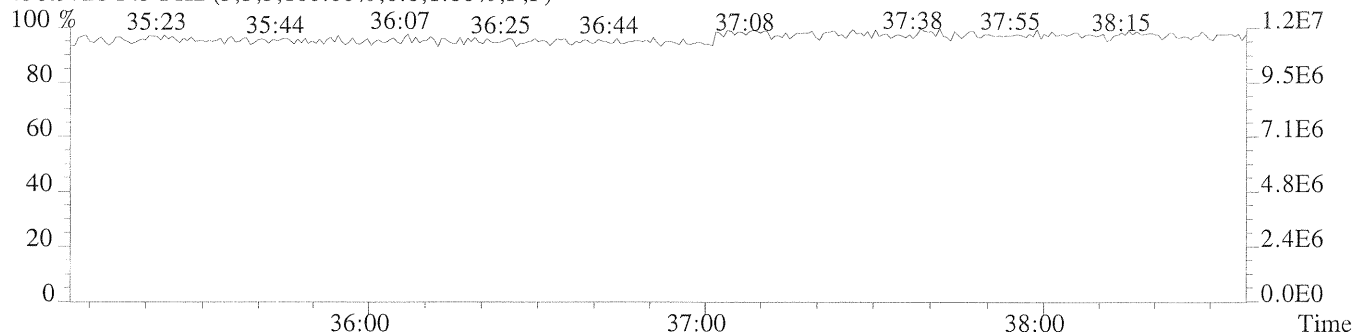
401.8559 F:3 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.25%,116.0,0.40%,F,T)



403.8529 F:3 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.25%,580.0,0.40%,F,T)



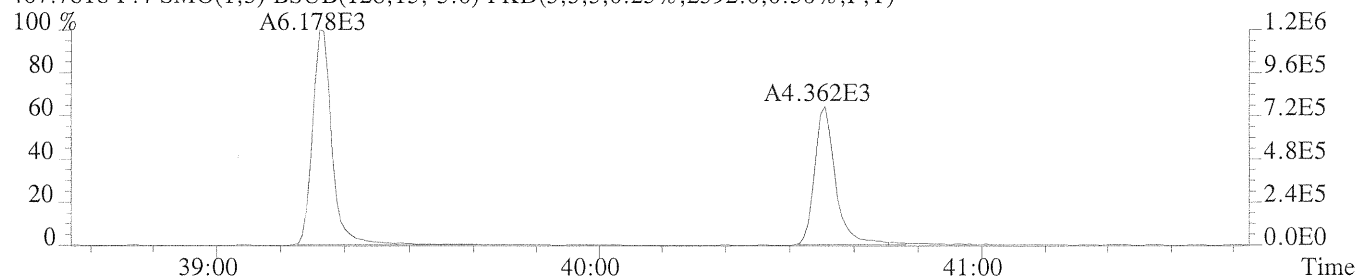
430.9728 F:3 PKD(3,3,3,100.00%,0.0,1.00%,F,F)



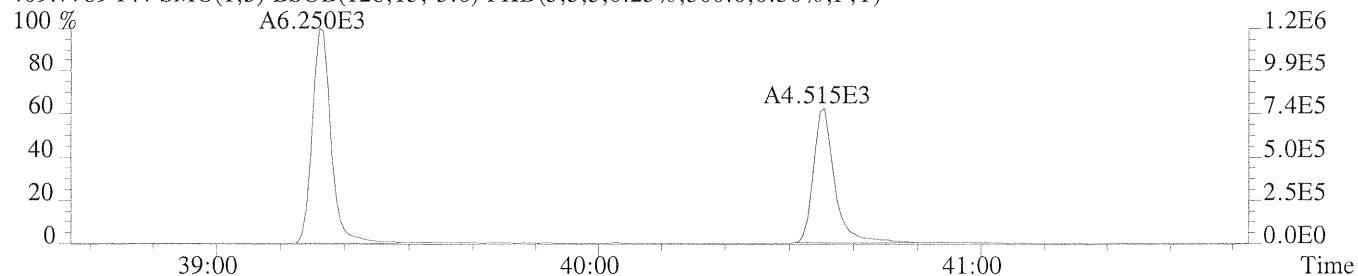
File:P200032 #1-281 Acq: 1-AUG-2008 16:23:43 Probe EI+ Magnet SIR VG BioTech Mass spectf

Sample#1 Exp:ICAL HRCC2

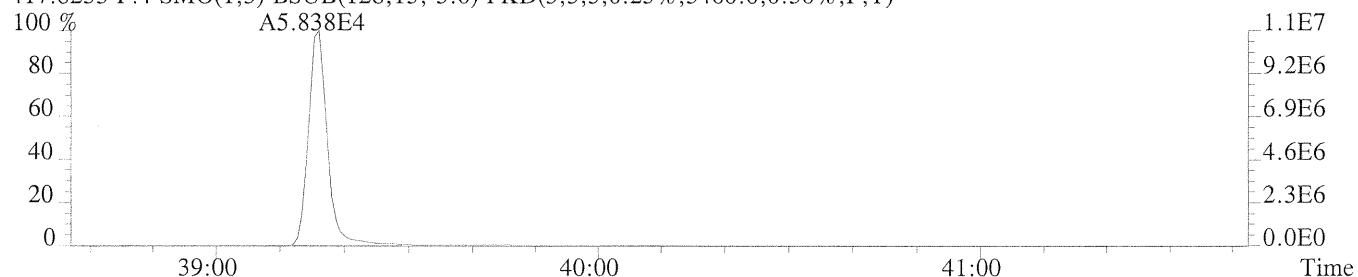
407.7818 F:4 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.25%,2392.0,0.50%,F,T)



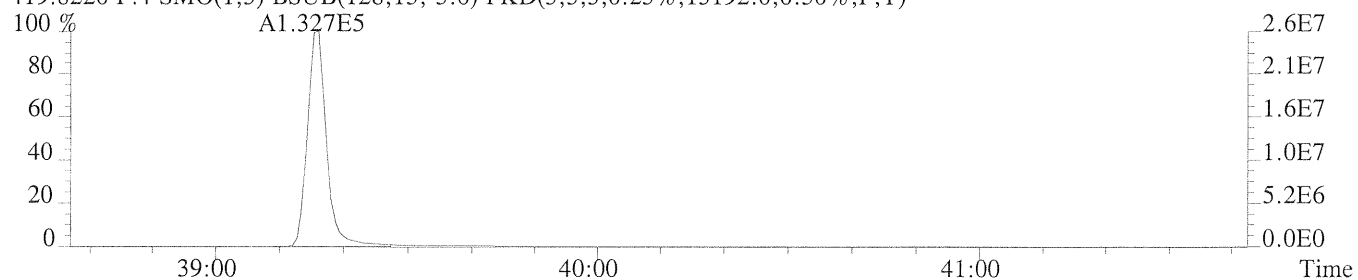
409.7789 F:4 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.25%,500.0,0.50%,F,T)



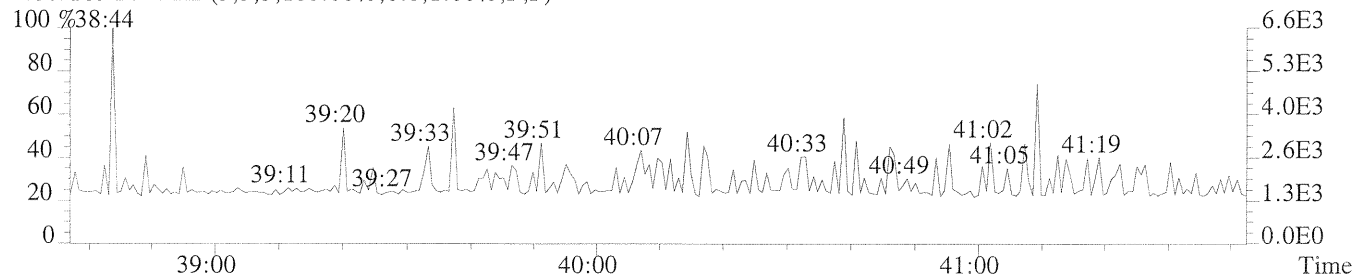
417.8253 F:4 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.25%,5460.0,0.50%,F,T)



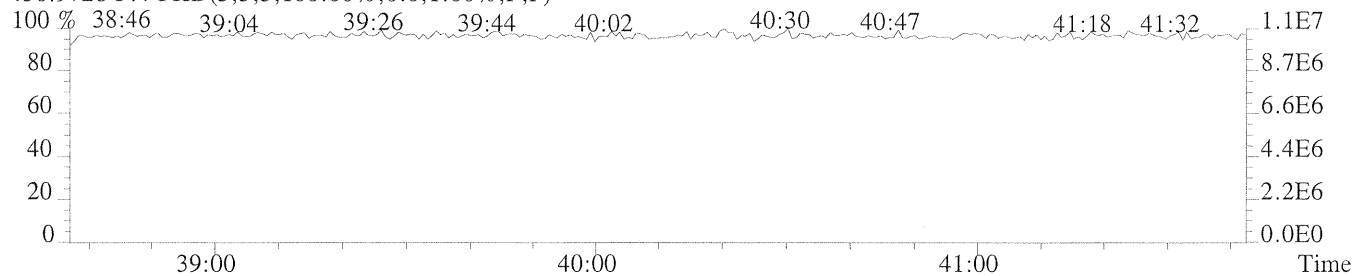
419.8220 F:4 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.25%,13192.0,0.50%,F,T)



479.7165 F:4 PKD(5,3,5,100.00%,0.0,1.00%,F,F)



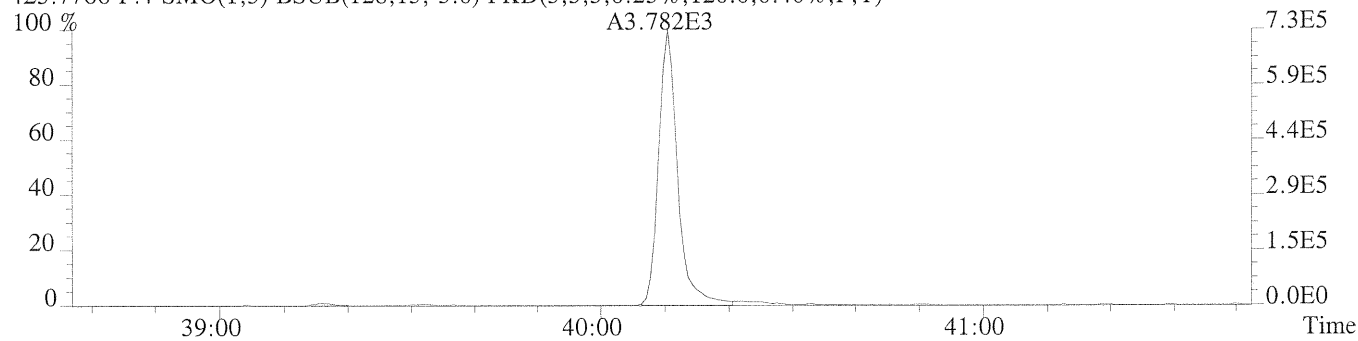
430.9728 F:4 PKD(3,3,3,100.00%,0.0,1.00%,F,F)



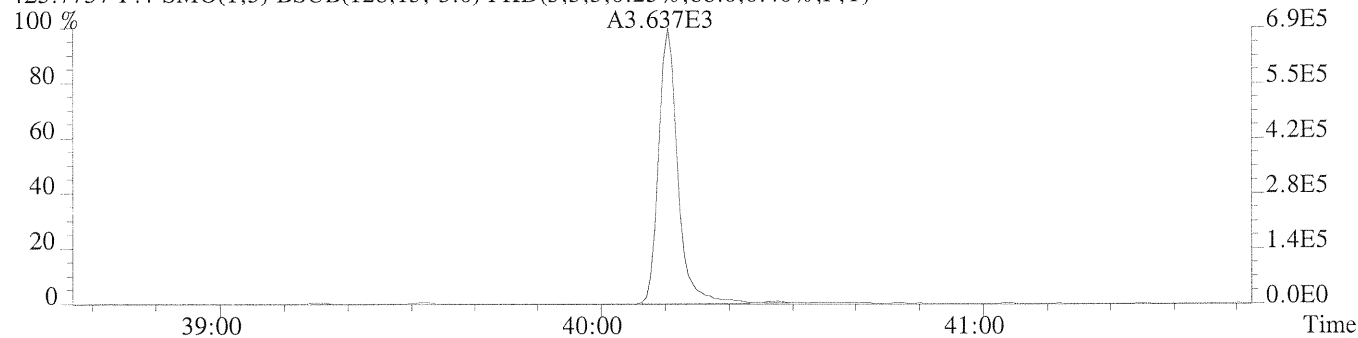
File:P200032 #1-281 Acq: 1-AUG-2008 16:23:43 Probe EI+ Magnet SIR VG BioTech Mass spectf

Sample#1 Exp:ICAL HRCC2

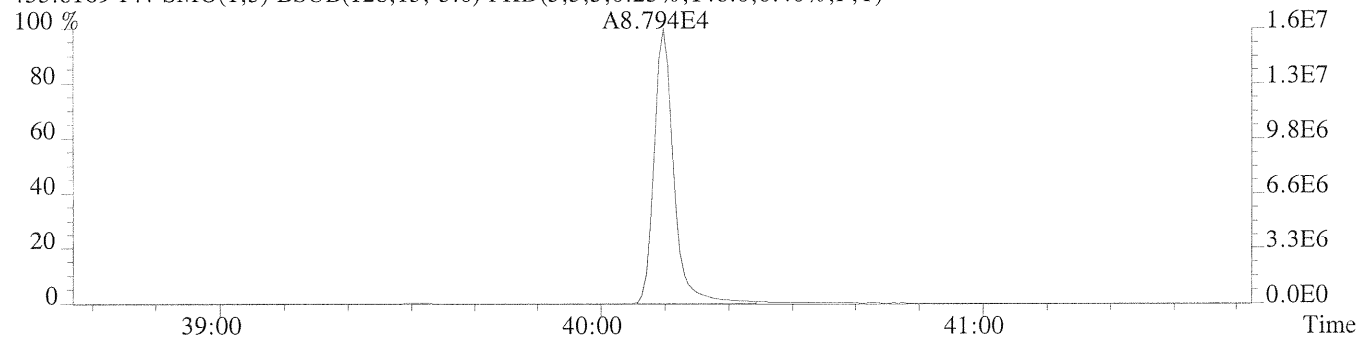
423.7766 F:4 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.25%,120.0,0.40%,F,T)



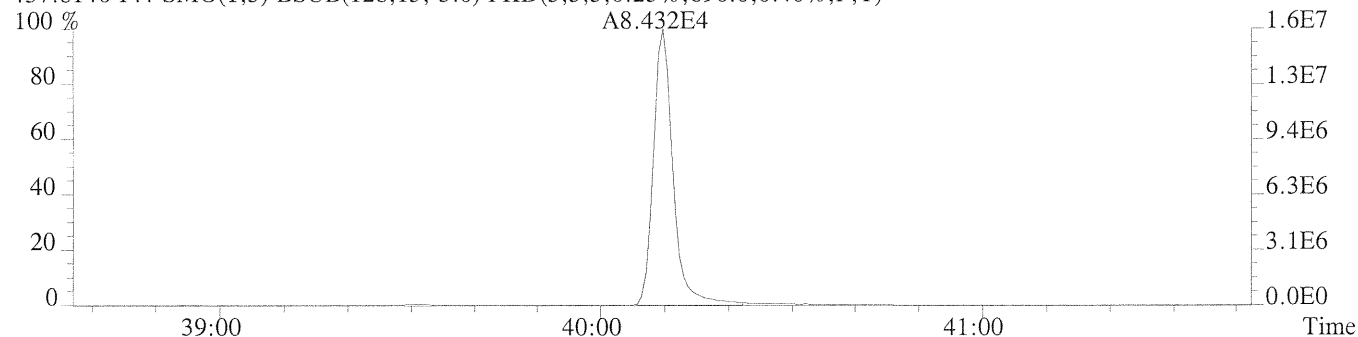
425.7737 F:4 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.25%,88.0,0.40%,F,T)



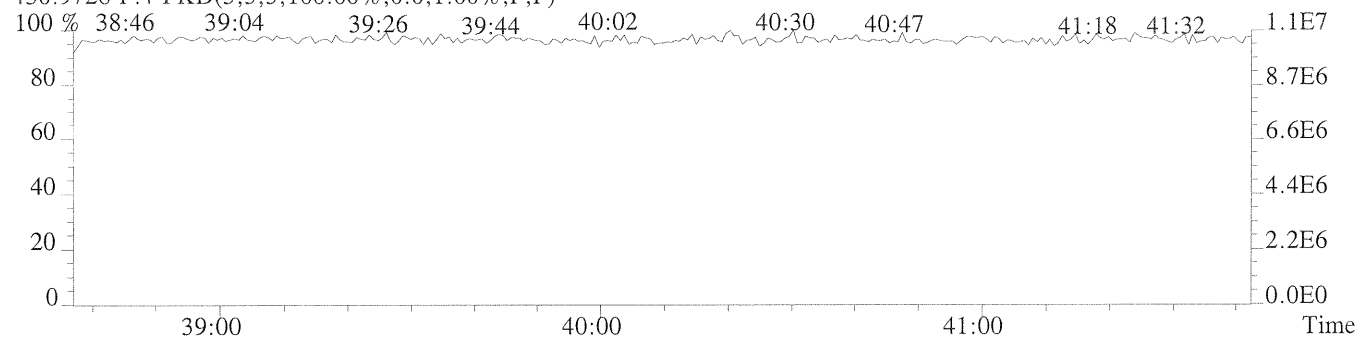
435.8169 F:4 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.25%,148.0,0.40%,F,T)



437.8140 F:4 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.25%,696.0,0.40%,F,T)



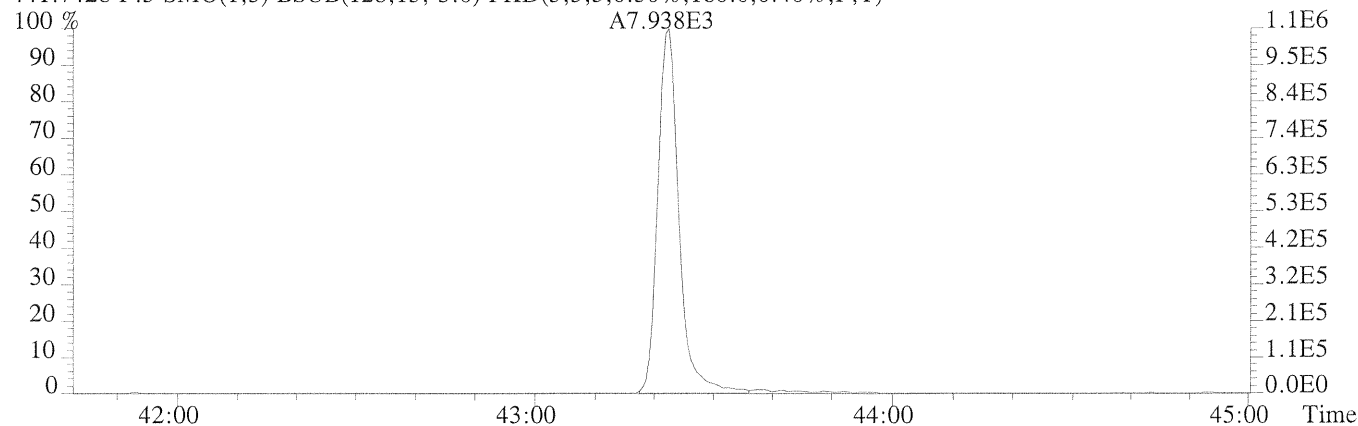
430.9728 F:4 PKD(3,3,3,100.00%,0.0,1.00%,F,F)



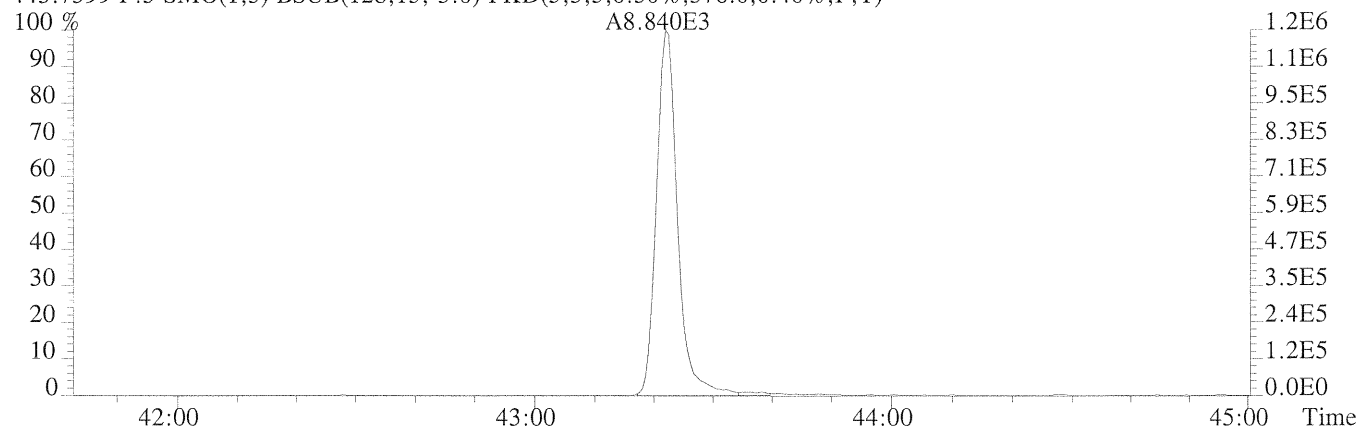
File:P200032 #1-364 Acq: 1-AUG-2008 16:23:43 Probe EI+ Magnet SIR VG BioTech Mass spectf

Sample#1 Exp:ICAL HRCC2

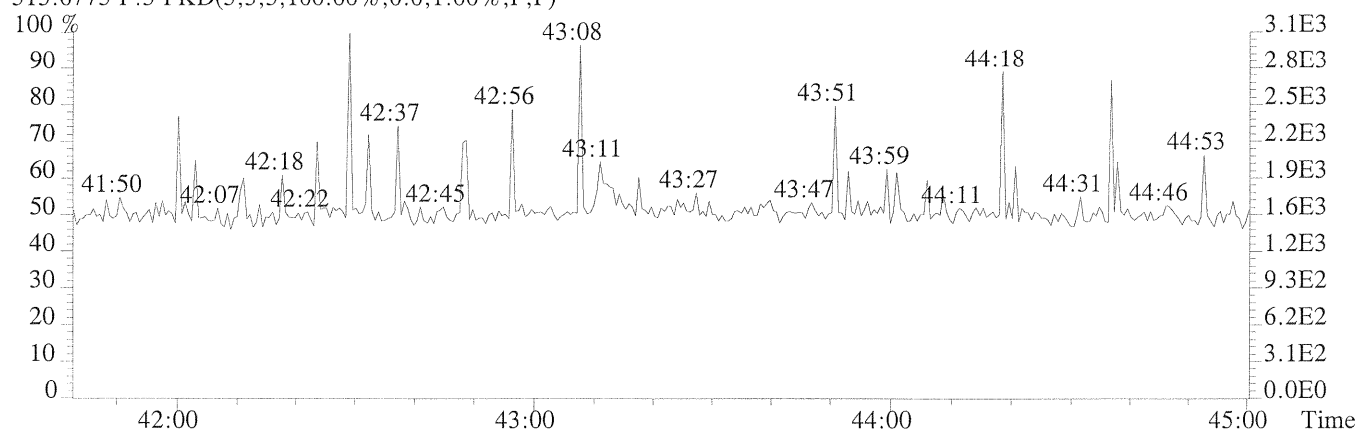
441.7428 F:5 SMO(1,3) BSUB(128,15,-3.0) PKD(5,3,5,0.30%,180.0,0.40%,F,T)



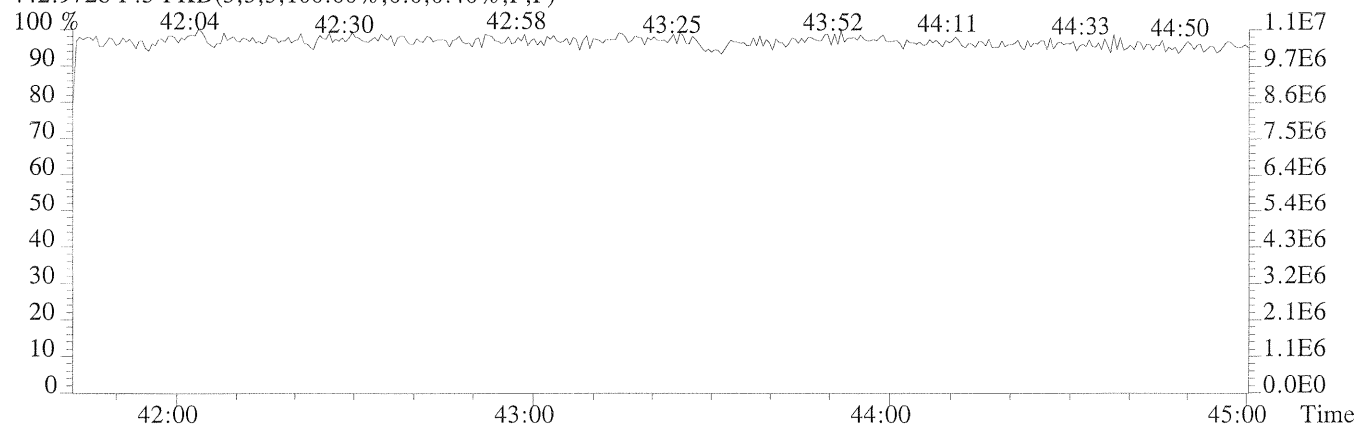
443.7399 F:5 SMO(1,3) BSUB(128,15,-3.0) PKD(5,3,5,0.30%,376.0,0.40%,F,T)



513.6775 F:5 PKD(5,3,5,100.00%,0.0,1.00%,F,F)



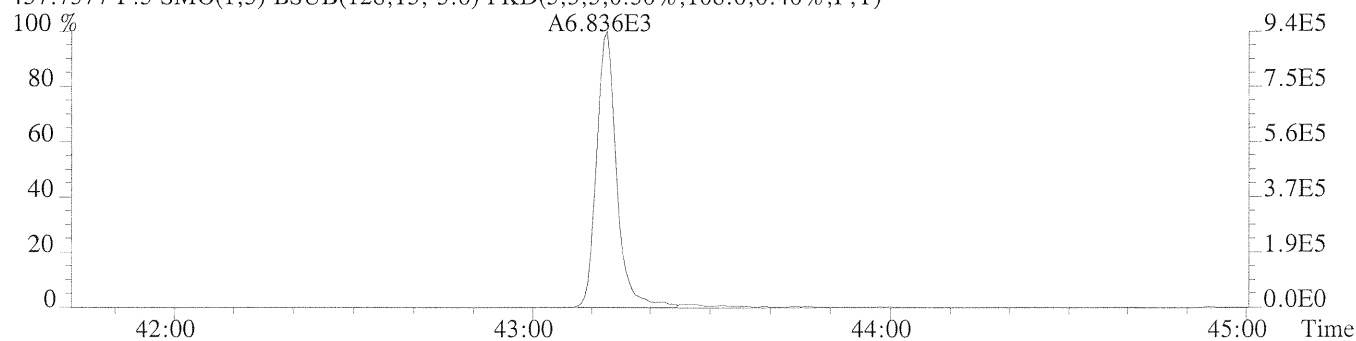
442.9728 F:5 PKD(3,3,3,100.00%,0.0,0.40%,F,F)



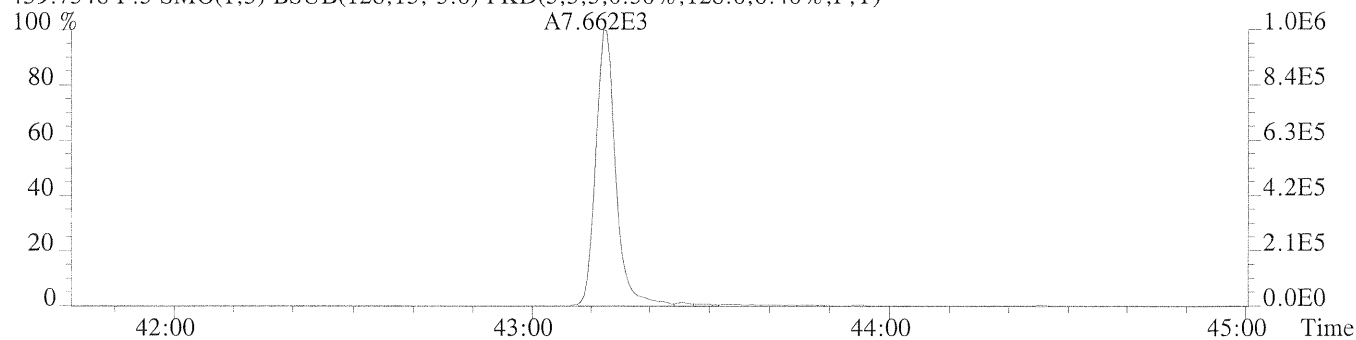
File:P200032 #1-364 Acq: 1-AUG-2008 16:23:43 Probe EI+ Magnet SIR VG BioTech Mass spectf

Sample#1 Exp:ICAL HRCC2

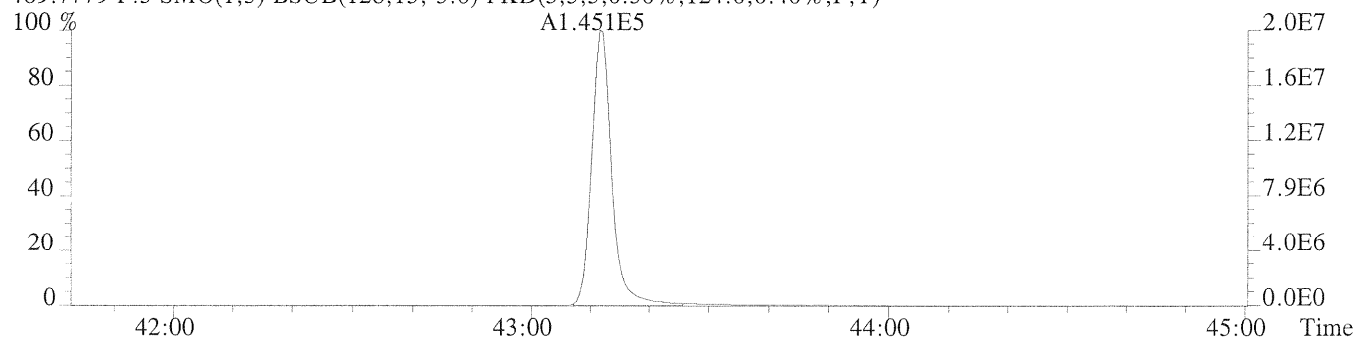
457.7377 F:5 SMO(1,3) BSUB(128,15,-3.0) PKD(5,3,5,0.30%,108.0,0.40%,F,T)



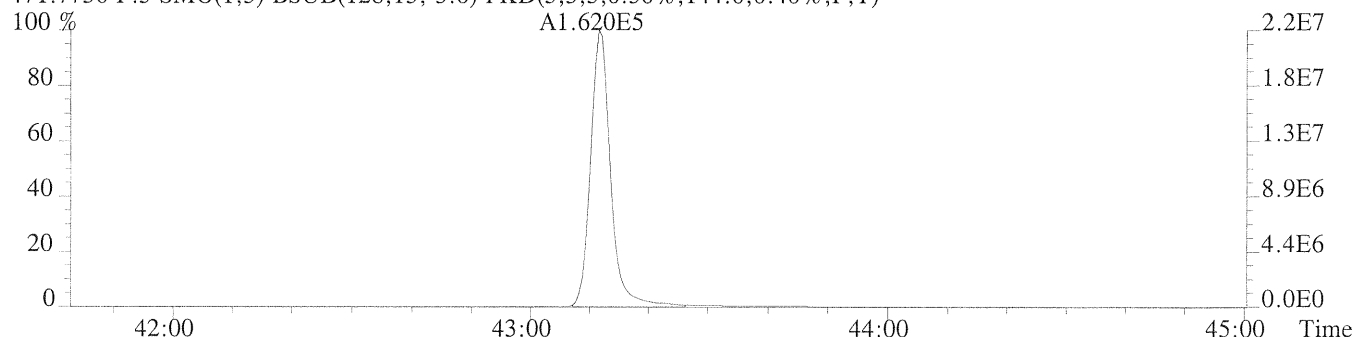
459.7348 F:5 SMO(1,3) BSUB(128,15,-3.0) PKD(5,3,5,0.30%,128.0,0.40%,F,T)



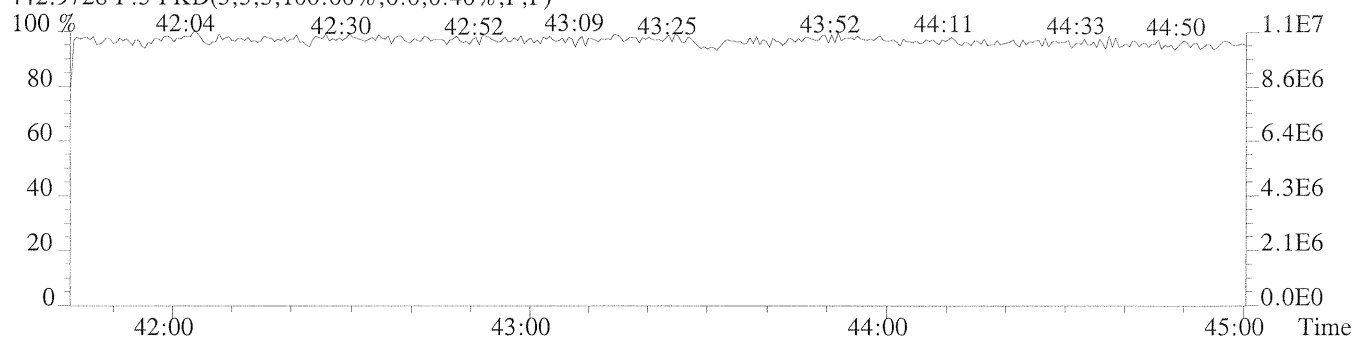
469.7779 F:5 SMO(1,3) BSUB(128,15,-3.0) PKD(5,3,5,0.30%,124.0,0.40%,F,T)



471.7750 F:5 SMO(1,3) BSUB(128,15,-3.0) PKD(5,3,5,0.30%,144.0,0.40%,F,T)



442.9728 F:5 PKD(3,3,3,100.00%,0.0,0.40%,F,F)



Columbia Analytical Services, Inc.
Sample Response Summary

CLIENT ID.
ICAL HRCC3

Run #3 Filename P200031 #1 Samp: 1 Inj: 1 Acquired: 1-AUG-08 15:21:27
Processed: 14-APR-10 10:16:05 LAB. ID: ICAL HRCC3

	Typ	Name	RT-1	Resp 1	Resp 2	Ratio	Meet	Mod?	RRT
1	Unk	2,3,7,8-TCDF	28:37	9.727e+03	1.298e+04	0.75	yes	no	1.001
2	Unk	1,2,3,7,8-PeCDF	32:59	3.258e+04	2.104e+04	1.55	yes	no	1.000
3	Unk	2,3,4,7,8-PeCDF	33:43	3.270e+04	2.157e+04	1.52	yes	no	1.022
4	Unk	1,2,3,4,7,8-HxCDF	36:33	2.534e+04	2.050e+04	1.24	yes	no	1.000
5	Unk	1,2,3,6,7,8-HxCDF	36:39	2.738e+04	2.264e+04	1.21	yes	no	1.003
6	Unk	2,3,4,6,7,8-HxCDF	37:08	2.448e+04	1.998e+04	1.23	yes	no	1.016
7	Unk	1,2,3,7,8,9-HxCDF	37:50	2.083e+04	1.696e+04	1.23	yes	no	1.036
8	Unk	1,2,3,4,6,7,8-HpCDF	39:16	2.179e+04	2.116e+04	1.03	yes	no	1.000
9	Unk	1,2,3,4,7,8,9-HpCDF	40:35	1.573e+04	1.523e+04	1.03	yes	no	1.034
10	Unk	OCDF	43:22	2.717e+04	3.003e+04	0.90	yes	no	1.004
11	Unk	2,3,7,8-TCDD	29:28	7.340e+03	9.509e+03	0.77	yes	no	1.001
12	Unk	1,2,3,7,8-PeCDD	34:05	2.325e+04	1.509e+04	1.54	yes	no	1.000
13	Unk	1,2,3,4,7,8-HxCDD	37:14	1.867e+04	1.514e+04	1.23	yes	no	0.998
14	Unk	1,2,3,6,7,8-HxCDD	37:19	2.060e+04	1.644e+04	1.25	yes	no	1.000
15	Unk	1,2,3,7,8,9-HxCDD	37:36	1.940e+04	1.499e+04	1.29	yes	no	1.008
16	Unk	1,2,3,4,6,7,8-HpCDD	40:10	1.322e+04	1.289e+04	1.03	yes	no	1.000
17	Unk	OCDD	43:12	2.356e+04	2.615e+04	0.90	yes	no	1.000
18	IS	13C-2,3,7,8-TCDF	28:36	5.703e+04	7.345e+04	0.78	yes	no	0.978
19	IS	13C-1,2,3,7,8-PeCDF	32:59	7.516e+04	4.772e+04	1.58	yes	no	1.128
20	IS	13C-1,2,3,4,7,8-HxCDF	36:32	7.242e+04	1.389e+05	0.52	yes	no	0.972
21	IS	13C-1,2,3,4,6,7,8-HpCDF	39:16	4.872e+04	1.104e+05	0.44	yes	no	1.044
22	IS	13C-2,3,7,8-TCDD	29:26	3.900e+04	4.946e+04	0.79	yes	no	1.007
23	IS	13C-1,2,3,7,8-PeCDD	34:04	5.386e+04	3.398e+04	1.58	yes	no	1.165
24	IS	13C-1,2,3,6,7,8-HxCDD	37:18	1.047e+05	8.324e+04	1.26	yes	no	0.992
25	IS	13C-1,2,3,4,6,7,8-HpCDD	40:10	7.599e+04	7.263e+04	1.05	yes	no	1.068
26	IS	13C-OCDD	43:12	1.221e+05	1.345e+05	0.91	yes	no	1.149
27	RS/RT	13C-1,2,3,4-TCDD	29:14	3.889e+04	5.040e+04	0.77	yes	no	*
28	RS/RT	13C-1,2,3,7,8,9-HxCDD	37:36	1.056e+05	8.337e+04	1.27	yes	no	*
29	C/Up	37Cl-2,3,7,8-TCDD	29:28	1.738e+04				no	1.008

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Columbia Analytical Services, Inc.
Signal/Noise Height Ratio Summary

CLIENT ID.
ICAL HRCC3

Run #3 Filename P200031 Samp: 1 Inj: 1 Acquired: 1-AUG-08 15:21:27
Processed: 14-APR-10 10:16:051 LAB. ID: ICAL HRCC3

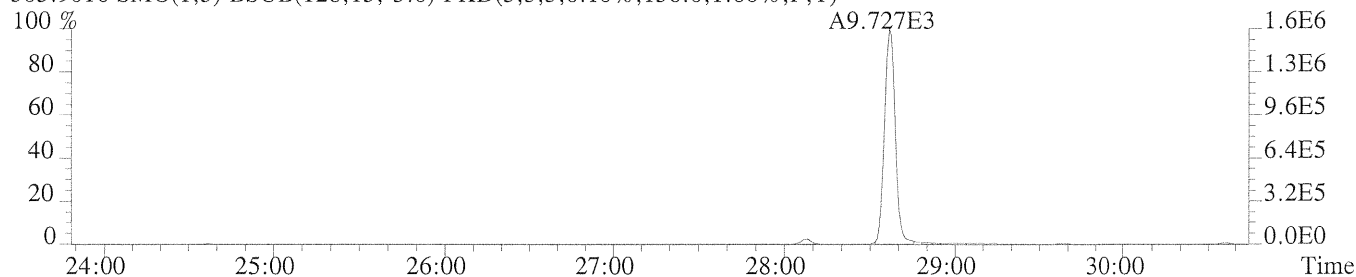
	Name	Signal 1	Noise 1	S/N Rat.1	Signal 2	Noise 2	S/N Rat.2
1	2,3,7,8-TCDF	1.60e+06	1.36e+02	1.2e+04	2.18e+06	8.00e+01	2.7e+04
2	1,2,3,7,8-PeCDF	6.18e+06	1.00e+02	6.2e+04	4.03e+06	4.76e+02	8.5e+03
3	2,3,4,7,8-PeCDF	6.42e+06	1.00e+02	6.4e+04	4.17e+06	4.76e+02	8.8e+03
4	1,2,3,4,7,8-HxCDF	5.53e+06	3.44e+02	1.6e+04	4.47e+06	1.72e+02	2.6e+04
5	1,2,3,6,7,8-HxCDF	5.57e+06	3.44e+02	1.6e+04	4.58e+06	1.72e+02	2.7e+04
6	2,3,4,6,7,8-HxCDF	5.02e+06	3.44e+02	1.5e+04	4.07e+06	1.72e+02	2.4e+04
7	1,2,3,7,8,9-HxCDF	4.09e+06	3.44e+02	1.2e+04	3.27e+06	1.72e+02	1.9e+04
8	1,2,3,4,6,7,8-HpCDF	4.49e+06	1.30e+03	3.5e+03	4.45e+06	1.18e+03	3.8e+03
9	1,2,3,4,7,8,9-HpCDF	2.86e+06	1.30e+03	2.2e+03	2.81e+06	1.18e+03	2.4e+03
10	OCDF	3.74e+06	7.60e+01	4.9e+04	4.12e+06	4.84e+02	8.5e+03
11	2,3,7,8-TCDD	1.33e+06	2.00e+02	6.6e+03	1.70e+06	1.12e+02	1.5e+04
12	1,2,3,7,8-PeCDD	4.51e+06	4.60e+02	9.8e+03	2.97e+06	1.08e+02	2.8e+04
13	1,2,3,4,7,8-HxCDD	4.13e+06	1.36e+02	3.0e+04	3.35e+06	1.28e+02	2.6e+04
14	1,2,3,6,7,8-HxCDD	4.21e+06	1.36e+02	3.1e+04	3.36e+06	1.28e+02	2.6e+04
15	1,2,3,7,8,9-HxCDD	3.80e+06	1.36e+02	2.8e+04	3.06e+06	1.28e+02	2.4e+04
16	1,2,3,4,6,7,8-HpCDD	2.53e+06	3.20e+02	7.9e+03	2.42e+06	5.60e+01	4.3e+04
17	OCDD	3.27e+06	1.16e+02	2.8e+04	3.68e+06	1.08e+02	3.4e+04
18	13C-2,3,7,8-TCDF	9.37e+06	6.96e+02	1.3e+04	1.21e+07	7.20e+02	1.7e+04
19	13C-1,2,3,7,8-PeCDF	1.44e+07	1.60e+02	9.0e+04	9.09e+06	1.20e+02	7.6e+04
20	13C-1,2,3,4,7,8-HxCDF	1.49e+07	1.32e+02	1.1e+05	2.89e+07	5.60e+02	5.2e+04
21	13C-1,2,3,4,6,7,8-HpCDF	9.98e+06	5.04e+03	2.0e+03	2.26e+07	5.44e+03	4.2e+03
22	13C-2,3,7,8-TCDD	6.78e+06	1.14e+03	5.9e+03	8.54e+06	6.40e+02	1.3e+04
23	13C-1,2,3,7,8-PeCDD	1.05e+07	1.12e+02	9.4e+04	6.66e+06	1.08e+02	6.2e+04
24	13C-1,2,3,6,7,8-HxCDD	2.19e+07	2.20e+02	1.0e+05	1.75e+07	2.88e+02	6.1e+04
25	13C-1,2,3,4,6,7,8-HpCDD	1.41e+07	7.52e+02	1.9e+04	1.36e+07	3.72e+02	3.6e+04
26	13C-OCDD	1.71e+07	1.16e+02	1.5e+05	1.90e+07	9.60e+01	2.0e+05
27	13C-1,2,3,4-TCDD	6.97e+06	1.14e+03	6.1e+03	8.89e+06	6.40e+02	1.4e+04
28	13C-1,2,3,7,8,9-HxCDD	2.11e+07	2.20e+02	9.6e+04	1.68e+07	2.88e+02	5.8e+04
29	37Cl-2,3,7,8-TCDD	3.07e+06	9.60e+01	3.2e+04			

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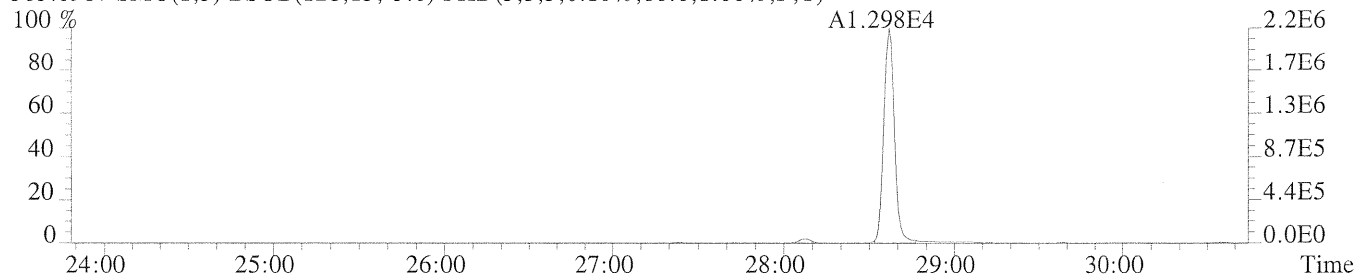
File:P200031 #1-578 Acq: 1-AUG-2008 15:21:27 Probe EI+ Magnet SIR VG BioTech Mass spectf

Sample#1 Exp:CCAL HRCC3

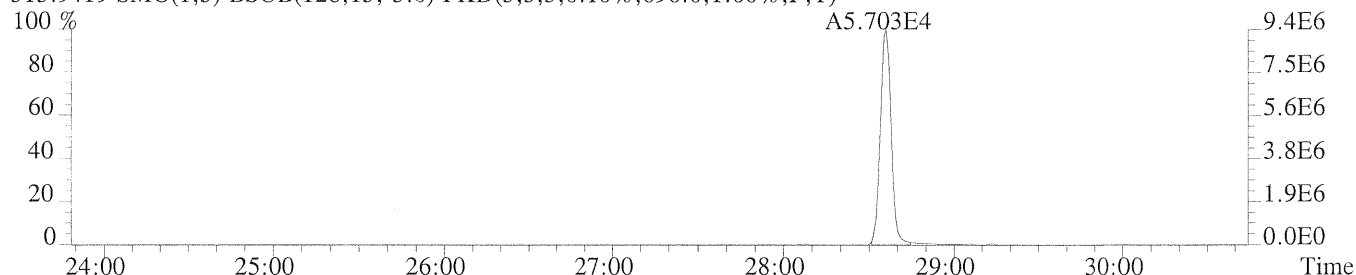
303.9016 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.10%,136.0,1.00%,F,T)



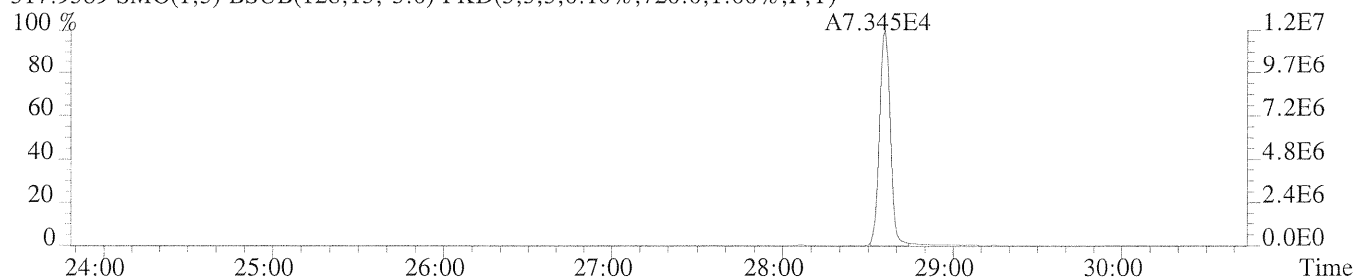
305.8987 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.10%,80.0,1.00%,F,T)



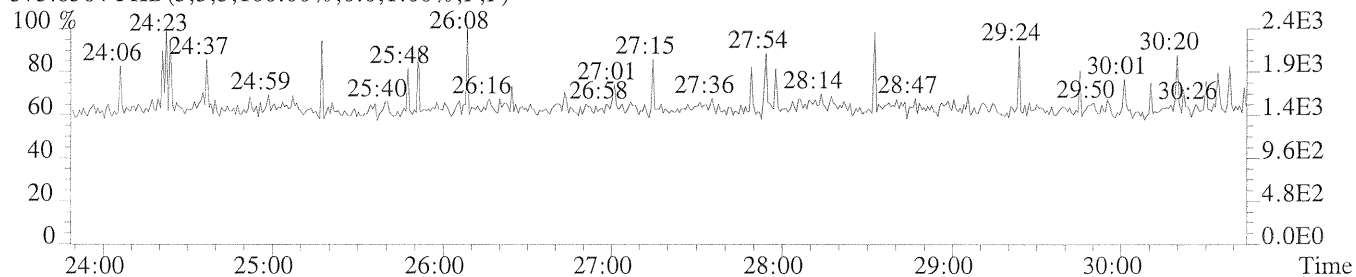
315.9419 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.10%,696.0,1.00%,F,T)



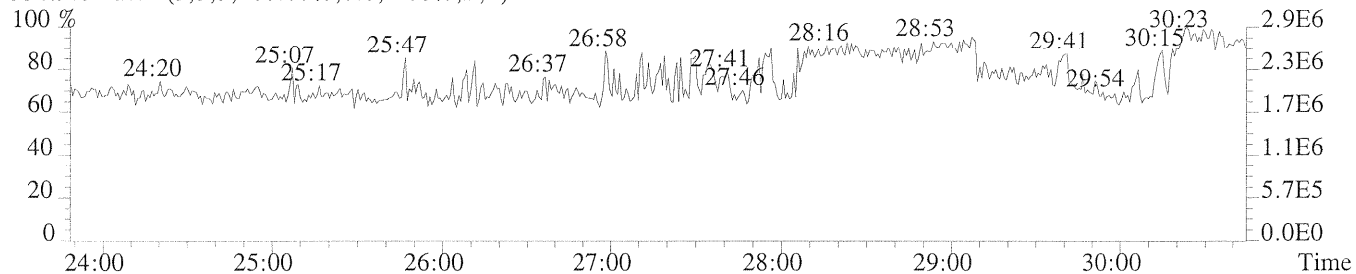
317.9389 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.10%,720.0,1.00%,F,T)



375.8364 PKD(5,3,5,100.00%,0.0,1.00%,F,F)



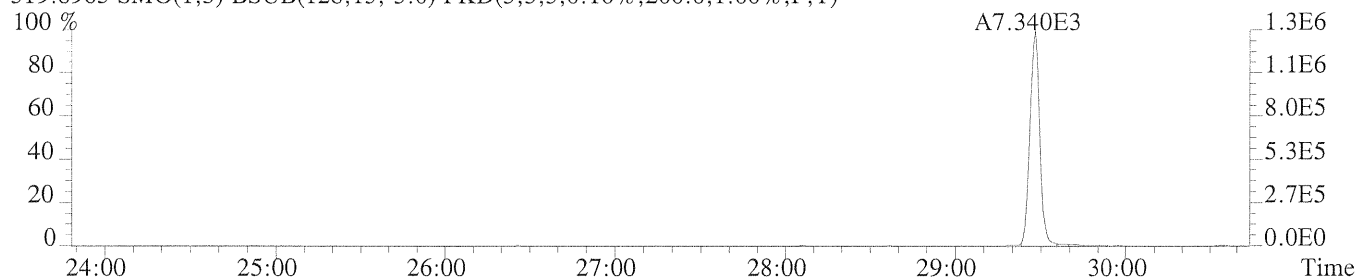
354.9792 PKD(3,3,3,100.00%,0.0,1.00%,F,F)



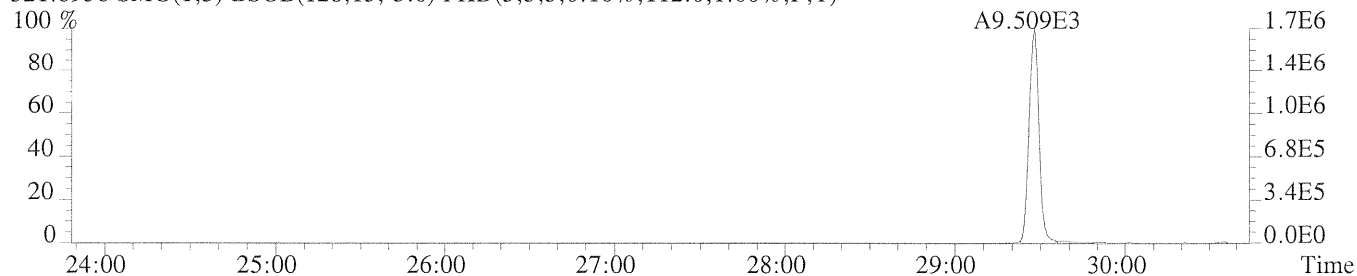
File:P200031 #1-578 Acq: 1-AUG-2008 15:21:27 Probe EI+ Magnet SIR VG BioTech Mass spectf

Sample#1 Exp:CCAL HRCC3

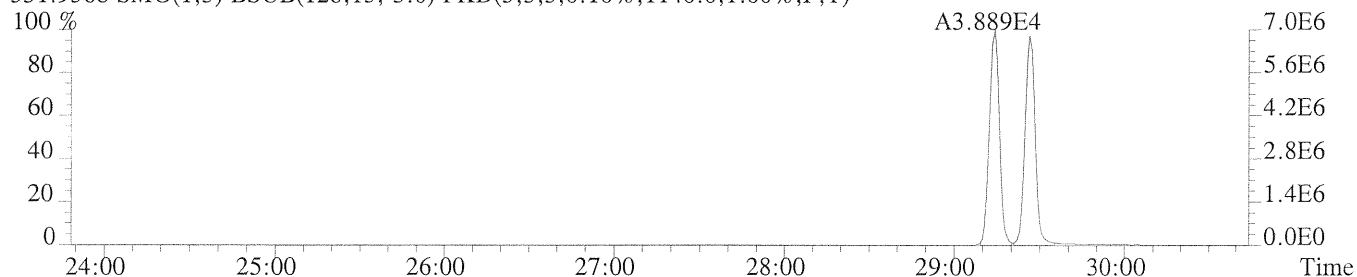
319.8965 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.10%,200.0,1.00%,F,T)



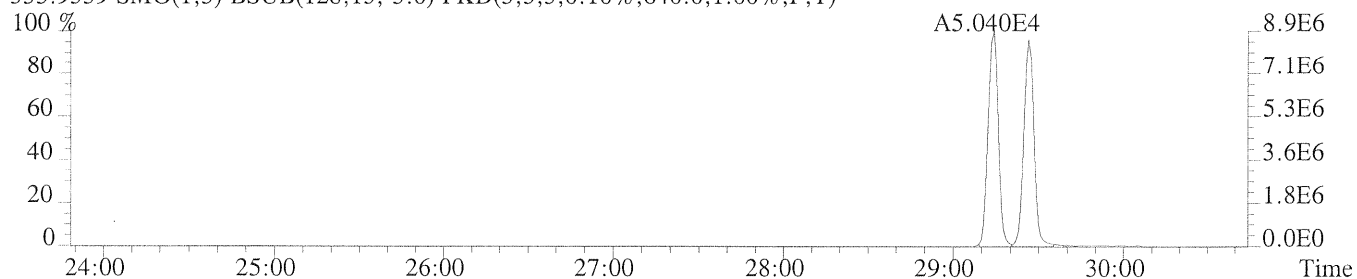
321.8936 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.10%,112.0,1.00%,F,T)



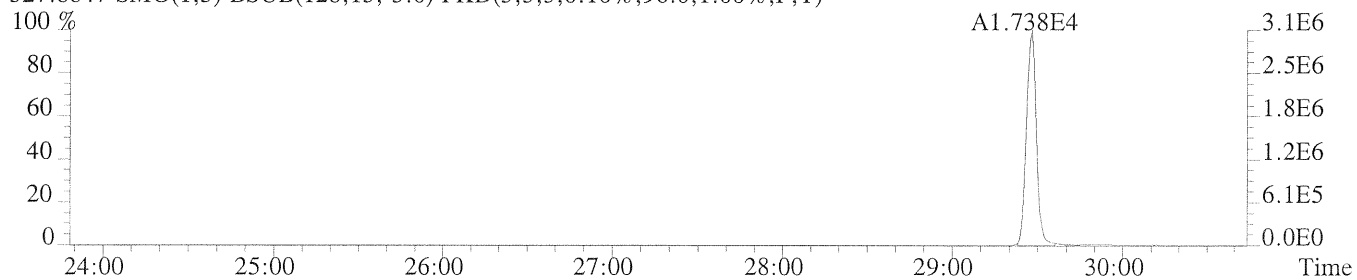
331.9368 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.10%,1140.0,1.00%,F,T)



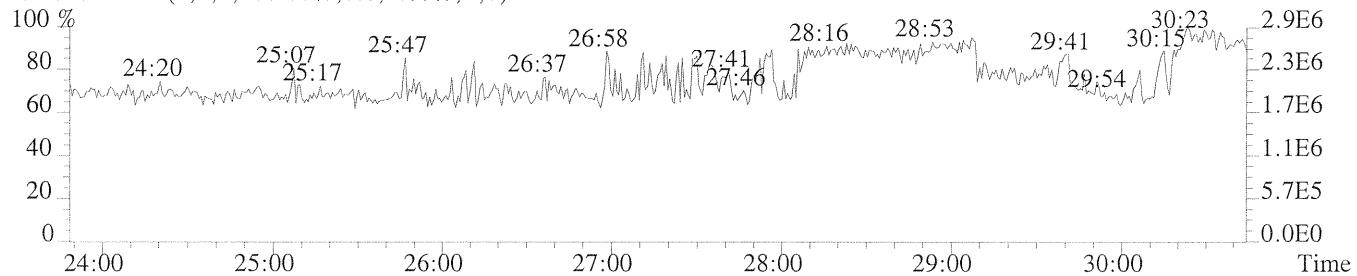
333.9339 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.10%,640.0,1.00%,F,T)



327.8847 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.10%,96.0,1.00%,F,T)



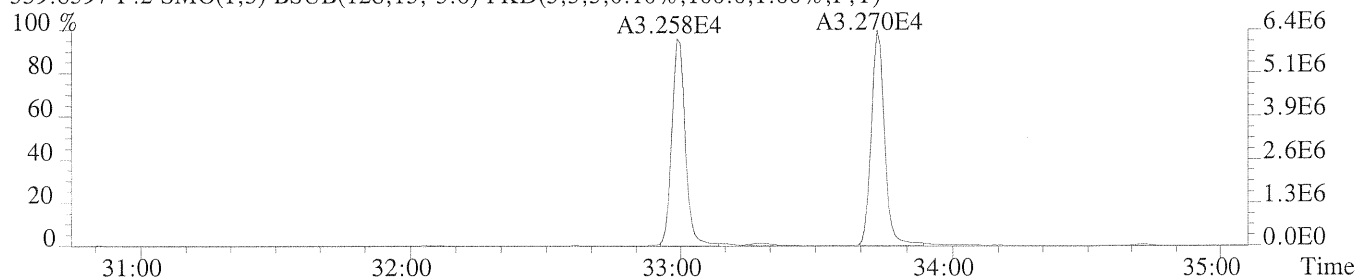
354.9792 PKD(3,3,3,100.00%,0.0,1.00%,F,F)



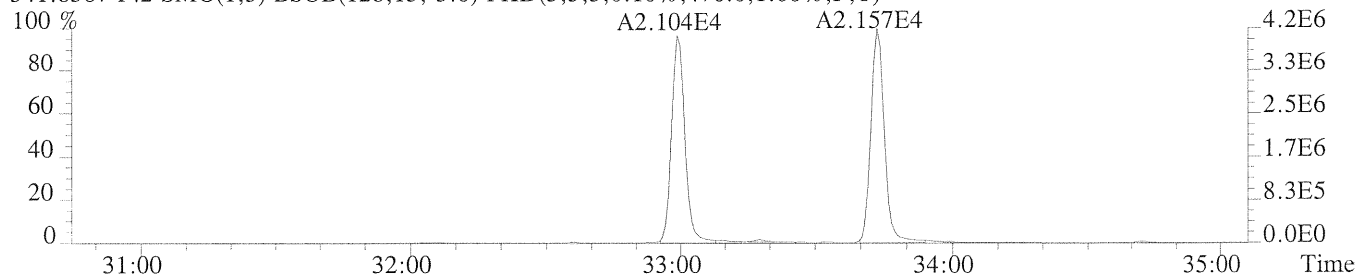
File:P200031 #1-396 Acq: 1-AUG-2008 15:21:27 Probe EI+ Magnet SIR VG BioTech Mass spectf

Sample#1 Exp:CCAL HRCC3

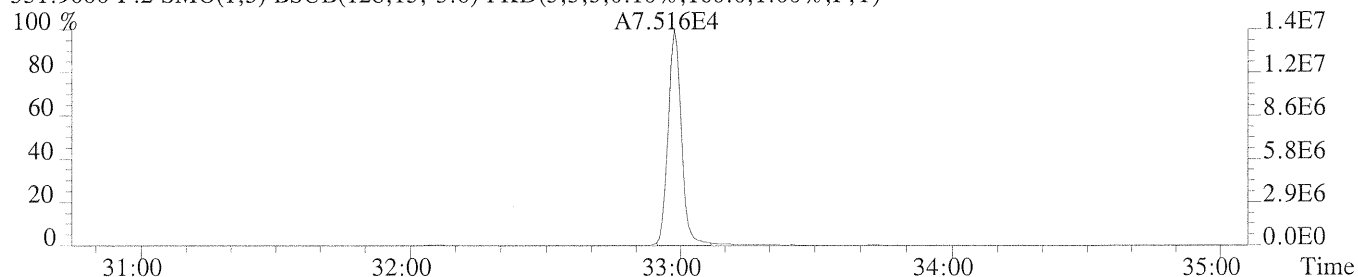
339.8597 F:2 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.10%,100.0,1.00%,F,T)



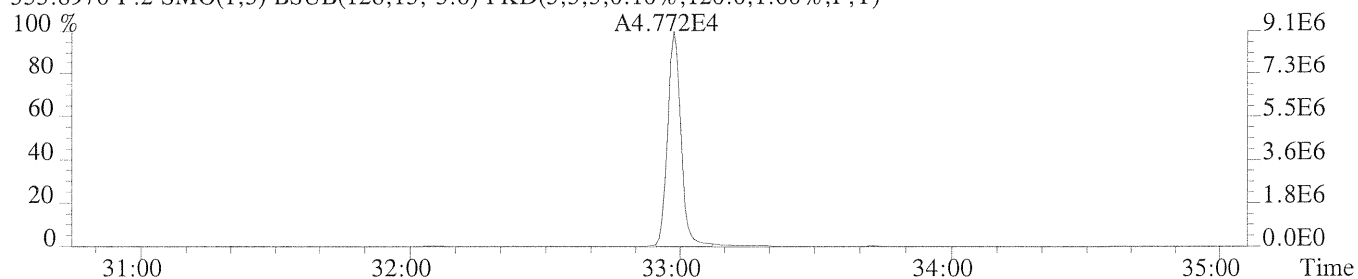
341.8567 F:2 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.10%,476.0,1.00%,F,T)



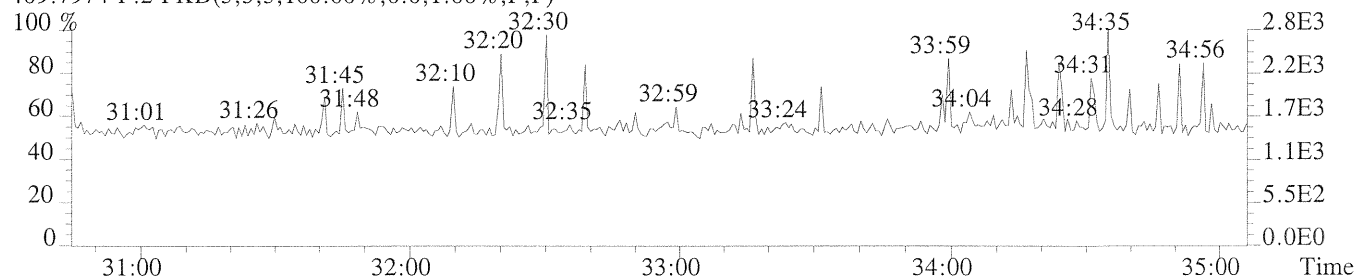
351.9000 F:2 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.10%,160.0,1.00%,F,T)



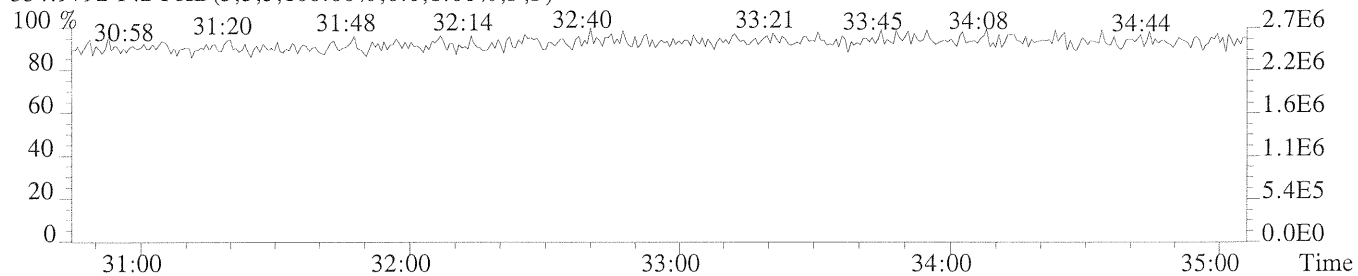
353.8970 F:2 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.10%,120.0,1.00%,F,T)



409.7974 F:2 PKD(5,3,5,100.00%,0.0,1.00%,F,F)



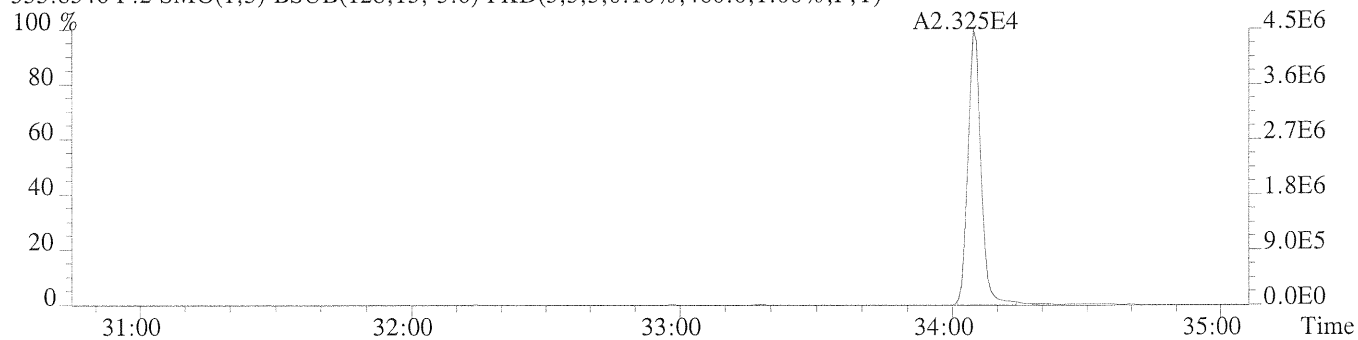
354.9792 F:2 PKD(3,3,3,100.00%,0.0,1.00%,F,F)



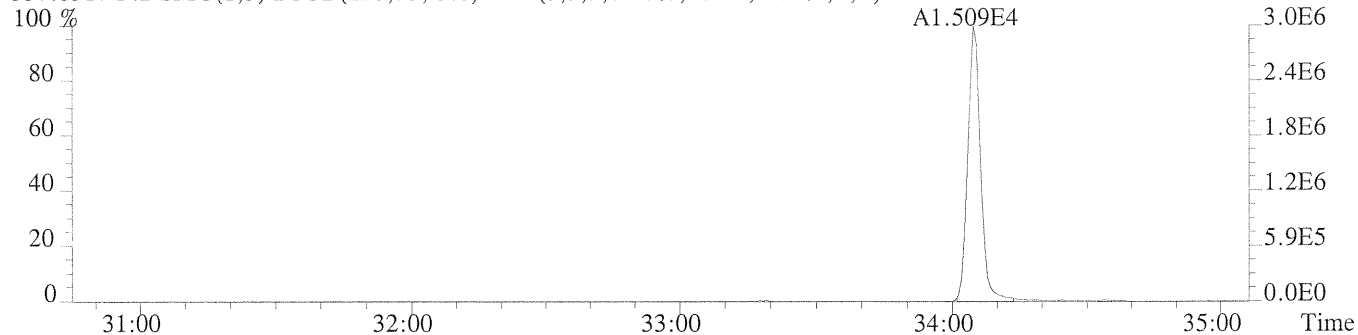
File:P200031 #1-396 Acq: 1-AUG-2008 15:21:27 Probe EI+ Magnet SIR VG BioTech Mass spectf

Sample#1 Exp:CCAL HRCC3

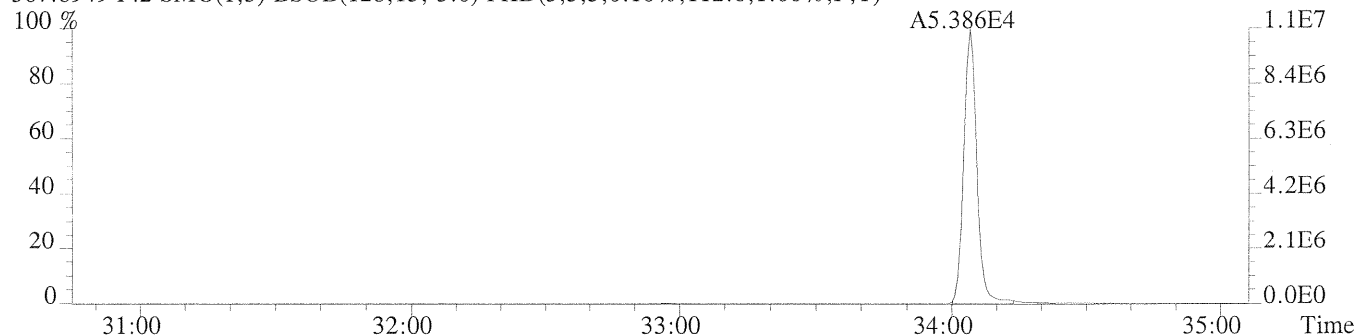
355.8546 F:2 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.10%,460.0,1.00%,F,T)



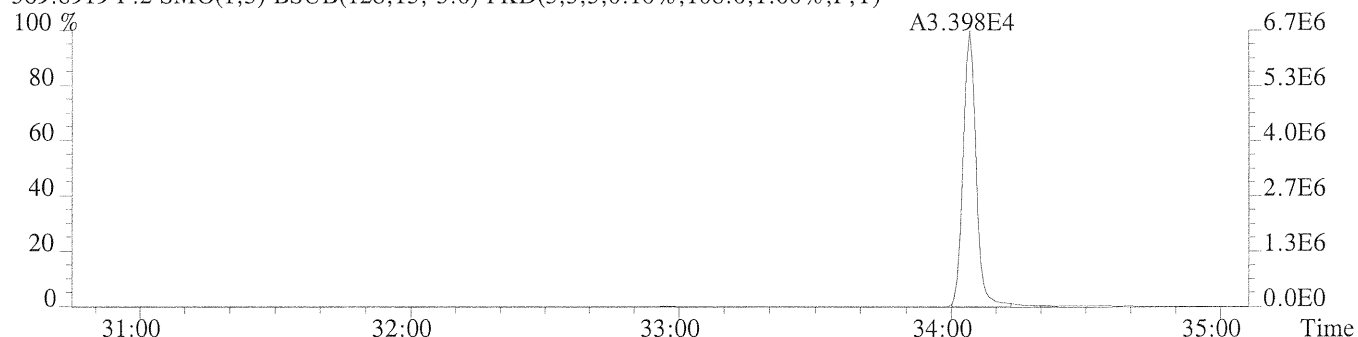
357.8517 F:2 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.10%,108.0,1.00%,F,T)



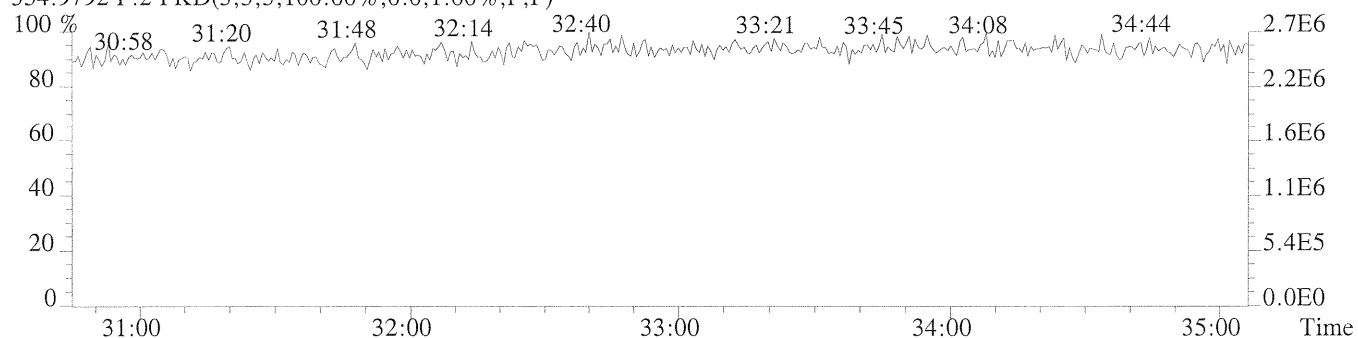
367.8949 F:2 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.10%,112.0,1.00%,F,T)



369.8919 F:2 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.10%,108.0,1.00%,F,T)



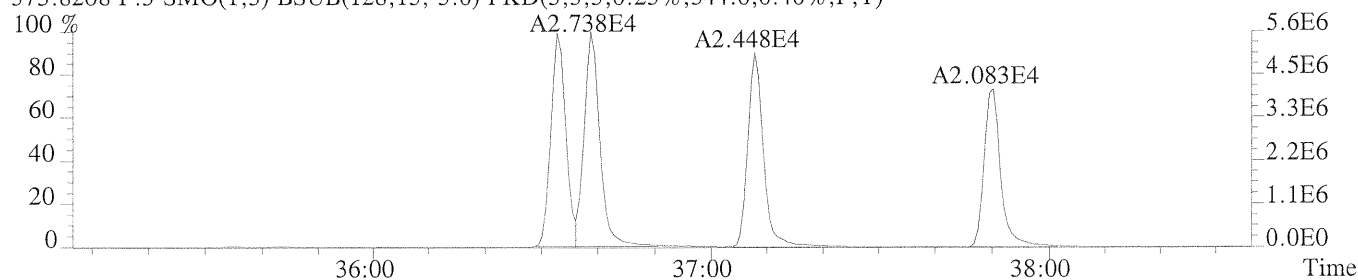
354.9792 F:2 PKD(3,3,3,100.00%,0.0,1.00%,F,F)



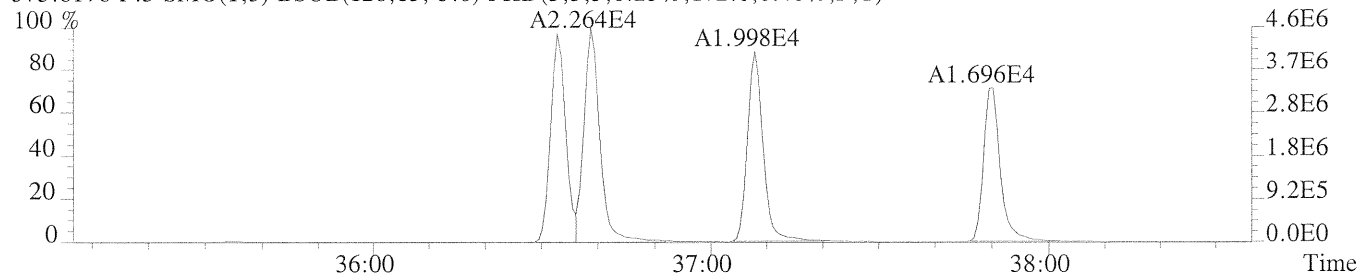
File:P200031 #1-318 Acq: 1-AUG-2008 15:21:27 Probe EI+ Magnet SIR VG BioTech Mass spectf

Sample#1 Exp:CCAL HRCC3

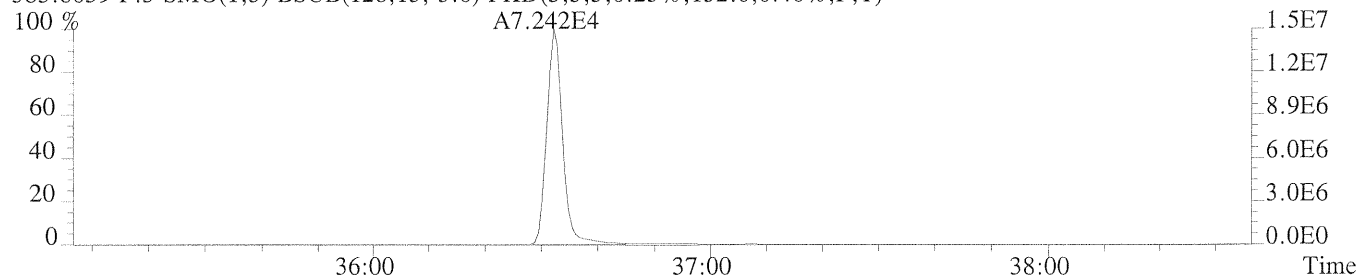
373.8208 F:3 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.25%,344.0,0.40%,F,T)



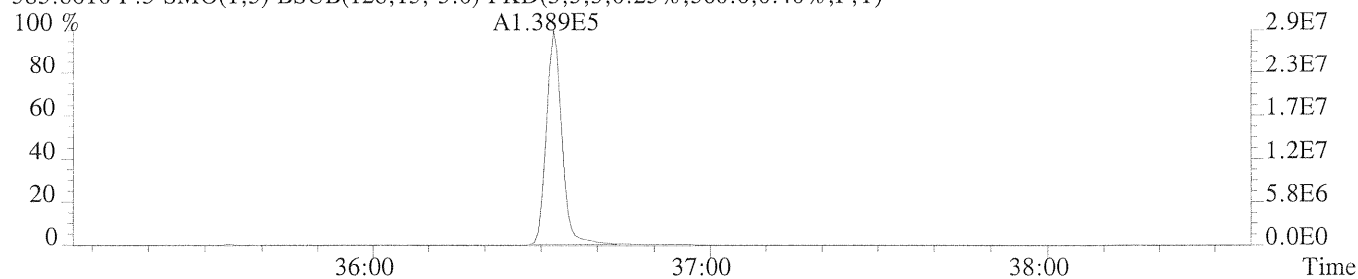
375.8178 F:3 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.25%,172.0,0.40%,F,T)



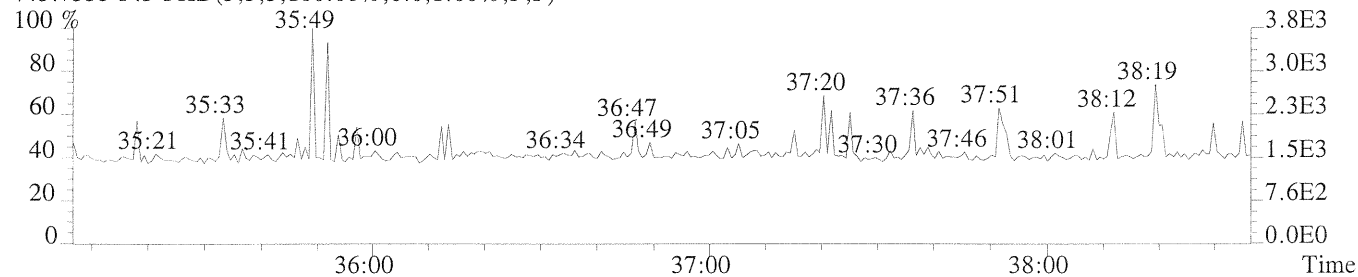
383.8639 F:3 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.25%,132.0,0.40%,F,T)



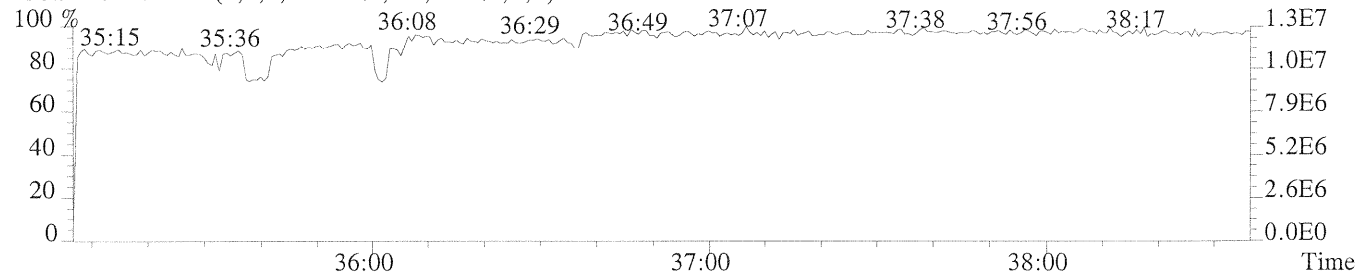
385.8610 F:3 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.25%,560.0,0.40%,F,T)



445.7555 F:3 PKD(5,3,5,100.00%,0.0,1.00%,F,F)



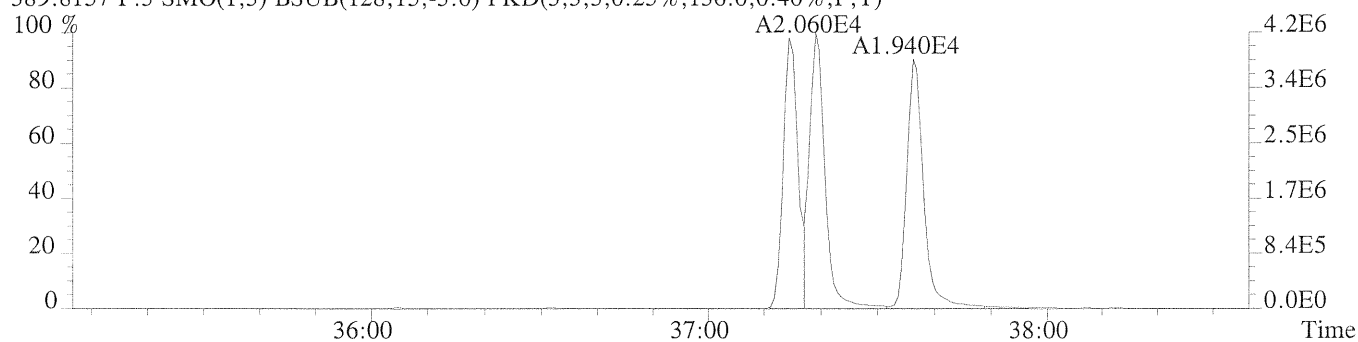
430.9728 F:3 PKD(3,3,3,100.00%,0.0,1.00%,F,F)



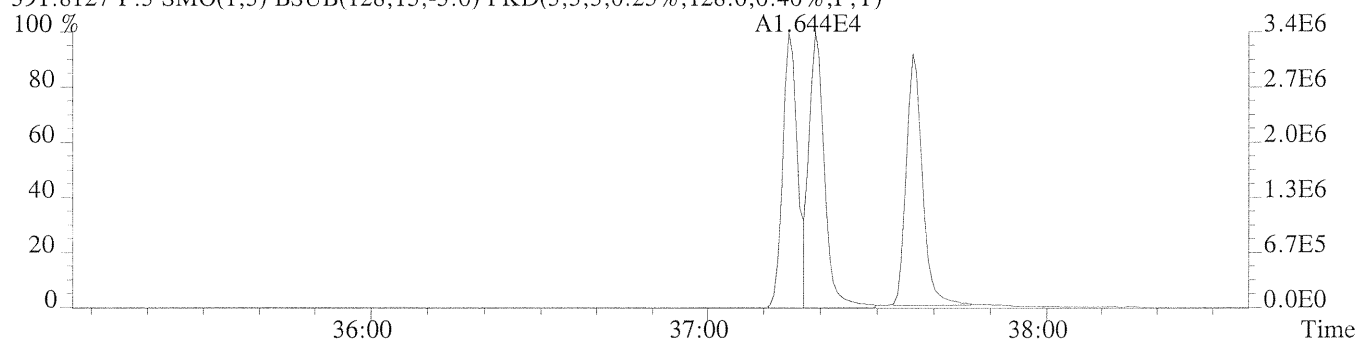
File:P200031 #1-318 Acq: 1-AUG-2008 15:21:27 Probe EI+ Magnet SIR VG BioTech Mass spectf

Sample#1 Exp:CCAL HRCC3

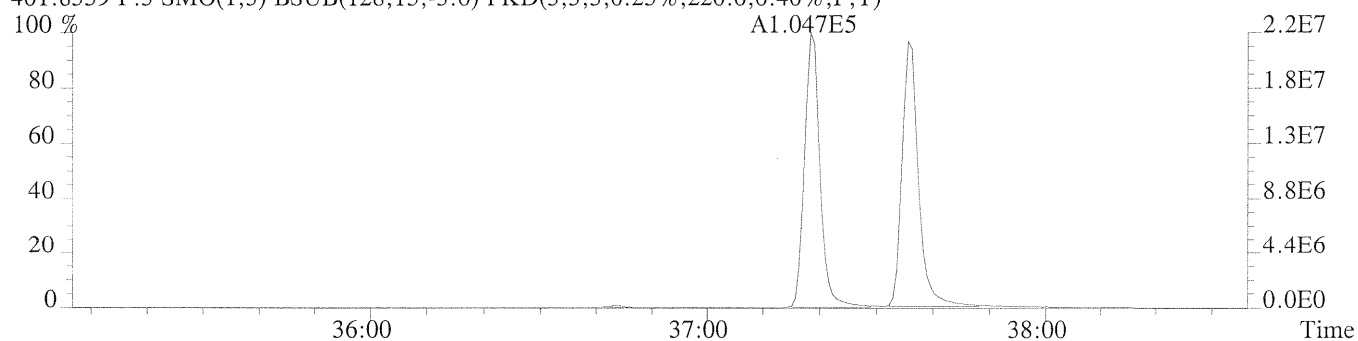
389.8157 F:3 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.25%,136.0,0.40%,F,T)



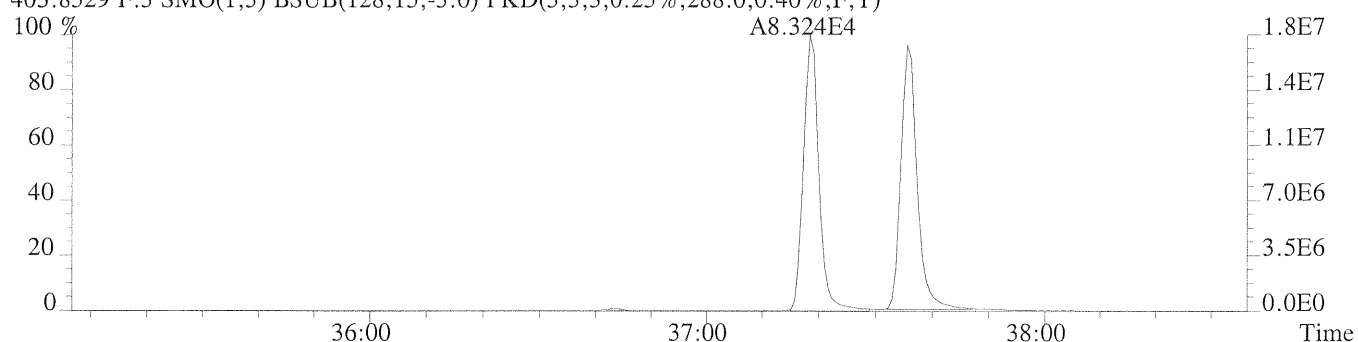
391.8127 F:3 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.25%,128.0,0.40%,F,T)



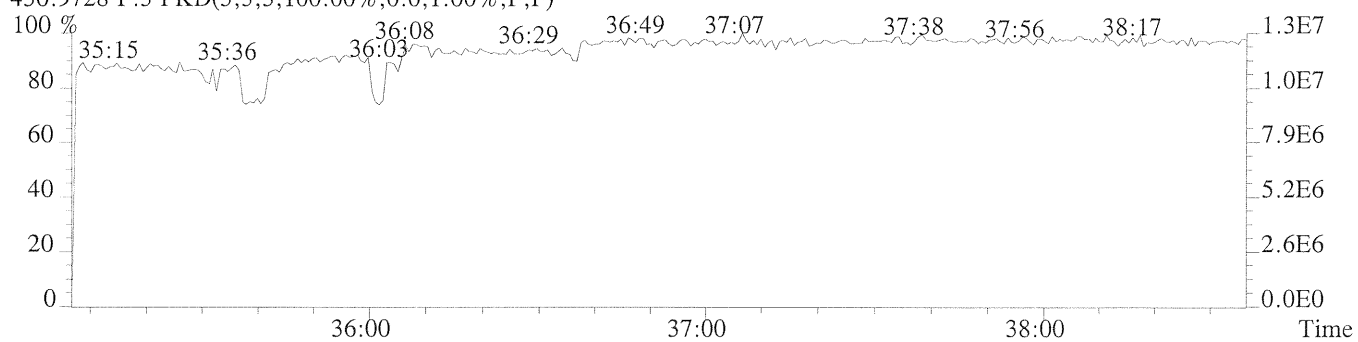
401.8559 F:3 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.25%,220.0,0.40%,F,T)



403.8529 F:3 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.25%,288.0,0.40%,F,T)



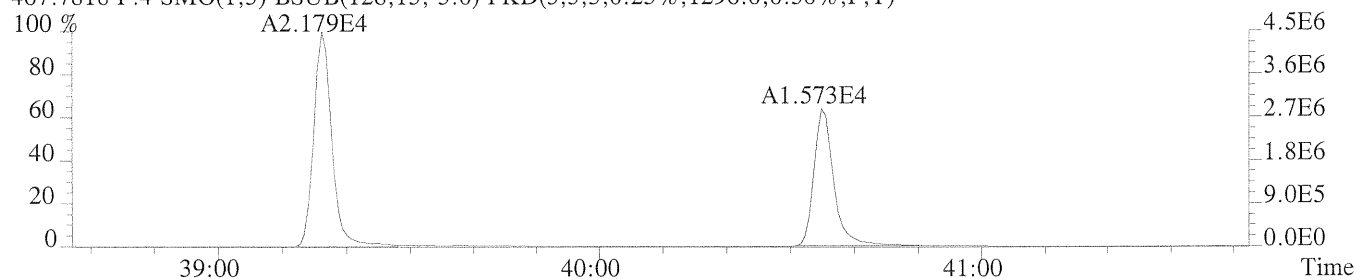
430.9728 F:3 PKD(3,3,3,100.00%,0.0,1.00%,F,F)



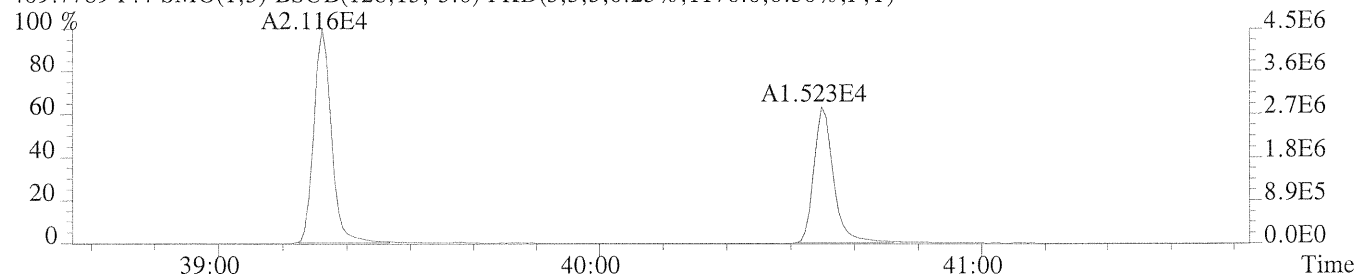
File:P200031 #1-281 Acq: 1-AUG-2008 15:21:27 Probe EI+ Magnet SIR VG BioTech Mass spectf

Sample#1 Exp:CCAL HRCC3

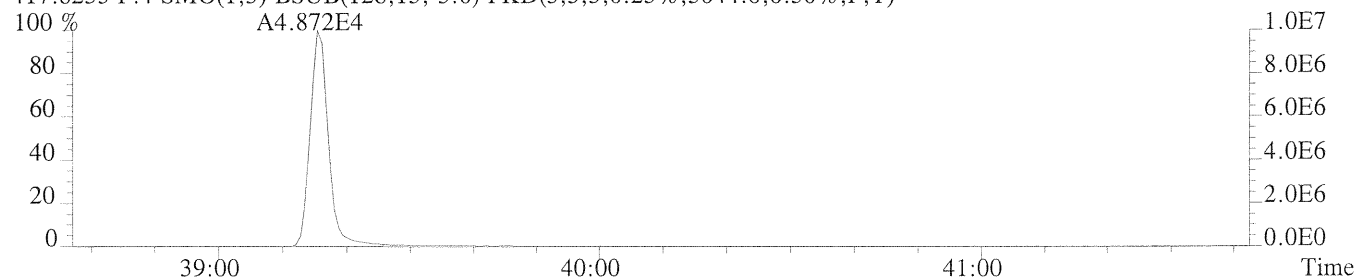
407.7818 F:4 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.25%,1296.0,0.50%,F,T)



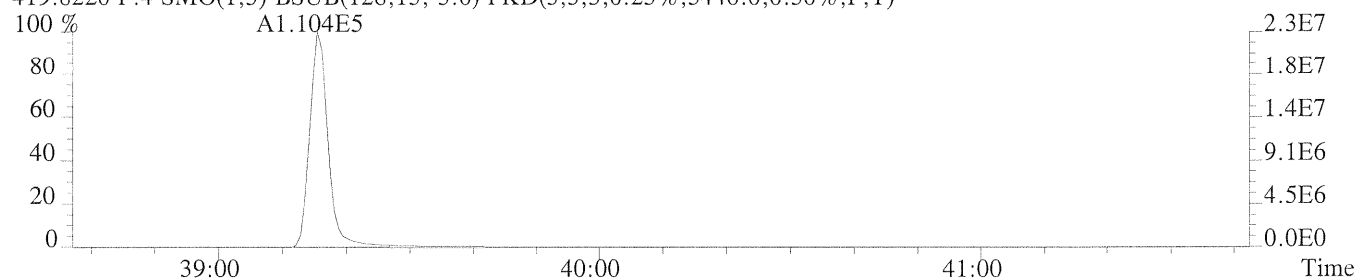
409.7789 F:4 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.25%,1176.0,0.50%,F,T)



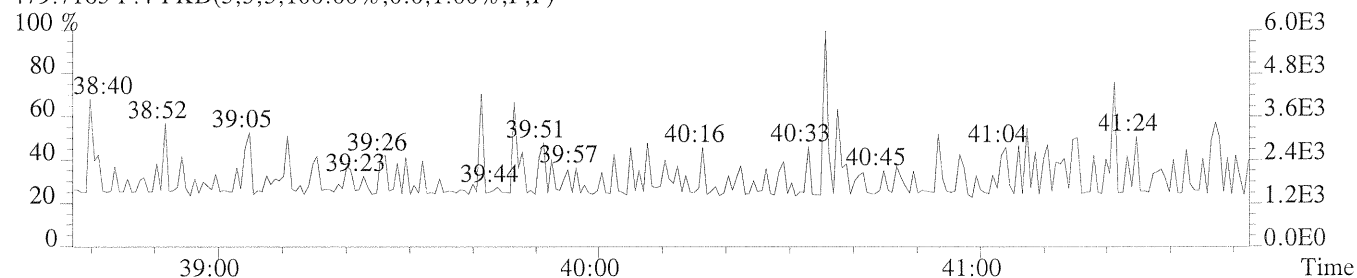
417.8253 F:4 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.25%,5044.0,0.50%,F,T)



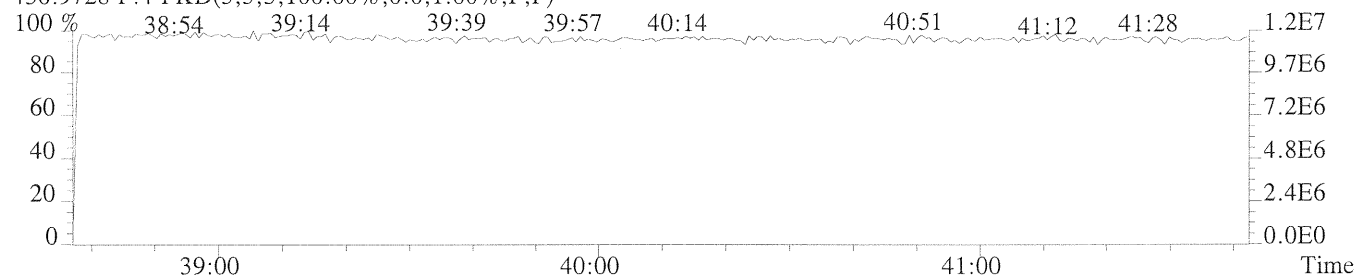
419.8220 F:4 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.25%,5440.0,0.50%,F,T)



479.7165 F:4 PKD(5,3,5,100.00%,0.0,1.00%,F,F)



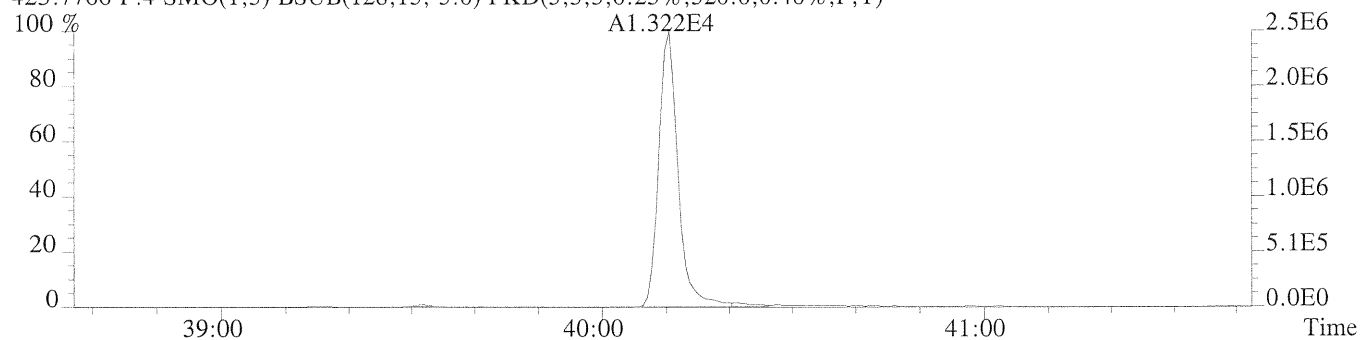
430.9728 F:4 PKD(3,3,3,100.00%,0.0,1.00%,F,F)



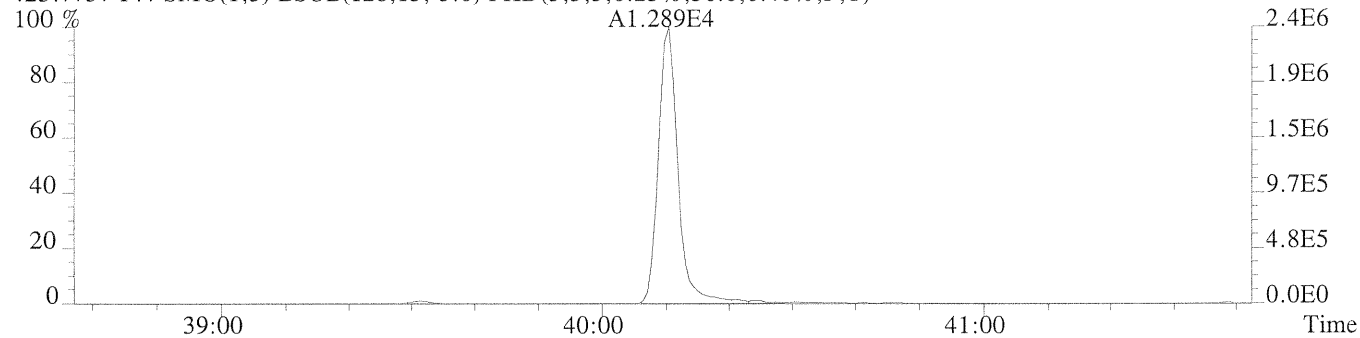
File:P200031 #1-281 Acq: 1-AUG-2008 15:21:27 Probe EI+ Magnet SIR VG BioTech Mass spectf

Sample#1 Exp:CCAL HRCC3

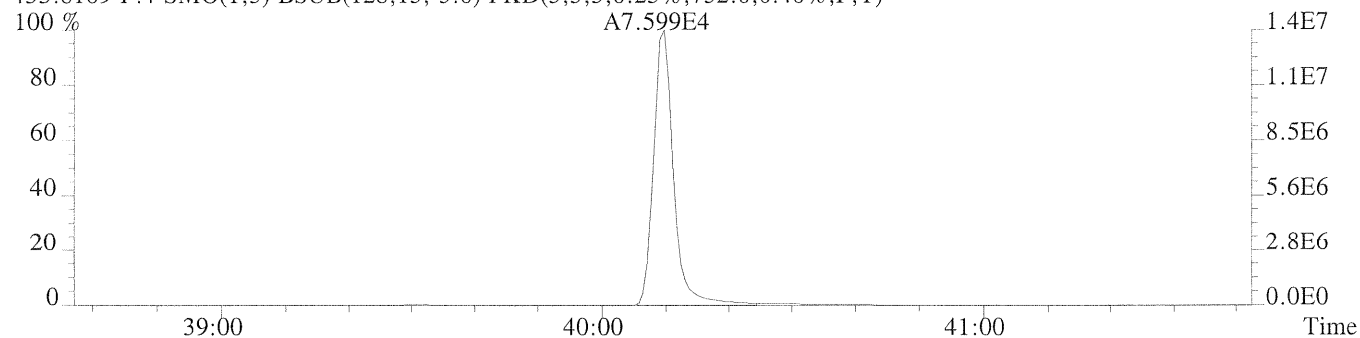
423.7766 F:4 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.25%,320.0,0.40%,F,T)



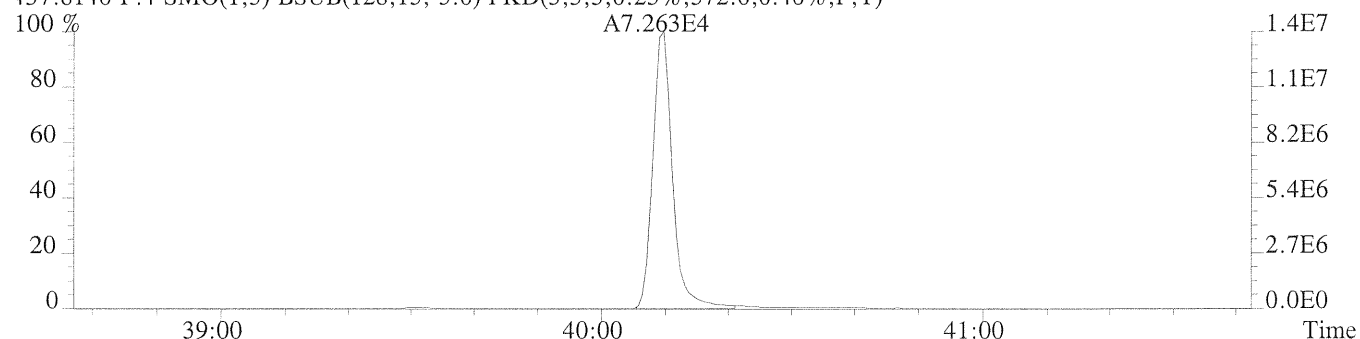
425.7737 F:4 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.25%,56.0,0.40%,F,T)



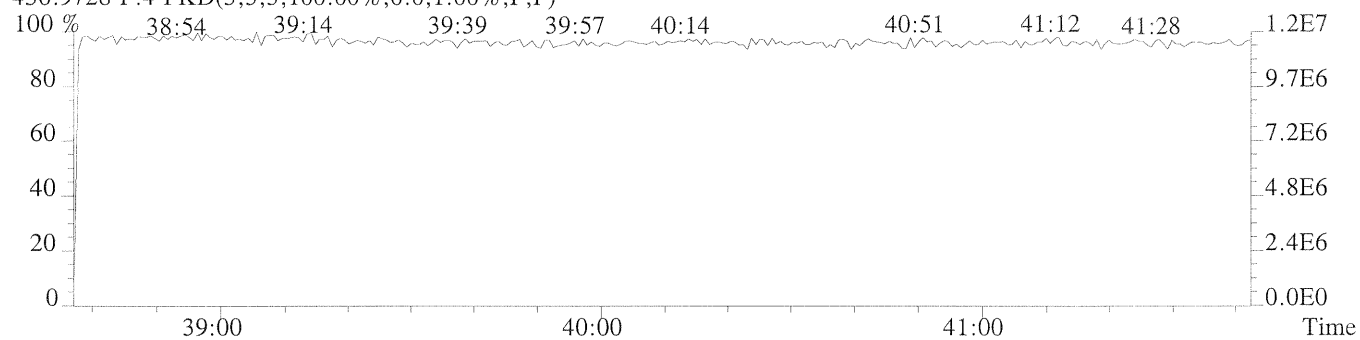
435.8169 F:4 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.25%,752.0,0.40%,F,T)



437.8140 F:4 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.25%,372.0,0.40%,F,T)



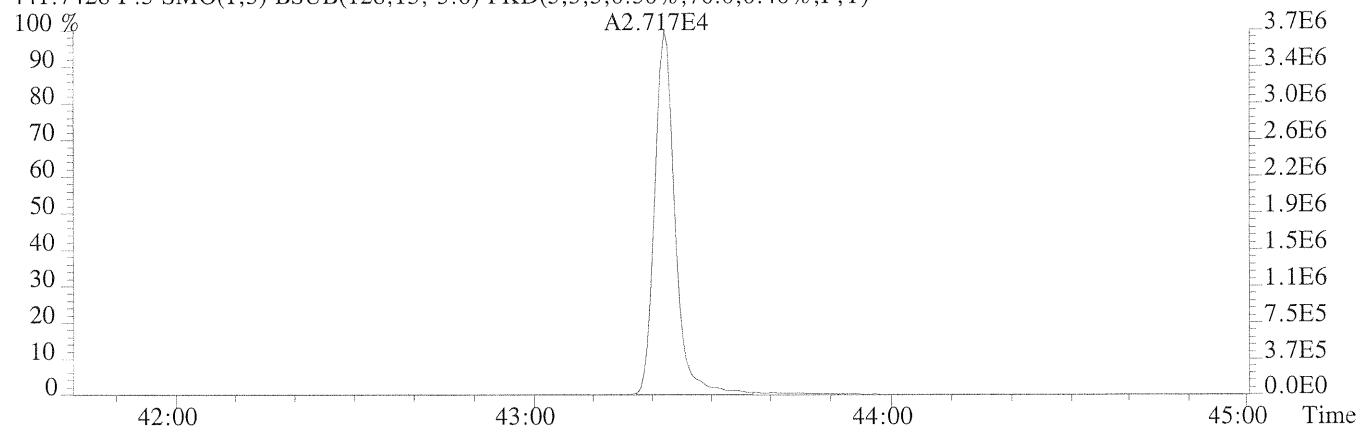
430.9728 F:4 PKD(3,3,3,100.00%,0.0,1.00%,F,F)



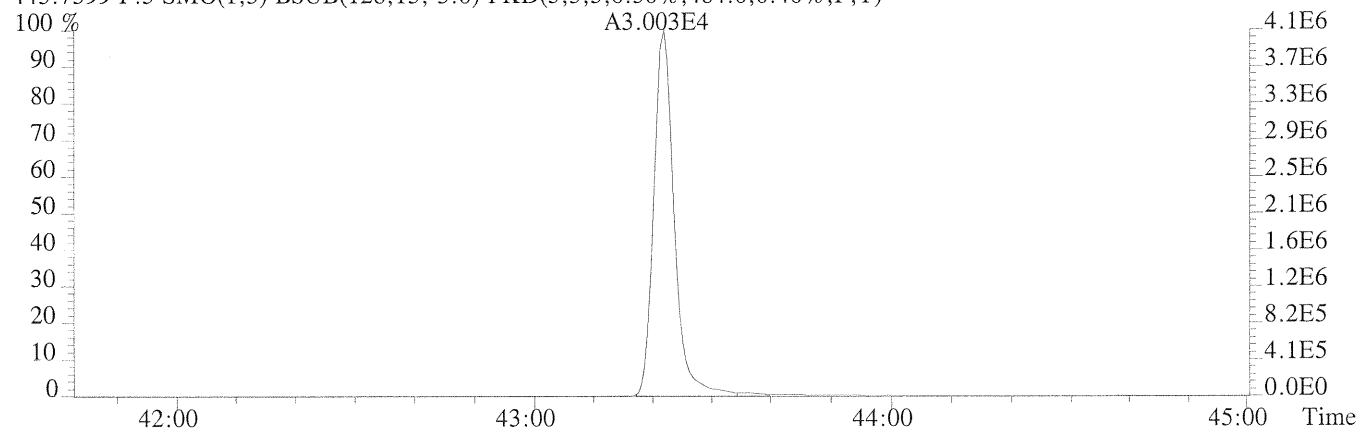
File:P200031 #1-364 Acq: 1-AUG-2008 15:21:27 Probe EI+ Magnet SIR VG BioTech Mass spectf

Sample#1 Exp:CCAL HRCC3

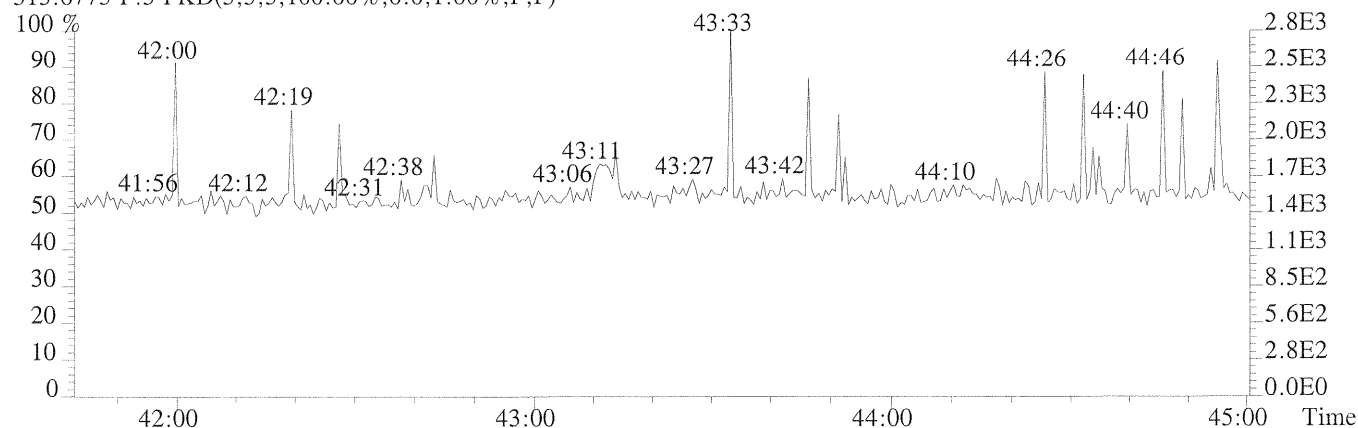
441.7428 F:5 SMO(1,3) BSUB(128,15,-3.0) PKD(5,3,5,0.30%,76.0,0.40%,F,T)



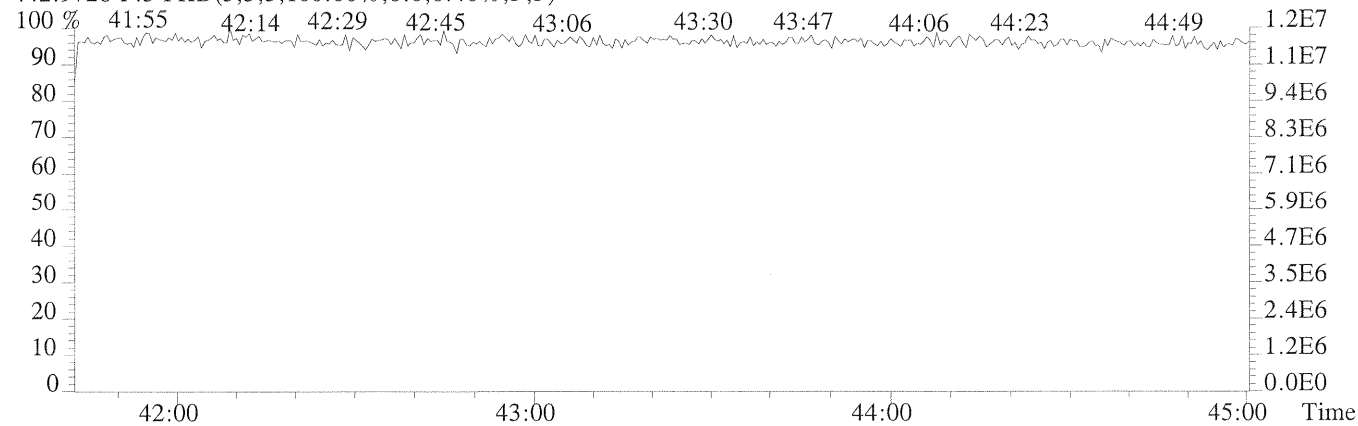
443.7399 F:5 SMO(1,3) BSUB(128,15,-3.0) PKD(5,3,5,0.30%,484.0,0.40%,F,T)



513.6775 F:5 PKD(5,3,5,100.00%,0.0,1.00%,F,F)



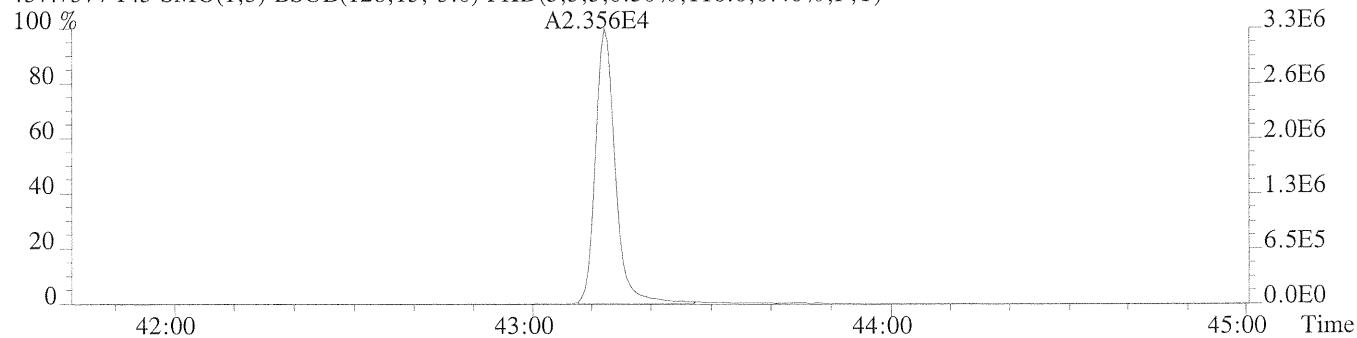
442.9728 F:5 PKD(3,3,3,100.00%,0.0,0.40%,F,F)



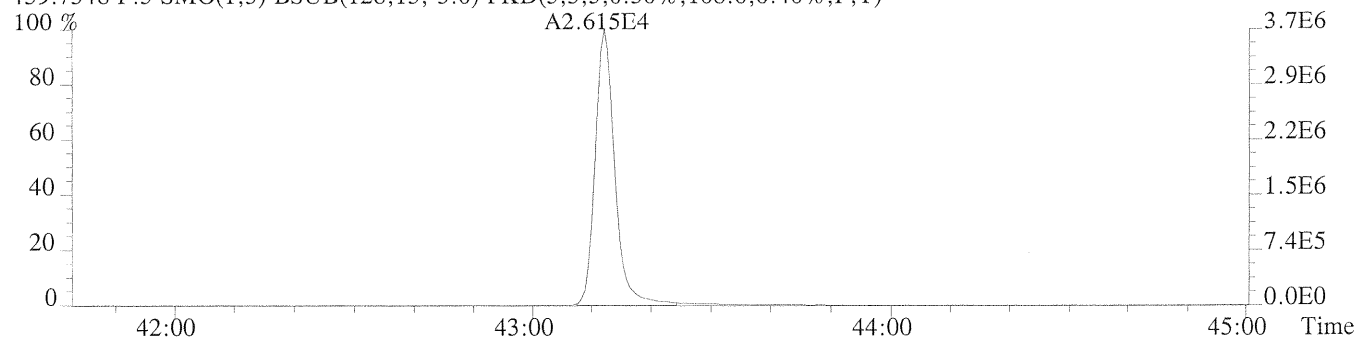
File:P200031 #1-364 Acq: 1-AUG-2008 15:21:27 Probe EI+ Magnet SIR VG BioTech Mass spectf

Sample#1 Exp:CCAL HRCC3

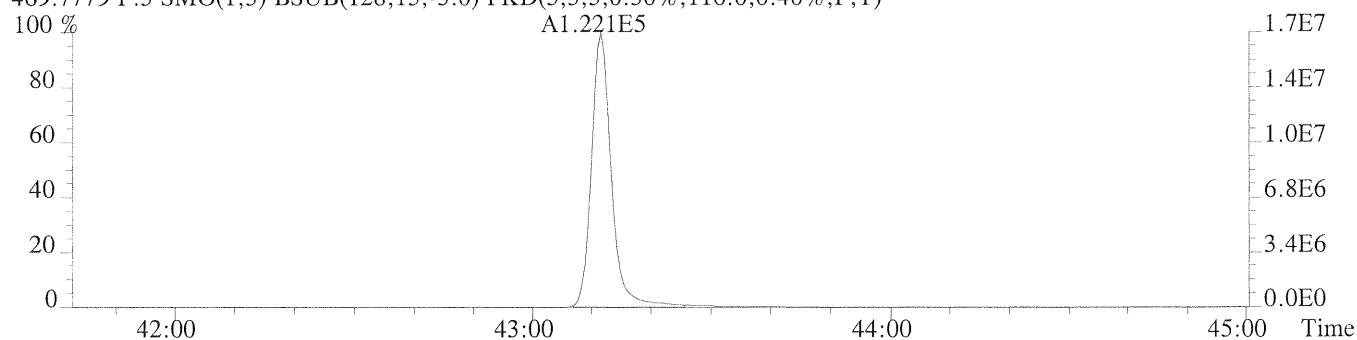
457.7377 F:5 SMO(1,3) BSUB(128,15,-3.0) PKD(5,3,5,0.30%,116.0,0.40%,F,T)



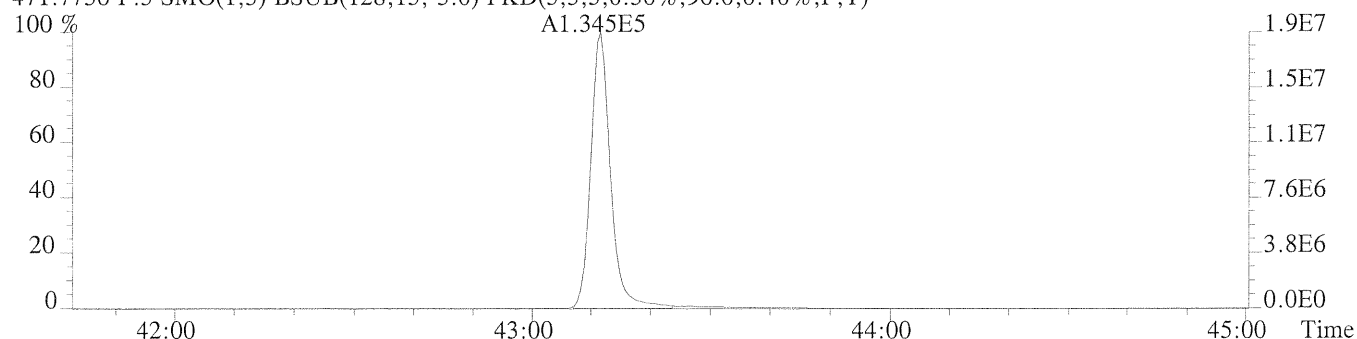
459.7348 F:5 SMO(1,3) BSUB(128,15,-3.0) PKD(5,3,5,0.30%,108.0,0.40%,F,T)



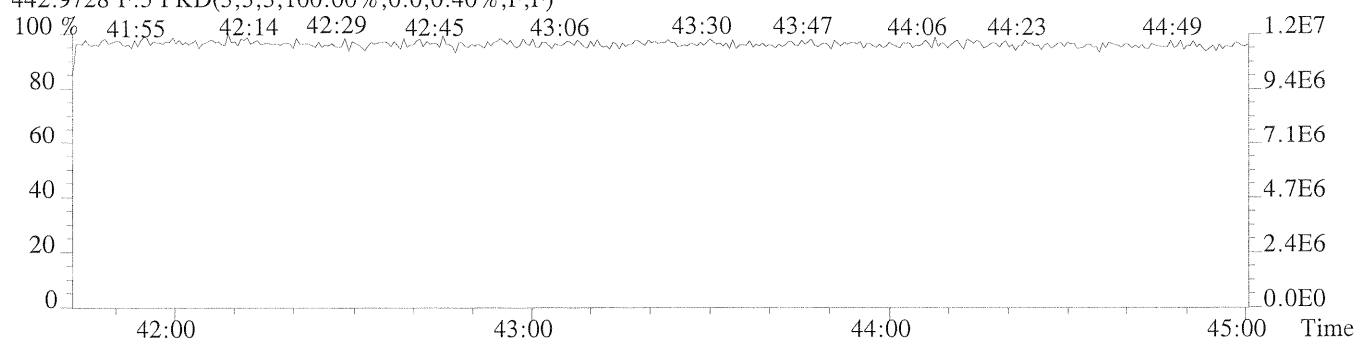
469.7779 F:5 SMO(1,3) BSUB(128,15,-3.0) PKD(5,3,5,0.30%,116.0,0.40%,F,T)



471.7750 F:5 SMO(1,3) BSUB(128,15,-3.0) PKD(5,3,5,0.30%,96.0,0.40%,F,T)



442.9728 F:5 PKD(3,3,3,100.00%,0.0,0.40%,F,F)



Columbia Analytical Services, Inc.
Sample Response Summary

CLIENT ID.
ICAL HRCC4

Run #4 Filename P200034 #1 Samp: 1 Inj: 1 Acquired: 1-AUG-08 18:16:07
Processed: 14-APR-10 10:16:05 LAB. ID: ICAL HRCC4

	Typ	Name	RT-1	Resp 1	Resp 2	Ratio	Meet	Mod?	RRT
1	Unk	2,3,7,8-TCDF	28:37	5.949e+04	7.773e+04	0.77	yes	no	1.001
2	Unk	1,2,3,7,8-PeCDF	32:59	1.730e+05	1.129e+05	1.53	yes	no	1.000
3	Unk	2,3,4,7,8-PeCDF	33:43	1.777e+05	1.155e+05	1.54	yes	no	1.022
4	Unk	1,2,3,4,7,8-HxCDF	36:33	1.393e+05	1.145e+05	1.22	yes	no	1.000
5	Unk	1,2,3,6,7,8-HxCDF	36:39	1.488e+05	1.220e+05	1.22	yes	no	1.003
6	Unk	2,3,4,6,7,8-HxCDF	37:07	1.316e+05	1.070e+05	1.23	yes	no	1.016
7	Unk	1,2,3,7,8,9-HxCDF	37:50	1.106e+05	9.316e+04	1.19	yes	no	1.036
8	Unk	1,2,3,4,6,7,8-HpCDF	39:16	1.136e+05	1.120e+05	1.01	yes	no	1.000
9	Unk	1,2,3,4,7,8,9-HpCDF	40:35	8.587e+04	8.403e+04	1.02	yes	no	1.034
10	Unk	OCDF	43:22	1.225e+05	1.373e+05	0.89	yes	no	1.004
11	Unk	2,3,7,8-TCDD	29:27	4.854e+04	6.302e+04	0.77	yes	no	1.001
12	Unk	1,2,3,7,8-PeCDD	34:05	1.219e+05	7.885e+04	1.55	yes	no	1.000
13	Unk	1,2,3,4,7,8-HxCDD	37:14	9.252e+04	7.438e+04	1.24	yes	no	0.998
14	Unk	1,2,3,6,7,8-HxCDD	37:19	1.077e+05	8.529e+04	1.26	yes	no	1.000
15	Unk	1,2,3,7,8,9-HxCDD	37:36	9.630e+04	7.703e+04	1.25	yes	no	1.008
16	Unk	1,2,3,4,6,7,8-HpCDD	40:10	7.095e+04	6.797e+04	1.04	yes	no	1.000
17	Unk	OCDD	43:12	1.024e+05	1.151e+05	0.89	yes	no	1.000
18	IS	13C-2,3,7,8-TCDF	28:35	7.162e+04	9.149e+04	0.78	yes	no	0.978
19	IS	13C-1,2,3,7,8-PeCDF	32:59	8.269e+04	5.270e+04	1.57	yes	no	1.128
20	IS	13C-1,2,3,4,7,8-HxCDF	36:32	8.145e+04	1.578e+05	0.52	yes	no	0.972
21	IS	13C-1,2,3,4,6,7,8-HpCDF	39:15	5.170e+04	1.185e+05	0.44	yes	no	1.044
22	IS	13C-2,3,7,8-TCDD	29:26	5.322e+04	6.866e+04	0.78	yes	no	1.007
23	IS	13C-1,2,3,7,8-PeCDD	34:04	5.592e+04	3.620e+04	1.54	yes	no	1.165
24	IS	13C-1,2,3,6,7,8-HxCDD	37:18	9.932e+04	7.945e+04	1.25	yes	no	0.992
25	IS	13C-1,2,3,4,6,7,8-HpCDD	40:09	7.950e+04	7.584e+04	1.05	yes	no	1.068
26	IS	13C-OCDD	43:11	1.074e+05	1.203e+05	0.89	yes	no	1.148
27	RS/RT	13C-1,2,3,4-TCDD	29:14	5.015e+04	6.372e+04	0.79	yes	no	*
28	RS/RT	13C-1,2,3,7,8,9-HxCDD	37:36	9.942e+04	7.911e+04	1.26	yes	no	*
29	C/Up	37Cl-2,3,7,8-TCDD	29:27	1.134e+05				no	1.007

Columbia Analytical Services, Inc.
19408 Park Row, Suite 320
Houston, TX 77084
Office (713) 266-1599. Fax (713) 266-0130

Columbia Analytical Services, Inc.
Signal/Noise Height Ratio Summary

CLIENT ID.
ICAL HRCC4

Run #4 Filename P200034 Samp: 1 Inj: 1 Acquired: 1-AUG-08 18:16:07
Processed: 14-APR-10 10:16:051 LAB. ID: ICAL HRCC4

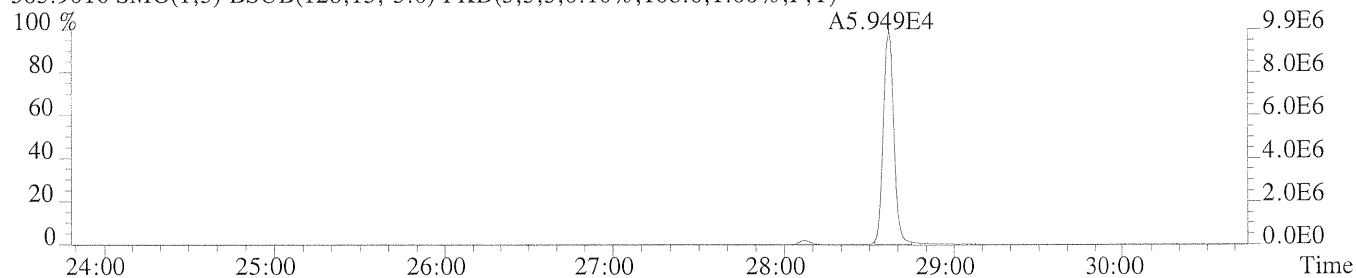
	Name	Signal 1	Noise 1	S/N Rat.1	Signal 2	Noise 2	S/N Rat.2
1	2,3,7,8-TCDF	9.94e+06	1.08e+02	9.2e+04	1.29e+07	1.44e+02	8.9e+04
2	1,2,3,7,8-PeCDF	3.32e+07	6.80e+01	4.9e+05	2.17e+07	7.12e+02	3.0e+04
3	2,3,4,7,8-PeCDF	3.51e+07	6.80e+01	5.2e+05	2.27e+07	7.12e+02	3.2e+04
4	1,2,3,4,7,8-HxCDF	3.05e+07	8.36e+02	3.6e+04	2.48e+07	7.36e+02	3.4e+04
5	1,2,3,6,7,8-HxCDF	2.90e+07	8.36e+02	3.5e+04	2.38e+07	7.36e+02	3.2e+04
6	2,3,4,6,7,8-HxCDF	2.68e+07	8.36e+02	3.2e+04	2.20e+07	7.36e+02	3.0e+04
7	1,2,3,7,8,9-HxCDF	2.28e+07	8.36e+02	2.7e+04	1.87e+07	7.36e+02	2.5e+04
8	1,2,3,4,6,7,8-HpCDF	2.34e+07	7.66e+03	3.1e+03	2.29e+07	6.00e+03	3.8e+03
9	1,2,3,4,7,8,9-HpCDF	1.57e+07	7.66e+03	2.0e+03	1.52e+07	6.00e+03	2.5e+03
10	OCDF	1.71e+07	4.72e+02	3.6e+04	1.94e+07	3.00e+02	6.5e+04
11	2,3,7,8-TCDD	8.44e+06	9.60e+01	8.8e+04	1.10e+07	1.48e+02	7.5e+04
12	1,2,3,7,8-PeCDD	2.44e+07	4.68e+02	5.2e+04	1.58e+07	1.56e+02	1.0e+05
13	1,2,3,4,7,8-HxCDD	2.13e+07	5.20e+02	4.1e+04	1.69e+07	1.60e+02	1.1e+05
14	1,2,3,6,7,8-HxCDD	2.20e+07	5.20e+02	4.2e+04	1.75e+07	1.60e+02	1.1e+05
15	1,2,3,7,8,9-HxCDD	2.07e+07	5.20e+02	4.0e+04	1.64e+07	1.60e+02	1.0e+05
16	1,2,3,4,6,7,8-HpCDD	1.37e+07	1.00e+03	1.4e+04	1.33e+07	8.56e+02	1.5e+04
17	OCDD	1.43e+07	1.24e+02	1.2e+05	1.62e+07	1.24e+02	1.3e+05
18	13C-2,3,7,8-TCDF	1.18e+07	1.01e+03	1.2e+04	1.52e+07	5.28e+02	2.9e+04
19	13C-1,2,3,7,8-PeCDF	1.58e+07	1.20e+02	1.3e+05	1.00e+07	1.32e+02	7.6e+04
20	13C-1,2,3,4,7,8-HxCDF	1.70e+07	1.44e+02	1.2e+05	3.29e+07	8.80e+02	3.7e+04
21	13C-1,2,3,4,6,7,8-HpCDF	1.08e+07	2.71e+03	4.0e+03	2.43e+07	8.02e+03	3.0e+03
22	13C-2,3,7,8-TCDD	9.31e+06	1.42e+03	6.5e+03	1.20e+07	5.92e+02	2.0e+04
23	13C-1,2,3,7,8-PeCDD	1.10e+07	1.60e+02	6.9e+04	7.00e+06	1.28e+02	5.5e+04
24	13C-1,2,3,6,7,8-HxCDD	2.15e+07	3.24e+02	6.6e+04	1.71e+07	5.48e+02	3.1e+04
25	13C-1,2,3,4,6,7,8-HpCDD	1.54e+07	1.51e+03	1.0e+04	1.47e+07	7.16e+02	2.1e+04
26	13C-OCDD	1.47e+07	1.96e+02	7.5e+04	1.68e+07	2.56e+02	6.6e+04
27	13C-1,2,3,4-TCDD	8.81e+06	1.42e+03	6.2e+03	1.11e+07	5.92e+02	1.9e+04
28	13C-1,2,3,7,8,9-HxCDD	2.11e+07	3.24e+02	6.5e+04	1.68e+07	5.48e+02	3.1e+04
29	37Cl-2,3,7,8-TCDD	1.97e+07	1.12e+02	1.8e+05			

Columbia Analytical Services, Inc.
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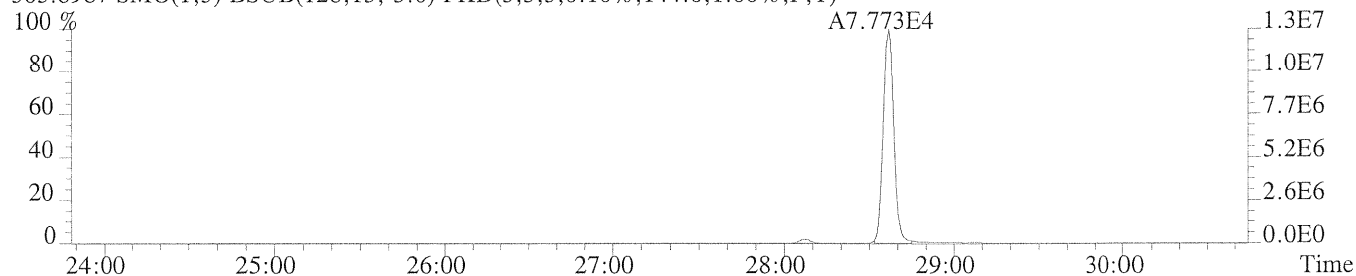
File:P200034 #1-578 Acq: 1-AUG-2008 18:16:07 Probe EI+ Magnet SIR VG BioTech Mass spectf

Sample#1 Exp:ICAL HRCC4

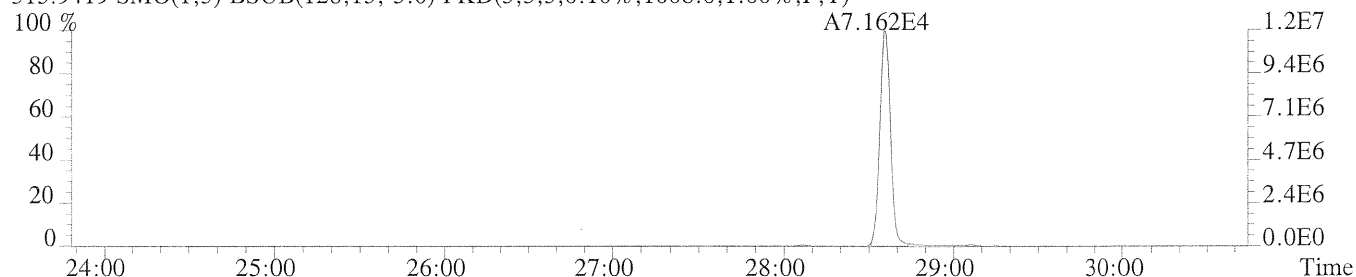
303.9016 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.10%,108.0,1.00%,F,T)



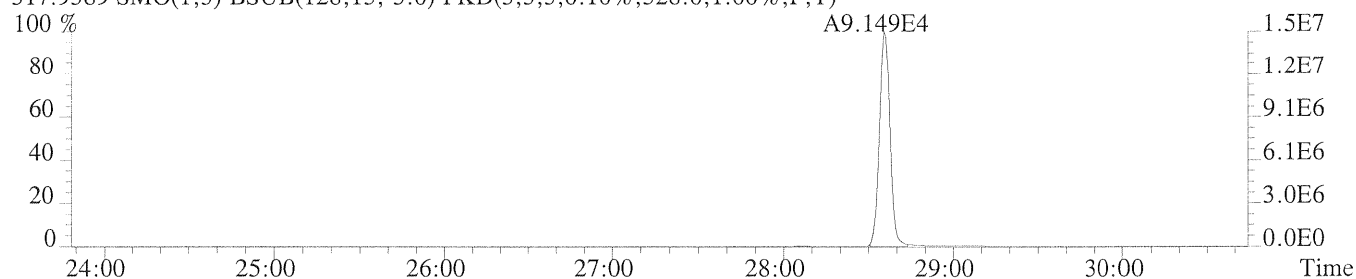
305.8987 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.10%,144.0,1.00%,F,T)



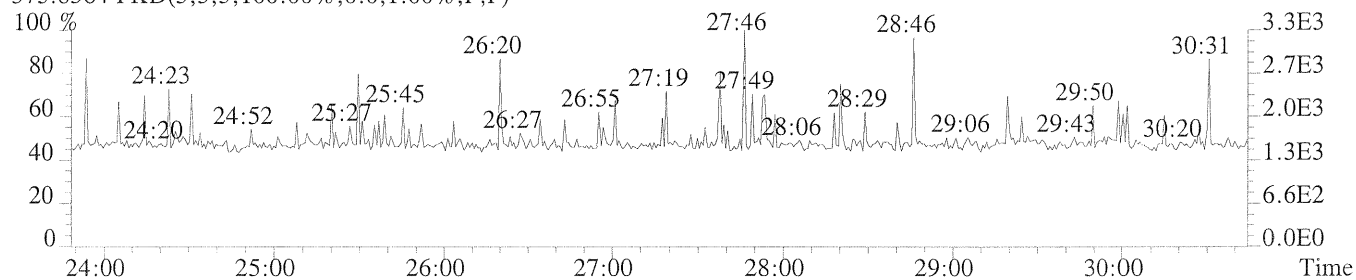
315.9419 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.10%,1008.0,1.00%,F,T)



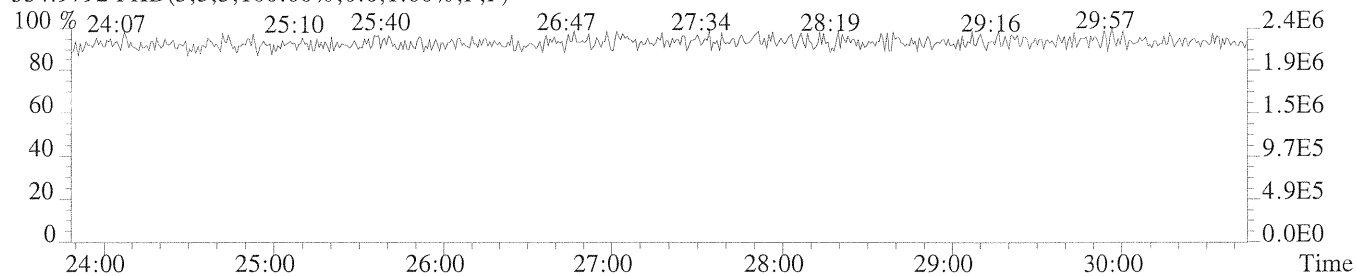
317.9389 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.10%,528.0,1.00%,F,T)



375.8364 PKD(5,3,5,100.00%,0.0,1.00%,F,F)



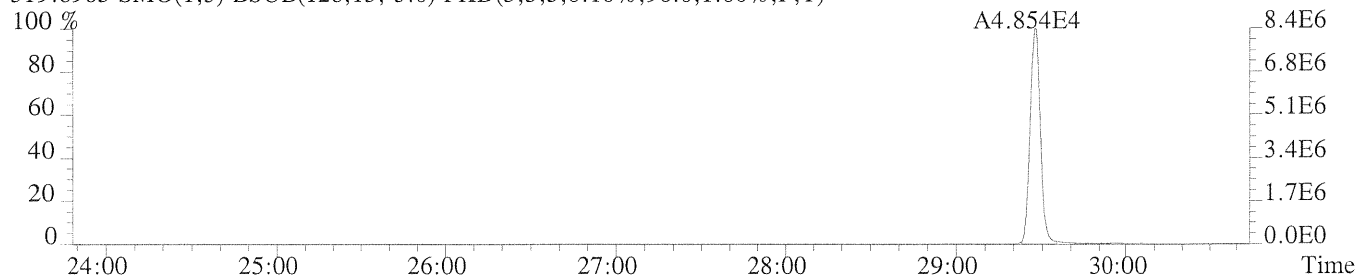
354.9792 PKD(3,3,3,100.00%,0.0,1.00%,F,F)



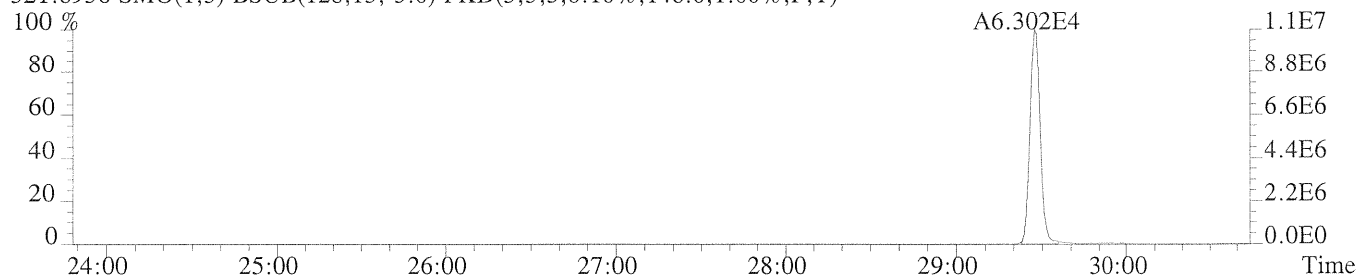
File:P200034 #1-578 Acq: 1-AUG-2008 18:16:07 Probe EI+ Magnet SIR VG BioTech Mass spectf

Sample#1 Exp:ICAL HRCC4

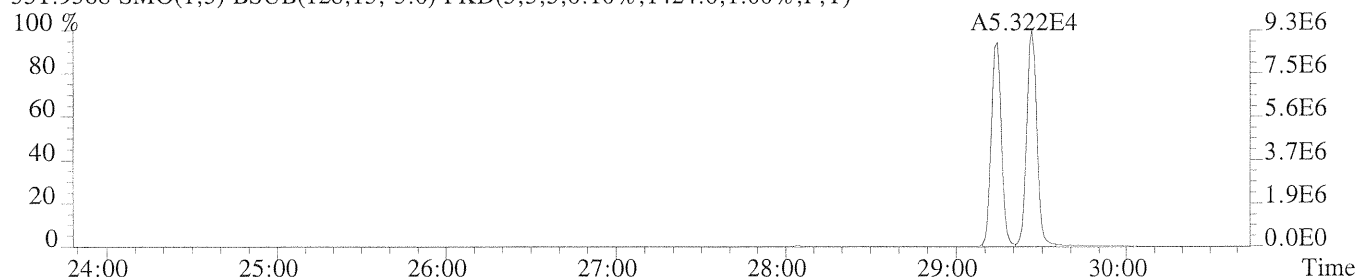
319.8965 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.10%,96.0,1.00%,F,T)



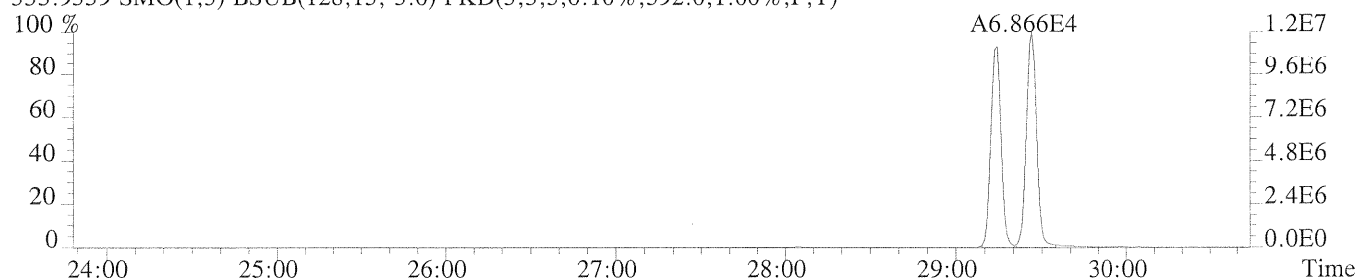
321.8936 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.10%,148.0,1.00%,F,T)



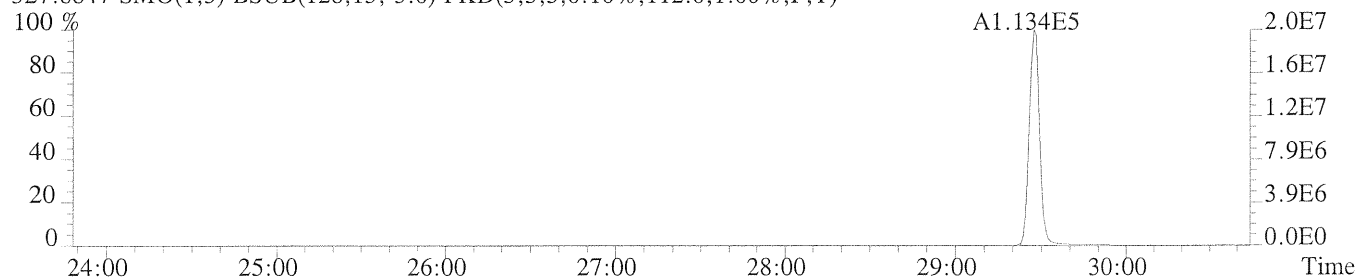
331.9368 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.10%,1424.0,1.00%,F,T)



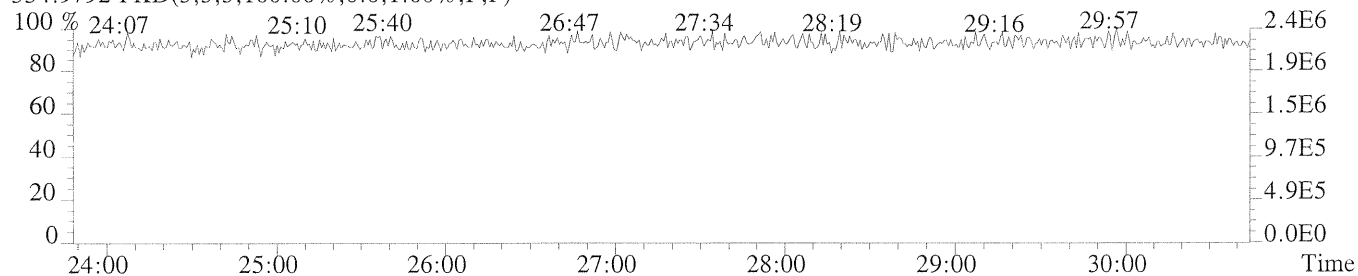
333.9339 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.10%,592.0,1.00%,F,T)



327.8847 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.10%,112.0,1.00%,F,T)



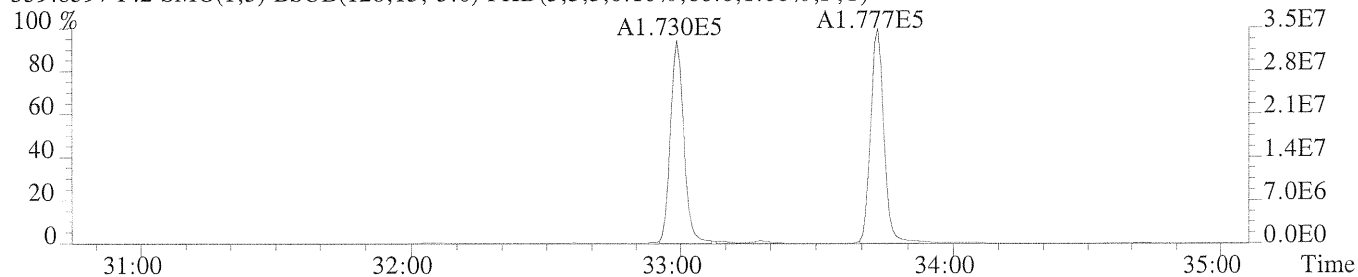
354.9792 PKD(3,3,3,100.00%,0.0,1.00%,F,F)



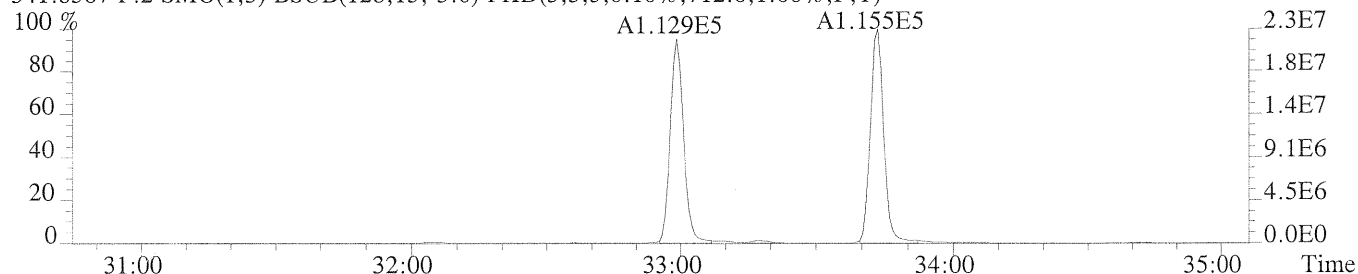
File:P200034 #1-396 Acq: 1-AUG-2008 18:16:07 Probe EI+ Magnet SIR VG BioTech Mass spectf

Sample#1 Exp:ICAL HRCC4

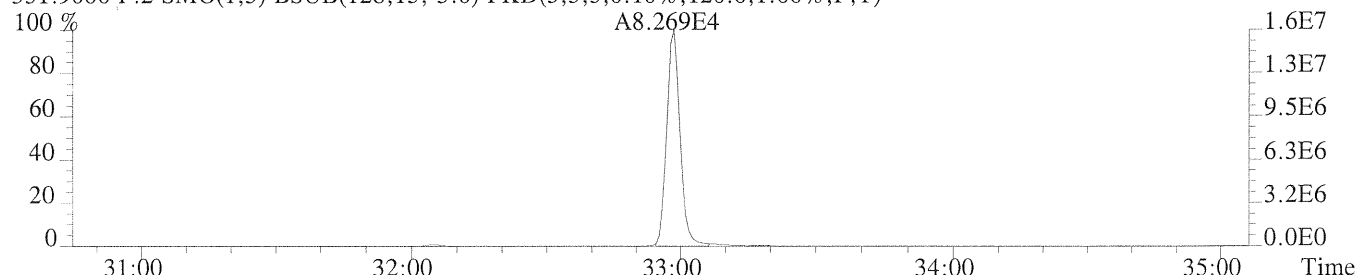
339.8597 F:2 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.10%,68.0,1.00%,F,T)



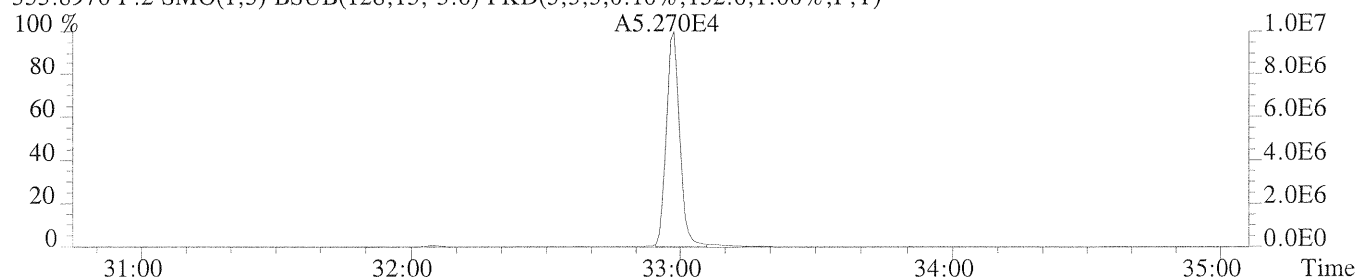
341.8567 F:2 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.10%,712.0,1.00%,F,T)



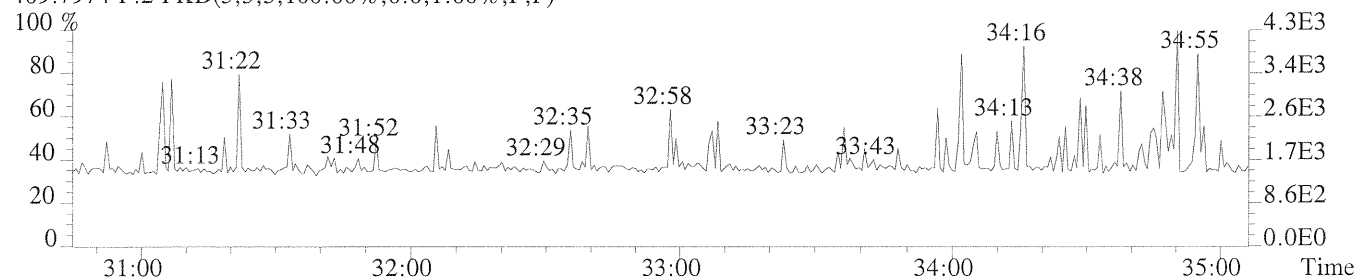
351.9000 F:2 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.10%,120.0,1.00%,F,T)



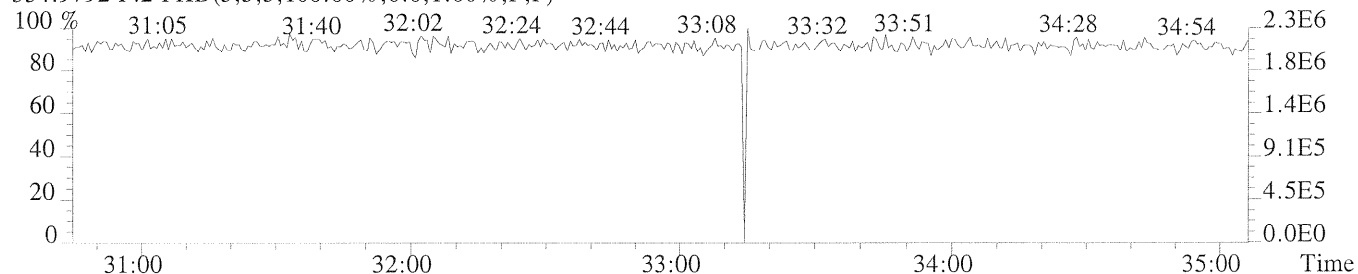
353.8970 F:2 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.10%,132.0,1.00%,F,T)



409.7974 F:2 PKD(5,3,5,100.00%,0.0,1.00%,F,F)



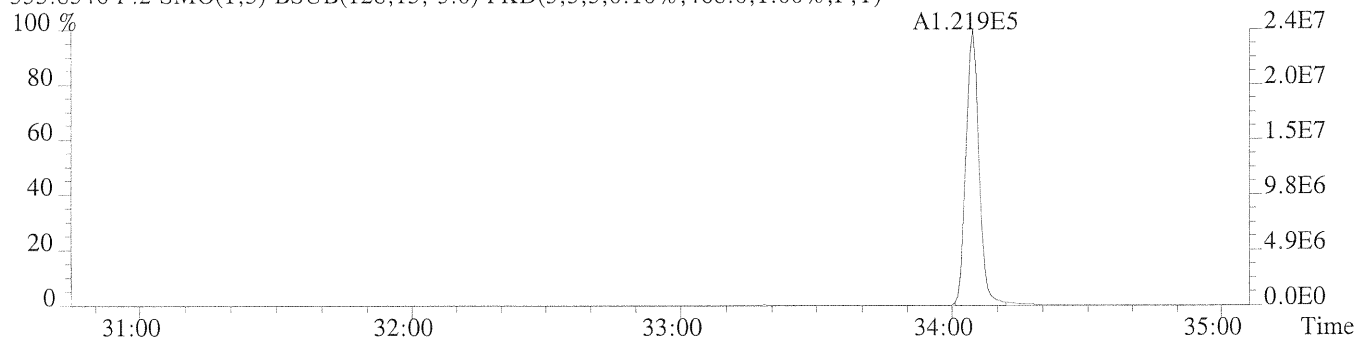
354.9792 F:2 PKD(3,3,3,100.00%,0.0,1.00%,F,F)



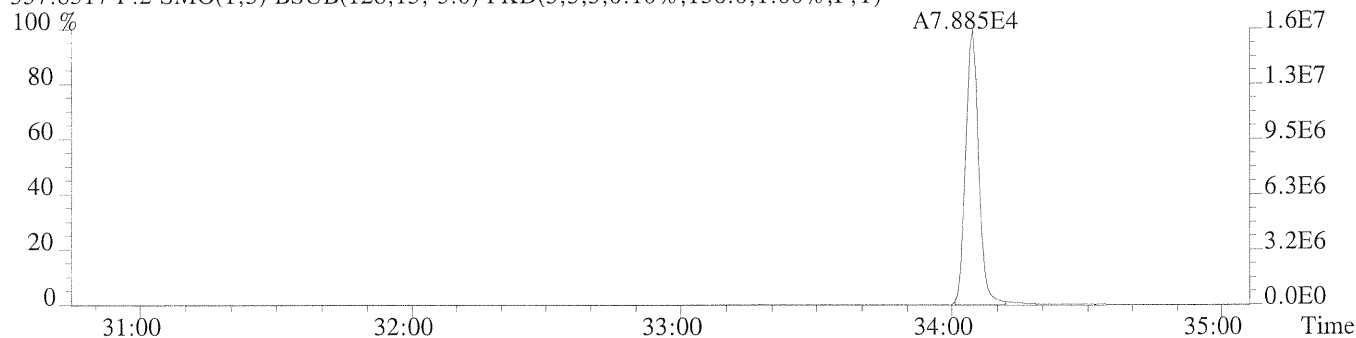
File:P200034 #1-396 Acq: 1-AUG-2008 18:16:07 Probe EI+ Magnet SIR VG BioTech Mass spectf

Sample#1 Exp:ICAL HRCC4

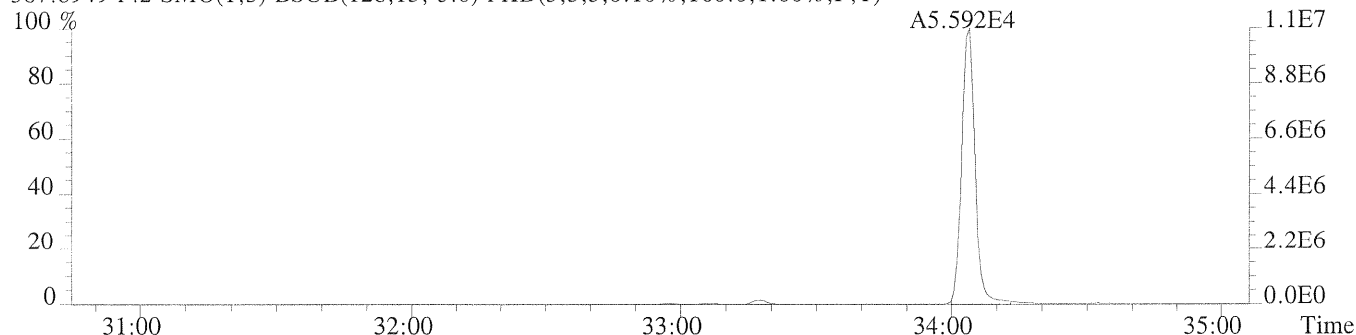
355.8546 F:2 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.10%,468.0,1.00%,F,T)



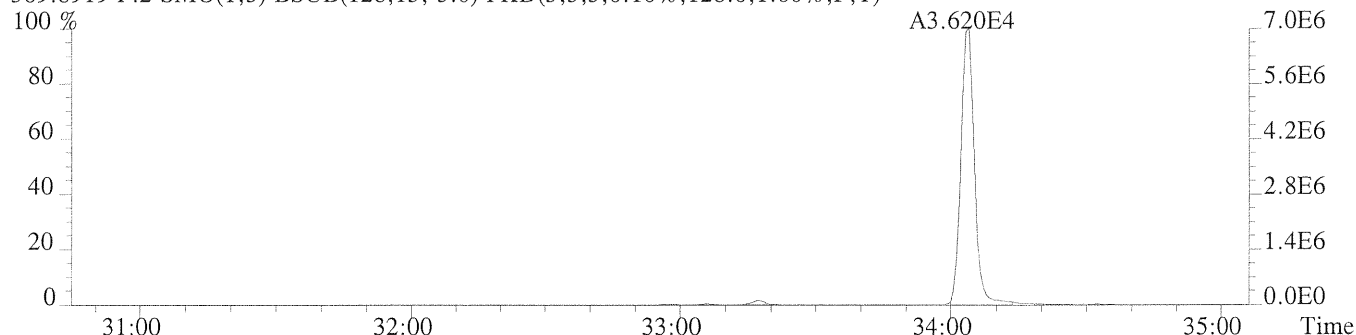
357.8517 F:2 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.10%,156.0,1.00%,F,T)



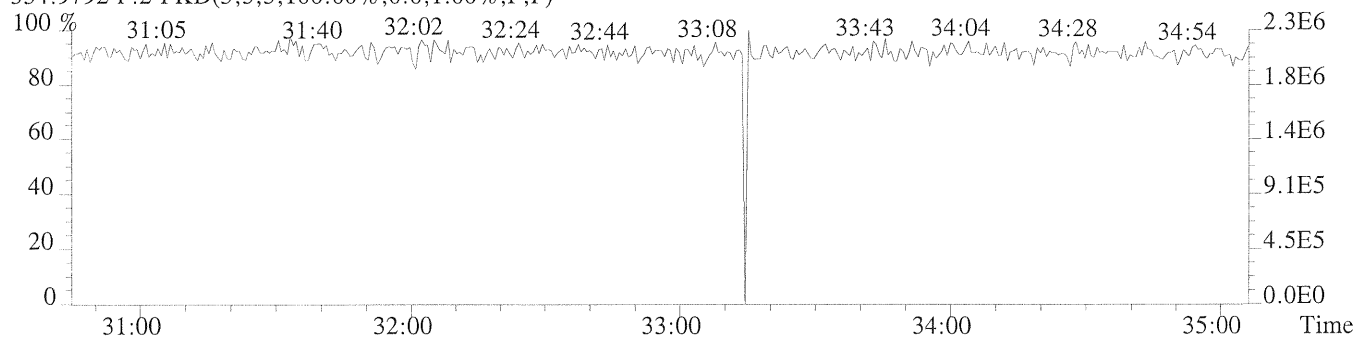
367.8949 F:2 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.10%,160.0,1.00%,F,T)



369.8919 F:2 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.10%,128.0,1.00%,F,T)



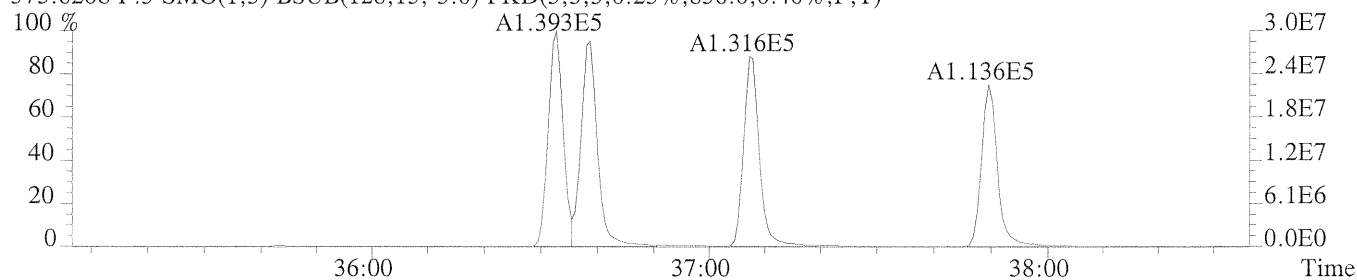
354.9792 F:2 PKD(3,3,3,100.00%,0.0,1.00%,F,F)



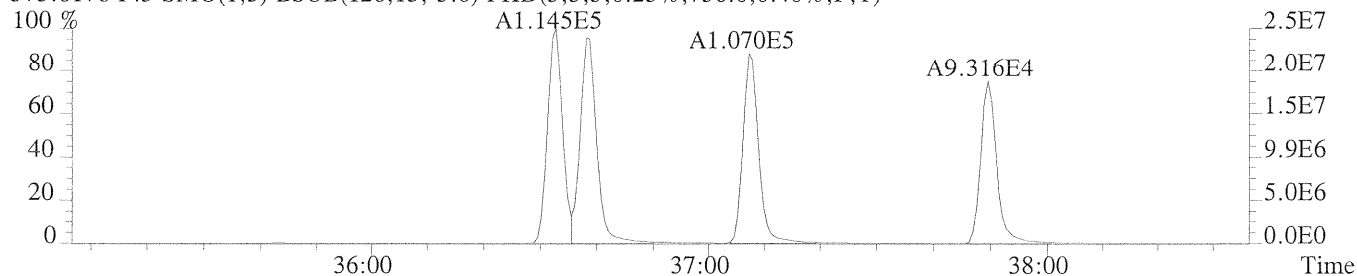
File:P200034 #1-318 Acq: 1-AUG-2008 18:16:07 Probe EI+ Magnet SIR VG BioTech Mass spectf

Sample#1 Exp:ICAL HRCC4

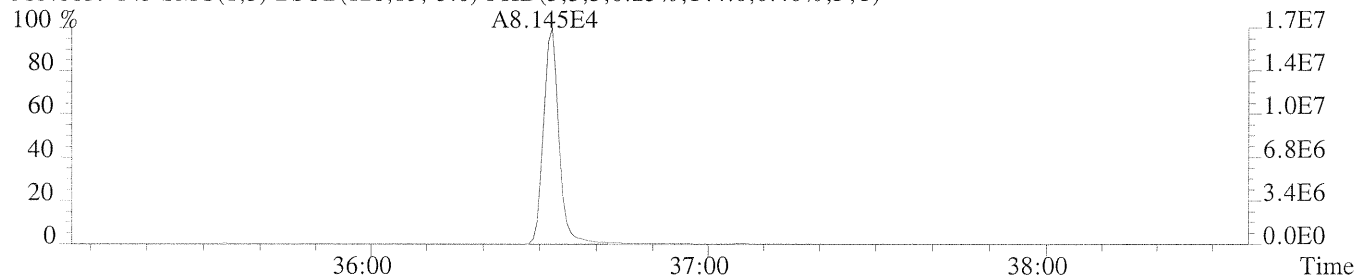
373.8208 F:3 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.25%,836.0,0.40%,F,T)



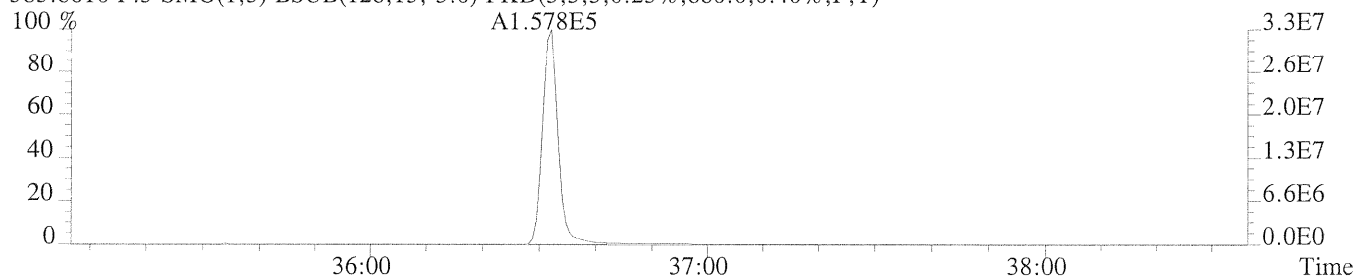
375.8178 F:3 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.25%,736.0,0.40%,F,T)



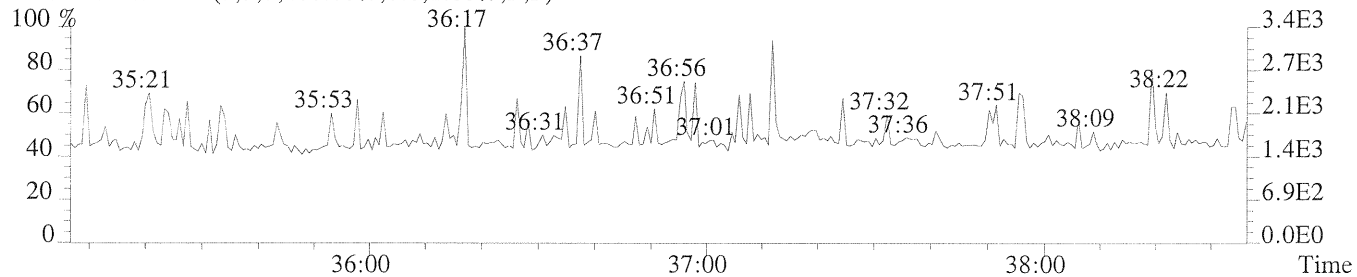
383.8639 F:3 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.25%,144.0,0.40%,F,T)



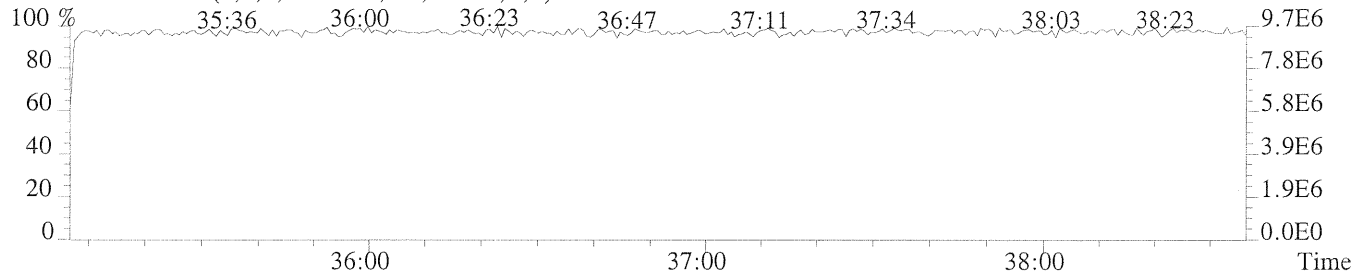
385.8610 F:3 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.25%,880.0,0.40%,F,T)



445.7555 F:3 PKD(5,3,5,100.00%,0.0,1.00%,F,F)



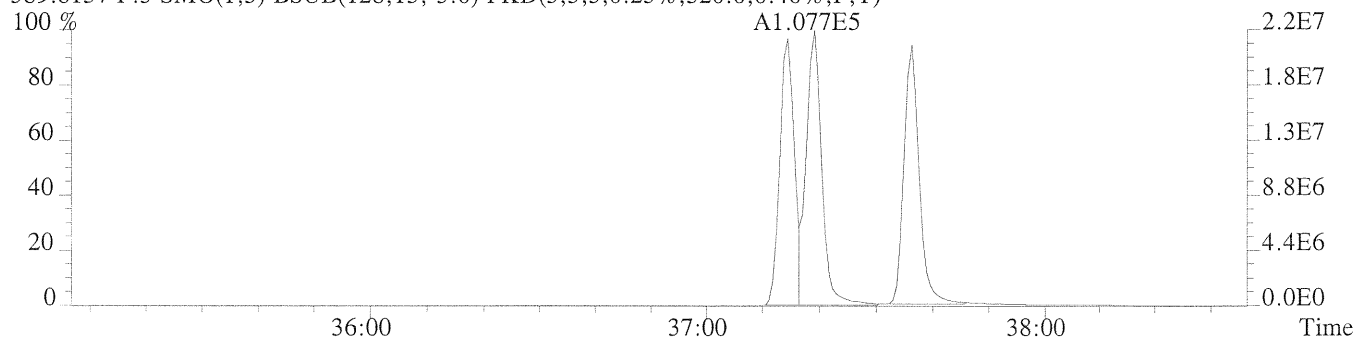
430.9728 F:3 PKD(3,3,3,100.00%,0.0,1.00%,F,F)



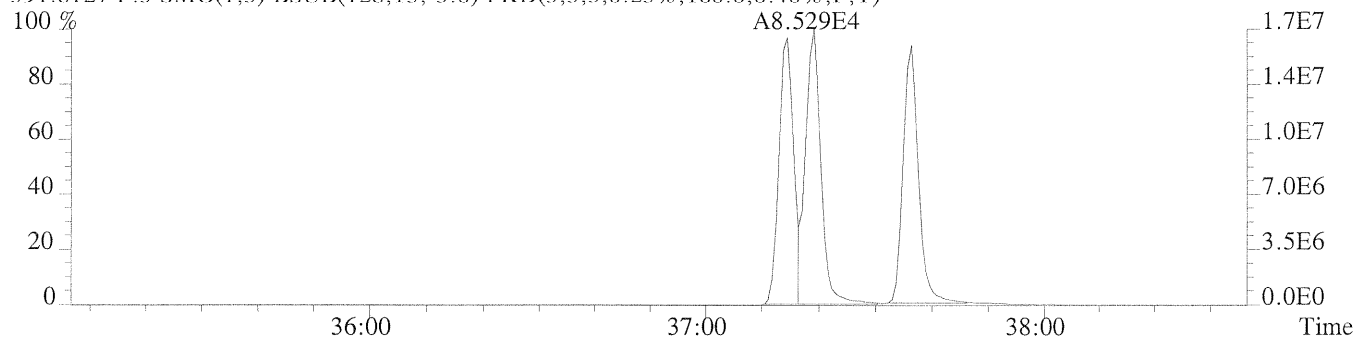
File:P200034 #1-318 Acq: 1-AUG-2008 18:16:07 Probe EI+ Magnet SIR VG BioTech Mass spectf

Sample#1 Exp:ICAL HRCC4

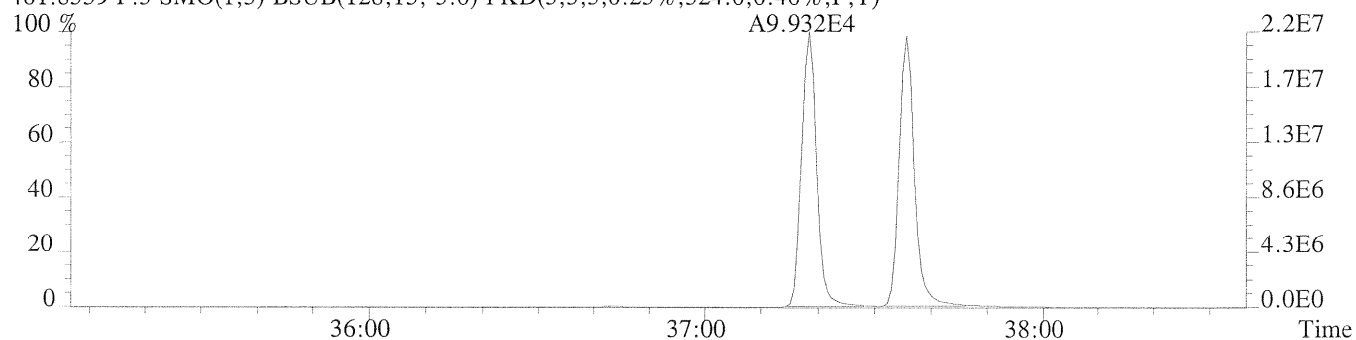
389.8157 F:3 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.25%,520.0,0.40%,F,T)



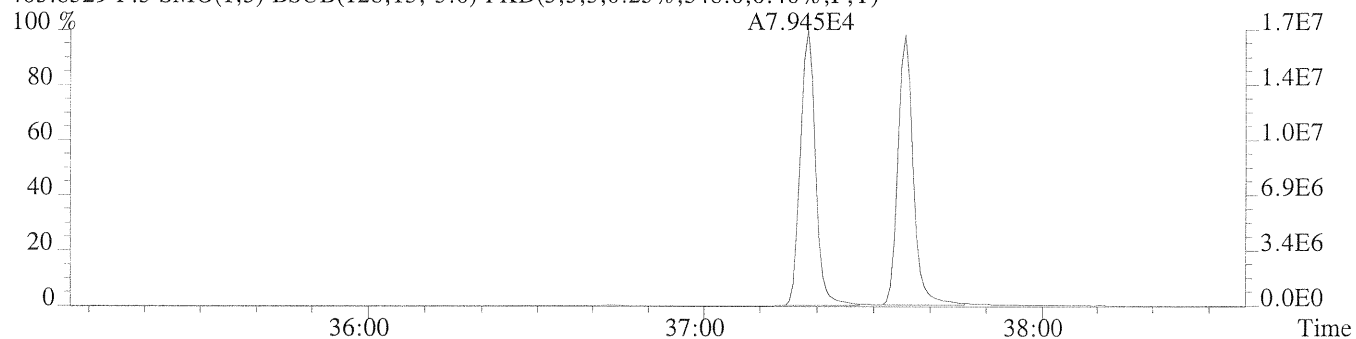
391.8127 F:3 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.25%,160.0,0.40%,F,T)



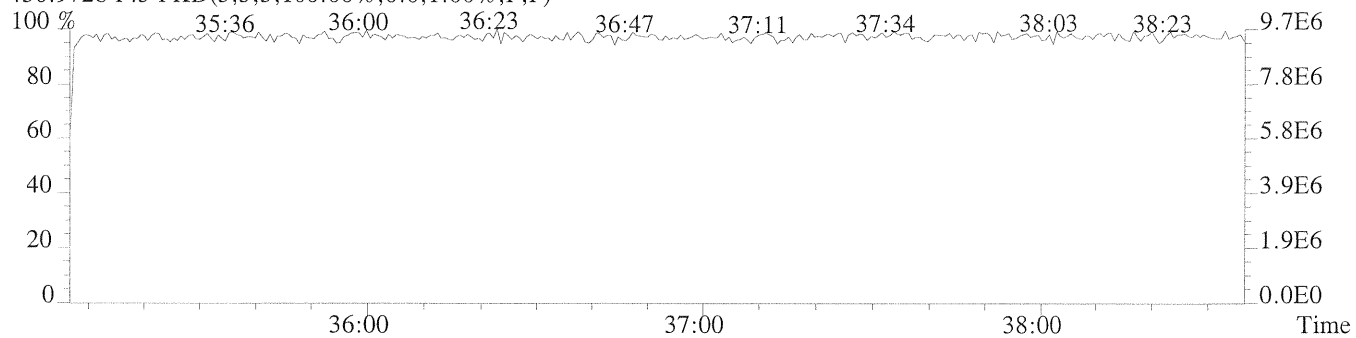
401.8559 F:3 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.25%,324.0,0.40%,F,T)



403.8529 F:3 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.25%,548.0,0.40%,F,T)

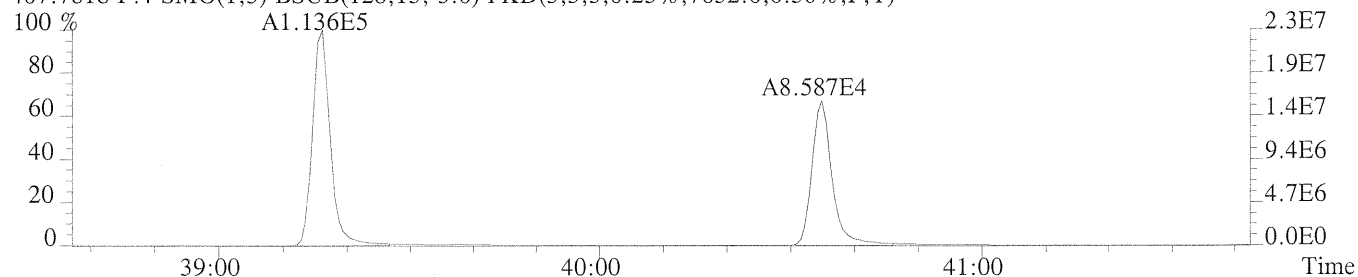


430.9728 F:3 PKD(3,3,3,100.00%,0.0,1.00%,F,F)

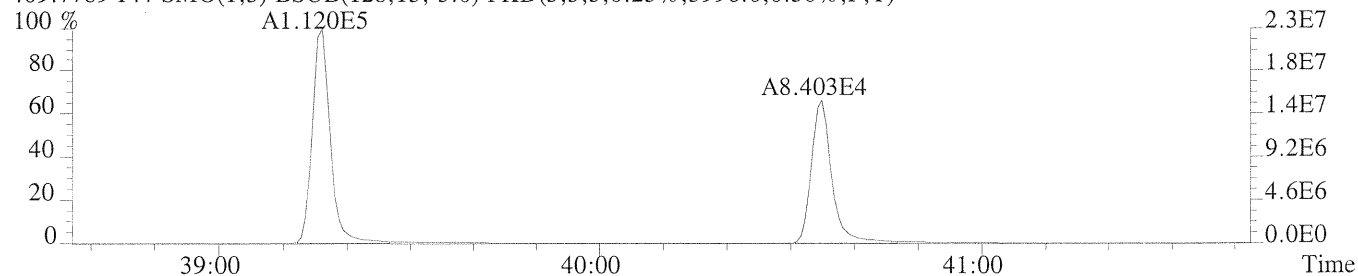


File:P200034 #1-281 Acq: 1-AUG-2008 18:16:07 Probe EI+ Magnet SIR VG BioTech Mass spectf
Sample#1 Exp:ICAL HRCC4

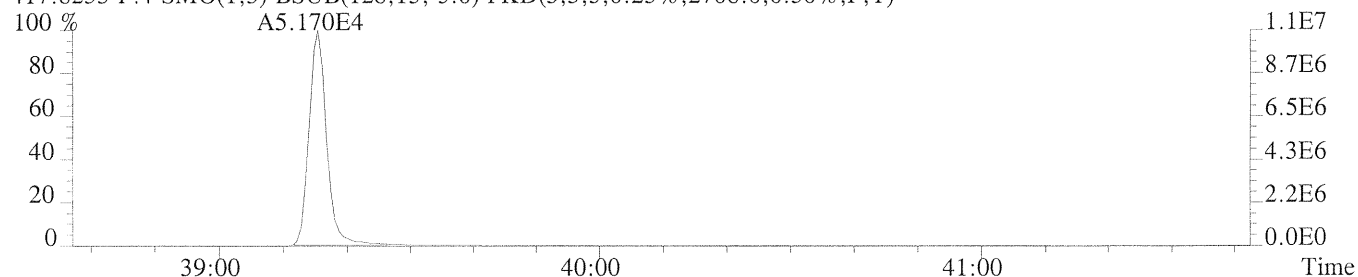
407.7818 F:4 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.25%,7652.0,0.50%,F,T)



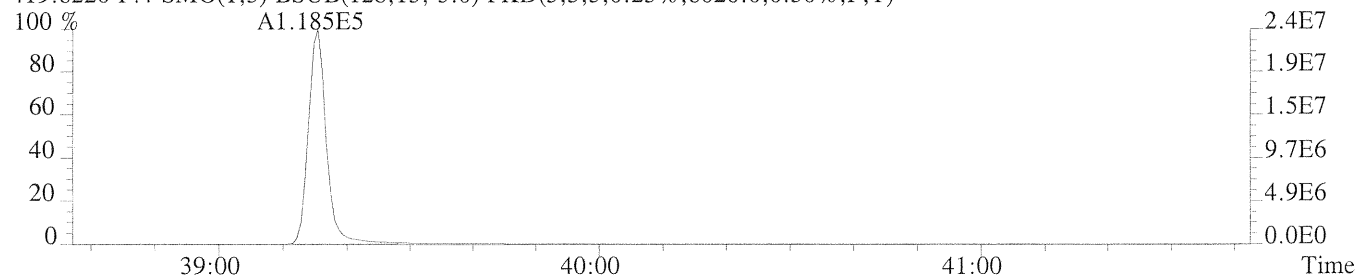
409.7789 F:4 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.25%,5996.0,0.50%,F,T)



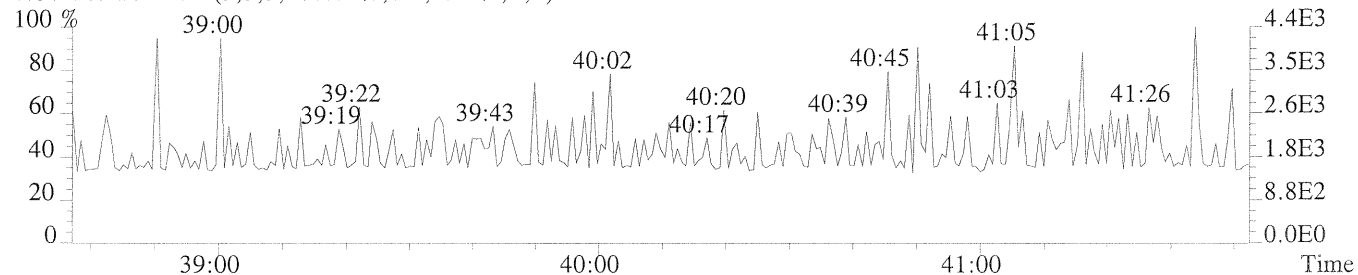
417.8253 F:4 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.25%,2708.0,0.50%,F,T)



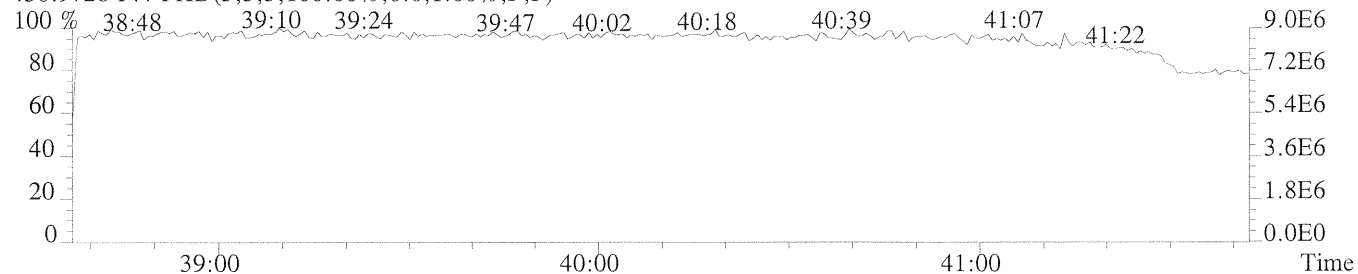
419.8220 F:4 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.25%,8020.0,0.50%,F,T)



479.7165 F:4 PKD(5,3,5,100.00%,0.0,1.00%,F,F)



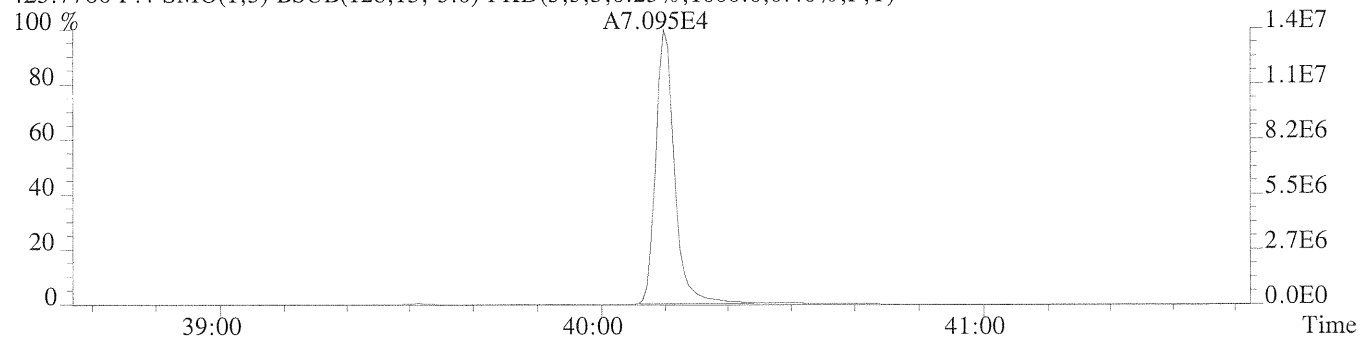
430.9728 F:4 PKD(3,3,3,100.00%,0.0,1.00%,F,F)



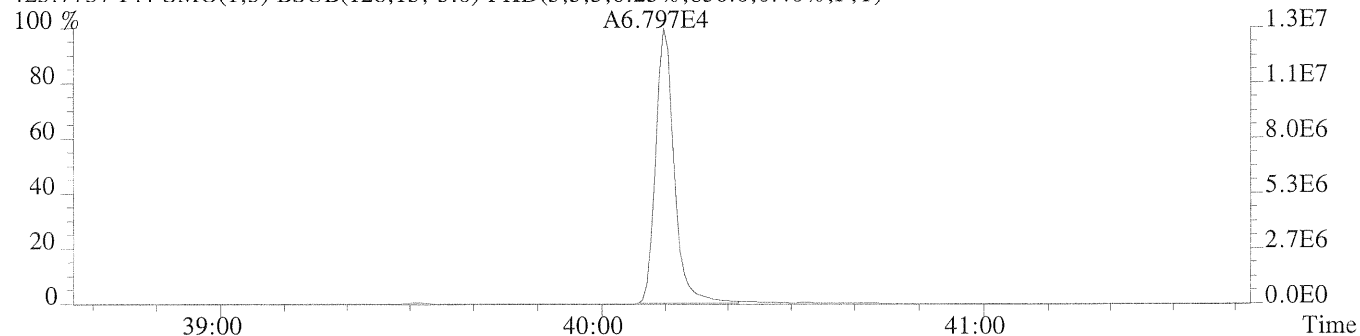
File:P200034 #1-281 Acq: 1-AUG-2008 18:16:07 Probe EI+ Magnet SIR VG BioTech Mass spectf

Sample#1 Exp:ICAL HRCC4

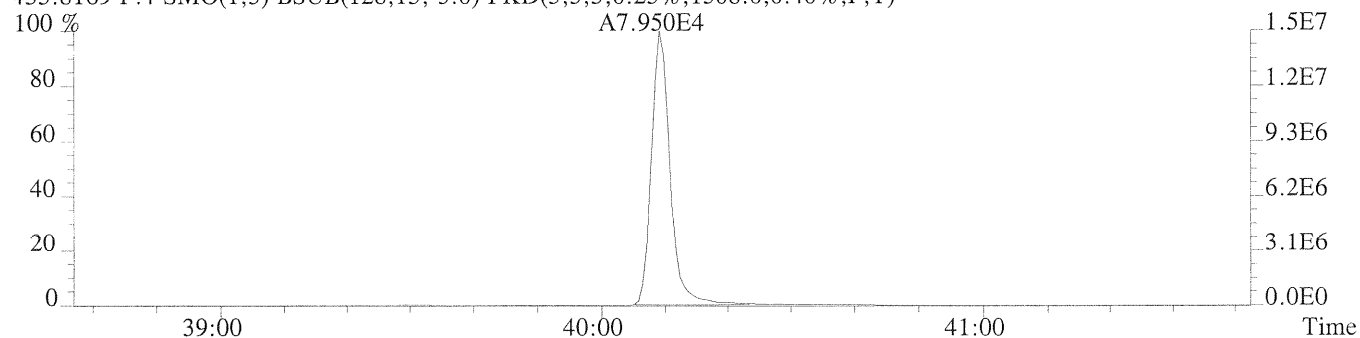
423.7766 F:4 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.25%,1000.0,0.40%,F,T)



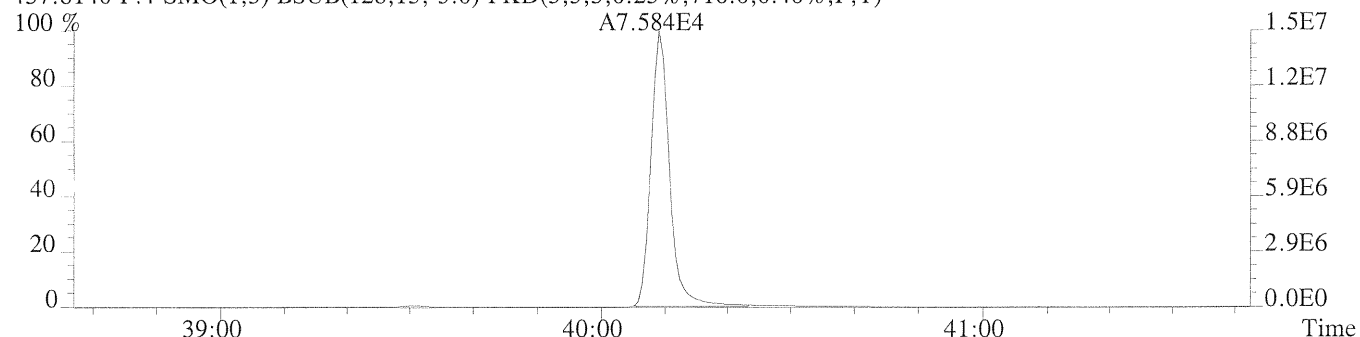
425.7737 F:4 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.25%,856.0,0.40%,F,T)



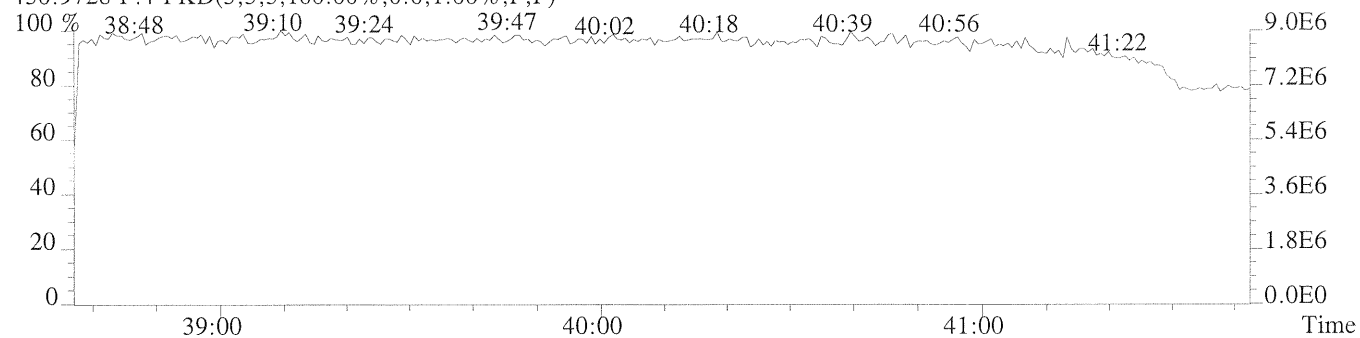
435.8169 F:4 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.25%,1508.0,0.40%,F,T)



437.8140 F:4 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.25%,716.0,0.40%,F,T)

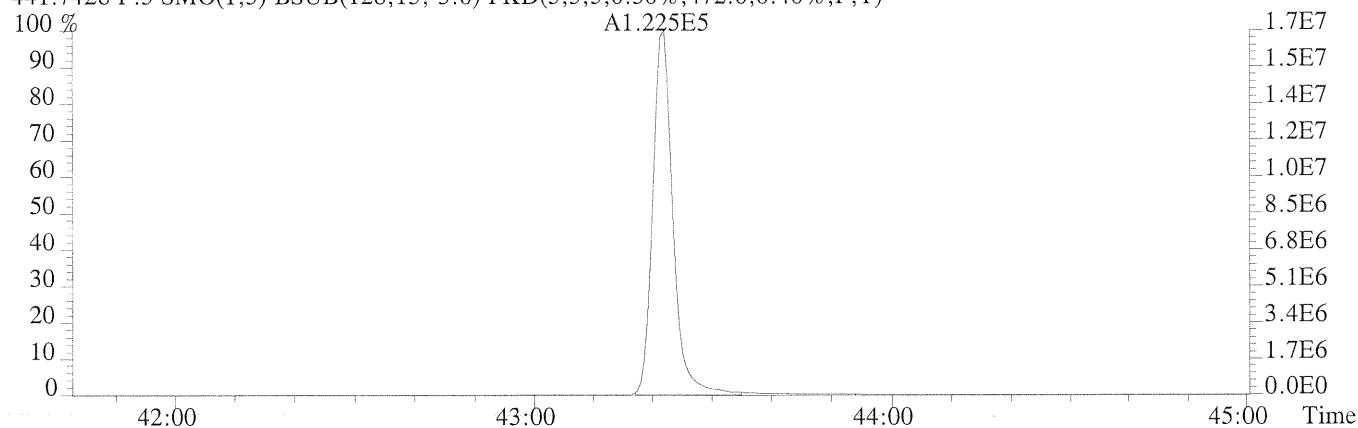


430.9728 F:4 PKD(3,3,3,100.00%,0.0,1.00%,F,F)

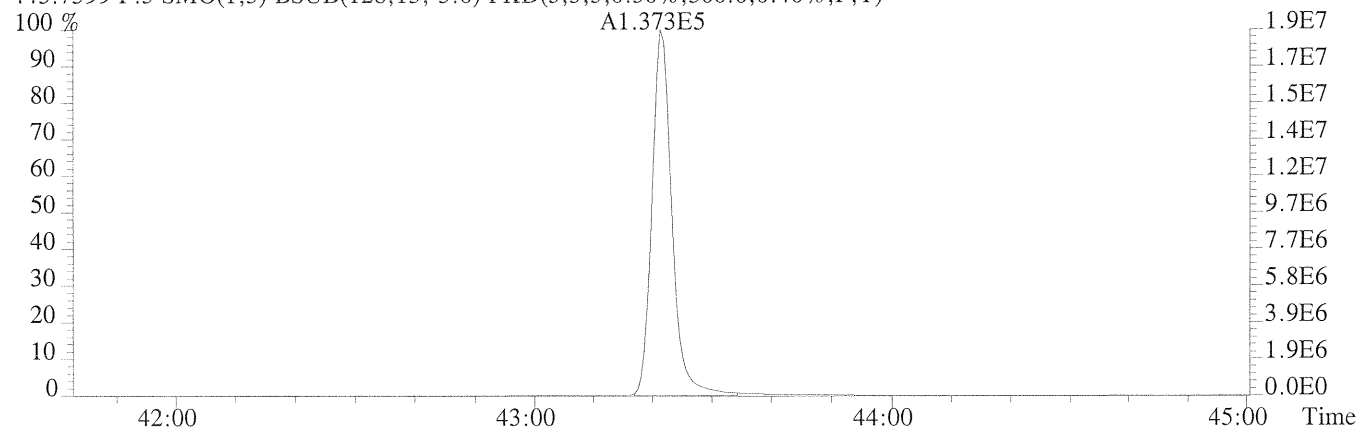


File:P200034 #1-364 Acq: 1-AUG-2008 18:16:07 Probe EI+ Magnet SIR VG BioTech Mass spectf
Sample#1 Exp:ICAL HRCC4

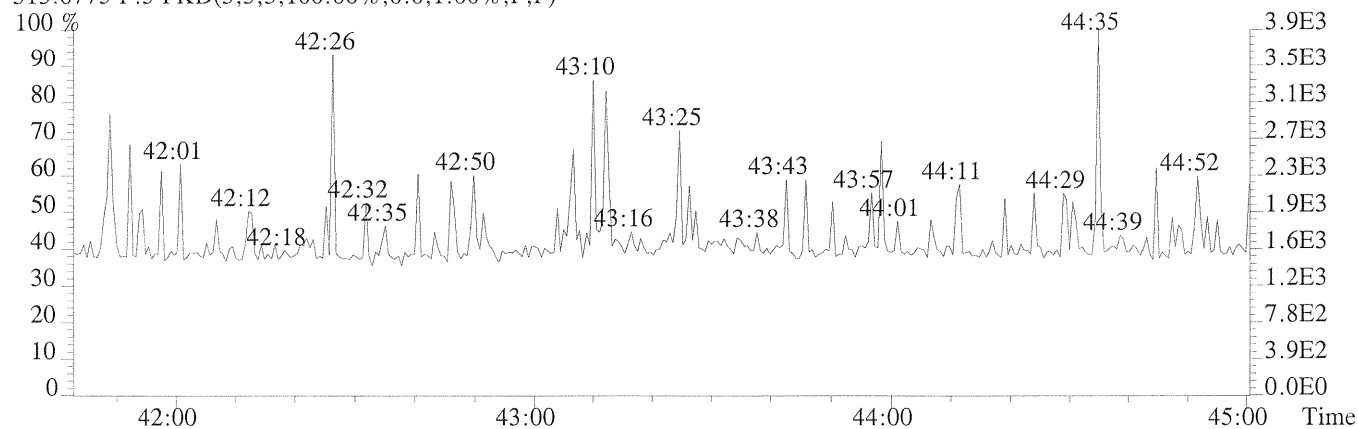
441.7428 F:5 SMO(1,3) BSUB(128,15,-3.0) PKD(5,3,5,0.30%,472.0,0.40%,F,T)



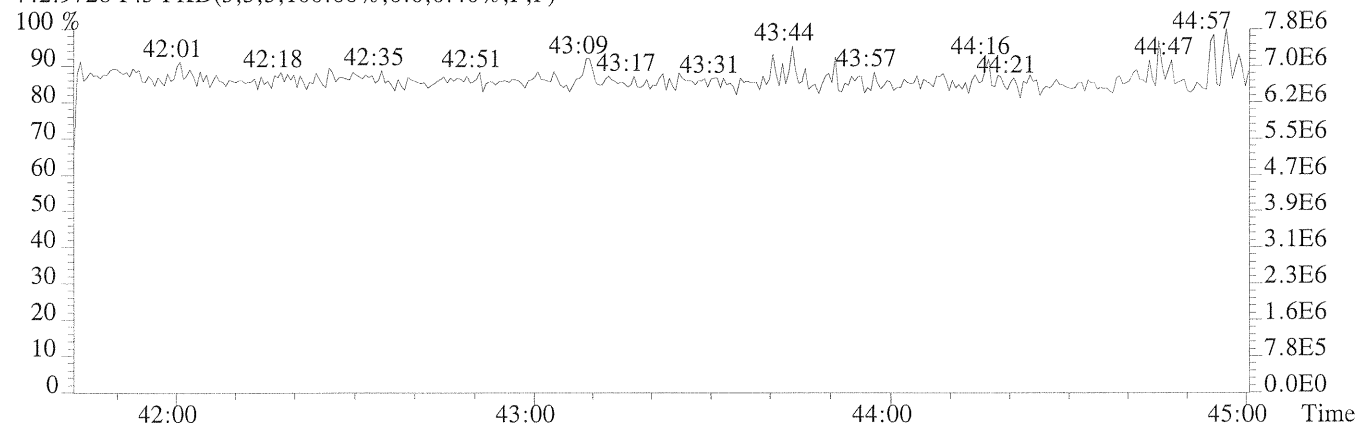
443.7399 F:5 SMO(1,3) BSUB(128,15,-3.0) PKD(5,3,5,0.30%,300.0,0.40%,F,T)



513.6775 F:5 PKD(5,3,5,100.00%,0.0,1.00%,F,F)



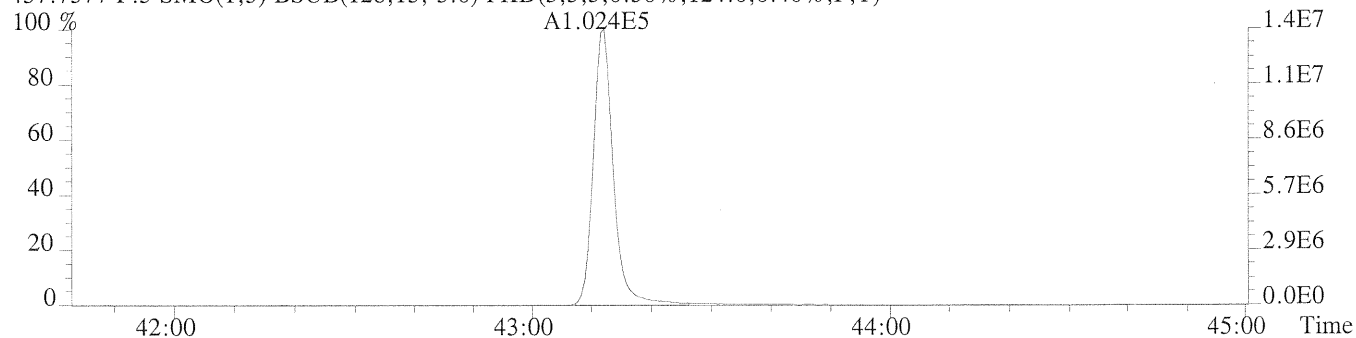
442.9728 F:5 PKD(3,3,3,100.00%,0.0,0.40%,F,F)



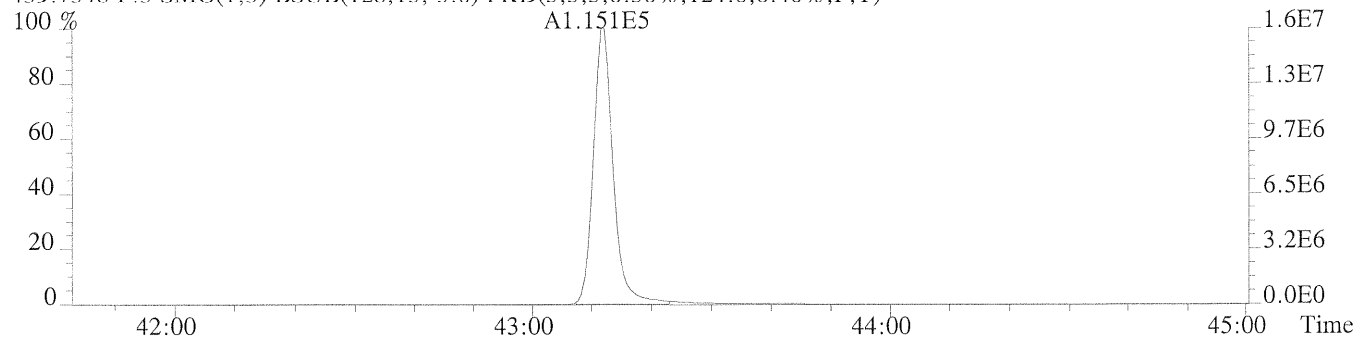
File:P200034 #1-364 Acq: 1-AUG-2008 18:16:07 Probe EI+ Magnet SIR VG BioTech Mass spectf

Sample#1 Exp:ICAL HRCC4

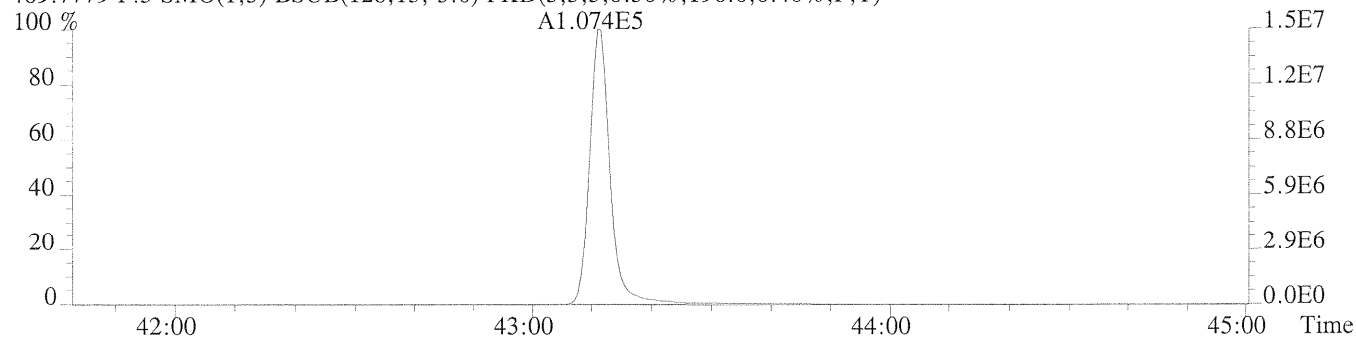
457.7377 F:5 SMO(1,3) BSUB(128,15,-3.0) PKD(5,3,5,0.30%,124.0,0.40%,F,T)



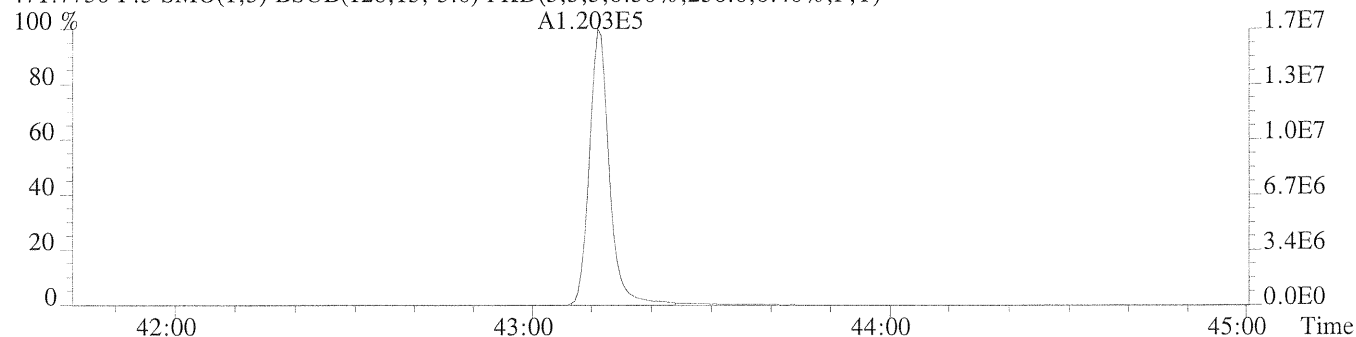
459.7348 F:5 SMO(1,3) BSUB(128,15,-3.0) PKD(5,3,5,0.30%,124.0,0.40%,F,T)



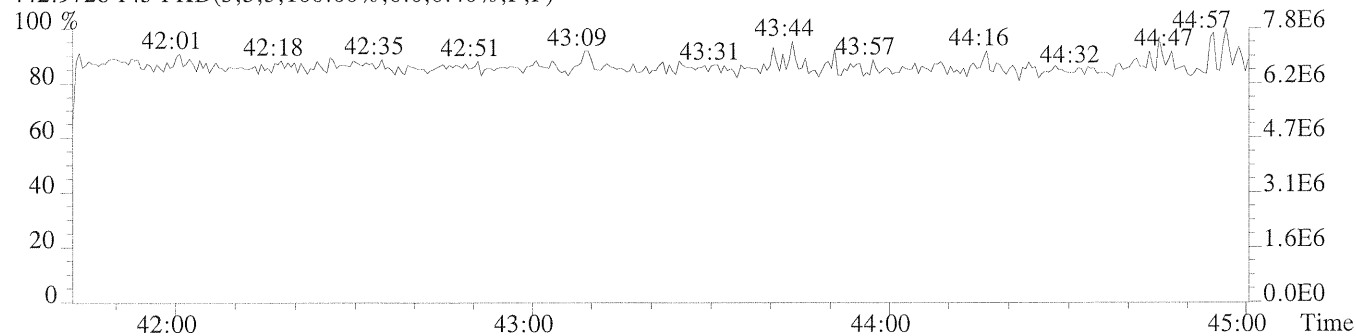
469.7779 F:5 SMO(1,3) BSUB(128,15,-3.0) PKD(5,3,5,0.30%,196.0,0.40%,F,T)



471.7750 F:5 SMO(1,3) BSUB(128,15,-3.0) PKD(5,3,5,0.30%,256.0,0.40%,F,T)



442.9728 F:5 PKD(3,3,3,100.00%,0.0,0.40%,F,F)



Columbia Analytical Services, Inc.
Sample Response Summary

CLIENT ID.
ICAL HRCC5

Run #5 Filename P200035 #1 Samp: 1 Inj: 1 Acquired: 1-AUG-08 19:02:53
Processed: 14-APR-10 10:16:05 LAB. ID: ICAL HRCC5

	Typ	Name	RT-1	Resp 1	Resp 2	Ratio	Meet	Mod?	RRT
1	Unk	2,3,7,8-TCDF	28:37	2.778e+05	3.613e+05	0.77	yes	no	1.001
2	Unk	1,2,3,7,8-PeCDF	32:59	9.322e+05	6.026e+05	1.55	yes	no	1.001
3	Unk	2,3,4,7,8-PeCDF	33:43	9.532e+05	6.205e+05	1.54	yes	no	1.023
4	Unk	1,2,3,4,7,8-HxCDF	36:33	8.312e+05	6.806e+05	1.22	yes	no	1.000
5	Unk	1,2,3,6,7,8-HxCDF	36:39	8.708e+05	7.082e+05	1.23	yes	no	1.003
6	Unk	2,3,4,6,7,8-HxCDF	37:07	7.911e+05	6.456e+05	1.23	yes	no	1.016
7	Unk	1,2,3,7,8,9-HxCDF	37:50	6.855e+05	5.576e+05	1.23	yes	no	1.036
8	Unk	1,2,3,4,6,7,8-HpCDF	39:16	6.364e+05	6.238e+05	1.02	yes	no	1.000
9	Unk	1,2,3,4,7,8,9-HpCDF	40:35	4.796e+05	4.689e+05	1.02	yes	no	1.034
10	Unk	OCDF	43:22	9.366e+05	1.046e+06	0.90	yes	no	1.004
11	Unk	2,3,7,8-TCDD	29:27	2.403e+05	3.098e+05	0.78	yes	no	1.001
12	Unk	1,2,3,7,8-PeCDD	34:05	7.049e+05	4.546e+05	1.55	yes	no	1.001
13	Unk	1,2,3,4,7,8-HxCDD	37:14	5.947e+05	4.721e+05	1.26	yes	no	0.998
14	Unk	1,2,3,6,7,8-HxCDD	37:19	6.719e+05	5.342e+05	1.26	yes	no	1.000
15	Unk	1,2,3,7,8,9-HxCDD	37:36	6.157e+05	4.966e+05	1.24	yes	no	1.008
16	Unk	1,2,3,4,6,7,8-HpCDD	40:10	4.218e+05	4.060e+05	1.04	yes	no	1.000
17	Unk	OCDD	43:12	8.683e+05	9.782e+05	0.89	yes	no	1.000
18	IS	13C-2,3,7,8-TCDF	28:35	8.257e+04	1.055e+05	0.78	yes	no	0.978
19	IS	13C-1,2,3,7,8-PeCDF	32:58	1.099e+05	7.109e+04	1.55	yes	no	1.128
20	IS	13C-1,2,3,4,7,8-HxCDF	36:32	1.196e+05	2.284e+05	0.52	yes	no	0.972
21	IS	13C-1,2,3,4,6,7,8-HpCDF	39:16	7.259e+04	1.645e+05	0.44	yes	no	1.044
22	IS	13C-2,3,7,8-TCDD	29:26	6.508e+04	8.401e+04	0.77	yes	no	1.007
23	IS	13C-1,2,3,7,8-PeCDD	34:03	7.915e+04	5.063e+04	1.56	yes	no	1.165
24	IS	13C-1,2,3,6,7,8-HxCDD	37:18	1.553e+05	1.236e+05	1.26	yes	no	0.992
25	IS	13C-1,2,3,4,6,7,8-HpCDD	40:09	1.176e+05	1.132e+05	1.04	yes	no	1.068
26	IS	13C-OCDD	43:12	2.227e+05	2.491e+05	0.89	yes	no	1.149
27	RS/RT	13C-1,2,3,4-TCDD	29:14	6.008e+04	7.642e+04	0.79	yes	no	*
28	RS/RT	13C-1,2,3,7,8,9-HxCDD	37:36	1.569e+05	1.263e+05	1.24	yes	no	*
29	C/Up	37Cl-2,3,7,8-TCDD	29:27	5.587e+05				no	1.007

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Columbia Analytical Services, Inc.
Signal/Noise Height Ratio Summary

CLIENT ID.
ICAL HRCC5

Run #5 Filename P200035 Samp: 1 Inj: 1 Acquired: 1-AUG-08 19:02:53
Processed: 14-APR-10 10:16:051 LAB. ID: ICAL HRCC5

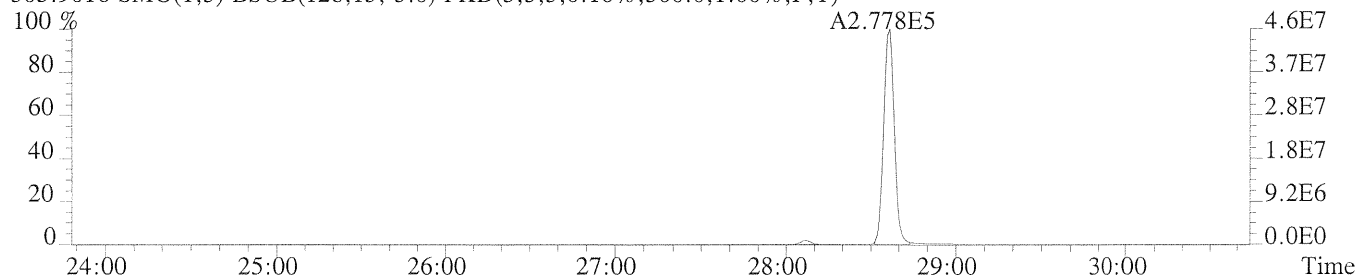
	Name	Signal 1	Noise 1	S/N Rat.1	Signal 2	Noise 2	S/N Rat.2
1	2,3,7,8-TCDF	4.60e+07	3.00e+02	1.5e+05	5.95e+07	4.96e+02	1.2e+05
2	1,2,3,7,8-PeCDF	1.81e+08	2.52e+02	7.2e+05	1.16e+08	7.64e+02	1.5e+05
3	2,3,4,7,8-PeCDF	1.88e+08	2.52e+02	7.5e+05	1.23e+08	7.64e+02	1.6e+05
4	1,2,3,4,7,8-HxCDF	1.85e+08	2.30e+03	8.0e+04	1.50e+08	1.08e+03	1.4e+05
5	1,2,3,6,7,8-HxCDF	1.78e+08	2.30e+03	7.7e+04	1.44e+08	1.08e+03	1.3e+05
6	2,3,4,6,7,8-HxCDF	1.65e+08	2.30e+03	7.2e+04	1.36e+08	1.08e+03	1.3e+05
7	1,2,3,7,8,9-HxCDF	1.44e+08	2.30e+03	6.3e+04	1.18e+08	1.08e+03	1.1e+05
8	1,2,3,4,6,7,8-HpCDF	1.37e+08	3.50e+04	3.9e+03	1.34e+08	1.74e+04	7.7e+03
9	1,2,3,4,7,8,9-HpCDF	9.45e+07	3.50e+04	2.7e+03	9.17e+07	1.74e+04	5.3e+03
10	OCDF	1.39e+08	1.36e+02	1.0e+06	1.54e+08	5.12e+02	3.0e+05
11	2,3,7,8-TCDD	4.32e+07	3.08e+02	1.4e+05	5.59e+07	2.36e+02	2.4e+05
12	1,2,3,7,8-PeCDD	1.40e+08	5.52e+02	2.5e+05	8.94e+07	1.88e+02	4.8e+05
13	1,2,3,4,7,8-HxCDD	1.39e+08	8.12e+02	1.7e+05	1.10e+08	5.16e+02	2.1e+05
14	1,2,3,6,7,8-HxCDD	1.41e+08	8.12e+02	1.7e+05	1.13e+08	5.16e+02	2.2e+05
15	1,2,3,7,8,9-HxCDD	1.34e+08	8.12e+02	1.6e+05	1.08e+08	5.16e+02	2.1e+05
16	1,2,3,4,6,7,8-HpCDD	8.74e+07	1.59e+03	5.5e+04	8.47e+07	1.03e+03	8.2e+04
17	OCDD	1.33e+08	1.36e+02	9.8e+05	1.49e+08	1.04e+02	1.4e+06
18	13C-2,3,7,8-TCDF	1.37e+07	9.56e+02	1.4e+04	1.76e+07	5.84e+02	3.0e+04
19	13C-1,2,3,7,8-PeCDF	2.12e+07	3.52e+02	6.0e+04	1.38e+07	4.60e+02	3.0e+04
20	13C-1,2,3,4,7,8-HxCDF	2.55e+07	4.96e+02	5.1e+04	4.85e+07	9.28e+02	5.2e+04
21	13C-1,2,3,4,6,7,8-HpCDF	1.57e+07	3.83e+03	4.1e+03	3.54e+07	5.94e+03	6.0e+03
22	13C-2,3,7,8-TCDD	1.14e+07	1.57e+03	7.2e+03	1.47e+07	7.80e+02	1.9e+04
23	13C-1,2,3,7,8-PeCDD	1.58e+07	3.56e+02	4.4e+04	1.02e+07	1.28e+02	7.9e+04
24	13C-1,2,3,6,7,8-HxCDD	3.46e+07	2.84e+02	1.2e+05	2.75e+07	8.88e+02	3.1e+04
25	13C-1,2,3,4,6,7,8-HpCDD	2.45e+07	1.56e+03	1.6e+04	2.34e+07	2.64e+02	8.9e+04
26	13C-OCDD	3.42e+07	1.16e+02	2.9e+05	3.79e+07	1.08e+02	3.5e+05
27	13C-1,2,3,4-TCDD	1.07e+07	1.57e+03	6.8e+03	1.36e+07	7.80e+02	1.7e+04
28	13C-1,2,3,7,8,9-HxCDD	3.39e+07	2.84e+02	1.2e+05	2.72e+07	8.88e+02	3.1e+04
29	37Cl-2,3,7,8-TCDD	1.01e+08	2.60e+02	3.9e+05			

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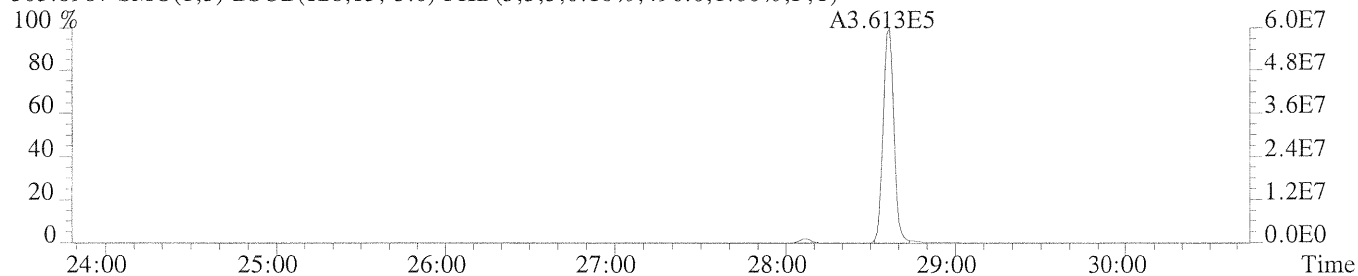
File:P200035 #1-578 Acq: 1-AUG-2008 19:02:53 Probe EI+ Magnet SIR VG BioTech Mass spectf

Sample#1 Exp:ICAL HRCC5

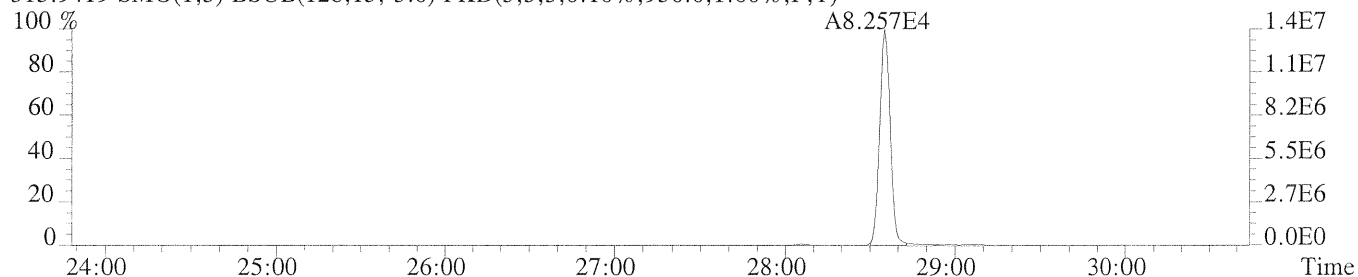
303.9016 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.10%,300.0,1.00%,F,T)



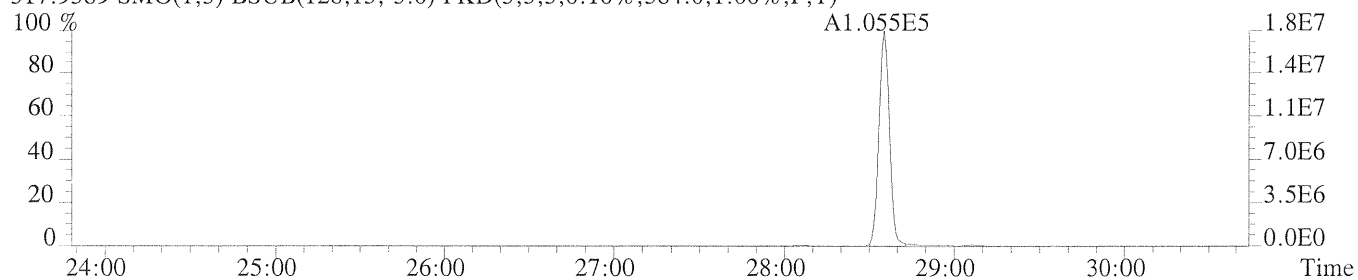
305.8987 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.10%,496.0,1.00%,F,T)



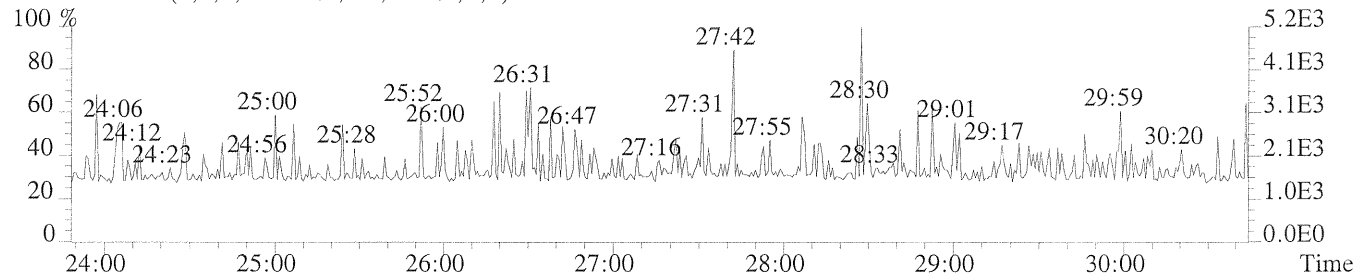
315.9419 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.10%,956.0,1.00%,F,T)



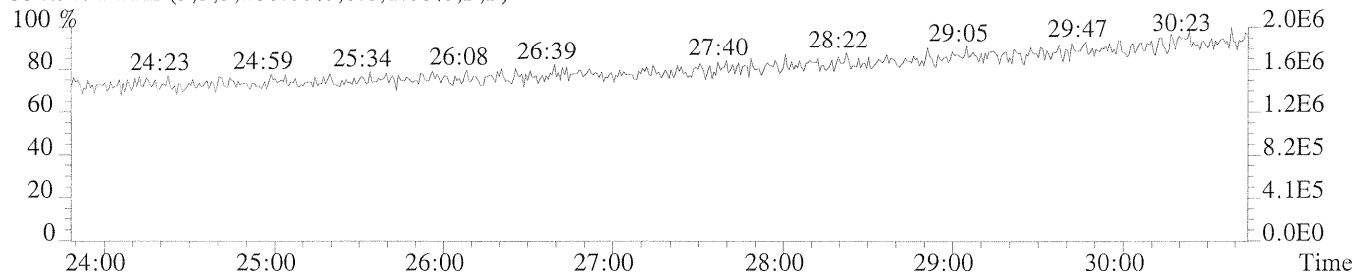
317.9389 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.10%,584.0,1.00%,F,T)



375.8364 PKD(5,3,5,100.00%,0.0,1.00%,F,F)



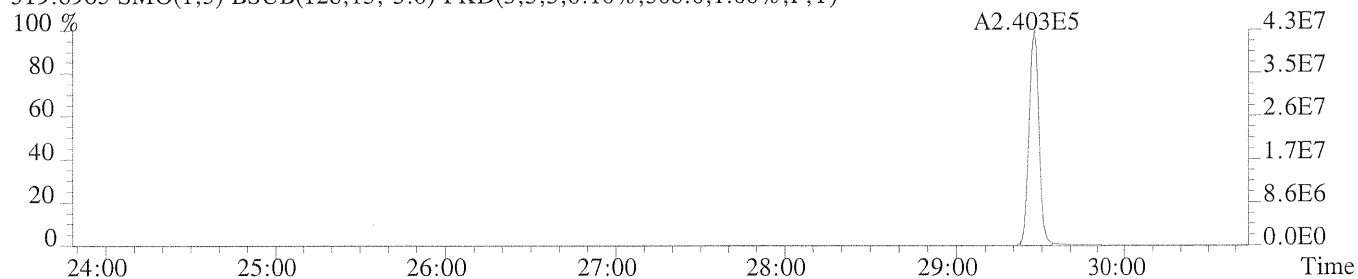
354.9792 PKD(3,3,3,100.00%,0.0,1.00%,F,F)



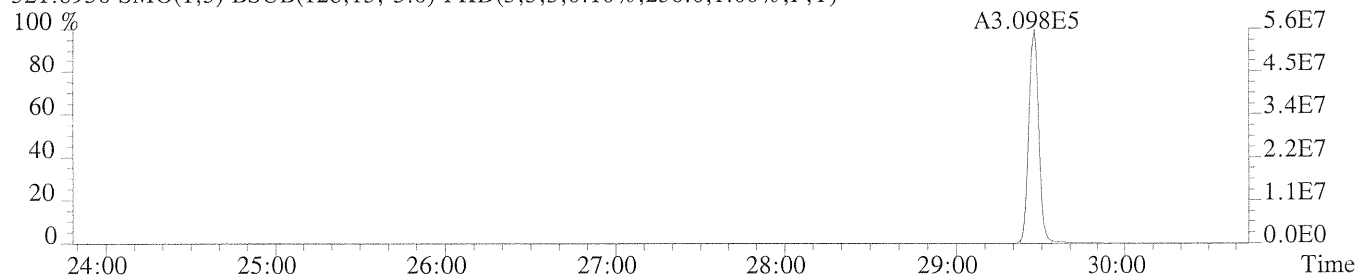
File:P200035 #1-578 Acq: 1-AUG-2008 19:02:53 Probe EI+ Magnet SIR VG BioTech Mass spectf

Sample#1 Exp:ICAL HRCC5

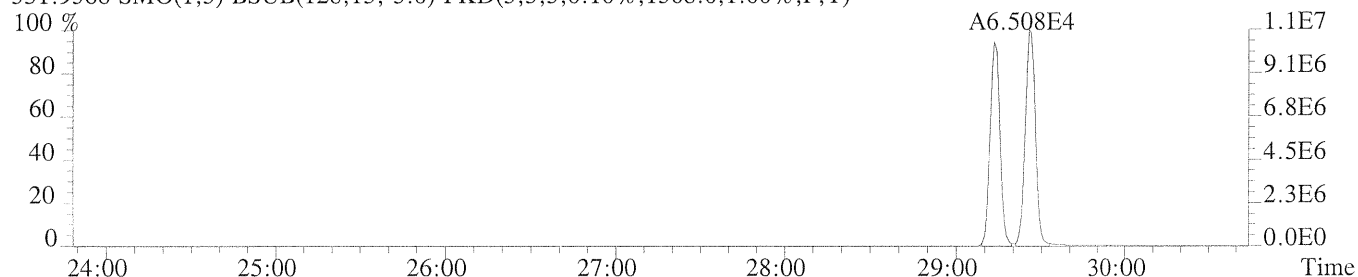
319.8965 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.10%,308.0,1.00%,F,T)



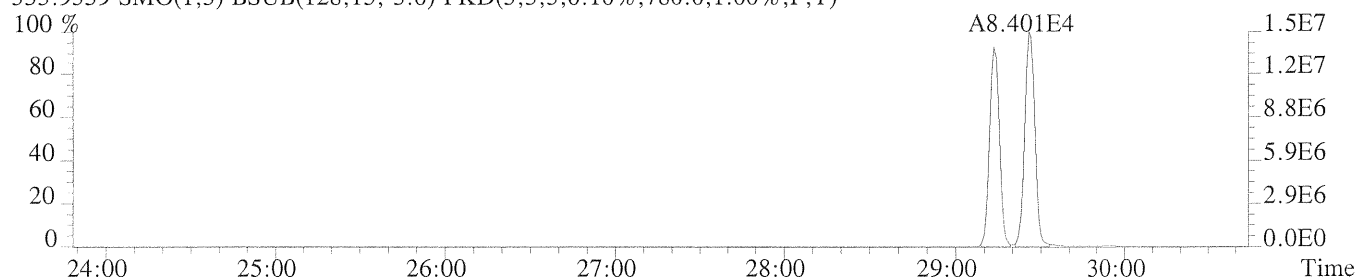
321.8936 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.10%,236.0,1.00%,F,T)



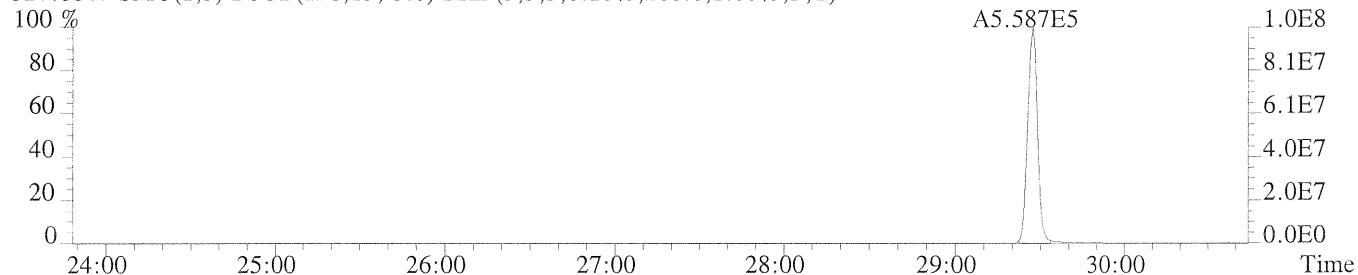
331.9368 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.10%,1568.0,1.00%,F,T)



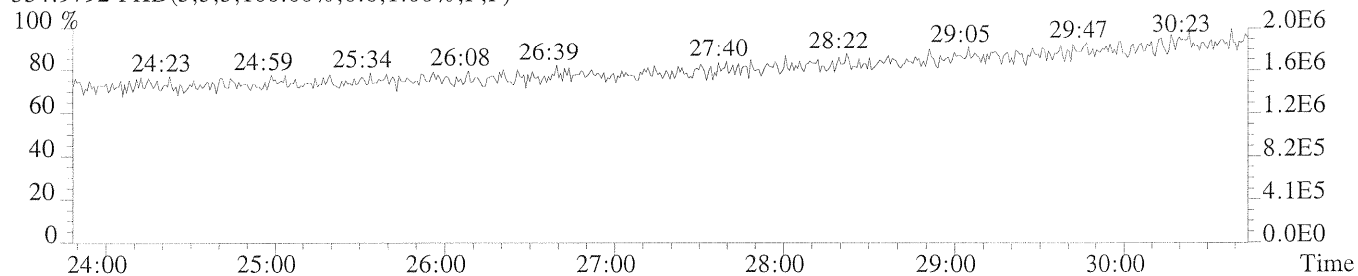
333.9339 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.10%,780.0,1.00%,F,T)



327.8847 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.10%,260.0,1.00%,F,T)



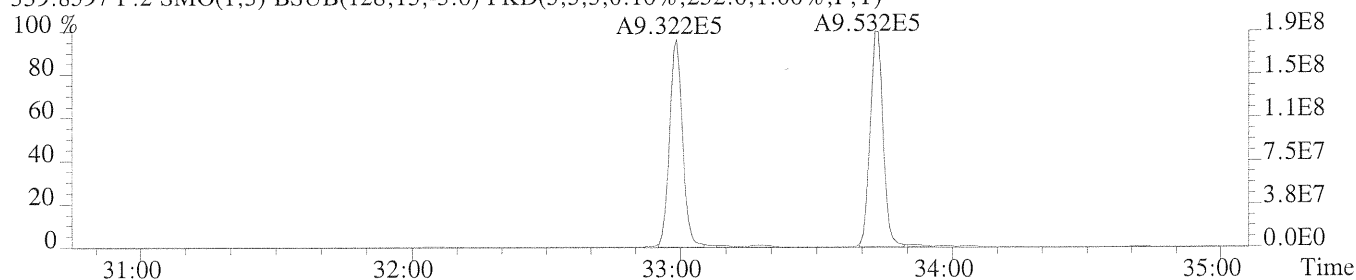
354.9792 PKD(3,3,3,100.00%,0.0,1.00%,F,F)



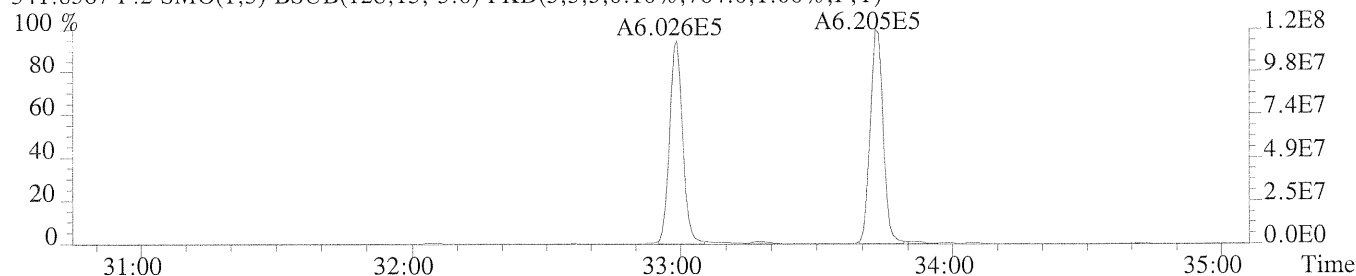
File:P200035 #1-396 Acq: 1-AUG-2008 19:02:53 Probe EI+ Magnet SIR VG BioTech Mass spectf

Sample#1 Exp:ICAL HRCC5

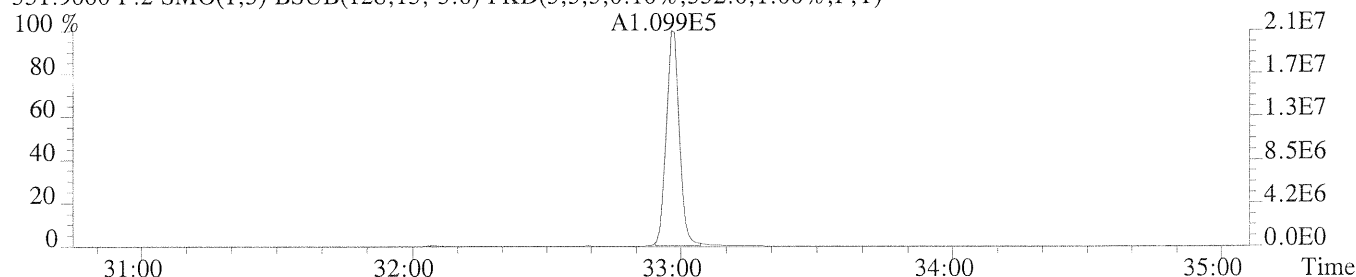
339.8597 F:2 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.10%,252.0,1.00%,F,T)



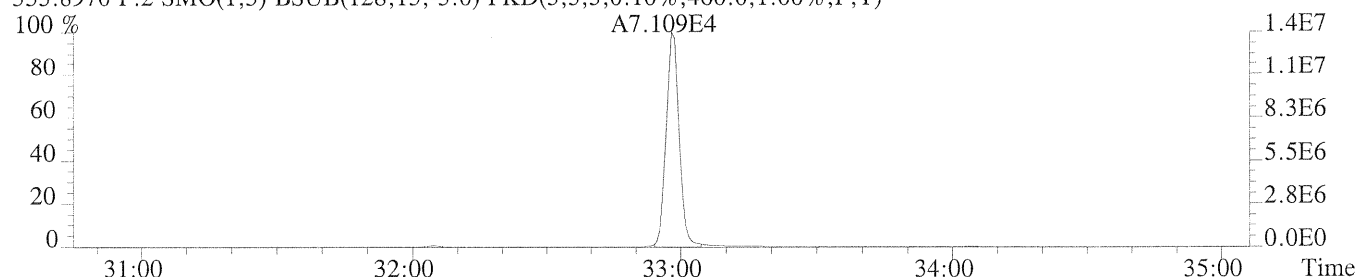
341.8567 F:2 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.10%,764.0,1.00%,F,T)



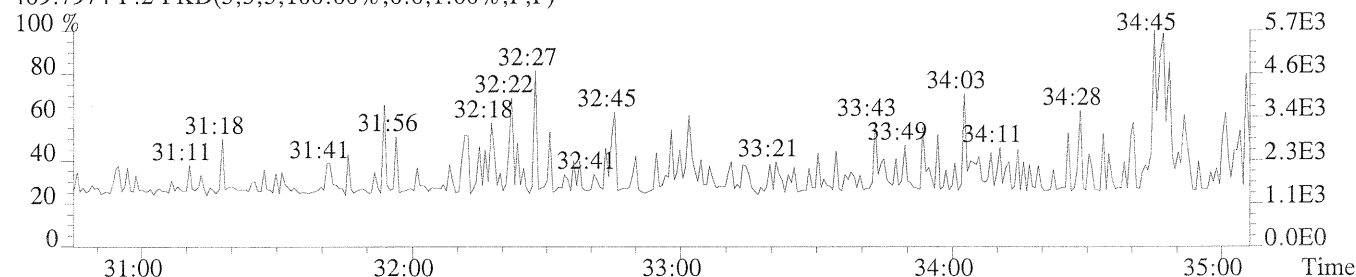
351.9000 F:2 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.10%,352.0,1.00%,F,T)



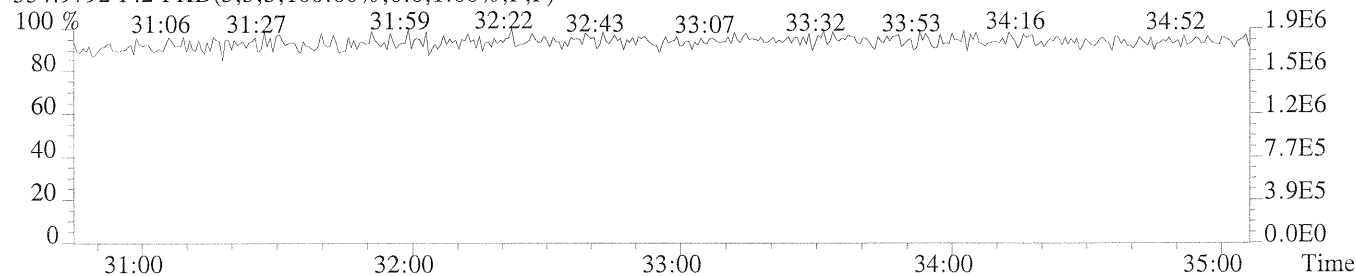
353.8970 F:2 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.10%,460.0,1.00%,F,T)



409.7974 F:2 PKD(5,3,5,100.00%,0.0,1.00%,F,F)



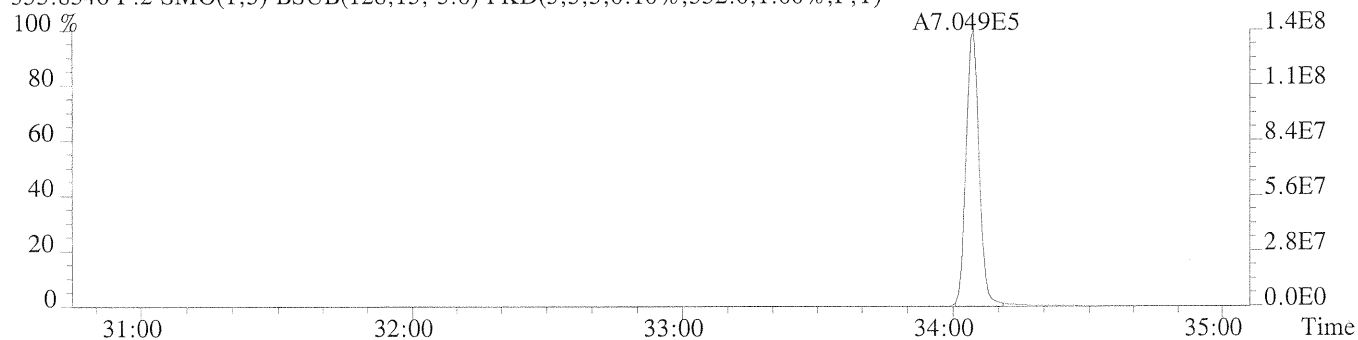
354.9792 F:2 PKD(3,3,3,100.00%,0.0,1.00%,F,F)



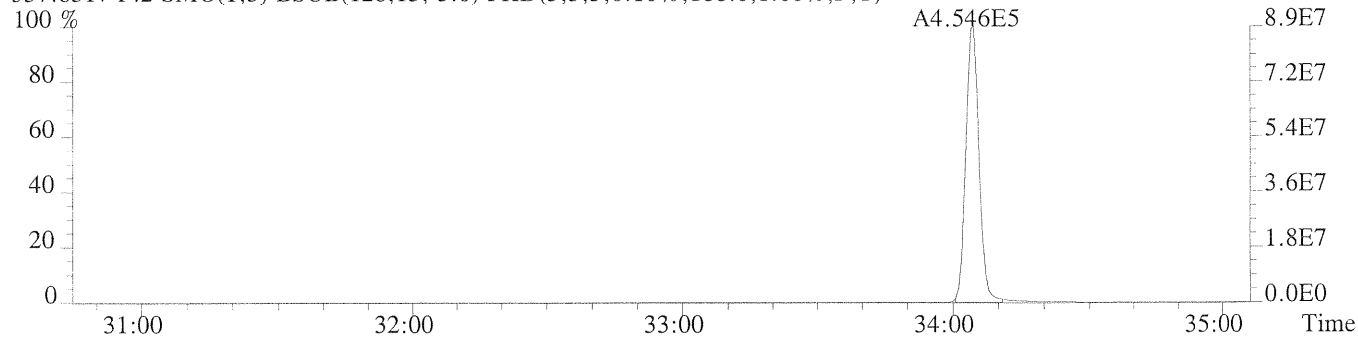
File:P200035 #1-396 Acq: 1-AUG-2008 19:02:53 Probe EI+ Magnet SIR VG BioTech Mass spectf

Sample#1 Exp:ICAL HRCC5

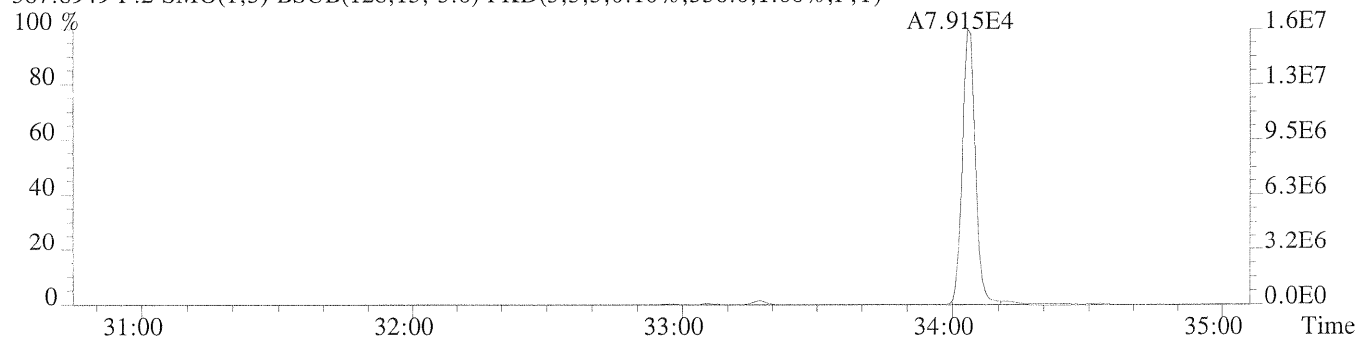
355.8546 F:2 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.10%,552.0,1.00%,F,T)



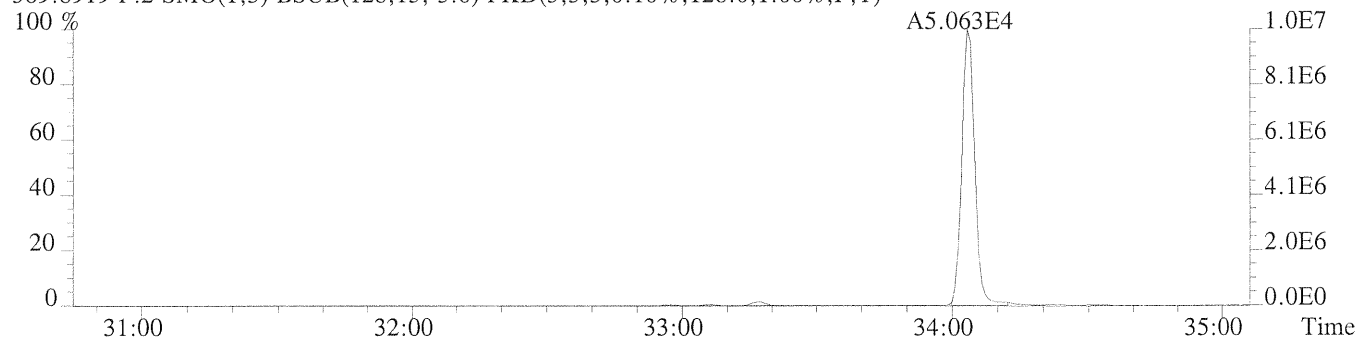
357.8517 F:2 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.10%,188.0,1.00%,F,T)



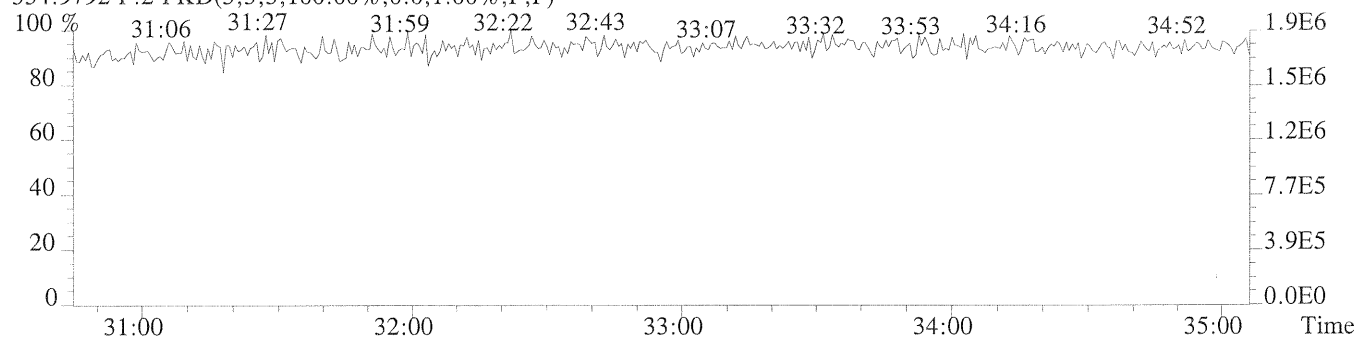
367.8949 F:2 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.10%,356.0,1.00%,F,T)



369.8919 F:2 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.10%,128.0,1.00%,F,T)



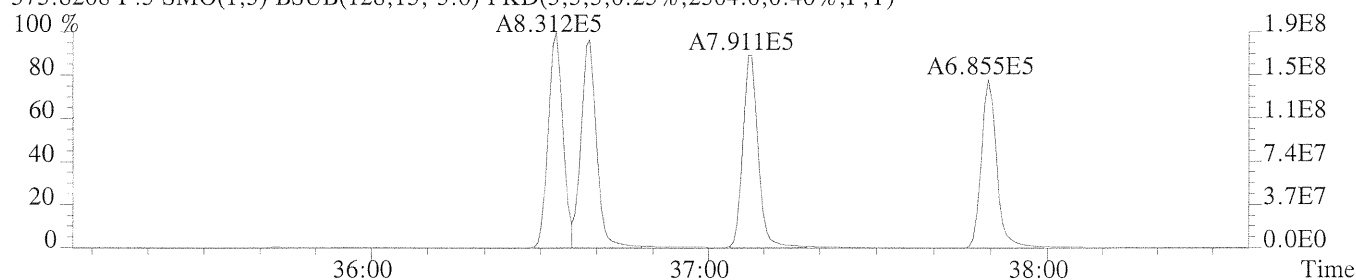
354.9792 F:2 PKD(3,3,3,100.00%,0.0,1.00%,F,F)



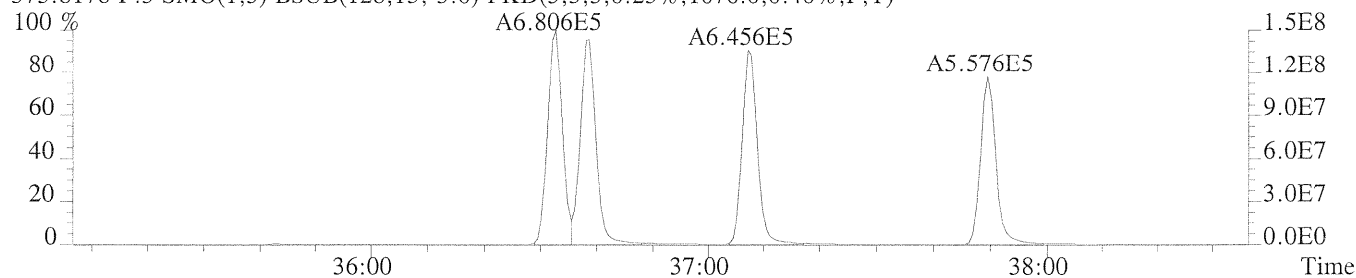
File:P200035 #1-318 Acq: 1-AUG-2008 19:02:53 Probe EI+ Magnet SIR VG BioTech Mass spectf

Sample#1 Exp:ICAL HRCC5

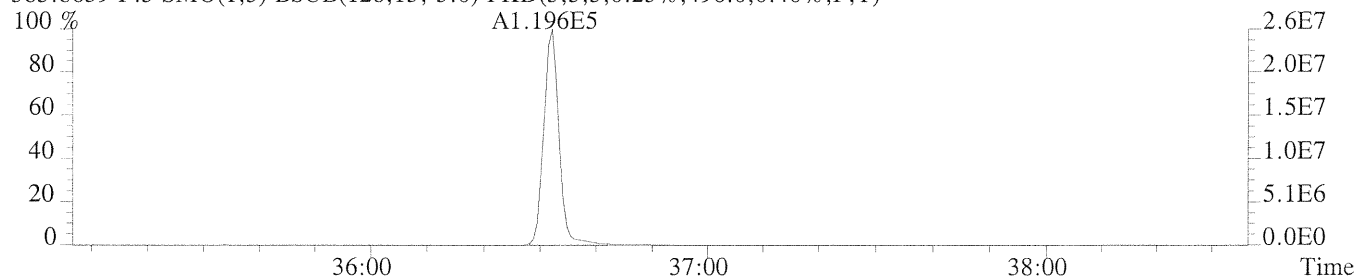
373.8208 F:3 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.25%,2304.0,0.40%,F,T)



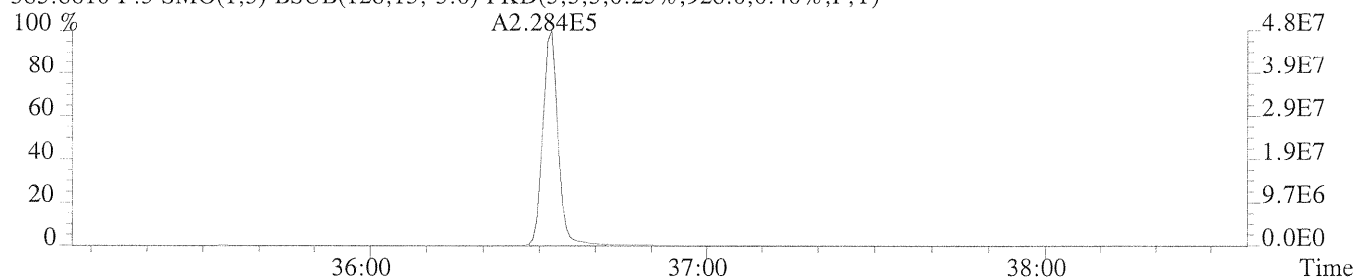
375.8178 F:3 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.25%,1076.0,0.40%,F,T)



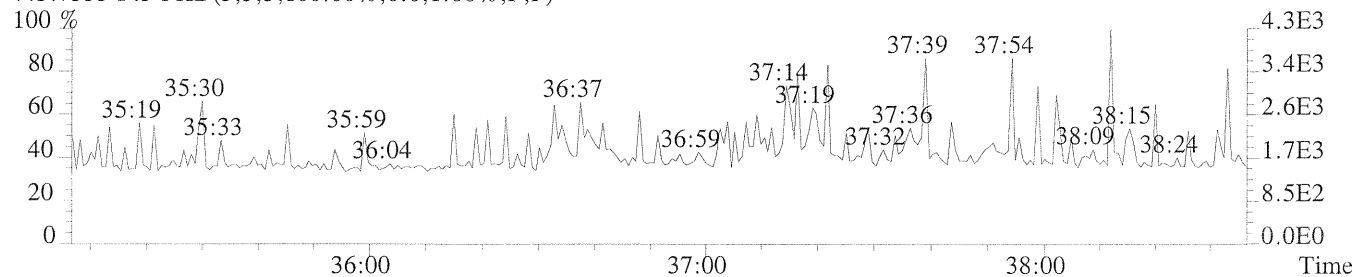
383.8639 F:3 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.25%,496.0,0.40%,F,T)



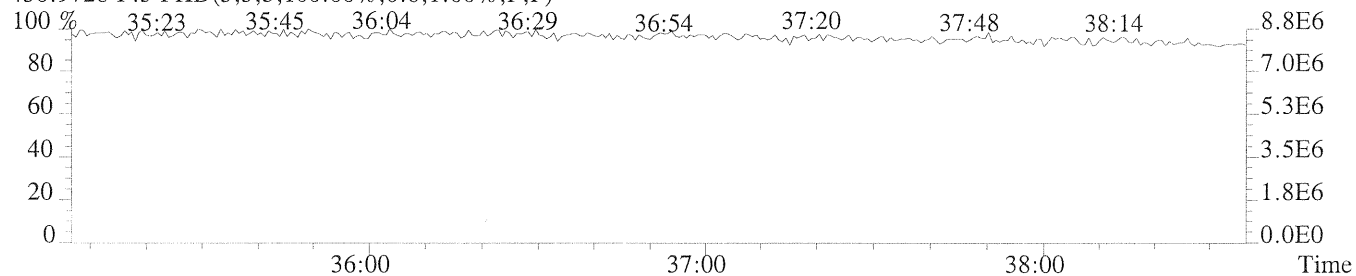
385.8610 F:3 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.25%,928.0,0.40%,F,T)



445.7555 F:3 PKD(5,3,5,100.00%,0.0,1.00%,F,F)



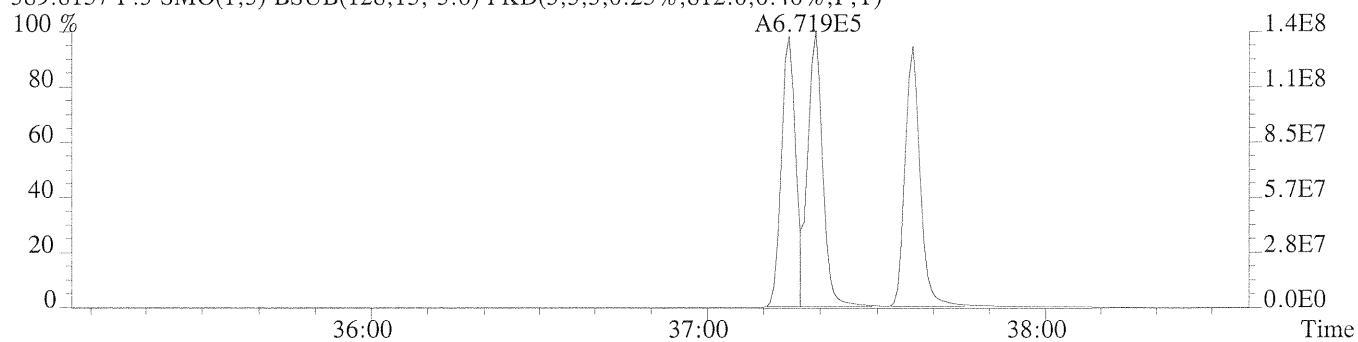
430.9728 F:3 PKD(3,3,3,100.00%,0.0,1.00%,F,F)



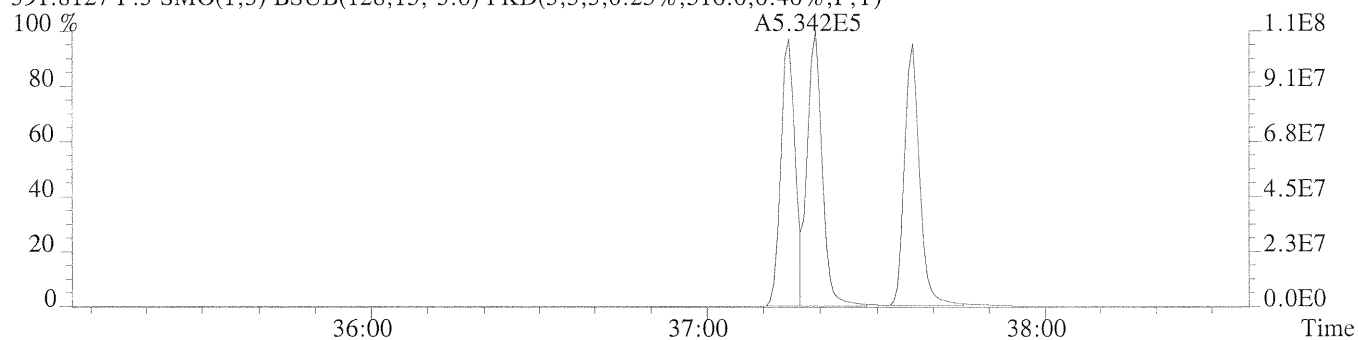
File:P200035 #1-318 Acq: 1-AUG-2008 19:02:53 Probe EI+ Magnet SIR VG BioTech Mass spectf

Sample#1 Exp:ICAL HRCC5

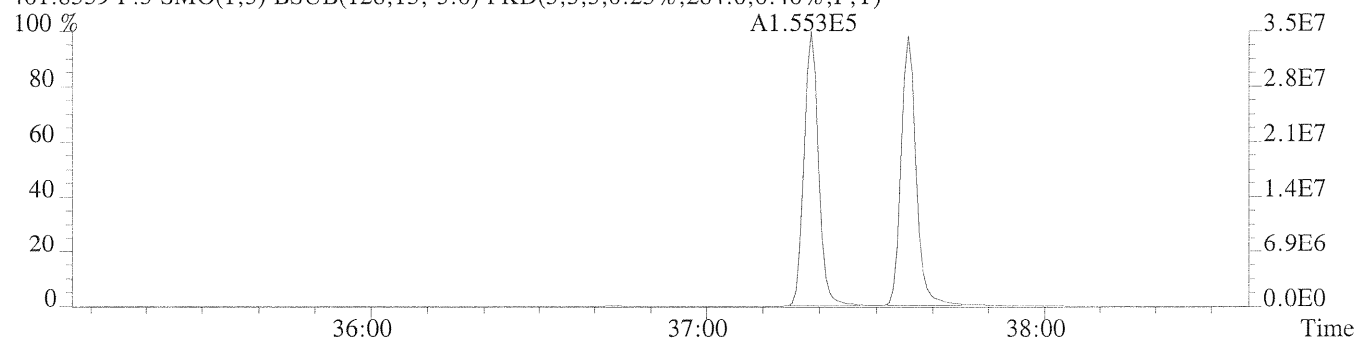
389.8157 F:3 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.25%,812.0,0.40%,F,T)



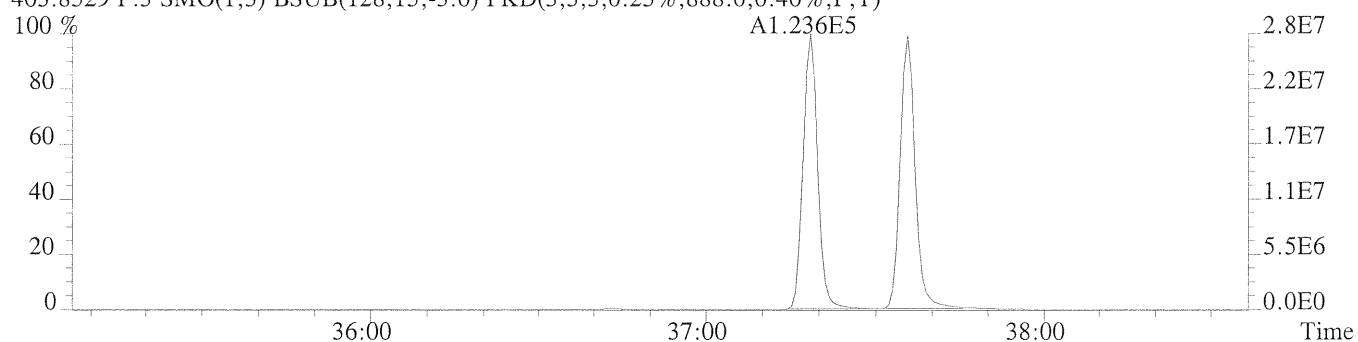
391.8127 F:3 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.25%,516.0,0.40%,F,T)



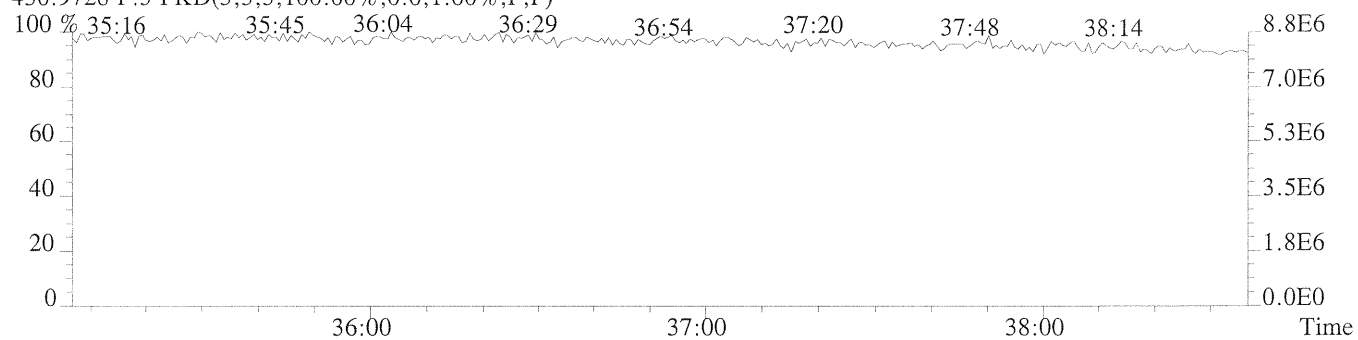
401.8559 F:3 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.25%,284.0,0.40%,F,T)



403.8529 F:3 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.25%,888.0,0.40%,F,T)



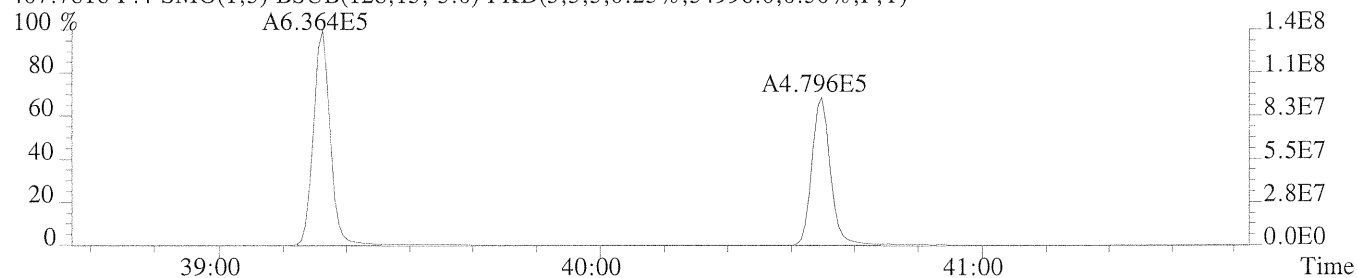
430.9728 F:3 PKD(3,3,3,100.00%,0.0,1.00%,F,F)



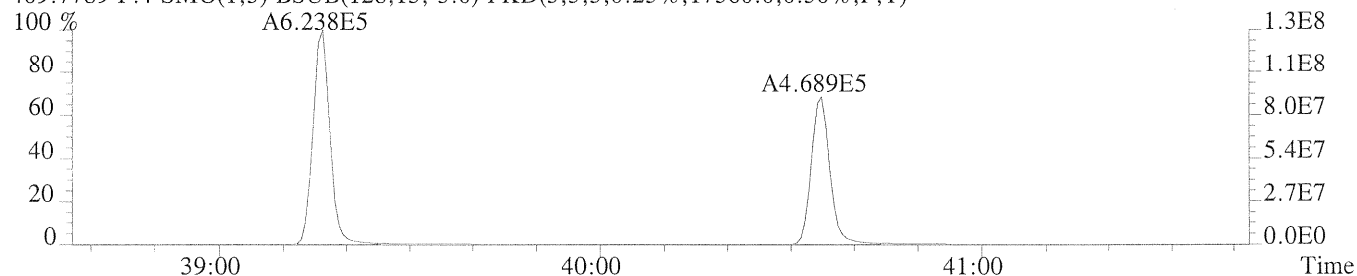
File:P200035 #1-281 Acq: 1-AUG-2008 19:02:53 Probe EI+ Magnet SIR VG BioTech Mass spectf

Sample#1 Exp:ICAL HRCC5

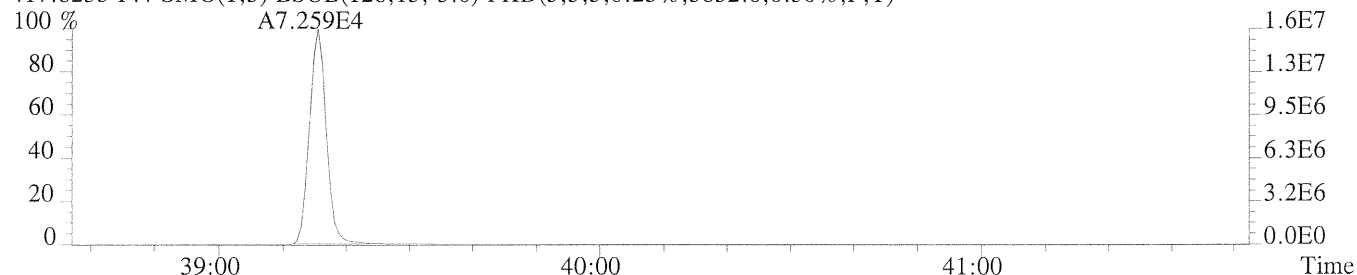
407.7818 F:4 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.25%,34996.0,0.50%,F,T)



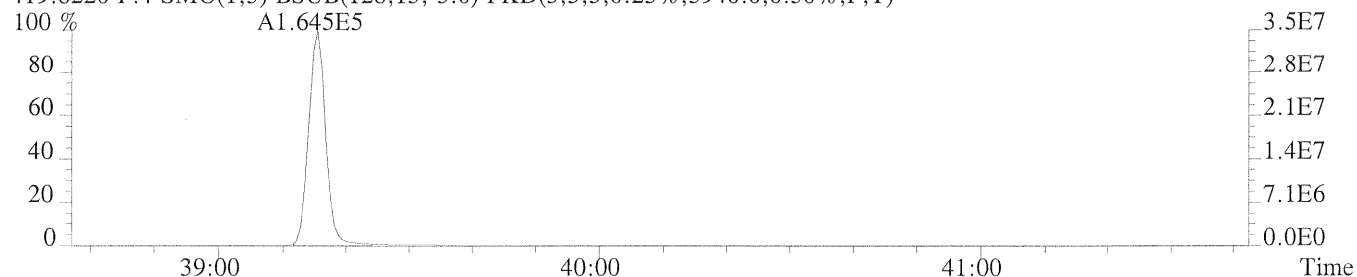
409.7789 F:4 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.25%,17360.0,0.50%,F,T)



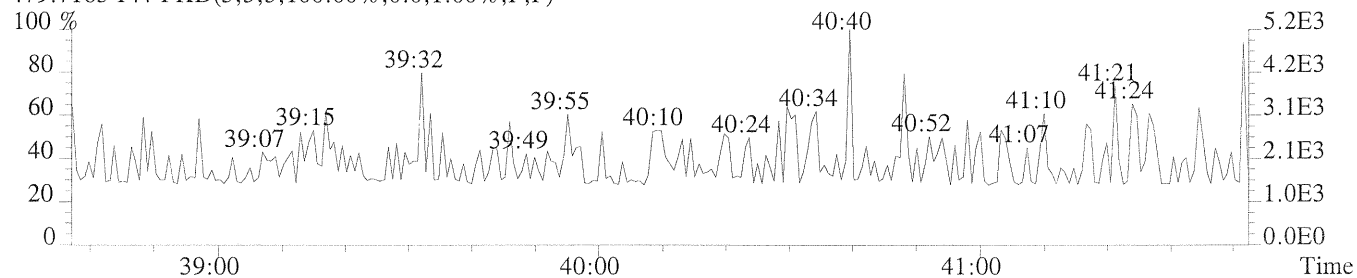
417.8253 F:4 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.25%,3832.0,0.50%,F,T)



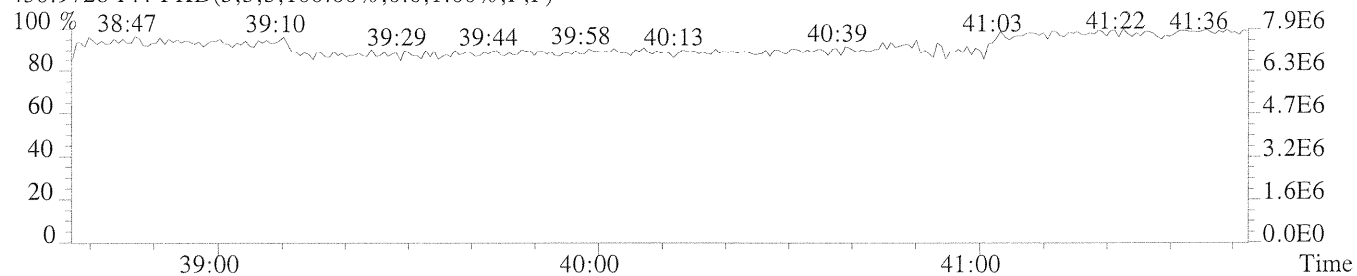
419.8220 F:4 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.25%,5940.0,0.50%,F,T)



479.7165 F:4 PKD(5,3,5,100.00%,0.0,1.00%,F,F)



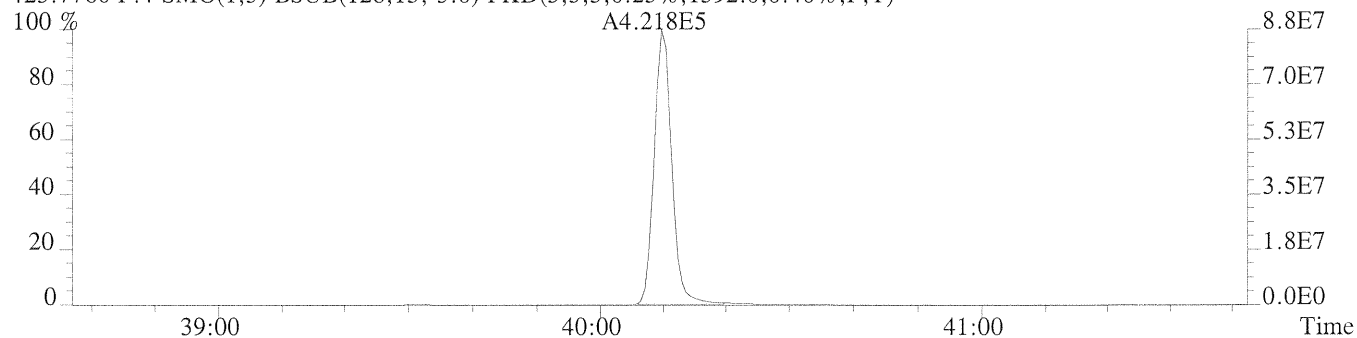
430.9728 F:4 PKD(3,3,3,100.00%,0.0,1.00%,F,F)



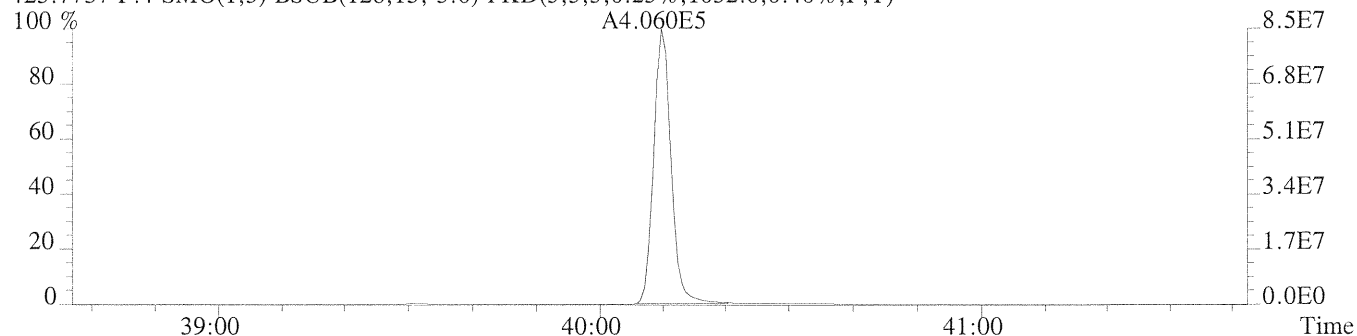
File:P200035 #1-281 Acq: 1-AUG-2008 19:02:53 Probe EI+ Magnet SIR VG BioTech Mass spectf

Sample#1 Exp:ICAL HRCC5

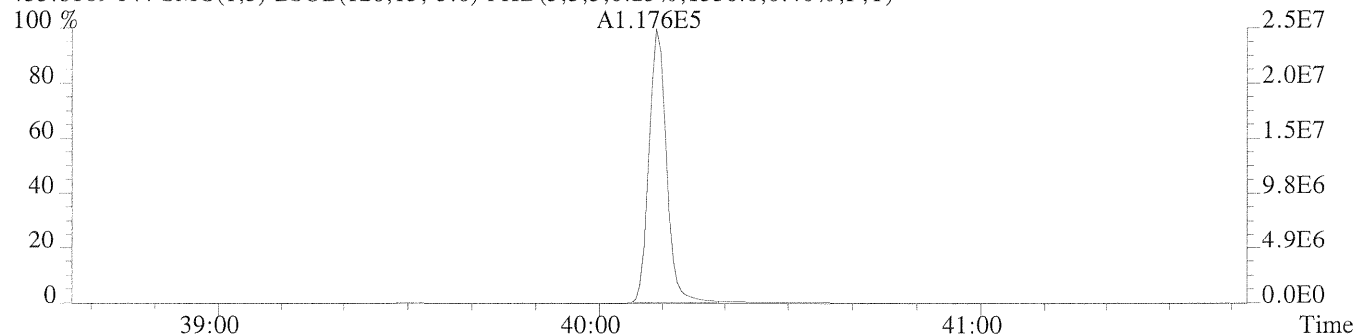
423.7766 F:4 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.25%,1592.0,0.40%,F,T)



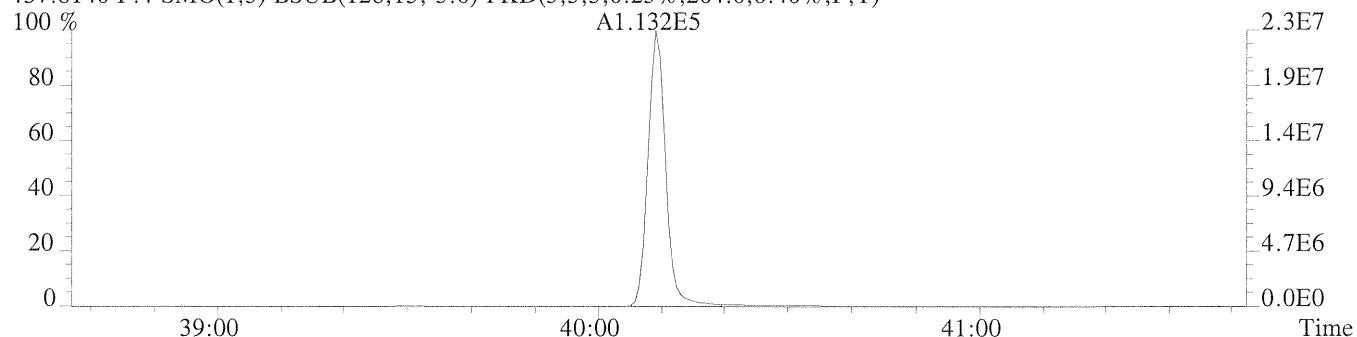
425.7737 F:4 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.25%,1032.0,0.40%,F,T)



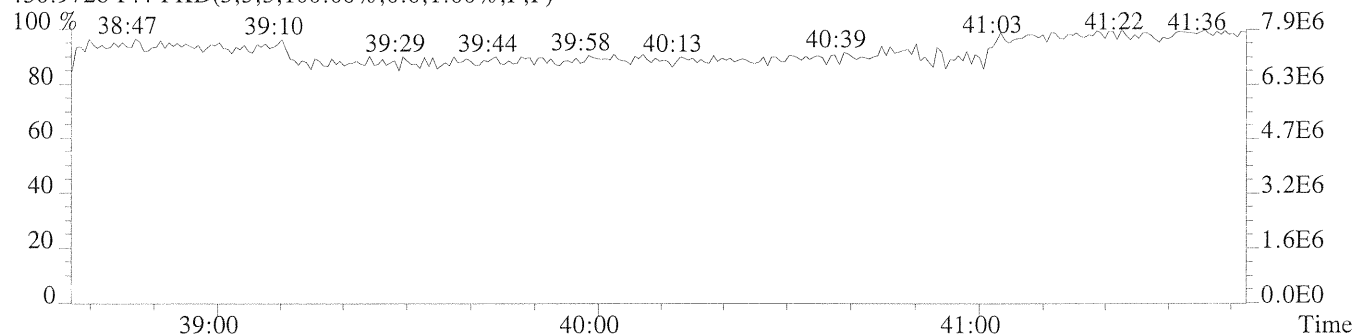
435.8169 F:4 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.25%,1556.0,0.40%,F,T)



437.8140 F:4 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.25%,264.0,0.40%,F,T)



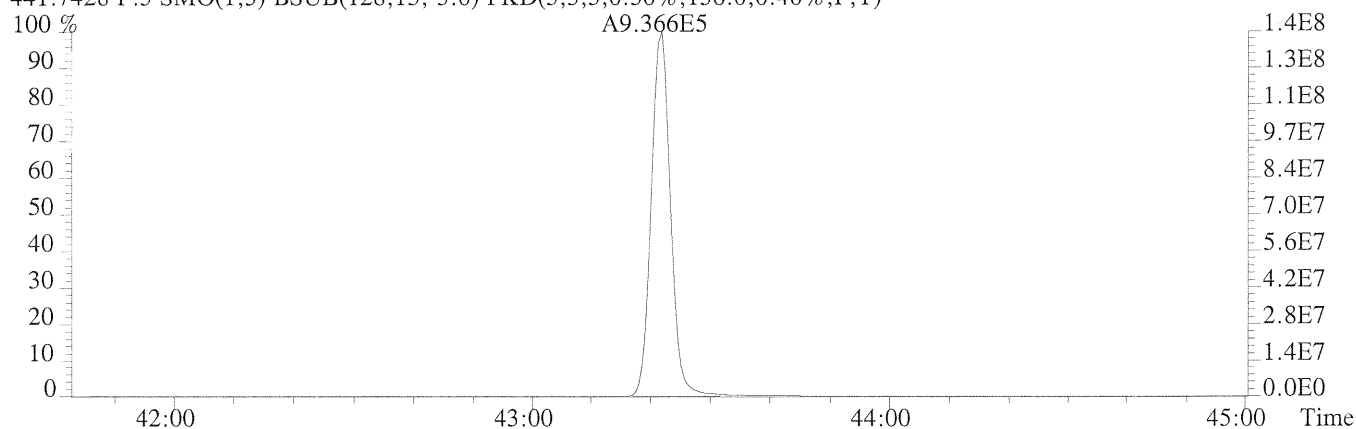
430.9728 F:4 PKD(3,3,3,100.00%,0.0,1.00%,F,F)



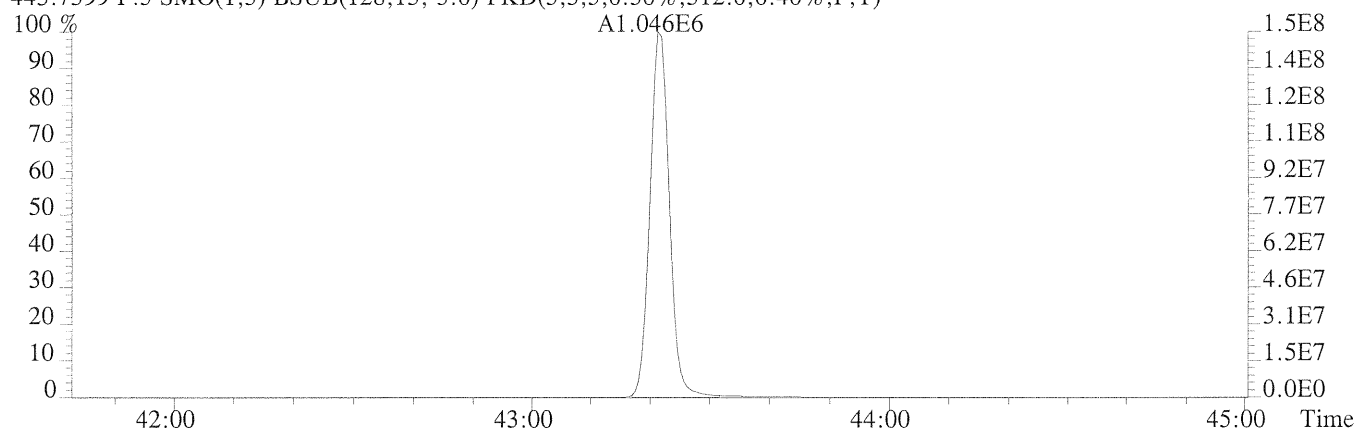
File:P200035 #1-364 Acq: 1-AUG-2008 19:02:53 Probe EI+ Magnet SIR VG BioTech Mass spectf

Sample#1 Exp:ICAL HRCC5

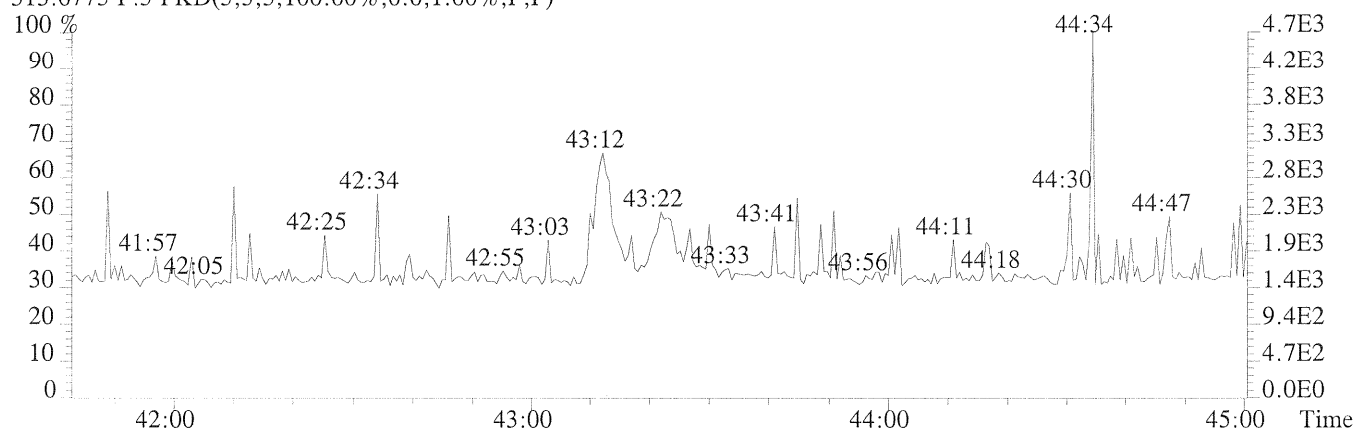
441.7428 F:5 SMO(1,3) BSUB(128,15,-3.0) PKD(5,3,5,0.30%,136.0,0.40%,F,T)



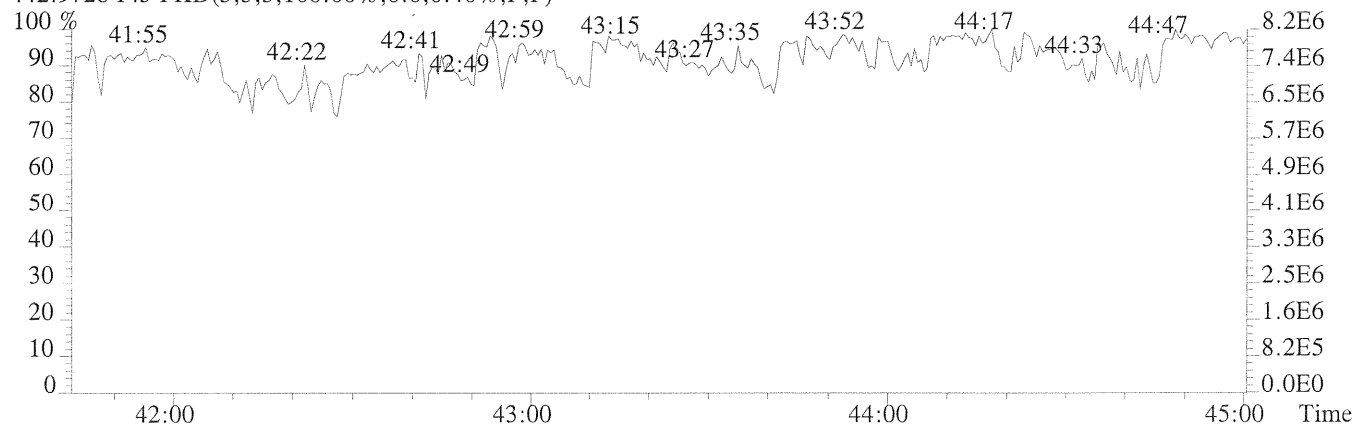
443.7399 F:5 SMO(1,3) BSUB(128,15,-3.0) PKD(5,3,5,0.30%,512.0,0.40%,F,T)



513.6775 F:5 PKD(5,3,5,100.00%,0.0,1.00%,F,F)



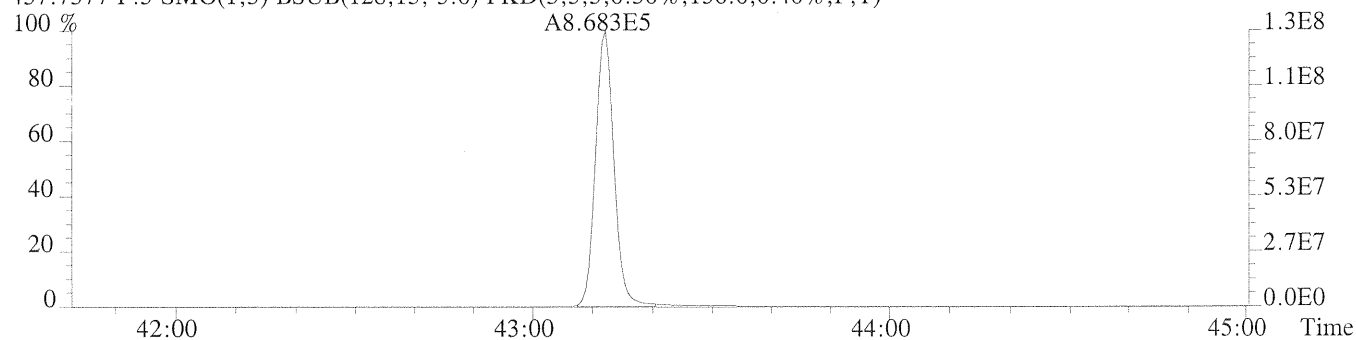
442.9728 F:5 PKD(3,3,3,100.00%,0.0,0.40%,F,F)



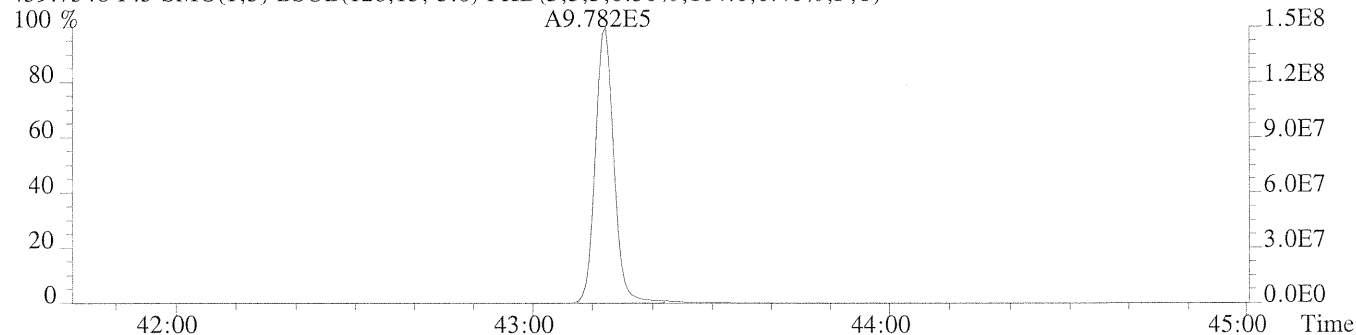
File:P200035 #1-364 Acq: 1-AUG-2008 19:02:53 Probe EI+ Magnet SIR VG BioTech Mass spectr

Sample#1 Exp:ICAL HRCC5

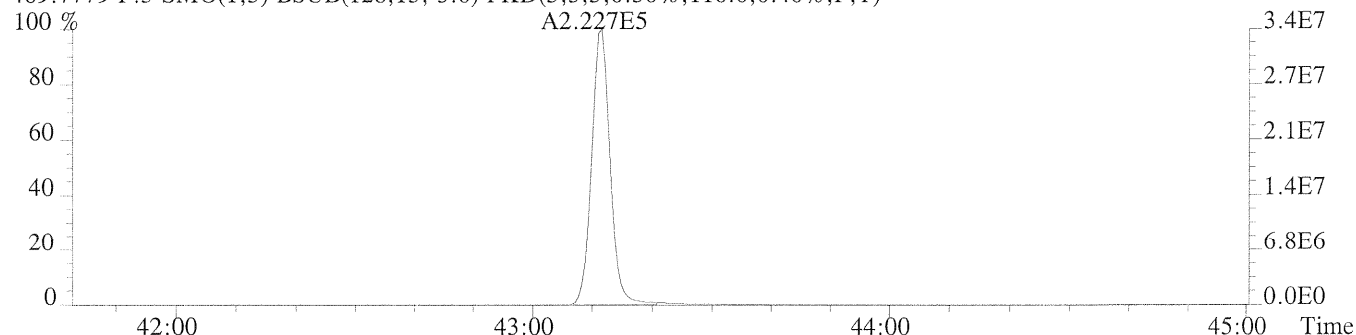
457.7377 F:5 SMO(1,3) BSUB(128,15,-3.0) PKD(5,3,5,0.30%,136.0,0.40%,F,T)



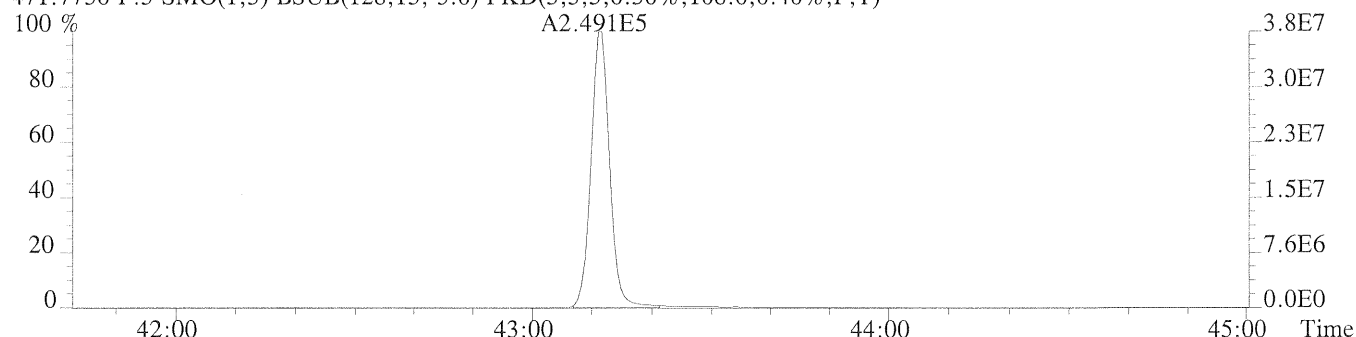
459.7348 F:5 SMO(1,3) BSUB(128,15,-3.0) PKD(5,3,5,0.30%,104.0,0.40%,F,T)



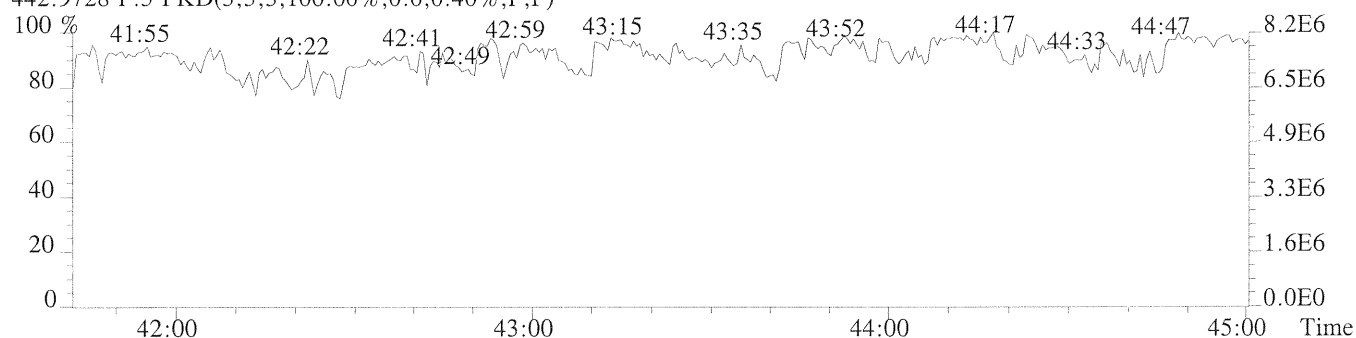
469.7779 F:5 SMO(1,3) BSUB(128,15,-3.0) PKD(5,3,5,0.30%,116.0,0.40%,F,T)



471.7750 F:5 SMO(1,3) BSUB(128,15,-3.0) PKD(5,3,5,0.30%,108.0,0.40%,F,T)



442.9728 F:5 PKD(3,3,3,100.00%,0.0,0.40%,F,F)



Initial Calibration QC Checklist

ICAL Name:

U701217TCDEFIN

Date:

17 DEC 07

Method: 1613 / 8290 / Tetra / TCDD Only / TCDF Conf / 8280 / 613 / M23 / TO-9

Retention Window/Column Performance Check

Analyst

Second Check

Windows in and first and last eluters labeled	N.A.	N/A
Column Performance shows less than or equal to 25% valley between column specific 2378 isomer and it's closest eluters	✓	✓
No QC ion deflections affect column specific 2378 isomer or it's closest eluters	✓	✓

Initial Calibration

Analyst

Second Check

Percent RSD within method criteria	✓	✓
All relative abundance ratios meet method criteria	✓	✓
No QC ion deflections of greater than 20%	✓	✓
Mass spectrometer resolution greater than or equal to 10,000 and documented	✓	✓
2378-TCDD elutes at 25 minutes or later on the DB-5 column	N.A.	N/A
Signal-to-noise of all target analytes and their labeled standards at least 10:1	✓	✓
Valley between labeled 123478 and 123678 HxCDD peaks less than or equal to 50%	N.A.	N/A
All Manual Intergrations signed and dated and first and final copies of Ical summary included	✓	✓

Analyst:

[Signature]

Second QC:

mc

CAS HOUSTON INC.
5DFC
PCDD/PCDF ANALYTICAL SEQUENCE SUMMARY
HIGH RESOLUTION

Page 1 of 1

Name: Columbia Analytical Services, Houston Contract

Lab Code: TX01411 CASE No.: Client No: SDG No.:

GC Column: DB-225 ID: 0.25 (mm) Instrument ID: AutoSpec-Ultima

Init. Calib. Date: 12/17/07

Init. Calib. Times: 16:11

THE ANALYTICAL SEQUENCE OF STANDARDS, SAMPLES, BLANKS, SPIKES AND
DUPLICATES IS AS FOLLOWS:

EPA SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
COLUMN PERFORM		U124666	17-DEC-07	16:11:13
ICAL CS1		U124667	17-DEC-07	16:58:32
ICAL CS2		U124668	17-DEC-07	17:25:10
ICAL CS3		U124669	17-DEC-07	18:02:45
ICAL CS4		U124670	17-DEC-07	18:37:40
ICAL CS5		U124671	17-DEC-07	19:12:26

FORM V CDD-3

DLM02.0

HRGC/HRMS RUN LOG

CAS HOUSTON

10655 Richmond Avenue, Suite 130-A

Houston, TX 77042

Acq Method: TCDF CAS

Result File: U7012117 TCDFL

Archive Tape:

GC Method: TCDF CAS

EDD File:

Batch #

Instrument ID: AutoSpec I

Columbia Analytical Services inc.
An Employee Owned Company

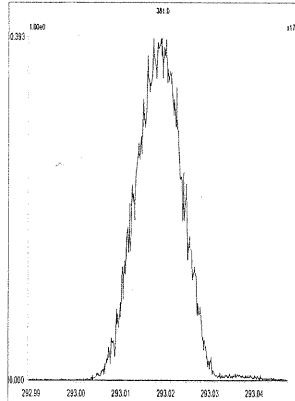
Date	Time	File	CAS ID	Client ID	Batch #	Analyst	Comments	RE
12/17/07		U124663	K0711172-018			PC		
		U124664	K0711252-017					
		U124665	K0711252-019					
16:11		U124666	Columbia Performance	04-59-1				
16:58		U124667	Ical CS1	04-95-1				
17:25		U124668	Ical CS2	04-17-1B				
18:02		U124669	Ical CS3	08-92-48				
18:37		U124670	Ical CS4	04-77-1				
19:12		U124671	Ical CS5	04-78-1				
		U124672	Columbia Performance					
		U124673	CCAL CS7	08-92-48				
		U124674	Fast Blank				1613	
		U124675	E0701199-011				70-9	
		U124676	E0701252-001					
		U124677	E0701252-003					
		U124678	E0701252-004					

Reviewed by: _____

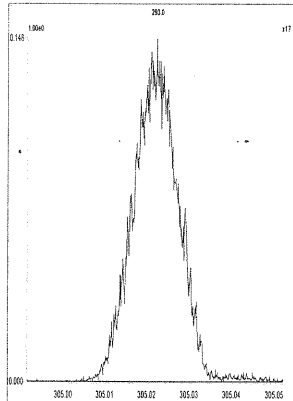
File: Experiment: tcdfcas.exp Reference: pfk.ref Function: 1 @ 200 (ppm)

Printed: Monday, December 17, 2007 16:10:24 Central Standard Time

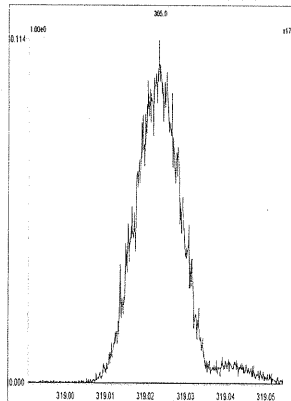
M 292.9824 R 12822



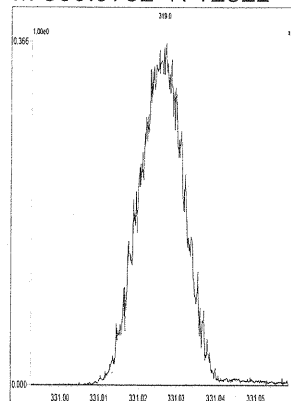
M 304.9824 R 12690



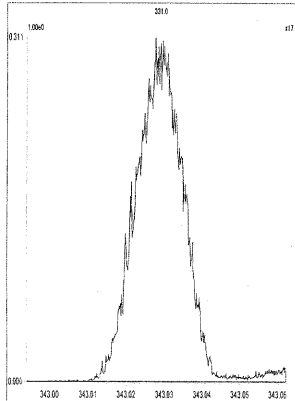
M 318.9792 R 13087



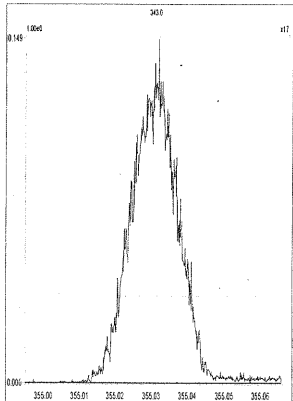
M 330.9792 R 12822



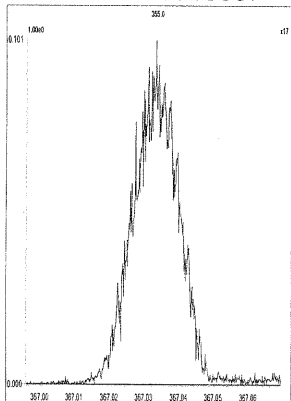
M 342.9792 R 12690



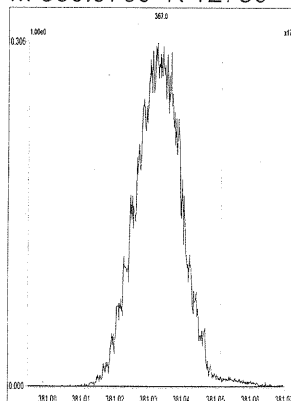
M 354.9792 R 13162



M 366.9792 R 13657



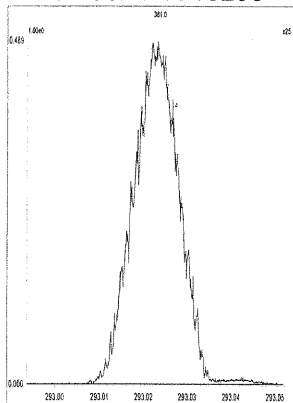
M 380.9760 R 12750



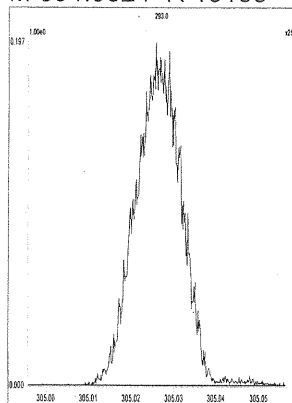
File: Experiment: tcdfcas.exp Reference: pfk.ref Function: 1 @ 200 (ppm)

Printed: Monday, December 17, 2007 19:56:44 Central Standard Time

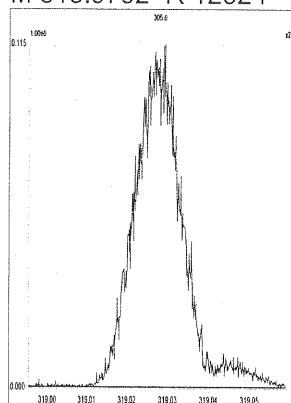
M 292.9824 R 13293



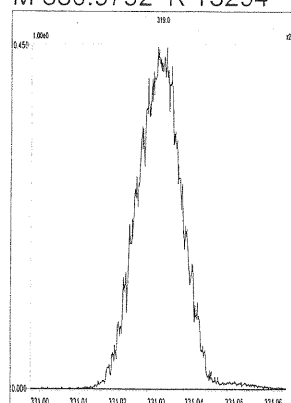
M 304.9824 R 13158



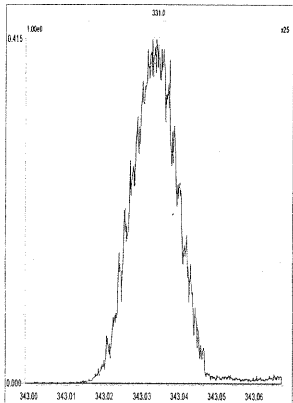
M 318.9792 R 12624



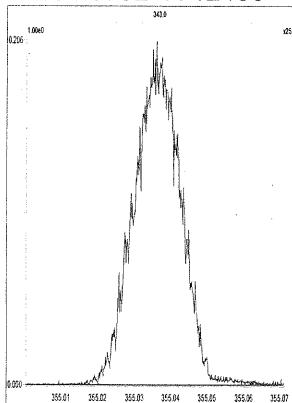
M 330.9792 R 13294



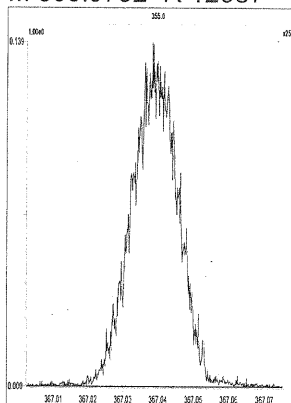
M 342.9792 R 12887



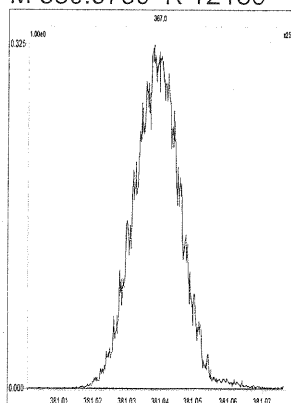
M 354.9792 R 12436



M 366.9792 R 12687



M 380.9760 R 12136



USEPA - CLP
5DFB

PCDD/PCDF WINDOW DEFINING MIX SUMMARY

EPA SAMPLE NO.

Column Perform

Lab Name: Columbia Analytical Services Contract: _____

Lab Code: TX01411 Case No.: _____ Client No.: _____ SDG No.: _____

GC Column: 30m DB-225 ID: 0.25 (mm) Lab File ID: U124666

Instrument ID: 70S Date Analyzed: 12/17/07

Time Analyzed: 16:11:13

Percent Valley determination for DB-5 (or equivalent) Column -
For the Column Performance Solution beginning the 12-hour period:

1478-TCDD/2378-TCDD: _____

QUALITY CONTROL (QC) LIMITS: _____

Percent Valley between the TCDD isomers must be less than or equal to 25%.

Percent Valley determination for DB-225 (or equivalent) Column -
For the Column Performance Solution beginning the 12-hour period:

2347-TCDF/2378-TCDF: 12%

QUALITY CONTROL (QC) LIMITS:

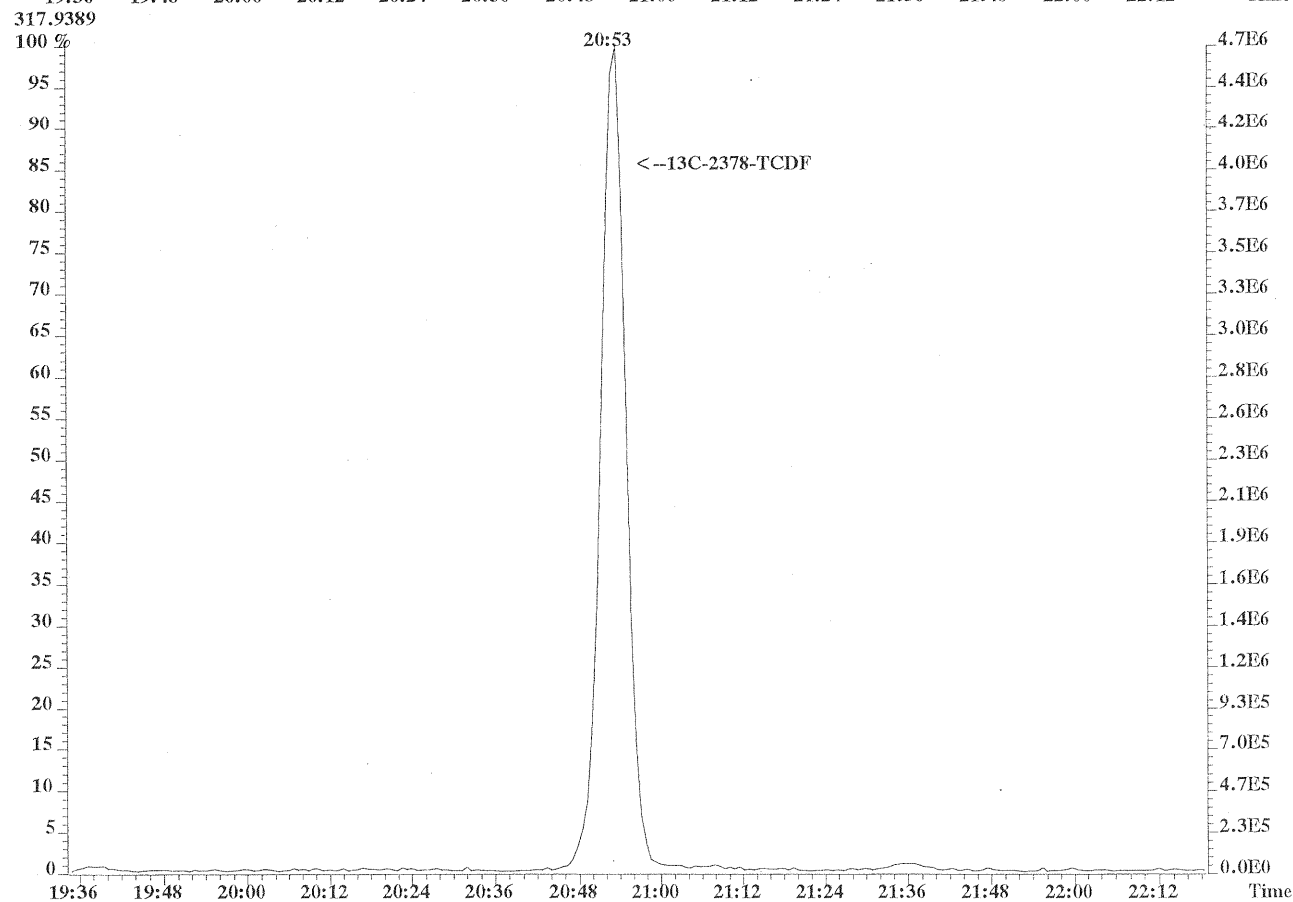
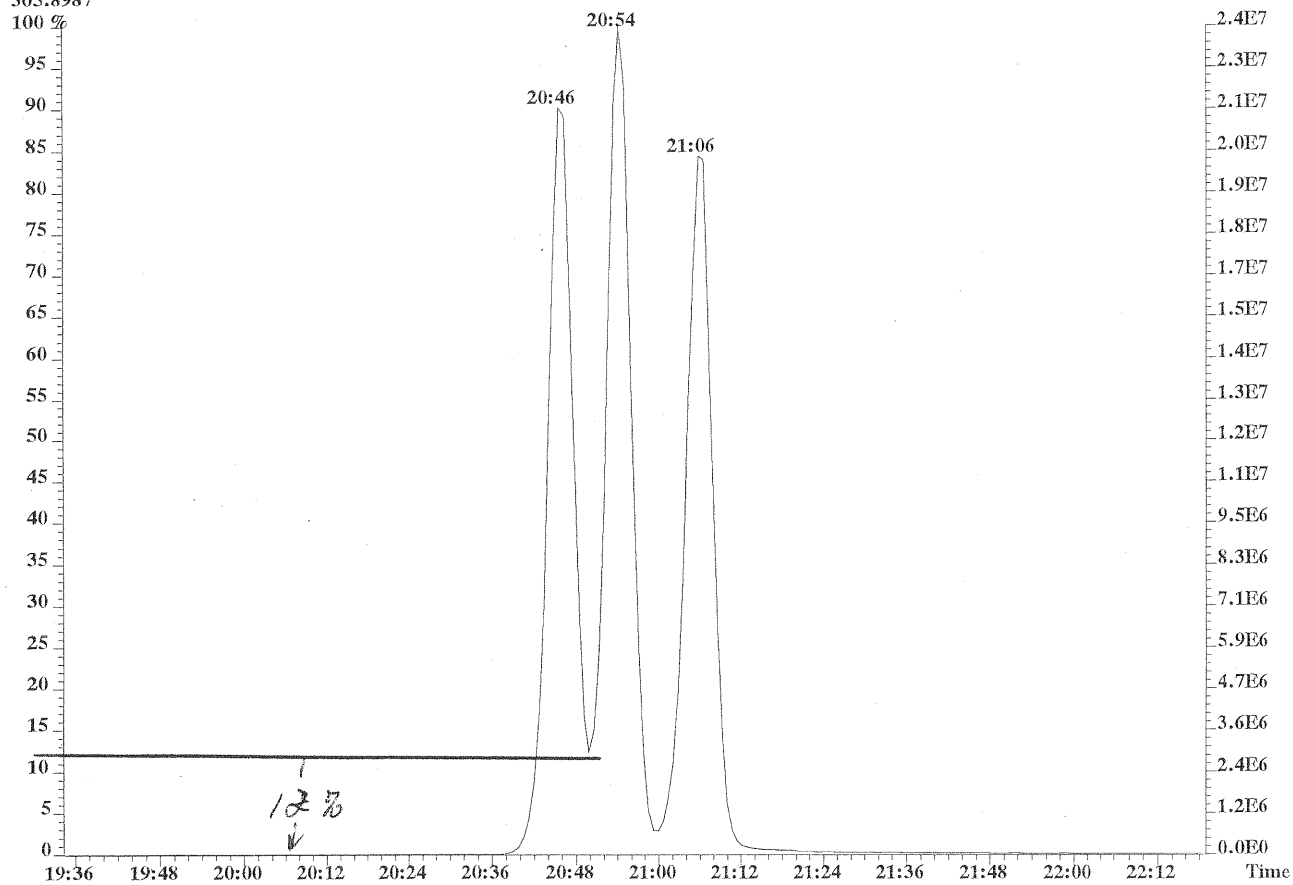
Percent Valley between the TCDF/TCDF isomers must be less than or equal to 25%.

Analyst Init: M

FORM V-HR CDD-2

DLM02.0

File:U124666 #1-751 Acq:17-DEC-2007 16:11:13 Probe EI+ Magnet SIR VG BioTech Mass spectrom
Sample#1 Exp:COLUMN PERFORM
305.8987



FORM 3A
TCDF INITIAL CALIBRATION RELATIVE RESPONSES

Lab Name: Columbia Analytical Services Episode No.:

Contract No.: SDG No.:

Initial Calibration Date: 12/17/07

Instrument ID.: AutoSpec-Ultima GC Column ID: DB-225

HRCC1 Data Filename: U124667 HRCC4 Data Filename: U124670

HRCC2 Data Filename: U124668 HRCC5 Data Filename: U124671

HRCC3 Data Filename: U124669

NATIVE ANALYTE	RELATIVE RESPONSE (RR)					MEAN RR	Cv (RSD) (1)
	HRCC1	HRCC2	HRCC3	HRCC4	HRCC5		
2,3,7,8-TCDF	1.13	0.97	0.95	1.03	1.04	1.02	6.59
LABELED STANDARD							
13C-2,3,7,8-TCDF	1.25	1.28	1.21	1.27	1.25	1.25	1.99
CLEANUP STANDARD							
37Cl-2,3,7,8-TCDD	0.97	0.93	0.89	0.96	0.97	0.94	3.69

(1) The %RSD for the unlabeled standard must not exceed +/- 20%, see Section 7.7.2.1, Method 8290.

8290F3A

FORM 3B
TCDF INITIAL CALIBRATION ION ABUNDANCE RATIOS

Lab Name: Columbia Analytical Services Episode No.:

Contract No.: SDG No.:

Initial Calibration Date: 12/17/07

Instrument ID.: AutoSpec_Ultima GC Column ID: DB-225

CS1 Data Filename: U124667 CS4 Data Filename: U124670

CS2 Data Filename: U124668 CS5 Data Filename: U124671

CS3 Data Filename: U124669

ION ABUNDANCE RATIOS

	CS1	CS2	CS3	CS4	CS5
NATIVE ANALYTE					
2,3,7,8-TCDF	0.79	0.84	0.77	0.79	0.79
LABELED STANDARD					
13C-2,3,7,8-TCDF	0.78	0.78	0.77	0.79	0.77
INTERNAL STANDARD					
13C-1,2,3,4-TCDD	0.78	0.79	0.79	0.79	0.78

(1) Ion Abundance Ratio Control Limits from Table 9, Method 1613

1613F3B

Columbia Analytical Services, Inc.
Sample Response Summary

Page 1 of 5
EPA SAMPLE NO.
ICAL CS1

Run #1 Filename U124667 Samp: 1 Inj: 1 Acquired: 17-DEC-07 16:58:32
Processed: 16-APR-10 09:47:05 Sample ID: ICAL CS1

Typ	Name	RT-1	Resp 1	Resp 2	Ratio	Meet	Mod?
1 Unk	2,3,7,8-TCDF	20:53	6.658e+02	8.408e+02	0.79	yes	no
2 IS	13C-2,3,7,8-TCDF	20:52	1.171e+05	1.500e+05	0.78	yes	no
3 RS/RT	13C-1,2,3,4-TCDD	19:41	9.379e+04	1.197e+05	0.78	yes	no
4 C/Up	37Cl-2,3,7,8-TCDD	19:24	1.034e+03				

Signal/Noise Height Ratio Summary

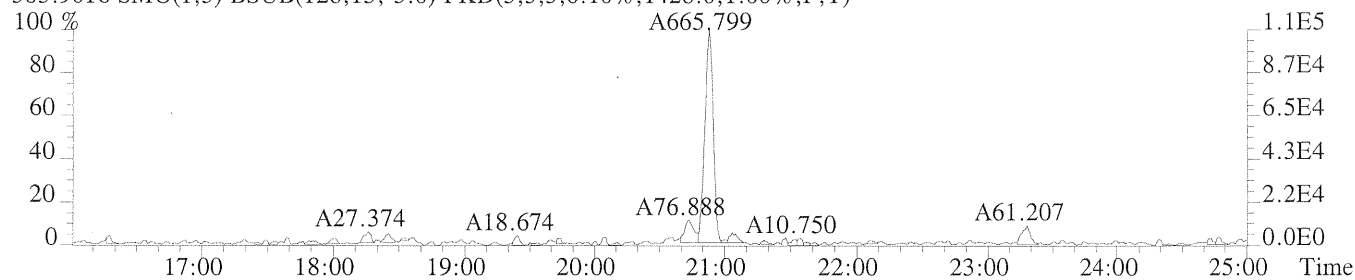
	Name	Signal 1	Noise 1	S/N Rat.1	Signal 2	Noise 2	S/N
1	2,3,7,8-TCDF	1.07e+05	1.43e+03	7.5e+01	1.22e+05	1.54e+03	8.0e+01
2	13C-2,3,7,8-TCDF	1.68e+07	7.11e+03	2.4e+03	2.15e+07	6.75e+03	3.2e+03
3	13C-1,2,3,4-TCDD	1.64e+07	5.71e+03	2.9e+03	2.11e+07	5.10e+03	4.1e+03
4	37Cl-2,3,7,8-TCDD	1.85e+05	1.66e+03	1.1e+02			

Columbia Analytical Services, Inc.
19408 Park Row, Suite 320
Houston, TX 77084
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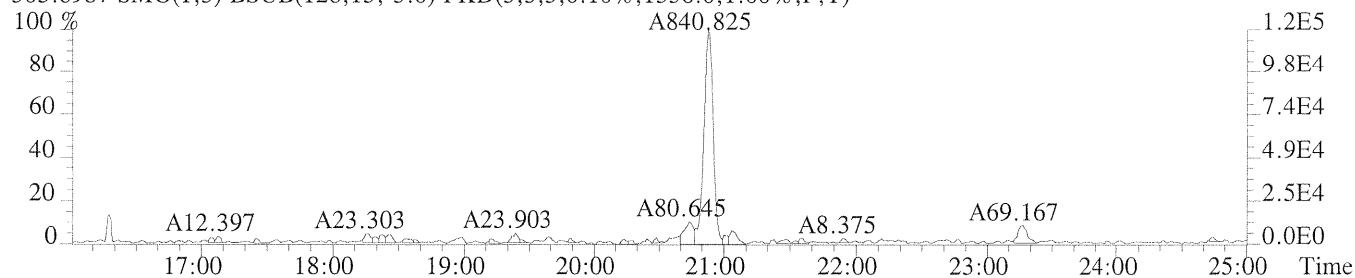
File:U124667 #1-751 Acq:17-DEC-2007 16:58:32 Probe EI+ Magnet SIR VG BioTech Mass spectf

Sample#1 Exp:ICAL CS1

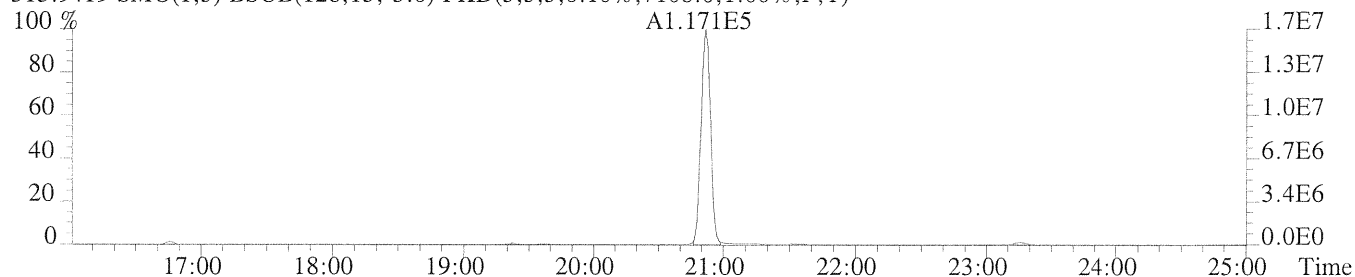
303.9016 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.10%,1428.0,1.00%,F,T)



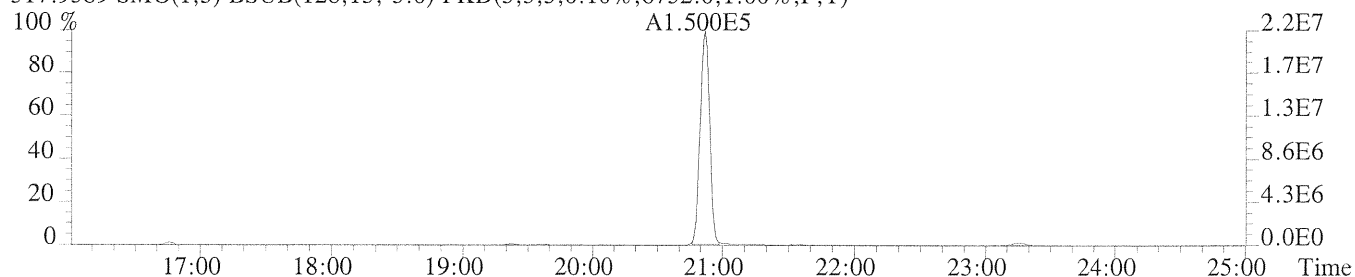
305.8987 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.10%,1536.0,1.00%,F,T)



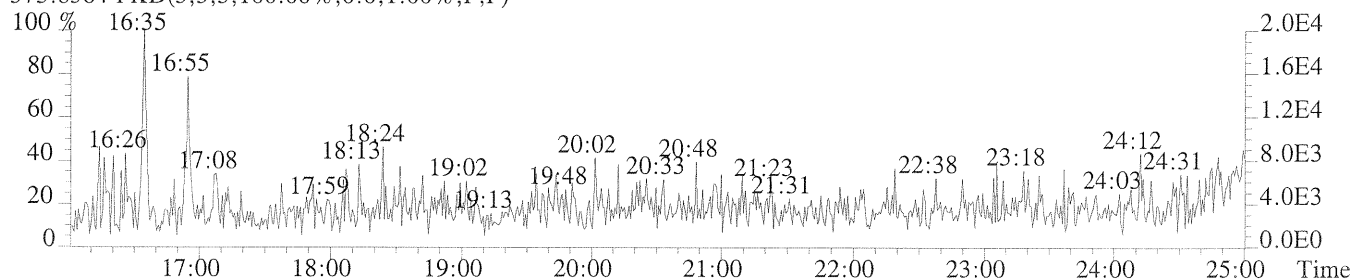
315.9419 SMO(1,5) BSUB(128,15,-3.0) PKD(3,3,3,0.10%,7108.0,1.00%,F,T)



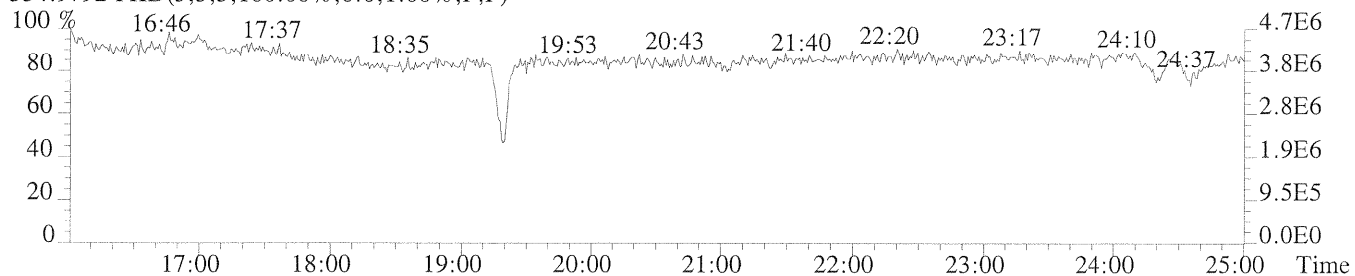
317.9389 SMO(1,5) BSUB(128,15,-3.0) PKD(3,3,3,0.10%,6752.0,1.00%,F,T)



375.8364 PKD(5,3,5,100.00%,0.0,1.00%,F,F)



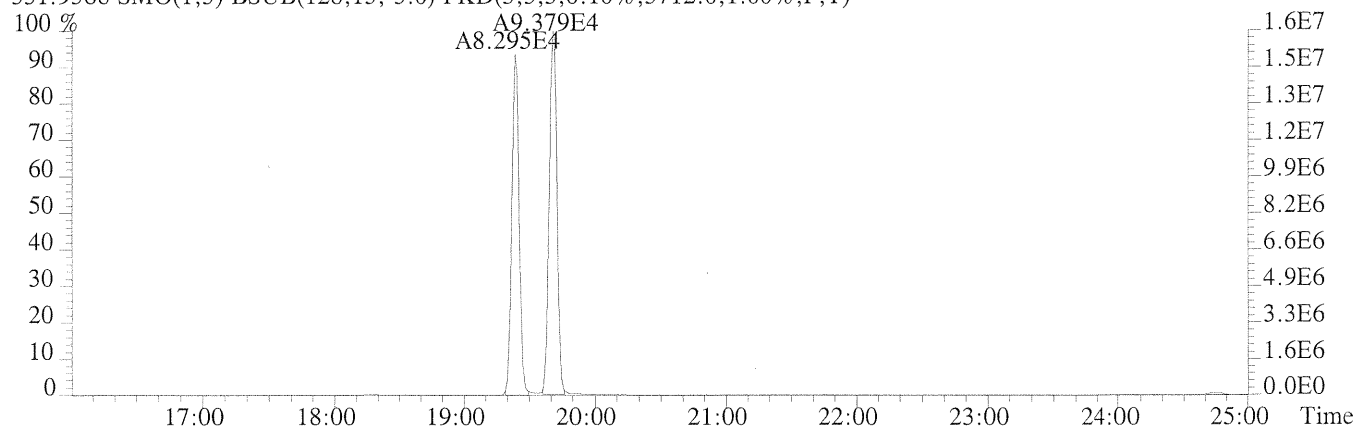
354.9792 PKD(3,3,3,100.00%,0.0,1.00%,F,F)



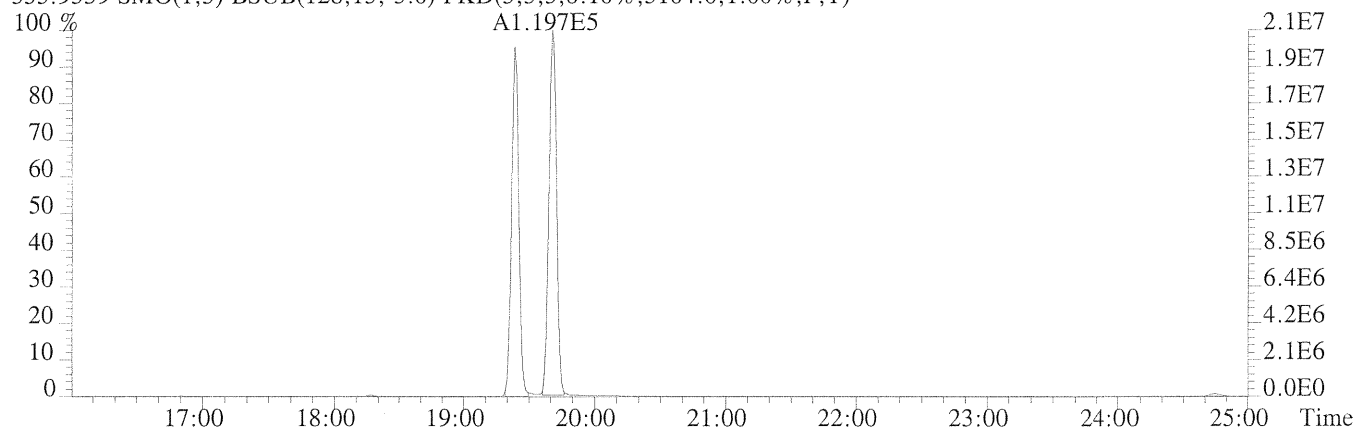
File:U124667 #1-751 Acq:17-DEC-2007 16:58:32 Probe EI+ Magnet SIR VG BioTech Mass spectf

Sample#1 Exp:ICAL CS1

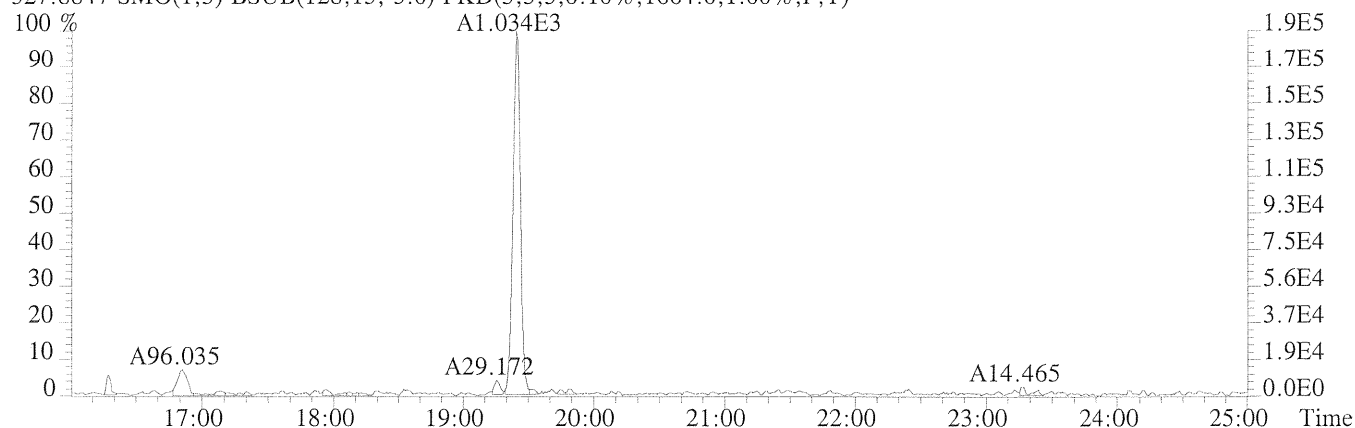
331.9368 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.10%,5712.0,1.00%,F,T)



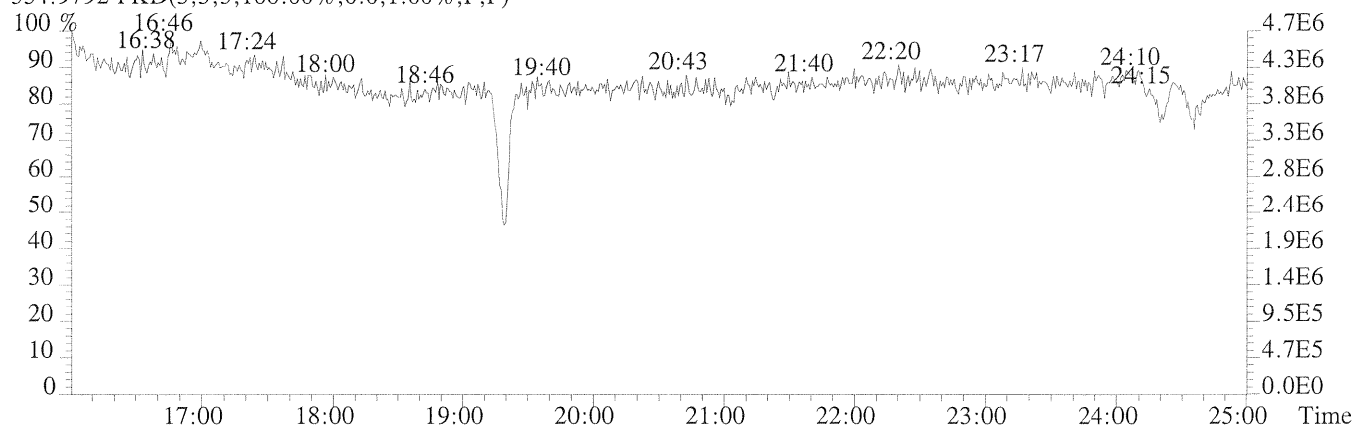
333.9339 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.10%,5104.0,1.00%,F,T)



327.8847 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.10%,1664.0,1.00%,F,T)



354.9792 PKD(3,3,3,100.00%,0.0,1.00%,F,F)



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Sample Response Summary

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EPA SAMPLE NO.
ICAL CS2

Run #2 Filename U124668 Samp: 1 Inj: 1 Acquired: 17-DEC-07 17:25:10
Processed: 16-APR-10 09:47:05 Sample ID: ICAL CS2

Typ	Name	RT-1	Resp 1	Resp 2	Ratio	Meet	Mod?
1 Unk	2,3,7,8-TCDF	20:53	2.206e+03	2.613e+03	0.84	yes	no
2 IS	13C-2,3,7,8-TCDF	20:52	1.084e+05	1.388e+05	0.78	yes	no
3 RS/RT	13C-1,2,3,4-TCDD	19:42	8.510e+04	1.082e+05	0.79	yes	no
4 C/Up	37Cl-2,3,7,8-TCDD	19:25	3.587e+03				

Signal/Noise Height Ratio Summary

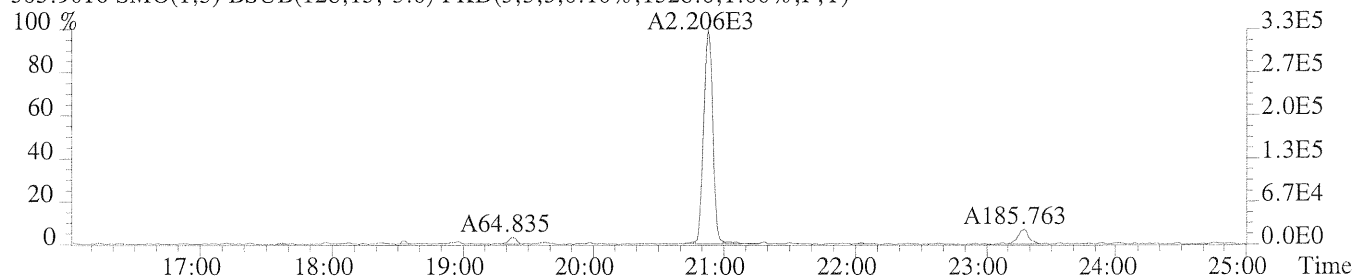
	Name	Signal 1	Noise 1	S/N Rat.1	Signal 2	Noise 2	S/N
1	2,3,7,8-TCDF	3.33e+05	1.53e+03	2.2e+02	4.04e+05	1.78e+03	2.3e+02
2	13C-2,3,7,8-TCDF	1.51e+07	9.38e+03	1.6e+03	1.92e+07	1.33e+04	1.4e+03
3	13C-1,2,3,4-TCDD	1.42e+07	4.19e+03	3.4e+03	1.81e+07	4.04e+03	4.5e+03
4	37Cl-2,3,7,8-TCDD	6.19e+05	2.19e+03	2.8e+02			

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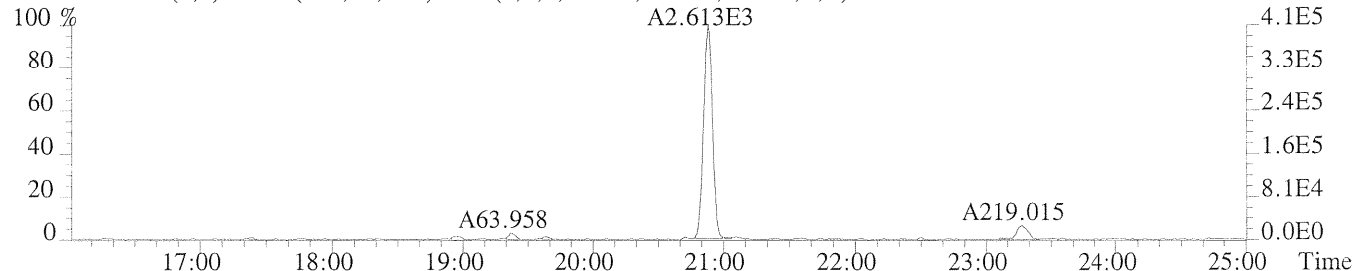
File:U124668 #1-751 Acq:17-DEC-2007 17:25:10 Probe EI+ Magnet SIR VG BioTech Mass spectf

Sample#1 Exp:ICAL CS2

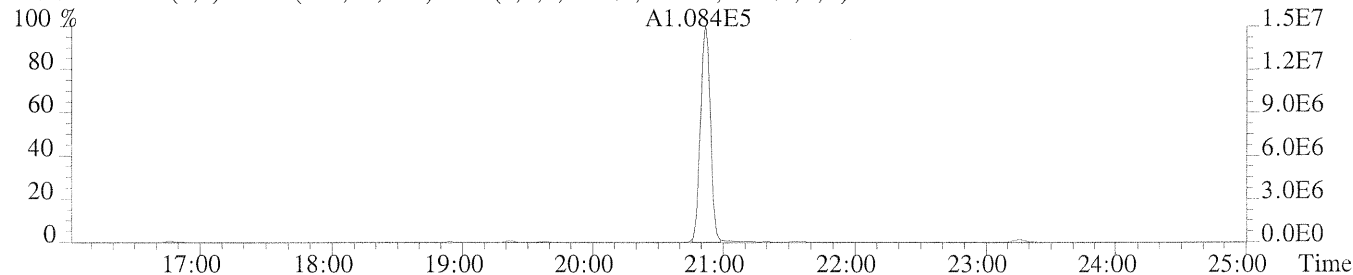
303.9016 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.10%,1528.0,1.00%,F,T)



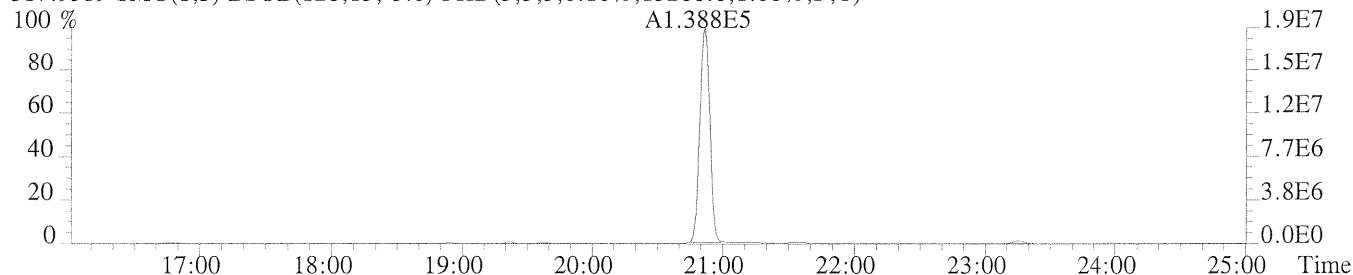
305.8987 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.10%,1784.0,1.00%,F,T)



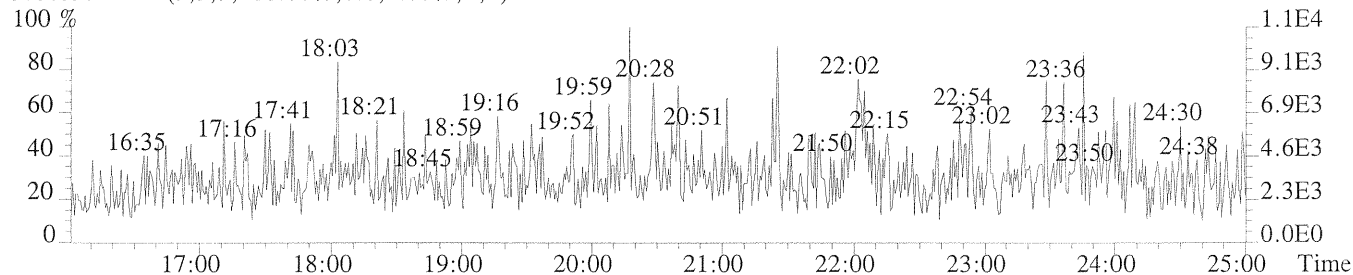
315.9419 SMO(1,5) BSUB(128,15,-3.0) PKD(3,3,3,0.10%,9376.0,1.00%,F,T)



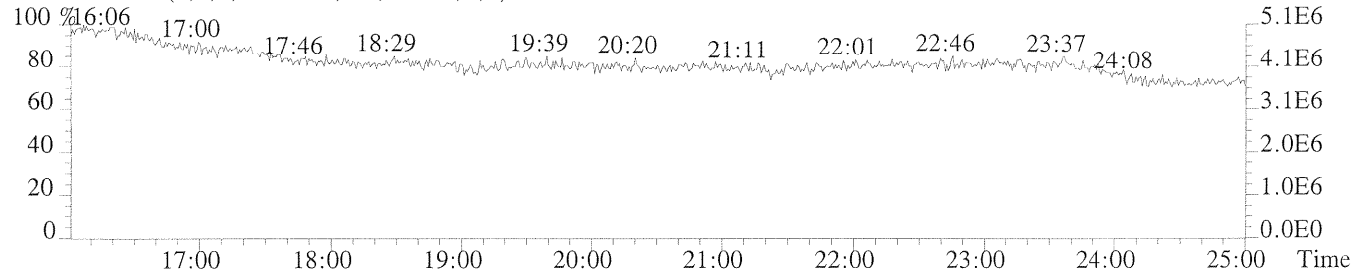
317.9389 SMO(1,5) BSUB(128,15,-3.0) PKD(3,3,3,0.10%,13260.0,1.00%,F,T)



375.8364 PKD(5,3,5,100.00%,0.0,1.00%,F,F)



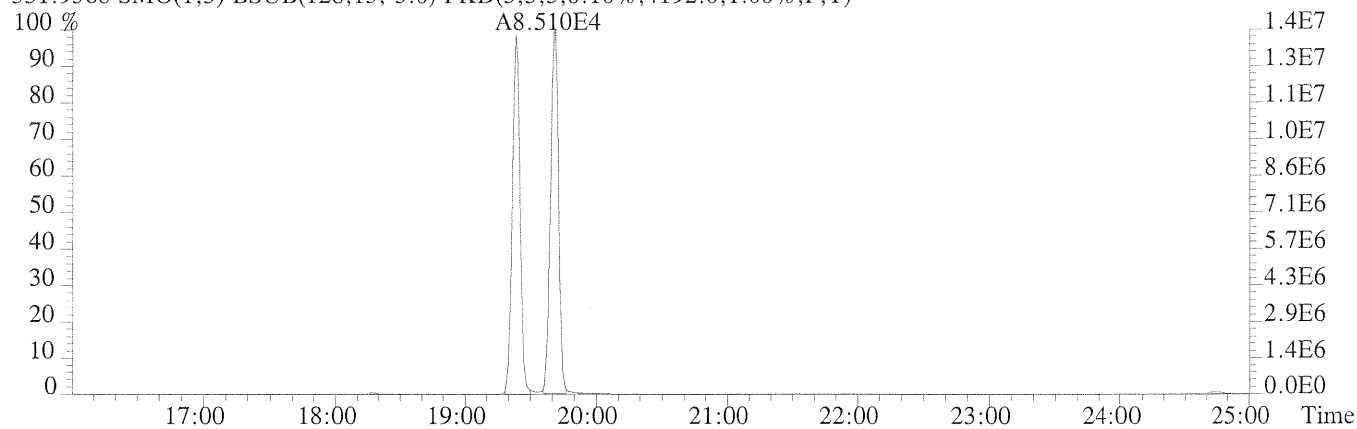
354.9792 PKD(3,3,3,100.00%,0.0,1.00%,F,F)



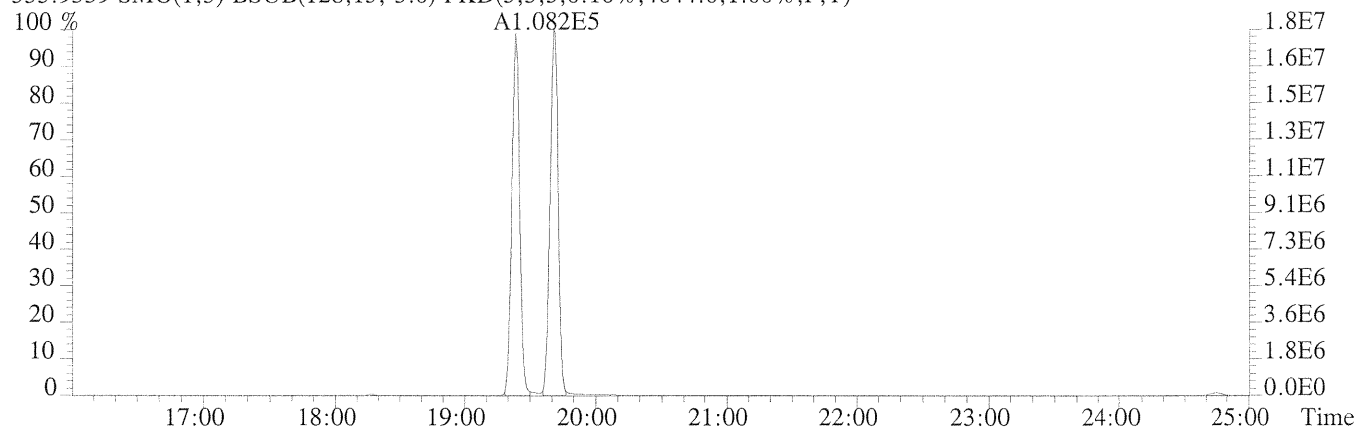
File:U124668 #1-751 Acq:17-DEC-2007 17:25:10 Probe EI+ Magnet SIR VG BioTech Mass spectf

Sample#1 Exp:ICAL CS2

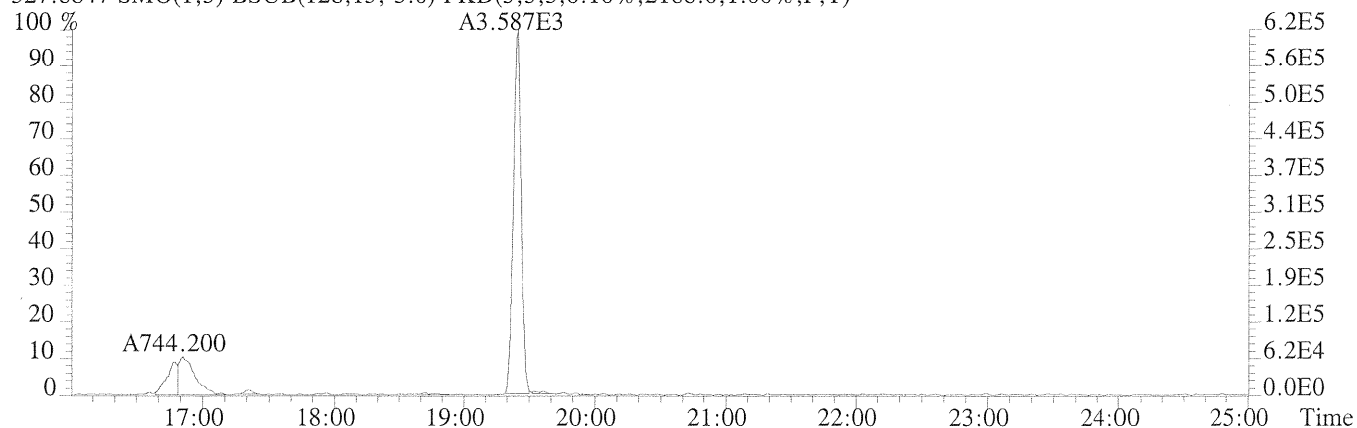
331.9368 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.10%,4192.0,1.00%,F,T)



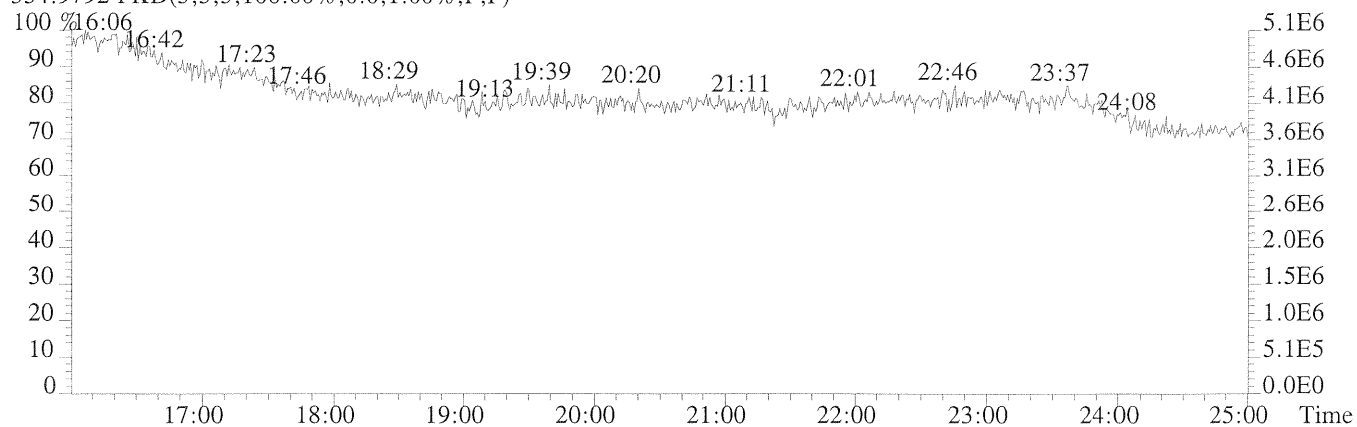
333.9339 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.10%,4044.0,1.00%,F,T)



327.8847 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.10%,2188.0,1.00%,F,T)



354.9792 PKD(3,3,3,100.00%,0.0,1.00%,F,F)



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Sample Response Summary

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EPA SAMPLE NO.
ICAL CS3

Run #3 Filename U124669 Samp: 1 Inj: 1 Acquired: 17-DEC-07 18:02:45
Processed: 16-APR-10 09:47:05 Sample ID: ICAL CS3

Typ	Name	RT-1	Resp 1	Resp 2	Ratio	Meet	Mod?
1 Unk	2,3,7,8-TCDF	20:53	5.941e+03	7.756e+03	0.77	yes	no
2 IS	13C-2,3,7,8-TCDF	20:52	6.245e+04	8.102e+04	0.77	yes	no
3 RS/RT	13C-1,2,3,4-TCDD	19:42	5.203e+04	6.622e+04	0.79	yes	no
4 C/Up	37Cl-2,3,7,8-TCDD	19:25	1.053e+04				

Signal/Noise Height Ratio Summary

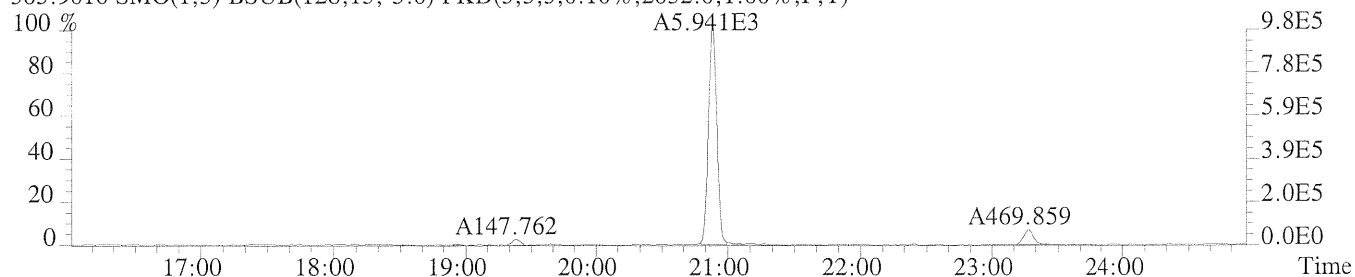
	Name	Signal 1	Noise 1	S/N Rat.1	Signal 2	Noise 2	S/N
1	2,3,7,8-TCDF	9.73e+05	2.03e+03	4.8e+02	1.25e+06	2.62e+03	4.8e+02
2	13C-2,3,7,8-TCDF	9.13e+06	4.88e+03	1.9e+03	1.19e+07	7.87e+03	1.5e+03
3	13C-1,2,3,4-TCDD	9.73e+06	5.12e+03	1.9e+03	1.23e+07	4.34e+03	2.8e+03
4	37Cl-2,3,7,8-TCDD	1.97e+06	2.32e+03	8.5e+02			

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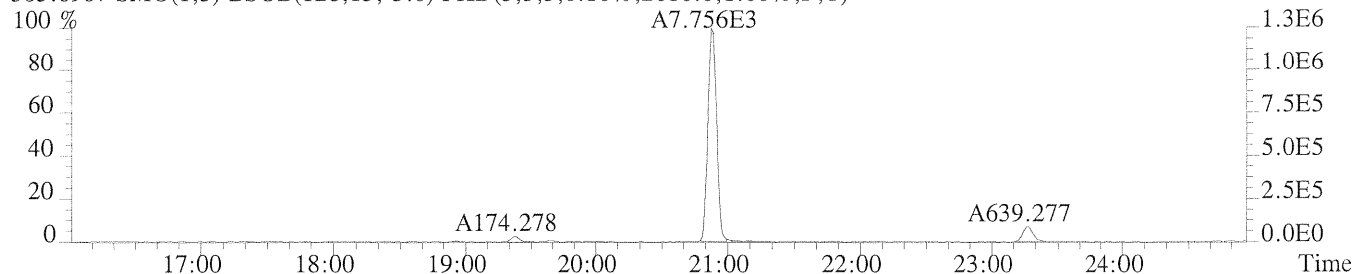
File:U124669 #1-746 Acq:17-DEC-2007 18:02:45 Probe EI+ Magnet SIR VG BioTech Mass spectf

Sample#1 Exp:ICAL CS3

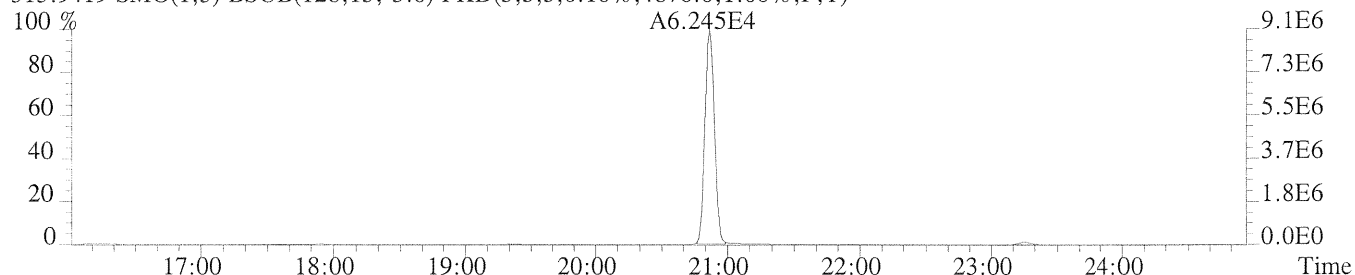
303.9016 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.10%,2032.0,1.00%,F,T)



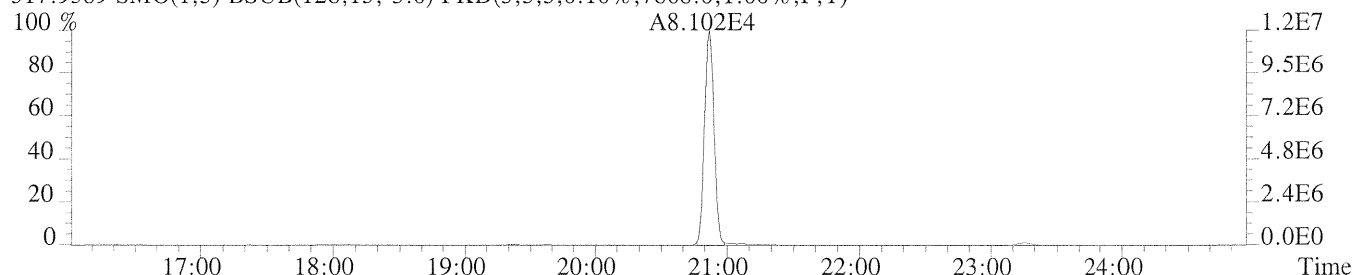
305.8987 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.10%,2616.0,1.00%,F,T)



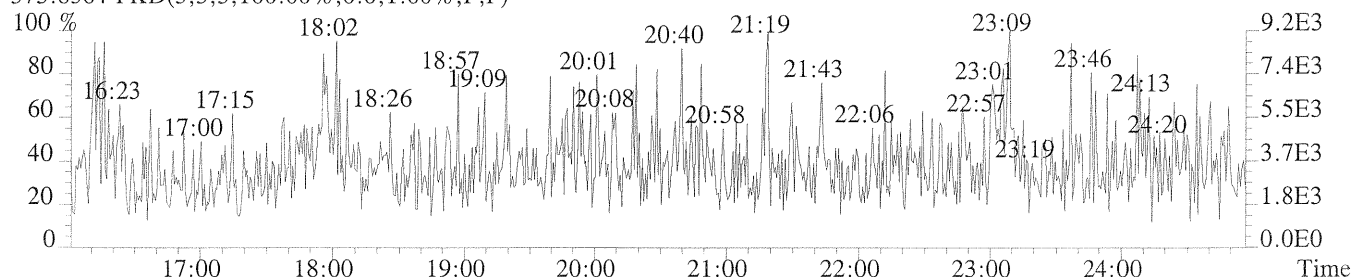
315.9419 SMO(1,5) BSUB(128,15,-3.0) PKD(3,3,3,0.10%,4876.0,1.00%,F,T)



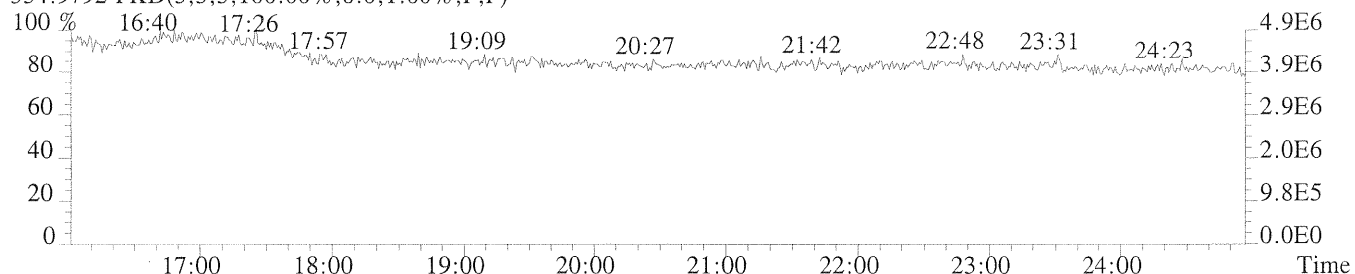
317.9389 SMO(1,5) BSUB(128,15,-3.0) PKD(3,3,3,0.10%,7868.0,1.00%,F,T)



375.8364 PKD(5,3,5,100.00%,0.0,1.00%,F,F)



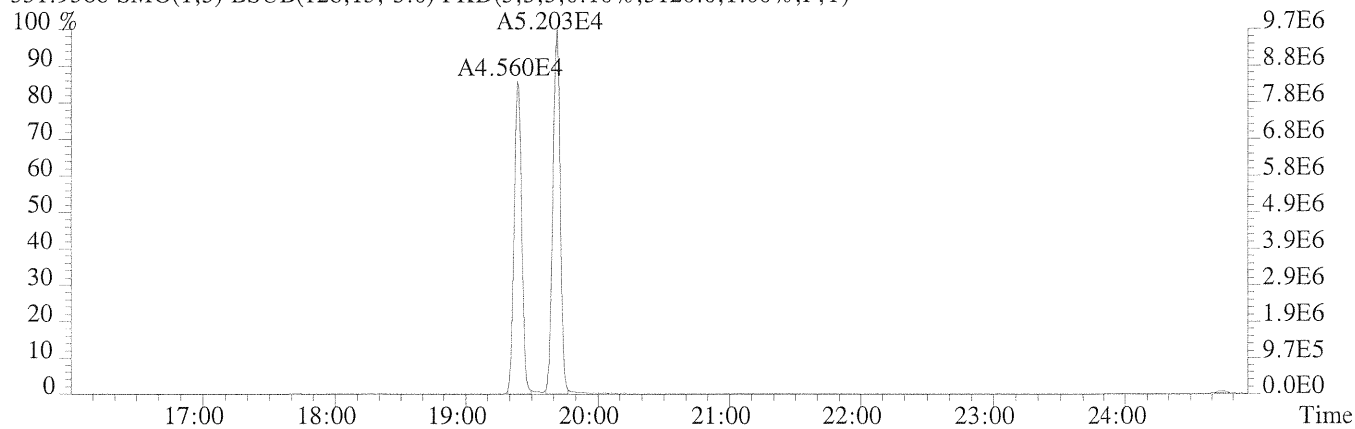
354.9792 PKD(3,3,3,100.00%,0.0,1.00%,F,F)



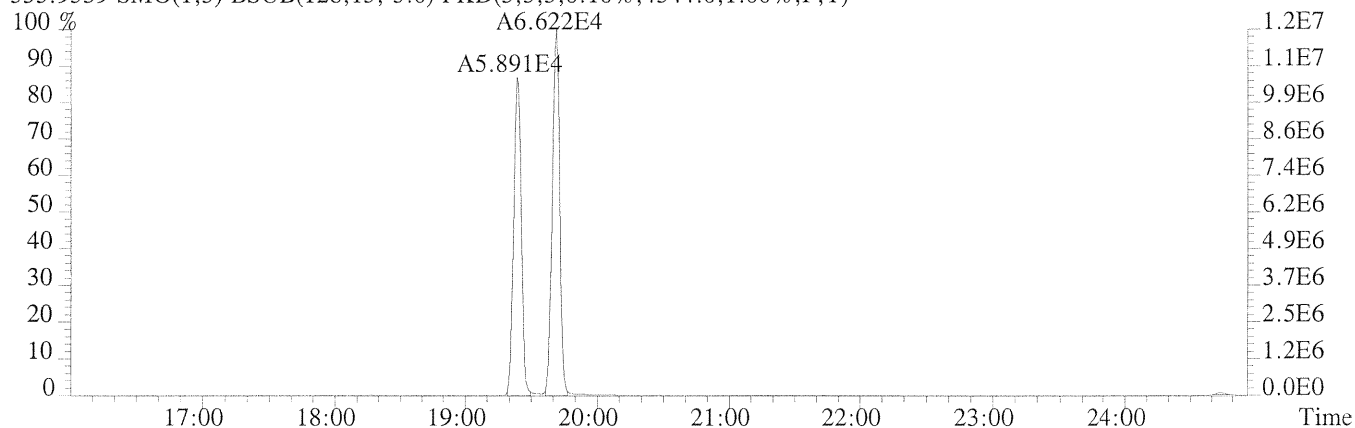
File:U124669 #1-746 Acq:17-DEC-2007 18:02:45 Probe EI+ Magnet SIR VG BioTech Mass spectf

Sample#1 Exp:ICAL CS3

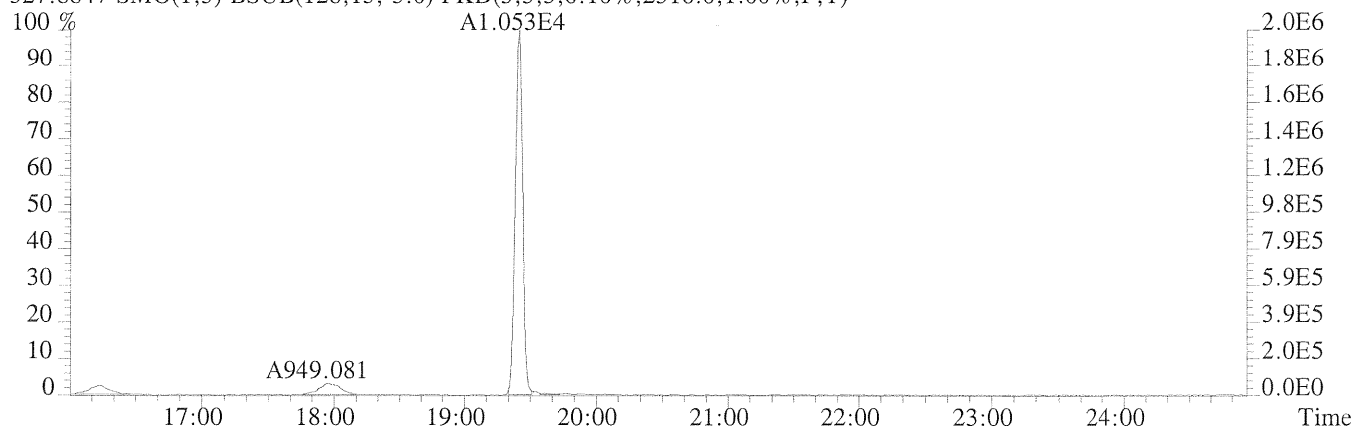
331.9368 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.10%,5120.0,1.00%,F,T)



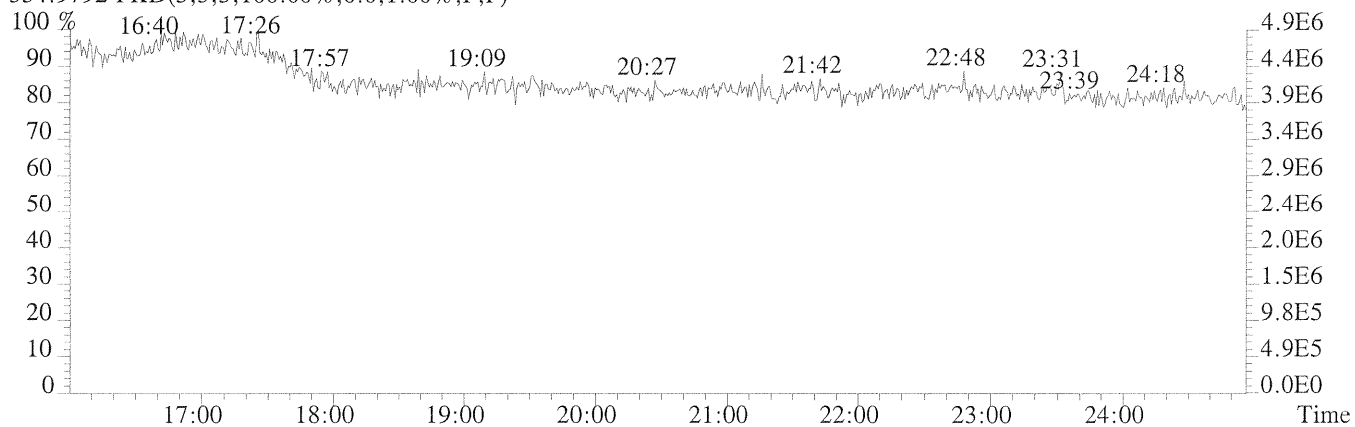
333.9339 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.10%,4344.0,1.00%,F,T)



327.8847 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.10%,2316.0,1.00%,F,T)



354.9792 PKD(3,3,3,100.00%,0.0,1.00%,F,F)



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Sample Response Summary

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EPA SAMPLE NO.
ICAL CS4

Run #4 Filename U124670 Samp: 1 Inj: 1 Acquired: 17-DEC-07 18:37:40
Processed: 16-APR-10 09:47:05 Sample ID: ICAL CS4

Typ	Name	RT-1	Resp 1	Resp 2	Ratio	Meet	Mod?
1 Unk	2,3,7,8-TCDF	20:52	5.184e+04	6.564e+04	0.79	yes	no
2 IS	13C-2,3,7,8-TCDF	20:51	1.259e+05	1.597e+05	0.79	yes	no
3 RS/RT	13C-1,2,3,4-TCDD	19:41	9.969e+04	1.259e+05	0.79	yes	no
4 C/Up	37Cl-2,3,7,8-TCDD	19:24	8.660e+04				

Signal/Noise Height Ratio Summary

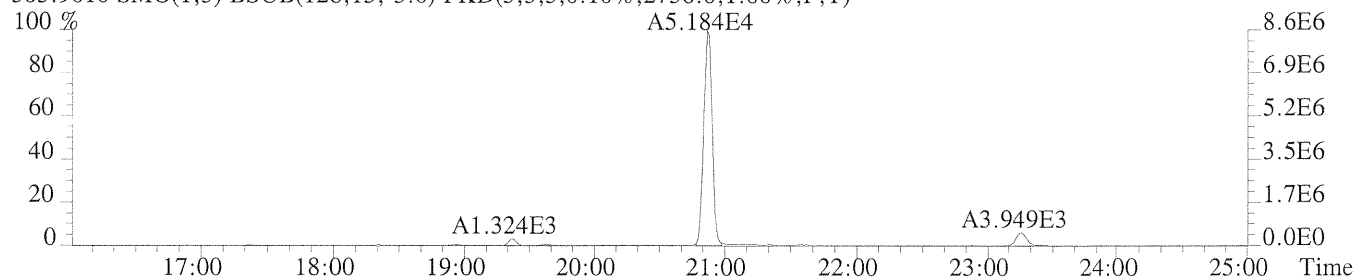
	Name	Signal 1	Noise 1	S/N Rat.1	Signal 2	Noise 2	S/N
1	2,3,7,8-TCDF	8.63e+06	2.74e+03	3.2e+03	1.09e+07	1.50e+03	7.3e+03
2	13C-2,3,7,8-TCDF	1.84e+07	1.15e+04	1.6e+03	2.33e+07	2.18e+04	1.1e+03
3	13C-1,2,3,4-TCDD	1.80e+07	6.57e+03	2.7e+03	2.26e+07	3.18e+03	7.1e+03
4	37Cl-2,3,7,8-TCDD	1.59e+07	2.53e+03	6.3e+03			

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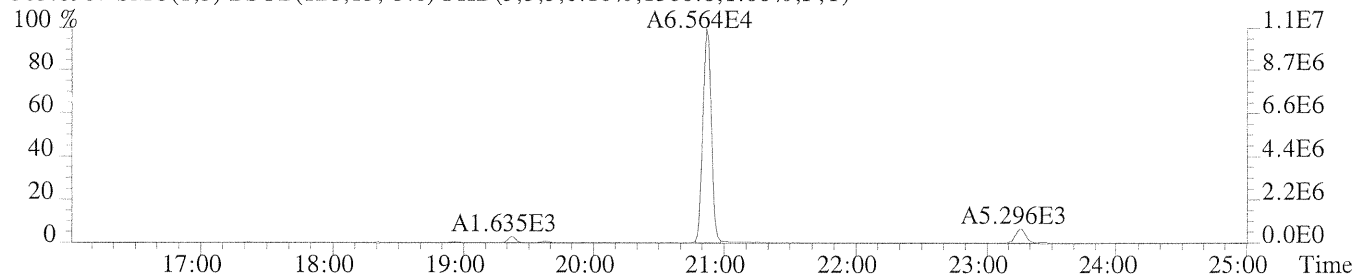
File:U124670 #1-751 Acq:17-DEC-2007 18:37:40 Probe EI+ Magnet SIR VG BioTech Mass spectf

Sample#1 Exp:ICAL CS4

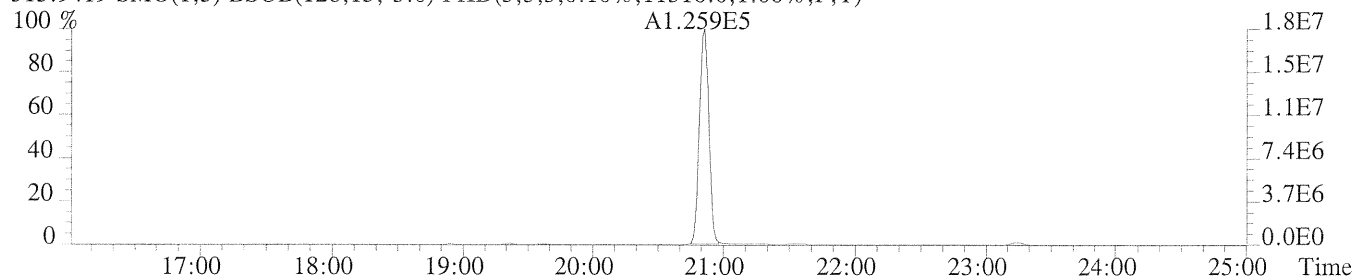
303.9016 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.10%,2736.0,1.00%,F,T)



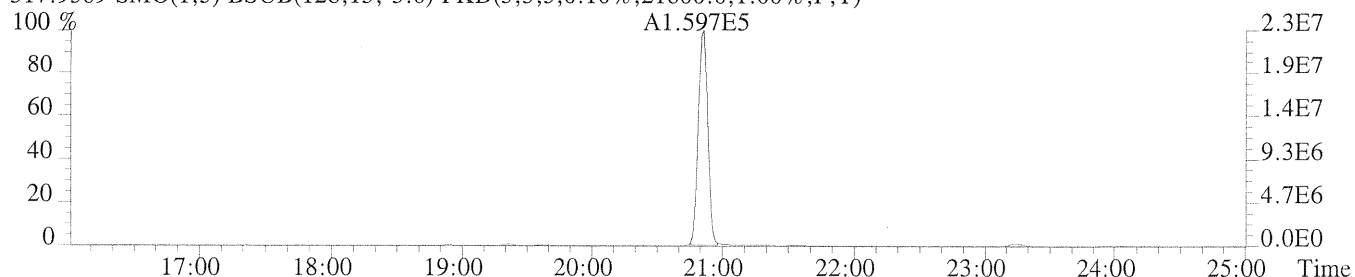
305.8987 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.10%,1500.0,1.00%,F,T)



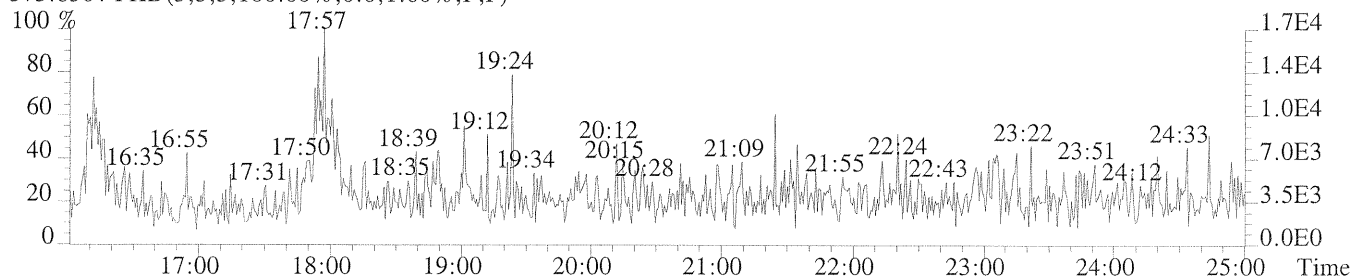
315.9419 SMO(1,5) BSUB(128,15,-3.0) PKD(3,3,3,0.10%,11516.0,1.00%,F,T)



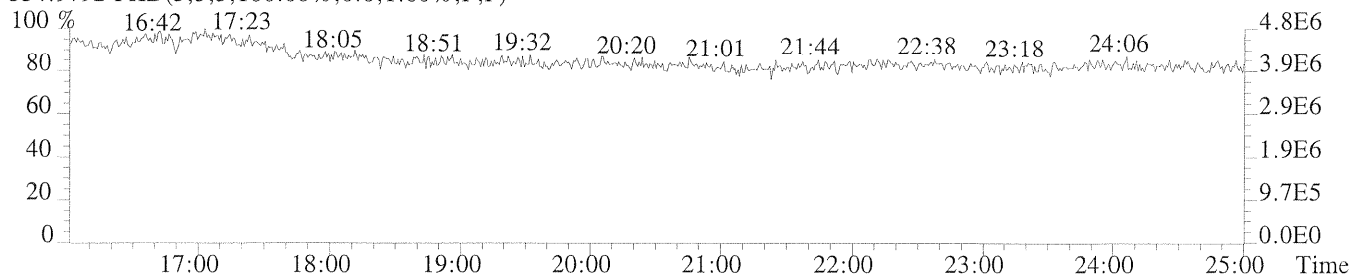
317.9389 SMO(1,5) BSUB(128,15,-3.0) PKD(3,3,3,0.10%,21800.0,1.00%,F,T)



375.8364 PKD(5,3,5,100.00%,0.0,1.00%,F,F)



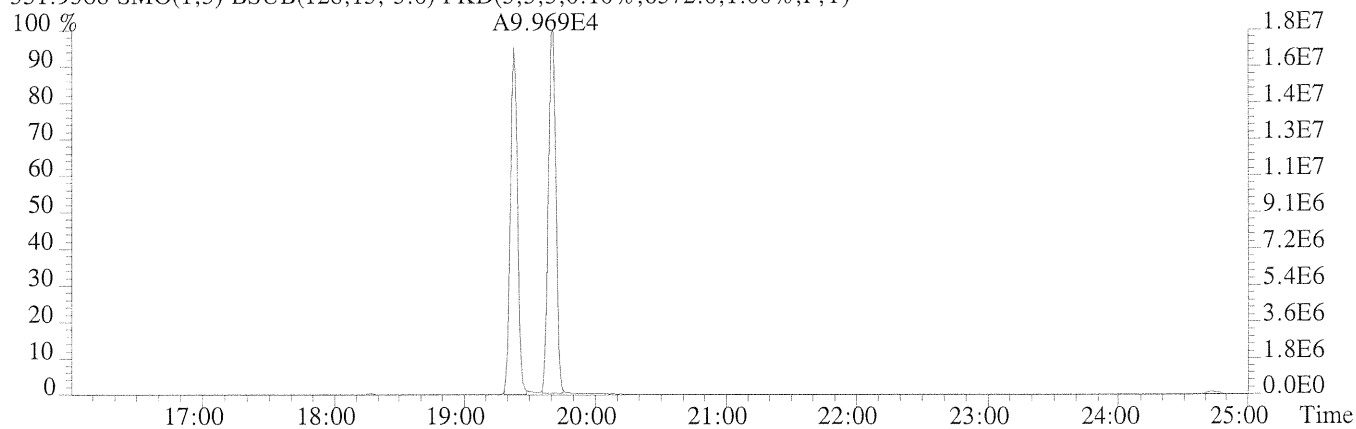
354.9792 PKD(3,3,3,100.00%,0.0,1.00%,F,F)



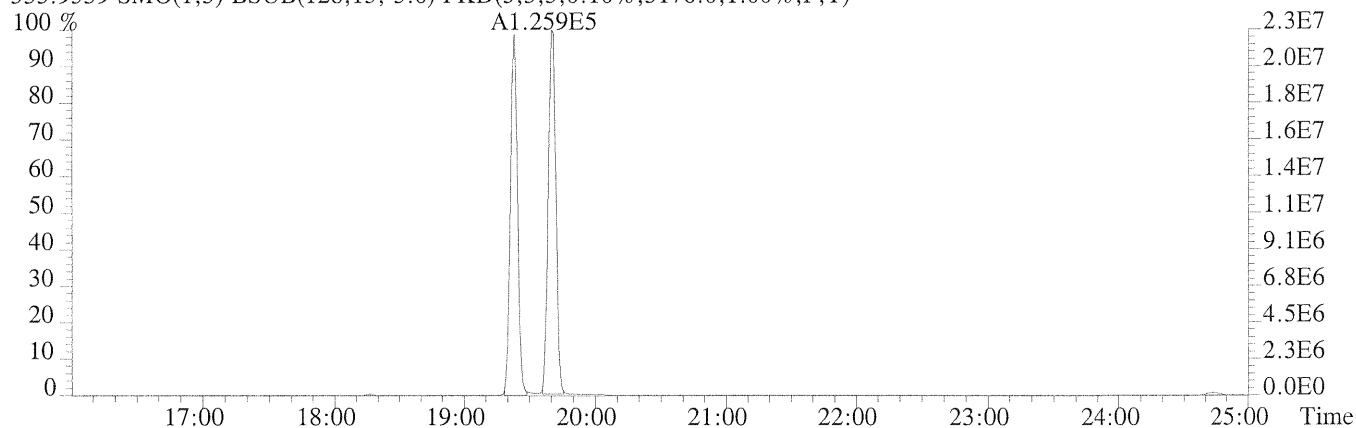
File:U124670 #1-751 Acq:17-DEC-2007 18:37:40 Probe EI+ Magnet SIR VG BioTech Mass spectf

Sample#1 Exp:ICAL CS4

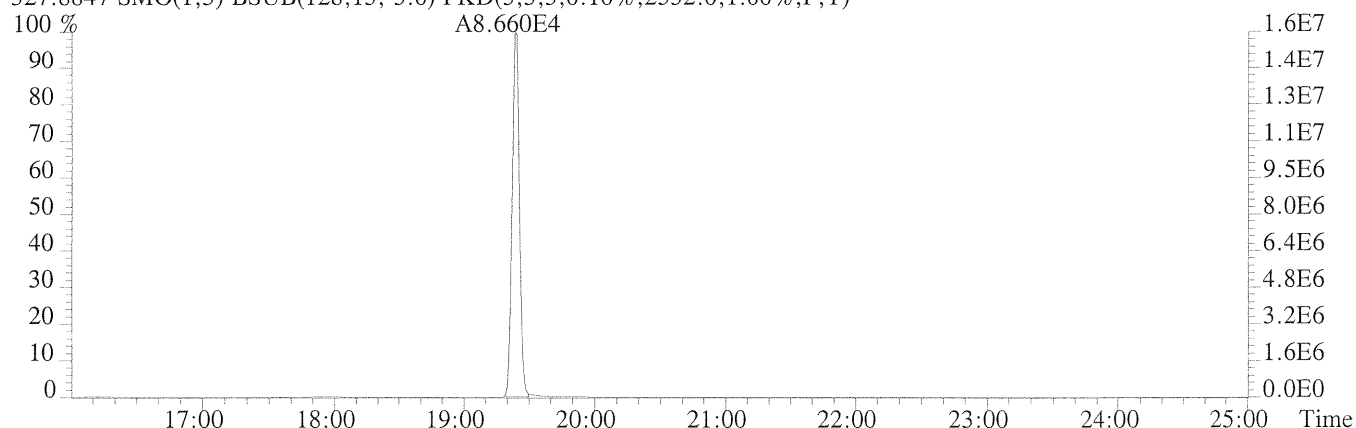
331.9368 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.10%,6572.0,1.00%,F,T)



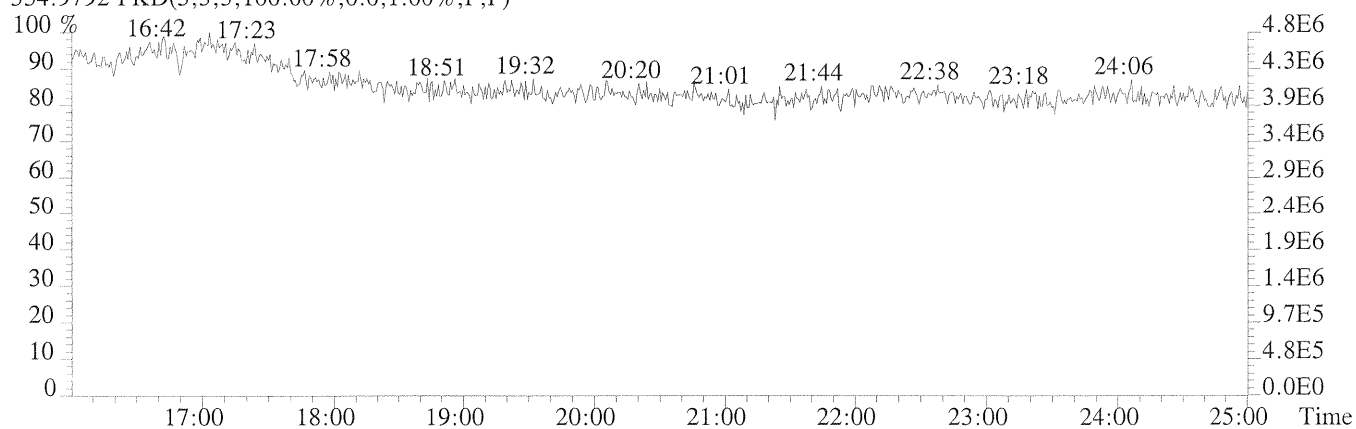
333.9339 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.10%,3176.0,1.00%,F,T)



327.8847 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.10%,2532.0,1.00%,F,T)



354.9792 PKD(3,3,3,100.00%,0.0,1.00%,F,F)



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Sample Response Summary

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EPA SAMPLE NO.
ICAL CS5

Run #5 Filename U124671 Samp: 1 Inj: 1 Acquired: 17-DEC-07 19:12:26
Processed: 16-APR-10 09:47:05 Sample ID: ICAL CS5

Typ	Name	RT-1	Resp 1	Resp 2	Ratio	Meet	Mod?
1 Unk	2,3,7,8-TCDF	20:53	2.171e+05	2.742e+05	0.79	yes	no
2 IS	13C-2,3,7,8-TCDF	20:51	1.031e+05	1.339e+05	0.77	yes	no
3 RS/RT	13C-1,2,3,4-TCDD	19:41	8.339e+04	1.069e+05	0.78	yes	no
4 C/Up	37Cl-2,3,7,8-TCDD	19:24	3.708e+05				

Signal/Noise Height Ratio Summary

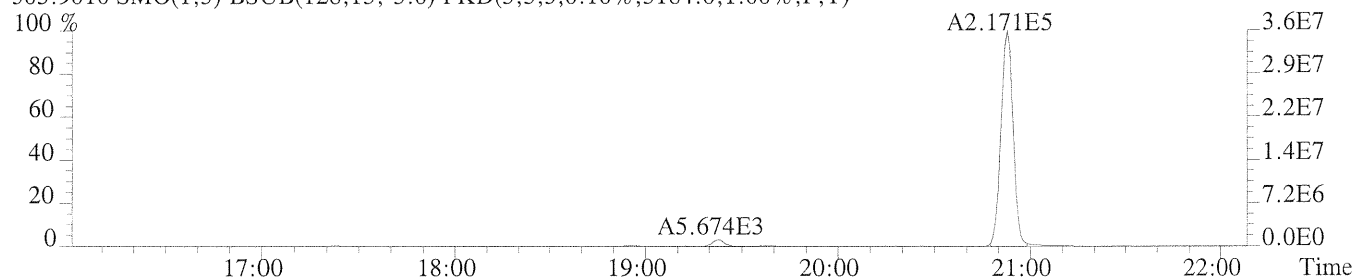
	Name	Signal 1	Noise 1	S/N Rat.1	Signal 2	Noise 2	S/N
1	2,3,7,8-TCDF	3.60e+07	3.18e+03	1.1e+04	4.53e+07	5.14e+03	8.8e+03
2	13C-2,3,7,8-TCDF	1.50e+07	1.04e+04	1.4e+03	1.96e+07	2.27e+04	8.6e+02
3	13C-1,2,3,4-TCDD	1.56e+07	6.06e+03	2.6e+03	2.01e+07	3.09e+03	6.5e+03
4	37Cl-2,3,7,8-TCDD	6.86e+07	2.76e+03	2.5e+04			

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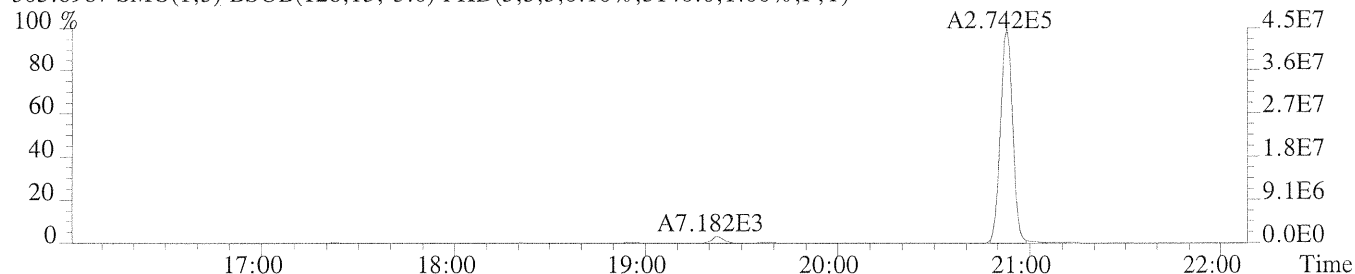
File:U124671 #1-512 Acq:17-DEC-2007 19:12:26 Probe EI+ Magnet SIR VG BioTech Mass spectf

Sample#1 Exp:ICAL CS5

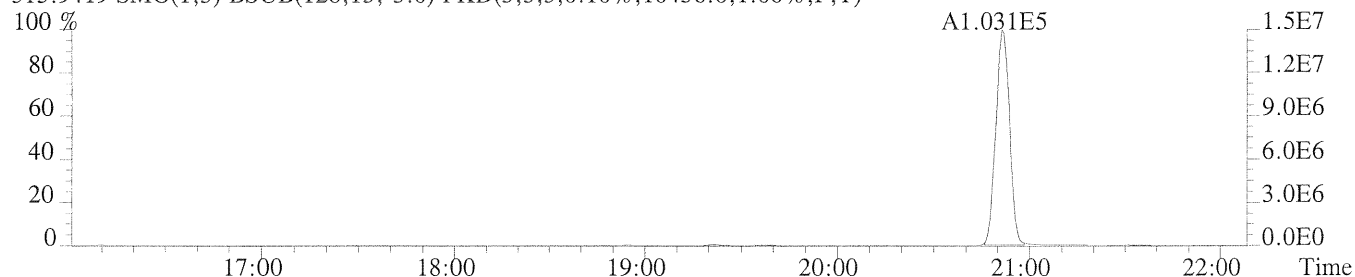
303.9016 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.10%,3184.0,1.00%,F,T)



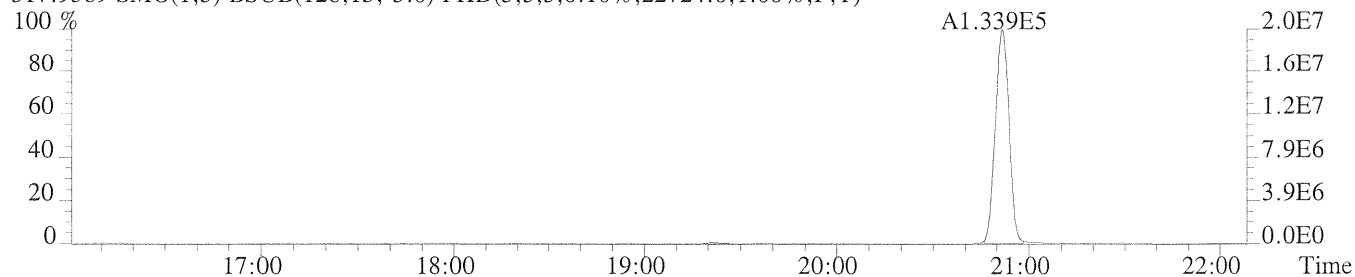
305.8987 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.10%,5140.0,1.00%,F,T)



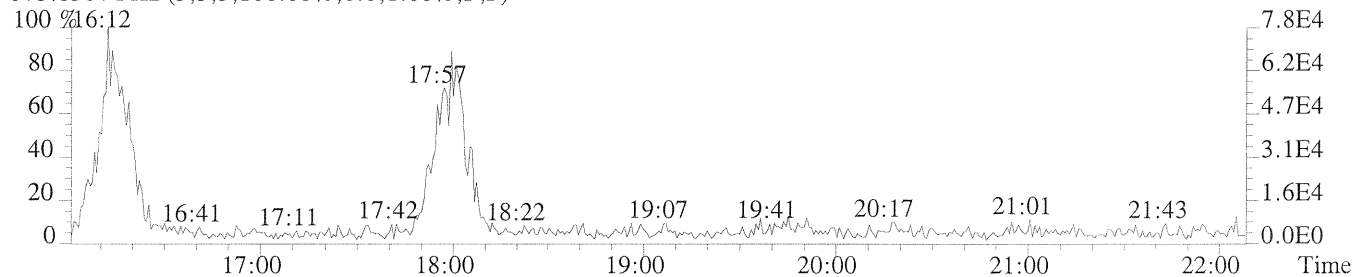
315.9419 SMO(1,5) BSUB(128,15,-3.0) PKD(3,3,3,0.10%,10436.0,1.00%,F,T)



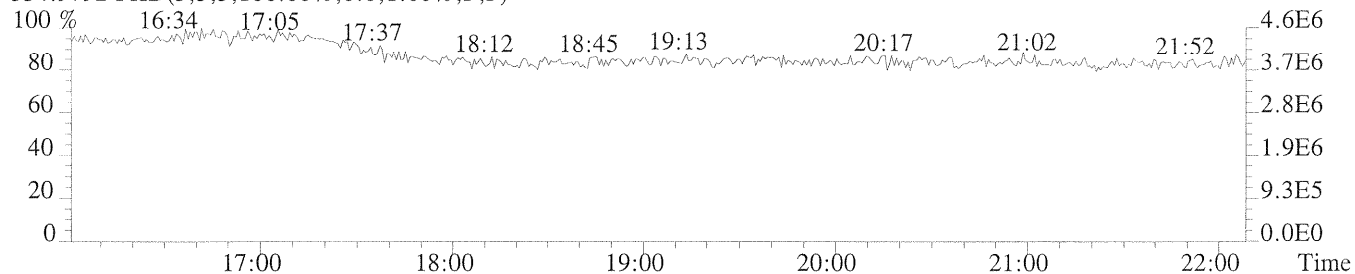
317.9389 SMO(1,5) BSUB(128,15,-3.0) PKD(3,3,3,0.10%,22724.0,1.00%,F,T)



375.8364 PKD(5,3,5,100.00%,0.0,1.00%,F,F)



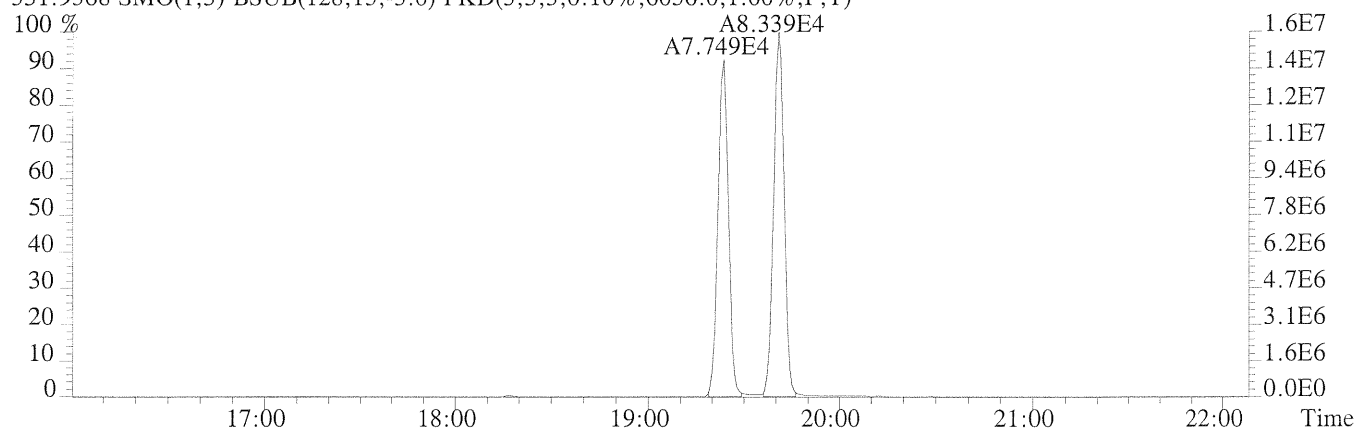
354.9792 PKD(3,3,3,100.00%,0.0,1.00%,F,F)



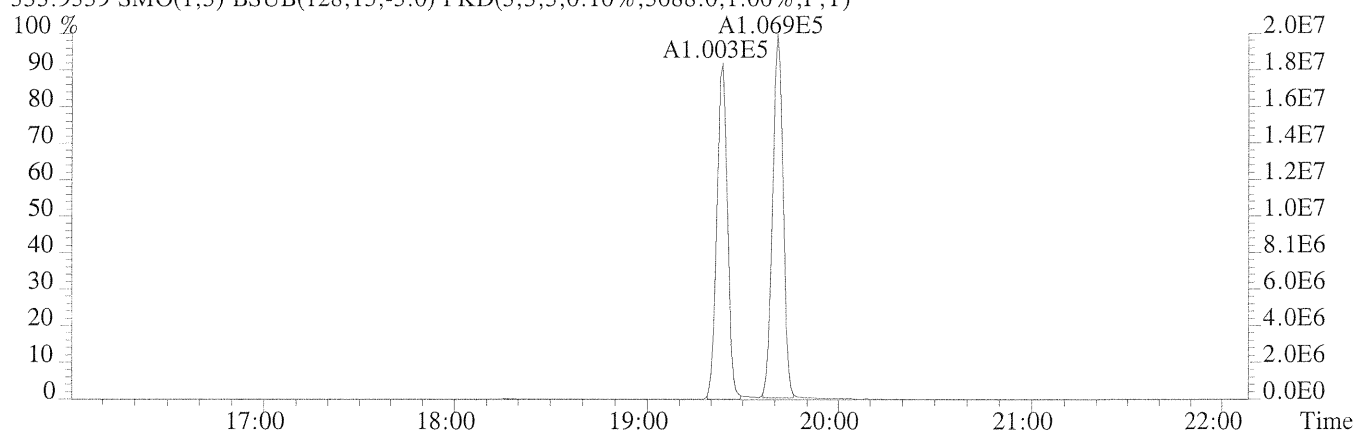
File:U124671 #1-512 Acq:17-DEC-2007 19:12:26 Probe EI+ Magnet SIR VG BioTech Mass spectf

Sample#1 Exp:ICAL CS5

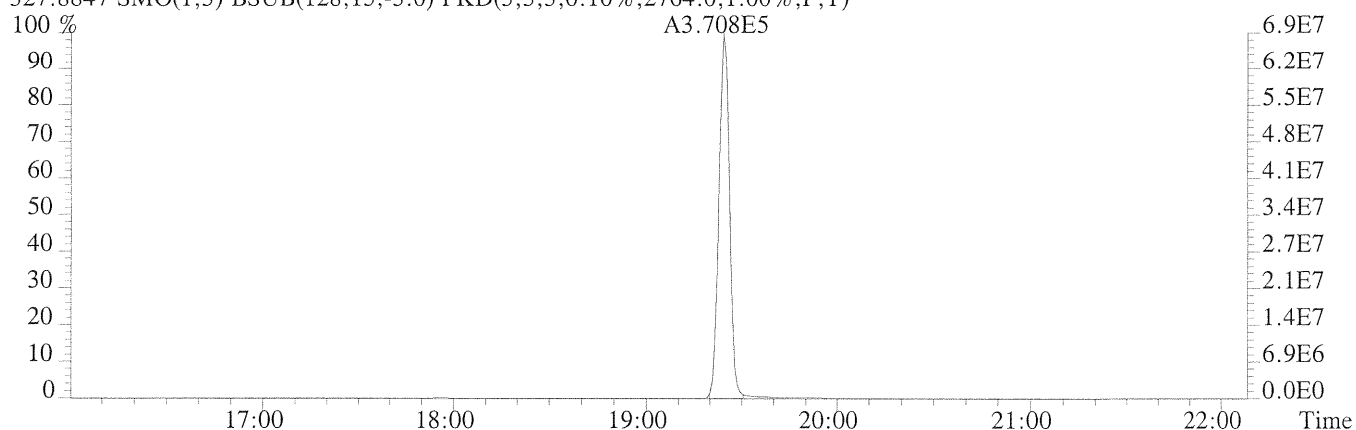
331.9368 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.10%,6056.0,1.00%,F,T)



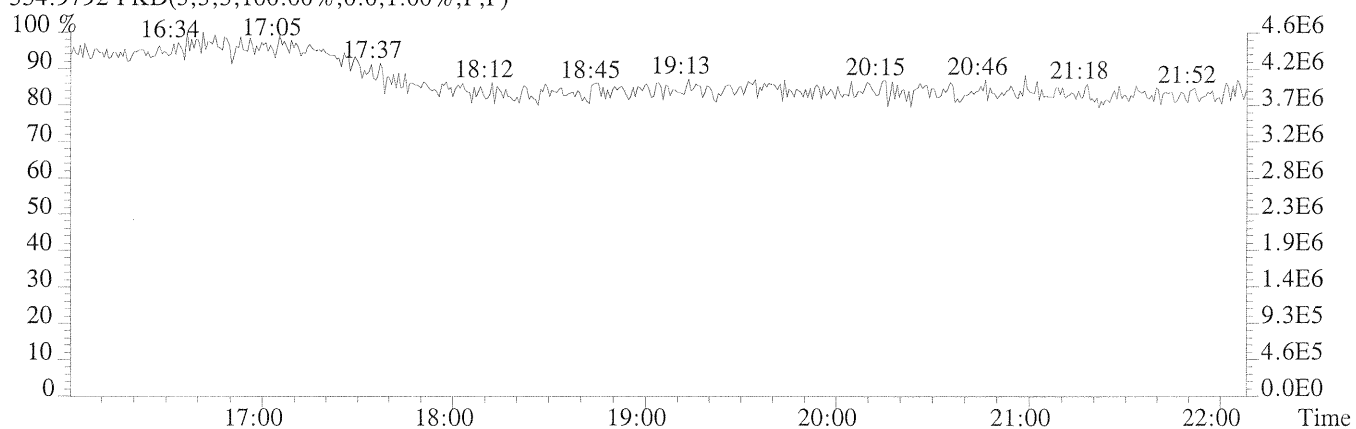
333.9339 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.10%,3088.0,1.00%,F,T)



327.8847 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.10%,2764.0,1.00%,F,T)



354.9792 PKD(3,3,3,100.00%,0.0,1.00%,F,F)



Appendix D

Analytical Chemistry Results for ‘Information Only’ Sediment Samples

Table D-1. San Rafael Channel 2010 Sediment Chemistries – ‘Information Only’ Core Section Composites.

Analyte	Units	Bay Background (RWQCB 1998) ¹	HWRP Acceptance Criteria ²	SRC-2010-1-B	SRC-2010-2-B	SRC-2010-3-B	SRC-2010-4-B	SRC-2010-5-B	SRC-2010-6-B	SRC-2010-7-B	SRC-2010-8-B
Grain Size											
Gravel (>2.00 mm)	%, dry wt	<100% fines	NA	15.80	15.40	33.50	35.30	15.60	14.10	4.64	11.8
Sand (0.0625 - 2.00 mm)	%, dry wt			51.8	12.3	23.7	21.6	21.4	21.5	18.2	32.8
Silt (0.0039 - 0.0625 mm)	%, dry wt			16.20	25.10	19.70	18.60	26.40	23.50	40.60	28.6
Clay (< 0.0039 mm)	%, dry wt			17.80	40.00	22.30	23.30	36.20	38.10	39.00	17.4
Percent fines (Silt+Clay)	%, dry wt			34.0	65.1	42.0	41.9	62.6	61.6	79.6	46.0
% Solids	%	-	-	50.4	50.9	49.2	51.4	49.1	45.6	53	51.0
TOC	%	-	-	1.33	1.36	1.27	1.299	1.497	1.56	1.64	4.33
Metals											
Arsenic	mg/kg, dry wt	15.3	15.3	11.1	12	11.3	11	12.3	12.6	12.40	11.4
Cadmium	mg/kg, dry wt	0.33	0.7	0.27	0.27	0.253	0.212	0.272	0.31	0.438	1.19
Chromium	mg/kg, dry wt	112	112	78.1	80	76.2	75.4	84.9	86.2	202	93.6
Copper	mg/kg, dry wt	68.1	68.1	54.3	57.5	53.4	54.7	62.4	72.5	65.3	117
Lead	mg/kg, dry wt	43.2	43.2	26.3	29.1	27.5	29.1	42.1	55.6	71.5	427
Mercury	mg/kg, dry wt	0.43	0.43	0.362	0.393	0.359	0.366	0.424	0.525	0.652	0.845
Nickel	mg/kg, dry wt	112	112	90.2	89.8	86.6	84	90.8	92.8	214	103
Selenium	mg/kg, dry wt	0.64	0.64	0.23	0.38	0.38	0.31	0.23	0.20	0.23	0.34
Silver	mg/kg, dry wt	0.58	0.58	0.308	0.329	0.332	0.335	0.423	0.518	0.358	0.71
Zinc	mg/kg, dry wt	158	158	126	129	140	134	154	169	155	306
Butyltins											
Tetra-n-butyltin	µg/kg, dry wt	-	-	<0.86	<0.85	<0.89	<0.85	<0.88	<0.95	<0.82	5.9
Tri-n-butyltin Cation	µg/kg, dry wt	-	-	<0.84	1.3 J	1.3 J	1.6 J	8.4	3.9	4.0	140
Di-n-butyltin Cation	µg/kg, dry wt	-	-	1.9 J	1.8 J	2.9	3.7	24	21	18	280
n-Butyltin Cation	µg/kg, dry wt	-	-	2.5	2.2	2.4	3.5	13	13	8.1	86
Σ detected Butylins	µg/kg, dry wt	-	-	4.4	5.3	6.6	8.8	45.4	37.9	30.1	512
PCBs											
Aroclor 1016	µg/kg, dry wt	-	-	<2.1	<2.1	<2.2	<2.1	<2.2	<2.4	<2.1	<2.1
Aroclor 1221	µg/kg, dry wt	-	-	<2.1	<2.1	<2.2	<2.1	<2.2	<2.4	<2.1	<2.1
Aroclor 1232	µg/kg, dry wt	-	-	<2.1	<2.1	<2.2	<2.1	<2.2	<2.4	<2.1	<2.1
Aroclor 1242	µg/kg, dry wt	-	-	<2.1	<2.1	<7.6	<2.1	<2.2	24	49	<2.1
Aroclor 1248	µg/kg, dry wt	-	-	<2.1	<2.1	<2.2	<2.1	<2.2	<2.4	<2.1	160
Aroclor 1254	µg/kg, dry wt	-	-	<5.2	<8.9	<14	<12	<19	37	51	200
Aroclor 1260	µg/kg, dry wt	-	-	<6.7	<11	18	15	20	29	46	210
Σ detected PCBs	µg/kg, dry wt	22.7	22.7	<6.7	<11	18	15	20	90	146	570

Table D-1. San Rafael Channel 2010 Sediment Chemistries – ‘Information Only’ Core Section Composites. (continued)

Analyte	Units	Bay Background (RWQCB 1998) ¹	HWRP Acceptance Criteria ²	SRC-2010-1-B	SRC-2010-2-B	SRC-2010-3-B	SRC-2010-4-B	SRC-2010-5-B	SRC-2010-6-B	SRC-2010-7-B	SRC-2010-8-B
Organochlorine Pesticides											
Aldrin	µg/kg, dry wt	1.1	-	<0.16	<0.16	<0.17	<0.16	<0.17	<0.18	<0.16	1.5
alpha-BHC	µg/kg, dry wt	-	-	<0.11	<0.11	<0.12	<0.11	<0.12	<0.13	<0.11	<0.11
beta-BHC	µg/kg, dry wt	-	-	<0.18	<0.18	<0.19	<0.18	<0.19	<0.20	<0.18	<0.18
delta-BHC	µg/kg, dry wt	-	-	<0.074	<0.074	<0.076	<0.079	<0.076	<0.082	<0.074	<0.98
gamma-BHC (lindane)	µg/kg, dry wt	-	-	<0.080	<0.080	<0.082	<0.080	<0.082	0.12 J	0.13 J	0.27 J
alpha-Chlordane	µg/kg, dry wt	-	-	<0.10	<0.99	<1.1	<0.10	<1.1	<0.11	1.3	20
gamma-Chlordane	µg/kg, dry wt	-	-	0.17 J	0.37 J	0.13 J	0.33 J	0.32 J	0.82 J	3.4	39
Chlordane	µg/kg, dry wt	1.1	1.1	<3.6	<2.0	<3.1	<3.7	<5.8	7.6 J	24	280
4,4'-DDD	µg/kg, dry wt	-	-	0.87 J	1.3	1.4	0.92 J	1.3	2.4	16	100
4,4'-DDE	µg/kg, dry wt	-	-	1.3	2	2.1	1.6	2	3.4	7.1	24
4,4'-DDT	µg/kg, dry wt	-	-	0.51 J	<0.59	<0.53	<0.55	<1.1	<1.7	1.8	15
2,4'-DDD	µg/kg, dry wt	-	-	<0.33	<0.37	<0.26	0.72 J	<0.46	2.4	2	12
2,4'-DDE	µg/kg, dry wt	-	-	<0.51	<0.99	<1.2	<0.61	<1.1	<1.1	<0.95	<5.1
2,4'-DDT	µg/kg, dry wt	-	-	0.66 J	0.52 J	0.42 J	0.43 J	0.75 J	2.6	<2.1	8.3
Σ detected DDTs	µg/kg, dry wt	7.0	7.0	1.3	3.82	3.92	3.67	4.05	10.8	26.9	159
Dieldrin	µg/kg, dry wt	0.44	0.72	<0.14	<0.14	<0.15	<0.14	<0.15	<1.4	<0.95	1.4
Endosulfan I	µg/kg, dry wt	-	-	<0.063	<0.063	<0.064	<0.063	<0.071	0.15 J	<0.95	<3.5
Endosulfan II	µg/kg, dry wt	-	-	<0.14	<0.14	<0.15	<0.14	<0.15	<0.16	<0.17	<0.98
Endosulfan sulfate	µg/kg, dry wt	-	-	<0.11	<0.11	<0.12	<0.11	<0.12	<0.13	<0.11	1.2
Endrin	µg/kg, dry wt	0.78	-	<0.094	<0.094	<0.096	<0.094	<0.096	<0.11	<0.29	<2.0
Endrin aldehyde	µg/kg, dry wt	-	6.4	<0.12	<0.12	<0.13	<0.12	<0.13	<0.14	<0.12	<0.98
Heptachlor	µg/kg, dry wt	-	0.3	<0.12	<0.12	<0.13	<0.12	<0.13	<0.14	<0.12	<0.16
Heptachlor epoxide	µg/kg, dry wt	-	0.3	<0.084	<0.084	<0.086	<0.084	0.31 J	<0.55	<0.67	<0.98
Toxaphene	µg/kg, dry wt	-	-	<11	<11	<13	<15	<26	<28	<32	<150
PAHs											
Naphthalene	µg/kg, dry wt	55.8	-	13	12	14	11	15	16	13	31
Acenaphthylene	µg/kg, dry wt	31.7	-	8.7	6.4	5.7	4.8 J	6.4	6.0	6.9	16
Acenaphthene	µg/kg, dry wt	26.6	-	6.7	3.7 J	3.9 J	4.1 J	4.4 J	4.0 J	3.6 J	37
Fluorene	µg/kg, dry wt	25.3	-	8.2	6.4	6.0	5.1	6.6	5.5	2.9 J	54
Phenanthrene	µg/kg, dry wt	237	-	83	50	46	38	70	42	30	360
Anthracene	µg/kg, dry wt	88	-	27	16	13	11	19	12	8.7	81
Fluoranthene	µg/kg, dry wt	514	-	150	120	130	100	180	140	170	850
Pyrene	µg/kg, dry wt	665	-	240	210	220	180	280	300	510	1300

Table D-1. San Rafael Channel 2010 Sediment Chemistries – ‘Information Only’ Core Section Composites. (continued)

Analyte	Units	Bay Background (RWQCB 1998) ¹	HWRP Acceptance Criteria ²	SRC-2010-1-B	SRC-2010-2-B	SRC-2010-3-B	SRC-2010-4-B	SRC-2010-5-B	SRC-2010-6-B	SRC-2010-7-B	SRC-2010-8-B
<i>PAHs</i>											
Benzo(a)anthracene	µg/kg, dry wt	244	-	83	64	68	55	91	69	65	370
Chrysene	µg/kg, dry wt	289	-	94	73	79	63	120	56	56	330
Benzo(b)fluoranthene	µg/kg, dry wt	371	-	110	110	130	110	180	170	210	590
Benzo(k)fluoranthene	µg/kg, dry wt	258	-	34	33	38	31	55	45	53	190
Benzo(a)pyrene	µg/kg, dry wt	412	-	120	120	140	110	170	160	230	510
Indeno(1,2,3-cd)pyrene	µg/kg, dry wt	382	-	100	110	120	100	160	170	260	550
Dibenzo(a,h)anthracene	µg/kg, dry wt	32.7	-	14	12	12	12	22	16	17	71
Benzo(g,h,i)perylene	µg/kg, dry wt	310	-	110	130	150	120	190	210	340	710
Σ detected PAHs	µg/kg, dry wt	3390	3390	1202	1077	1156	955	1569	1422	2038	6050

Notes:

¹ San Francisco Regional Water Quality Control Board (1998) Staff Report: Ambient Concentrations of Toxic Chemicals in San Francisco Bay Sediments. May 1998.

² HWRP Biological Opinion (USFWS 2005)

J - value detected below the reporting limit and is an estimate

Bold Font and Bold Outline = Value > Bay Background

Bold Font and Grey Shading = Value > HWRP Acceptance Criteria and Bay Background

Appendix E

Sediment Porewater Water Quality Analyses and Overlying Water Ammonia Analyses Performed in Support of Bioassay Testing

**Table E-1. Sediment porewater initial water quality characteristics for
Ampelisca abdita toxicity tests.**

Sample ID	pH	Salinity (ppt)	Total Ammonia (mg/L N)	Total Sulfide (mg/L)
Lab Control	7.22	29.0	22.0	0.099
SF-10	7.44	28.4	4.61	0.167
SF-11	7.53	29.0	3.30	0.265
SRC-2010-1	7.46	27.7	4.58	0.108
SRC-2010-2	7.36	28.3	3.49	0.039
SRC-2010-3	7.32	27.1	8.08	0.096
SRC-2010-4	7.30	27.3	3.65	0.067
SRC-2010-5	7.60	27.4	9.97	0.052
SRC-2010-6	7.38	27.5	9.98	0.073
SRC-2010-7	7.48	27.3	11.2	0.141
SRC-2010-8	7.49	27.1	2.08	0.365

**Table E-2. Sediment porewater final water quality characteristics for
Ampelisca abdita toxicity tests.**

Sample ID	pH	Salinity (ppt)	Total Ammonia (mg/L N)	Total Sulfide (mg/L)
Lab Control	7.15	32.3	7.94	0.018
SF-10	7.57	35.7	<1.0	0.005
SF-11	7.59	37.4	<1.0	0.039
SRC-2010-1	7.20	33.9	<1.0	0.016
SRC-2010-2	7.16	30.6	<1.0	0.004
SRC-2010-3	7.22	30.4	1.52	0.010
SRC-2010-4	7.24	30.9	2.80	0.006
SRC-2010-5	7.17	31.7	1.75	0.016
SRC-2010-6	7.17	32.1	<1.0	0.019
SRC-2010-7	7.22	31.0	1.68	0.026
SRC-2010-8	6.80	33.1	3.47	0.100

Table E-3. Sediment overlying water total ammonia levels for *Ampelisca abdita* tests.

Sample ID	Total Ammonia (mg/L N)	
	Test Initiation	Test Termination
Lab Control	3.07	2.88
SF-10	<1.0	<1.0
SF-11	<1.0	<1.0
SRC-2010-1	1.20	<1.0
SRC-2010-2	<1.0	<1.0
SRC-2010-3	<1.0	<1.0
SRC-2010-4	<1.0	<1.0
SRC-2010-5	1.74	<1.0
SRC-2010-6	<1.0	<1.0
SRC-2010-7	1.60	<1.0
SRC-2010-8	<1.0	<1.0

Table E-4. Sediment porewater initial water quality characteristics for *Neanthes arenacoedentata* tests.

Sample ID	pH	Salinity (ppt)	Total Ammonia (mg/L N)	Total Sulfide (mg/L)
Lab Control	7.21	30.4	10.0	0.225
SF-10	7.03	27.9	2.30	0.033
SF-11	7.48	28.5	<1.0	0.318
SRC-2010-1	7.28	29.2	11.6	0.036
SRC-2010-2	7.22	28.6	12.2	0.015
SRC-2010-3	7.23	28.7	8.99	0.020
SRC-2010-4	7.20	29.3	11.0	0.028
SRC-2010-5	7.23	29.5	7.97	0.040
SRC-2010-6	7.23	29.6	10.6	0.111
SRC-2010-7	7.39	29.9	5.78	0.018
SRC-2010-8	7.21	28.1	12.1	0.634

**Table E-5. Sediment porewater final water quality characteristics for
Neanthes arenacoedentata tests.**

Sample ID	pH	Salinity (ppt)	Total Ammonia (mg/L N)	Total Sulfide (mg/L)
Lab Control	7.14	31.9	6.69	0.108
SF-10	6.99	30.1	1.47	0.034
SF-11	7.67	32.2	<1.0	0.203
SRC-2010-1	7.39	32.4	2.09	0.039
SRC-2010-2	7.11	31.9	1.88	0.038
SRC-2010-3	7.21	29.1	2.87	0.036
SRC-2010-4	7.17	31.3	2.64	0.046
SRC-2010-5	7.09	31.8	3.16	0.037
SRC-2010-6	7.19	31.4	7.88	0.036
SRC-2010-7	7.03	31.9	2.05	0.049
SRC-2010-8	6.89	29.4	4.16	0.135

**Table E-6. Sediment overlying water total ammonia levels for
Neanthes arenacoedentata tests.**

Sample ID	Total Ammonia (mg/L N)	
	Test Initiation	Test Termination
Lab Control	3.46	1.38
SF-10	1.03	<1.0
SF-11	<1.0	<1.0
SRC-2010-1	3.49	1.52
SRC-2010-2	4.08	<1.0
SRC-2010-3	1.11	<1.0
SRC-2010-4	2.53	<1.0
SRC-2010-5	2.49	<1.0
SRC-2010-6	2.01	1.67
SRC-2010-7	2.03	<1.0
SRC-2010-8	1.66	1.78

Appendix F

Test Data and Summary of Statistics for the Evaluation of the Toxicity of the San Rafael Channel Sediments to the Amphipod, *Ampelisca abdita*

CETIS Summary Report

Report Date: 11 Aug-10 16:34 (p 1 of 2)
Test Code: 20-7887-4336/39613-22

10 Day Marine/Estuarine Sediment Test						Pacific EcoRisk				
Batch ID:	13-9545-1556	Test Type: Survival		Analyst:	Jeremy Laurin					
Start Date:	01 Aug-10 10:00	Protocol: ASTM E1218-97a (1997)		Diluent:	Not Applicable					
Ending Date:	11 Aug-10 09:15	Species: Ampelisca abdita		Brine:	Not Applicable					
Duration:	9d 23h	Source: Aquatic Research Organisms, NH		Age:	NA					
Sample Code	Sample ID	Sample Date	Receive Date	Sample Age	Client Name	Project				
Lab Control	12-9044-1032	01 Aug-10 10:00	01 Aug-10 10:00	N/A (19.7 °C)	ACOE	16087				
SF-10	08-4984-0145	15 Jun-10 10:05	15 Jun-10 15:00	47d (0 °C)						
SF-11	14-4973-6714	15 Jun-10 09:30	15 Jun-10 15:00	47d 0h (0 °C)						
SRC-2010-01	17-0782-1094	08 Jun-10 09:20	08 Jun-10 19:00	54d 1h (2.4 °C						
SRC-2010-02	21-4363-5601	09 Jun-10 08:00	09 Jun-10 19:00	53d 2h (1.6 °C						
SRC-2010-03	15-3808-8719	09 Jun-10 11:05	09 Jun-10 19:00	52d 23h (1.6 °						
SRC-2010-04	03-3478-6159	11 Jun-10 08:40	11 Jun-10 17:00	51d 1h (0.2 °C						
SRC-2010-05	02-1820-9844	08 Jun-10 14:45	08 Jun-10 19:00	53d 19h (2.4 °						
SRC-2010-06	15-6585-2712	09 Jun-10 15:30	09 Jun-10 19:00	52d 18h (3.7 °						
SRC-2010-07	08-0994-4638	10 Jun-10 09:00	10 Jun-10 17:00	52d 1h (0.6 °C						
SRC-2010-08	08-9351-2460	10 Jun-10 11:55	10 Jun-10 17:00	51d 22h (1.4 °						
Sample Code	Material Type	Sample Source		Station Location		Latitude	Longitude			
Lab Control	Control Sediment	San Rafael Channel		Lab Control						
SF-10	Sediment	San Rafael Channel		San Pablo						
SF-11	Sediment	San Rafael Channel		Alcatraz						
SRC-2010-01	Sediment	San Rafael Channel		SRC-2010-01						
SRC-2010-02	Sediment	San Rafael Channel		SRC-2010-02						
SRC-2010-03	Sediment	San Rafael Channel		SRC-2010-03						
SRC-2010-04	Sediment	San Rafael Channel		SRC-2010-04						
SRC-2010-05	Sediment	San Rafael Channel		SRC-2010-05						
SRC-2010-06	Sediment	San Rafael Channel		SRC-2010-06						
SRC-2010-07	Sediment	San Rafael Channel		SRC-2010-07						
SRC-2010-08	Sediment	San Rafael Channel		SRC-2010-08						
Batch Note:	Comparisons Made With The Reference Site SF-10									
Survival Rate Summary										
Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
Lab Control	5	0.85	0.831	0.869	0.8	0.9	0.00913	0.05	5.88%	0.0%
SF-10	5	0.92	0.91	0.93	0.9	0.95	0.005	0.0274	2.98%	-8.24%
SF-11	5	0.91	0.886	0.934	0.85	1	0.0119	0.0652	7.16%	-7.06%
SRC-2010-01	5	0.93	0.909	0.951	0.85	1	0.0104	0.057	6.13%	-9.41%
SRC-2010-02	5	0.9	0.863	0.937	0.8	1	0.0183	0.1	11.1%	-5.88%
SRC-2010-03	5	0.94	0.924	0.956	0.9	1	0.00764	0.0418	4.45%	-10.6%
SRC-2010-04	5	0.9	0.874	0.926	0.8	1	0.0129	0.0707	7.86%	-5.88%
SRC-2010-05	5	0.94	0.907	0.973	0.8	1	0.0163	0.0894	9.52%	-10.6%
SRC-2010-06	5	0.88	0.87	0.89	0.85	0.9	0.005	0.0274	3.11%	-3.53%
SRC-2010-07	5	0.96	0.94	0.98	0.9	1	0.01	0.0548	5.71%	-12.9%
SRC-2010-08	5	0.84	0.795	0.885	0.7	1	0.0218	0.119	14.2%	1.18%

CETIS Summary Report

Report Date: 11 Aug-10 16:34 (p 2 of 2)
Test Code: 20-7887-4336/39613-22

10 Day Marine/Estuarine Sediment Test					Pacific EcoRisk
Survival Rate Detail					
Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
Lab Control	0.8	0.9	0.8	0.85	0.9
SF-10	0.95	0.9	0.95	0.9	0.9
SF-11	0.95	1	0.85	0.9	0.85
SRC-2010-01	0.9	0.95	0.95	0.85	1
SRC-2010-02	0.8	0.8	1	1	0.9
SRC-2010-03	1	0.95	0.95	0.9	0.9
SRC-2010-04	1	0.9	0.9	0.9	0.8
SRC-2010-05	1	0.8	0.9	1	1
SRC-2010-06	0.9	0.85	0.85	0.9	0.9
SRC-2010-07	1	1	0.9	1	0.9
SRC-2010-08	0.75	0.9	0.7	0.85	1

CETIS Analytical Report

Report Date: 1 Aug-10 16:34 (p 10 of 10)
Test Code: 20-7887-4336/39613-22

10 Day Marine/Estuarine Sediment Test							Pacific EcoRisk			
Analysis ID: 10-9602-0220		Endpoint: Survival Rate		CETIS Version: CETISv1.7.0						
Analyzed: 11 Aug-10 16:32		Analysis: Parametric-Two Sample		Official Results: Yes						
Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD		
Angular (Corrected)	0	C > T	Not Run				N/A	6.22%		
Equal Variance t Two-Sample Test										
Sample Code	vs	Sample Code	Test Stat	Critical	MSD	P-Value	Decision(5%)			
Lab Control		SF-10	-2.79	1.86	0.0735	0.9883	Non-Significant Effect			
ANOVA Table										
Source	Sum Squares		Mean Square		DF	F Stat	P-Value	Decision(5%)		
Between	0.03049439		0.03049439		1	7.8	0.0234	Significant Effect		
Error	0.03126868		0.003908585		8					
Total	0.06176307		0.03440297		9					
ANOVA Assumptions										
Attribute	Test		Test Stat	Critical	P-Value	Decision(1%)				
Variances	Variance Ratio F		1.81	23.2	0.5784	Equal Variances				
Distribution	Shapiro-Wilk Normality		0.838		0.0423	Normal Distribution				
Survival Rate Summary										
Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
Lab Control	5	0.85	0.831	0.869	0.8	0.9	0.00928	0.05	5.88%	0.0%
SF-10	5	0.92	0.91	0.93	0.9	0.95	0.00509	0.0274	2.98%	-8.24%
Angular (Corrected) Transformed Summary										
Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
Lab Control	5	1.18	1.15	1.2	1.11	1.25	0.0132	0.071	6.03%	0.0%
SF-10	5	1.29	1.27	1.31	1.25	1.35	0.00979	0.0527	4.09%	-9.38%
Graphics										
<div><div><p>Survival Rate dot plot showing means and 95% confidence intervals for Lab Control and SF-10. The y-axis ranges from 0.0 to 1.0. Lab Control has a mean of 0.85, and SF-10 has a mean of 0.92. A horizontal line at 0.85 is labeled 'Reject Null'.</p></div><div><p>Combined Corr. Angle dot plot showing individual data points for Lab Control and SF-10. The y-axis ranges from -0.08 to 0.08. Lab Control points are clustered around -0.04, and SF-10 points are clustered around 0.06.</p></div></div>										

10-Day Estuarine/Marine Sediment Toxicity Test Data

Client: ACOE-San RafaelTest ID#: 39613-22Date (Day 0): 8-6-10Species: Ampelisca abditaProject #: 16087Organism Supplier: BraziliaOrganism Log #: 5366

Day of Test	Test Replicate	Sample ID: Control					Sign-Off
		Temp (°C)	pH	D.O. (mg/L)	Salinity (ppt)	# Alive	
Day 0	Rep A	19.7	8.02	7.6	29.1	20	Date: 08/01/10
	Rep B	19.7	8.02	7.6	28.5	20	Time: 10:00
	Rep C	19.7	7.95	7.5	28.5	20	WQ: <u>8</u>
	Rep D	19.7	8.06	7.7	29.1	20	Scientist Initiation: <u>PA</u>
	Rep E	19.7	8.00	7.6	29.8	20	Scientist Confirmation: <u>PA</u>
Day 1	Rep A	19.7	8.07	7.7	29.5		Date: 8/1/10 Time: 9:10
Day 2	Rep B	20.2	8.17	7.7	29.0		WQ: <u>CB</u> Date: 8/3/10 Time: 8:20
Day 3	Rep C	19.8	8.15	7.6	28.9		WQ: <u>CB</u> Date: 8/4/10 Time: 9:20
Day 4	Rep D	20.2	8.30	7.7	28.8		WQ: <u>CB</u> Date: 8/5/10 Time: 09:20
Day 5	Rep E	20.1	8.27	7.4	28.9		WQ: <u>CB</u> Date: 8/6/10 Time: 09:30
Day 6	Rep A	20.2	8.27	7.7	27.7		Date: 8/7/10 Time: 09:30
Day 7	Rep B	20.2	8.35	7.6	28.9		WQ: <u>8</u> Date: 8/8/10 Time: 10:00
Day 8	Rep C	20.2	8.27	7.5	28.2		WQ: <u>8</u> Date: 8/9/10 Time: 10:00
Day 9	Rep D	20.2	8.33	7.5	29.3		Date: 8/10/10 Time: 09:00
Day 10	Rep A	20.1	8.28	7.6	28.5	16	Date: 8/11/10
	Rep B	20.1	8.25	7.4	29.2	18	Time: 09:15
	Rep C	20.1	8.27	7.4	28.5	16	WQ: <u>CB</u>
	Rep D	20.1	8.34	7.5	29.5	17	Scientist Counts: <u>mm</u>
	Rep E	20.1	8.29	7.9	30.0	18	

Day of Test	Matrix	pH	D.O. (mg/L)	Salinity (ppt)	Total Sulfide (mg/L)	Total Ammonia (mg/L)	Sign-Off
Day 0	Porewater	7.22	2.0	29.0	0.092	22.0	Date: 08/01/10 Time: 10:00
	Overlying Water					3.07	WQ: <u>8</u> Date: 08/01/10 Time: 10:00
	Meter ID	PH09	RD04	EC05	DR4000	DR3800	WQ: <u>8</u>
Day 10	Porewater	7.15	1.74	32.3	0.018	7.94	Date: 8/11/10 Time: 15:20
	Overlying Water					2.88	WQ: <u>mm</u> Date: 8/11/10 Time: 11:00
	Meter ID	PH03	RD04	EC05	DR4000	DR3800	WQ: <u>CB</u>

10-Day Estuarine/Marine Sediment Toxicity Test Data

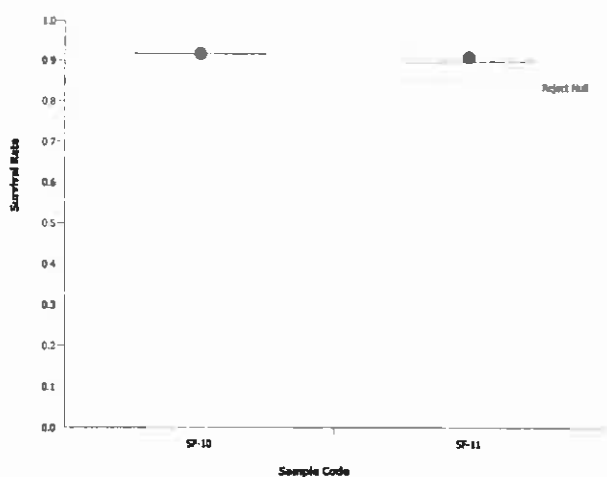
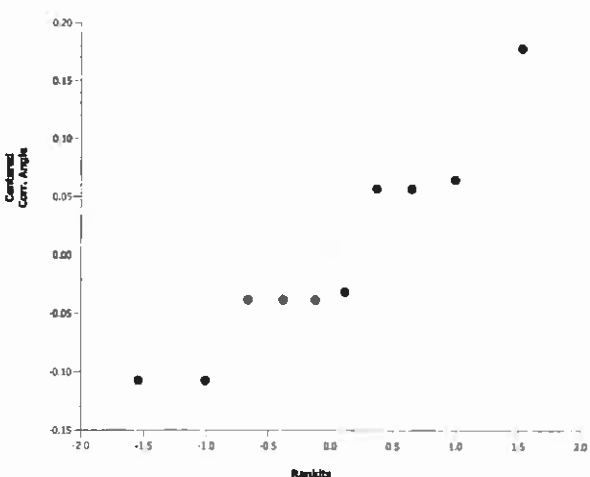
Client: ACOE (San Rafael)Test ID#: 39613Date (Day 0): 8-1-10Species: Ampelisca abditaProject #: 16087Organism Supplier: BrezinaOrganism Log #: 5366

Day of Test	Test Replicate	Sample ID: <u>SF-10 (San Pablo)</u>					Sign-Off
		Temp (°C)	pH	D.O. (mg/L)	Salinity (ppt)	# Alive	
Day 0	Rep A	19.7	7.93	7.7	29.8	20	Date: <u>08/01/10</u>
	Rep B	19.7	7.94	7.6	27.9	20	Time: <u>10:00</u>
	Rep C	19.7	7.92	7.7	29.2	20	WQ: <u>SC</u>
	Rep D	19.7	7.94	7.7	29.3	20	Scientist Initiation: <u>PA</u>
	Rep E	19.7	7.94	7.6	29.3	20	Scientist Confirmation: <u>PA</u>
Day 1	Rep A	19.7	7.93	7.7	29.6		Date: <u>8/1/10</u> Time: <u>9:10</u>
Day 2	Rep B	20.2	7.94	7.6	28.0		Date: <u>8/2/10</u> Time: <u>0920</u>
Day 3	Rep C	19.8	8.01	7.9	29.5		Date: <u>8/3/10</u> Time: <u>9:20</u>
Day 4	Rep D	20.2	8.05	7.6	29.5		Date: <u>8/4/10</u> Time: <u>0920</u>
Day 5	Rep E	20.1	8.05	7.6	28.6		Date: <u>8/5/10</u> Time: <u>0920</u>
Day 6	Rep A	20.2	8.02	7.6	29.1		Date: <u>8/6/10</u> Time: <u>0730</u>
Day 7	Rep B	20.2	8.02	7.5	28.9		Date: <u>8/7/10</u> Time: <u>10:00</u>
Day 8	Rep C	20.2	8.06	7.4	29.6		Date: <u>8/8/10</u> Time: <u>0940</u>
Day 9	Rep D	20.2	8.05	7.7	29.8		Date: <u>8/9/10</u> Time: <u>0900</u>
Day 10	Rep A	20.1	8.07	7.8	29.0	19	Date: <u>8/11/10</u>
	Rep B	20.1	8.08	7.7	28.8	18	Time: <u>0915</u>
	Rep C	20.1	8.02	7.6	29.6	19	WQ: <u>CH</u>
	Rep D	20.1	8.07	7.6	30.0	18	Scientist Counts: <u>mm</u>
	Rep E	20.1	8.10	7.6	27.8	18	

Day of Test	Matrix	pH	D.O. (mg/L)	Salinity (ppt)	Total Sulfide (mg/L)	Total Ammonia (mg/L)	Sign-Off
Day 0	Porewater	7.44	4.7	28.4	0.167	4.61	Date: <u>8/1/10</u> Time: <u>12:00</u>
	Overlying Water					<1	WQ: <u>SC</u>
	Meter ID	<u>PH09</u>	<u>DO04</u>	<u>EC05</u>	<u>DR3800</u>	<u>DR3800</u>	
Day 10	Porewater	7.57	4.9	35.7	0.005	41.0	Date: <u>8/11/10</u> Time: <u>1520</u>
	Overlying Water					41.0	WQ: <u>UM</u>
	Meter ID	<u>PH03</u>	<u>DO04</u>	<u>EC05</u>	<u>DR4000</u>	<u>DR3800</u>	Date: <u>8/11/10</u> Time: <u>1100</u>

CETIS Analytical Report

Report Date: 11 Aug-10 16:34 (p 9 of 10)
Test Code: 20-7887-4336/39613-22

10 Day Marine/Estuarine Sediment Test							Pacific EcoRisk			
Analysis ID: 03-7309-7015		Endpoint: Survival Rate		CETIS Version: CETISv1.7.0						
Analyzed: 11 Aug-10 16:32		Analysis: Parametric-Two Sample		Official Results: Yes						
Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD		
Angular (Corrected)	0	C > T	Not Run				N/A	7.34%		
Equal Variance t Two-Sample Test										
Sample Code	vs	Sample Code	Test Stat	Critical	MSD	P-Value	Decision(5%)			
SF-10		SF-11	0.129	1.86	0.111	0.4503	Non-Significant Effect			
ANOVA Table										
Source	Sum Squares		Mean Square		DF	F Stat	P-Value	Decision(5%)		
Between	0.0001476247		0.0001476247		1	0.0166	0.9007	Non-Significant Effect		
Error	0.07114504		0.008893129		8					
Total	0.07129266		0.009040754		9					
ANOVA Assumptions										
Attribute	Test		Test Stat	Critical	P-Value	Decision(1%)				
Variances	Variance Ratio F		5.4	23.2	0.1312	Equal Variances				
Distribution	Shapiro-Wilk Normality		0.902		0.2289	Normal Distribution				
Survival Rate Summary										
Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
SF-10	5	0.92	0.91	0.93	0.9	0.95	0.00509	0.0274	2.98%	0.0%
SF-11	5	0.91	0.885	0.935	0.85	1	0.0121	0.0652	7.16%	1.09%
Angular (Corrected) Transformed Summary										
Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
SF-10	5	1.29	1.27	1.31	1.25	1.35	0.00979	0.0527	4.09%	0.0%
SF-11	5	1.28	1.23	1.33	1.17	1.46	0.0227	0.123	9.57%	0.6%
Graphics										
<div><div></div><div></div></div>										

10-Day Estuarine/Marine Sediment Toxicity Test Data

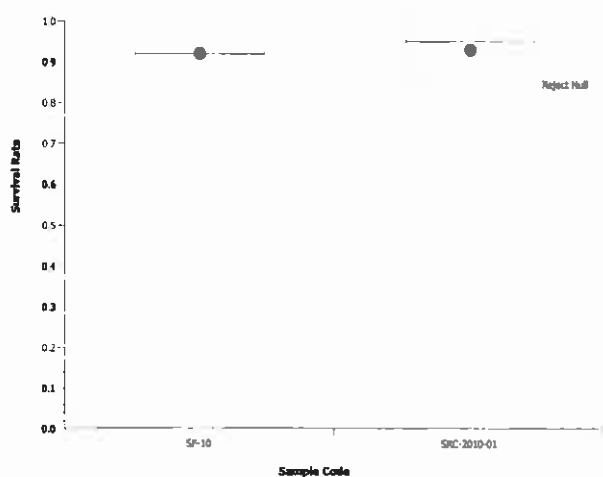
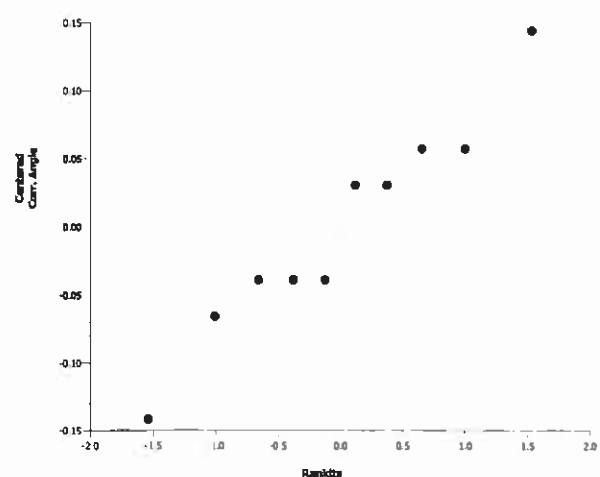
Client: ACOE (San Rafael)Test ID#: 39614Date (Day 0): 8.1.10Species: Ampelisca abditaProject #: 16087Organism Supplier: BrezinaOrganism Log #: 5366

Day of Test	Test Replicate	Sample ID: <u>SF-11 (Alcatraz)</u>					Sign-Off
		Temp (°C)	pH	D.O. (mg/L)	Salinity (ppt)	# Alive	
Day 0	Rep A	19.7	7.99	7.7	28.2	20	Date: <u>8/1/10</u>
	Rep B	19.7	7.94	7.6	29.6	20	Time: <u>10:00</u>
	Rep C	19.7	7.90	7.6	29.5	20	WQ: <u>SG</u>
	Rep D	19.7	7.93	7.7	29.6	20	Scientist Initiation: <u>PA</u>
	Rep E	19.7	7.94	7.7	29.6	20	Scientist Confirmation: <u>2</u>
Day 1	Rep A	19.7	7.99	7.7	28.9		Date: <u>8/2/10</u> Time: <u>9:10</u>
Day 2	Rep B	20.2	8.04	7.7	27.7		WQ: <u>CB</u> Date: <u>8/3/10</u> Time: <u>09:20</u>
Day 3	Rep C	19.8	8.07	7.7	29.0		Date: <u>8/4/10</u> Time: <u>9:20</u>
Day 4	Rep D	20.2	8.03	7.7	29.7		WQ: <u>CB</u> Date: <u>8/5/10</u> Time: <u>09:20</u>
Day 5	Rep E	20.1	8.03	7.7	29.1		WQ: <u>CB</u> Date: <u>8/6/10</u> Time: <u>09:30</u>
Day 6	Rep A	20.2	8.01	7.6	28.9		Date: <u>8/7/10</u> Time: <u>09:30</u>
Day 7	Rep B	20.2	8.03	7.6	27.7		WQ: <u>SG</u> Date: <u>8/8/10</u> Time: <u>10:00</u>
Day 8	Rep C	20.2	8.07	7.6	28.8		Date: <u>8/9/10</u> Time: <u>09:35</u>
Day 9	Rep D	20.2	8.02	7.4	29.2		WQ: <u>CB</u> Date: <u>8/10/10</u> Time: <u>09:00</u>
Day 10	Rep A	20.1	8.14	7.6	27.6	19	Date: <u>8/11/10</u>
	Rep B	20.1	8.13	7.7	26.8	20	Time: <u>09:19</u>
	Rep C	20.1	8.10	7.7	28.1	17	WQ: <u>CB</u>
	Rep D	20.1	8.06	7.7	28.9	18	Scientist Counts: <u>W</u>
	Rep E	20.1	8.09	7.6	29.4	17	

Day of Test	Matrix	pH	D.O. (mg/L)	Salinity (ppt)	Total Sulfide (mg/L)	Total Ammonia (mg/L)	Sign-Off
Day 0	Porewater	7.53	5.5	29.0	0.283	3.20	Date: <u>8/1/10</u> Time: <u>12:00</u>
	Overlying Water					<1	WQ: <u>SG</u> Date: <u>8/1/10</u> Time: <u>12:00</u>
	Meter ID	PA09	RD04	EC05	DR400	DR3800	
Day 10	Porewater	7.59	7.2	37.4	0.039	1.0	Date: <u>8/11/10</u> Time: <u>12:30</u>
	Overlying Water					1.0	WQ: <u>W</u> Date: <u>8/11/10</u> Time: <u>11:00</u>
	Meter ID	PH03	RD04	EC05	DR400	DR3800	

CETIS Analytical Report

Report Date: 11 Aug-10 16:34 (p 8 of 10)
Test Code: 20-7887-4336/39613-22

10 Day Marine/Estuarine Sediment Test							Pacific EcoRisk			
Analysis ID: 02-4543-0314		Endpoint: Survival Rate		CETIS Version: CETISv1.7.0						
Analyzed: 11 Aug-10 16:32		Analysis: Parametric-Two Sample		Official Results: Yes						
Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD		
Angular (Corrected)	0	C > T	Not Run				N/A	6.52%		
Equal Variance t Two-Sample Test										
Sample Code	vs	Sample Code	Test Stat	Critical	MSD	P-Value	Decision(5%)			
SF-10		SRC-2010-01	-0.496	1.86	0.1	0.6835	Non-Significant Effect			
ANOVA Table										
Source	Sum Squares		Mean Square		DF	F Stat	P-Value	Decision(5%)		
Between	0.001789282		0.001789282		1	0.246	0.6330	Non-Significant Effect		
Error	0.05809853		0.007262316		8					
Total	0.05988781		0.009051599		9					
ANOVA Assumptions										
Attribute	Test		Test Stat	Critical	P-Value	Decision(1%)				
Variances	Variance Ratio F		4.23	23.2	0.1916	Equal Variances				
Distribution	Shapiro-Wilk Normality		0.961		0.7977	Normal Distribution				
Survival Rate Summary										
Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
SF-10	5	0.92	0.91	0.93	0.9	0.95	0.00509	0.0274	2.98%	0.0%
SRC-2010-01	5	0.93	0.908	0.952	0.85	1	0.0106	0.057	6.13%	-1.09%
Angular (Corrected) Transformed Summary										
Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
SF-10	5	1.29	1.27	1.31	1.25	1.35	0.00979	0.0527	4.09%	0.0%
SRC-2010-01	5	1.31	1.27	1.36	1.17	1.46	0.0201	0.108	8.25%	-2.08%
Graphics										
<div><div></div><div></div></div>										

10-Day Estuarine/Marine Sediment Toxicity Test Data

Client: ACOE (San Rafael)Test ID#: 39615Date (Day 0): 8/1/10Species: Ampelisca abditaProject #: 16087Organism Supplier: BrezinaOrganism Log #: 5366

Day of Test	Test Replicate	Sample ID: <u>SRC-2010-01</u>					Sign-Off
		Temp (°C)	pH	D.O. (mg/L)	Salinity (ppt)	# Alive	
Day 0	Rep A	19.7	7.87	7.6	29.2	20	Date: <u>08/01/10</u>
	Rep B	19.7	7.88	7.5	29.6	20	Time: <u>10:00</u>
	Rep C	19.7	7.91	7.7	29.4	20	WQ: <u>56</u>
	Rep D	19.7	7.83	7.5	29.2	20	Scientist Initials: <u>PA</u>
	Rep E	19.7	7.89	7.7	28.9	20	Scientist Confirmation: <u>[Signature]</u>
Day 1	Rep A	19.7	7.93	7.7	29.8		Date: <u>8/1/10</u> Time: <u>9:10</u>
Day 2	Rep B	20.2	7.98	7.7	29.4		WQ: <u>64</u>
Day 3	Rep C	19.8	8.03	7.8	29.3		Date: <u>8/3/10</u> Time: <u>9:20</u>
Day 4	Rep D	20.2	8.03	7.7	30.0		WQ: <u>64</u>
Day 5	Rep E	20.1	7.99	7.7	29.0		Date: <u>8/5/10</u> Time: <u>06:20</u>
Day 6	Rep A	20.2	7.99	7.6	29.6		WQ: <u>64</u> <u>06:30</u>
Day 7	Rep B	20.2	8.04	7.6	29.3		Date: <u>8/7/10</u> Time: <u>07:30</u>
Day 8	Rep C	20.2	8.11	7.7	29.9		WQ: <u>64</u> <u>07:30</u>
Day 9	Rep D	20.2	8.07	7.7	30.0		Date: <u>8/9/10</u> Time: <u>07:30</u>
Day 10	Rep A	20.1	8.13	7.6	29.3	18	Date: <u>8/11/10</u>
	Rep B	20.1	8.12	7.6	28.3	19	Time: <u>09:15</u>
	Rep C	20.1	8.18	7.6	29.2	19	WQ: <u>64</u>
	Rep D	20.1	8.15	7.6	28.8	17	Scientist Counts: <u>[Signature]</u>
	Rep E	20.1	8.10	7.6	29.3	20	

Day of Test	Matrix	pH	D.O. (mg/L)	Salinity (ppt)	Total Sulfide (mg/L)	Total Ammonia (mg/L)	Sign-Off
Day 0	Porewater	7.46	6.3	27.7	0.108	4.58	Date: <u>8/1/10</u> Time: <u>12:00</u>
	Overlying Water					1.20	WQ: <u>64</u>
	Meter ID	<u>RA09</u>	<u>RD04</u>	<u>EC05</u>	<u>DR4000</u>	<u>DR3800</u>	
Day 10	Porewater	7.20	4.4	33.9	0.016	1.0	Date: <u>8/11/10</u> Time: <u>13:20</u>
	Overlying Water					1.0	WQ: <u>64</u>
	Meter ID	<u>PH03</u>	<u>RD04</u>	<u>EC05</u>	<u>DR4000</u>	<u>DR3800</u>	

Report Date: 11 Aug-10 16:34 (p 7 of 10)
Test Code: 20-7887-4336/39613-22

Graphics

The survival plot on the left shows the survival rate for two sample codes: SF-10 and SMC-2010-03. The y-axis is labeled 'Survival Rate' and ranges from 0.0 to 1.0. The x-axis is labeled 'Sample Code'. For SF-10, the survival rate is approximately 0.92. For SMC-2010-03, the survival rate is approximately 0.90. A horizontal line at 0.9 is labeled 'Reject Null'.

The QQ plot on the right shows the standardized residuals for the SMC-2010-03 model. The y-axis is labeled 'Standardized Corr. Angle' and ranges from -0.25 to 0.20. The x-axis is labeled 'Ranks' and ranges from -2.0 to 2.0. The residuals are plotted as points, showing a distribution that is roughly symmetric around zero.

10-Day Estuarine/Marine Sediment Toxicity Test Data

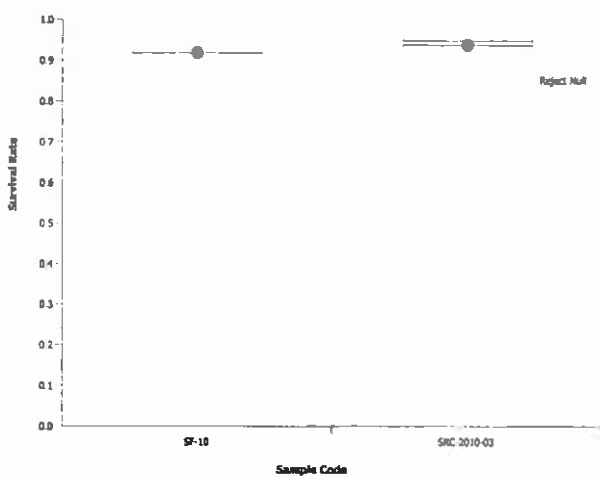
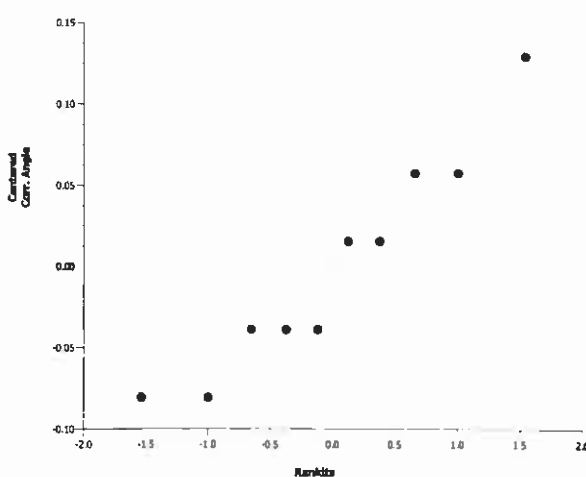
Client: ACOE (San Rafael)Test ID#: 39616Date (Day 0): 8/1/10Species: Ampelisca abditaProject #: 16087Organism Supplier: BrezinaOrganism Log #: 5366

Day of Test	Test Replicate	Sample ID: <u>SRC-2010-02</u>					Sign-Off
		Temp (°C)	pH	D.O. (mg/L)	Salinity (ppt)	# Alive	
Day 0	Rep A	19.7	7.89	7.7	28.5	20	Date: <u>08/01/10</u>
	Rep B	19.7	7.76	7.4	29.8	20	Time: <u>10:00</u>
	Rep C	19.7	7.90	7.6	29.7	20	WQ: <u>SC</u>
	Rep D	19.7	7.92	7.6	29.0	20	Scientist Initiation: <u>SC</u>
	Rep E	19.7	7.93	7.6	29.0	20	Scientist Confirmation: <u>SC</u>
Day 1	Rep A	19.7	7.91	7.7	29.1		Date: <u>8/1/10</u> Time: <u>9:10</u>
Day 2	Rep B	20.2	7.91	5.3	30.0		WQ: <u>CB</u>
Day 3	Rep C	19.8	8.03	7.6	29.9		Date: <u>8/3/10</u> Time: <u>09:20</u>
Day 4	Rep D	20.2	8.03	7.7	29.7		WQ: <u>CB</u>
Day 5	Rep E	20.1	7.98	7.8	29.0		Date: <u>8/5/10</u> Time: <u>09:20</u>
Day 6	Rep A	20.2	7.97	7.6	27.4		WQ: <u>CB</u>
Day 7	Rep B	20.2	7.97	7.6	27.8		Date: <u>8/6/10</u> Time: <u>09:30</u>
Day 8	Rep C	20.2	8.11	7.7	29.5		WQ: <u>CB</u>
Day 9	Rep D	20.2	8.10	7.7	29.7		Date: <u>8/8/10</u> Time: <u>09:30</u>
Day 10	Rep A	20.1	8.08	7.5	29.2	16	Date: <u>8/9/10</u> Time: <u>09:30</u>
	Rep B	20.1	8.03	7.6	28.8	16	WQ: <u>CB</u>
	Rep C	20.1	8.14	7.6	28.6	20	Scientist Counts: <u>SC</u>
	Rep D	20.1	8.16	7.6	29.0	20	
	Rep E	20.1	8.09	7.6	27.5	18	

Day of Test	Matrix	pH	D.O. (mg/L)	Salinity (ppt)	Total Sulfide (mg/L)	Total Ammonia (mg/L)	Sign-Off
Day 0	Porewater	7.36	6.4	28.3	0.039	2.49	Date: <u>8/1/10</u> Time: <u>12:00</u>
	Overlying Water					0.872	WQ: <u>SC</u>
	Meter ID	<u>PH09</u>	<u>RD04</u>	<u>EC05</u>	<u>DR4000</u>	<u>DR3800</u>	
Day 10	Porewater	7.16	4.0	30.6	0.004	4.0	Date: <u>8/11/10</u> Time: <u>13:20</u>
	Overlying Water					4.0	WQ: <u>um</u>
	Meter ID	<u>PH03</u>	<u>RD04</u>	<u>EC05</u>	<u>DR4000</u>	<u>DR3800</u>	

CETIS Analytical Report

Report Date: 11 Aug-10 16:34 (p 6 of 10)
Test Code: 20-7887-4336/39613-22

10 Day Marine/Estuarine Sediment Test							Pacific EcoRisk			
Analysis ID: 06-3594-9714		Endpoint: Survival Rate			CETIS Version: CETISv1.7.0					
Analyzed: 11 Aug-10 16:32		Analysis: Parametric-Two Sample			Official Results: Yes					
Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD		
Angular (Corrected)	0	C > T	Not Run				N/A	5.35%		
Equal Variance t Two-Sample Test										
Sample Code	vs	Sample Code	Test Stat	Critical	MSD	P-Value	Decision(5%)			
SF-10		SRC-2010-03	-0.923	1.86	0.0845	0.8086	Non-Significant Effect			
ANOVA Table										
Source	Sum Squares		Mean Square		DF	F Stat	P-Value	Decision(5%)		
Between	0.004397951		0.004397951		1	0.853	0.3828	Non-Significant Effect		
Error	0.04126568		0.00515821		8					
Total	0.04566363		0.00955616		9					
ANOVA Assumptions										
Attribute	Test		Test Stat	Critical	P-Value	Decision(1%)				
Variances	Variance Ratio F		2.71	23.2	0.3571	Equal Variances				
Distribution	Shapiro-Wilk Normality		0.924		0.3895	Normal Distribution				
Survival Rate Summary										
Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
SF-10	5	0.92	0.91	0.93	0.9	0.95	0.00509	0.0274	2.98%	0.0%
SRC-2010-03	5	0.94	0.924	0.956	0.9	1	0.00777	0.0418	4.45%	-2.17%
Angular (Corrected) Transformed Summary										
Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
SF-10	5	1.29	1.27	1.31	1.25	1.35	0.00979	0.0527	4.09%	0.0%
SRC-2010-03	5	1.33	1.3	1.36	1.25	1.46	0.0161	0.0868	6.53%	-3.26%
Graphics										
<div><div></div><div></div></div>										

10-Day Estuarine/Marine Sediment Toxicity Test Data

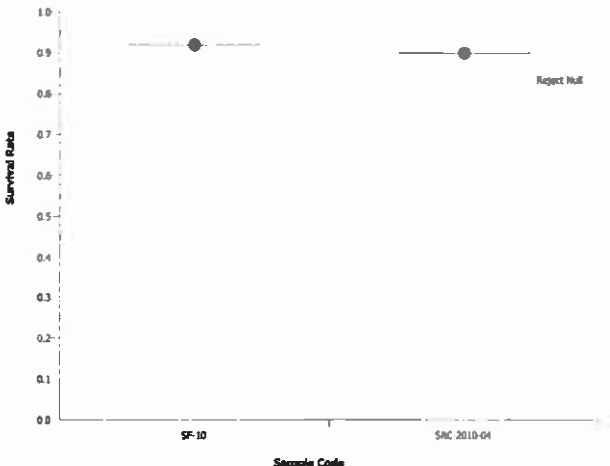
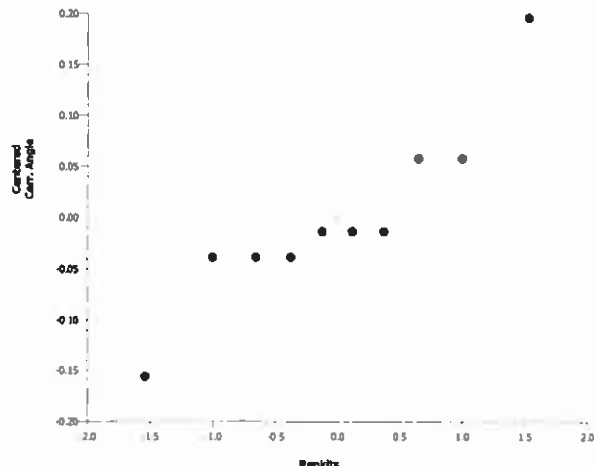
Client: ACOE (San Rafael)Test ID#: 39617Date (Day 0): 8.1.10Species: Ampelisca abditaProject #: 16087Organism Supplier: BrezinaOrganism Log #: 9366

Day of Test	Test Replicate	Sample ID: <u>SRC-2010-03</u>					Sign-Off
		Temp (°C)	pH	D.O. (mg/L)	Salinity (ppt)	# Alive	
Day 0	Rep A	19.7	7.83	7.3	29.4	20	Date: 08/01/10
	Rep B	19.7	7.93	7.7	28.5	20	Time: 10:00
	Rep C	19.7	7.94	7.7	28.7	20	WQ: SC
	Rep D	19.7	7.86	7.7	28.7	20	Scientist Initiation: PA
	Rep E	19.7	7.89	7.5	28.9	20	Scientist Confirmation: 2
Day 1	Rep A	19.7	7.99	7.7	29.9		Date: 8/1/10 Time: 9:10
Day 2	Rep B	20.2	8.02	7.6	28.7		Date: 8/2/10 Time: 0920
Day 3	Rep C	19.8	8.08	7.6	29.2		Date: 8/3/10 Time: 9:20
Day 4	Rep D	20.2	8.00	7.7	28.6		Date: 8/4/10 Time: 0920
Day 5	Rep E	20.1	8.03	7.6	28.6		Date: 8/5/10 Time: 0930
Day 6	Rep A	20.2	8.01	7.5	28.7		Date: 8/6/10 Time: 0930
Day 7	Rep B	20.2	8.11	7.6	29.6		Date: 8/7/10 Time: 10:00
Day 8	Rep C	20.2	8.17	7.7	28.8		Date: 8/8/10 Time: 0937
Day 9	Rep D	20.2	8.07	7.6	30.8		Date: 8/9/10 Time: 0900
Day 10	Rep A	20.1	8.19	7.6	28.3	20	Date: 8/11/10
	Rep B	20.1	8.21	7.6	28.7	19	Time: 0915
	Rep C	20.1	8.24	7.6	28.3	19	WQ: CA
	Rep D	20.1	8.15	7.6	28.4	18	Scientist Counts: m
	Rep E	20.1	8.17	7.5	28.3	18	

Day of Test	Matrix	pH	D.O. (mg/L)	Salinity (ppt)	Total Sulfide (mg/L)	Total Ammonia (mg/L)	Sign-Off
Day 0	Porewater	7.32	5.8	27.1	0.096	8.08	Date: 8/1/10 Time: 12:00
	Overlying Water					0.504	WQ: SC
	Meter ID	PH09	RD04	EC05	DR4000	DR3800	Date: 8/1/10 Time: 12:00
Day 10	Porewater	7.22	4.6	30.4	0.010	1.52	WQ: SC
	Overlying Water					1.0	Date: 8/11/10 Time: 1100
	Meter ID	PH03	RD04	EC05	DR4000	DR3800	WQ: CA

CETIS Analytical Report

Report Date: 11 Aug-10 16:34 (p 5 of 10)
Test Code: 20-7887-4336/39613-22

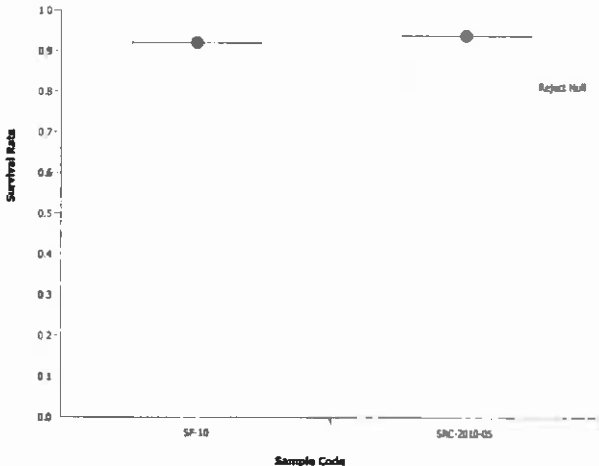
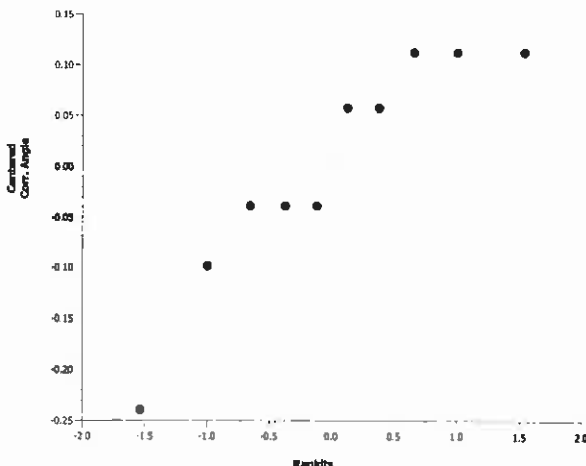
10 Day Marine/Estuarine Sediment Test							Pacific EcoRisk			
Analysis ID: 14-5970-6849		Endpoint: Survival Rate			CETIS Version: CETISv1.7.0					
Analyzed: 11 Aug-10 16:32		Analysis: Parametric-Two Sample			Official Results: Yes					
Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD		
Angular (Corrected)	0	C > T	Not Run				N/A	7.52%		
Equal Variance t Two-Sample Test										
Sample Code	vs	Sample Code	Test Stat	Critical	MSD	P-Value	Decision(5%)			
SF-10		SRC-2010-04	0.409	1.86	0.113	0.3466	Non-Significant Effect			
ANOVA Table										
Source	Sum Squares		Mean Square		DF	F Stat	P-Value	Decision(5%)		
Between	0.001553973		0.001553973		1	0.167	0.6933	Non-Significant Effect		
Error	0.07430839		0.009288548		8					
Total	0.07586236		0.01084252		9					
ANOVA Assumptions										
Attribute	Test		Test Stat	Critical	P-Value	Decision(1%)				
Variances	Variance Ratio F		5.69	23.2	0.1208	Equal Variances				
Distribution	Shapiro-Wilk Normality		0.889		0.1668	Normal Distribution				
Survival Rate Summary										
Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
SF-10	5	0.92	0.91	0.93	0.9	0.95	0.00509	0.0274	2.98%	0.0%
SRC-2010-04	5	0.9	0.873	0.927	0.8	1	0.0131	0.0707	7.86%	2.17%
Angular (Corrected) Transformed Summary										
Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
SF-10	5	1.29	1.27	1.31	1.25	1.35	0.00979	0.0527	4.09%	0.0%
SRC-2010-04	5	1.26	1.21	1.31	1.11	1.46	0.0233	0.126	9.95%	1.94%
Graphics										
<div><div></div><div></div></div>										

10-Day Estuarine/Marine Sediment Toxicity Test Data

Client: ACOE (San Rafael)Test ID#: 39618Date (Day 0): 8-1-10Species: Ampelisca abditaProject #: 16087Organism Supplier: BrezinaOrganism Log #: 5366

Day of Test	Test Replicate	Sample ID: <u>SRC-2010-04</u>					Sign-Off
		Temp (°C)	pH	D.O. (mg/L)	Salinity (ppt)	# Alive	
Day 0	Rep A	19.7	7.88	7.7	29.0	20	Date: <u>8/1/10</u>
	Rep B	19.7	7.84	7.8	28.5	20	Time: <u>10:00</u>
	Rep C	19.7	7.78	7.7	28.5	20	WQ: <u>SC</u>
	Rep D	19.7	7.87	7.7	28.5	20	Scientist Initiation: <u>PA</u>
	Rep E	19.7	7.87	7.7	29.2	20	Scientist Confirmation: <u>PA</u>
Day 1	Rep A	19.7	7.99	7.7	29.2		Date: <u>8/2/10</u> Time: <u>9:10</u>
Day 2	Rep B	20.2	7.95	7.6	28.9		Date: <u>8/3/10</u> Time: <u>0920</u>
Day 3	Rep C	19.8	7.92	7.7	28.1		Date: <u>8/4/10</u> Time: <u>9:20</u>
Day 4	Rep D	20.2	7.95	7.6	29.3		Date: <u>8/5/10</u> Time: <u>0920</u>
Day 5	Rep E	20.1	7.99	7.6	29.7		Date: <u>8/6/10</u> Time: <u>0930</u>
Day 6	Rep A	20.2	7.88	6.7	29.6		Date: <u>8/7/10</u> Time: <u>0930</u>
Day 7	Rep B	20.2	7.96	7.6	29.6		Date: <u>8/8/10</u> Time: <u>10:00</u>
Day 8	Rep C	20.2	7.94	7.7	29.0		Date: <u>8/9/10</u> Time: <u>0937</u>
Day 9	Rep D	20.2	8.01	7.6	29.2		Date: <u>8/10/10</u> Time: <u>0900</u>
Day 10	Rep A	20.1	8.00	7.0	29.8	20	Date: <u>8/11/10</u>
	Rep B	20.1	8.06	7.5	29.4	18	Time: <u>0915</u>
	Rep C	20.1	7.92	7.5	28.6	18	WQ: <u>CA</u>
	Rep D	20.1	8.03	7.5	29.4	18	Scientist Counts: <u>PA</u>
	Rep E	20.1	7.99	7.5	29.6	16	

Day of Test	Matrix	pH	D.O. (mg/L)	Salinity (ppt)	Total Sulfide (mg/L)	Total Ammonia (mg/L)	Sign-Off
Day 0	Porewater	7.30	6.2	27.3	0.067	3.65	Date: <u>8/1/10</u> Time: <u>12:00</u>
	Overlying Water					<1	WQ: <u>SC</u>
	Meter ID	<u>PH09</u>	<u>DO04</u>	<u>EC05</u>	<u>DR4000</u>	<u>DR3800</u>	Date: <u>8/1/10</u> Time: <u>12:00</u>
Day 10	Porewater	7.24	4.2	30.9	0.006	2.80	WQ: <u>SC</u>
	Overlying Water					61.0	Date: <u>8/11/10</u> Time: <u>1320</u>
	Meter ID	<u>PH03</u>	<u>DO04</u>	<u>EC05</u>	<u>DR4000</u>	<u>DR3800</u>	WQ: <u>CA</u> Time: <u>1100</u>

10 Day Marine/Estuarine Sediment Test							Pacific EcoRisk			
Analysis ID: 11-3010-6798		Endpoint: Survival Rate			CETIS Version: CETISv1.7.0					
Analyzed: 11 Aug-10 16:32		Analysis: Parametric-Two Sample			Official Results: Yes					
Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD		
Angular (Corrected)	0	C > T	Not Run				N/A	9.76%		
Equal Variance t Two-Sample Test										
Sample Code	vs	Sample Code	Test Stat	Critical	MSD	P-Value	Decision(5%)			
SF-10		SRC-2010-05	-0.775	1.86	0.141	0.7697	Non-Significant Effect			
ANOVA Table										
Source	Sum Squares		Mean Square		DF	F Stat	P-Value	Decision(5%)		
Between	0.008688781		0.008688781		1	0.601	0.4606	Non-Significant Effect		
Error	0.1157063		0.01446329		8					
Total	0.1243951		0.02315207		9					
ANOVA Assumptions										
Attribute	Test		Test Stat	Critical	P-Value	Decision(1%)				
Variances	Variance Ratio F		9.41	23.2	0.0518	Equal Variances				
Distribution	Shapiro-Wilk Normality		0.878		0.1232	Normal Distribution				
Survival Rate Summary										
Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
SF-10	5	0.92	0.91	0.93	0.9	0.95	0.00509	0.0274	2.98%	0.0%
SRC-2010-05	5	0.94	0.906	0.974	0.8	1	0.0166	0.0894	9.52%	-2.17%
Angular (Corrected) Transformed Summary										
Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
SF-10	5	1.29	1.27	1.31	1.25	1.35	0.00979	0.0527	4.09%	0.0%
SRC-2010-05	5	1.35	1.28	1.41	1.11	1.46	0.03	0.162	12.0%	-4.58%
Graphics										
<div><div><p>Survival Rate</p><p>Sample Code</p><p>SF-10</p><p>SRC-2010-05</p><p>Reject Null</p></div><div><p>Transformed Corr. Angle</p><p>Ranks</p></div></div>										

10-Day Estuarine/Marine Sediment Toxicity Test Data

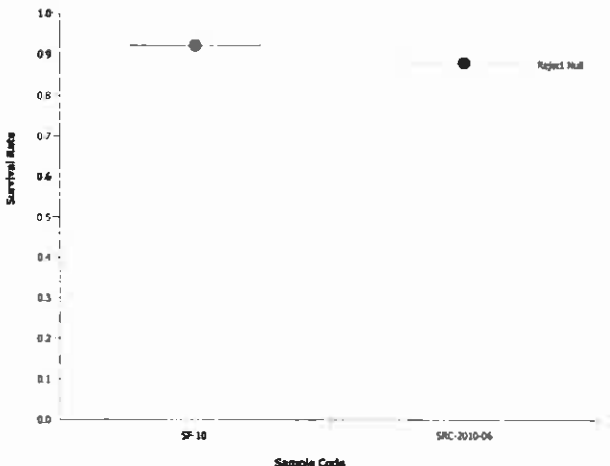
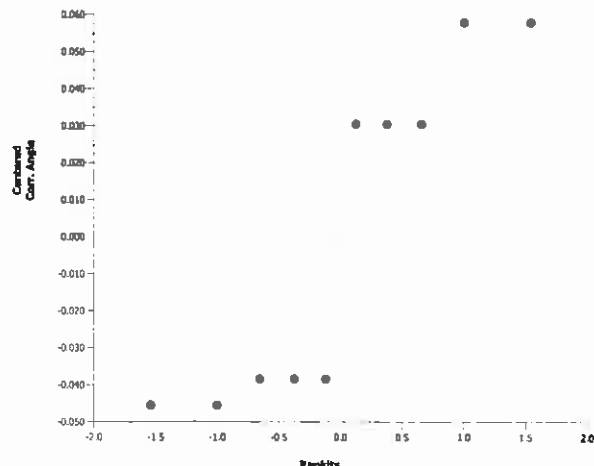
Client: ACOE (San Rafael)Test ID#: 39619Date (Day 0): 8/1/10Species: Ampelisca abditaProject #: 16087Organism Supplier: BrezinaOrganism Log #: 5366

Day of Test	Test Replicate	Sample ID: SRC-2010-05					Sign-Off
		Temp (°C)	pH	D.O. (mg/L)	Salinity (ppt)	# Alive	
Day 0	Rep A	19.7	7.86	7.4	29.5	20	Date: 08/01/10
	Rep B	19.7	7.88	7.6	29.2	20	Time: 10:00
	Rep C	19.7	7.90	7.6	29.2	20	WQ: SG
	Rep D	19.7	7.87	7.6	29.5	20	Scientist Initiation: PA
	Rep E	19.7	7.88	7.6	28.9	20	Scientist Confirmation: [Signature]
Day 1	Rep A	19.7	7.90	7.7	29.8		Date: 8/2/10 Time: 9:10
Day 2	Rep B	20.2	7.97	7.8	29.8		WQ: [Signature] Date: 8/3/10 Time: 09:20
Day 3	Rep C	19.8	8.00	7.7	29.4		WQ: [Signature] Date: 8/4/10 Time: 9:20
Day 4	Rep D	20.2	7.94	7.6	28.1		WQ: [Signature] Date: 8/5/10 Time: 09:20
Day 5	Rep E	20.1	7.97	7.6	28.8		WQ: [Signature] Date: 8/6/10 Time: 09:30
Day 6	Rep A	20.2	8.01	7.5	29.0		WQ: [Signature] Date: 8/7/10 Time: 09:30
Day 7	Rep B	20.2	7.97	7.7	30.0		WQ: [Signature] Date: 8/8/10 Time: 10:00
Day 8	Rep C	20.2	8.08	7.6	28.9		WQ: [Signature] Date: 8/9/10 Time: 09:30
Day 9	Rep D	20.2	8.02	7.7	29.5		WQ: [Signature] Date: 8/9/10 Time: 09:00
Day 10	Rep A	20.1	8.11	7.5	29.3	20	Date: 8/11/10
	Rep B	20.1	8.07	7.6	28.2	16	Time: 09:15
	Rep C	20.1	8.11	7.6	27.8	18	WQ: [Signature]
	Rep D	20.1	8.05	7.6	28.0	20	Scientist Counts: [Signature]
	Rep E	20.1	8.02	7.5	29.0	20	

Day of Test	Matrix	pH	D.O. (mg/L)	Salinity (ppt)	Total Sulfide (mg/L)	Total Ammonia (mg/L)	Sign-Off
Day 0	Porewater	7.60	6.4	27.4	0.052	9.97	Date: 8/1/10 Time: 12:00
	Overlying Water					10.24	WQ: SG Date: 8/1/10 Time: 12:00
	Meter ID	PH09	RDO4	EC05	DR4000	DR3800	WQ: SG
Day 10	Porewater	7.17	3.9	31.7	0.016	1.75	Date: 8/11/10 Time: 13:20
	Overlying Water					11.0	WQ: [Signature] Date: 8/11/10 Time: 11:00
	Meter ID	PH03	RDO4	EC05	DR4000	DR3800	

CETIS Analytical Report

Report Date: 11 Aug-10 16:34 (p 3 of 10)
Test Code: 20-7887-4336/39613-22

10 Day Marine/Estuarine Sediment Test							Pacific EcoRisk			
Analysis ID: 10-0977-4310		Endpoint: Survival Rate		CETIS Version: CETISv1.7.0						
Analyzed: 11 Aug-10 16:32		Analysis: Parametric-Two Sample		Official Results: Yes						
Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD		
Angular (Corrected)	0	C > T	Not Run				N/A	3.33%		
Equal Variance t Two-Sample Test										
Sample Code	vs	Sample Code	Test Stat	Critical	MSD	P-Value	Decision(5%)			
SF-10		SRC-2010-06	2.29	1.86	0.0558	0.0255	Significant Effect			
ANOVA Table										
Source	Sum Squares		Mean Square		DF	F Stat	P-Value	Decision(5%)		
Between	0.01185921		0.01185921		1	5.26	0.0510	Non-Significant Effect		
Error	0.01803578		0.002254473		8					
Total	0.02989499		0.01411368		9					
ANOVA Assumptions										
Attribute	Test		Test Stat	Critical	P-Value	Decision(1%)				
Variances	Variance Ratio F		1.61	23.2	0.6576	Equal Variances				
Distribution	Shapiro-Wilk Normality		0.788		0.0105	Normal Distribution				
Survival Rate Summary										
Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
SF-10	5	0.92	0.91	0.93	0.9	0.95	0.00509	0.0274	2.98%	0.0%
SRC-2010-06	5	0.88	0.87	0.89	0.85	0.9	0.00509	0.0274	3.11%	4.35%
Angular (Corrected) Transformed Summary										
Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
SF-10	5	1.29	1.27	1.31	1.25	1.35	0.00979	0.0527	4.09%	0.0%
SRC-2010-06	5	1.22	1.2	1.23	1.17	1.25	0.00772	0.0416	3.41%	5.35%
Graphics										
<div><div></div><div></div></div>										

10-Day Estuarine/Marine Sediment Toxicity Test Data

Client: ACOE (San Rafael)Test ID#: 39620Date (Day 0): 8.1.10Species: Ampelisca abditaProject #: 16087Organism Supplier: BrezinaOrganism Log #: 5366

Day of Test	Test Replicate	Sample ID: <u>SRC-2010-06</u>					Sign-Off
		Temp (°C)	pH	D.O. (mg/L)	Salinity (ppt)	# Alive	
Day 0	Rep A	19.7	7.80	7.4	29.2	20	Date: 08/01/10
	Rep B	19.7	7.68	7.3	29.4	20	Time: 10:00
	Rep C	19.7	7.83	7.6	29.8	20	WQ: SC
	Rep D	19.7	7.82	7.5	29.8	20	Scientist Initiation: PA
	Rep E	19.7	7.80	7.4	27.8	20	Scientist Confirmation: [Signature]
Day 1	Rep A	19.7	7.95	7.7	29.7		Date: 8/1/10 Time: 9:10
Day 2	Rep B	20.2	7.86	7.7	29.8		WQ: SC
Day 3	Rep C	19.8	7.87	7.6	30.0		Date: 8/3/10 Time: 09:20
Day 4	Rep D	20.2	7.93	7.6	29.3		WQ: SC
Day 5	Rep E	20.1	7.74	6.1	29.0		Date: 8/5/10 Time: 09:20
Day 6	Rep A	20.2	7.94	7.5	29.5		WQ: SC
Day 7	Rep B	20.2	7.88	7.6	29.9		Date: 8/7/10 Time: 09:30
Day 8	Rep C	20.2	8.01	7.4	29.8		WQ: SC
Day 9	Rep D	20.2	8.02	7.6	29.4		Date: 8/9/10 Time: 09:30
Day 10	Rep A	20.1	8.07	7.6	29.4	18	Date: 8/11/10
	Rep B	20.1	8.00	7.5	29.3	17	Time: 09:15
	Rep C	20.1	8.04	7.4	29.4	17	WQ: SC
	Rep D	20.1	8.05	7.5	29.6	18	Scientist Counts: [Signature]
	Rep E	20.1	7.94	7.4	28.2	18	

Day of Test	Matrix	pH	D.O. (mg/L)	Salinity (ppt)	Total Sulfide (mg/L)	Total Ammonia (mg/L)	Sign-Off
Day 0	Porewater	7.38	4.9	27.5	0.073	2.98	Date: 8/1/10 Time: 12:00
	Overlying Water					41	WQ: SC
	Meter ID	PH09	RD04	EC05	DR4000	DR3800	Date: 8/1/10 Time: 12:00
Day 10	Porewater	7.17	4.2	32.1	0.019	41.0	WQ: SC
	Overlying Water					41.0	Date: 8/11/10 Time: 13:20
	Meter ID	PH03	RD04	EC05	DR4000	DR3800	WQ: SC

CETIS Analytical Report

Report Date: 11 Aug-10 16:33 (p 2 of 10)
Test Code: 20-7887-4336/39613-22

10 Day Marine/Estuarine Sediment Test							Pacific EcoRisk			
Analysis ID: 19-8857-6741		Endpoint: Survival Rate			CETIS Version: CETISv1.7.0					
Analyzed: 11 Aug-10 16:32		Analysis: Parametric-Two Sample			Official Results: Yes					
Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD		
Angular (Corrected)	0	C > T	Not Run				N/A	6.89%		
Equal Variance t Two-Sample Test										
Sample Code	vs	Sample Code	Test Stat	Critical	MSD	P-Value	Decision(5%)			
SF-10		SRC-2010-07	-1.55	1.86	0.105	0.9196	Non-Significant Effect			
ANOVA Table										
Source	Sum Squares		Mean Square		DF	F Stat	P-Value	Decision(5%)		
Between	0.01906758		0.01906758		1	2.39	0.1609	Non-Significant Effect		
Error	0.06388931		0.007986164		8					
Total	0.0829569		0.02705375		9					
ANOVA Assumptions										
Attribute	Test		Test Stat	Critical	P-Value	Decision(1%)				
Variances	Variance Ratio F		4.75	23.2	0.1605	Equal Variances				
Distribution	Shapiro-Wilk Normality		0.837		0.0403	Normal Distribution				
Survival Rate Summary										
Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
SF-10	5	0.92	0.91	0.93	0.9	0.95	0.00509	0.0274	2.98%	0.0%
SRC-2010-07	5	0.96	0.939	0.981	0.9	1	0.0102	0.0548	5.71%	-4.35%
Angular (Corrected) Transformed Summary										
Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
SF-10	5	1.29	1.27	1.31	1.25	1.35	0.00979	0.0527	4.09%	0.0%
SRC-2010-07	5	1.37	1.33	1.42	1.25	1.46	0.0213	0.115	8.35%	-6.78%
Graphics										
<div><div><p>A dot plot showing Survival Rate for two sample codes: SF-10 and SRC-2010-07. The y-axis ranges from 0.0 to 1.0. SF-10 has a mean survival rate of approximately 0.92, and SRC-2010-07 has a mean survival rate of approximately 0.96. Both have 95% confidence intervals shown as horizontal lines. A horizontal line at approximately 0.95 is labeled 'Reject Null'.</p></div><div><p>A dot plot showing Centered Corr. Angle for two sample codes: SF-10 and SRC-2010-07. The y-axis ranges from -0.15 to 0.10. SF-10 has a mean centered correlation angle of approximately 1.29, and SRC-2010-07 has a mean centered correlation angle of approximately 1.37. Both have 95% confidence intervals shown as horizontal lines.</p></div></div>										

10-Day Estuarine/Marine Sediment Toxicity Test Data

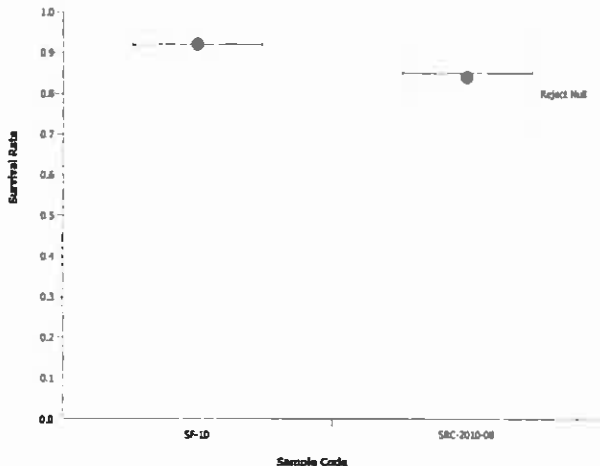
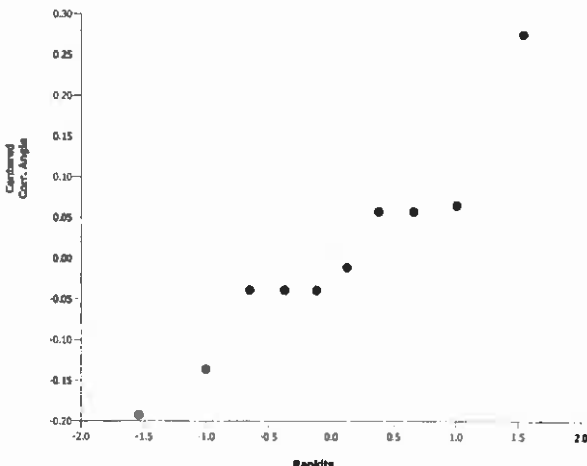
Client: ACOE (San Rafael)Test ID#: 39621Date (Day 0): 8.1.10Species: Ampelisca abditaProject #: 16087Organism Supplier: BrezinaOrganism Log #: 5366

Day of Test	Test Replicate	Sample ID: <u>SRC-2010-07</u>					Sign-Off
		Temp (°C)	pH	D.O. (mg/L)	Salinity (ppt)	# Alive	
Day 0	Rep A	19.7	7.95	7.8	29.2	20	Date: <u>08/01/10</u>
	Rep B	19.7	7.97	7.7	29.4	20	Time: <u>10:00</u>
	Rep C	19.7	7.93	7.7	29.0	20	WQ: <u>SC</u>
	Rep D	19.7	7.96	7.7	29.3	20	Scientist Initiation: <u>FA</u>
	Rep E	19.7	8.02	7.6	29.2	20	Scientist Confirmation: <u>2</u>
Day 1	Rep A	19.7	7.87	7.7	29.5		Date: <u>8/1/10</u> Time: <u>9:10</u>
Day 2	Rep B	20.2	8.03	7.7	30.0		WQ: <u>CB</u> Date: <u>8/3/10</u> Time: <u>09:20</u>
Day 3	Rep C	19.8	7.97	7.8	29.8		WQ: <u>CB</u> Date: <u>8/4/10</u> Time: <u>9:20</u>
Day 4	Rep D	20.2	8.04	7.6	28.9		WQ: <u>CB</u> Date: <u>8/5/10</u> Time: <u>09:20</u>
Day 5	Rep E	20.1	8.05	7.6	28.1		WQ: <u>CB</u> Date: <u>8/6/10</u> Time: <u>09:30</u>
Day 6	Rep A	20.2	7.97	7.4	29.7		Date: <u>8/7/10</u> Time: <u>09:30</u>
Day 7	Rep B	20.2	8.02	7.7	29.6		WQ: <u>SC</u> Date: <u>8/8/10</u> Time: <u>10:00</u>
Day 8	Rep C	20.2	8.06	7.6	29.8		WQ: <u>CB</u> Date: <u>8/9/10</u> Time: <u>09:35</u>
Day 9	Rep D	20.2	8.09	7.6	29.3		WQ: <u>CB</u> Date: <u>8/10/10</u> Time: <u>09:00</u>
Day 10	Rep A	20.1	8.05	7.5	30.0	20	Date: <u>8/11/10</u>
	Rep B	20.1	8.14	7.5	29.7	20	Time: <u>09:15</u>
	Rep C	20.1	8.12	7.6	29.9	18	WQ: <u>CB</u>
	Rep D	20.1	8.22	7.6	29.6	20	Scientist Counts: <u>min</u>
	Rep E	20.1	8.15	7.5	29.1	18	

Day of Test	Matrix	pH	D.O. (mg/L)	Salinity (ppt)	Total Sulfide (mg/L)	Total Ammonia (mg/L)	Sign-Off
Day 0	Porewater	7.48	4.9	27.3	0.141	11.2	Date: <u>8/1/10</u> Time: <u>12:00</u>
	Overlying Water					1.60	WQ: <u>SC</u> Date: <u>8/1/10</u> Time: <u>12:00</u>
	Meter ID	<u>PH09</u>	<u>R204</u>	<u>EC05</u>	<u>DR4000</u>	<u>DR3800</u>	
Day 10	Porewater	7.22	3.8	31.0	0.026	1.68	Date: <u>8/11/10</u> Time: <u>1320</u>
	Overlying Water					1.0	WQ: <u>CB</u> Date: <u>8/11/10</u> Time: <u>1100</u>
	Meter ID	<u>PH03</u>	<u>R204</u>	<u>EC05</u>	<u>DR4000</u>	<u>DR3800</u>	

CETIS Analytical Report

Report Date: 11 Aug-10 16:33 (p 1 of 10)
Test Code: 20-7887-4336/39613-22

10 Day Marine/Estuarine Sediment Test							Pacific EcoRisk			
Analysis ID: 13-6238-6682		Endpoint: Survival Rate			CETIS Version: CETISv1.7.0					
Analyzed: 11 Aug-10 16:32		Analysis: Parametric-Two Sample			Official Results: Yes					
Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD		
Angular (Corrected)	0	C > T	Not Run				N/A	11.2%		
Equal Variance t Two-Sample Test										
Sample Code	vs	Sample Code	Test Stat	Critical	MSD	P-Value	Decision(5%)			
SF-10		SRC-2010-08	1.21	1.86	0.159	0.1304	Non-Significant Effect			
ANOVA Table										
Source	Sum Squares		Mean Square		DF	F Stat	P-Value	Decision(5%)		
Between	0.0268788		0.0268788		1	1.46	0.2608	Non-Significant Effect		
Error	0.1468595		0.01835743		8					
Total	0.1737382		0.04523623		9					
ANOVA Assumptions										
Attribute	Test		Test Stat	Critical	P-Value	Decision(1%)				
Variances	Variance Ratio F		12.2	23.2	0.0326	Equal Variances				
Distribution	Shapiro-Wilk Normality		0.923		0.3852	Normal Distribution				
Survival Rate Summary										
Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
SF-10	5	0.92	0.91	0.93	0.9	0.95	0.00509	0.0274	2.98%	0.0%
SRC-2010-08	5	0.84	0.795	0.885	0.7	1	0.0222	0.119	14.2%	8.7%
Angular (Corrected) Transformed Summary										
Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
SF-10	5	1.29	1.27	1.31	1.25	1.35	0.00979	0.0527	4.09%	0.0%
SRC-2010-08	5	1.18	1.11	1.25	0.991	1.46	0.0342	0.184	15.6%	8.05%
Graphics										
<div><div><p>Survival Rate Summary Plot: The y-axis represents the Survival Rate from 0.0 to 1.0. The x-axis shows Sample Codes SF-10 and SRC-2010-08. SF-10 has a mean survival rate of 0.92 with a 95% CI of [0.91, 0.93]. SRC-2010-08 has a mean survival rate of 0.84 with a 95% CI of [0.795, 0.885]. A horizontal line at 0.85 is labeled 'Reject Null'.</p></div><div><p>Angular (Corrected) Transformed Summary Plot: The y-axis represents 'Transformed Data - Angles' from -0.20 to 0.30. The x-axis represents 'Rankits' from -2.0 to 2.0. Data points are plotted for each sample code, showing a distribution of transformed values.</p></div></div>										

10-Day Estuarine/Marine Sediment Toxicity Test Data

Client: ACOE (San Rafael)Test ID#: 39622Date (Day 0): 8.1.10Species: Ampelisca abditaProject #: 16087Organism Supplier: BrezinaOrganism Log #: 3366

Day of Test	Test Replicate	Sample ID: <u>SRC-2010-08</u>					Sign-Off
		Temp (°C)	pH	D.O. (mg/L)	Salinity (ppt)	# Alive	
Day 0	Rep A	19.7	7.79	7.3	28.7	20	Date: <u>08/01/10</u> Time: <u>10:00</u> WQ: <u>SG</u> Scientist Initiation: <u>PA</u> Scientist Confirmation: <u>2</u>
	Rep B	19.7	7.67	7.1	28.6	20	
	Rep C	19.7	7.82	7.5	28.7	20	
	Rep D	19.7	7.61	6.6	28.6	20	
	Rep E	19.7	7.69	7.0	29.6	20	
Day 1	Rep A	19.7	7.86	7.7	28.9		Date: <u>8/1/10</u> Time: <u>9:10</u> WQ: <u>SG</u>
Day 2	Rep B	20.2	7.77	7.4	29.0		Date: <u>8/3/10</u> Time: <u>09:20</u> WQ: <u>SG</u>
Day 3	Rep C	19.8	8.16	7.0	28.7		Date: <u>8/4/10</u> Time: <u>9:20</u> WQ: <u>SG</u>
Day 4	Rep D	20.2	8.23	7.9	29.1		Date: <u>8/5/10</u> Time: <u>09:20</u> WQ: <u>SG</u>
Day 5	Rep E	20.1	8.38	6.6	29.9		Date: <u>8/6/10</u> Time: <u>09:30</u> WQ: <u>SG</u>
Day 6	Rep A	20.2	8.41	7.4	27.9		Date: <u>8/7/10</u> Time: <u>09:30</u> WQ: <u>SG</u>
Day 7	Rep B	20.2	7.92	6.2	28.0		Date: <u>8/8/10</u> Time: <u>10:00</u> WQ: <u>SG</u>
Day 8	Rep C	20.2	8.40	6.7	28.2		Date: <u>8/9/10</u> Time: <u>09:00</u> WQ: <u>SG</u>
Day 9	Rep D	20.2	8.46	7.3	29.5		Date: <u>8/10/10</u> Time: <u>09:00</u> WQ: <u>SG</u>
Day 10	Rep A	20.1	8.38	7.5	28.9	15	Date: <u>8/11/10</u> Time: <u>09:15</u> WQ: <u>SG</u> Scientist Counts: <u>W</u>
	Rep B	20.1	8.06	6.2	28.1	18	
	Rep C	20.1	8.13	5.9	28.2	14	
	Rep D	20.1	8.42	6.4	29.6	17	
	Rep E	20.1	8.38	6.6	29.5	20	

Day of Test	Matrix	pH	D.O. (mg/L)	Salinity (ppt)	Total Sulfide (mg/L)	Total Ammonia (mg/L)	Sign-Off
Day 0	Porewater	7.49	3.8	27.1	0.365	2.08	Date: <u>8/1/10</u> Time: <u>12:00</u> WQ: <u>SG</u>
	Overlying Water					0.081	Date: <u>8/1/10</u> Time: <u>12:00</u> WQ: <u>SG</u>
	Meter ID	<u>PA09</u>	<u>RD04</u>	<u>EC05</u>	<u>DR4000</u>	<u>DR3800</u>	
Day 10	Porewater	6.80	3.5	33.1	0.100	3.47	Date: <u>8/11/10</u> Time: <u>13:20</u> WQ: <u>W</u>
	Overlying Water					1.0	Date: <u>8/11/10</u> Time: <u>11:00</u> WQ: <u>SG</u>
	Meter ID	<u>PH03</u>	<u>RD04</u>	<u>EC05</u>	<u>DR4000</u>	<u>DR3800</u>	

Appendix G

Test Data and Summary of Statistics for the Reference Toxicant Evaluation of the Amphipod, *Ampelisca abdita*

CETIS Summary Report

Report Date: 08 Aug-10 09:38 (p 1 of 1)
Test Code: 11-8400-5954/39626

Acute Amphipod Survival Test							Pacific EcoRisk				
Batch ID:	16-7734-4128	Test Type:	Survival	Analyst:	Padrick Anderson						
Start Date:	01 Aug-10 16:50	Protocol:	ASTM E1367-99 (Amphipod)	Diluent:	Diluted Seawater						
Ending Date:	05 Aug-10 14:50	Species:	Ampelisca abdita	Brine:	Not Applicable						
Duration:	94h	Source:	Brezina and Associates	Age:	NA						
Sample ID:	11-3329-6818	Code:	KCl	Client:	Reference Toxicant						
Sample Date:	01 Aug-10 16:50	Material:	Potassium chloride	Project:	17165						
Receive Date:	01 Aug-10 16:50	Source:	Reference Toxicant								
Sample Age:	N/A (19.9 °C)	Station:	In House								
Comparison Summary											
Analysis ID	Endpoint	NOEL	LOEL	TOEL	PMSD	TU	Method				
02-6514-7291	Survival Rate	0.5	1	0.707	24.8%		Dunnett's Multiple Comparison Test				
Point Estimate Summary											
Analysis ID	Endpoint	Level	g/L	95% LCL	95% UCL	TU	Method				
11-5225-6550	Survival Rate	EC50	1.1	0.934	1.29		Spearman-Kärber				
Survival Rate Summary											
Conc-g/L	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
0	Lab Water Contr	2	0.95	0.924	0.976	0.9	1	0.0129	0.0707	7.44%	0.0%
0.25		2	0.95	0.924	0.976	0.9	1	0.0129	0.0707	7.44%	0.0%
0.5		2	0.9	0.847	0.953	0.8	1	0.0258	0.141	15.7%	5.26%
1		2	0.65	0.624	0.676	0.6	0.7	0.0129	0.0707	10.9%	31.6%
2		2	0	0	0	0	0	0	0		100.0%
4		2	0	0	0	0	0	0	0		100.0%
Survival Rate Detail											
Conc-g/L	Control Type	Rep 1	Rep 2								
0	Lab Water Contr	0.9	1								
0.25		0.9	1								
0.5		0.8	1								
1		0.7	0.6								
2		0	0								
4		0	0								

CETIS Analytical Report

Report Date: 08 Aug-10 09:38 (p 1 of 2)
Test Code: 11-8400-5954/39626

Acute Amphipod Survival Test							Pacific EcoRisk				
Analysis ID: 02-6514-7291		Endpoint: Survival Rate		CETIS Version: CETISv1.7.0							
Analyzed: 08 Aug-10 9:37		Analysis: Parametric-Control vs Treatments		Official Results: Yes							
Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD			
Angular (Corrected)	0	C > T	Not Run	0.5	1	0.707		24.8%			
Dunnett's Multiple Comparison Test											
Control	vs	Conc-g/L	Test Stat	Critical	MSD	P-Value	Decision(5%)				
Lab Water Control		0.25	0	2.83	0.323	0.8333	Non-Significant Effect				
		0.5	0.62	2.83	0.323	0.6007	Non-Significant Effect				
		1*	3.43	2.83	0.323	0.0242	Significant Effect				
		2*	10.2	2.83	0.323	<0.0001	Significant Effect				
		4*	10.2	2.83	0.323	<0.0001	Significant Effect				
ANOVA Table											
Source	Sum Squares		Mean Square		DF	F Stat	P-Value	Decision(5%)			
Between	3.184033		0.6368067		5	48.6	<0.0001	Significant Effect			
Error	0.07855225		0.01309204		6						
Total	3.262586		0.6498987		11						
ANOVA Assumptions											
Attribute	Test			Test Stat	Critical	P-Value	Decision(1%)				
Variances	Mod Levene Equality of Variance			65500	8.75	<0.0001	Unequal Variances				
Distribution	Shapiro-Wilk Normality			0.97		0.9090	Normal Distribution				
Survival Rate Summary											
Conc-g/L	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
0	Lab Water Contr	2	0.95	0.923	0.977	0.9	1	0.0131	0.0707	7.44%	0.0%
0.25		2	0.95	0.923	0.977	0.9	1	0.0131	0.0707	7.44%	0.0%
0.5		2	0.9	0.846	0.954	0.8	1	0.0263	0.141	15.7%	5.26%
1		2	0.65	0.623	0.677	0.6	0.7	0.0131	0.0707	10.9%	31.6%
2		2	0	0	0	0	0	0	0		100.0%
4		2	0	0	0	0	0	0	0		100.0%
Angular (Corrected) Transformed Summary											
Conc-g/L	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
0	Lab Water Cont	2	1.33	1.29	1.37	1.25	1.41	0.0214	0.115	8.66%	0.0%
0.25		2	1.33	1.29	1.37	1.25	1.41	0.0214	0.115	8.66%	0.0%
0.5		2	1.26	1.18	1.34	1.11	1.41	0.04	0.216	17.1%	5.33%
1		2	0.939	0.91	0.967	0.886	0.991	0.0138	0.0743	7.92%	29.5%
2		2	0.159	0.159	0.159	0.159	0.159	0	0	0.0%	88.1%
4		2	0.159	0.159	0.159	0.159	0.159	0	0	0.0%	88.1%

Acute Amphipod Survival Test

Pacific EcoRisk

Analysis ID: 02-6514-7291

Endpoint: Survival Rate

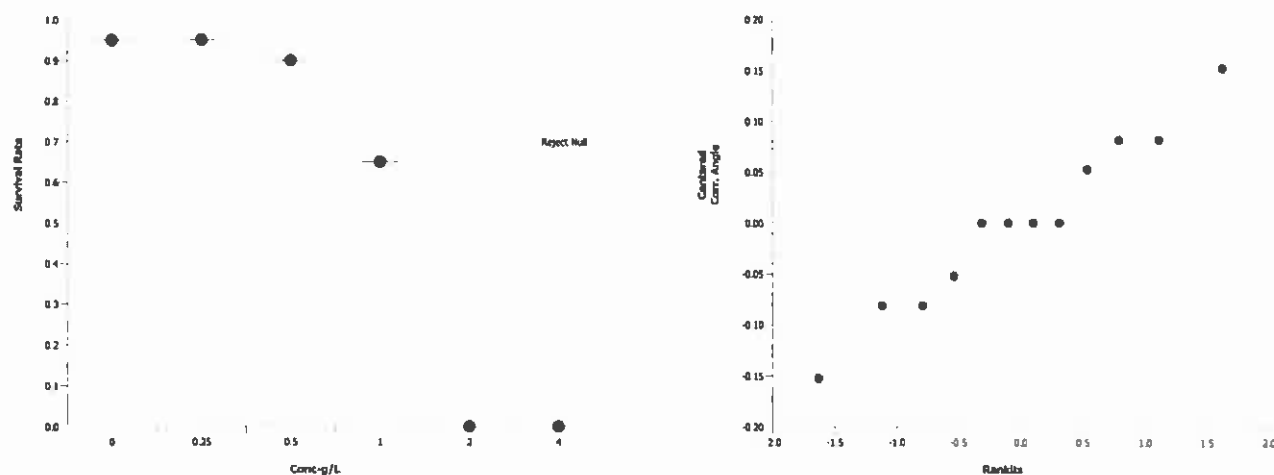
CETIS Version: CETISv1.7.0

Analyzed: 08 Aug-10 9:37

Analysis: Parametric-Control vs Treatments

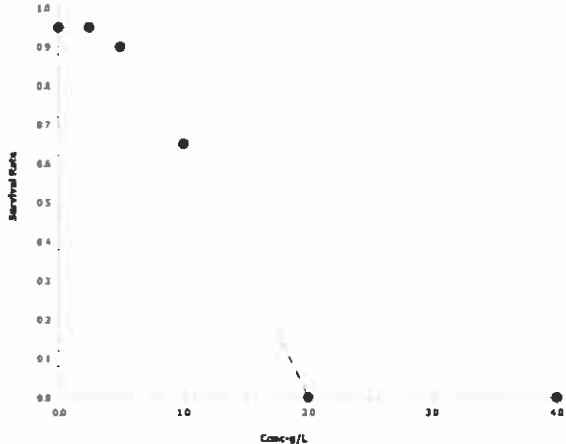
Official Results: Yes

Graphics



CETIS Analytical Report

Report Date: 08 Aug-10 09:38 (p 1 of 1)
Test Code: 11-8400-5954/39626

Acute Amphipod Survival Test						Pacific EcoRisk					
Analysis ID: 11-5225-6550		Endpoint: Survival Rate		CETIS Version: CETISv1.7.0							
Analyzed: 08 Aug-10 9:37		Analysis: Untrimmed Spearman-Kärber		Official Results: Yes							
Spearman-Kärber Estimates											
Threshold Option		Threshold	Trim	Mu	Sigma	EC50	95% LCL	95% UCL			
Control Threshold		0.05	0.00%	0.0396	0.0347	1.1	0.934	1.29			
Survival Rate Summary				Calculated Variate(A/B)							
Conc-g/L	Control Type	Count	Mean	Min	Max	Std Err	Std Dev	CV%	Diff%	A	B
0	Lab Water Contr	2	0.95	0.9	1	0.0129	0.0707	7.44%	0.0%	19	20
0.25		2	0.95	0.9	1	0.0129	0.0707	7.44%	0.0%	19	20
0.5		2	0.9	0.8	1	0.0258	0.141	15.7%	5.26%	18	20
1		2	0.65	0.6	0.7	0.0129	0.0707	10.9%	31.6%	13	20
2		2	0	0	0	0	0		100.0%	0	20
4		2	0	0	0	0	0		100.0%	0	20
Survival Rate Detail											
Conc-g/L	Control Type	Rep 1	Rep 2								
0	Lab Water Control	0.9	1								
0.25		0.9	1								
0.5		0.8	1								
1		0.7	0.6								
2		0	0								
4		0	0								
Graphics											
											

96 Hour Marine Reference Toxicant Test Data

Client: _____ Reference Toxicant: _____
 Test Material: _____ Potassium Chloride _____
 Test ID#: 39626 Project #: 17165
 Test Date: 8/11/10 Randomization: 2:05:1

Organism Log #: 5366
 Organism Supplier: Brezing
 Species: Ampelisca abdita
 Control/Diluent: 28 ppt Seawater

Treatment (g KCl/L)	Temp (°C)	pH		D.O. (mg/L)		Salinity (ppt)		# Live Organisms		SIGN-OFF
		new	old	new	old	new	old	A	B	
Control	19.9	7.93		9.2		28.6		10	10	Date: 8/11/10
0.25	19.9	7.91		9.1		28.8		10	10	Test Solution Prep: [initials]
0.5	19.9	7.92		9.1		29.2		10	10	New WQ: [initials]
1	19.9	7.92		9.1		29.9		10	10	Initiation Time: 16:50
2	19.9	7.92		9.1		31.1		10	10	Initiation Signoff: [initials]
4	19.9	7.91		9.0		33.0		10	10	Ref Tox Stock Batch #: 14/15
Meter ID: 48A		pH 14		KV4		EC04				
Control	20.9		7.79		6.9		28.2	10	10	Date: 8/2/10
0.25	20.9		7.81		7.0		28.7	10	10	Count Time: 13:15
0.5	20.9		7.83		6.9		29.0	9	10	Count Signoff: [initials]
1	20.9		7.83		6.9		29.4	10	10	Old WQ: WM
2	20.9		7.83		6.9		30.4	0	0	
4	20.9		7.82		6.9		32.5	0	0	
Meter ID: 48A			pH 12		R003		EC05			
Control	20.2		7.72		7.2		28.2	10	10	Date: 8/3/10
0.25	20.2		7.79		7.1		28.8	9	10	Count Time: 10:25
0.5	20.2		7.81		7.1		29.1	10	10	Count Signoff: [initials]
1	20.2		7.81		7.1		29.4	10	10	Old WQ: [initials]
2	-		-		-		-	-	-	
4	-		-		-		-	-	-	
Meter ID: 48A			pH 09		R003		EC05			
Control	19.6		7.80		7.2		27.4	9	10	Date: 8/4/10
0.25	19.6		7.91		7.2		28.6	9	10	Count Time: 9:00
0.5	19.6		7.92		7.3		28.8	8	10	Count Signoff: [initials]
1	19.6		7.92		7.3		29.2	10	9	Old WQ: ON
2	-		-		-		-	-	-	
4	-		-		-		-	-	-	
Meter ID: 48A			pH 14		R003		EC05			
Control	19.7		7.89		7.3		28.3	9	10	Date: 8/5/10
0.25	19.7		7.89		7.3		28.7	9	10	Termination Time: 14:50
0.5	19.7		7.91		7.4		29.0	8	10	Termination Signoff: [initials]
1	19.7		7.90		7.4		29.3	7	6	Old WQ: JM
2	-		-		-		-	-	-	
4	-		-		-		-	-	-	
Meter ID: 48A			pH 03		R004		EC03			

Appendix H

Test Data and Summary of Statistics for the Evaluation of the Toxicity of the San Rafael Channel Sediments to the Polychaete, *Neanthes arenaceodentata*

CETIS Summary Report

Report Date: 21 Jul-10 15:54 (p 1 of 2)
Test Code: 04-4894-3223/39425-34

10 Day Marine/Estuarine Sediment Test						Pacific EcoRisk				
Batch ID:	02-4301-0464		Test Type:		Survival		Analyst:	Jason Walker		
Start Date:	11 Jul-10 11:00		Protocol:		ASTM E1218-97a (1997)		Diluent:	Not Applicable		
Ending Date:	21 Jul-10 09:00		Species:		Neanthes arenaceodentata		Brine:	Not Applicable		
Duration:	9d 22h		Source:		Don Reisch		Age:	N/A		
Sample Code	Sample ID	Sample Date	Receive Date	Sample Age	Client Name	Project				
Lab Control	11-8603-3517	11 Jul-10 11:00	11 Jul-10 11:00	N/A (20.9 °C)	ACOE	16087				
SF-10	08-4984-0145	15 Jun-10 10:05	15 Jun-10 15:00	26d 1h (0 °C)						
SF-11	14-4973-6714	15 Jun-10 09:30	15 Jun-10 15:00	26d 2h (0 °C)						
SRC-2010-01	17-0782-1094	08 Jun-10 09:20	08 Jun-10 19:00	33d 2h (2.4 °C)						
SRC-2010-02	21-4363-5601	09 Jun-10 08:00	09 Jun-10 19:00	32d 3h (1.6 °C)						
SRC-2010-03	15-3808-8719	09 Jun-10 11:05	09 Jun-10 19:00	32d (1.6 °C)						
SRC-2010-04	03-3478-6159	11 Jun-10 08:40	11 Jun-10 17:00	30d 2h (0.2 °C)						
SRC-2010-05	02-1820-9844	08 Jun-10 14:45	08 Jun-10 19:00	32d 20h (2.4 °						
SRC-2010-06	15-6585-2712	09 Jun-10 15:30	09 Jun-10 19:00	31d 20h (3.7 °						
SRC-2010-07	08-0994-4638	10 Jun-10 09:00	10 Jun-10 17:00	31d 2h (0.6 °C						
SRC-2010-08	08-9351-2460	10 Jun-10 11:55	10 Jun-10 17:00	30d 23h (1.4 °						
Sample Code	Material Type	Sample Source		Station Location		Latitude	Longitude			
Lab Control	Control Sediment	San Rafael Channel		Lab Control						
SF-10	Sediment	San Rafael Channel		San Pablo						
SF-11	Sediment	San Rafael Channel		Alcatraz						
SRC-2010-01	Sediment	San Rafael Channel		SRC-2010-01						
SRC-2010-02	Sediment	San Rafael Channel		SRC-2010-02						
SRC-2010-03	Sediment	San Rafael Channel		SRC-2010-03						
SRC-2010-04	Sediment	San Rafael Channel		SRC-2010-04						
SRC-2010-05	Sediment	San Rafael Channel		SRC-2010-05						
SRC-2010-06	Sediment	San Rafael Channel		SRC-2010-06						
SRC-2010-07	Sediment	San Rafael Channel		SRC-2010-07						
SRC-2010-08	Sediment	San Rafael Channel		SRC-2010-08						
Survival Rate Summary										
Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
Lab Control	5	0.94	0.907	0.973	0.8	1	0.0163	0.0894	9.52%	0.0%
SF-10	5	0.94	0.92	0.96	0.9	1	0.01	0.0548	5.83%	0.0%
SF-11	5	0.9	0.9	0.9	0.9	0.9	0	0	0.0%	4.26%
SRC-2010-01	5	0.96	0.94	0.98	0.9	1	0.01	0.0548	5.71%	-2.13%
SRC-2010-02	5	0.94	0.92	0.96	0.9	1	0.01	0.0548	5.83%	0.0%
SRC-2010-03	5	0.86	0.827	0.893	0.8	1	0.0163	0.0894	10.4%	8.51%
SRC-2010-04	5	0.9	0.874	0.926	0.8	1	0.0129	0.0707	7.86%	4.26%
SRC-2010-05	5	0.9	0.874	0.926	0.8	1	0.0129	0.0707	7.86%	4.26%
SRC-2010-06	5	0.96	0.927	0.993	0.8	1	0.0163	0.0894	9.32%	-2.13%
SRC-2010-07	5	0.94	0.92	0.96	0.9	1	0.01	0.0548	5.83%	0.0%
SRC-2010-08	5	0.92	0.889	0.951	0.8	1	0.0153	0.0837	9.09%	2.13%

CETIS Summary Report

Report Date: 21 Jul-10 15:54 (p 2 of 2)
Test Code: 04-4894-3223/39425-34

10 Day Marine/Estuarine Sediment Test					Pacific EcoRisk
Survival Rate Detail					
Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
Lab Control	0.8	1	1	0.9	1
SF-10	0.9	1	0.9	0.9	1
SF-11	0.9	0.9	0.9	0.9	0.9
SRC-2010-01	1	0.9	1	0.9	1
SRC-2010-02	0.9	1	0.9	0.9	1
SRC-2010-03	0.9	0.8	0.8	0.8	1
SRC-2010-04	0.9	0.9	0.9	0.8	1
SRC-2010-05	1	0.8	0.9	0.9	0.9
SRC-2010-06	1	1	1	0.8	1
SRC-2010-07	0.9	0.9	1	0.9	1
SRC-2010-08	1	0.9	1	0.8	0.9

CETIS Analytical Report

Report Date: 21 Jul-10 15:56 (p 10 of 10)
 Test Code: 04-4894-3223/39425-34

10 Day Marine/Estuarine Sediment Test							Pacific EcoRisk			
Analysis ID: 03-2222-9193		Endpoint: Survival Rate			CETIS Version: CETISv1.7.0					
Analyzed: 21 Jul-10 15:54		Analysis: Parametric-Two Sample			Official Results: Yes					
Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD		
Angular (Corrected)	0	C > T	Not Run				N/A	8.9%		
Equal Variance t Two-Sample Test										
Sample Code	vs	Sample Code	Test Stat	Critical	MSD	P-Value	Decision(5%)			
Lab Control		SF-10	0.0575	1.86	0.136	0.4778	Non-Significant Effect			
ANOVA Table										
Source	Sum Squares		Mean Square		DF	F Stat	P-Value	Decision(5%)		
Between	4.440833E-05		4.440833E-05		1	0.0033	0.9556	Non-Significant Effect		
Error	0.1076002		0.01345003		8					
Total	0.1076446		0.01349444		9					
ANOVA Assumptions										
Attribute	Test		Test Stat	Critical	P-Value	Decision(1%)				
Variances	Variance Ratio F		2.38	23.2	0.4225	Equal Variances				
Distribution	Shapiro-Wilk Normality		0.794		0.0121	Normal Distribution				
Survival Rate Summary										
Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
Lab Control	5	0.94	0.906	0.974	0.8	1	0.0166	0.0894	9.52%	0.0%
SF-10	5	0.94	0.919	0.961	0.9	1	0.0102	0.0548	5.83%	0.0%
Angular (Corrected) Transformed Summary										
Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
Lab Control	5	1.32	1.27	1.37	1.11	1.41	0.0256	0.138	10.4%	0.0%
SF-10	5	1.31	1.28	1.35	1.25	1.41	0.0166	0.0893	6.79%	0.32%
Graphics										
<div><div><p>Survival Rate</p><p>Sample Code</p><p>Lab Control</p><p>SF-10</p><p>Rejects Null</p></div><div><p>Combined Corr. Angle</p><p>Rankita</p></div></div>										

10-Day Estuarine/Marine Sediment Toxicity Test Data

Client: ACOE (San Rafael Channel)Test ID #: 39425-39434Date (Day 0): 7/11/10Species: *Neanthes arenaceodentata*Project #: 16087Organism Supplier: Don ReishOrganism Log #: 5299

Day of Test	Test Replicate	Control					Sign-Off
		Sample ID:	Temp (°C)	pH	D.O. (mg/L)	Salinity (ppt)	
Day 0	Rep A	20.9	7.98	7.3	30.8	10	Date: 07/11/10 Time: 11:00 WQ: SG Scientist Initiation: PA Scientist Confirmation: SH
	Rep B	20.9	7.82	7.2	30.8	10	
	Rep C	20.9	8.10	7.6	31.2	10	
	Rep D	20.9	7.73	6.8	30.7	10	
	Rep E	20.9	7.69	6.5	31.3	10	
Day 1	Rep A	20.5	7.90	7.5	31.1		Date: 7/12/10 Time: 1140 WQ: UM
Day 2	Rep B	20.4	8.11	7.8	31.5		Date: 7/13/10 Time: 0935 WQ: CB
Day 3	Rep C	20.5	8.29	8.9	30.3		Date: 7/14/10 Time: 11:18 WQ: BT
Day 4	Rep D	20.5	7.93	7.4	31.0		Date: 7/15/10 Time: 08:40 WQ: BT
Day 5	Rep E	21.0	8.08	6.3	31.0		Date: 7/16/10 Time: 4:16 WQ: BT
Day 6	Rep A	21.0	8.44	7.2	31.7		Date: 7/17/10 Time: 1450 WQ: BT
Day 7	Rep B	21.0	8.10	7.2	29.9		Date: 7/18/10 Time: 1130 WQ: NB
Day 8	Rep C	21.0	8.25	7.6	31.2		Date: 7/19/10 Time: 1330 WQ: NB
Day 9	Rep D	20.3	8.11	6.8	30.9		Date: 7/20/10 Time: 14:30 WQ: SG
Day 10	Rep A	20.8	8.25	7.3	32.1	8	Date: 7.21.10 Time: 900 WQ: NB Scientist: mm
	Rep B	20.8	8.20	7.2	30.1	10	
	Rep C	20.8	8.28	7.3	31.8	10	
	Rep D	20.8	8.22	7.3	30.3	9	
	Rep E	20.8	8.14	7.0	32.6	10	

Day of Test	Matrix	pH	D.O. (mg/L)	Salinity (ppt)	Total Sulfide (mg/L)	Total Ammonia (mg/L)	Sign-Off
Day 0	Porewater	7.21	3.4	30.4	0.225	10.0	Date: 07/10/10 Time: 12:00 WQ: SG
	Overlying Water					3.46	Date: 07/11/10 Time: 11:00 WQ: SG
	Meter ID	PH12	RD03	EC03	DB4000	DR3800	
Day 10	Porewater	7.14	4.1	31.9	0.108	6.67	Date: 7.21.10 Time: 1400 WQ: NB
	Overlying Water					1.38	Date: 7.21.10 Time: 930 WQ: NB
	Meter ID	PH12	RD04	EC04	DR3800	DR3800	

10-Day Estuarine/Marine Sediment Toxicity Test Data

Client: ACOE (San Rafael Channel)

Test ID #: 39425

Date (Day 0): 7/11/10

Species: *Neanthes arenaceodentata*

Project #: 16087

Organism Supplier: Don Reish

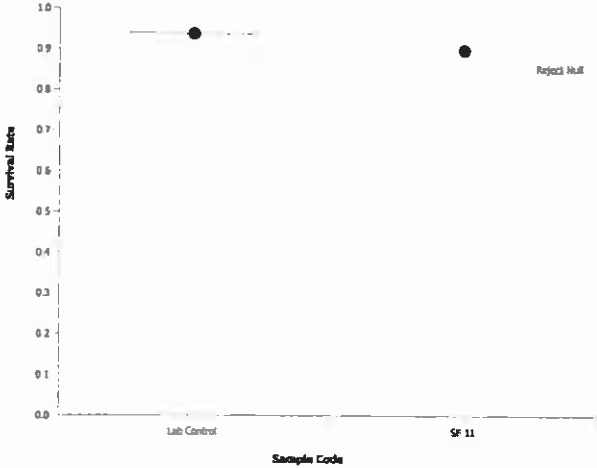
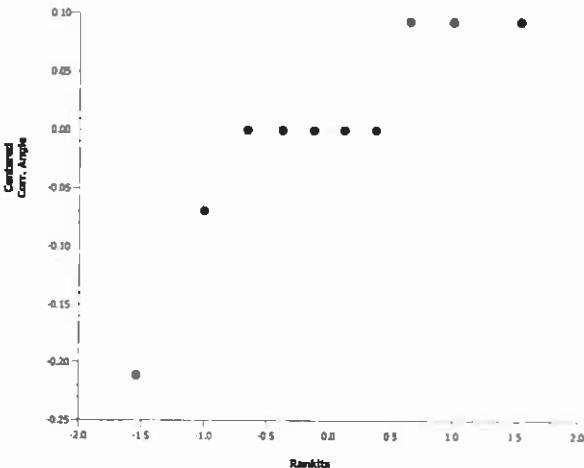
Organism Log #: 5289

Day of Test	Test Replicate	Sample ID: SF-10					Sign-Off
		Temp (°C)	pH	D.O. (mg/L)	Salinity (ppt)	# Alive	
Day 0	Rep A	20.9	7.98	7.5	30.8	10	Date: 07/11/10 Time: 11:00 WQ: SG Scientist Initiation: PA Scientist Confirmation: SG
	Rep B	20.9	7.98	7.4	30.9	10	
	Rep C	20.9	8.03	7.4	30.9	10	
	Rep D	20.9	8.05	7.5	31.0	10	
	Rep E	20.9	7.88	6.8	30.8	10	
Day 1	Rep A	20.5	7.86	7.5	31.4		Date: 7/12/10 WQ: VMA Time: 140
Day 2	Rep B	20.4	7.74	7.5	30.9		Date: 7/13/10 WQ: 0018 Time: 0935
Day 3	Rep C	20.9	8.28	8.1	31.2		Date: 7/14/10 WQ: 05 Time: 11:28
Day 4	Rep D	20.5	7.97	8.5	31.5		Date: 7/15/10 WQ: DT Time: 08:45
Day 5	Rep E	21.0	8.03	7.2	31.7		Date: 7/16/10 WQ: 15 Time: 1630
Day 6	Rep A	21.0	8.33	6.7	31.1		Date: 7/17/10 WQ: 05 Time: 1450
Day 7	Rep B	21.0	7.90	6.8	29.3		Date: 7/18/10 WQ: 11B Time: 1130
Day 8	Rep C	21.0	7.96	7.4	28.6		Date: 7/19/10 WQ: 11B Time: 1370
Day 9	Rep D	20.3	7.91	7.3	31.0		Date: 7/20/10 WQ: SG Time: 14:30
Day 10	Rep A	20.8	8.08	7.3	30.8	9	Date: 7.21.10 Time: 900 WQ: 11B Scientist: <i>mu</i>
	Rep B	20.8	8.05	7.3	29.6	10	
	Rep C	20.8	8.08	7.4	30.7	9	
	Rep D	20.8	8.10	7.4	31.7	9	
	Rep E	20.8	8.11	7.4	32.0	10	

Day of Test	Matrix	pH	D.O. (mg/L)	Salinity (ppt)	Total Sulfide (mg/L)	Total Ammonia (mg/L)	Sign-Off
Day 0	Porewater	7.03	4.6	27.9	0.033	2.30	Date: 07/11/10 Time: 12:00 WQ: SG
	Overlying Water					1.03	Date: 07/11/10 Time: 11:00 WQ: SG
	Meter ID	PH12	RD03	EC03	DR4000	DR3800	
Day 10	Porewater	6.99	5.5	30.1	0.034	1.47	Date: 7.21.10 Time: 1450 WQ: 11B
	Overlying Water					1.00	Date: 7.21.10 Time: 430 WQ: 11B
	Meter ID	PH12	RD04	EC04	DR4000	DR3800	

CETIS Analytical Report

Report Date: 21 Jul-10 15:55 (p 9 of 10)
Test Code: 04-4894-3223/39425-34

10 Day Marine/Estuarine Sediment Test							Pacific EcoRisk																																								
Analysis ID: 11-9515-9881		Endpoint: Survival Rate		CETIS Version: CETISv1.7.0																																											
Analyzed: 21 Jul-10 15:54		Analysis: Parametric-Two Sample		Official Results: Yes																																											
Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD																																							
Angular (Corrected)	0	C > T	Not Run				N/A	7.3%																																							
Equal Variance t Two-Sample Test																																															
Sample Code	vs	Sample Code	Test Stat	Critical	MSD	P-Value	Decision(5%)																																								
Lab Control		SF-11	1.13	1.86	0.114	0.1460	Non-Significant Effect																																								
ANOVA Table																																															
Source	Sum Squares		Mean Square		DF	F Stat	P-Value	Decision(5%)																																							
Between	0.01204187		0.01204187		1	1.27	0.2921	Non-Significant Effect																																							
Error	0.07572903		0.009466128		8																																										
Total	0.08777089		0.021508		9																																										
ANOVA Assumptions																																															
Attribute	Test		Test Stat	Critical	P-Value	Decision(1%)																																									
Variances	Mod Levene Equality of Varlance		2.53	13.7	0.1625	Equal Variances																																									
Distribution	Shapiro-Wilk Normality		0.816		0.0226	Normal Distribution																																									
Survival Rate Summary																																															
Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%																																					
Lab Control	5	0.94	0.906	0.974	0.8	1	0.0166	0.0894	9.52%	0.0%																																					
SF-11	5	0.9	0.9	0.9	0.9	0.9	0	0	0.0%	4.26%																																					
Angular (Corrected) Transformed Summary																																															
Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%																																					
Lab Control	5	1.32	1.27	1.37	1.11	1.41	0.0256	0.138	10.4%	0.0%																																					
SF-11	5	1.25	1.25	1.25	1.25	1.25	0	0	0.0%	5.26%																																					
Graphics																																															
<div><div><table><caption>Survival Rate Data</caption><thead><tr><th>Sample Code</th><th>Count</th><th>Mean</th><th>95% LCL</th><th>95% UCL</th></tr></thead><tbody><tr><td>Lab Control</td><td>5</td><td>0.94</td><td>0.906</td><td>0.974</td></tr><tr><td>SF 11</td><td>5</td><td>0.9</td><td>0.9</td><td>0.9</td></tr></tbody></table></div><div><table><caption>Combined Corr. Angles Data</caption><thead><tr><th>Rankita</th><th>Combined Corr. Angle</th></tr></thead><tbody><tr><td>-1.5</td><td>-0.22</td></tr><tr><td>-1.0</td><td>-0.07</td></tr><tr><td>-0.5</td><td>0.00</td></tr><tr><td>0.0</td><td>0.00</td></tr><tr><td>0.5</td><td>0.00</td></tr><tr><td>1.0</td><td>0.00</td></tr><tr><td>1.5</td><td>0.00</td></tr><tr><td>1.8</td><td>0.09</td></tr><tr><td>2.0</td><td>0.09</td></tr><tr><td>2.2</td><td>0.09</td></tr></tbody></table></div></div>											Sample Code	Count	Mean	95% LCL	95% UCL	Lab Control	5	0.94	0.906	0.974	SF 11	5	0.9	0.9	0.9	Rankita	Combined Corr. Angle	-1.5	-0.22	-1.0	-0.07	-0.5	0.00	0.0	0.00	0.5	0.00	1.0	0.00	1.5	0.00	1.8	0.09	2.0	0.09	2.2	0.09
Sample Code	Count	Mean	95% LCL	95% UCL																																											
Lab Control	5	0.94	0.906	0.974																																											
SF 11	5	0.9	0.9	0.9																																											
Rankita	Combined Corr. Angle																																														
-1.5	-0.22																																														
-1.0	-0.07																																														
-0.5	0.00																																														
0.0	0.00																																														
0.5	0.00																																														
1.0	0.00																																														
1.5	0.00																																														
1.8	0.09																																														
2.0	0.09																																														
2.2	0.09																																														

10-Day Estuarine/Marine Sediment Toxicity Test Data

Client: ACOE (San Rafael Channel)

Test ID #: 39426

Date (Day 0): 7/11/10

Species: *Neanthes arenaceodentata*

Project #: 16087

Organism Supplier: Don Reish

Organism Log #: 5299

Day of Test	Test Replicate	Sample ID: SF-11					Sign-Off
		Temp (°C)	pH	D.O. (mg/L)	Salinity (ppt)	# Alive	
Day 0	Rep A	20.9	8.08	7.5	30.8	10	Date: 07/11/10 Time: 11:00 WQ: SC Scientist Initiation: <i>DR</i> Scientist Confirmation: <i>SH</i>
	Rep B	20.9	8.08	7.6	30.3	10	
	Rep C	20.9	8.08	7.6	30.5	10	
	Rep D	20.9	8.07	7.6	30.5	10	
	Rep E	20.9	8.05	7.5	30.1	10	
Day 1	Rep A	20.5	7.95	7.6	31.4		Date: 7/12/10 WQ: <i>W</i> Time: 1140
Day 2	Rep B	20.4	7.87	7.6	30.1		Date: 7/13/10 WQ: <i>W</i> Time: 0936
Day 3	Rep C	20.5	8.34	8.9	31.2		Date: 7/14/10 WQ: <i>DT</i> Time: 11:28
Day 4	Rep D	20.5	7.93	8.5	31.5		Date: 7/15/10 WQ: <i>DT</i> Time: 08:47
Day 5	Rep E	21.0	7.99	7.2	31.1		Date: 7/16/10 WQ: <i>DT</i> Time: 1430
Day 6	Rep A	21.0	8.34	6.8	31.0		Date: 7/17/10 WQ: <i>DT</i> Time: 1750
Day 7	Rep B	21.0	8.00	7.6	31.4		Date: 7/18/10 WQ: <i>NB</i> Time: 1130
Day 8	Rep C	21.5	8.00	7.5	31.4		Date: 7/19/10 WQ: <i>NB</i> Time: 1330
Day 9	Rep D	20.3	7.87	7.0	31.1		Date: 7/20/10 WQ: <i>SC</i> Time: 14:30
Day 10	Rep A	20.8	8.08	7.4	29.9	9	Date: 7.21.10 Time: 915 WQ: <i>NB</i> Scientist: <i>mm</i>
	Rep B	20.8	8.08	7.4	30.0	9	
	Rep C	20.8	8.08	7.4	30.5	9	
	Rep D	20.8	8.06	7.5	30.8	9	
	Rep E	20.8	8.06	7.5	30.9	9	

Day of Test	Matrix	pH	D.O. (mg/L)	Salinity (ppt)	Total Sulfide (mg/L)	Total Ammonia (mg/L)	Sign-Off
Day 0	Porewater	7.48	6.0	28.5	0.318	<1	Date: 07/10/10 Time: 12:10 WQ: <i>SC</i>
	Overlying Water					<1	Date: 07/11/10 Time: 11:00 WQ: <i>SC</i>
	Meter ID	PH12	RD03	EC03	DR4000	DR3800	
Day 10	Porewater	7.67	6.5	32.2	0.203	<1.00	Date: 7.21.10 Time: 1400 WQ: <i>NB</i>
	Overlying Water					<1.00	Date: 7.21.10 Time: 0930 WQ: <i>NB</i>
	Meter ID	PH12	RD04	EC04	DR4000	DR3800	

CETIS Analytical Report

Report Date: 21 Jul-10 15:55 (p 8 of 10)
Test Code: 04-4894-3223/39425-34

10 Day Marine/Estuarine Sediment Test							Pacific EcoRisk																																								
Analysis ID: 08-8043-8918		Endpoint: Survival Rate			CETIS Version: CETISv1.7.0																																										
Analyzed: 21 Jul-10 15:54		Analysis: Parametric-Two Sample			Official Results: Yes																																										
Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD																																							
Angular (Corrected)	0	C > T	Not Run				N/A	8.9%																																							
Equal Variance t Two-Sample Test																																															
Sample Code	vs	Sample Code	Test Stat	Critical	MSD	P-Value	Decision(5%)																																								
Lab Control		SRC-2010-01	-0.387	1.86	0.136	0.6455	Non-Significant Effect																																								
ANOVA Table																																															
Source	Sum Squares		Mean Square		DF	F Stat	P-Value	Decision(5%)																																							
Between	0.002013477		0.002013477		1	0.15	0.7089	Non-Significant Effect																																							
Error	0.1076002		0.01345003		8																																										
Total	0.1096137		0.01546351		9																																										
ANOVA Assumptions																																															
Attribute	Test		Test Stat	Critical	P-Value	Decision(1%)																																									
Variances	Variance Ratio F		2.38	23.2	0.4225	Equal Variances																																									
Distribution	Shapiro-Wilk Normality		0.811		0.0197	Normal Distribution																																									
Survival Rate Summary																																															
Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%																																					
Lab Control	5	0.94	0.906	0.974	0.8	1	0.0166	0.0894	9.52%	0.0%																																					
SRC-2010-01	5	0.96	0.939	0.981	0.9	1	0.0102	0.0548	5.71%	-2.13%																																					
Angular (Corrected) Transformed Summary																																															
Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%																																					
Lab Control	5	1.32	1.27	1.37	1.11	1.41	0.0256	0.138	10.4%	0.0%																																					
SRC-2010-01	5	1.35	1.31	1.38	1.25	1.41	0.0166	0.0893	6.63%	-2.15%																																					
Graphics																																															
<div><div><table><caption>Survival Rate Data</caption><thead><tr><th>Sample Code</th><th>Count</th><th>Mean</th><th>95% LCL</th><th>95% UCL</th></tr></thead><tbody><tr><td>Lab Control</td><td>5</td><td>0.94</td><td>0.906</td><td>0.974</td></tr><tr><td>SRC-2010-01</td><td>5</td><td>0.96</td><td>0.939</td><td>0.981</td></tr></tbody></table></div><div><table><caption>Normal Q-Q Plot Data</caption><thead><tr><th>Ranks</th><th>Standardized Quantiles</th></tr></thead><tbody><tr><td>1.0</td><td>-0.22</td></tr><tr><td>2.0</td><td>-0.10</td></tr><tr><td>3.0</td><td>-0.10</td></tr><tr><td>4.0</td><td>-0.07</td></tr><tr><td>5.0</td><td>0.07</td></tr><tr><td>6.0</td><td>0.07</td></tr><tr><td>7.0</td><td>0.07</td></tr><tr><td>8.0</td><td>0.09</td></tr><tr><td>9.0</td><td>0.09</td></tr><tr><td>10.0</td><td>0.09</td></tr></tbody></table></div></div>											Sample Code	Count	Mean	95% LCL	95% UCL	Lab Control	5	0.94	0.906	0.974	SRC-2010-01	5	0.96	0.939	0.981	Ranks	Standardized Quantiles	1.0	-0.22	2.0	-0.10	3.0	-0.10	4.0	-0.07	5.0	0.07	6.0	0.07	7.0	0.07	8.0	0.09	9.0	0.09	10.0	0.09
Sample Code	Count	Mean	95% LCL	95% UCL																																											
Lab Control	5	0.94	0.906	0.974																																											
SRC-2010-01	5	0.96	0.939	0.981																																											
Ranks	Standardized Quantiles																																														
1.0	-0.22																																														
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3.0	-0.10																																														
4.0	-0.07																																														
5.0	0.07																																														
6.0	0.07																																														
7.0	0.07																																														
8.0	0.09																																														
9.0	0.09																																														
10.0	0.09																																														

10-Day Estuarine/Marine Sediment Toxicity Test Data

Client: ACOE (San Rafael Channel)

Test ID #: 39427

Date (Day 0): 7/11/10

Species: *Neanthes arenaceodentata*

Project #: 16087

Organism Supplier: Don Reish

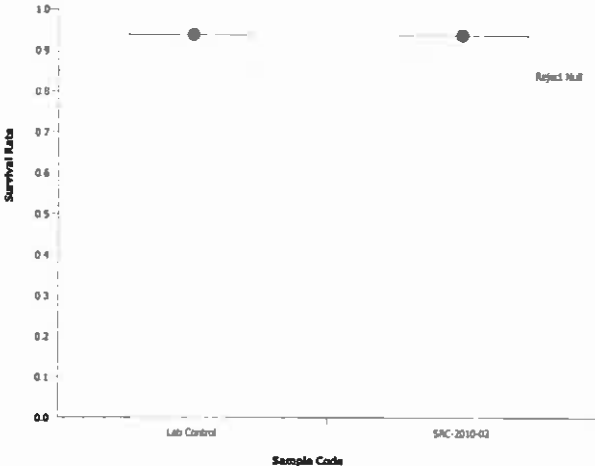
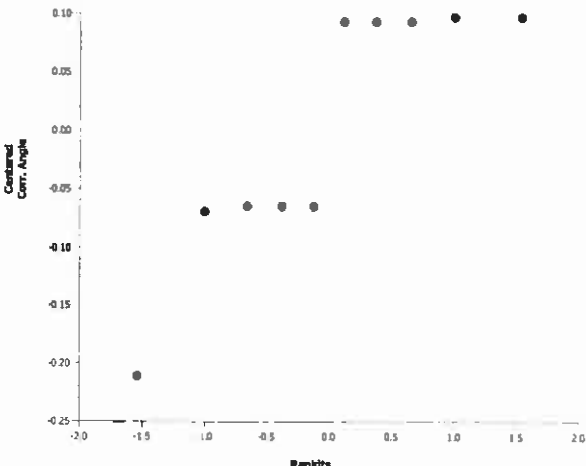
Organism Log #: 5289

Day of Test	Test Replicate	Sample ID: SRC-2010-01					Sign-Off
		Temp (°C)	pH	D.O. (mg/L)	Salinity (ppt)	# Alive	
Day 0	Rep A	20.9	7.88	7.2	30.9	10	Date: 07/11/10
	Rep B	20.9	7.82	7.1	30.8	10	Time: 11:00
	Rep C	20.9	7.83	7.0	30.8	10	WQ: SG
	Rep D	20.9	7.89	7.2	31.0	10	Scientist Initiation: <i>DR</i>
	Rep E	20.9	7.91	7.4	31.5	10	Scientist Confirmation: <i>SH</i>
Day 1	Rep A	20.5	7.87	7.6	31.9		Date: 7/12/10 Time: 1140
Day 2	Rep B	20.4	7.80	7.6	30.5		Date: 7/13/10 Time: 0945
Day 3	Rep C	20.5	8.29	8.5	30.3		Date: 7/14/10 Time: 11:19
Day 4	Rep D	20.5	8.73	8.5	31.8		Date: 7/15 Time: 09:06
Day 5	Rep E	21.0	8.01	7.9	30.0		Date: 7/16/10 Time: 1640
Day 6	Rep A	21.0	8.27	7.9	31.8		Date: 7/17/10 Time: 1450
Day 7	Rep B	21.0	7.85	7.6	31.4		Date: 7/18/10 Time: 1130
Day 8	Rep C	21.5	7.90	7.7	31.3		Date: 7/19/10 Time: 1330
Day 9	Rep D	20.3	7.83	7.4	31.1		Date: 7/20/10 Time: 14:30
Day 10	Rep A	20.8	7.95	7.3	31.3	10	Date: 7.21.10
	Rep B	20.8	7.96	7.3	30.9	9	Time: 1015
	Rep C	20.8	7.95	7.3	30.1	10	WQ: NB
	Rep D	20.8	7.94	7.3	30.6	9	Scientist: <i>mm</i>
	Rep E	20.8	7.95	7.3	32.5	10	

Day of Test	Matrix	pH	D.O. (mg/L)	Salinity (ppt)	Total Sulfide (mg/L)	Total Ammonia (mg/L)	Sign-Off
Day 0	Porewater	7.28	4.1	29.2	0.036	11.6	Date: 07/10/10 Time: 12:00
	Overlying Water					3.49	Date: 07/11/10 Time: 11:00
	Meter ID	PH12	RD03	EC03	DR4000	DR3800	
Day 10	Porewater	7.39	6.2	32.4	0.039	2.09	Date: 7.21.10 Time: 1400
	Overlying Water					1.52	Date: 7.21.10 Time: 1045
	Meter ID	PH12	RD04	EC04	DR4000	DR3800	

CETIS Analytical Report

Report Date: 21 Jul-10 15:55 (p 7 of 10)
Test Code: 04-4894-3223/39425-34

10 Day Marine/Estuarine Sediment Test							Pacific EcoRisk			
Analysis ID: 16-1253-7505		Endpoint: Survival Rate			CETIS Version: CETISv1.7.0					
Analyzed: 21 Jul-10 15:54		Analysis: Parametric-Two Sample			Official Results: Yes					
Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD		
Angular (Corrected)	0	C > T	Not Run				N/A	8.9%		
Equal Variance t Two-Sample Test										
Sample Code	vs	Sample Code	Test Stat	Critical	MSD	P-Value	Decision(5%)			
Lab Control		SRC-2010-02	0.0575	1.86	0.136	0.4778	Non-Significant Effect			
ANOVA Table										
Source	Sum Squares		Mean Square		DF	F Stat	P-Value	Decision(5%)		
Between	4.440833E-05		4.440833E-05		1	0.0033	0.9556	Non-Significant Effect		
Error	0.1076002		0.01345003		8					
Total	0.1076446		0.01349444		9					
ANOVA Assumptions										
Attribute	Test		Test Stat	Critical	P-Value	Decision(1%)				
Variances	Variance Ratio F		2.38	23.2	0.4225	Equal Variances				
Distribution	Shapiro-Wilk Normality		0.794		0.0121	Normal Distribution				
Survival Rate Summary										
Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
Lab Control	5	0.94	0.906	0.974	0.8	1	0.0166	0.0894	9.52%	0.0%
SRC-2010-02	5	0.94	0.919	0.961	0.9	1	0.0102	0.0548	5.83%	0.0%
Angular (Corrected) Transformed Summary										
Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
Lab Control	5	1.32	1.27	1.37	1.11	1.41	0.0256	0.138	10.4%	0.0%
SRC-2010-02	5	1.31	1.28	1.35	1.25	1.41	0.0166	0.0893	6.79%	0.32%
Graphics										
<div><div></div><div></div></div>										

10-Day Estuarine/Marine Sediment Toxicity Test Data

Client: ACOE (San Rafael Channel)

Test ID #: 39428

Date (Day 0): 7-11-10

Species: *Neanthes arenaceodentata*

Project #: 16087

Organism Supplier: Don Reish

Organism Log #: 5299

Day of Test	Test Replicate	Sample ID: SRC-2010-02					Sign-Off
		Temp (°C)	pH	D.O. (mg/L)	Salinity (ppt)	# Alive	
Day 0	Rep A	20.9	7.91	7.4	31.1	10	Date: 07/11/10 Time: 11:00 WQ: SC Scientist Initiation: <i>RA</i> Scientist Confirmation: <i>SH</i>
	Rep B	20.9	7.78	7.2	30.5	10	
	Rep C	20.9	7.87	7.3	30.5	10	
	Rep D	20.9	7.87	7.5	31.5	10	
	Rep E	20.9	7.87	7.6	29.4	10	
Day 1	Rep A	20.5	7.88	7.6	31.7		Date: 7/12/10 Time: 1140 WQ: UM
Day 2	Rep B	20.4	7.71	7.6	30.2		Date: 7/13/10 Time: 0942 WQ: UM
Day 3	Rep C	20.5	8.28	8.8	30.4		Date: 7/14/10 Time: 11:19 WQ: DT
Day 4	Rep D	20.5	7.89	8.6	31.1		Date: 7/15/10 Time: 09:06 WQ: DT
Day 5	Rep E	21.0	7.96	7.3	30.5		Date: 7/16/10 Time: 1640 WQ: DT
Day 6	Rep A	21.0	8.24	7.3	30.7		Date: 7/17/10 Time: 1450 WQ: DT
Day 7	Rep B	21.0	7.77	7.1	31.5		Date: 7/18/10 Time: 1130 WQ: NB
Day 8	Rep C	21.5	7.95	7.6	31.9		Date: 7/19/10 Time: 1330 WQ: NB
Day 9	Rep D	20.3	7.85	7.5	31.2		Date: 7/20/10 Time: 14:30 WQ: SC
Day 10	Rep A	20.8	8.08	7.1	31.4	9	Date: 7-21-10 Time: 1015 WQ: NB Scientist: <i>mm</i>
	Rep B	20.8	7.97	6.8	30.5	10	
	Rep C	20.8	7.97	7.2	30.9	9	
	Rep D	20.8	7.99	7.5	31.0	9	
	Rep E	20.8	7.99	7.5	33.1	10	

Day of Test	Matrix	pH	D.O. (mg/L)	Salinity (ppt)	Total Sulfide (mg/L)	Total Ammonia (mg/L)	Sign-Off
Day 0	Porewater	7.22	3.7	28.6	0.015	12.2	Date: 07/10/10 Time: 12:00 WQ: SC
	Overlying Water					4.08	Date: 07/11/10 Time: 11:00 WQ: SC
	Meter ID	PH12	RD03	EC03	DR4000	DR3800	
Day 10	Porewater	7.11	6.0	31.9	0.038	1.88	Date: 7-21-10 Time: 1400 WQ: NB
	Overlying Water					41.00	Date: 7-21-10 Time: 1045 WQ: NB
	Meter ID	PH12	RD04	EC04	DR4000	DR3800	

CETIS Analytical Report

Report Date: 21 Jul-10 15:55 (p 6 of 10)
 Test Code: 04-4894-3223/39425-34

10 Day Marine/Estuarine Sediment Test							Pacific EcoRisk			
Analysis ID: 07-1463-5003		Endpoint: Survival Rate		CETIS Version: CETISv1.7.0						
Analyzed: 21 Jul-10 15:54		Analysis: Parametric-Two Sample		Official Results: Yes						
Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD		
Angular (Corrected)	0	C > T	Not Run				N/A	10.7%		
Equal Variance t Two-Sample Test										
Sample Code	vs	Sample Code	Test Stat	Critical	MSD	P-Value	Decision(5%)			
Lab Control		SRC-2010-03	1.41	1.86	0.16	0.0976	Non-Significant Effect			
ANOVA Table										
Source	Sum Squares		Mean Square		DF	F Stat	P-Value	Decision(5%)		
Between	0.03717765		0.03717765		1	2	0.1953	Non-Significant Effect		
Error	0.1488882		0.01861103		8					
Total	0.1860659		0.05578868		9					
ANOVA Assumptions										
Attribute	Test		Test Stat	Critical	P-Value	Decision(1%)				
Variances	Variance Ratio F		1.04	23.2	0.9741	Equal Variances				
Distribution	Shapiro-Wilk Normality		0.927		0.4235	Normal Distribution				
Survival Rate Summary										
Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
Lab Control	5	0.94	0.906	0.974	0.8	1	0.0166	0.0894	9.52%	0.0%
SRC-2010-03	5	0.86	0.826	0.894	0.8	1	0.0166	0.0894	10.4%	8.51%
Angular (Corrected) Transformed Summary										
Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
Lab Control	5	1.32	1.27	1.37	1.11	1.41	0.0256	0.138	10.4%	0.0%
SRC-2010-03	5	1.2	1.15	1.25	1.11	1.41	0.0251	0.135	11.3%	9.25%
Graphics										
<div><div><p>A dot plot showing Survival Rate on the y-axis (0.0 to 1.0) for two sample codes on the x-axis: Lab Control and SRC-2010-03. Lab Control has a mean survival rate of approximately 0.94, and SRC-2010-03 has a mean survival rate of approximately 0.86. Both have 95% confidence intervals shown as horizontal lines. A horizontal line at approximately 0.86 is labeled 'Reject Null'.</p></div><div><p>A dot plot showing Combined Corr. Angle on the y-axis (-0.25 to 0.25) for two sample codes on the x-axis: Lab Control and SRC-2010-03. Lab Control has a mean combined correlation angle of approximately 0.138, and SRC-2010-03 has a mean combined correlation angle of approximately 0.135. Both have 95% confidence intervals shown as horizontal lines.</p></div></div>										

10-Day Estuarine/Marine Sediment Toxicity Test Data

Client: ACOE (San Rafael Channel)

Test ID #: 39429

Date (Day 0): 7.11.10

Species: *Neanthes arenaceodentata*

Project #: 16087

Organism Supplier: Don Reish

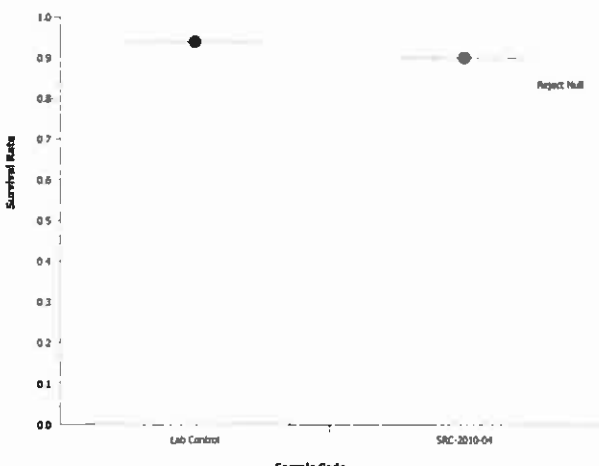
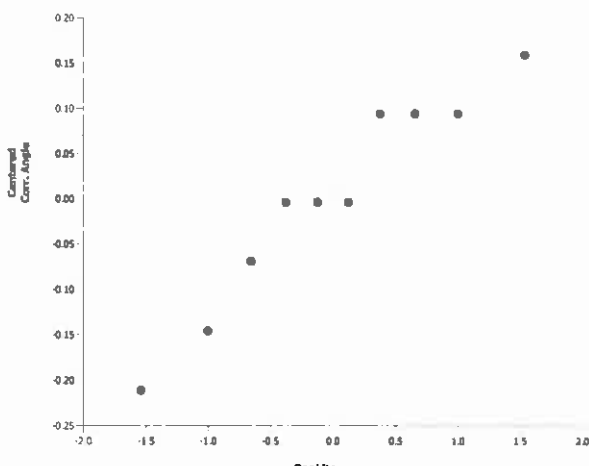
Organism Log #: 5299

Day of Test	Test Replicate	Sample ID: SRC-2010-03					Sign-Off
		Temp (°C)	pH	D.O. (mg/L)	Salinity (ppt)	# Alive	
Day 0	Rep A	20.9	7.64	5.9	29.0	10	Date: 07/11/10 Time: 11:00 WQ: SG Scientist Initiation: Scientist Confirmation:
	Rep B	20.9	7.89	7.3	28.8	10	
	Rep C	20.9	7.76	6.9	28.8	10	
	Rep D	20.9	7.90	7.4	28.9	10	
	Rep E	20.9	7.70	6.3	29.2	10	
Day 1	Rep A	20.5	7.68	6.7	29.5		Date: 7/11/10 Time: 1140
Day 2	Rep B	20.4	7.79	7.7	28.8		Date: 7/11/10 Time: 0941
Day 3	Rep C	20.9	8.17	8.8	28.8		Date: 7/14/10 Time: 11:20
Day 4	Rep D	20.5	7.84	8.4	29.5		Date: 7/13/10 Time: 09:04
Day 5	Rep E	21.0	7.87	7.0	31.2		Date: 7/14/10 Time: 1440
Day 6	Rep A	21.0	8.25	7.2	31.2		Date: 7/17/10 Time: 1450
Day 7	Rep B	21.0	7.96	7.5	30.5		Date: 7/18/10 Time: 1130
Day 8	Rep C	21.5	8.02	7.6	31.0		Date: 7/19/10 Time: 1330
Day 9	Rep D	20.3	7.88	7.5	31.5		Date: 7/20/10 Time: 14:30
Day 10	Rep A	20.8	8.05	7.0	32.5	9	Date: 7.21.10 Time: 1015 WQ: NB Scientist:
	Rep B	20.8	8.06	7.2	30.4	8	
	Rep C	20.8	8.06	7.4	31.1	8	
	Rep D	20.8	8.07	7.4	30.6	8	
	Rep E	20.8	8.03	7.5	31.0	10	

Day of Test	Matrix	pH	D.O. (mg/L)	Salinity (ppt)	Total Sulfide (mg/L)	Total Ammonia (mg/L)	Sign-Off
Day 0	Porewater	7.23	4.9	28.7	0.020	8.99	Date: 07/10/10 Time: 12:00
	Overlying Water					1.11	Date: 07/11/10 Time: 11:00
	Meter ID	PH03	RD02	EC04	DR4000	DR3800	
Day 10	Porewater	7.21	6.0	29.1	0.036	2.87	Date: 7.21.10 Time: 1400
	Overlying Water					4.00	Date: 7.21.10 Time: 1044
	Meter ID	PH12	RD04	EC04	DR4000	DR3800	

CETIS Analytical Report

Report Date: 21 Jul-10 15:55 (p 5 of 10)
Test Code: 04-4894-3223/39425-34

10 Day Marine/Estuarine Sediment Test							Pacific EcoRisk			
Analysis ID: 10-2515-6858		Endpoint: Survival Rate			CETIS Version: CETISv1.7.0					
Analyzed: 21 Jul-10 15:54		Analysis: Parametric-Two Sample			Official Results: Yes					
Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD		
Angular (Corrected)	0	C > T	Not Run				N/A	9.58%		
Equal Variance t Two-Sample Test										
Sample Code	vs	Sample Code	Test Stat	Critical	MSD	P-Value	Decision(5%)			
Lab Control		SRC-2010-04	0.834	1.86	0.145	0.2144	Non-Significant Effect			
ANOVA Table										
Source	Sum Squares		Mean Square	DF	F Stat	P-Value	Decision(5%)			
Between	0.01062373		0.01062373	1	0.695	0.4287	Non-Significant Effect			
Error	0.1223343		0.01529179	8						
Total	0.1329581		0.02591552	9						
ANOVA Assumptions										
Attribute	Test		Test Stat	Critical	P-Value	Decision(1%)				
Variances	Variance Ratio F		1.62	23.2	0.6496	Equal Variances				
Distribution	Shapiro-Wilk Normality		0.934		0.4923	Normal Distribution				
Survival Rate Summary										
Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
Lab Control	5	0.94	0.906	0.974	0.8	1	0.0166	0.0894	9.52%	0.0%
SRC-2010-04	5	0.9	0.873	0.927	0.8	1	0.0131	0.0707	7.86%	4.26%
Angular (Corrected) Transformed Summary										
Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
Lab Control	5	1.32	1.27	1.37	1.11	1.41	0.0256	0.138	10.4%	0.0%
SRC-2010-04	5	1.25	1.21	1.29	1.11	1.41	0.02	0.108	8.61%	4.94%
Graphics										
<div><div></div><div></div></div>										

10-Day Estuarine/Marine Sediment Toxicity Test Data

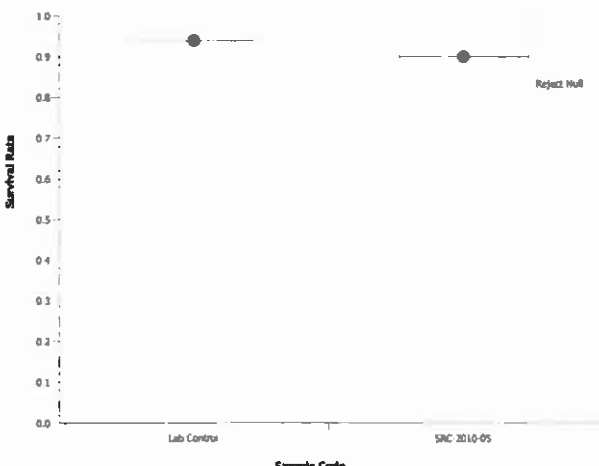
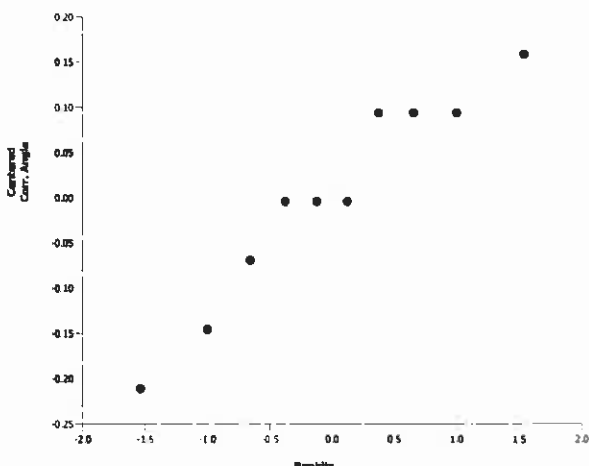
Client: ACOE (San Rafael Channel)Test ID #: 39430Date (Day 0): 7/11/10Species: *Neanthes arenaceodentata*Project #: 16087Organism Supplier: Don ReishOrganism Log #: 5299

Day of Test	Test Replicate	Sample ID: <u>SRC-2010-04</u>					Sign-Off
		Temp (°C)	pH	D.O. (mg/L)	Salinity (ppt)	# Alive	
Day 0	Rep A	20.7	7.96	7.5	30.5	10	Date: <u>07/11/10</u> Time: <u>11:00</u> WQ: <u>SS</u> Scientist Initiation: <u>AA</u> Scientist Confirmation: <u>SH</u>
	Rep B	20.9	7.98	7.6	30.3	10	
	Rep C	20.9	7.96	7.6	30.5	10	
	Rep D	20.9	7.96	7.6	30.6	10	
	Rep E	20.9	7.92	7.6	31.4	10	
Day 1	Rep A	20.5	7.89	7.5	31.0		Date: <u>7/12/10</u> Time: <u>11:10</u> WQ: <u>UM</u>
Day 2	Rep B	20.4	7.80	7.6	30.1		Date: <u>7/13/10</u> Time: <u>09:38</u> WQ: <u>003</u>
Day 3	Rep C	20.5	8.25	8.1	30.7		Date: <u>7/14/10</u> Time: <u>11:22</u> WQ: <u>DT</u>
Day 4	Rep D	20.5	7.94	8.4	31.1		Date: <u>7/15/10</u> Time: <u>08:58</u> WQ: <u>ST</u>
Day 5	Rep E	21.0	7.87	6.6	31.1		Date: <u>7/16/10</u> Time: <u>14:30</u> WQ: <u>DT</u>
Day 6	Rep A	21.0	8.28	7.0	30.8		Date: <u>7/17/10</u> Time: <u>14:50</u> WQ: <u>DT</u>
Day 7	Rep B	21.0	7.93	7.6	31.9		Date: <u>7/18/10</u> Time: <u>11:30</u> WQ: <u>NB</u>
Day 8	Rep C	21.6	7.99	7.7	31.5		Date: <u>7/19/10</u> Time: <u>13:30</u> WQ: <u>NB</u>
Day 9	Rep D	20.3	7.86	7.5	29.8		Date: <u>7/20/10</u> Time: <u>14:30</u> WQ: <u>SC</u>
Day 10	Rep A	20.8	7.93	7.3	30.9	9	Date: <u>7.21.10</u> Time: <u>945</u> WQ: <u>NB</u> Scientist: <u>mm / Eux</u>
	Rep B	20.8	8.02	7.3	31.2	9	
	Rep C	20.8	8.05	7.4	30.5	9	
	Rep D	20.8	8.04	7.4	29.8	8	
	Rep E	20.8	7.97	7.4	31.4	10	

Day of Test	Matrix	pH	D.O. (mg/L)	Salinity (ppt)	Total Sulfide (mg/L)	Total Ammonia (mg/L)	Sign-Off
Day 0	Porewater	7.20	3.8	29.3	0.028	11.0	Date: <u>07/19/10</u> Time: <u>12:00</u> WQ: <u>SS</u>
	Overlying Water					2.53	Date: <u>07/11/10</u> Time: <u>11:00</u> WQ: <u>ST</u>
	Meter ID	<u>PH03</u>	<u>DO02</u>	<u>EC04</u>	<u>DR4000</u>	<u>DR3800</u>	
Day 10	Porewater	7.17	5.9	31.3	0.046	2.64	Date: <u>7.21.10</u> Time: <u>1400</u> WQ: <u>NB</u>
	Overlying Water					41.01	Date: <u>7.21.10</u> Time: <u>1015</u> WQ: <u>NB</u>
	Meter ID	<u>PH02</u>	<u>DO04</u>	<u>EC04</u>	<u>DR4000</u>	<u>DR3800</u>	

CETIS Analytical Report

Report Date: 21 Jul-10 15:55 (p 4 of 10)
Test Code: 04-4894-3223/39425-34

10 Day Marine/Estuarine Sediment Test							Pacific EcoRisk			
Analysis ID: 17-9984-4512		Endpoint: Survival Rate		CETIS Version: CETISv1.7.0						
Analyzed: 21 Jul-10 15:54		Analysis: Parametric-Two Sample		Official Results: Yes						
Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD		
Angular (Corrected)	0	C > T	Not Run				N/A	9.58%		
Equal Variance t Two-Sample Test										
Sample Code	vs	Sample Code	Test Stat	Critical	MSD	P-Value	Decision(5%)			
Lab Control		SRC-2010-05	0.834	1.86	0.145	0.2144	Non-Significant Effect			
ANOVA Table										
Source	Sum Squares		Mean Square		DF	F Stat	P-Value	Decision(5%)		
Between	0.01062373		0.01062373		1	0.695	0.4287	Non-Significant Effect		
Error	0.1223343		0.01529179		8					
Total	0.1329581		0.02591552		9					
ANOVA Assumptions										
Attribute	Test		Test Stat	Critical	P-Value	Decision(1%)				
Variances	Variance Ratio F		1.62	23.2	0.6496	Equal Variances				
Distribution	Shapiro-Wilk Normality		0.934		0.4923	Normal Distribution				
Survival Rate Summary										
Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
Lab Control	5	0.94	0.906	0.974	0.8	1	0.0166	0.0894	9.52%	0.0%
SRC-2010-05	5	0.9	0.873	0.927	0.8	1	0.0131	0.0707	7.86%	4.26%
Angular (Corrected) Transformed Summary										
Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
Lab Control	5	1.32	1.27	1.37	1.11	1.41	0.0256	0.138	10.4%	0.0%
SRC-2010-05	5	1.25	1.21	1.29	1.11	1.41	0.02	0.108	8.61%	4.94%
Graphics										
<div><div></div><div></div></div>										

10-Day Estuarine/Marine Sediment Toxicity Test Data

Client: ACOE (San Rafael Channel)

Test ID #: 39431

Date (Day 0): 7/11/10

Species: *Neanthes arenaceodentata*

Project #: 16087

Organism Supplier: Don Reish

Organism Log #: 5299

Day of Test	Test Replicate	Sample ID: SRC-2010-05					Sign-Off
		Temp (°C)	pH	D.O. (mg/L)	Salinity (ppt)	# Alive	
Day 0	Rep A	20.9	7.76	6.9	31.3	10	Date: 07/11/10 Time: 11:00 WQ: SG Scientist Initiation: [Signature] Scientist Confirmation: [Signature]
	Rep B	20.9	7.85	7.2	30.8	10	
	Rep C	20.9	7.87	7.5	31.1	10	
	Rep D	20.9	7.94	7.5	31.2	10	
	Rep E	20.9	7.90	7.0	30.8	10	
Day 1	Rep A	20.5	7.72	6.9	31.7		Date: 7/12/10 WQ: UM Time: 1140
Day 2	Rep B	20.4	7.59	7.3	30.5		Date: 7/13/10 WQ: JB Time: 0935
Day 3	Rep C	20.5	8.16	8.9	31.9		Date: 7/14/10 WQ: DA Time: 11:21
Day 4	Rep D	20.5	8.03	8.1	29.1		Date: 7/15/10 WQ: DS Time: 9:01
Day 5	Rep E	21.0	7.91	7.1	32.0		Date: 7/16/10 WQ: [Signature] Time: 1636
Day 6	Rep A	21.0	8.31	7.3	29.4		Date: 7/17/10 WQ: DS Time: 1450
Day 7	Rep B	21.0	7.92	7.4	29.8		Date: 7/18/10 WQ: NB Time: 1130
Day 8	Rep C	21.5	8.01	7.5	31.1		Date: 7/19/10 WQ: NB Time: 1330
Day 9	Rep D	20.3	7.89	7.5	30.9		Date: 7/20/10 WQ: SG Time: 14:30
Day 10	Rep A	20.8	8.01	7.3	30.2	10	Date: 7/21/10 Time: 945 WQ: NB Scientist: [Signature]
	Rep B	20.8	8.05	7.3	29.9	8	
	Rep C	20.8	8.07	7.3	30.7	9	
	Rep D	20.8	8.05	7.3	30.6	9	
	Rep E	20.8	8.04	7.3	32.4	9	

Day of Test	Matrix	pH	D.O. (mg/L)	Salinity (ppt)	Total Sulfide (mg/L)	Total Ammonia (mg/L)	Sign-Off
Day 0	Porewater	7.23	4.3	29.5	0.040	2.97	Date: 07/10/10 WQ: SG Time: 12:00
	Overlying Water					2.49	Date: 07/11/10 WQ: SG Time: 11:00
	Meter ID	PA03	RP02	EC04	DR4000	DR3800	
Day 10	Porewater	7.09	6.0	31.8	0.037	3.16	Date: 7/21/10 WQ: NB Time: 1450
	Overlying Water					4.00	Date: 7/21/10 WQ: NB Time: 1015
	Meter ID	TH12	RD04	EC04	DR4000	DR3800	

CETIS Analytical Report

Report Date: 21 Jul-10 15:55 (p 3 of 10)
Test Code: 04-4894-3223/39425-34

10 Day Marine/Estuarine Sediment Test							Pacific EcoRisk			
Analysis ID: 12-9945-8768		Endpoint: Survival Rate			CETIS Version: CETISv1.7.0					
Analyzed: 21 Jul-10 15:54		Analysis: Nonparametric-Two Sample			Official Results: Yes					
Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD		
Angular (Corrected)	0	C > T	Not Run				N/A	10.8%		
Wilcoxon Rank Sum Two-Sample Test										
Sample Code	vs	Sample Code	Test Stat	Critical	Ties	P-Value	Decision(5%)			
Lab Control		SRC-2010-06	29.5		2	0.5794	Non-Significant Effect			
ANOVA Table										
Source	Sum Squares		Mean Square	DF	F Stat	P-Value	Decision(5%)			
Between	0.002655933		0.002655933	1	0.142	0.7165	Non-Significant Effect			
Error	0.1500843		0.01876054	8						
Total	0.1527403		0.02141647	9						
ANOVA Assumptions										
Attribute	Test		Test Stat	Critical	P-Value	Decision(1%)				
Variances	Variance Ratio F		1.02	23.2	0.9863	Equal Variances				
Distribution	Shapiro-Wilk Normality		0.72		0.0016	Non-normal Distribution				
Survival Rate Summary										
Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
Lab Control	5	0.94	0.906	0.974	0.8	1	0.0166	0.0894	9.52%	0.0%
SRC-2010-06	5	0.96	0.926	0.994	0.8	1	0.0166	0.0894	9.32%	-2.13%
Angular (Corrected) Transformed Summary										
Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
Lab Control	5	1.32	1.27	1.37	1.11	1.41	0.0256	0.138	10.4%	0.0%
SRC-2010-06	5	1.35	1.3	1.4	1.11	1.41	0.0253	0.136	10.1%	-2.47%
Graphics										

10-Day Estuarine/Marine Sediment Toxicity Test Data

Client: ACOE (San Rafael Channel)

Test ID #: 39432

Date (Day 0): 7-11-10

Species: *Neanthes arenaceodentata*

Project #: 16087

Organism Supplier: Don Reish

Organism Log #: 5299

Day of Test	Test Replicate	Sample ID: SRC-2010-06					Sign-Off
		Temp (°C)	pH	D.O. (mg/L)	Salinity (ppt)	# Alive	
Day 0	Rep A	20.9	7.85	7.5	30.6	10	Date: 07/11/10 Time: 11:00 WQ: SG Scientist Initiation: RA Scientist Confirmation: SF
	Rep B	20.9	7.89	7.6	30.9	10	
	Rep C	20.9	7.90	7.6	30.5	10	
	Rep D	20.9	7.91	7.6	30.7	10	
	Rep E	20.9	7.92	7.6	31.7	10	
Day 1	Rep A	20.5	7.78	7.5	31.0		Date: 7/12/10 Time: 11:40 WQ: WAM
Day 2	Rep B	20.4	7.77	7.7	31.0		Date: 7/13/10 Time: 09:39 WQ: OOB
Day 3	Rep C	20.5	8.26	8.9	30.4		Date: 7/14/10 Time: 11:21 WQ: BT
Day 4	Rep D	20.5	8.15	8.3	31.2		Date: 7/15/10 Time: 09:10 WQ: BT
Day 5	Rep E	21.0	7.92	7.2	30.8		Date: 7/16/10 Time: 11:30 WQ: BT
Day 6	Rep A	21.0	8.16	7.4	32.0		Date: 7/17/10 Time: 11:50 WQ: BT
Day 7	Rep B	21.0	7.80	7.6	29.4		Date: 7/18/10 Time: 11:30 WQ: NB
Day 8	Rep C	21.5	7.89	7.6	30.9		Date: 7/19/10 Time: 11:30 WQ: NB
Day 9	Rep D	20.3	7.70	7.6	31.2		Date: 7/20/10 Time: 11:30 WQ: SG
Day 10	Rep A	20.8	7.80	7.4	31.9	10	Date: 7-21-10 Time: 945 WQ: NB Scientist: mm
	Rep B	20.8	7.82	7.3	30.7	10	
	Rep C	20.8	7.84	7.4	30.0	10	
	Rep D	20.8	7.84	7.4	30.6	8	
	Rep E	20.8	7.87	7.4	32.7	10	

Day of Test	Matrix	pH	D.O. (mg/L)	Salinity (ppt)	Total Sulfide (mg/L)	Total Ammonia (mg/L)	Sign-Off
Day 0	Porewater	7.23	4.5	29.6	0.111	10.6	Date: 07/14/10 Time: 12:00 WQ: SG
	Overlying Water					2.01	Date: 07/11/10 Time: 11:00 WQ: SG
	Meter ID	PA03	PD02	EC04	DR4000	DR3800	
Day 10	Porewater	7.19	6.1	31.4	0.036	7.88	Date: 7-21-10 Time: 1400 WQ: NB
	Overlying Water					1.67	Date: 7-21-10 Time: 1015 WQ: NB
	Meter ID	PH12	PD04	EC04	DR4000	DR3800	

CETIS Analytical Report

Report Date: 21 Jul-10 15:55 (p 2 of 10)
 Test Code: 04-4894-3223/39425-34

10 Day Marine/Estuarine Sediment Test							Pacific EcoRisk			
Analysis ID: 05-8005-6640		Endpoint: Survival Rate		CETIS Version: CETISv1.7.0						
Analyzed: 21 Jul-10 15:54		Analysis: Parametric-Two Sample		Official Results: Yes						
Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD		
Angular (Corrected)	0	C > T	Not Run				N/A	8.9%		
Equal Variance t Two-Sample Test										
Sample Code	vs	Sample Code	Test Stat	Critical	MSD	P-Value	Decision(5%)			
Lab Control		SRC-2010-07	0.0575	1.86	0.136	0.4778	Non-Significant Effect			
ANOVA Table										
Source	Sum Squares		Mean Square		DF	F Stat	P-Value	Decision(5%)		
Between	4.440833E-05		4.440833E-05		1	0.0033	0.9556	Non-Significant Effect		
Error	0.1076002		0.01345003		8					
Total	0.1076446		0.01349444		9					
ANOVA Assumptions										
Attribute	Test		Test Stat	Critical	P-Value	Decision(1%)				
Variances	Variance Ratio F		2.38	23.2	0.4225	Equal Variances				
Distribution	Shapiro-Wilk Normality		0.794		0.0121	Normal Distribution				
Survival Rate Summary										
Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
Lab Control	5	0.94	0.906	0.974	0.8	1	0.0166	0.0894	9.52%	0.0%
SRC-2010-07	5	0.94	0.919	0.961	0.9	1	0.0102	0.0548	5.83%	0.0%
Angular (Corrected) Transformed Summary										
Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
Lab Control	5	1.32	1.27	1.37	1.11	1.41	0.0256	0.138	10.4%	0.0%
SRC-2010-07	5	1.31	1.28	1.35	1.25	1.41	0.0166	0.0893	6.79%	0.32%
Graphics										
<p>The left plot, titled 'Survival Rate', shows two data points with horizontal error bars. The y-axis ranges from 0.0 to 1.0. The x-axis is labeled 'Sample Code' with categories 'Lab Control' and 'SRC-2010-07'. Both points are at approximately 0.94. A horizontal line at 0.94 is labeled 'Reject Null'. The right plot, titled 'Standardized Corr. Angle', shows a normal probability plot. The y-axis ranges from -0.25 to 0.10. The x-axis is labeled 'Rankits' and ranges from -2.0 to 2.0. There are two sets of points: one set for 'Lab Control' (around rankits -1.5 to -0.5) and one set for 'SRC-2010-07' (around rankits 0.0 to 1.5).</p>										

10-Day Estuarine/Marine Sediment Toxicity Test Data

Client: ACOE (San Rafael Channel)

Test ID #: 39433


Date (Day 0): 7/11/10

Species: *Neanthes arenaceodentata*

Project #: 16087

Organism Supplier: Don Reish

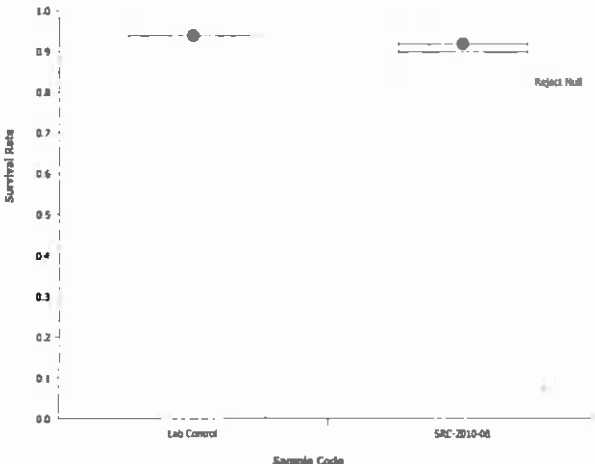
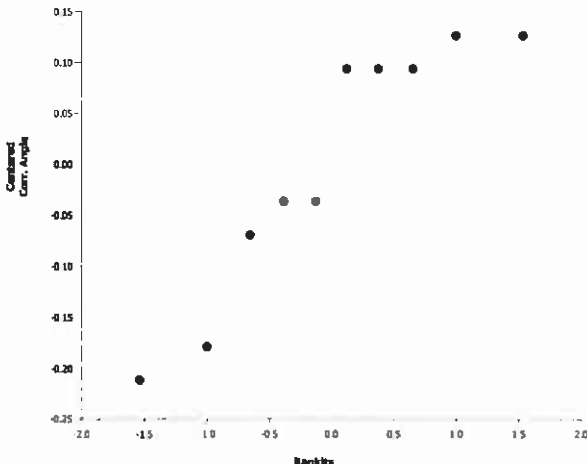
Organism Log #: 5299

Day of Test	Test Replicate	Sample ID: SRC-2010-07					Sign-Off
		Temp (°C)	pH	D.O. (mg/L)	Salinity (ppt)	# Alive	
Day 0	Rep A	20.9	7.92	7.5	31.4	10	Date: 07/11/10
	Rep B	20.9	7.93	7.5	30.7	10	Time: 11:00
	Rep C	20.9	7.92	7.5	30.5	10	WQ: SG
	Rep D	20.9	7.91	7.5	31.2	10	Scientist Initiation: AA
	Rep E	20.9	7.93	7.6	30.6	10	Scientist Confirmation: SA
Day 1	Rep A	20.5	7.79	7.5	31.2		Date: 7/12/10 Time: 1140
Day 2	Rep B	20.4	7.74	7.4	30.4		Date: 7/13/10 Time: 0937
Day 3	Rep C	20.5	8.25	8.7	31.0		Date: 7/14/10 Time: 11:23
Day 4	Rep D	20.5	7.88	8.2	31.5		Date: 7/15/10 Time: 08:51
Day 5	Rep E	21.0	7.99	7.1	31.6		Date: 7/16/10 Time: 1430
Day 6	Rep A	21.0	8.36	6.7	31.7		Date: 7/17/10 Time: 1750
Day 7	Rep B	21.0	7.95	7.2	28.7		Date: 7/18/10 Time: 1130
Day 8	Rep C	21.6	8.14	7.2	31.4		Date: 7/19/10 Time: 1230
Day 9	Rep D	20.3	8.14	7.1	31.0		Date: 7/20/10 Time: 14:30
Day 10	Rep A	20.3	8.11	7.3	30.8	9	Date: 7.21.10
	Rep B	20.8	8.09	7.2	29.2	9	Time: 915
	Rep C	20.8	8.14	7.1	30.4	10	WQ: NB
	Rep D	20.8	8.21	7.1	30.5	9	Scientist: 
	Rep E	20.8	8.21	7.2	31.9	10	

Day of Test	Matrix	pH	D.O. (mg/L)	Salinity (ppt)	Total Sulfide (mg/L)	Total Ammonia (mg/L)	Sign-Off
Day 0	Porewater	7.39	3.7	29.9	0.018	5.78	Date: 07/10/10 Time: 12:00
	Overlying Water					2.03	Date: 07/11/10 Time: 11:00
	Meter ID	PH03	RD02	ECO4	DR4000	DR3800	WQ: SA
Day 10	Porewater	7.03	5.6	31.9	0.049	2.05	Date: 7.21.10 Time: 1400
	Overlying Water					21.00	Date: 7.21.10 Time: 0930
	Meter ID	PH12	RD04	ECO4	DR4000	DR3800	WQ: NB

CETIS Analytical Report

Report Date: 21 Jul-10 15:55 (p 1 of 10)
Test Code: 04-4894-3223/39425-34

10 Day Marine/Estuarine Sediment Test							Pacific EcoRisk			
Analysis ID: 14-0875-5089		Endpoint: Survival Rate		CETIS Version: CETISv1.7.0						
Analyzed: 21 Jul-10 15:54		Analysis: Parametric-Two Sample		Official Results: Yes						
Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD		
Angular (Corrected)	0	C > T	Not Run				N/A	10.5%		
Equal Variance t Two-Sample Test										
Sample Code	vs	Sample Code	Test Stat	Critical	MSD	P-Value	Decision(5%)			
Lab Control		SRC-2010-08	0.387	1.86	0.157	0.3546	Non-Significant Effect			
ANOVA Table										
Source	Sum Squares		Mean Square	DF	F Stat	P-Value	Decision(5%)			
Between	0.002655933		0.002655933	1	0.149	0.7092	Non-Significant Effect			
Error	0.1422081		0.01777601	8						
Total	0.144864		0.02043194	9						
ANOVA Assumptions										
Attribute	Test		Test Stat	Critical	P-Value	Decision(1%)				
Variances	Variance Ratio F		1.14	23.2	0.9026	Equal Variances				
Distribution	Shapiro-Wilk Normality		0.862		0.0800	Normal Distribution				
Survival Rate Summary										
Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
Lab Control	5	0.94	0.906	0.974	0.8	1	0.0166	0.0894	9.52%	0.0%
SRC-2010-08	5	0.92	0.888	0.952	0.8	1	0.0155	0.0837	9.09%	2.13%
Angular (Corrected) Transformed Summary										
Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
Lab Control	5	1.32	1.27	1.37	1.11	1.41	0.0256	0.138	10.4%	0.0%
SRC-2010-08	5	1.29	1.24	1.33	1.11	1.41	0.0239	0.129	10.0%	2.47%
Graphics										
<div><div><p>Survival Rate</p><p>Sample Code</p><p>Lab Control</p><p>SRC-2010-08</p><p>Reject Null</p></div><div><p>Transformed Corr. Angle</p><p>Rankits</p></div></div>										

10-Day Estuarine/Marine Sediment Toxicity Test Data

Client: ACOE (San Rafael Channel)

Test ID #: 39434

Date (Day 0): 7/11/10

Species: *Neanthes arenaceodentata*

Project #: 16087

Organism Supplier: Don Reish

Organism Log #: 5299

Day of Test	Test Replicate	Sample ID: SRC-2010-08					Sign-Off
		Temp (°C)	pH	D.O. (mg/L)	Salinity (ppt)	# Alive	
Day 0	Rep A	20.9	7.86	7.4	29.0	10	Date: 07/11/10 Time: 11:00 WQ: SG Scientist Initiation: PA Scientist Confirmation: SH
	Rep B	20.9	7.85	7.4	28.7	10	
	Rep C	20.9	7.90	7.5	28.7	10	
	Rep D	20.9	7.53	5.6	28.5	10	
	Rep E	20.9	7.55	5.9	29.2	10	
Day 1	Rep A	20.5	7.88	7.6	29.5		Date: 7/12/10 WQ: VM Time: 1140
Day 2	Rep B	20.4	7.68	7.8	28.9		Date: 7/13/10 WQ: OOB Time: 0940
Day 3	Rep C	20.5	8.42	8.9	29.3		Date: 7/14/10 WQ: DS Time: 11:21
Day 4	Rep D	20.5	8.38	7.5	30.7		Date: 7/15/10 WQ: DS Time: 09:02
Day 5	Rep E	21.0	8.31	7.0	30.5		Date: 7/16/10 WQ: DT Time: 1430 ST 1630
Day 6	Rep A	21.0	8.70	6.9	31.0		Date: 7/17/10 WQ: DS Time: 1450
Day 7	Rep B	21.0	8.41	7.4	30.2		Date: 7/18/10 WQ: NB Time: 1130
Day 8	Rep C	21.5	8.00	7.4	30.2		Date: 7/19/10 WQ: NB Time: 1330
Day 9	Rep D	20.3	8.28	4.7	30.7		Date: 7/20/10 WQ: SG Time: 14:30
Day 10	Rep A	20.8	8.38	7.1	32.8	10	Date: 7/21/10 Time: 945 WQ: NB Scientist:
	Rep B	20.8	8.41	7.1	30.9	9	
	Rep C	20.8	8.35	7.1	30.9	10	
	Rep D	20.8	8.36	7.0	30.2	8	
	Rep E	20.8	8.36	7.1	34.4	9	

Day of Test	Matrix	pH	D.O. (mg/L)	Salinity (ppt)	Total Sulfide (mg/L)	Total Ammonia (mg/L)	Sign-Off
Day 0	Porewater	7.21	2.3	28.1	0.834	12.1	Date: 07/10/10 WQ: SG Time: 12:00
	Overlying Water					1.66	Date: 07/11/10 WQ: SG Time: 11:00
	Meter ID	PA03	PD02	EC04	DR 4000	DR 3800	
Day 10	Porewater	6.89	4.2	29.4	0.135	4.16	Date: 7/21/10 WQ: NB Time: 1400
	Overlying Water					1.78	Date: 7/21/10 WQ: NB Time: 1015
	Meter ID	PLA2	PD04	EC04	DR4000	DR3800	

Appendix I

Test Data and Summary of Statistics for the Reference Toxicant Evaluation of the Polychaete, *Neanthes arenaceodentata*

CETIS Summary Report

Report Date: 21 Jul-10 14:02 (p 1 of 1)

Test Code: 19-7375-4677/39445

Acute Polychaete Survival Test							Pacific EcoRisk				
Batch ID:	13-4734-0148	Test Type:	Survival	Analyst:	Jason Walker						
Start Date:	11 Jul-10 14:30	Protocol:	ASTM E1611-00 (Polychaete)	Diluent:	Diluted Seawater						
Ending Date:	15 Jul-10 15:15	Species:	Neanthes arenaceodentata	Brine:	Not Applicable						
Duration:	4d 1h	Source:	Don Reisch	Age:	N/A						
Sample ID:	16-3370-3763	Code:	KCl	Client:	Reference Toxicant						
Sample Date:	11 Jul-10 14:30	Material:	Potassium chloride	Project:	17108						
Receive Date:	11 Jul-10 14:30	Source:	Reference Toxicant								
Sample Age:	N/A (20.5 °C)	Station:	In House								
Comparison Summary											
Analysis ID	Endpoint	NOEL	LOEL	TOEL	PMSD	TU	Method				
02-1157-0090	Survival Rate	1	2	1.41	15.6%		Dunnett's Multiple Comparison Test				
Point Estimate Summary											
Analysis ID	Endpoint	Level	g/L	95% LCL	95% UCL	TU	Method				
17-1790-7765	Survival Rate	EC50	2.3	1.88	2.81		Spearman-Kärber				
Survival Rate Summary											
Conc-g/L	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
0	Lab Water Contr	2	1	1	1	1	1	0	0	0.0%	0.0%
0.25		2	1	1	1	1	1	0	0	0.0%	0.0%
0.5		2	1	1	1	1	1	0	0	0.0%	0.0%
1		2	1	1	1	1	1	0	0	0.0%	0.0%
2		2	0.7	0.647	0.753	0.6	0.8	0.0258	0.141	20.2%	30.0%
4		2	0	0	0	0	0	0	0		100.0%
Survival Rate Detail											
Conc-g/L	Control Type	Rep 1	Rep 2								
0	Lab Water Contr	1	1								
0.25		1	1								
0.5		1	1								
1		1	1								
2		0.8	0.6								
4		0	0								

96 Hour Marine Reference Toxicant Test Data

Client: _____ Reference Toxicant: _____
 Test Material: _____ Potassium Chloride _____
 Test ID#: 39445 Project #: 17108
 Test Date: 7-11-10 Randomization: 2-6-1

Organism Log #: 5299
 Organism Supplier: Don Reish
 Species: *Neanthes arenaceodentata*
 Control/Diluent: 30 ppt Seawater

Treatment (g KCl/L)	Temp (°C)	pH		D.O. (mg/L)		Salinity (ppt)		# Live Organisms		SIGN-OFF
		new	old	new	old	new	old	A	B	
Control	20.5	7.95		7.7		28.8		5	5	Date: 7-11-10
0.25	20.5	7.99		7.7		29.3		5	5	Test Solution Prep: MM
0.5	20.5	7.97		7.8		29.5		5	5	New WQ: MM
1	20.5	7.94		7.9		29.7		5	5	Initiation Time: PA 7:30
2	20.5	7.87		8.0		30.4		5	5	Initiation Signoff: PA
4	20.5	7.74		8.3		31.5		5	5	Ref Tox Stock Batch # 6
Meter ID:	41A	PH12		R002		EC03				
Control	20.5		7.75		7.6	29.2		5	5	Date: 7/12/10
0.25	20.5		7.74		7.6	29.8		5	5	Count Time: 0900
0.5	20.5		7.75		7.6	29.8		5	5	Count Signoff: AN
1	20.5		7.75		7.5	30.1		5	5	Old WQ: MM
2	20.5		7.75		7.5	30.9		5	5	
4	20.5		7.74		7.5	32.2		()	()	
Meter ID:	41A		PH14		R002	EC05				
Control	20.5		7.92		7.6	29.4		5	5	Date: 7/13/10
0.25	20.5		7.92		7.6	29.7		5	5	Count Time: 1020
0.5	20.5		7.95		7.6	29.9		5	5	Count Signoff: AN
1	20.5		7.91		7.6	30.3		5	5	Old WQ: MM
2	20.5		7.91		7.6	30.9		5	5	
4	-		-		-	-		-	-	
Meter ID:	41A		PH03		R002	EC05				
Control	20.7		8.13		7.5	29.8		5	5	Date: 7/14/10
0.25	20.7		8.31		7.4	30.2		5	5	Count Time: 1110
0.5	20.7		8.35		7.4	30.0		5	5	Count Signoff: JFW
1	20.7		8.36		7.8	30.3		5	5	Old WQ: JFW
2	20.7		8.35		7.3	31.3		5	5	
4	-		-		-	-		-	-	
Meter ID:	41A		PH03		R002	EC05				
Control	20.8		7.89		7.1	29.3		5	5	Date: 7/15/10
0.25	20.8		7.88		7.1	30.3		5	5	Termination Time: 1515
0.5	20.8		7.89		7.2	30.1		5	5	Termination Signoff: JFW
1	20.8		7.87		7.2	30.3		5	5	Old WQ: NVS
2	20.8		7.85		7.3	31.3		4	3	
4	-		-		-	-		-	-	
Meter ID:	41A		PH12		R002	EC05				

Appendix J

Test Data and Summary of Statistics for the Evaluation of the Toxicity of the San Rafael Channel Sediment SET Sediment Elutriates to Bivalve (*Mytilus galloprovincialis*) Embryos

CETIS Summary Report

Report Date: 21 Jul-10 15:42 (p 1 of 2)
Test Code: 01-4962-2794/39435

Bivalve Larval Survival and Development Test							Pacific EcoRisk				
Batch ID:	18-8220-2847	Test Type:	Development-Survival				Analyst:	Jason Walker			
Start Date:	07 Jul-10 15:10	Protocol:	ASTM E724-98 (Bivalve)				Diluent:	Diluted Seawater			
Ending Date:	09 Jul-10 15:50	Species:	Mytilus galloprovincialis				Brine:	Crystal Sea			
Duration:	49h	Source:	Dave Gutoff				Age:	N/A			
Sample ID:	08-4984-0145	Code:	SF-10				Client:	ACOE			
Sample Date:	15 Jun-10 10:05	Material:	Elutriate				Project:	16087			
Receive Date:	15 Jun-10 15:00	Source:	San Rafael Channel								
Sample Age:	22d 5h (0 °C)	Station:	San Pablo								
Comparison Summary											
Analysis ID	Endpoint	NOEL	LOEL	TOEL	PMSD	TU	Method				
09-7603-7859	Development Rate	50	100	70.7	35.3%	2	Wilcoxon/Bonferroni Adj Test				
05-9658-7524	Survival Rate	10	50	22.4	42.0%	10	Wilcoxon/Bonferroni Adj Test				
Point Estimate Summary											
Analysis ID	Endpoint	Level	%	95% LCL	95% UCL	TU	Method				
05-2543-4723	Development Rate	EC5	0.609	N/A	82.1	164	Linear Interpolation (ICPIN)				
		EC10	51	N/A	56	1.96					
		EC15	53.7	N/A	58.4	1.86					
		EC20	56.4	N/A	60.9	1.77					
		EC25	59.1	N/A	63.3	1.69					
		EC40	67.3	54.8	70.7	1.49					
		EC50	72.8	62.4	75.6	1.37					
19-3132-1948	Survival Rate	EC50	50.3	46.6	54.2	1.99	Trimmed Spearman-Kärber				
Development Rate Summary											
Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
0	Lab Water Contr	5	0.975	0.969	0.981	0.952	0.988	0.00294	0.0161	1.65%	0.0%
0	Site Water	5	0.992	0.989	0.996	0.98	1	0.00155	0.00846	0.85%	-1.83%
1		4	0.741	0.558	0.924	0.00625	0.994	0.0895	0.49	66.1%	23.9%
10		4	0.98	0.975	0.985	0.959	0.988	0.0025	0.0137	1.4%	-0.54%
50		4	0.952	0.946	0.958	0.931	0.968	0.00292	0.016	1.68%	2.35%
100		4	0	0	0	0	0	0	0		100.0%
Survival Rate Summary											
Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
0	Lab Water Contr	5	0.907	0.886	0.928	0.863	1	0.0103	0.0564	6.23%	0.0%
0	Site Water	5	0.881	0.864	0.898	0.813	0.918	0.00823	0.0451	5.11%	2.79%
1		4	0.681	0.512	0.851	0.00549	0.989	0.083	0.455	66.7%	24.8%
10		4	0.775	0.737	0.813	0.648	0.868	0.0186	0.102	13.2%	14.5%
50		4	0.603	0.568	0.638	0.522	0.698	0.0172	0.0943	15.6%	33.5%
100		4	0	0	0	0	0	0	0		100.0%

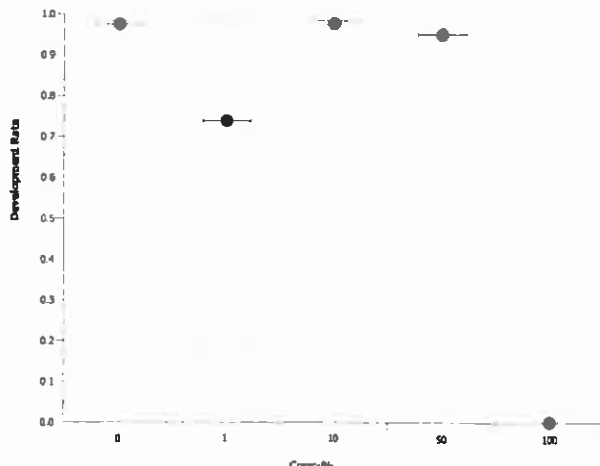
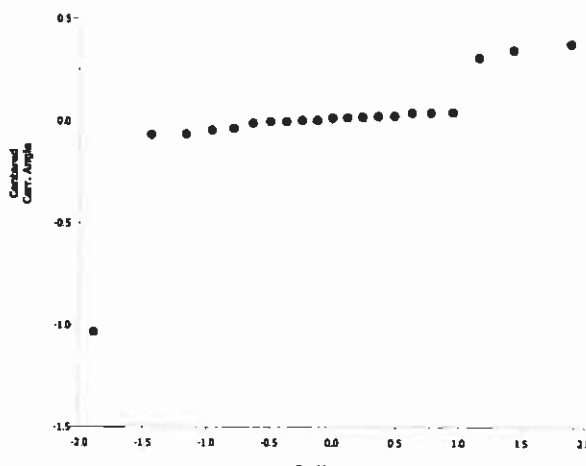
CETIS Summary Report

Report Date: 21 Jul-10 15:42 (p 2 of 2)
 Test Code: 01-4962-2794/39435

Bivalve Larval Survival and Development Test						Pacific EcoRisk
Development Rate Detail						
Conc-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Lab Water Contr	0.988	0.952	0.964	0.982	0.987
0	Site Water	1	0.988	0.994	0.98	1
1		0.978	0.00625	0.988	0.994	
10		0.959	0.987	0.985	0.988	
50		0.931	0.968	0.96	0.948	
100		0	0	0	0	
Survival Rate Detail						
Conc-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Lab Water Contr	0.885	0.868	1	0.918	0.863
0	Site Water	0.907	0.918	0.912	0.813	0.857
1		0.989	0.00549	0.89	0.841	
10		0.648	0.846	0.736	0.868	
50		0.522	0.67	0.522	0.698	
100		0	0	0	0	

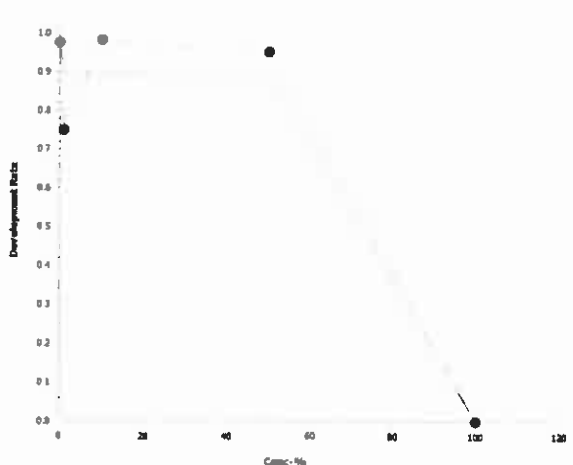
CETIS Analytical Report

Report Date: 21 Jul-10 15:30 (p 2 of 2)
Test Code: 01-4962-2794/39435

Bivalve Larval Survival and Development Test							Pacific EcoRisk				
Analysis ID: 09-7603-7859		Endpoint: Development Rate			CETIS Version: CETISv1.7.0						
Analyzed: 21 Jul-10 15:30		Analysis: Nonparametric-Multiple Comparison			Official Results: Yes						
Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD			
Angular (Corrected)	0	C > T	Not Run	50	100	70.7	2	35.3%			
Wilcoxon/Bonferroni Adj Test											
Control	vs	Conc-%	Test Stat	Critical	Ties	P-Value	Decision(5%)				
Lab Water Control	1		22		0	1.0000	Non-Significant Effect				
	10		21		0	1.0000	Non-Significant Effect				
	50		13		0	0.2222	Non-Significant Effect				
	100*		10		0	0.0317	Significant Effect				
ANOVA Table											
Source	Sum Squares		Mean Square	DF	F Stat	P-Value	Decision(5%)				
Between	5.654326		1.413581	4	15.6	<0.0001	Significant Effect				
Error	1.447489		0.09046805	16							
Total	7.101815		1.50405	20							
ANOVA Assumptions											
Attribute	Test		Test Stat	Critical	P-Value	Decision(1%)					
Variances	Bartlett Equality of Variance		52.5	13.3	<0.0001	Unequal Variances					
Distribution	Shapiro-Wilk Normality		0.601		<0.0001	Non-normal Distribution					
Development Rate Summary											
Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
0	Lab Water Contr	5	0.975	0.968	0.981	0.952	0.988	0.00299	0.0161	1.65%	0.0%
1		4	0.741	0.555	0.928	0.00625	0.994	0.091	0.49	66.1%	23.9%
10		4	0.98	0.975	0.985	0.959	0.988	0.00254	0.0137	1.4%	-0.54%
50		4	0.952	0.946	0.958	0.931	0.968	0.00297	0.016	1.68%	2.35%
100		4	0	0	0	0	0	0	0		100.0%
Angular (Corrected) Transformed Summary											
Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
0	Lab Water Cont	5	1.42	1.4	1.44	1.35	1.46	0.00927	0.0499	3.52%	0.0%
1		4	1.11	0.851	1.38	0.0791	1.49	0.128	0.69	62.0%	21.4%
10		4	1.43	1.42	1.45	1.37	1.46	0.00814	0.0439	3.06%	-1.16%
50		4	1.35	1.34	1.37	1.31	1.39	0.00688	0.0371	2.74%	4.61%
100		4	0.0444	0.0428	0.046	0.0406	0.0486	0.000783	0.00422	9.5%	96.9%
Graphics											
<div><div></div><div></div></div>											

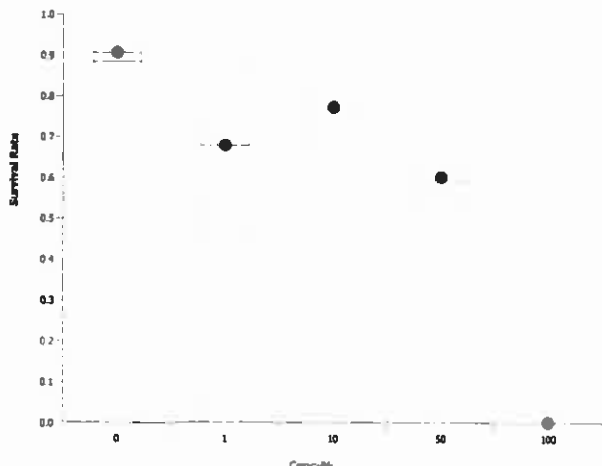
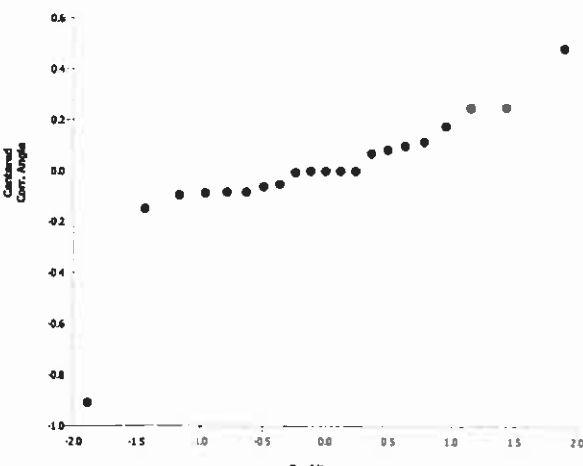
CETIS Analytical Report

Report Date: 21 Jul-10 15:30 (p 1 of 1)
 Test Code: 01-4962-2794/39435

Bivalve Larval Survival and Development Test										Pacific EcoRisk		
Analysis ID: 05-2543-4723		Endpoint: Development Rate				CETIS Version: CETISv1.7.0						
Analyzed: 21 Jul-10 15:30		Analysis: Linear Interpolation (ICPIN)				Official Results: Yes						
Linear Interpolation Options												
X Transform	Y Transform	Seed	Resamples	Exp 95% CL	Method							
Linear	Linear	57951	200	Yes	Two-Point Interpolation							
Point Estimates												
Level	%	95% LCL	95% UCL	TU	95% LCL	95% UCL						
EC5	0.609	N/A	82.1	164	1.22	N/A						
EC10	51	N/A	56	1.96	1.79	N/A						
EC15	53.7	N/A	58.4	1.86	1.71	N/A						
EC20	56.4	N/A	60.9	1.77	1.64	N/A						
EC25	59.1	N/A	63.3	1.69	1.58	N/A						
EC40	67.3	54.8	70.7	1.49	1.42	1.82						
EC50	72.8	62.4	75.6	1.37	1.32	1.6						
Development Rate Summary												
			Calculated Variate(A/B)									
Conc-%	Control Type	Count	Mean	Min	Max	Std Err	Std Dev	CV%	Diff%	A	B	
0	Lab Water Contr	5	0.975	0.952	0.988	0.00294	0.0161	1.65%	0.0%	829	851	
1		4	0.741	0.00625	0.994	0.0895	0.49	66.1%	23.9%	496	662	
10		4	0.98	0.959	0.988	0.0025	0.0137	1.4%	-0.54%	564	575	
50		4	0.952	0.931	0.968	0.00292	0.016	1.68%	2.35%	439	461	
100		4	0	0	0	0	0		100.0%	0	518	
Development Rate Detail												
Conc-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5						
0	Lab Water Control	0.988	0.952	0.964	0.982	0.987						
1		0.978	0.00625	0.988	0.994							
10		0.959	0.987	0.985	0.988							
50		0.931	0.968	0.96	0.948							
100		0	0	0	0							
Graphics												
												

CETIS Analytical Report

Report Date: 21 Jul-10 15:30 (p 1 of 2)
Test Code: 01-4962-2794/39435

Bivalve Larval Survival and Development Test							Pacific EcoRisk				
Analysis ID: 05-9658-7524		Endpoint: Survival Rate			CETIS Version: CETISv1.7.0						
Analyzed: 21 Jul-10 15:30		Analysis: Nonparametric-Multiple Comparison			Official Results: Yes						
Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD			
Angular (Corrected)	0	C > T	Not Run	10	50	22.4	10	42.0%			
Wilcoxon/Bonferroni Adj Test											
Control	vs	Conc-%	Test Stat	Critical	Ties	P-Value	Decision(5%)				
Lab Water Control		1	17		0	1.0000	Non-Significant Effect				
		10	11.5		1	0.0635	Non-Significant Effect				
		50*	10		0	0.0317	Significant Effect				
		100*	10		0	0.0317	Significant Effect				
ANOVA Table											
Source	Sum Squares		Mean Square		DF	F Stat	P-Value	Decision(5%)			
Between	3.873203		0.9683007		4	11.8	0.0001	Significant Effect			
Error	1.307741		0.08173379		16						
Total	5.180943		1.050035		20						
ANOVA Assumptions											
Attribute	Test		Test Stat	Critical	P-Value	Decision(1%)					
Variances	Mod Levene Equality of Variance		1.33	4.89	0.3045	Equal Variances					
Distribution	Shapiro-Wilk Normality		0.771		0.0002	Non-normal Distribution					
Survival Rate Summary											
Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
0	Lab Water Contr	5	0.907	0.885	0.928	0.863	1	0.0105	0.0564	6.23%	0.0%
1		4	0.681	0.508	0.854	0.00549	0.989	0.0844	0.455	66.7%	24.8%
10		4	0.775	0.736	0.814	0.648	0.868	0.019	0.102	13.2%	14.5%
50		4	0.603	0.567	0.639	0.522	0.698	0.0175	0.0943	15.6%	33.5%
100		4	0	0	0	0	0	0	0		100.0%
Angular (Corrected) Transformed Summary											
Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
0	Lab Water Cont	5	1.29	1.23	1.34	1.19	1.53	0.0265	0.143	11.1%	0.0%
1		4	0.983	0.747	1.22	0.0742	1.47	0.115	0.62	63.0%	23.5%
10		4	1.08	1.04	1.13	0.936	1.2	0.0227	0.122	11.3%	15.7%
50		4	0.891	0.854	0.928	0.807	0.989	0.018	0.0969	10.9%	30.7%
100		4	0.0371	0.0371	0.0371	0.0371	0.0371	0	0	0.0%	97.1%
Graphics											
											

CETIS Analytical Report

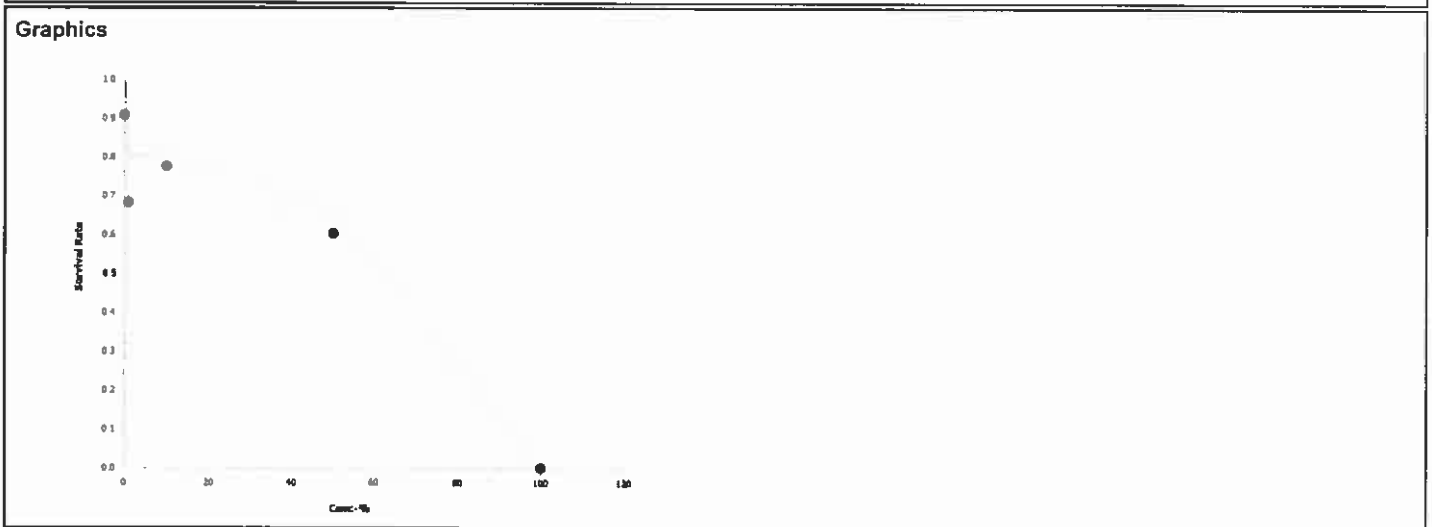
Report Date: 21 Jul-10 15:31 (p 1 of 1)
 Test Code: 01-4962-2794/39435

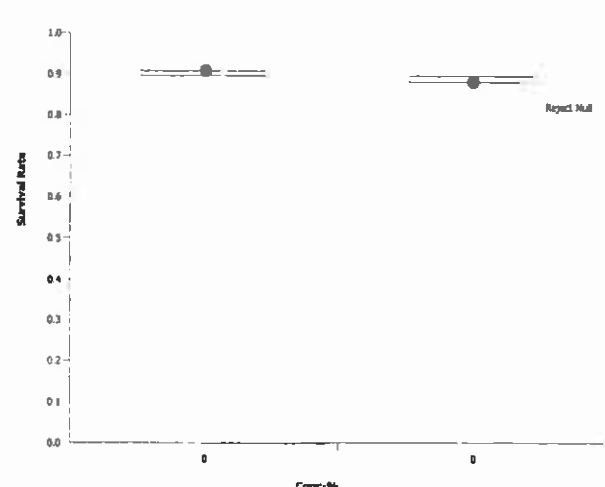
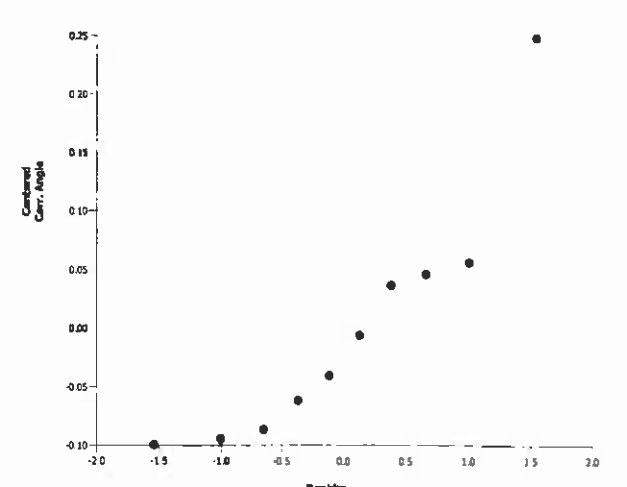
Bivalve Larval Survival and Development Test				Pacific EcoRisk			
Analysis ID:	19-3132-1948	Endpoint:	Survival Rate	CETIS Version:	CETISv1.7.0		
Analyzed:	21 Jul-10 15:30	Analysis:	Trimmed Spearman-Kärber	Official Results:	Yes		

Trimmed Spearman-Kärber Estimates							
Threshold Option	Threshold	Trim	Mu	Sigma	EC50	95% LCL	95% UCL
Control Threshold	0.0934	19.70%	1.7	0.0164	50.3	46.6	54.2

Survival Rate Summary			Calculated Variate(A/B)								
Conc-%	Control Type	Count	Mean	Min	Max	Std Err	Std Dev	CV%	Diff%	A	B
0	Lab Water Contr	5	0.907	0.863	1	0.0103	0.0564	6.23%	0.0%	825	910
1		4	0.681	0.00549	0.989	0.083	0.455	66.7%	24.8%	496	728
10		4	0.775	0.648	0.868	0.0186	0.102	13.2%	14.5%	564	728
50		4	0.603	0.522	0.698	0.0172	0.0943	15.6%	33.5%	439	728
100		4	0	0	0	0	0		100.0%	0	728

Survival Rate Detail						
Conc-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Lab Water Control	0.885	0.868	1	0.918	0.863
1		0.989	0.00549	0.89	0.841	
10		0.648	0.846	0.736	0.868	
50		0.522	0.67	0.522	0.698	
100		0	0	0	0	

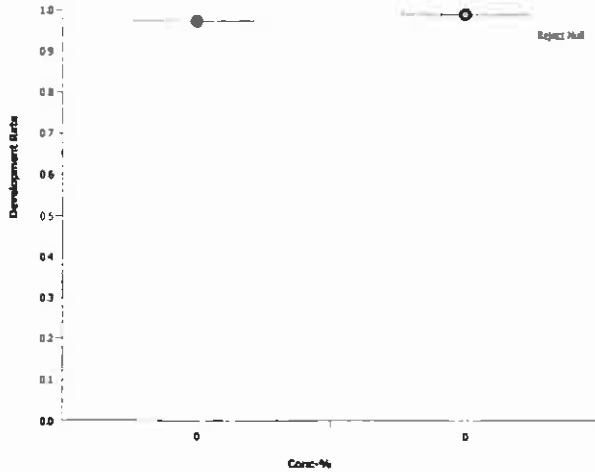
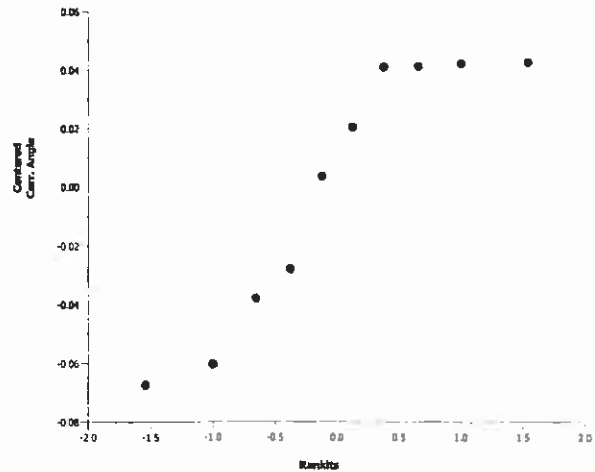


Bivalve Larval Survival and Development Test							Pacific EcoRisk				
Analysis ID: 17-3724-4183		Endpoint: Survival Rate		CETIS Version: CETISv1.7.0							
Analyzed: 20 Jul-10 15:59		Analysis: Parametric-Two Sample		Official Results: Yes							
Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD			
Angular (Corrected)	0	C > T	Not Run	0	>0			7.77%			
Equal Variance t Two-Sample Test											
Control	vs	Control	Test Stat	Critical	MSD	P-Value	Decision(5%)				
Lab Water Control		Site Water	0.88	1.86	0.131	0.2022	Non-Significant Effect				
ANOVA Table											
Source	Sum Squares		Mean Square		DF	F Stat	P-Value	Decision(5%)			
Between	0.009684817		0.009684817		1	0.775	0.4043	Non-Significant Effect			
Error	0.09996058		0.01249507		8						
Total	0.1096454		0.02217989		9						
ANOVA Assumptions											
Attribute	Test		Test Stat	Critical	P-Value	Decision(1%)					
Variances	Variance Ratio F		4.49	23.2	0.1746	Equal Variances					
Distribution	Shapiro-Wilk Normality		0.847		0.0532	Normal Distribution					
Survival Rate Summary											
Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
0	Site Water	5	0.881	0.864	0.898	0.813	0.918	0.00837	0.0451	5.11%	0.0%
0	Lab Water Contr	5	0.907	0.885	0.928	0.863	1	0.0105	0.0564	6.23%	-2.87%
Angular (Corrected) Transformed Summary											
Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
0	Site Water	5	1.22	1.2	1.25	1.12	1.28	0.0125	0.0674	5.51%	0.0%
0	Lab Water Cont	5	1.29	1.23	1.34	1.19	1.53	0.0265	0.143	11.1%	-5.09%
Graphics											
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CETIS Analytical Report

Report Date: 20 Jul-10 16:01 (p 4 of 4)

Test Code: 18-6831-4622/39436

Bivalve Larval Survival and Development Test										Pacific EcoRisk	
Analysis ID: 06-7674-0949			Endpoint: Development Rate			CETIS Version: CETISv1.7.0					
Analyzed: 20 Jul-10 15:57			Analysis: Parametric-Two Sample			Official Results: Yes					
Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD			
Angular (Corrected)	0	C > T	Not Run	0	>0			1.83%			
Equal Variance t Two-Sample Test											
Control	vs	Control	Test Stat	Critical	MSD	P-Value	Decision(5%)				
Lab Water Control		Site Water	-2.43	1.86	0.0556	0.9793	Non-Significant Effect				
ANOVA Table											
Source	Sum Squares		Mean Square		DF	F Stat	P-Value	Decision(5%)			
Between	0.01315582		0.01315582		1	5.89	0.0413	Significant Effect			
Error	0.01785393		0.002231742		8						
Total	0.03100976		0.01538756		9						
ANOVA Assumptions											
Attribute	Test		Test Stat	Critical	P-Value	Decision(1%)					
Variances	Variance Ratio F		1.26	23.2	0.8272	Equal Variances					
Distribution	Shapiro-Wilk Normality		0.849		0.0569	Normal Distribution					
Development Rate Summary											
Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
0	Site Water	5	0.992	0.989	0.996	0.98	1	0.00157	0.00846	0.85%	0.0%
0	Lab Water Contr	5	0.975	0.968	0.981	0.952	0.988	0.00299	0.0161	1.65%	1.8%
Angular (Corrected) Transformed Summary											
Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
0	Site Water	5	1.49	1.47	1.51	1.43	1.53	0.00825	0.0444	2.98%	0.0%
0	Lab Water Cont	5	1.42	1.4	1.44	1.35	1.46	0.00927	0.0499	3.52%	4.87%
Graphics											
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Mytilus sp. Development Toxicity Test Count Data

Client: ACOE - San Rafael Channel
 Test Material: SF-10
 Test ID #: 39435
 Project #: 16087
 Sample Salinity adjusted with: Crystal Sea Salt S

Test Start Date: 7-7-10
 Test End Date: 7-9-10
 Enumeration Date: 7/20/10
 Investigator: JAN / JM
 Innoculation Count: 182

Concentration	Replicate	Number of Normal Larvae	Number of Abnormal Larvae	Total Number Larvae	Percent Normal Development	Percent Survival
Control	A	141	2	143	99	88
	B	158	8	146	95	87
	C	186	7	193	96	100
	D	167	3	170	98	92
	E	157	2	159	99	86
1.0%	A *	—	—	—	—	—
	B	180	4	184	98	99
	C	1	159	160	1	1
	D	162	2	164	99	89
	E	153	1	154	99	84
10%	A *	—	—	—	—	—
	B	118	5	123	96	65
	C	154	2	156	99	85
	D	134	2	136	99	74
	E	158	2	160	99	87
50%	A *	—	—	—	—	—
	B	Jm 15 95	7	102	93	52
	C	122	4	126	97	67
	D	95	4	99	96	52
	E	127	7	134	95	70
100%	A *	—	—	—	—	—
	B	0	106	106	0	0
	C	0	152	152	0	0
	D	0	111	111	0	0
	E	0	149	149	0	0

* Replicate not preserved. Remove from statistics.

Mytilus sp. Development Toxicity Test Water Chemistry Data

Client: ACOE - San Rafael Channel
 Test Material: SF-10
 Test ID#: 39435 Project #: 16087
 Test Date: 7-7-10 Randomization: _____
 Sample Salinity adjusted with: Crystal Sea Salts

Organism Log#: 5286 Age: N/A
 Organism Supplier: Cutler
 Control/Diluent: 30ppt FSW

Day 0					
Treatment	Temperature (°C)	pH	D.O. (mg/L)	Salinity (ppt)	Signoff
Control	16.4	7.80	8.7	30.7	Test Solution Prep: <u>mm</u>
1.0%	16.4	7.82	8.8	31.0	New WQ: <u>008</u>
10%	16.4	7.82	8.6	30.7	Innoculation Date: <u>7-7-10</u>
50%	16.4	7.81	8.0	29.6	Innoculation Time: <u>1510</u>
100%	16.4	7.80	7.0	28.1	Innoculation Signoff: <u>[Signature]</u>
Meter ID	23	PH14	RD03	EC03	

Day 1					
Treatment	Temperature (°C)	pH	D.O. (mg/L)	Salinity (ppt)	Signoff
Control	16.3				Date: <u>7/8/10</u>
1.0%	16.3				Signoff: <u>[Signature]</u>
10%	16.3				
50%	16.3				
100%	16.3				
Meter ID	23				

Day 2					
Treatment	Temperature (°C)	pH	D.O. (mg/L)	Salinity (ppt)	Signoff
Control	16.2	7.91	9.0	30.3	Termination Signoff: <u>AB</u>
1.0%	16.2	7.96	9.1	30.6	Termination Date: <u>7-9-10</u>
10%	16.2	7.99	9.3	30.8	Termination Time: <u>1550</u>
50%	16.2	8.02	9.4	29.7	Old WQ: <u>NVS</u>
100%	16.2	8.07	9.4	28.4	
Meter ID	23	PH14	RD03	EC05	

CETIS Summary Report

Report Date: 20 Jul-10 16:06 (p 1 of 2)
Test Code: 18-6831-4622/39436

Bivalve Larval Survival and Development Test							Pacific EcoRisk				
Batch ID:	18-8220-2847		Test Type:	Development-Survival			Analyst:	Jason Walker			
Start Date:	07 Jul-10 15:10		Protocol:	ASTM E724-98 (Bivalve)			Diluent:	Diluted Seawater			
Ending Date:	09 Jul-10 15:50		Species:	Mytilus galloprovincialis			Brine:	Crystal Sea			
Duration:	49h		Source:	Dave Gutoff			Age:	N/A			
Sample ID:	14-4973-6714		Code:	SF-11			Client:	ACOE			
Sample Date:	15 Jun-10 09:30		Material:	Elutriate			Project:	16087			
Receive Date:	15 Jun-10 15:00		Source:	San Rafael Channel							
Sample Age:	22d 6h (0 °C)		Station:	Alcatraz							
Comparison Summary											
Analysis ID	Endpoint		NOEL	LOEL	TOEL	PMSD	TU	Method			
06-7674-0949	Development Rate		0	>0		1.83%		Equal Variance t Two-Sample Test			
02-0138-3745			100	>100	N/A	1.82%	1	Dunnett's Multiple Comparison Test			
17-3724-4183	Survival Rate		0	>0		7.77%		Equal Variance t Two-Sample Test			
19-1951-3855			10	50	22.4	13.7%	10	Dunnett's Multiple Comparison Test			
Point Estimate Summary											
Analysis ID	Endpoint		Level	%	95% LCL	95% UCL	TU	Method			
19-5245-0576	Development Rate		EC5	>100	N/A	N/A	<1	Linear Interpolation (ICPIN)			
			EC10	>100	N/A	N/A	<1				
			EC15	>100	N/A	N/A	<1				
			EC20	>100	N/A	N/A	<1				
			EC25	>100	N/A	N/A	<1				
			EC40	>100	N/A	N/A	<1				
			EC50	>100	N/A	N/A	<1				
12-6431-1769	Survival Rate		EC1	3.35	0.0652	10.6	29.8	Linear Regression (MLE)			
			EC5	12.1	1.16	24.7	8.24				
			EC10	24.1	5.28	39.8	4.15				
			EC15	38.3	14.2	56.5	2.61				
			EC20	55.2	29.5	79.3	1.81				
			EC25	75.7	49.5	118	1.32				
			EC40	168	110	532	0.596				
			EC50	270	156	1500	0.37				
Development Rate Summary											
Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
0	Lab Water Contr	5	0.975	0.969	0.981	0.952	0.988	0.00294	0.0161	1.65%	0.0%
0	Site Water	5	0.992	0.989	0.996	0.98	1	0.00155	0.00846	0.85%	-1.83%
1		5	0.994	0.992	0.996	0.985	1	0.000992	0.00543	0.55%	-1.94%
10		5	0.982	0.978	0.985	0.97	0.994	0.00176	0.00965	0.98%	-0.74%
50		5	0.982	0.978	0.986	0.97	0.992	0.00196	0.0107	1.09%	-0.71%
100		5	0.986	0.984	0.987	0.979	0.992	0.000937	0.00513	0.52%	-1.12%
Survival Rate Summary											
Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
0	Lab Water Contr	5	0.907	0.886	0.928	0.863	1	0.0103	0.0564	6.23%	0.0%
0	Site Water	5	0.881	0.864	0.898	0.813	0.918	0.00823	0.0451	5.11%	2.79%
1		5	0.952	0.923	0.98	0.824	1	0.014	0.0768	8.07%	-4.97%
10		5	0.891	0.867	0.915	0.846	1	0.0118	0.0646	7.25%	1.7%
50		5	0.749	0.729	0.77	0.703	0.835	0.0101	0.0556	7.42%	17.3%
100		5	0.657	0.617	0.697	0.516	0.775	0.0194	0.106	16.2%	27.5%

CETIS Summary Report

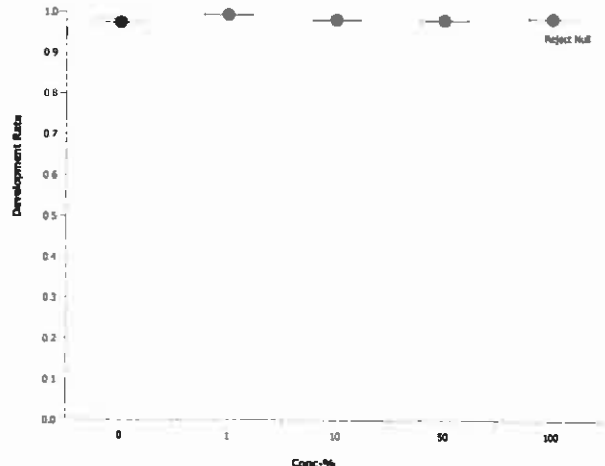
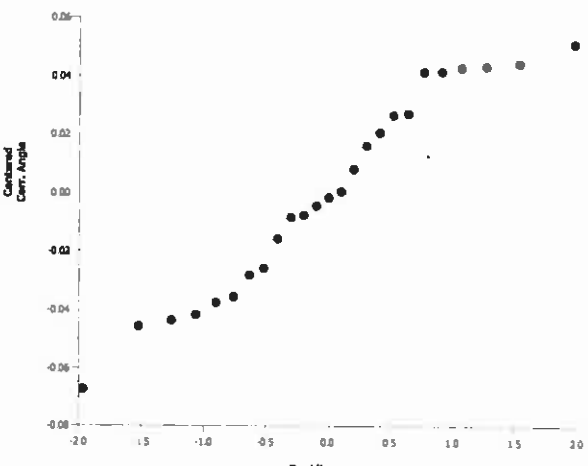
Report Date: 20 Jul-10 16:06 (p 2 of 2)
 Test Code: 18-6831-4622/39436

Bivalve Larval Survival and Development Test						Pacific EcoRisk
Development Rate Detail						
Conc-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Lab Water Contr	0.988	0.952	0.964	0.982	0.987
0	Site Water	1	0.988	0.994	0.98	1
1		0.993	0.985	1	0.994	0.995
10		0.989	0.981	0.97	0.975	0.994
50		0.981	0.97	0.992	0.992	0.972
100		0.989	0.982	0.979	0.992	0.986
Survival Rate Detail						
Conc-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Lab Water Contr	0.885	0.868	1	0.918	0.863
0	Site Water	0.907	0.918	0.912	0.813	0.857
1		0.824	1	1	0.934	1
10		1	0.846	0.901	0.852	0.857
50		0.835	0.703	0.709	0.725	0.775
100		0.516	0.599	0.775	0.648	0.747

CETIS Analytical Report

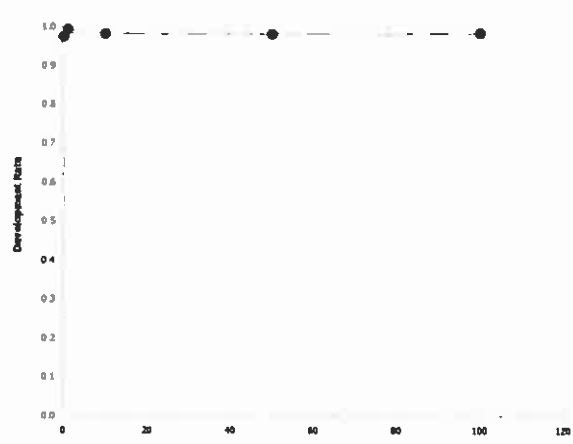
Report Date: 20 Jul-10 16:01 (p 3 of 4)

Test Code: 18-6831-4622/39436

Bivalve Larval Survival and Development Test								Pacific EcoRisk			
Analysis ID: 02-0138-3745		Endpoint: Development Rate				CETIS Version: CETISv1.7.0					
Analyzed: 20 Jul-10 15:58		Analysis: Parametric-Control vs Treatments				Official Results: Yes					
Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD			
Angular (Corrected)	0	C > T	Not Run	100	>100	N/A	1	1.82%			
Dunnett's Multiple Comparison Test											
Control	vs	Conc-%	Test Stat	Critical	MSD	P-Value	Decision(5%)				
Lab Water Control		1	-3.2	2.3	0.0553	1.0000	Non-Significant Effect				
		10	-0.953	2.3	0.0553	0.9729	Non-Significant Effect				
		50	-0.946	2.3	0.0553	0.9724	Non-Significant Effect				
		100	-1.46	2.3	0.0553	0.9931	Non-Significant Effect				
ANOVA Table											
Source	Sum Squares		Mean Square		DF	F Stat	P-Value	Decision(5%)			
Between	0.01608651		0.004021626		4	2.79	0.0544	Non-Significant Effect			
Error	0.02883165		0.001441583		20						
Total	0.04491816		0.005463209		24						
ANOVA Assumptions											
Attribute	Test			Test Stat	Critical	P-Value	Decision(1%)				
Variances	Bartlett Equality of Variance			2.56	13.3	0.6339	Equal Variances				
Distribution	Shapiro-Wilk Normality			0.945		0.1913	Normal Distribution				
Development Rate Summary											
Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
0	Lab Water Contr	5	0.975	0.968	0.981	0.952	0.988	0.00299	0.0161	1.65%	0.0%
1		5	0.994	0.991	0.996	0.985	1	0.00101	0.00543	0.55%	-1.94%
10		5	0.982	0.978	0.985	0.97	0.994	0.00179	0.00965	0.98%	-0.74%
50		5	0.982	0.977	0.986	0.97	0.992	0.00199	0.0107	1.09%	-0.71%
100		5	0.986	0.984	0.987	0.979	0.992	0.000954	0.00514	0.52%	-1.12%
Angular (Corrected) Transformed Summary											
Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
0	Lab Water Cont	5	1.42	1.4	1.44	1.35	1.46	0.00927	0.0499	3.52%	0.0%
1		5	1.49	1.48	1.51	1.45	1.54	0.00581	0.0313	2.09%	-5.43%
10		5	1.44	1.43	1.45	1.4	1.49	0.00715	0.0385	2.67%	-1.61%
50		5	1.44	1.42	1.46	1.4	1.48	0.00783	0.0422	2.93%	-1.6%
100		5	1.45	1.44	1.46	1.43	1.48	0.00407	0.0219	1.51%	-2.47%
Graphics											
											

CETIS Analytical Report

Report Date: 20 Jul-10 16:02 (p 1 of 1)
 Test Code: 18-6831-4622/39436

Bivalve Larval Survival and Development Test										Pacific EcoRisk	
Analysis ID: 19-5245-0576		Endpoint: Development Rate		CETIS Version: CETISv1.7.0							
Analyzed: 20 Jul-10 15:59		Analysis: Linear Interpolation (ICPIN)		Official Results: Yes							
Linear Interpolation Options											
X Transform	Y Transform	Seed	Resamples	Exp 95% CL	Method						
Linear	Linear	57951	200	Yes	Two-Point Interpolation						
Point Estimates											
Level	%	95% LCL	95% UCL	TU	95% LCL	95% UCL					
EC5	>100	N/A	N/A	<1	N/A	N/A					
EC10	>100	N/A	N/A	<1	N/A	N/A					
EC15	>100	N/A	N/A	<1	N/A	N/A					
EC20	>100	N/A	N/A	<1	N/A	N/A					
EC25	>100	N/A	N/A	<1	N/A	N/A					
EC40	>100	N/A	N/A	<1	N/A	N/A					
EC50	>100	N/A	N/A	<1	N/A	N/A					
Development Rate Summary				Calculated Variate(A/B)							
Conc-%	Control Type	Count	Mean	Min	Max	Std Err	Std Dev	CV%	Diff%	A	B
0	Lab Water Contr	5	0.975	0.952	0.988	0.00294	0.0161	1.65%	0.0%	829	851
1		5	0.994	0.985	1	0.000992	0.00543	0.55%	-1.94%	927	933
10		5	0.982	0.97	0.994	0.00176	0.00965	0.98%	-0.74%	811	826
50		5	0.982	0.97	0.992	0.00196	0.0107	1.09%	-0.71%	682	695
100		5	0.986	0.979	0.992	0.000938	0.00514	0.52%	-1.12%	598	607
Development Rate Detail											
Conc-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
0	Lab Water Control	0.988	0.952	0.964	0.982	0.987					
1		0.993	0.985	1	0.994	0.995					
10		0.989	0.981	0.97	0.975	0.994					
50		0.981	0.97	0.992	0.992	0.972					
100		0.989	0.982	0.979	0.992	0.986					
Graphics											
											

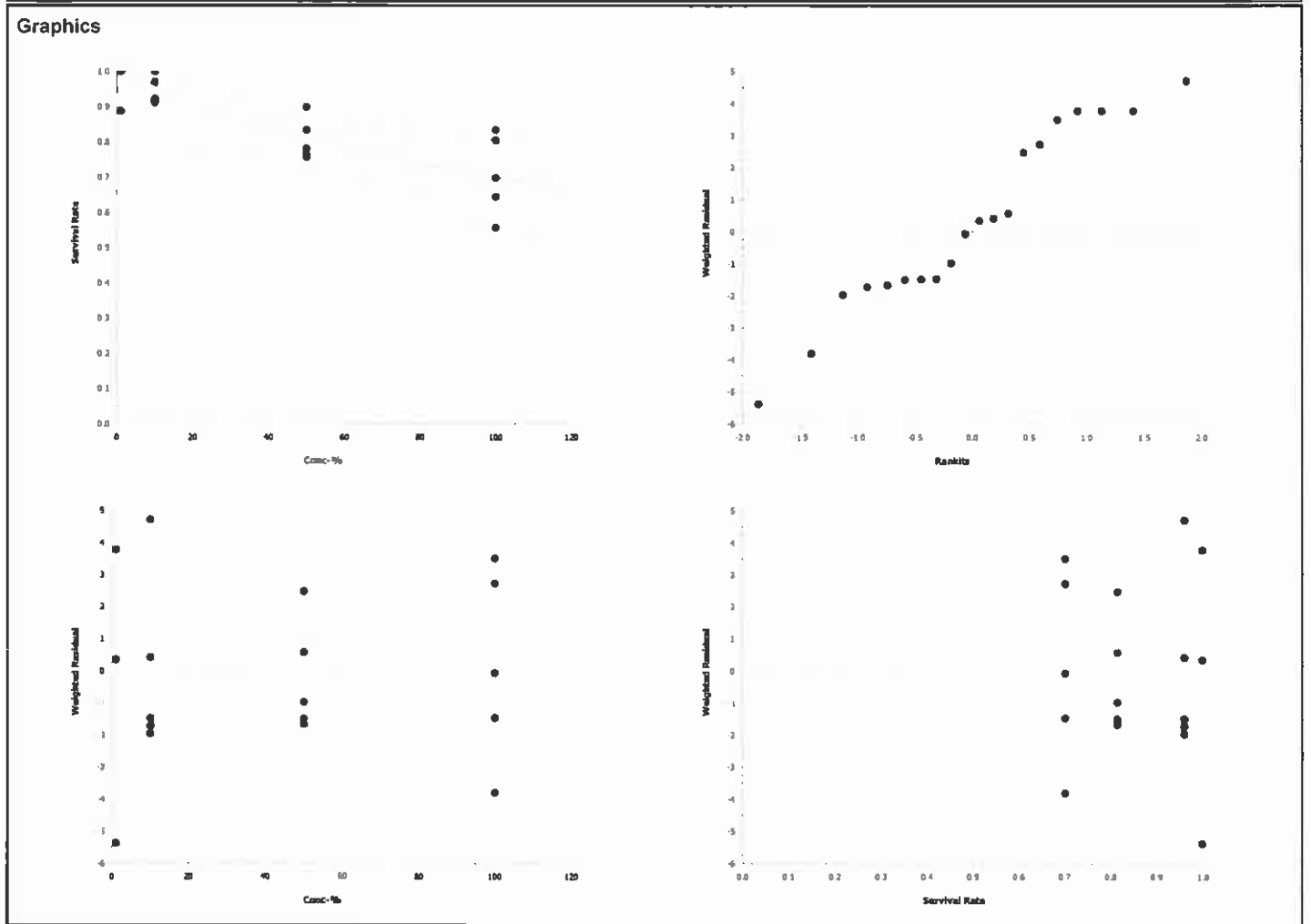
Bivalve Larval Survival and Development Test							Pacific EcoRisk				
Analysis ID: 19-1951-3855		Endpoint: Survival Rate		CETIS Version: CETISv1.7.0							
Analyzed: 20 Jul-10 16:01		Analysis: Parametric-Control vs Treatments		Official Results: Yes							
Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD			
Angular (Corrected)	0	C > T	Not Run	10	50	22.4	10	13.7%			
Dunnett's Multiple Comparison Test											
Control	vs	Conc-%	Test Stat	Critical	MSD	P-Value	Decision(5%)				
Lab Water Control		1	-1.43	2.3	0.2	0.9926	Non-Significant Effect				
		10	0.269	2.3	0.2	0.7017	Non-Significant Effect				
		50*	2.73	2.3	0.2	0.0213	Significant Effect				
		100*	3.88	2.3	0.2	0.0017	Significant Effect				
ANOVA Table											
Source	Sum Squares		Mean Square		DF	F Stat	P-Value	Decision(5%)			
Between	0.7049681		0.176242		4	9.36	0.0002	Significant Effect			
Error	0.3767461		0.0188373		20						
Total	1.081714		0.1950793		24						
ANOVA Assumptions											
Attribute	Test			Test Stat	Critical	P-Value	Decision(1%)				
Variances	Bartlett Equality of Variance			3.51	13.3	0.4759	Equal Variances				
Distribution	Shapiro-Wilk Normality			0.942		0.1663	Normal Distribution				
Survival Rate Summary											
Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
0	Lab Water Contr	5	0.907	0.885	0.928	0.863	1	0.0105	0.0564	6.23%	0.0%
1		5	0.952	0.922	0.981	0.824	1	0.0143	0.0768	8.07%	-4.97%
10		5	0.891	0.867	0.916	0.846	1	0.012	0.0646	7.25%	1.7%
50		5	0.749	0.728	0.771	0.703	0.835	0.0103	0.0556	7.42%	17.3%
100		5	0.657	0.617	0.698	0.516	0.775	0.0197	0.106	16.2%	27.5%
Angular (Corrected) Transformed Summary											
Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
0	Lab Water Cont	5	1.29	1.23	1.34	1.19	1.53	0.0265	0.143	11.1%	0.0%
1		5	1.41	1.34	1.48	1.14	1.53	0.0334	0.18	12.8%	-9.69%
10		5	1.26	1.2	1.32	1.17	1.53	0.0289	0.155	12.3%	1.82%
50		5	1.05	1.02	1.07	0.995	1.15	0.0123	0.0664	6.34%	18.4%
100		5	0.949	0.906	0.992	0.802	1.08	0.021	0.113	11.9%	26.2%
Graphics											

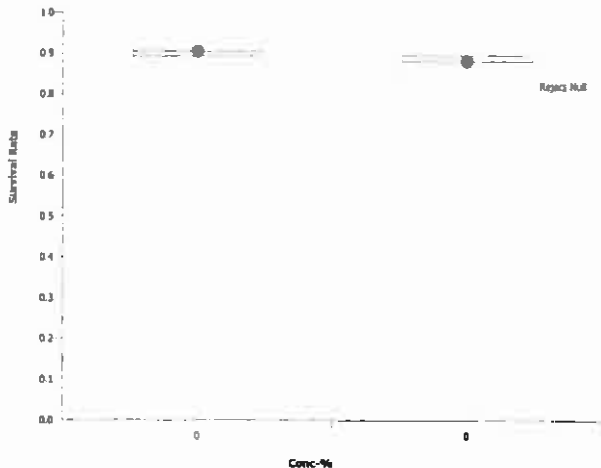
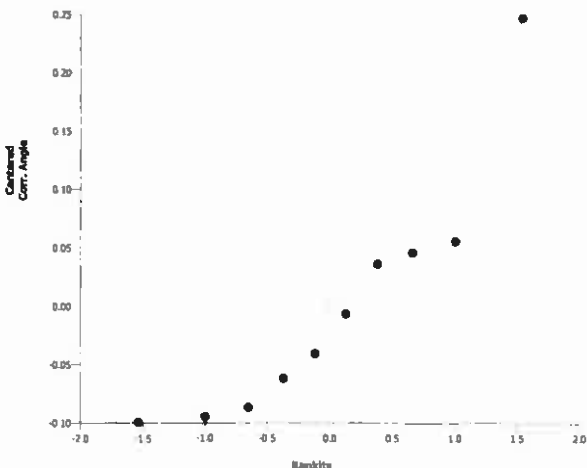
CETIS Analytical Report

Report Date: 20 Jul-10 16:02 (p 1 of 2)
 Test Code: 18-6831-4622/39436

Bivalve Larval Survival and Development Test										Pacific EcoRisk	
Analysis ID: 12-6431-1769		Endpoint: Survival Rate					CETIS Version: CETISv1.7.0				
Analyzed: 20 Jul-10 16:00		Analysis: Linear Regression (MLE)					Official Results: Yes				
Linear Regression Options											
Model Function				Threshold Option		Threshold	Optimized	Pooled	Het Corr	Weighted	
Log-Normal [NED=A+B*log(X)]				Control Threshold		0.093407	Yes	No	Yes	Yes	
Regression Summary											
Iters	LL	QAICc	Mu	Sigma	G Stat	Chi-Sq	Critical	P-Value	Decision(5%)		
17	-1010	409	1.67	0.82	0.311	89.8	28.9	0.0000	Significant Heterogeneity		
Point Estimates											
Level	%	95% LCL	95% UCL	TU	95% LCL	95% UCL					
EC1	3.35	0.0652	10.6	29.8	9.48	1530					
EC5	12.1	1.16	24.7	8.24	4.05	86.1					
EC10	24.1	5.28	39.8	4.15	2.52	18.9					
EC15	38.3	14.2	56.5	2.61	1.77	7.03					
EC20	55.2	29.5	79.3	1.81	1.26	3.39					
EC25	75.7	49.5	118	1.32	0.849	2.02					
EC40	168	110	532	0.596	0.188	0.908					
EC50	270	156	1500	0.37	0.0667	0.64					
Regression Parameters											
Parameter	Estimate	Std Error	95% LCL	95% UCL	t Stat	P-Value	Decision(5%)				
Threshold	0.071	0.014	0.0416	0.1	5.07	<0.0001	Significant Parameter				
Slope	1.22	0.324	0.54	1.9	3.77	0.0014	Significant Parameter				
Intercept	2.03	0.592	0.79	3.28	3.44	0.0029	Significant Parameter				
Residual Analysis											
Attribute	Method				Test Stat	Critical	P-Value	Decision(5%)			
Variances	Bartlett Equality of Variance				2.28	7.81	0.5157	Equal Variances			
	Mod Levene Equality of Variance				0.279	3.49	0.8395	Equal Variances			
Distribution	Shapiro-Wilk Normality				0.939		0.2320	Normal Distribution			
Survival Rate Summary											
Conc-%	Control Type	Count	Calculated Variate(A/B)								
			Mean	Min	Max	Std Err	Std Dev	CV%	Diff%	A	B
0	Lab Water Contr	5	0.907	0.863	1	0.0103	0.0564	6.23%	0.0%	825	910
1		5	0.952	0.824	1	0.014	0.0768	8.07%	-4.97%	866	910
10		5	0.891	0.846	1	0.0118	0.0646	7.25%	1.7%	811	910
50		5	0.749	0.703	0.835	0.0101	0.0556	7.42%	17.3%	682	910
100		5	0.657	0.516	0.775	0.0194	0.106	16.2%	27.5%	598	910
Survival Rate Detail											
Conc-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
0	Lab Water Control	0.885	0.868	1	0.918	0.863					
1		0.824	1	1	0.934	1					
10		1	0.846	0.901	0.852	0.857					
50		0.835	0.703	0.709	0.725	0.775					
100		0.516	0.599	0.775	0.648	0.747					

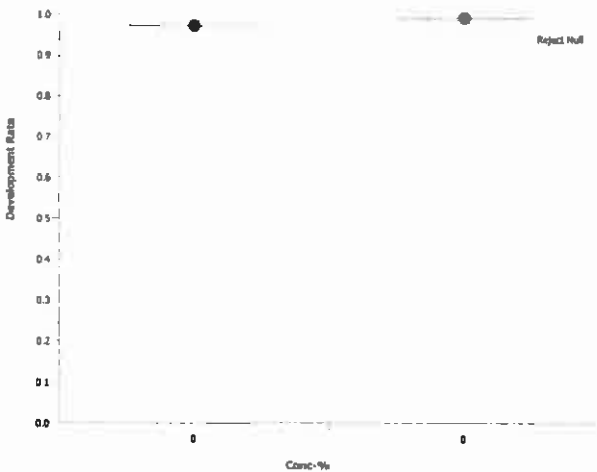
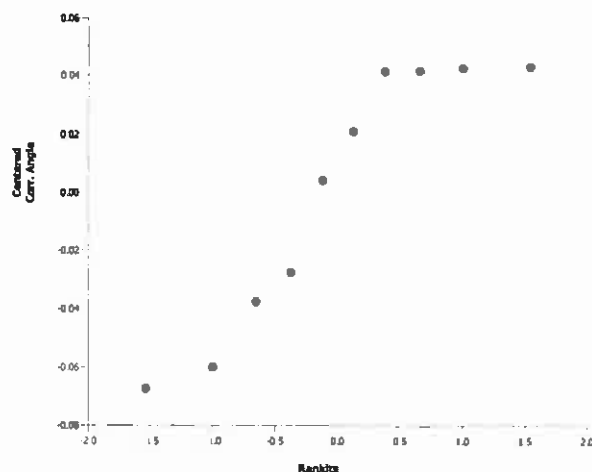
Bivalve Larval Survival and Development Test			Pacific EcoRisk
Analysis ID: 12-6431-1769	Endpoint: Survival Rate	CETIS Version: CETISv1.7.0	
Analyzed: 20 Jul-10 16:00	Analysis: Linear Regression (MLE)	Official Results: Yes	



Bivalve Larval Survival and Development Test							Pacific EcoRisk				
Analysis ID: 17-3724-4183		Endpoint: Survival Rate		CETIS Version: CETISv1.7.0							
Analyzed: 20 Jul-10 15:59		Analysis: Parametric-Two Sample		Official Results: Yes							
Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD			
Angular (Corrected)	0	C > T	Not Run	0	>0			7.77%			
Equal Variance t Two-Sample Test											
Control	vs	Control	Test Stat	Critical	MSD	P-Value	Decision(5%)				
Lab Water Control		Site Water	0.88	1.86	0.131	0.2022	Non-Significant Effect				
ANOVA Table											
Source	Sum Squares		Mean Square		DF	F Stat	P-Value	Decision(5%)			
Between	0.009684817		0.009684817		1	0.775	0.4043	Non-Significant Effect			
Error	0.09996058		0.01249507		8						
Total	0.1096454		0.02217989		9						
ANOVA Assumptions											
Attribute	Test		Test Stat	Critical	P-Value	Decision(1%)					
Variances	Variance Ratio F		4.49	23.2	0.1746	Equal Variances					
Distribution	Shapiro-Wilk Normality		0.847		0.0532	Normal Distribution					
Survival Rate Summary											
Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
0	Site Water	5	0.881	0.864	0.898	0.813	0.918	0.00837	0.0451	5.11%	0.0%
0	Lab Water Contr	5	0.907	0.885	0.928	0.863	1	0.0105	0.0564	6.23%	-2.87%
Angular (Corrected) Transformed Summary											
Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
0	Site Water	5	1.22	1.2	1.25	1.12	1.28	0.0125	0.0674	5.51%	0.0%
0	Lab Water Cont	5	1.29	1.23	1.34	1.19	1.53	0.0265	0.143	11.1%	-5.09%
Graphics											
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CETIS Analytical Report

Report Date: 20 Jul-10 16:01 (p 4 of 4)
Test Code: 18-6831-4622/39436

Bivalve Larval Survival and Development Test							Pacific EcoRisk				
Analysis ID: 06-7674-0949		Endpoint: Development Rate		CETIS Version: CETISv1.7.0							
Analyzed: 20 Jul-10 15:57		Analysis: Parametric-Two Sample		Official Results: Yes							
Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD			
Angular (Corrected)	0	C > T	Not Run	0	>0			1.83%			
Equal Variance t Two-Sample Test											
Control	vs	Control	Test Stat	Critical	MSD	P-Value	Decision(5%)				
Lab Water Control		Site Water	-2.43	1.86	0.0556	0.9793	Non-Significant Effect				
ANOVA Table											
Source	Sum Squares		Mean Square		DF	F Stat	P-Value	Decision(5%)			
Between	0.01315582		0.01315582		1	5.89	0.0413	Significant Effect			
Error	0.01785393		0.002231742		8						
Total	0.03100976		0.01538756		9						
ANOVA Assumptions											
Attribute	Test		Test Stat	Critical	P-Value	Decision(1%)					
Variances	Variance Ratio F		1.26	23.2	0.8272	Equal Variances					
Distribution	Shapiro-Wilk Normality		0.849		0.0569	Normal Distribution					
Development Rate Summary											
Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
0	Site Water	5	0.992	0.989	0.996	0.98	1	0.00157	0.00846	0.85%	0.0%
0	Lab Water Contr	5	0.975	0.968	0.981	0.952	0.988	0.00299	0.0161	1.65%	1.8%
Angular (Corrected) Transformed Summary											
Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
0	Site Water	5	1.49	1.47	1.51	1.43	1.53	0.00825	0.0444	2.98%	0.0%
0	Lab Water Cont	5	1.42	1.4	1.44	1.35	1.46	0.00927	0.0499	3.52%	4.87%
Graphics											
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Mytilus sp. Development Toxicity Test Count Data

Client: **ACOE-San Rafael Channel**
 Test Material: Salt Control/Site Water
 Test ID #: 39435-44
 Project #: 16087
 Sample Salinity adjusted with: Crystal Sea Salts

Test Start Date: 7-7-10
 Test End Date: 7/9/10
 Enumeration Date: 7/20/10
 Investigator: JK
 Inoculation Counts: 182

Concentration	Replicate	Number of Normal Larvae	Number of Abnormal Larvae	Total Number Larvae	Percent Normal Development	Percent Survival
Control	A	141	2	143	99	88
	B	158	8	166	95	87
	C	186	7	193	96	100
	D	147	3	170	98	92
	E	157	2	159	99	86
Salt Control	A	187	1	188	99.5	100
	B	183	4	187	97.9	100
	C	180	3	183	98.4	98.9
	D	189	2	191	99.0	100
	E	—	—	—	—	—
Site Water Control	A	165	0	165	100	90.7
	B	167	2	169	98.8	91.8
	C	166	1	167	99.4	91.2
	D	148	3	151	98	81.3
	E	156	0	156	100	85.7

Mytilus sp. Development Toxicity Test Count Data

Client: ACOE - San Rafael Channel
 Test Material: SF-11
 Test ID #: 39436
 Project #: 16087
 Sample Salinity adjusted with : Crystal Sea Salts

Test Start Date: 7-7-10
 Test End Date: 7-9-10
 Enumeration Date: 7/20/10
 Investigator: JM
 Innoculation Count: 182

Concentration	Replicate	Number of Normal Larvae	Number of Abnormal Larvae	Total Number Larvae	Percent Normal Development	Percent Survival
Control	A	161	2	163	99	88
	B	158	8	166	95	87
	C	186	7	193	96	100
	D	167	3	170	98	92
	E	157	2	159	99	86
1.0%	A	150	1	151	99.3	82.4
	B	197	3	200	98.5	100
	C	200	0	200	100	100
	D	170	1	171	99.4	93.4
	E	210	1	211	99.5	100
10%	A	182	2	184	98.9	100
	B	154	3	157	98.1	84.6
	C	164	4	168	97.0	90.1
	D	155	3	158	97.5	85.2
	E	156	1	157	99.4	85.7
50%	A	152 152	3 3	155	98.1	83.5
	B	128 128	4	132	97	70.3
	C	129	1	130	99.2	70.9
	D	132 132	1 1	133	99.2	72.5
	E	141 141	4 4	145	97.2	77.5
100%	A	94 94	1 1	95	98.9	51.6
	B	109 109	2	111	98.2	59.9
	C	141 141	3 3	144	97.9	77.5
	D	136 136	3 3	139	99.2	64.8
	E	86 186	2	138	98.6	74.7

Mytilus sp. Development Toxicity Test Water Chemistry Data

Client: ACOE - San Rafael Channel
 Test Material: SF-11
 Test ID#: 39436 Project #: 16087
 Test Date: 7-7-10 Randomization:
 Sample Salinity adjusted with: Crystal Sea Salt S

Organism Log#: S286 Age: N/A
 Organism Supplier: Guthrie
 Control/Diluent: 30ppt FSW

Day 0					
Treatment	Temperature (°C)	pH	D.O. (mg/L)	Salinity (ppt)	Signoff
Control	16.4	7.80	8.7	30.7	Test Solution Prep: <u>MM</u>
1.0%	16.4	7.83	8.4	31.1	New WQ: <u>OJB</u>
10%	16.4	7.84	8.6	30.7	Innoculation Date: <u>7-7-10</u>
50%	16.4	7.88	8.6	29.6	Innoculation Time: <u>1510</u>
100%	16.4	7.92	8.5	28.1	Innoculation Signoff: <u>22</u>
Meter ID	23	PH14	RD03	EC03	

Day 1					
Treatment	Temperature (°C)	pH	D.O. (mg/L)	Salinity (ppt)	Signoff
Control	16.3				Date: <u>7/8/10</u>
1.0%	16.3				Signoff: <u>W</u>
10%	16.3				
50%	16.3				
100%	16.3				
Meter ID	23				

Day 2					
Treatment	Temperature (°C)	pH	D.O. (mg/L)	Salinity (ppt)	Signoff
Control	14.2	7.94	8.7	31.0	Termination Signoff: <u>AB</u>
1.0%	14.2	7.96	9.1	31.2	Termination Date: <u>7-9-10</u>
10%	14.2	8.00	8.9	30.8	Termination Time: <u>1550</u>
50%	14.2	8.04	9.0	29.8	Old WQ: <u>NVS</u>
100%	14.2	8.07	8.9	28.3	
Meter ID	23	PH14	RD03	EC05	

Mytilus sp. Development Toxicity Test Water Chemistry Data

Client: ACOE-San Rafael Channel
 Test Material: Salt Control/Site Water
 Test ID#: 39435-44 Project #: 16087
 Test Date: 7-7-10 Randomization: _____
 Sample Salinity adjusted with: Crystal Sea Salts

Organism Log#: S286 Age: N/A
 Organism Supplier: Cutliff
 Control/Diluent: 30 ppt FSW

Day 0					
Treatment	Temperature (°C)	pH	D.O. (mg/L)	Salinity (ppt)	Signoff
Control	16.4	7.80	8.7	30.7	Date & Inoculation Time: 7-7-10 1510
Crystal Sea Salt Control (24 ppt FSW +)	16.4	8.13	8.3	29.0	Test Solution Prep: mm
Site Water Control	16.4	8.01	8.2	28.0	Inoculation Signoff: Zu
Meter ID	23	ph14	RD03	EC03	New WQ: 00B

Day 1					
Treatment	Temperature (°C)	pH	D.O. (mg/L)	Salinity (ppt)	Signoff
Control	16.3				Date: 7/8/10
Crystal Sea Salt Control	16.3				Old WQ: Zu
Site Water Control	16.3				
Meter ID	23				

Day 2					
Treatment	Temperature (°C)	pH	D.O. (mg/L)	Salinity (ppt)	Signoff
Control	16.2	7.91	9.0	30.3	Date: 7/9/10
Crystal Sea Salt Control	16.2	8.05	7.3	29.0	Termination: AB 1550
Site Water Control	16.2	8.12	7.3	28.3	Old WQ: NVS
Meter ID	23	PH12	RD02	EC03	

CETIS Summary Report

Report Date: 20 Jul-10 16:16 (p 1 of 2)
Test Code: 07-7822-1795/39437

Bivalve Larval Survival and Development Test							Pacific EcoRisk				
Batch ID:	18-8220-2847	Test Type:	Development-Survival				Analyst:	Jason Walker			
Start Date:	07 Jul-10 15:10	Protocol:	ASTM E724-98 (Bivalve)				Diluent:	Diluted Seawater			
Ending Date:	09 Jul-10 15:50	Species:	Mytilus galloprovincialis				Brine:	Crystal Sea			
Duration:	49h	Source:	Dave Gutoff				Age:	N/A			
Sample ID:	17-0782-1094	Code:	SRC-2010-01				Client:	ACOE			
Sample Date:	08 Jun-10 09:20	Material:	Elutriate				Project:	16087			
Receive Date:	08 Jun-10 19:00	Source:	San Rafael Channel								
Sample Age:	29d 6h (2.4 °C)	Station:	SRC-2010-01								
Comparison Summary											
Analysis ID	Endpoint	NOEL	LOEL	TOEL	PMSD	TU	Method				
07-4547-5965	Development Rate	25	50	35.4	2.27%	4	Steel Many-One Rank Test				
18-8621-9088	Survival Rate	25	50	35.4	12.2%	4	Dunnett's Multiple Comparison Test				
Point Estimate Summary											
Analysis ID	Endpoint	Level	%	95% LCL	95% UCL	TU	Method				
19-4802-1863	Development Rate	EC5	27.4	27	27.6	3.66	Linear Interpolation (ICPIN)				
		EC10	29.7	29	30.3	3.36					
		EC15	32.1	30.9	32.9	3.12					
		EC20	34.4	32.9	35.5	2.9					
		EC25	36.8	34.9	38.1	2.72					
		EC40	43.9	40.8	46	2.28					
		EC50	48.6	44.8	51.8	2.06					
03-6779-1230	Survival Rate	EC50	48.8	47.7	50	2.05	Trimmed Spearman-Kärber				
Development Rate Summary											
Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
0	Lab Water Contr	5	0.975	0.969	0.981	0.952	0.988	0.00294	0.0161	1.65%	0.0%
0	Site Water	5	0.992	0.989	0.996	0.98	1	0.00155	0.00846	0.85%	-1.83%
1		5	0.983	0.981	0.986	0.973	0.988	0.00123	0.00672	0.68%	-0.87%
10		5	0.988	0.984	0.992	0.968	0.995	0.00209	0.0114	1.16%	-1.39%
25		5	0.99	0.988	0.993	0.983	1	0.0012	0.00659	0.67%	-1.63%
50		5	0.456	0.429	0.482	0.333	0.514	0.0129	0.0706	15.5%	53.2%
100		5	0	0	0	0	0	0	0		100.0%
Survival Rate Summary											
Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
0	Lab Water Contr	5	0.907	0.886	0.928	0.863	1	0.0103	0.0564	6.23%	0.0%
0	Site Water	5	0.881	0.864	0.898	0.813	0.918	0.00823	0.0451	5.11%	2.79%
1		5	0.845	0.823	0.867	0.769	0.896	0.0106	0.0581	6.87%	6.79%
10		5	0.932	0.899	0.965	0.83	1	0.0162	0.0885	9.49%	-2.79%
25		5	0.905	0.892	0.919	0.863	0.962	0.00674	0.0369	4.08%	0.12%
50		5	0.429	0.379	0.479	0.242	0.577	0.0244	0.134	31.2%	52.7%
100		5	0	0	0	0	0	0	0		100.0%

CETIS Summary Report

Report Date:

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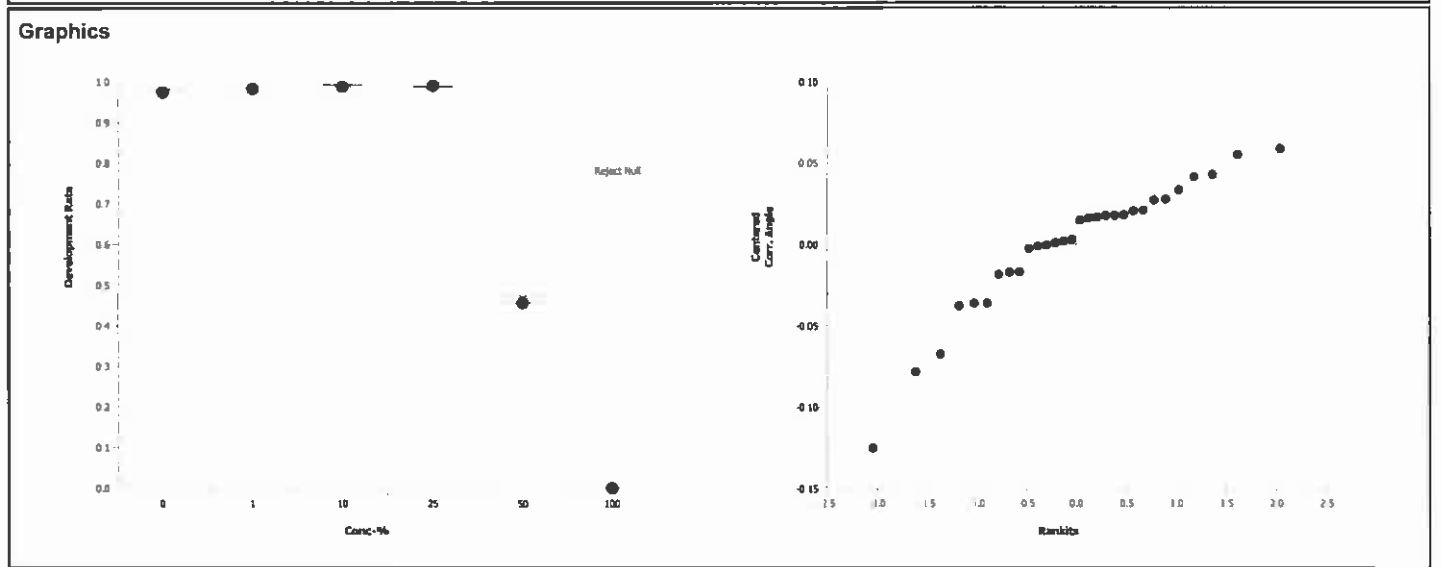
Test Code:

07-7822-1795/39437

Bivalve Larval Survival and Development Test						Pacific EcoRisk
Development Rate Detail						
Conc-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Lab Water Contr	0.988	0.952	0.964	0.982	0.987
0	Site Water	1	0.988	0.994	0.98	1
1		0.988	0.988	0.973	0.979	0.988
10		0.994	0.995	0.99	0.994	0.968
25		1	0.983	0.988	0.994	0.987
50		0.514	0.489	0.473	0.47	0.333
100		0	0	0	0	0
Survival Rate Detail						
Conc-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Lab Water Contr	0.885	0.868	1	0.918	0.863
0	Site Water	0.907	0.918	0.912	0.813	0.857
1		0.896	0.874	0.797	0.769	0.89
10		0.841	1	1	0.989	0.83
25		0.912	0.962	0.885	0.907	0.863
50		0.505	0.473	0.577	0.346	0.242
100		0	0	0	0	0

Bivalve Larval Survival and Development Test							Pacific EcoRisk				
Analysis ID: 07-4547-5965		Endpoint: Development Rate			CETIS Version: CETISv1.7.0						
Analyzed: 20 Jul-10 16:15		Analysis: Nonparametric-Control vs Treatments			Official Results: Yes						
Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD			
Angular (Corrected)	0	C > T	Not Run	25	50	35.4	4	2.27%			
Steel Many-One Rank Test											
Control	vs	Conc-%	Test Stat	Critical	Ties	P-Value	Decision(5%)				
Lab Water Control	1		33	16	0	0.9907	Non-Significant Effect				
	10		37	16	0	0.9996	Non-Significant Effect				
	25		36	16	2	0.9991	Non-Significant Effect				
	50*		15	16	0	0.0191	Significant Effect				
	100*		15	16	0	0.0191	Significant Effect				
ANOVA Table											
Source	Sum Squares		Mean Square		DF	F Stat	P-Value	Decision(5%)			
Between	8.741861		1.748372		5	900	<0.0001	Significant Effect			
Error	0.04660997		0.001942082		24						
Total	8.788471		1.750314		29						
ANOVA Assumptions											
Attribute	Test		Test Stat	Critical	P-Value	Decision(1%)					
Variances	Bartlett Equality of Variance		23	15.1	0.0003	Unequal Variances					
Distribution	Shapiro-Wilk Normality		0.905		0.0114	Normal Distribution					
Development Rate Summary											
Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
0	Lab Water Contr	5	0.975	0.968	0.981	0.952	0.988	0.00299	0.0161	1.65%	0.0%
1		5	0.983	0.981	0.986	0.973	0.988	0.00125	0.00672	0.68%	-0.87%
10		5	0.988	0.984	0.992	0.968	0.995	0.00212	0.0114	1.16%	-1.39%
25		5	0.99	0.988	0.993	0.983	1	0.00122	0.00659	0.67%	-1.63%
50		5	0.456	0.429	0.483	0.333	0.514	0.0131	0.0706	15.5%	53.2%
100		5	0	0	0	0	0	0	0		100.0%
Angular (Corrected) Transformed Summary											
Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
0	Lab Water Cont	5	1.42	1.4	1.44	1.35	1.46	0.00927	0.0499	3.52%	0.0%
1		5	1.44	1.43	1.45	1.41	1.46	0.00466	0.0251	1.74%	-1.79%
10		5	1.47	1.45	1.49	1.39	1.5	0.00836	0.045	3.06%	-3.68%
25		5	1.48	1.46	1.49	1.44	1.53	0.00673	0.0362	2.45%	-4.23%
50		5	0.741	0.713	0.768	0.615	0.799	0.0134	0.072	9.73%	47.7%
100		5	0.0401	0.0393	0.0409	0.0375	0.043	0.000392	0.00211	5.27%	97.2%

Bivalve Larval Survival and Development Test			Pacific EcoRisk
Analysis ID: 07-4547-5965	Endpoint: Development Rate	CETIS Version: CETISv1.7.0	
Analyzed: 20 Jul-10 16:15	Analysis: Nonparametric-Control vs Treatments	Official Results: Yes	



CETIS Analytical Report

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Test Code: 07-7822-1795/39437

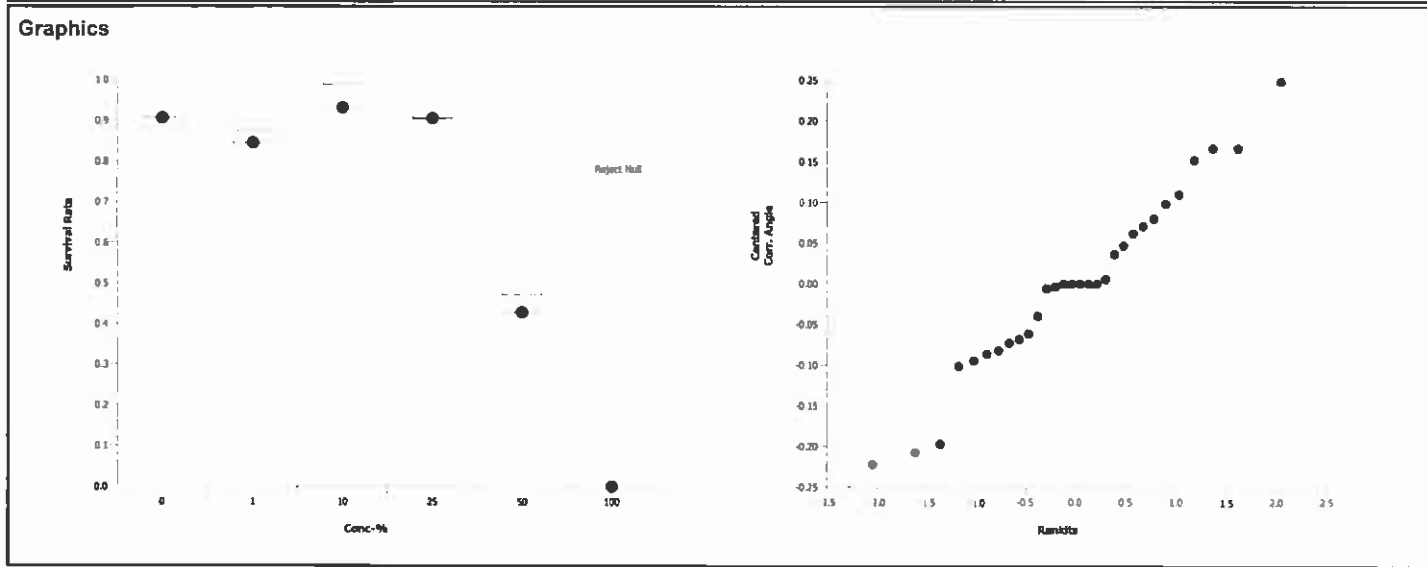
Bivalve Larval Survival and Development Test										Pacific EcoRisk		
Analysis ID: 19-4802-1863		Endpoint: Development Rate		CETIS Version: CETISv1.7.0								
Analyzed: 20 Jul-10 16:15		Analysis: Linear Interpolation (ICPIN)		Official Results: Yes								
Linear Interpolation Options												
X Transform	Y Transform	Seed	Resamples	Exp 95% CL	Method							
Linear	Linear	57951	200	Yes	Two-Point Interpolation							
Point Estimates												
Level	%	95% LCL	95% UCL	TU	95% LCL	95% UCL						
EC5	27.4	27	27.6	3.66	3.62	3.71						
EC10	29.7	29	30.3	3.36	3.31	3.45						
EC15	32.1	30.9	32.9	3.12	3.04	3.23						
EC20	34.4	32.9	35.5	2.9	2.82	3.04						
EC25	36.8	34.9	38.1	2.72	2.62	2.87						
EC40	43.9	40.8	46	2.28	2.17	2.45						
EC50	48.6	44.8	51.8	2.06	1.93	2.23						
Development Rate Summary												
			Calculated Variate(A/B)									
Conc-%	Control Type	Count	Mean	Min	Max	Std Err	Std Dev	CV%	Diff%	A	B	
0	Lab Water Contr	5	0.975	0.952	0.988	0.00294	0.0161	1.65%	0.0%	829	851	
1		5	0.983	0.973	0.988	0.00123	0.00672	0.68%	-0.87%	769	782	
10		5	0.988	0.968	0.995	0.00209	0.0114	1.16%	-1.39%	867	877	
25		5	0.99	0.983	1	0.0012	0.00659	0.67%	-1.63%	824	832	
50		5	0.456	0.333	0.514	0.0129	0.0706	15.5%	53.2%	390	843	
100		5	0	0	0	0	0		100.0%	0	784	
Development Rate Detail												
Conc-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5						
0	Lab Water Control	0.988	0.952	0.964	0.982	0.987						
1		0.988	0.988	0.973	0.979	0.988						
10		0.994	0.995	0.99	0.994	0.968						
25		1	0.983	0.988	0.994	0.987						
50		0.514	0.489	0.473	0.47	0.333						
100		0	0	0	0	0						
Graphics												

CETIS Analytical Report

Report Date: 20 Jul-10 16:15 (p 1 of 4)
Test Code: 07-7822-1795/39437

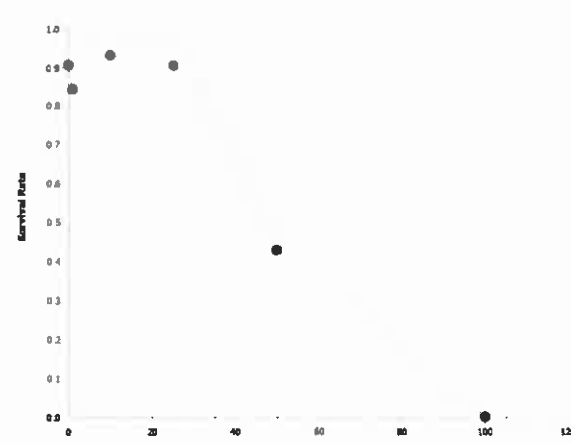
Bivalve Larval Survival and Development Test							Pacific EcoRisk				
Analysis ID: 18-8621-9088		Endpoint: Survival Rate			CETIS Version: CETISv1.7.0						
Analyzed: 20 Jul-10 16:15		Analysis: Parametric-Control vs Treatments			Official Results: Yes						
Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD			
Angular (Corrected)	0	C > T	Not Run	25	50	35.4	4	12.2%			
Dunnett's Multiple Comparison Test											
Control	vs	Conc-%	Test Stat	Critical	MSD	P-Value	Decision(5%)				
Lab Water Control	1		1.48	2.36	0.183	0.2307	Non-Significant Effect				
	10		-1.06	2.36	0.183	0.9859	Non-Significant Effect				
	25		0.282	2.36	0.183	0.7370	Non-Significant Effect				
	50*		7.42	2.36	0.183	<0.0001	Significant Effect				
	100*		16.1	2.36	0.183	<0.0001	Significant Effect				
ANOVA Table											
Source	Sum Squares		Mean Square		DF	F Stat	P-Value	Decision(5%)			
Between	6.609546		1.321909		5	88.1	<0.0001	Significant Effect			
Error	0.3600617		0.01500257		24						
Total	6.969607		1.336912		29						
ANOVA Assumptions											
Attribute	Test			Test Stat	Critical	P-Value	Decision(1%)				
Variances	Mod Levene Equality of Variance			1.98	4.25	0.1313	Equal Variances				
Distribution	Shapiro-Wilk Normality			0.975		0.6946	Normal Distribution				
Survival Rate Summary											
Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
0	Lab Water Contr	5	0.907	0.885	0.928	0.863	1	0.0105	0.0564	6.23%	0.0%
1		5	0.845	0.823	0.867	0.769	0.896	0.0108	0.0581	6.87%	6.79%
10		5	0.932	0.898	0.966	0.83	1	0.0164	0.0885	9.49%	-2.79%
25		5	0.905	0.891	0.92	0.863	0.962	0.00686	0.0369	4.08%	0.12%
50		5	0.429	0.378	0.479	0.242	0.577	0.0248	0.134	31.2%	52.7%
100		5	0	0	0	0	0	0	0		100.0%
Angular (Corrected) Transformed Summary											
Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
0	Lab Water Cont	5	1.29	1.23	1.34	1.19	1.53	0.0265	0.143	11.1%	0.0%
1		5	1.17	1.14	1.2	1.07	1.24	0.0147	0.0791	6.76%	8.91%
10		5	1.37	1.29	1.44	1.15	1.53	0.0368	0.198	14.5%	-6.39%
25		5	1.26	1.24	1.29	1.19	1.37	0.0128	0.0688	5.44%	1.7%
50		5	0.711	0.658	0.764	0.514	0.863	0.0258	0.139	19.5%	44.7%
100		5	0.0371	0.0371	0.0371	0.0371	0.0371	0	0	0.0%	97.1%

Bivalve Larval Survival and Development Test			Pacific EcoRisk
Analysis ID: 18-8621-9088	Endpoint: Survival Rate	CETIS Version: CETISv1.7.0	
Analyzed: 20 Jul-10 16:15	Analysis: Parametric-Control vs Treatments	Official Results: Yes	



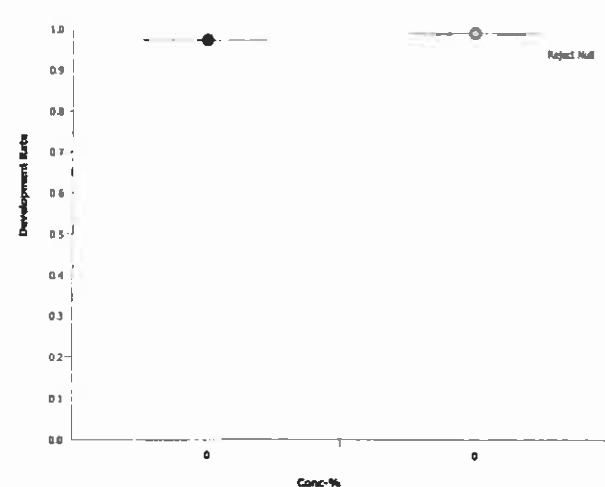
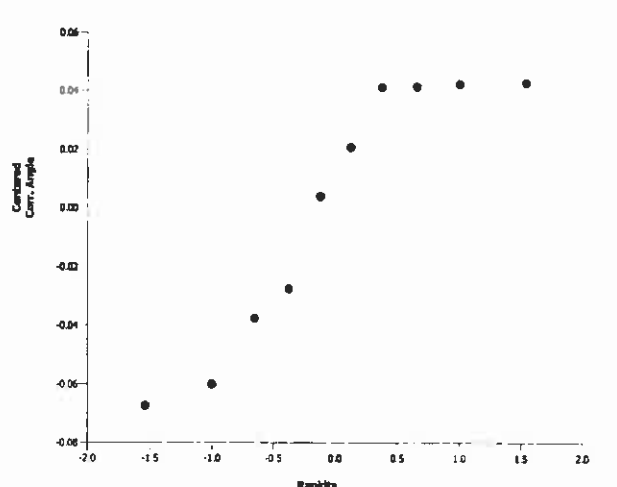
CETIS Analytical Report

Report Date: 20 Jul-10 16:16 (p 1 of 1)
Test Code: 07-7822-1795/39437

Bivalve Larval Survival and Development Test										Pacific EcoRisk	
Analysis ID: 03-6779-1230		Endpoint: Survival Rate				CETIS Version: CETISv1.7.0					
Analyzed: 20 Jul-10 16:15		Analysis: Trimmed Spearman-Kärber				Official Results: Yes					
Trimmed Spearman-Kärber Estimates											
Threshold Option		Threshold	Trim	Mu	Sigma	EC50	95% LCL	95% UCL			
Control Threshold		0.0934	1.37%	1.69	0.00516	48.8	47.7	50			
Survival Rate Summary			Calculated Variate(A/B)								
Conc-%	Control Type	Count	Mean	Min	Max	Std Err	Std Dev	CV%	Diff%	A	B
0	Lab Water Contr	5	0.907	0.863	1	0.0103	0.0564	6.23%	0.0%	825	910
1		5	0.845	0.769	0.896	0.0106	0.0581	6.87%	6.79%	769	910
10		5	0.932	0.83	1	0.0162	0.0885	9.49%	-2.79%	848	910
25		5	0.905	0.863	0.962	0.00674	0.0369	4.08%	0.12%	824	910
50		5	0.429	0.242	0.577	0.0244	0.134	31.2%	52.7%	390	910
100		5	0	0	0	0	0		100.0%	0	910
Survival Rate Detail											
Conc-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
0	Lab Water Control	0.885	0.868	1	0.918	0.863					
1		0.896	0.874	0.797	0.769	0.89					
10		0.841	1	1	0.989	0.83					
25		0.912	0.962	0.885	0.907	0.863					
50		0.505	0.473	0.577	0.346	0.242					
100		0	0	0	0	0					
Graphics											
											

CETIS Analytical Report

Report Date: 20 Jul-10 16:01 (p 4 of 4)
Test Code: 18-6831-4622/39436

Bivalve Larval Survival and Development Test							Pacific EcoRisk				
Analysis ID: 06-7674-0949		Endpoint: Development Rate		CETIS Version: CETISv1.7.0							
Analyzed: 20 Jul-10 15:57		Analysis: Parametric-Two Sample		Official Results: Yes							
Data Transform	Zeta	All Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD			
Angular (Corrected)	0	C > T	Not Run	0	>0			1.83%			
Equal Variance t Two-Sample Test											
Control	vs	Control	Test Stat	Critical	MSD	P-Value	Decision(5%)				
Lab Water Control		Site Water	-2.43	1.86	0.0556	0.9793	Non-Significant Effect				
ANOVA Table											
Source	Sum Squares		Mean Square		DF	F Stat	P-Value	Decision(5%)			
Between	0.01315582		0.01315582		1	5.89	0.0413	Significant Effect			
Error	0.01785393		0.002231742		8						
Total	0.03100976		0.01538756		9						
ANOVA Assumptions											
Attribute	Test		Test Stat	Critical	P-Value	Decision(1%)					
Variances	Variance Ratio F		1.26	23.2	0.8272	Equal Variances					
Distribution	Shapiro-Wilk Normality		0.849		0.0569	Normal Distribution					
Development Rate Summary											
Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
0	Site Water	5	0.992	0.989	0.996	0.98	1	0.00157	0.00846	0.85%	0.0%
0	Lab Water Contr	5	0.975	0.968	0.981	0.952	0.988	0.00299	0.0161	1.65%	1.8%
Angular (Corrected) Transformed Summary											
Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
0	Site Water	5	1.49	1.47	1.51	1.43	1.53	0.00825	0.0444	2.98%	0.0%
0	Lab Water Cont	5	1.42	1.4	1.44	1.35	1.46	0.00927	0.0499	3.52%	4.87%
Graphics											
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Report Date: 20 Jul-10 16:01 (p 2 of 4)
Test Code: 18-6831-4622/39436

000-034-163-2

Mytilus sp. Development Toxicity Test Count Data

Client: ACOE - San Rafael Channel
 Test Material: SRC-2010-01
 Test ID #: 39437
 Project #: 16087
 Sample Salinity adjusted with: Crystal Sea Salts

Test Start Date: 2-2-10
 Test End Date: 7-9-10
 Enumeration Date: 7/20/10
 Investigator: Jm
 Inoculation Count: 182

Concentration	Replicate	Number of Normal Larvae	Number of Abnormal Larvae	Total Number Larvae	Percent Normal Development	Percent Survival
Control	A	161	2	163	99	88
	B	158	8	166	95	87
	C	186	7	193	96	100
	D	167	3	170	98	92
	E	157	2	159	99	86
1.0%	A	163	2	165	98.8	89.6
	B	159	2	161	98.8	87.4
	C	145	4	149	97.3	79.7
	D	140	3	143	97.9	76.9
	E	162	2	164	98.8	89.0
10%	A	153	1	154	99.4	84.1
	B	183	1	184	99.5	100
	C	200	2	202	99.0	100
	D	180	1	181	99.4	98.9
	E	151	5	156	96.8 98.7 Jm	83
25%	A	166	0	166	100	91.2
	B	175	3	178	98.3	96.2
	C	161	2	163	98.8	88.5
	D	165	1	166	99.4	90.7
	E	157	2	159	98.7	86.3
50%	A	92	87	179	51.4	50.5
	B	86	90	176	48.9	47.3
	C	105	117	222	47.3	57.7
	D	63	71	134	47.0	34.6
	E	44	88	132	33.3	24.2
100%	A	0	178	178	0	0
	B	0	148	148	0	0
	C	0	135	135	0	0
	D	0	164	164	0	0
	E	0	159	159	0	0

Mytilus sp. Development Toxicity Test Water Chemistry Data

Client: ACOE - San Rafael Channel
 Test Material: SRC-2010-01
 Test ID#: 39437 Project #: 16087
 Test Date: 7-7-10 Randomization:
 Sample Salinity adjusted with: Crystal Sea Salts

Organism Log#: 5286 Age: N/A
 Organism Supplier: Certaff
 Control/Diluent: 30ppt FSW

Day 0					
Treatment	Temperature (°C)	pH	D.O. (mg/L)	Salinity (ppt)	Signoff
Control	16.4	7.80	8.7	30.7	Test Solution Prep m
1%	16.4	7.86	8.5	30.9	New WQ: <u>008</u>
10%	16.4	7.85	8.5	30.7	Inoculation Date: 7-7-10
25%	16.4	7.87	8.4	30.2	Inoculation Time: 1510
50%	16.4	7.89	8.3	29.5	Inoculation Signoff: m
100%	16.4	7.94	7.7	28.0	
Meter ID	23	PH14	RD03	EC03	

Day 1					
Treatment	Temperature (°C)	pH	D.O. (mg/L)	Salinity (ppt)	Signoff
Control	16.3				Date: 7/8/10
1%	16.3				Signoff: m
10%	16.3				
25%	16.3				
50%	16.3				
100%	16.3				
Meter ID	23				

Day 2					
Treatment	Temperature (°C)	pH	D.O. (mg/L)	Salinity (ppt)	Signoff
Control	16.2	7.94	8.6	31.2	Termination Signoff: <u>AB</u>
1%	16.2	7.99	9.1	31.2	Termination Date: 7-9-10
10%	16.2	8.05	8.9	30.8	Termination Time: 1510
25%	16.2	8.10	8.9	30.5	Old WQ: <u>NVS</u>
50%	16.2	8.17	8.9	29.7	
100%	16.2	8.24	9.0	NM	
Meter ID	23	PH14	RD03	EC05	

CETIS Summary Report

Report Date: 20 Jul-10 16:28 (p 1 of 2)

Test Code: 18-9108-5089/39438

Bivalve Larval Survival and Development Test							Pacific EcoRisk				
Batch ID:	18-8220-2847		Test Type:	Development-Survival			Analyst:	Jason Walker			
Start Date:	07 Jul-10 15:10		Protocol:	ASTM E724-98 (Bivalve)			Diluent:	Diluted Seawater			
Ending Date:	09 Jul-10 15:50		Species:	Mytilus galloprovincialis			Brine:	Crystal Sea			
Duration:	49h		Source:	Dave Guttoff			Age:	N/A			
Sample ID:	21-4363-5601		Code:	SRC-2010-02			Client:	ACOE			
Sample Date:	09 Jun-10 08:00		Material:	Elutriate			Project:	16087			
Receive Date:	09 Jun-10 19:00		Source:	San Rafael Channel							
Sample Age:	28d 7h (1.6 °C)		Station:	SRC-2010-02							
Comparison Summary											
Analysis ID	Endpoint		NOEL	LOEL	TOEL	PMSD	TU	Method			
10-4884-0897	Development Rate		25	50	35.4	1.7%	4	Steel Many-One Rank Test			
13-2907-0402	Survival Rate		25	50	35.4	12.8%	4	Steel Many-One Rank Test			
Point Estimate Summary											
Analysis ID	Endpoint		Level	%	95% LCL	95% UCL	TU	Method			
13-7464-8732	Development Rate		EC5	26.2	25.9	26.3	3.81	Linear Interpolation (ICPIN)			
			EC10	27.5	27.2	27.5	3.64				
			EC15	28.7	28.5	28.8	3.48				
			EC20	30	29.7	30	3.33				
			EC25	31.2	31	31.3	3.2				
			EC40	35	34.8	35	2.86				
		EC50	37.5	37.3	37.6	2.67					
13-0969-1803	Survival Rate		EC50	35.4	35.3	35.4	2.83	Spearman-Kärber			
Development Rate Summary											
Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
0	Lab Water Contr	5	0.975	0.969	0.981	0.952	0.988	0.00294	0.0161	1.65%	0.0%
0	Site Water	5	0.992	0.989	0.996	0.98	1	0.00155	0.00846	0.85%	-1.83%
1		5	0.992	0.988	0.995	0.977	1	0.00155	0.0085	0.86%	-1.74%
10		5	0.993	0.991	0.994	0.989	1	0.000886	0.00485	0.49%	-1.85%
25		5	0.986	0.981	0.99	0.967	0.994	0.00205	0.0112	1.14%	-1.13%
50		5	0.0015	0.000248	0.00276	0	0.00752	0.000614	0.00336	224.0%	99.8%
100		5	0	0	0	0	0	0	0		100.0%
Survival Rate Summary											
Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
0	Lab Water Contr	5	0.907	0.886	0.928	0.863	1	0.0103	0.0564	6.23%	0.0%
0	Site Water	5	0.881	0.864	0.898	0.813	0.918	0.00823	0.0451	5.11%	2.79%
1		5	0.897	0.838	0.955	0.621	1	0.0285	0.156	17.4%	1.09%
10		5	0.986	0.979	0.993	0.956	1	0.00345	0.0189	1.91%	-8.73%
25		5	0.938	0.92	0.956	0.868	1	0.00881	0.0483	5.14%	-3.52%
50		5	0.0011	0.000181	0.00202	0	0.00549	0.000449	0.00246	224.0%	99.9%
100		5	0	0	0	0	0	0	0		100.0%

CETIS Summary Report

Report Date: 20 Jul-10 16:28 (p 2 of 2)
 Test Code: 18-9108-5089/39438

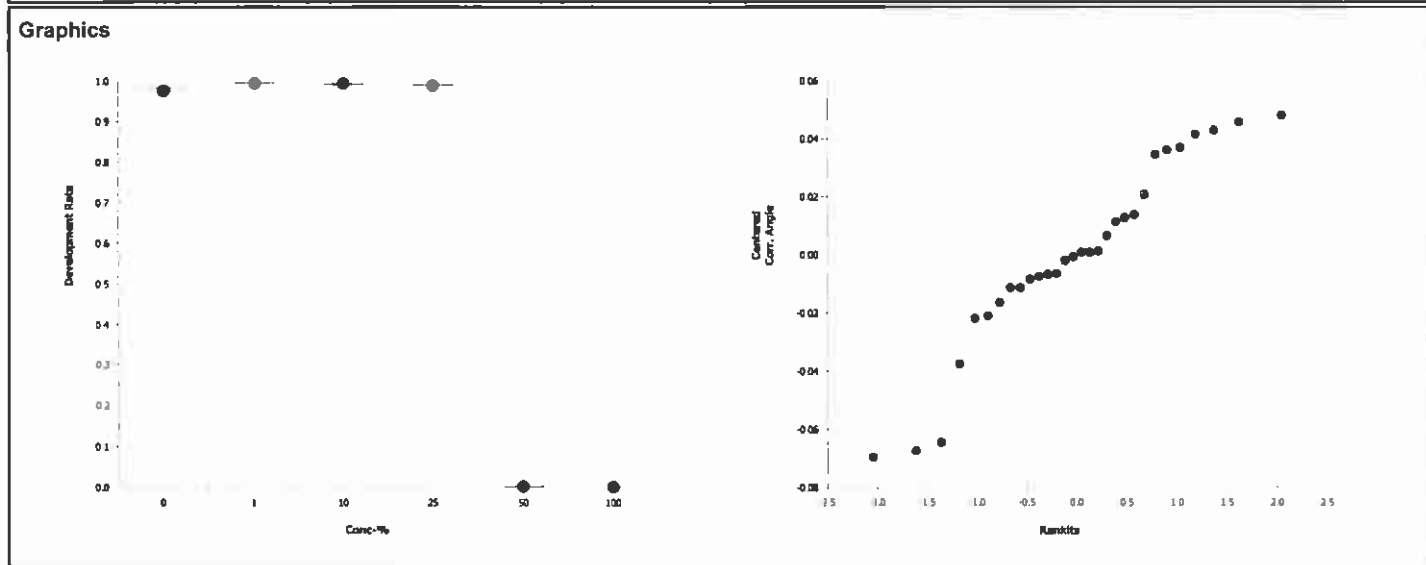
Bivalve Larval Survival and Development Test						Pacific EcoRisk
Development Rate Detail						
Conc-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Lab Water Contr	0.988	0.952	0.964	0.982	0.987
0	Site Water	1	0.988	0.994	0.98	1
1		0.977	0.994	0.995	0.991	1
10		0.99	0.989	0.995	0.989	1
25		0.967	0.994	0.985	0.994	0.989
50		0	0.00752	0	0	0
100		0	0	0	0	0
Survival Rate Detail						
Conc-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Lab Water Contr	0.885	0.868	1	0.918	0.863
0	Site Water	0.907	0.918	0.912	0.813	0.857
1		0.951	0.973	1	0.621	0.94
10		1	0.995	1	0.978	0.956
25		0.956	0.868	1	0.923	0.945
50		0	0.00549	0	0	0
100		0	0	0	0	0

CETIS Analytical Report

Report Date: 20 Jul-10 16:28 (p 3 of 4)
Test Code: 18-9108-5089/39438

Bivalve Larval Survival and Development Test							Pacific EcoRisk				
Analysis ID: 10-4884-0897		Endpoint: Development Rate			CETIS Version: CETISv1.7.0						
Analyzed: 20 Jul-10 16:27		Analysis: Nonparametric-Control vs Treatments			Official Results: Yes						
Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD			
Angular (Corrected)	0	C > T	Not Run	25	50	35.4	4	1.7%			
Steel Many-One Rank Test											
Control	vs	Conc-%	Test Stat	Critical	Ties	P-Value	Decision(5%)				
Lab Water Control	1		37	16	0	0.9996	Non-Significant Effect				
	10		40	16	0	1.0000	Non-Significant Effect				
	25		35	16	0	0.9979	Non-Significant Effect				
	50*		15	16	0	0.0191	Significant Effect				
	100*		15	16	0	0.0191	Significant Effect				
ANOVA Table											
Source	Sum Squares		Mean Square		DF	F Stat	P-Value	Decision(5%)			
Between	13.38251		2.676502		5	2180	<0.0001	Significant Effect			
Error	0.02945574		0.001227322		24						
Total	13.41197		2.677729		29						
ANOVA Assumptions											
Attribute	Test			Test Stat	Critical	P-Value	Decision(1%)				
Variances	Bartlett Equality of Variance			23.6	15.1	0.0003	Unequal Variances				
Distribution	Shapiro-Wilk Normality			0.933		0.0584	Normal Distribution				
Development Rate Summary											
Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
0	Lab Water Contr	5	0.975	0.968	0.981	0.952	0.988	0.00299	0.0161	1.65%	0.0%
1		5	0.992	0.988	0.995	0.977	1	0.00158	0.0085	0.86%	-1.74%
10		5	0.993	0.991	0.994	0.989	1	0.000901	0.00485	0.49%	-1.85%
25		5	0.986	0.981	0.99	0.967	0.994	0.00209	0.0112	1.14%	-1.13%
50		5	0.0015	0.000225	0.00278	0	0.00752	0.000624	0.00336	224.0%	99.8%
100		5	0	0	0	0	0	0	0		100.0%
Angular (Corrected) Transformed Summary											
Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
0	Lab Water Cont	5	1.42	1.4	1.44	1.35	1.46	0.00927	0.0499	3.52%	0.0%
1		5	1.48	1.47	1.5	1.42	1.53	0.00767	0.0413	2.78%	-4.77%
10		5	1.49	1.48	1.5	1.47	1.53	0.00548	0.0295	1.98%	-4.96%
25		5	1.46	1.44	1.47	1.39	1.49	0.00806	0.0434	2.98%	-2.82%
50		5	0.0507	0.043	0.0584	0.0393	0.0868	0.00378	0.0203	40.1%	96.4%
100		5	0.04	0.0395	0.0406	0.038	0.0413	0.000252	0.00136	3.39%	97.2%

Bivalve Larval Survival and Development Test			Pacific EcoRisk
Analysis ID: 10-4884-0897	Endpoint: Development Rate	CETIS Version: CETISv1.7.0	
Analyzed: 20 Jul-10 16:27	Analysis: Nonparametric-Control vs Treatments	Official Results: Yes	



Report Date: 20 Jul-10 16:28 (p 1 of 1)
Test Code: 18-9108-5089/39438

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CETIS™ v1.7.0.1

Analyst: JN

QA: FAN

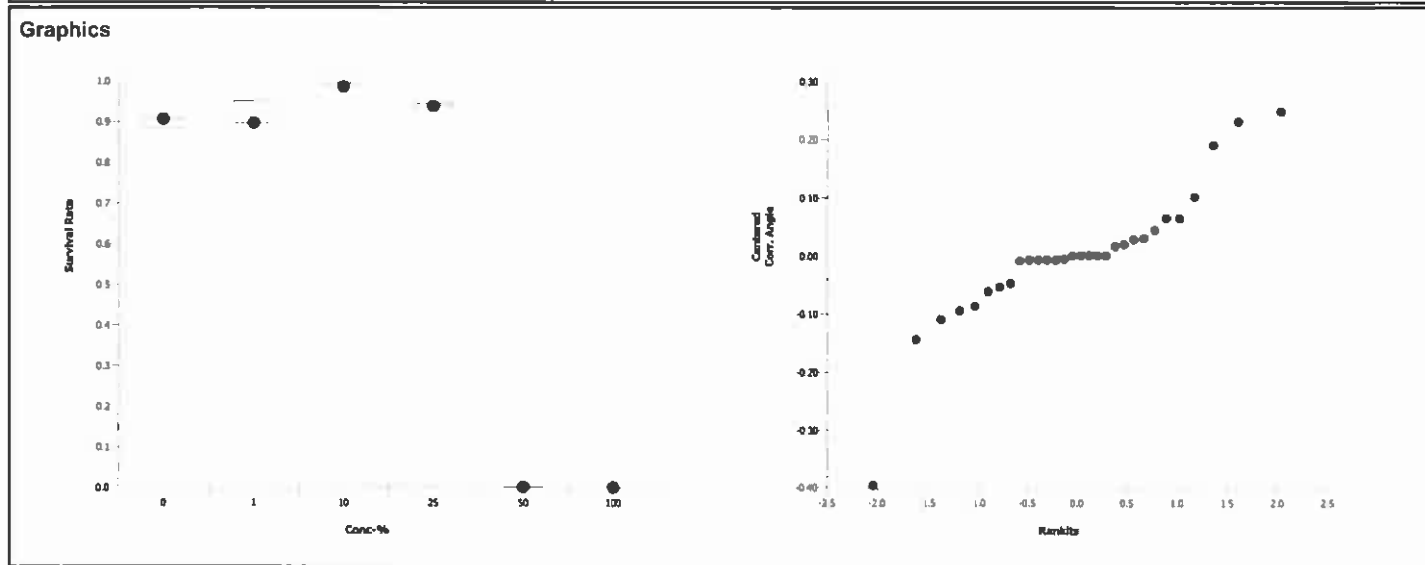
CETIS Analytical Report

Report Date: 20 Jul-10 16:28 (p 1 of 4)

Test Code: 18-9108-5089/39438

Blvalve Larval Survival and Development Test								Pacific EcoRisk			
Analysis ID: 13-2907-0402		Endpoint: Survival Rate		CETIS Version: CETISv1.7.0							
Analyzed: 20 Jul-10 16:28		Analysis: Nonparametric-Control vs Treatments		Official Results: Yes							
Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD			
Angular (Corrected)	0	C > T	Not Run	25	50	35.4	4	12.8%			
Steel Many-One Rank Test											
Control	vs	Conc-%	Test Stat	Critical	Ties	P-Value	Decision(5%)				
Lab Water Control	1		31.5	16	1	0.9757	Non-Significant Effect				
	10		36	16	1	0.9991	Non-Significant Effect				
	25		33	16	2	0.9907	Non-Significant Effect				
	50*		15	16	0	0.0191	Significant Effect				
	100*		15	16	0	0.0191	Significant Effect				
ANOVA Table											
Source	Sum Squares		Mean Square		DF	F Stat	P-Value	Decision(5%)			
Between	11.53393		2.306787		5	142	<0.0001	Significant Effect			
Error	0.3886414		0.01619339		24						
Total	11.92257		2.32298		29						
ANOVA Assumptions											
Attribute	Test			Test Stat	Critical	P-Value	Decision(1%)				
Variances	Mod Levene Equality of Variance			1.67	4.25	0.1936	Equal Variances				
Distribution	Shapiro-Wilk Normality			0.864		0.0012	Non-normal Distribution				
Survival Rate Summary											
Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	MIn	Max	Std Err	Std Dev	CV%	Diff%
0	Lab Water Contr	5	0.907	0.885	0.928	0.863	1	0.0105	0.0564	6.23%	0.0%
1		5	0.897	0.837	0.956	0.621	1	0.029	0.156	17.4%	1.09%
10		5	0.986	0.979	0.993	0.956	1	0.0035	0.0189	1.91%	-8.73%
25		5	0.938	0.92	0.957	0.868	1	0.00896	0.0483	5.14%	-3.52%
50		5	0.0011	0.000164	0.00203	0	0.00549	0.000456	0.00246	224.0%	99.9%
100		5	0	0	0	0	0	0	0		100.0%
Angular (Corrected) Transformed Summary											
Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	MIn	Max	Std Err	Std Dev	CV%	Diff%
0	Lab Water Cont	5	1.29	1.23	1.34	1.19	1.53	0.0265	0.143	11.1%	0.0%
1		5	1.3	1.21	1.39	0.907	1.53	0.0438	0.236	18.1%	-1.35%
10		5	1.47	1.44	1.5	1.36	1.53	0.0142	0.0764	5.2%	-14.3%
25		5	1.34	1.3	1.39	1.2	1.53	0.0228	0.123	9.14%	-4.49%
50		5	0.0445	0.0382	0.0508	0.0371	0.0742	0.00308	0.0166	37.3%	96.5%
100		5	0.0371	0.0371	0.0371	0.0371	0.0371	0	0	0.0%	97.1%

Bivalve Larval Survival and Development Test			Pacific EcoRisk
Analysis ID: 13-2907-0402	Endpoint: Survival Rate	CETIS Version: CETISv1.7.0	
Analyzed: 20 Jul-10 16:28	Analysis: Nonparametric-Control vs Treatments	Official Results: Yes	



CETIS Analytical Report

Report Date: 20 Jul-10 16:28 (p 1 of 1)
 Test Code: 18-9108-5089/39438

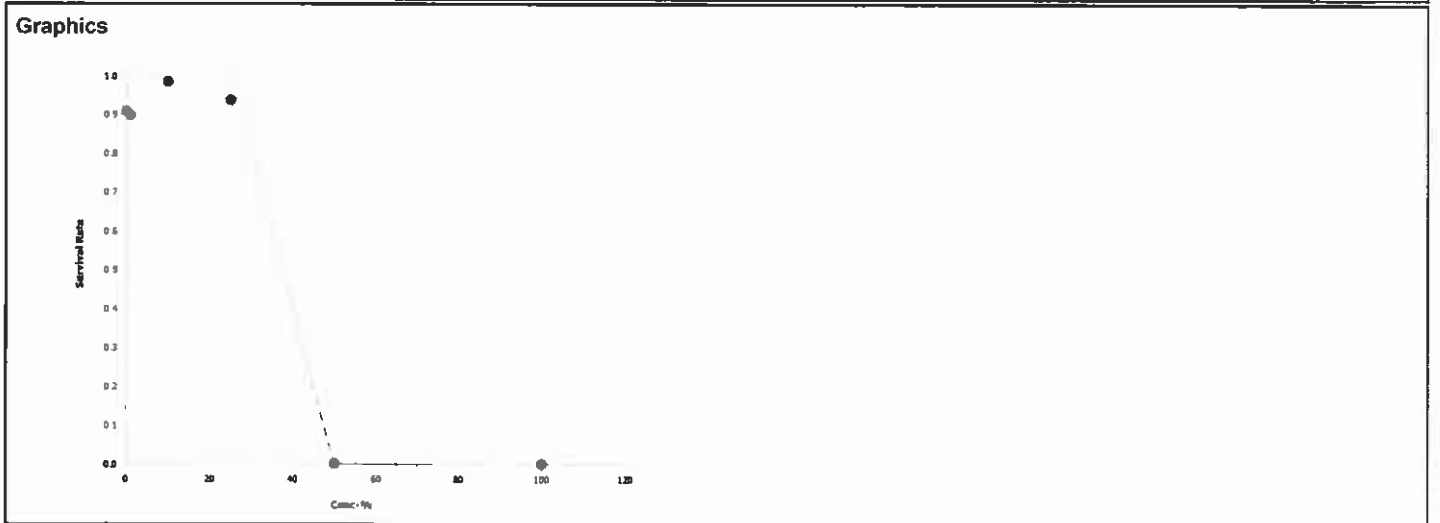
Bivalve Larval Survival and Development Test						Pacific EcoRisk
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Analysis ID: 13-0969-1803	Endpoint: Survival Rate	CETIS Version: CETISv1.7.0
Analyzed: 20 Jul-10 16:28	Analysis: Untrimmed Spearman-Kärber	Official Results: Yes

Spearman-Kärber Estimates							
Threshold Option	Threshold	Trim	Mu	Sigma	EC50	95% LCL	95% UCL
Control Threshold	0.0934	0.00%	1.55	0.000342	35.4	35.3	35.4

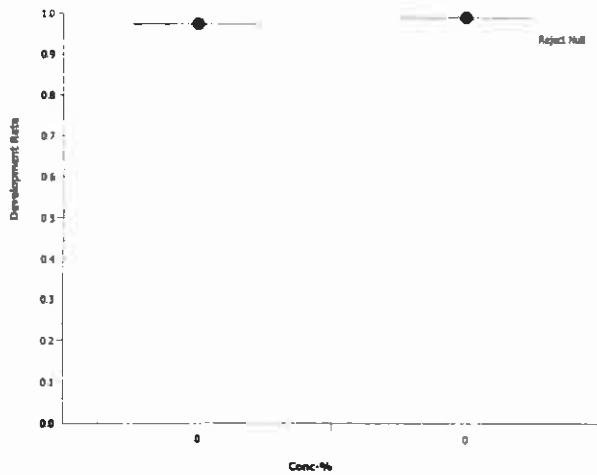
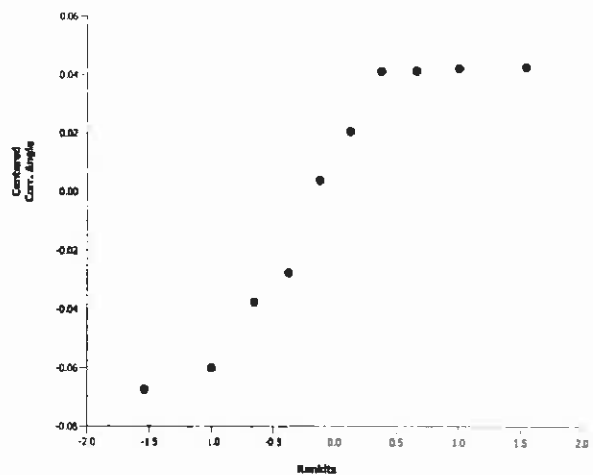
Survival Rate Summary			Calculated Variate(A/B)								
Conc-%	Control Type	Count	Mean	Min	Max	Std Err	Std Dev	CV%	Diff%	A	B
0	Lab Water Contr	5	0.907	0.863	1	0.0103	0.0564	6.23%	0.0%	825	910
1		5	0.897	0.621	1	0.0285	0.156	17.4%	1.09%	816	910
10		5	0.986	0.956	1	0.00345	0.0189	1.91%	-8.73%	897	910
25		5	0.938	0.868	1	0.00881	0.0483	5.14%	-3.52%	854	910
50		5	0.0011	0	0.00549	0.000449	0.00246	224.0%	99.9%	1	910
100		5	0	0	0	0	0		100.0%	0	910

Survival Rate Detail						
Conc-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Lab Water Control	0.885	0.868	1	0.918	0.863
1		0.951	0.973	1	0.621	0.94
10		1	0.995	1	0.978	0.956
25		0.956	0.868	1	0.923	0.945
50		0	0.00549	0	0	0
100		0	0	0	0	0



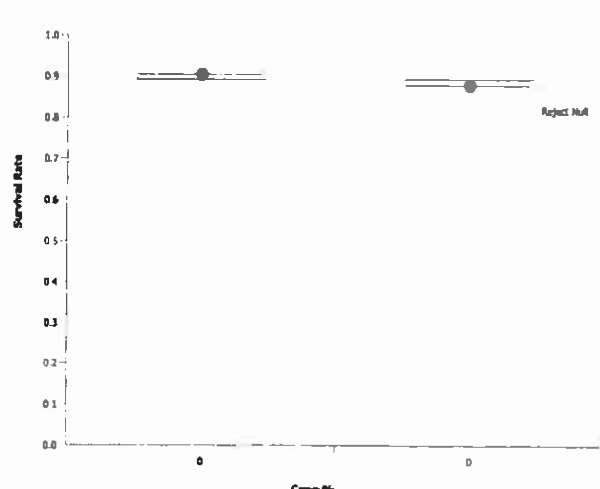
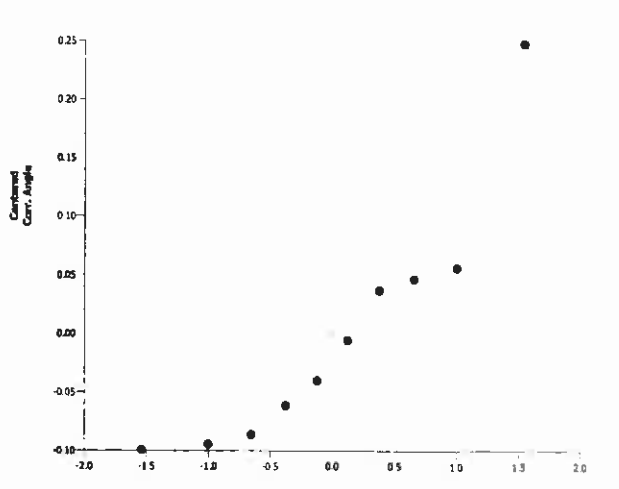
CETIS Analytical Report

Report Date: 20 Jul-10 16:01 (p 4 of 4)
Test Code: 18-6831-4622/39436

Bivalve Larval Survival and Development Test										Pacific EcoRisk	
Analysis ID: 06-7674-0949		Endpoint: Development Rate		CETIS Version: CETISv1.7.0							
Analyzed: 20 Jul-10 15:57		Analysis: Parametric-Two Sample		Official Results: Yes							
Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD			
Angular (Corrected)	0	C > T	Not Run	0	>0			1.83%			
Equal Variance t Two-Sample Test											
Control	vs	Control	Test Stat	Critical	MSD	P-Value	Decision(5%)				
Lab Water Control		Site Water	-2.43	1.86	0.0556	0.9793	Non-Significant Effect				
ANOVA Table											
Source	Sum Squares		Mean Square	DF	F Stat	P-Value	Decision(5%)				
Between	0.01315582		0.01315582	1	5.89	0.0413	Significant Effect				
Error	0.01785393		0.002231742	8							
Total	0.03100976		0.01538756	9							
ANOVA Assumptions											
Attribute	Test		Test Stat	Critical	P-Value	Decision(1%)					
Variances	Variance Ratio F		1.26	23.2	0.8272	Equal Variances					
Distribution	Shapiro-Wilk Normality		0.849		0.0569	Normal Distribution					
Development Rate Summary											
Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
0	Site Water	5	0.992	0.989	0.996	0.98	1	0.00157	0.00846	0.85%	0.0%
0	Lab Water Contr	5	0.975	0.968	0.981	0.952	0.988	0.00299	0.0161	1.65%	1.8%
Angular (Corrected) Transformed Summary											
Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
0	Site Water	5	1.49	1.47	1.51	1.43	1.53	0.00825	0.0444	2.98%	0.0%
0	Lab Water Cont	5	1.42	1.4	1.44	1.35	1.46	0.00927	0.0499	3.52%	4.87%
Graphics											
											

CETIS Analytical Report

Report Date: 20 Jul-10 16:01 (p 2 of 4)
Test Code: 18-6831-4622/39436

Bivalve Larval Survival and Development Test							Pacific EcoRisk				
Analysis ID: 17-3724-4183		Endpoint: Survival Rate		CETIS Version: CETISv1.7.0							
Analyzed: 20 Jul-10 15:59		Analysis: Parametric-Two Sample		Official Results: Yes							
Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD			
Angular (Corrected)	0	C > T	Not Run	0	>0			7.77%			
Equal Variance t Two-Sample Test											
Control	vs	Control	Test Stat	Critical	MSD	P-Value	Decision(5%)				
Lab Water Control		Site Water	0.88	1.86	0.131	0.2022	Non-Significant Effect				
ANOVA Table											
Source	Sum Squares		Mean Square		DF	F Stat	P-Value	Decision(5%)			
Between	0.009684817		0.009684817		1	0.775	0.4043	Non-Significant Effect			
Error	0.09996058		0.01249507		8						
Total	0.1096454		0.02217989		9						
ANOVA Assumptions											
Attribute	Test		Test Stat	Critical	P-Value	Decision(1%)					
Variances	Variance Ratio F		4.49	23.2	0.1746	Equal Variances					
Distribution	Shapiro-Wilk Normality		0.847		0.0532	Normal Distribution					
Survival Rate Summary											
Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
0	Site Water	5	0.881	0.864	0.898	0.813	0.918	0.00837	0.0451	5.11%	0.0%
0	Lab Water Contr	5	0.907	0.885	0.928	0.863	1	0.0105	0.0564	6.23%	-2.87%
Angular (Corrected) Transformed Summary											
Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
0	Site Water	5	1.22	1.2	1.25	1.12	1.28	0.0125	0.0674	5.51%	0.0%
0	Lab Water Contr	5	1.29	1.23	1.34	1.19	1.53	0.0265	0.143	11.1%	-5.09%
Graphics											
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Mytilus sp. Development Toxicity Test Count Data

Client: ACOE - San Rafael Channel
 Test Material: SRC-2010-02
 Test ID #: 39438
 Project #: 16087
 Sample Salinity adjusted with: Crystal Sea Salts

Test Start Date: 7-7-10
 Test End Date: 7-9-10
 Enumeration Date: 7/20/10
 Investigator: JM
 Inoculation Count: 182

Concentration	Replicate	Number of Normal Larvae	Number of Abnormal Larvae	Total Number Larvae	Percent Normal Development	Percent Survival
Control	A	161	2	163	99	88
	B	158	8	166	95	87
	C	186	7	193	96	100
	D	167	3	170	98	92
	E	157	2	159	99	86
1.0%	A	173	4	177	97.7	95.1
	B	177	1	178	99.4	97.3
	C	184	1	185	99.5	100
	D	113	1	114	99.1	62.1
	E	171	0	171	100.0	94.0
10%	A	198	2	200	99	100
	B	181	2	183	98.9	99.5
	C	204	1	205	99.5	100
	D	178	2	180	98.9	97.8
	E	174	0	174	100.0	95.6
25%	A	174	6	180	96.7	95.6
	B	158	1	159	99.4	87
	C	198	3	201	98.5	100
	D	168	1	169	99.4	86.8
	E	172	2	174	98.9	94.5
50%	A	0	162	162	0	0
	B	1	132	133	0.8 0.008	0.5 0.005
	C	0	128	128	0	0
	D	0	130	130	0	0
	E	0	162	162	0	0
100%	A	0	162	162	0	0
	B	0	147	147	0	0
	C	0	173	173	0	0
	D	0	150	150	0	0
	E	0	148	150	0	0

Mytilus sp. Development Toxicity Test Water Chemistry Data

Client: ACOE - San Rafael Channel
 Test Material: SRC-2010-02
 Test ID#: 39438 Project #: 16087
 Test Date: 7-7-10 Randomization: _____
 Sample Salinity adjusted with: Crystal Sea Salts

Organism Log#: 5286 Age: N/A
 Organism Supplier: Cutler
 Control/Diluent: 30ppt FSW

Day 0					
Treatment	Temperature (°C)	pH	D.O. (mg/L)	Salinity (ppt)	Signoff
Control	16.4	7.80	8.7	30.7	Test Solution Prep: <u>mm</u>
1%	16.4	7.87	8.4	30.9	New WQ: <u>008</u>
10%	16.4	7.88	8.5	30.8	Inoculation Date: <u>7-7-10</u>
25%	16.4	7.92	8.5	30.9	Inoculation Time: <u>16:15:10</u>
50%	16.4	7.98	8.3	30.7	Inoculation Signoff: <u>mm</u>
100%	16.4	8.02	7.7	30.4	
Meter ID	23	PH14	RD03	EC03	

Day 1					
Treatment	Temperature (°C)	pH	D.O. (mg/L)	Salinity (ppt)	Signoff
Control	16.3				Date: <u>7/8/10</u>
1%	16.3				Signoff: <u>mm</u>
10%	16.3				
25%	16.3				
50%	16.3				
100%	16.3				
Meter ID	23				

Day 2					
Treatment	Temperature (°C)	pH	D.O. (mg/L)	Salinity (ppt)	Signoff
Control	16.2	8.01	8.8	31.1	Termination Signoff: <u>AB</u>
1%	16.2	8.02	8.9	31.2	Termination Date: <u>7-9-10</u>
10%	16.2	8.07	9.1	31.1	Termination Time: <u>1550</u>
25%	16.2	8.15	8.9	30.7	Old WQ: <u>NVS</u>
50%	16.2	8.20	9.2	30.8	
100%	16.2	8.32	9.0	30.6	
Meter ID	23	PH14	RD03	EC05	

CETIS Summary Report

Report Date: 20 Jul-10 16:35 (p 1 of 2)
 Test Code: 03-8665-0729/39439

Bivalve Larval Survival and Development Test							Pacific EcoRisk				
Batch ID:	18-8220-2847	Test Type:	Development-Survival				Analyst:	Jason Walker			
Start Date:	07 Jul-10 15:10	Protocol:	ASTM E724-98 (Bivalve)				Diluent:	Diluted Seawater			
Ending Date:	09 Jul-10 15:50	Species:	Mytilus galloprovincialis				Brine:	Crystal Sea			
Duration:	49h	Source:	Dave Guloff				Age:	N/A			
Sample ID:	15-3808-8719	Code:	SRC-2010-03				Client:	ACOE			
Sample Date:	09 Jun-10 11:05	Material:	Elutriate				Project:	16087			
Receive Date:	09 Jun-10 19:00	Source:	San Rafael Channel								
Sample Age:	28d 4h (1.6 °C)	Station:	SRC-2010-03								
Comparison Summary											
Analysis ID	Endpoint	NOEL	LOEL	TOEL	PMSD	TU	Method				
03-3527-9393	Development Rate	25	50	35.4	1.54%	4	Steel Many-One Rank Test				
15-2854-7142	Survival Rate	25	50	35.4	14.5%	4	Dunnett's Multiple Comparison Test				
Point Estimate Summary											
Analysis ID	Endpoint	Level	%	95% LCL	95% UCL	TU	Method				
13-4014-5099	Development Rate	EC5	26.8	26.3	27.1	3.74	Linear Interpolation (ICPIN)				
		EC10	28.7	28.2	29.1	3.48					
		EC15	30.7	30.1	31.1	3.26					
		EC20	32.7	32	33.1	3.06					
		EC25	34.6	33.9	35.1	2.89					
		EC40	40.5	39.6	41.3	2.47					
		EC50	44.5	43.3	45.3	2.25					
09-8801-6635	Survival Rate	EC50	39.2	37.8	40.5	2.55	Spearman-Kärber				
Development Rate Summary											
Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
0	Lab Water Contr	5	0.975	0.969	0.981	0.952	0.988	0.00294	0.0161	1.65%	0.0%
0	Site Water	5	0.992	0.989	0.996	0.98	1	0.00155	0.00846	0.85%	-1.83%
1		5	0.992	0.989	0.994	0.982	1	0.00125	0.00683	0.69%	-1.73%
10		5	0.992	0.99	0.994	0.986	1	0.00104	0.00571	0.58%	-1.8%
25		5	0.981	0.978	0.983	0.968	0.986	0.00134	0.00736	0.75%	-0.62%
50		5	0.353	0.343	0.364	0.306	0.381	0.00516	0.0283	8.0%	63.7%
100		5	0	0	0	0	0	0	0		100.0%
Survival Rate Summary											
Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
0	Lab Water Contr	5	0.907	0.886	0.928	0.863	1	0.0103	0.0564	6.23%	0.0%
0	Site Water	5	0.881	0.864	0.898	0.813	0.918	0.00823	0.0451	5.11%	2.79%
1		5	0.909	0.869	0.949	0.736	1	0.0197	0.108	11.9%	-0.24%
10		5	0.83	0.805	0.855	0.769	0.934	0.0121	0.0665	8.02%	8.48%
25		5	0.89	0.853	0.928	0.764	1	0.0183	0.1	11.3%	1.82%
50		5	0.3	0.281	0.319	0.225	0.352	0.00926	0.0507	16.9%	66.9%
100		5	0	0	0	0	0	0	0		100.0%

CETIS Summary Report

Report Date:

20 Jul-10 16:35 (p 2 of 2)

Test Code:

03-8665-0729/39439

Blvalve Larval Survival and Development Test						Pacific EcoRisk
Development Rate Detail						
Conc-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Lab Water Contr	0.988	0.952	0.964	0.982	0.987
0	Site Water	1	0.988	0.994	0.98	1
1		0.995	0.988	1	0.982	0.993
10		0.986	1	0.987	0.994	0.993
25		0.968	0.984	0.983	0.982	0.986
50		0.365	0.381	0.306	0.354	0.361
100		0	0	0	0	0
Survival Rate Detail						
Conc-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Lab Water Contr	0.885	0.868	1	0.918	0.863
0	Site Water	0.907	0.918	0.912	0.813	0.857
1		1	0.907	1	0.901	0.736
10		0.775	0.769	0.841	0.934	0.83
25		0.824	1	0.978	0.885	0.764
50		0.275	0.352	0.225	0.313	0.335
100		0	0	0	0	0

CETIS Analytical Report

Report Date: 20 Jul-10 16:35 (p 3 of 4)
Test Code: 03-8665-0729/39439

Bivalve Larval Survival and Development Test							Pacific EcoRisk				
Analysis ID: 03-3527-9393		Endpoint: Development Rate			CETIS Version: CETISv1.7.0						
Analyzed: 20 Jul-10 16:34		Analysis: Nonparametric-Control vs Treatments			Official Results: Yes						
Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD			
Angular (Corrected)	0	C > T	Not Run	25	50	35.4	4	1.54%			
Steel Many-One Rank Test											
Control	vs	Conc-%	Test Stat	Critical	Ties	P-Value	Decision(5%)				
Lab Water Control	1		37	16	0	0.9996	Non-Significant Effect				
	10		36	16	0	0.9991	Non-Significant Effect				
	25		28	16	0	0.8627	Non-Significant Effect				
	50*		15	16	0	0.0191	Significant Effect				
	100*		15	16	0	0.0191	Significant Effect				
ANOVA Table											
Source	Sum Squares		Mean Square		DF	F Stat	P-Value	Decision(5%)			
Between	9.191415		1.838283		5	1740	<0.0001	Significant Effect			
Error	0.02533418		0.001055591		24						
Total	9.216749		1.839339		29						
ANOVA Assumptions											
Attribute	Test			Test Stat	Critical	P-Value	Decision(1%)				
Variances	Bartlett Equality of Variance			21	15.1	0.0008	Unequal Variances				
Distribution	Shapiro-Wilk Normality			0.948		0.1518	Normal Distribution				
Development Rate Summary											
Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
0	Lab Water Contr	5	0.975	0.968	0.981	0.952	0.988	0.00299	0.0161	1.65%	0.0%
1		5	0.992	0.989	0.994	0.982	1	0.00127	0.00683	0.69%	-1.73%
10		5	0.992	0.99	0.994	0.986	1	0.00106	0.00571	0.58%	-1.8%
25		5	0.981	0.978	0.983	0.968	0.986	0.00137	0.00736	0.75%	-0.62%
50		5	0.353	0.343	0.364	0.306	0.381	0.00525	0.0283	8.0%	63.7%
100		5	0	0	0	0	0	0	0		100.0%
Angular (Corrected) Transformed Summary											
Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
0	Lab Water Cont	5	1.42	1.4	1.44	1.35	1.46	0.00927	0.0499	3.52%	0.0%
1		5	1.48	1.47	1.5	1.44	1.53	0.0069	0.0372	2.5%	-4.67%
10		5	1.48	1.47	1.5	1.45	1.53	0.00577	0.0311	2.09%	-4.76%
25		5	1.43	1.42	1.44	1.39	1.45	0.00456	0.0246	1.71%	-1.13%
50		5	0.636	0.625	0.648	0.586	0.665	0.00555	0.0299	4.7%	55.1%
100		5	0.042	0.0414	0.0425	0.0395	0.0435	0.00029	0.00156	3.72%	97.0%

Bivalve Larval Survival and Development Test

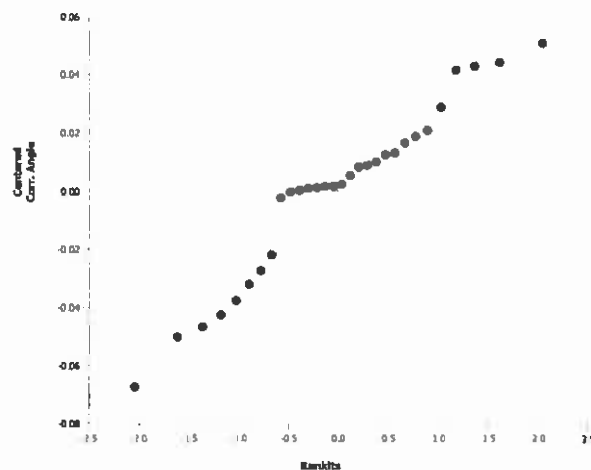
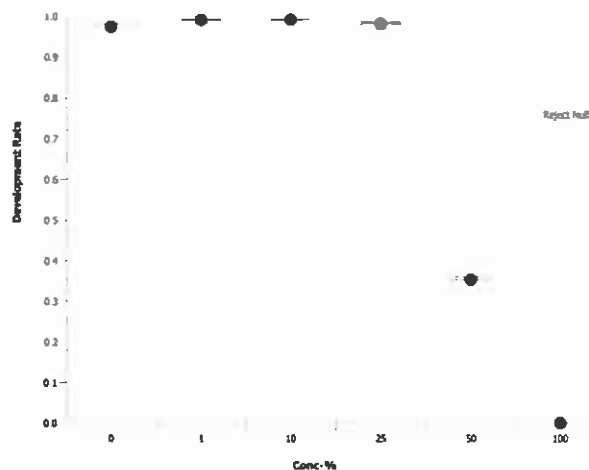
Pacific EcoRisk

Analysis ID: 03-3527-9393
 Analyzed: 20 Jul-10 16:34

Endpoint: Development Rate
 Analysis: Nonparametric-Control vs Treatments

CETIS Version: CETISv1.7.0
 Official Results: Yes

Graphics



CETIS Analytical Report

Report Date: 20 Jul-10 16:35 (p 1 of 1)
 Test Code: 03-8665-0729/39439

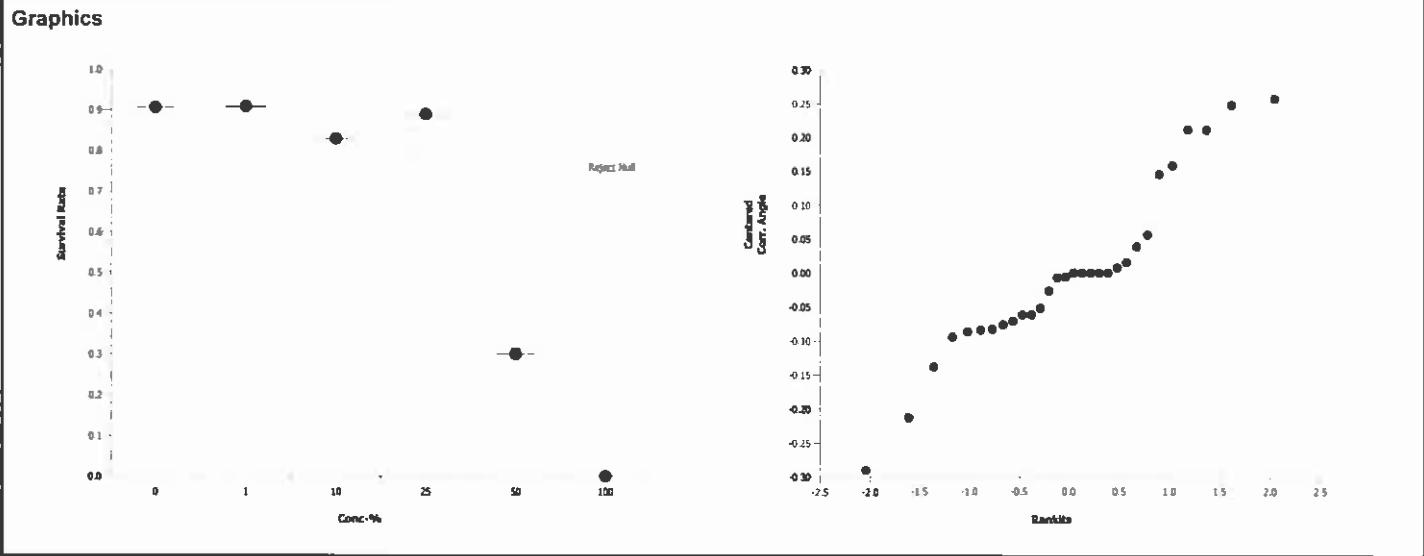
Bivalve Larval Survival and Development Test										Pacific EcoRisk		
Analysis ID: 13-4014-5099		Endpoint: Development Rate		CETIS Version: CETISv1.7.0								
Analyzed: 20 Jul-10 16:34		Analysis: Linear Interpolation (ICPIN)		Official Results: Yes								
Linear Interpolation Options												
X Transform	Y Transform	Seed	Resamples	Exp 95% CL	Method							
Linear	Linear	57951	200	Yes	Two-Point Interpolation							
Point Estimates												
Level	%	95% LCL	95% UCL	TU	95% LCL	95% UCL						
EC5	26.8	26.3	27.1	3.74	3.69	3.8						
EC10	28.7	28.2	29.1	3.48	3.44	3.54						
EC15	30.7	30.1	31.1	3.26	3.21	3.32						
EC20	32.7	32	33.1	3.06	3.02	3.13						
EC25	34.6	33.9	35.1	2.89	2.85	2.95						
EC40	40.5	39.6	41.3	2.47	2.42	2.53						
EC50	44.5	43.3	45.3	2.25	2.21	2.31						
Development Rate Summary				Calculated Variate(A/B)								
Conc-%	Control Type	Count	Mean	Min	Max	Std Err	Std Dev	CV%	Diff%	A	B	
0	Lab Water Contr	5	0.975	0.952	0.988	0.00294	0.0161	1.65%	0.0%	829	851	
1		5	0.992	0.982	1	0.00125	0.00683	0.69%	-1.73%	843	850	
10		5	0.992	0.986	1	0.00104	0.00571	0.58%	-1.8%	755	761	
25		5	0.981	0.968	0.986	0.00134	0.00736	0.75%	-0.62%	818	834	
50		5	0.353	0.306	0.381	0.00516	0.0283	8.0%	63.7%	272	769	
100		5	0	0	0	0	0		100.0%	0	713	
Development Rate Detail												
Conc-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5						
0	Lab Water Control	0.988	0.952	0.964	0.982	0.987						
1		0.995	0.988	1	0.982	0.993						
10		0.986	1	0.987	0.994	0.993						
25		0.968	0.984	0.983	0.982	0.986						
50		0.365	0.381	0.306	0.354	0.361						
100		0	0	0	0	0						
Graphics												

CETIS Analytical Report

Report Date: 20 Jul-10 16:35 (p 1 of 4)
Test Code: 03-8665-0729/39439

Bivalve Larval Survival and Development Test								Pacific EcoRisk			
Analysis ID: 15-2854-7142		Endpoint: Survival Rate				CETIS Version: CETISv1.7.0					
Analyzed: 20 Jul-10 16:34		Analysis: Parametric-Control vs Treatments				Official Results: Yes					
Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD			
Angular (Corrected)	0	C > T	Not Run	25	50	35.4	4	14.5%			
Dunnett's Multiple Comparison Test											
Control	vs	Conc-%	Test Stat	Critical	MSD	P-Value	Decision(5%)				
Lab Water Control		1	-0.412	2.36	0.209	0.9268	Non-Significant Effect				
		10	1.5	2.36	0.209	0.2230	Non-Significant Effect				
		25	0.105	2.36	0.209	0.8003	Non-Significant Effect				
		50*	7.99	2.36	0.209	<0.0001	Significant Effect				
		100*	14.1	2.36	0.209	<0.0001	Significant Effect				
ANOVA Table											
Source	Sum Squares		Mean Square		DF	F Stat	P-Value	Decision(5%)			
Between	6.847641		1.369528		5	69.9	<0.0001	Significant Effect			
Error	0.4700412		0.01958505		24						
Total	7.317682		1.389113		29						
ANOVA Assumptions											
Attribute	Test			Test Stat	Critical	P-Value	Decision(1%)				
Variances	Mod Levene Equality of Variance			2.96	4.25	0.0402	Equal Variances				
Distribution	Shapiro-Wilk Normality			0.933		0.0592	Normal Distribution				
Survival Rate Summary											
Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
0	Lab Water Contr	5	0.907	0.885	0.928	0.863	1	0.0105	0.0564	6.23%	0.0%
1		5	0.909	0.868	0.95	0.736	1	0.02	0.108	11.9%	-0.24%
10		5	0.83	0.804	0.855	0.769	0.934	0.0123	0.0665	8.02%	8.48%
25		5	0.89	0.852	0.928	0.764	1	0.0186	0.1	11.3%	1.82%
50		5	0.3	0.281	0.319	0.225	0.352	0.00942	0.0507	16.9%	66.9%
100		5	0	0	0	0	0	0	0		100.0%
Angular (Corrected) Transformed Summary											
Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
0	Lab Water Cont	5	1.29	1.23	1.34	1.19	1.53	0.0265	0.143	11.1%	0.0%
1		5	1.32	1.24	1.4	1.03	1.53	0.0397	0.214	16.2%	-2.83%
10		5	1.15	1.12	1.19	1.07	1.31	0.0181	0.0974	8.45%	10.3%
25		5	1.28	1.2	1.35	1.06	1.53	0.0365	0.197	15.4%	0.73%
50		5	0.578	0.557	0.6	0.495	0.635	0.0105	0.0563	9.74%	55.0%
100		5	0.0371	0.0371	0.0371	0.0371	0.0371	0	0	0.0%	97.1%

Bivalve Larval Survival and Development Test			Pacific EcoRisk
Analysis ID: 15-2854-7142	Endpoint: Survival Rate	CETIS Version: CETISv1.7.0	
Analyzed: 20 Jul-10 16:34	Analysis: Parametric-Control vs Treatments	Official Results: Yes	



CETIS Analytical Report

Report Date: 20 Jul-10 16:35 (p 1 of 1)
 Test Code: 03-8665-0729/39439

Bivalve Larval Survival and Development Test				Pacific EcoRisk
Analysis ID: 09-8801-6635	Endpoint: Survival Rate	CETIS Version: CETISv1.7.0		
Analyzed: 20 Jul-10 16:34	Analysis: Untrimmed Spearman-Kärber	Official Results: Yes		

Spearman-Kärber Estimates							
Threshold Option	Threshold	Trim	Mu	Sigma	EC50	95% LCL	95% UCL
Control Threshold	0.0934	0.00%	1.59	0.00745	39.2	37.8	40.5

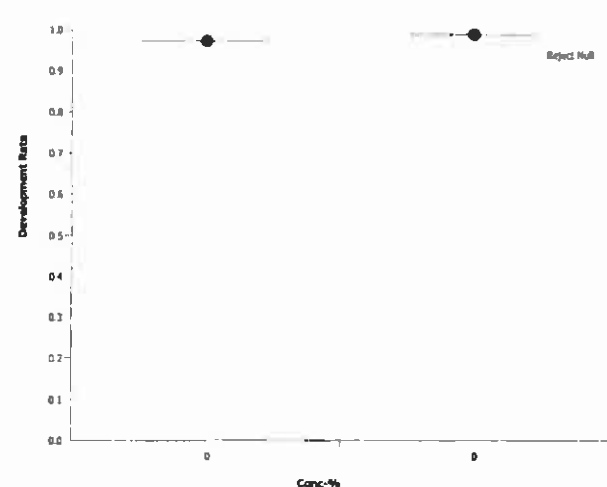
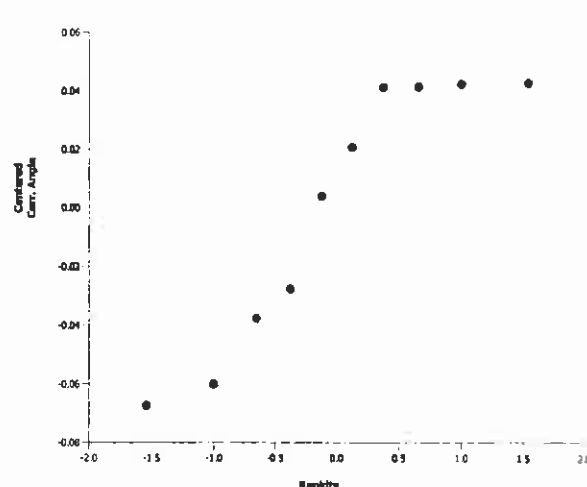
Survival Rate Summary			Calculated Variate(A/B)								
Conc-%	Control Type	Count	Mean	Min	Max	Std Err	Std Dev	CV%	Diff%	A	B
0	Lab Water Contr	5	0.907	0.863	1	0.0103	0.0564	6.23%	0.0%	825	910
1		5	0.909	0.736	1	0.0197	0.108	11.9%	-0.24%	827	910
10		5	0.83	0.769	0.934	0.0121	0.0665	8.02%	8.48%	755	910
25		5	0.89	0.764	1	0.0183	0.1	11.3%	1.82%	810	910
50		5	0.3	0.225	0.352	0.00926	0.0507	16.9%	66.9%	273	910
100		5	0	0	0	0	0		100.0%	0	910

Survival Rate Detail						
Conc-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Lab Water Control	0.885	0.868	1	0.918	0.863
1		1	0.907	1	0.901	0.736
10		0.775	0.769	0.841	0.934	0.83
25		0.824	1	0.978	0.885	0.764
50		0.275	0.352	0.225	0.313	0.335
100		0	0	0	0	0



CETIS Analytical Report

Report Date: 20 Jul-10 16:01 (p 4 of 4)
Test Code: 18-6831-4622/39436

Bivalve Larval Survival and Development Test							Pacific EcoRisk				
Analysis ID: 06-7674-0949		Endpoint: Development Rate		CETIS Version: CETISv1.7.0							
Analyzed: 20 Jul-10 15:57		Analysis: Parametric-Two Sample		Official Results: Yes							
Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD			
Angular (Corrected)	0	C > T	Not Run	0	>0			1.83%			
Equal Variance t Two-Sample Test											
Control	vs	Control	Test Stat	Critical	MSD	P-Value	Decision(5%)				
Lab Water Control		Site Water	-2.43	1.86	0.0556	0.9793	Non-Significant Effect				
ANOVA Table											
Source	Sum Squares		Mean Square		DF	F Stat	P-Value	Decision(5%)			
Between	0.01315582		0.01315582		1	5.89	0.0413	Significant Effect			
Error	0.01785393		0.002231742		8						
Total	0.03100976		0.01538756		9						
ANOVA Assumptions											
Attribute	Test			Test Stat	Critical	P-Value	Decision(1%)				
Variances	Variance Ratio F			1.26	23.2	0.8272	Equal Variances				
Distribution	Shapiro-Wilk Normality			0.849		0.0569	Normal Distribution				
Development Rate Summary											
Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
0	Site Water	5	0.992	0.989	0.996	0.98	1	0.00157	0.00846	0.85%	0.0%
0	Lab Water Contr	5	0.975	0.968	0.981	0.952	0.988	0.00299	0.0161	1.65%	1.8%
Angular (Corrected) Transformed Summary											
Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
0	Site Water	5	1.49	1.47	1.51	1.43	1.53	0.00825	0.0444	2.98%	0.0%
0	Lab Water Conl	5	1.42	1.4	1.44	1.35	1.46	0.00927	0.0499	3.52%	4.87%
Graphics											
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CETIS Analytical Report

Report Date: 20 Jul-10 16:01 (p 2 of 4)

Test Code: 18-6831-4622/39436

Blvalve Larval Survival and Development Test Pacific EcoRisk

Analysis ID: 17-3724-4183	Endpoint: Survival Rate	CETIS Version: CETISv1.7.0
Analyzed: 20 Jul-10 15:59	Analysis: Parametric-Two Sample	Official Results: Yes

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Angular (Corrected)	0	C > T	Not Run	0	>0			7.77%

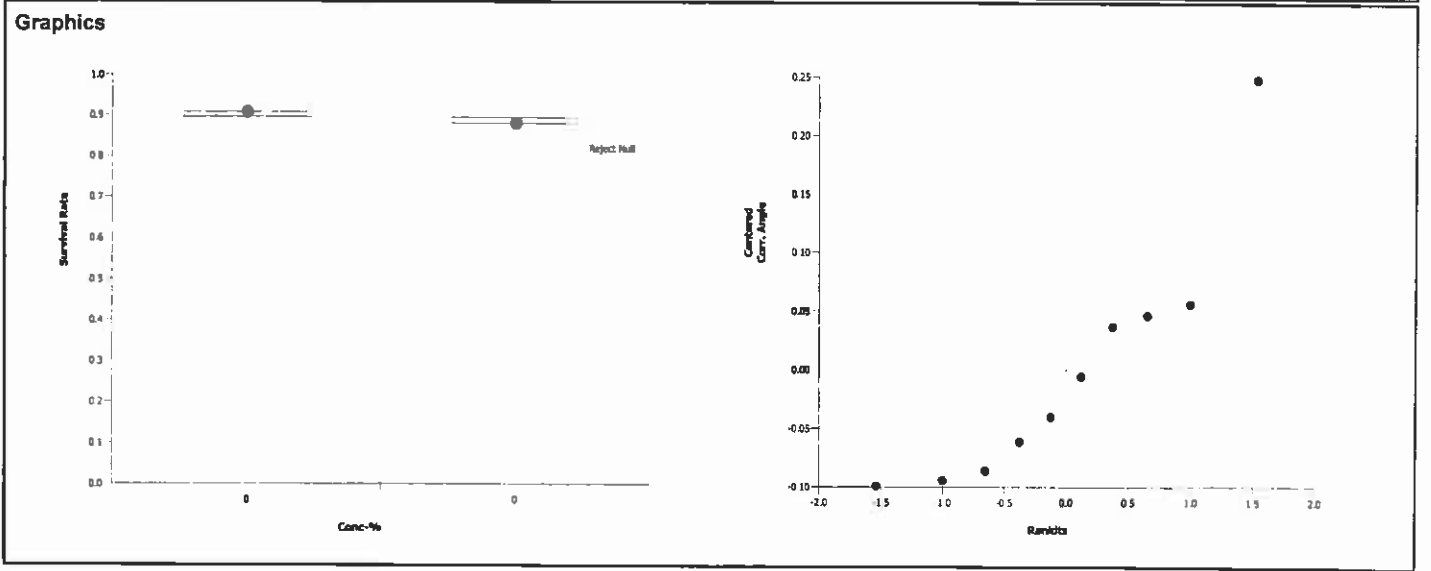
Equal Variance t Two-Sample Test						
Control	vs Control	Test Stat	Critical	MSD	P-Value	Decision(5%)
Lab Water Control	Site Water	0.88	1.86	0.131	0.2022	Non-Significant Effect

ANOVA Table						
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	0.009684817	0.009684817	1	0.775	0.4043	Non-Significant Effect
Error	0.09996058	0.01249507	8			
Total	0.1096454	0.02217989	9			

ANOVA Assumptions					
Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Variance Ratio F	4.49	23.2	0.1746	Equal Variances
Distribution	Shapiro-Wilk Normality	0.847		0.0532	Normal Distribution

Survival Rate Summary											
Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
0	Site Water	5	0.881	0.864	0.898	0.813	0.918	0.00837	0.0451	5.11%	0.0%
0	Lab Water Contr	5	0.907	0.885	0.928	0.863	1	0.0105	0.0564	6.23%	-2.87%

Angular (Corrected) Transformed Summary											
Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
0	Site Water	5	1.22	1.2	1.25	1.12	1.28	0.0125	0.0674	5.51%	0.0%
0	Lab Water Cont	5	1.29	1.23	1.34	1.19	1.53	0.0265	0.143	11.1%	-5.09%



Mytilus sp. Development Toxicity Test Count Data

Client: ACOE - San Rafael Channel
 Test Material: SRC-2010-03
 Test ID #: 39439
 Project #: 16087
 Sample Salinity adjusted with: Cystad Sea Salt S

Test Start Date: 7-7-10
 Test End Date: 7-9-10
 Enumeration Date: 7/20/10
 Investigator: JW
 Inoculation Count: 182

Concentration	Replicate	Number of Normal Larvae	Number of Abnormal Larvae	Total Number Larvae	Percent Normal Development	Percent Survival
Control	A	141	2	143	99	88
	B	158	8	166	95	87
	C	184	7	193	96	100
	D	147	3	170	98	92
	E	157	2	159	99	86
1.0%	A	196	1	197	99.5	100
	B	162 165	2	167	98.8	90.7
	C	184	0	184	100	100
	D	164	3	167	98.2	90.1
	E	134	1	135	99.3	73.6
10%	A	141	2	143	98.6	77.5
	B	140	0	140	100	76.9
	C	153	2	155	98.7	84.1
	D	170	1	171	99.4	93.4
	E	151	1	152	99.3	83.0
25%	A	150	5	155	96.8	82.4
	B	190	3	193	98.4	100
	C	178	3	181	98.3	97.8
	D	161	3	164	98.2	88.5
	E	139	2	141	98.6	76.4
50%	A	50 53	128 87	137	36.5	27.5
	B	64	104	168	38.1	35.2
	C	41	93	134	44.1 30.6	22.5
	D	57	104	161	54.8 35.4	31.3
	E	61	108	169	36.1	33.5
100%	A	0	135	135	0	0
	B	0	141	141	0	0
	C	0	145	145	0	0
	D	0	160	160	0	0
	E	0	132	132	0	0

Mytilus sp. Development Toxicity Test Water Chemistry Data

Client: ACOE - San Rafael Channel
 Test Material: SRC-2010-03
 Test ID#: 39439 Project #: 16087
 Test Date: 7-7-10 Randomization:
 Sample Salinity adjusted with: Crystal Sea Salt S

Organism Log#: 5286 Age: N/A
 Organism Supplier: Gulf
 Control/Diluent: 30ppt FSW

Day 0					
Treatment	Temperature (°C)	pH	D.O. (mg/L)	Salinity (ppt)	Signoff
Control	16.4	7.80	8.7	30.7	Test Solution Prep: <u>mm</u>
1%	16.4	7.93	8.2	31.0	New WQ <u>998</u>
10%	16.4	7.89	8.5	30.6	Inoculation Date: <u>7-7-10</u>
25%	16.4	7.91	8.4	30.1	Inoculation Time: <u>1510</u>
50%	16.4	7.96	8.2	29.3	Inoculation Signoff: <u>mm</u>
100%	16.4	8.03	7.6	27.4 28.3	
Meter ID	23	PH14	RD03	EC03	

Day 1					
Treatment	Temperature (°C)	pH	D.O. (mg/L)	Salinity (ppt)	Signoff
Control	16.3				Date: <u>7/8/10</u>
1%	16.3				Signoff: <u>mm</u>
10%	16.3				
25%	16.3				
50%	16.3				
100%	16.3				
Meter ID	23				

Day 2					
Treatment	Temperature (°C)	pH	D.O. (mg/L)	Salinity (ppt)	Signoff
Control	16.2	8.01	8.9	30.8	Termination Signoff: <u>7-9-10</u>
1%	16.2	7.99	9.0	30.5	Termination Date: <u>NB</u>
10%	16.2	8.04	9.1	30.9	Termination Time: <u>1530</u>
25%	16.2	8.09	9.1	30.3	Old WQ: <u>NVS</u>
50%	16.2	8.18	9.1	29.4	
100%	16.2	8.27	8.9	28.2	
Meter ID	23	PH14	RD03	EC05	

CETIS Summary Report

Report Date: 20 Jul-10 18:27 (p 1 of 2)
Test Code: 17-4631-1017/39440

Bivalve Larval Survival and Development Test							Pacific EcoRisk				
Batch ID:	18-8220-2847	Test Type:	Development-Survival				Analyst:	Jason Walker			
Start Date:	07 Jul-10 15:10	Protocol:	ASTM E724-98 (Bivalve)				Diluent:	Diluted Seawater			
Ending Date:	09 Jul-10 15:50	Species:	Mytilus galloprovincialis				Brine:	Crystal Sea			
Duration:	49h	Source:	Dave Guloff				Age:	N/A			
Sample ID:	03-3478-6159	Code:	SRC-2010-04				Client:	ACOE			
Sample Date:	11 Jun-10 08:40	Material:	Elutriate				Project:	16087			
Receive Date:	11 Jun-10 17:00	Source:	San Rafael Channel								
Sample Age:	26d 7h (0.2 °C)	Station:	SRC-2010-04								
Comparison Summary											
Analysis ID	Endpoint	NOEL	LOEL	TOEL	PMSD	TU	Method				
05-5081-9119	Development Rate	25	50	35.4	1.2%	4	Steel Many-One Rank Test				
04-1802-0416	Survival Rate	25	50	35.4	13.3%	4	Steel Many-One Rank Test				
Point Estimate Summary											
Analysis ID	Endpoint	Level	%	95% LCL	95% UCL	TU	Method				
04-2788-1947	Development Rate	EC5	26.3	26.1	26.3	3.81	Linear Interpolation (ICPIN)				
		EC10	27.5	27.3	27.5	3.64					
		EC15	28.8	28.6	28.8	3.48					
		EC20	30	29.8	30	3.33					
		EC25	31.3	31.1	31.3	3.2					
		EC40	35	34.9	35	2.86					
		EC50	37.5	37.4	37.5	2.67					
20-9542-8667	Survival Rate	EC50	35	34.6	35.3	2.86	Trimmed Spearman-Kärber				
Development Rate Summary											
Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
0	Lab Water Contr	5	0.975	0.969	0.981	0.952	0.988	0.00294	0.0161	1.65%	0.0%
0	Site Water	5	0.992	0.989	0.996	0.98	1	0.00155	0.00846	0.85%	-1.83%
1		5	0.986	0.985	0.988	0.981	0.994	0.000948	0.00519	0.53%	-1.21%
10		5	0.984	0.982	0.987	0.978	0.995	0.00127	0.00694	0.71%	-1.0%
25		5	0.983	0.982	0.985	0.978	0.987	0.000678	0.00371	0.38%	-0.87%
50		5	0	0	0	0	0	0	0		100.0%
100		5	0	0	0	0	0	0	0		100.0%
Survival Rate Summary											
Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
0	Lab Water Contr	5	0.907	0.886	0.928	0.863	1	0.0103	0.0564	6.23%	0.0%
0	Site Water	5	0.881	0.864	0.898	0.813	0.918	0.00823	0.0451	5.11%	2.79%
1		5	0.881	0.867	0.896	0.835	0.923	0.00715	0.0392	4.44%	2.79%
10		5	0.897	0.844	0.949	0.67	1	0.0255	0.14	15.6%	1.09%
25		5	0.885	0.858	0.911	0.808	0.995	0.0131	0.072	8.13%	2.42%
50		5	0	0	0	0	0	0	0		100.0%
100		5	0	0	0	0	0	0	0		100.0%

CETIS Summary Report

Report Date:

20 Jul-10 18:27 (p 2 of 2)

Test Code:

17-4631-1017/39440

Bivalve Larval Survival and Development Test						Pacific EcoRisk
Development Rate Detail						
Conc-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Lab Water Contr	0.988	0.952	0.964	0.982	0.987
0	Site Water	1	0.988	0.994	0.98	1
1		0.987	0.981	0.988	0.994	0.982
10		0.984	0.995	0.978	0.987	0.978
25		0.987	0.981	0.978	0.987	0.982
50		0	0	0	0	0
100		0	0	0	0	0
Survival Rate Detail						
Conc-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Lab Water Contr	0.885	0.868	1	0.918	0.863
0	Site Water	0.907	0.918	0.912	0.813	0.857
1		0.846	0.835	0.912	0.89	0.923
10		0.67	1	0.973	0.852	0.989
25		0.808	0.863	0.995	0.846	0.912
50		0	0	0	0	0
100		0	0	0	0	0

CETIS Analytical Report

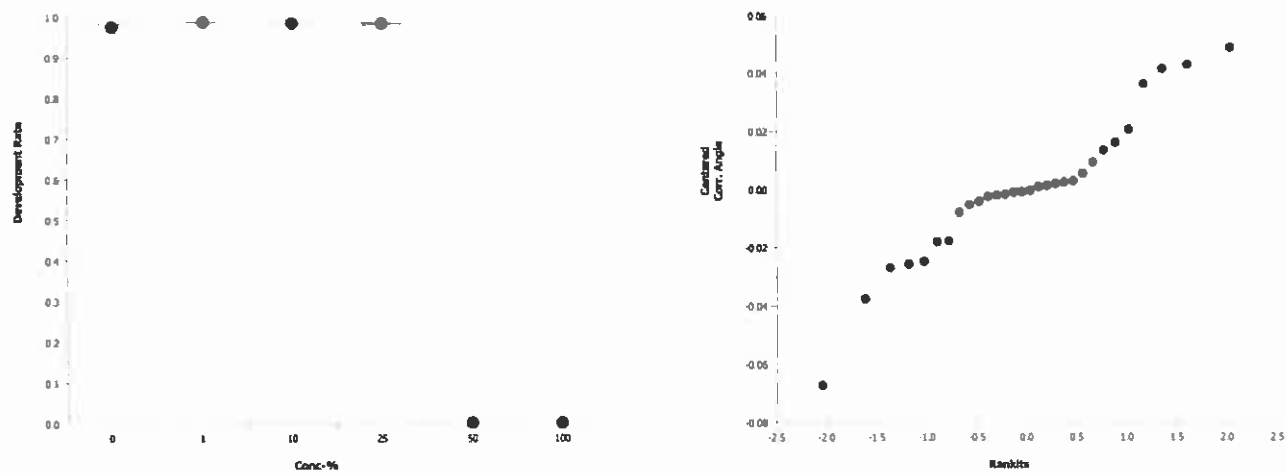
Report Date: 20 Jul-10 18:26 (p 3 of 4)

Test Code: 17-4631-1017/39440

Bivalve Larval Survival and Development Test								Pacific EcoRisk			
Analysis ID: 05-5081-9119		Endpoint: Development Rate		CETIS Version: CETISv1.7.0							
Analyzed: 20 Jul-10 18:26		Analysis: Nonparametric-Control vs Treatments		Official Results: Yes							
Data Transform		Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD		
Angular (Corrected)		0	C > T	Not Run	25	50	35.4	4	1.2%		
Steel Many-One Rank Test											
Control		vs	Conc-%	Test Stat	Critical	Ties	P-Value	Decision(5%)			
Lab Water Control		1	33	16	0	0.9907	Non-Significant Effect				
		10	30	16	0	0.9446	Non-Significant Effect				
		25	27	16	0	0.8003	Non-Significant Effect				
		50*	15	16	0	0.0191	Significant Effect				
		100*	15	16	0	0.0191	Significant Effect				
ANOVA Table											
Source		Sum Squares		Mean Square		DF	F Stat	P-Value	Decision(5%)		
Between		13.08188		2.616376		5	3690	<0.0001	Significant Effect		
Error		0.0170161		0.0007090042		24					
Total		13.0989		2.617085		29					
ANOVA Assumptions											
Attribute		Test		Test Stat	Critical	P-Value	Decision(1%)				
Variances		Bartlett Equality of Variance		37.1	15.1	<0.0001	Unequal Variances				
Distribution		Shapiro-Wilk Normality		0.94		0.0889	Normal Distribution				
Development Rate Summary											
Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
0	Lab Water Contr	5	0.975	0.968	0.981	0.952	0.988	0.00299	0.0161	1.65%	0.0%
1		5	0.986	0.984	0.988	0.981	0.994	0.000964	0.00519	0.53%	-1.21%
10		5	0.984	0.982	0.987	0.978	0.995	0.00129	0.00695	0.71%	-1.0%
25		5	0.983	0.982	0.985	0.978	0.987	0.00069	0.00371	0.38%	-0.87%
50		5	0	0	0	0	0	0	0		100.0%
100		5	0	0	0	0	0	0	0		100.0%
Angular (Corrected) Transformed Summary											
Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
0	Lab Water Cont	5	1.42	1.4	1.44	1.35	1.46	0.00927	0.0499	3.52%	0.0%
1		5	1.46	1.45	1.47	1.43	1.49	0.00445	0.024	1.65%	-2.77%
10		5	1.45	1.44	1.46	1.42	1.5	0.00579	0.0312	2.15%	-2.24%
25		5	1.44	1.44	1.45	1.42	1.46	0.00269	0.0145	1.01%	-1.71%
50		5	0.0405	0.0398	0.0412	0.0386	0.0434	0.000351	0.00189	4.67%	97.1%
100		5	0.0397	0.0389	0.0405	0.0373	0.0421	0.000401	0.00216	5.44%	97.2%

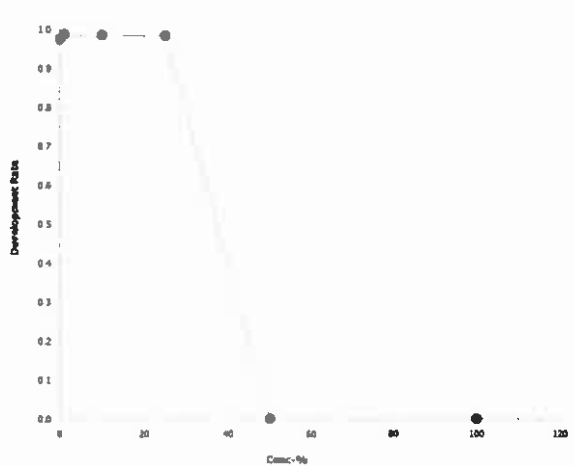
Bivalve Larval Survival and Development Test				Pacific EcoRisk
Analysis ID:	05-5081-9119	Endpoint:	Development Rate	CETIS Version: CETISv1.7.0
Analyzed:	20 Jul-10 18:26	Analysis:	Nonparametric-Control vs Treatments	Official Results: Yes

Graphics



CETIS Analytical Report

Report Date: 20 Jul-10 18:27 (p 1 of 1)
Test Code: 17-4631-1017/39440

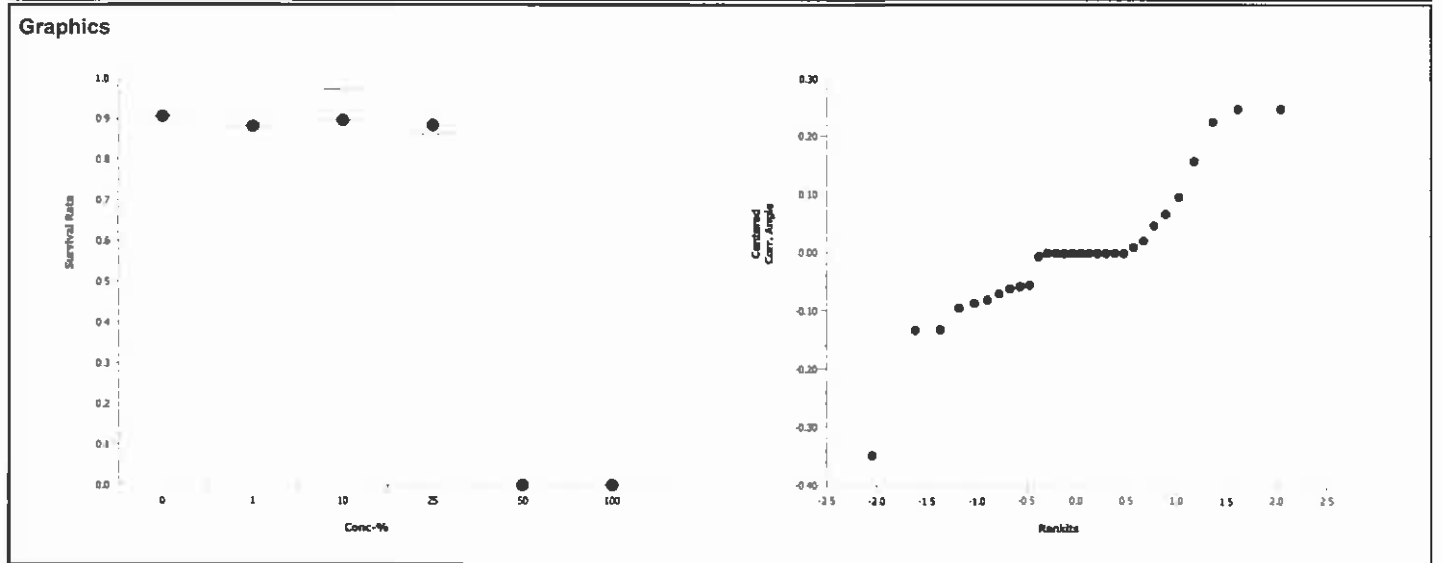
Bivalve Larval Survival and Development Test										Pacific EcoRisk		
Analysis ID: 04-2788-1947		Endpoint: Development Rate		CETIS Version: CETISv1.7.0								
Analyzed: 20 Jul-10 18:26		Analysis: Linear Interpolation (ICPIN)		Official Results: Yes								
Linear Interpolation Options												
X Transform	Y Transform	Seed	Resamples	Exp 95% CL	Method							
Linear	Linear	57951	200	Yes	Two-Point Interpolation							
Point Estimates												
Level	%	95% LCL	95% UCL	TU	95% LCL	95% UCL						
EC5	26.3	26.1	26.3	3.81	3.81	3.84						
EC10	27.5	27.3	27.5	3.64	3.64	3.66						
EC15	28.8	28.6	28.8	3.48	3.48	3.5						
EC20	30	29.8	30	3.33	3.33	3.35						
EC25	31.3	31.1	31.3	3.2	3.2	3.22						
EC40	35	34.9	35	2.86	2.86	2.87						
EC50	37.5	37.4	37.5	2.67	2.67	2.67						
Development Rate Summary			Calculated Variate(A/B)									
Conc-%	Control Type	Count	Mean	Min	Max	Std Err	Std Dev	CV%	Diff%	A	B	
0	Lab Water Contr	5	0.975	0.952	0.988	0.00294	0.0161	1.65%	0.0%	829	851	
1		5	0.986	0.981	0.994	0.000948	0.00519	0.53%	-1.21%	802	813	
10		5	0.984	0.978	0.995	0.00127	0.00695	0.71%	-1.0%	819	832	
25		5	0.983	0.978	0.987	0.000678	0.00371	0.38%	-0.87%	805	819	
50		5	0	0	0	0	0		100.0%	0	766	
100		5	0	0	0	0	0		100.0%	0	800	
Development Rate Detail												
Conc-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5						
0	Lab Water Control	0.988	0.952	0.964	0.982	0.987						
1		0.987	0.981	0.988	0.994	0.982						
10		0.984	0.995	0.978	0.987	0.978						
25		0.987	0.981	0.978	0.987	0.982						
50		0	0	0	0	0						
100		0	0	0	0	0						
Graphics												
												

CETIS Analytical Report

Report Date: 20 Jul-10 18:26 (p 1 of 4)
Test Code: 17-4631-1017/39440

Blvalve Larval Survival and Development Test								Pacific EcoRisk			
Analysis ID: 04-1802-0416		Endpoint: Survival Rate		CETIS Version: CETISv1.7.0							
Analyzed: 20 Jul-10 18:26		Analysis: Nonparametric-Control vs Treatments		Official Results: Yes							
Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD			
Angular (Corrected)	0	C > T	Not Run	25	50	35.4	4	13.3%			
Steel Many-One Rank Test											
Control	vs	Conc-%	Test Stat	Critical	Ties	P-Value	Decision(5%)				
Lab Water Control		1	25	16	0	0.6353	Non-Significant Effect				
		10	27.5	16	1	0.8333	Non-Significant Effect				
		25	22.5	16	1	0.3937	Non-Significant Effect				
		50*	15	16	0	0.0191	Significant Effect				
		100*	15	16	0	0.0191	Significant Effect				
ANOVA Table											
Source	Sum Squares		Mean Square		DF	F Stat	P-Value	Decision(5%)			
Between	10.091		2.0182		5	118	<0.0001	Significant Effect			
Error	0.410012		0.01708383		24						
Total	10.50101		2.035284		29						
ANOVA Assumptions											
Attribute	Test		Test Stat	Critical	P-Value	Decision(1%)					
Variances	Mod Levene Equality of Variance		2.6	4.25	0.0615	Equal Variances					
Distribution	Shapiro-Wilk Normality		0.893		0.0057	Non-normal Distribution					
Survival Rate Summary											
Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
0	Lab Water Contr	5	0.907	0.885	0.928	0.863	1	0.0105	0.0564	6.23%	0.0%
1		5	0.881	0.866	0.896	0.835	0.923	0.00727	0.0392	4.44%	2.79%
10		5	0.897	0.844	0.95	0.67	1	0.026	0.14	15.6%	1.09%
25		5	0.885	0.857	0.912	0.808	0.995	0.0134	0.072	8.13%	2.42%
50		5	0	0	0	0	0	0	0		100.0%
100		5	0	0	0	0	0	0	0		100.0%
Angular (Corrected) Transformed Summary											
Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
0	Lab Water Cont	5	1.29	1.23	1.34	1.19	1.53	0.0265	0.143	11.1%	0.0%
1		5	1.22	1.2	1.25	1.15	1.29	0.0113	0.0607	4.96%	4.9%
10		5	1.31	1.22	1.4	0.959	1.53	0.044	0.237	18.1%	-1.72%
25		5	1.25	1.19	1.31	1.12	1.5	0.0277	0.149	12.0%	2.89%
50		5	0.0371	0.0371	0.0371	0.0371	0.0371	0	0	0.0%	97.1%
100		5	0.0371	0.0371	0.0371	0.0371	0.0371	0	0	0.0%	97.1%

Bivalve Larval Survival and Development Test			Pacific EcoRisk
Analysis ID: 04-1802-0416	Endpoint: Survival Rate	CETIS Version: CETISv1.7.0	
Analyzed: 20 Jul-10 18:26	Analysis: Nonparametric-Control vs Treatments	Official Results: Yes	



CETIS Analytical Report

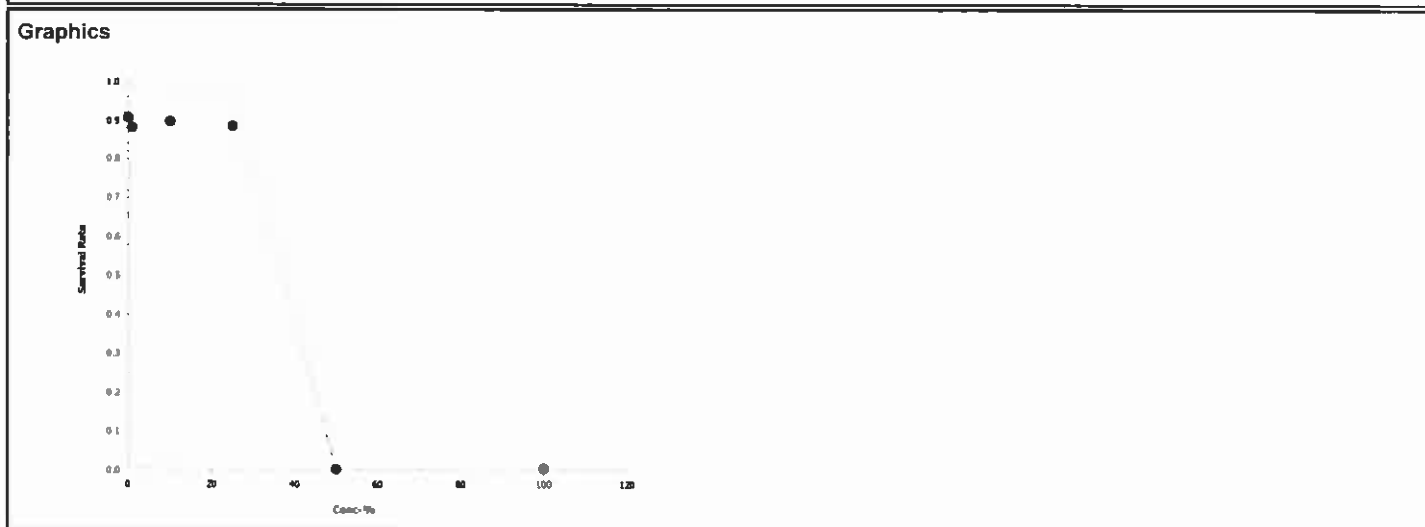
Report Date: 20 Jul-10 18:27 (p 1 of 1)
 Test Code: 17-4631-1017/39440

Bivalve Larval Survival and Development Test				Pacific EcoRisk			
Analysis ID:	20-9542-8667	Endpoint:	Survival Rate	CETIS Version:	CETISv1.7.0		
Analyzed:	20 Jul-10 18:26	Analysis:	Trimmed Spearman-Kärber	Official Results:	Yes		

Trimmed Spearman-Kärber Estimates							
Threshold Option	Threshold	Trim	Mu	Sigma	EC50	95% LCL	95% UCL
Control Threshold	0.0934	1.94%	1.54	0.00208	35	34.6	35.3

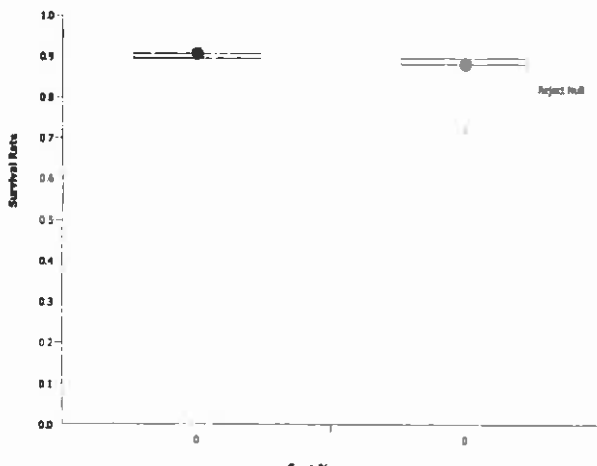
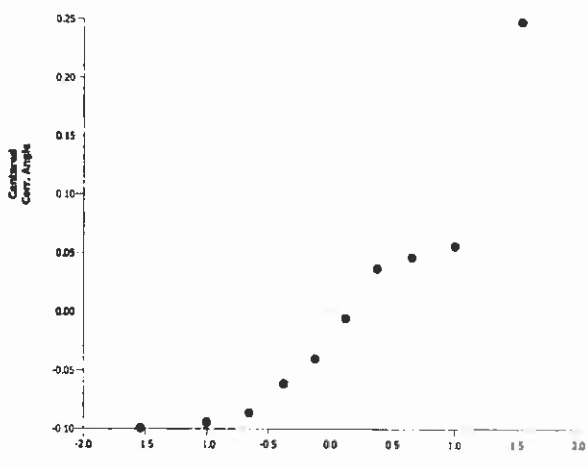
Survival Rate Summary			Calculated Variate(A/B)								
Conc-%	Control Type	Count	Mean	Min	Max	Std Err	Std Dev	CV%	Diff%	A	B
0	Lab Water Contr	5	0.907	0.863	1	0.0103	0.0564	6.23%	0.0%	825	910
1		5	0.881	0.835	0.923	0.00715	0.0392	4.44%	2.79%	802	910
10		5	0.897	0.67	1	0.0255	0.14	15.6%	1.09%	816	910
25		5	0.885	0.808	0.995	0.0131	0.072	8.13%	2.42%	805	910
50		5	0	0	0	0	0		100.0%	0	910
100		5	0	0	0	0	0		100.0%	0	910

Survival Rate Detail						
Conc-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Lab Water Control	0.885	0.868	1	0.918	0.863
1		0.846	0.835	0.912	0.89	0.923
10		0.67	1	0.973	0.852	0.989
25		0.808	0.863	0.995	0.846	0.912
50		0	0	0	0	0
100		0	0	0	0	0



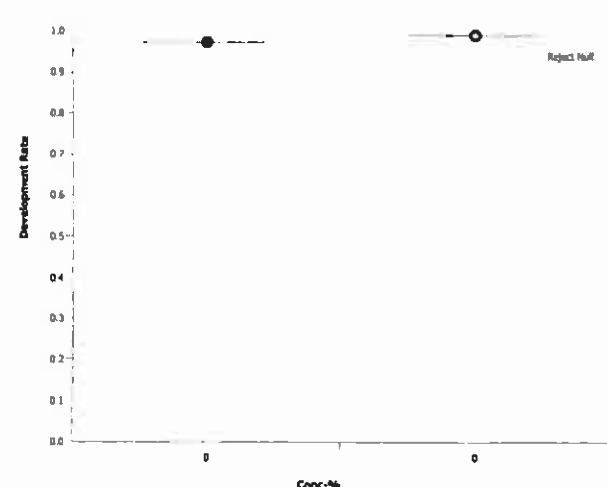
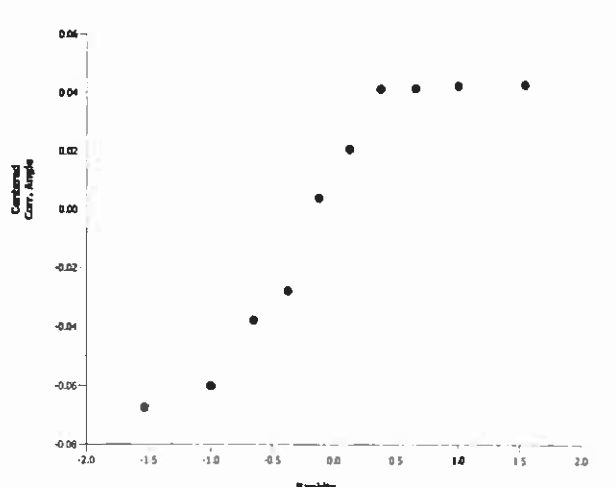
CETIS Analytical Report

Report Date: 20 Jul-10 16:01 (p 2 of 4)
Test Code: 18-6831-4622/39436

Bivalve Larval Survival and Development Test								Pacific EcoRisk			
Analysis ID: 17-3724-4183		Endpoint: Survival Rate		CETIS Version: CETISv1.7.0							
Analyzed: 20 Jul-10 15:59		Analysis: Parametric-Two Sample		Official Results: Yes							
Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD			
Angular (Corrected)	0	C > T	Nol Run	0	>0			7.77%			
Equal Variance t Two-Sample Test											
Control	vs	Control	Test Stat	Critical	MSD	P-Value	Decision(5%)				
Lab Water Control		Site Water	0.88	1.86	0.131	0.2022	Non-Significant Effect				
ANOVA Table											
Source	Sum Squares		Mean Square		DF	F Stat	P-Value	Decision(5%)			
Between	0.009684817		0.009684817		1	0.775	0.4043	Non-Significant Effect			
Error	0.09996058		0.01249507		8						
Total	0.1096454		0.02217989		9						
ANOVA Assumptions											
Attribute	Test		Test Stat	Critical	P-Value	Decision(1%)					
Variances	Variance Ratio F		4.49	23.2	0.1746	Equal Variances					
Distribution	Shapiro-Wilk Normality		0.847		0.0532	Normal Distribution					
Survival Rate Summary											
Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
0	Site Water	5	0.881	0.864	0.898	0.813	0.918	0.00837	0.0451	5.11%	0.0%
0	Lab Water Contr	5	0.907	0.885	0.928	0.863	1	0.0105	0.0564	6.23%	-2.87%
Angular (Corrected) Transformed Summary											
Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
0	Site Water	5	1.22	1.2	1.25	1.12	1.28	0.0125	0.0674	5.51%	0.0%
0	Lab Water Cont	5	1.29	1.23	1.34	1.19	1.53	0.0265	0.143	11.1%	-5.09%
Graphics											
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CETIS Analytical Report

Report Date: 20 Jul-10 16:01 (p 4 of 4)
Test Code: 18-6831-4622/39436

Bivalve Larval Survival and Development Test										Pacific EcoRisk	
Analysis ID: 06-7674-0949		Endpoint: Development Rate		CETIS Version: CETISv1.7.0							
Analyzed: 20 Jul-10 15:57		Analysis: Parametric-Two Sample		Official Results: Yes							
Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD			
Angular (Corrected)	0	C > T	Not Run	0	>0			1.83%			
Equal Variance t Two-Sample Test											
Control	vs	Control	Test Stat	Critical	MSD	P-Value	Decision(5%)				
Lab Water Control		Site Water	-2.43	1.86	0.0556	0.9793	Non-Significant Effect				
ANOVA Table											
Source	Sum Squares		Mean Square		DF	F Stat	P-Value	Decision(5%)			
Between	0.01315582		0.01315582		1	5.89	0.0413	Significant Effect			
Error	0.01785393		0.002231742		8						
Total	0.03100976		0.01538756		9						
ANOVA Assumptions											
Attribute	Test		Test Stat	Critical	P-Value	Decision(1%)					
Variances	Variance Ratio F		1.26	23.2	0.8272	Equal Variances					
Distribution	Shapiro-Wilk Normality		0.849		0.0569	Normal Distribution					
Development Rate Summary											
Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
0	Site Water	5	0.992	0.989	0.996	0.98	1	0.00157	0.00846	0.85%	0.0%
0	Lab Water Contr	5	0.975	0.968	0.981	0.952	0.988	0.00299	0.0161	1.65%	1.8%
Angular (Corrected) Transformed Summary											
Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
0	Site Water	5	1.49	1.47	1.51	1.43	1.53	0.00825	0.0444	2.98%	0.0%
0	Lab Water Cont	5	1.42	1.4	1.44	1.35	1.46	0.00927	0.0499	3.52%	4.87%
Graphics											
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Mytilus sp. Development Toxicity Test Count Data

Client: ACOE - San Rafael Channel
 Test Material: SRC-2010-04
 Test ID #: 39440
 Project #: 16087
 Sample Salinity adjusted with : Crystal Sea Salts

Test Start Date: 7.7.10
 Test End Date: 7-9-10
 Enumeration Date: 7/20/10
 Investigator: JM
 Inoculation Count: 182

Concentration	Replicate	Number of Normal Larvae	Number of Abnormal Larvae	Total Number Larvae	Percent Normal Development	Percent Survival
Control	A	141	2	163	99	88
	B	158	8	146	95	87
	C	186	7	193	96	100
	D	167	3	170	98	92
	E	157	2	159	99	86
1.0%	A	154	2	156	99	85
	B	152	3	155	98	84
	C	166	2	168	99	91
	D	162	1	163	99	89
	E	168	3	171	98	92
10%	A	122	2	124	98	67
	B	185	1	186	99	100
	C	177	4	181	98	97
	D	155	2	157	99	85
	E	180	4	184	98	99
25%	A	147	2	149	99	81
	B	157	3	160	98	86
	C	181	4	185	98	99
	D	154	2	156	99	85
	E	166	3	169	98	91
50%	A	0	146	146	0	0
	B	0	159	159	0	0
	C	0	160	160	0	0
	D	0	133	133	0	0
	E	0	168	168	0	0
100%	A	0	144	144	0	0
	B	0	173	173	0	0
	C	0	162	162	0	0
	D	0	141	141	0	0
	E	0	180	180	0	0

Mytilus sp. Development Toxicity Test Water Chemistry Data

Client: ACOE - San Rafael Channel
 Test Material: SRC-2010-04
 Test ID#: 39440 Project #: 16087
 Test Date: 7-7-10 Randomization: _____
 Sample Salinity adjusted with: Crystal Sea Salts

Organism Log#: 5256 Age: N/A
 Organism Supplier: Corbitt
 Control/Diluent: 30ppt FSW

Day 0					
Treatment	Temperature (°C)	pH	D.O. (mg/L)	Salinity (ppt)	Signoff
Control	16.4	7.80	8.7	30.7	Test Solution Prep: <u>mm</u>
1%	16.4	7.86	8.4	31.6	New WQ: <u>COB</u>
10%	16.4	7.88	8.5	30.6	Inoculation Date: <u>7-7-10</u>
25%	16.4	7.93	8.5	30.1	Inoculation Time: <u>1510</u>
50%	16.4	7.99	8.2	29.2	Inoculation Signoff: <u>mm</u>
100%	16.4	8.07	7.6	27.3 28.4 <u>026</u>	
Meter ID	23	PH14	RDO3	EC03	

Day 1					
Treatment	Temperature (°C)	pH	D.O. (mg/L)	Salinity (ppt)	Signoff
Control	16.3				Date: <u>7/8/10</u>
1%	16.3				Signoff: <u>mm</u>
10%	16.3				
25%	16.3				
50%	16.3				
100%	16.3				
Meter ID	23				

Day 2					
Treatment	Temperature (°C)	pH	D.O. (mg/L)	Salinity (ppt)	Signoff
Control	16.2	8.00	9.0	30.8	Termination Signoff: <u>NB</u>
1%	16.2	7.98	9.0	31.2	Termination Date: <u>7-9-10</u>
10%	16.2	8.03	9.1	30.8	Termination Time: <u>1550</u>
25%	16.2	8.09	9.1	30.3	Old WQ: <u>NVS</u>
50%	16.2	8.17	9.0	29.4	
100%	16.2	8.27	8.6	27.3	
Meter ID	23	PH14	RDO3	EC05	

CETIS Summary Report

Report Date: 21 Jul-10 12:43 (p 1 of 2)

Test Code: 12-0421-4632/39441

Bivalve Larval Survival and Development Test							Pacific EcoRisk				
Batch ID:	18-8220-2847		Test Type:	Development-Survival			Analyst:	Jason Walker			
Start Date:	07 Jul-10 15:10		Protocol:	ASTM E724-98 (Bivalve)			Diluent:	Diluted Seawater			
Ending Date:	09 Jul-10 15:50		Species:	Mytilus galloprovincialis			Brine:	Crystal Sea			
Duration:	49h		Source:	Dave Guloff			Age:	N/A			
Sample ID:	02-1820-9844		Code:	SRC-2010-05			Client:	ACOE			
Sample Date:	08 Jun-10 14:45		Material:	Elutriate			Project:	16087			
Receive Date:	08 Jun-10 19:00		Source:	San Rafael Channel							
Sample Age:	29d 0h (2.4 °C)		Station:	SRC-2010-05							
Comparison Summary											
Analysis ID	Endpoint		NOEL	LOEL	TOEL	PMSD	TU	Method			
05-3669-6983	Development Rate		25	50	35.4	1.42%	4	Steel Many-One Rank Test			
08-7263-6112	Survival Rate		25	50	35.4	6.93%	4	Steel Many-One Rank Test			
Point Estimate Summary											
Analysis ID	Endpoint		Level	%	95% LCL	95% UCL	TU	Method			
00-3150-2275	Development Rate		EC5	26.3	26	26.3	3.81	Linear Interpolation (ICPIN)			
			EC10	27.5	27.2	27.5	3.64				
			EC15	28.8	28.5	28.8	3.48				
			EC20	30	29.8	30	3.33				
			EC25	31.3	31	31.3	3.2				
			EC40	35	34.8	35	2.86				
			EC50	37.5	37.4	37.5	2.67				
00-5965-0086	Survival Rate		EC50	35.1	34.9	35.2	2.85	Trimmed Spearman-Kärber			
Development Rate Summary											
Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
0	Lab Water Contr	5	0.975	0.969	0.981	0.952	0.988	0.00294	0.0161	1.65%	0.0%
0	Site Water	5	0.992	0.989	0.996	0.98	1	0.00155	0.00846	0.85%	-1.83%
1		5	0.989	0.986	0.992	0.974	0.994	0.00153	0.00839	0.85%	-1.45%
10		5	0.978	0.974	0.982	0.963	0.987	0.00177	0.00971	0.99%	-0.35%
25		5	0.988	0.986	0.99	0.981	0.994	0.00108	0.00589	0.6%	-1.37%
50		5	0	0	0	0	0	0	0		100.0%
100		5	0	0	0	0	0	0	0		100.0%
Survival Rate Summary											
Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
0	Lab Water Contr	5	0.907	0.886	0.928	0.863	1	0.0103	0.0564	6.23%	0.0%
0	Site Water	5	0.881	0.864	0.898	0.813	0.918	0.00823	0.0451	5.11%	2.79%
1		5	0.876	0.855	0.897	0.824	0.945	0.0103	0.0565	6.45%	3.39%
10		5	0.885	0.866	0.903	0.841	0.951	0.00894	0.049	5.54%	2.42%
25		5	0.898	0.885	0.911	0.863	0.951	0.00645	0.0353	3.93%	0.97%
50		5	0	0	0	0	0	0	0		100.0%
100		5	0	0	0	0	0	0	0		100.0%

CETIS Summary Report

Report Date:

21 Jul-10 12:43 (p 2 of 2)

Test Code:

12-0421-4632/39441

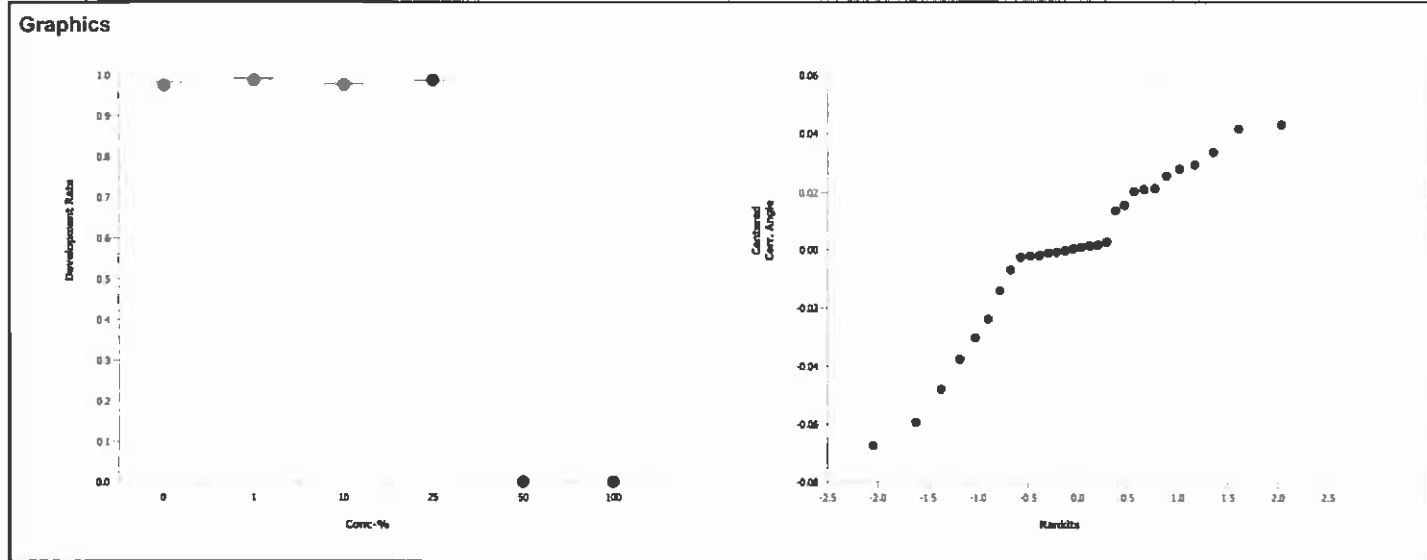
Bivalve Larval Survival and Development Test						Pacific EcoRisk
Development Rate Detail						
Conc-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Lab Water Contr	0.988	0.952	0.964	0.982	0.987
0	Site Water	1	0.988	0.994	0.98	1
1		0.994	0.988	0.993	0.974	0.994
10		0.987	0.982	0.983	0.975	0.963
25		0.983	0.994	0.988	0.981	0.994
50		0	0	0	0	0
100		0	0	0	0	0
Survival Rate Detail						
Conc-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Lab Water Contr	0.885	0.868	1	0.918	0.863
0	Site Water	0.907	0.918	0.912	0.813	0.857
1		0.846	0.929	0.824	0.835	0.945
10		0.857	0.923	0.951	0.841	0.852
25		0.951	0.901	0.907	0.863	0.868
50		0	0	0	0	0
100		0	0	0	0	0

CETIS Analytical Report

Report Date: 20 Jul-10 19:02 (p 3 of 4)
Test Code: 12-0421-4632/39441

Bivalve Larval Survival and Development Test							Pacific EcoRisk				
Analysis ID: 05-3669-6983		Endpoint: Development Rate		CETIS Version: CETISv1.7.0							
Analyzed: 20 Jul-10 19:01		Analysis: Nonparametric-Control vs Treatments		Official Results: Yes							
Data Transform		Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD		
Angular (Corrected)		0	C > T	Not Run	25	50	35.4	4	1.42%		
Steel Many-One Rank Test											
Control	vs	Conc-%	Test Stat	Critical	Ties	P-Value	Decision(5%)				
Lab Water Control	1		37	16	0	0.9996	Non-Significant Effect				
	10		27	16	0	0.8003	Non-Significant Effect				
	25		35	16	0	0.9979	Non-Significant Effect				
	50*		15	16	0	0.0191	Significant Effect				
	100*		15	16	0	0.0191	Significant Effect				
ANOVA Table											
Source	Sum Squares		Mean Square		DF	F Stat	P-Value	Decision(5%)			
Between	13.12266		2.624531		5	2840	<0.0001	Significant Effect			
Error	0.02218976		0.0009245734		24						
Total	13.14485		2.625456		29						
ANOVA Assumptions											
Attribute	Test			Test Stat	Critical	P-Value	Decision(1%)				
Variances	Bartlett Equality of Variance			38.2	15.1	<0.0001	Unequal Variances				
Distribution	Shapiro-Wilk Normality			0.933		0.0603	Normal Distribution				
Development Rate Summary											
Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
0	Lab Water Contr	5	0.975	0.968	0.981	0.952	0.988	0.00299	0.0161	1.65%	0.0%
1		5	0.989	0.986	0.992	0.974	0.994	0.00156	0.00839	0.85%	-1.45%
10		5	0.978	0.974	0.982	0.963	0.987	0.0018	0.00971	0.99%	-0.35%
25		5	0.988	0.986	0.99	0.981	0.994	0.00109	0.00589	0.6%	-1.37%
50		5	0	0	0	0	0	0	0		100.0%
100		5	0	0	0	0	0	0	0		100.0%
Angular (Corrected) Transformed Summary											
Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
0	Lab Water Cont	5	1.42	1.4	1.44	1.35	1.46	0.00927	0.0499	3.52%	0.0%
1		5	1.47	1.46	1.48	1.41	1.49	0.0066	0.0356	2.42%	-3.7%
10		5	1.42	1.41	1.44	1.38	1.46	0.0059	0.0318	2.23%	-0.54%
25		5	1.46	1.45	1.47	1.43	1.49	0.00518	0.0279	1.9%	-3.31%
50		5	0.0426	0.0418	0.0434	0.0404	0.0453	0.00038	0.00205	4.81%	97.0%
100		5	0.0398	0.0393	0.0403	0.0378	0.0411	0.000242	0.0013	3.27%	97.2%

Bivalve Larval Survival and Development Test			Pacific EcoRisk
Analysis ID: 05-3669-6983	Endpoint: Development Rate	CETIS Version: CETISv1.7.0	
Analyzed: 20 Jul-10 19:01	Analysis: Nonparametric-Control vs Treatments	Official Results: Yes	



Report Date: 20 Jul-10 19:02 (p 1 of 1)
Test Code: 12-0421-4632/39441

000-034-163-2 CETIS™ v1.7.0.1 Analyst: JC QA: BK

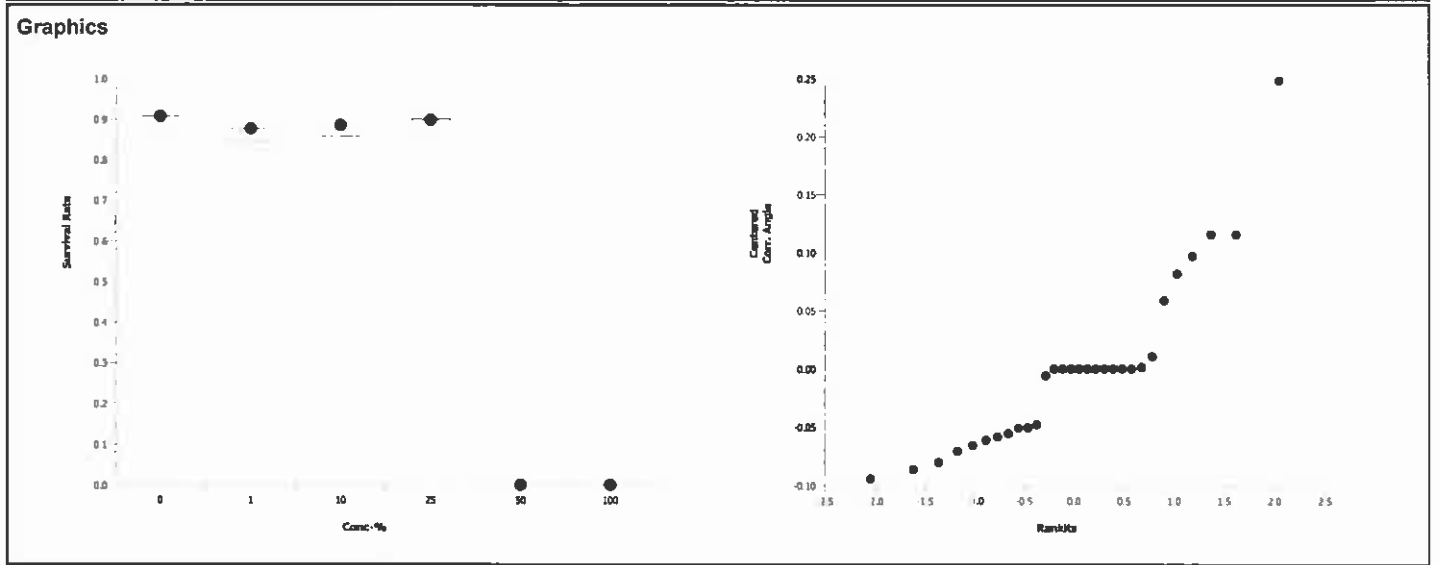
CETIS Analytical Report

Report Date: 20 Jul-10 19:01 (p 1 of 4)

Test Code: 12-0421-4632/39441

Bivalve Larval Survival and Development Test							Pacific EcoRisk				
Analysis ID: 08-7263-6112		Endpoint: Survival Rate		CETIS Version: CETISv1.7.0							
Analyzed: 20 Jul-10 19:01		Analysis: Nonparametric-Control vs Treatments		Official Results: Yes							
Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD			
Angular (Corrected)	0	C > T	Not Run	25	50	35.4	4	6.93%			
Steel Many-One Rank Test											
Control	vs	Conc-%	Test Stat	Critical	Ties	P-Value	Decision(5%)				
Lab Water Control	1		23	16	0	0.4415	Non-Significant Effect				
	10		23	16	0	0.4415	Non-Significant Effect				
	25		27	16	2	0.8003	Non-Significant Effect				
	50*		15	16	0	0.0191	Significant Effect				
	100*		15	16	0	0.0191	Significant Effect				
ANOVA Table											
Source	Sum Squares		Mean Square		DF	F Stat	P-Value	Decision(5%)			
Between	9.759267		1.951853		5	297	<0.0001	Significant Effect			
Error	0.1578731		0.006578048		24						
Total	9.91714		1.958431		29						
ANOVA Assumptions											
Attribute	Test		Test Stat	Critical	P-Value	Decision(1%)					
Variances	Mod Levene Equality of Variance		1.55	4.25	0.2234	Equal Variances					
Distribution	Shapiro-Wilk Normality		0.852		0.0007	Non-normal Distribution					
Survival Rate Summary											
Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
0	Lab Water Contr	5	0.907	0.885	0.928	0.863	1	0.0105	0.0564	6.23%	0.0%
1		5	0.876	0.854	0.897	0.824	0.945	0.0105	0.0565	6.45%	3.39%
10		5	0.885	0.866	0.903	0.841	0.951	0.0091	0.049	5.54%	2.42%
25		5	0.898	0.884	0.911	0.863	0.951	0.00656	0.0353	3.93%	0.97%
50		5	0	0	0	0	0	0	0		100.0%
100		5	0	0	0	0	0	0	0		100.0%
Angular (Corrected) Transformed Summary											
Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
0	Lab Water Cont	5	1.29	1.23	1.34	1.19	1.53	0.0265	0.143	11.1%	0.0%
1		5	1.22	1.18	1.25	1.14	1.33	0.017	0.0914	7.5%	5.21%
10		5	1.23	1.2	1.26	1.16	1.35	0.0153	0.0825	6.7%	4.24%
25		5	1.25	1.23	1.27	1.19	1.35	0.0116	0.0622	4.98%	2.8%
50		5	0.0371	0.0371	0.0371	0.0371	0.0371	0	0	0.0%	97.1%
100		5	0.0371	0.0371	0.0371	0.0371	0.0371	0	0	0.0%	97.1%

Bivalve Larval Survival and Development Test			Pacific EcoRisk
Analysis ID: 08-7263-6112	Endpoint: Survival Rate	CETIS Version: CETISv1.7.0	
Analyzed: 20 Jul-10 19:01	Analysis: Nonparametric-Control vs Treatments	Official Results: Yes	



CETIS Analytical Report

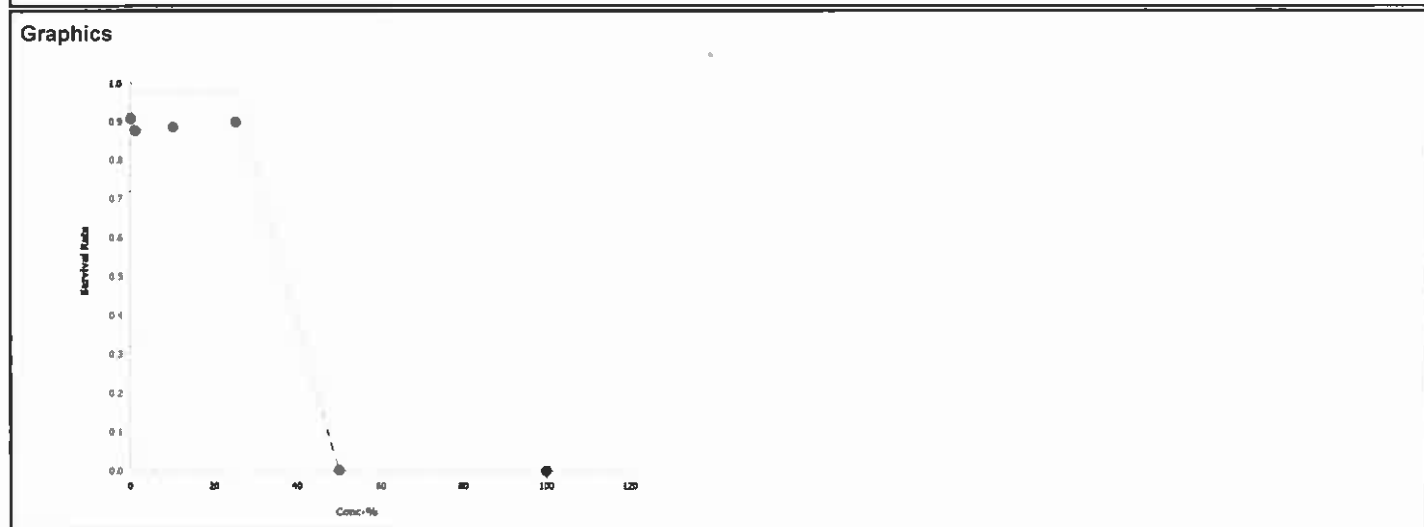
Report Date: 20 Jul-10 19:02 (p 1 of 1)
Test Code: 12-0421-4632/39441

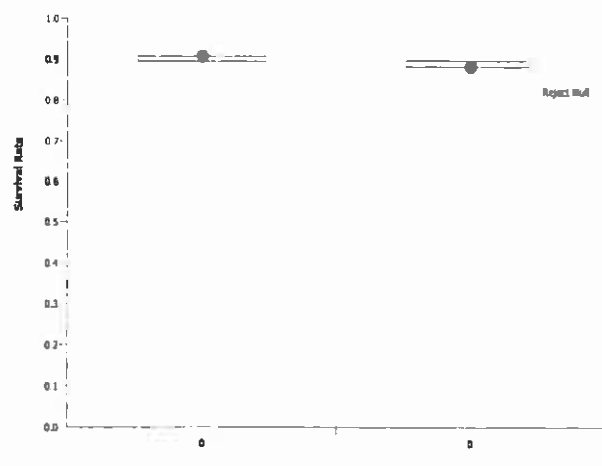
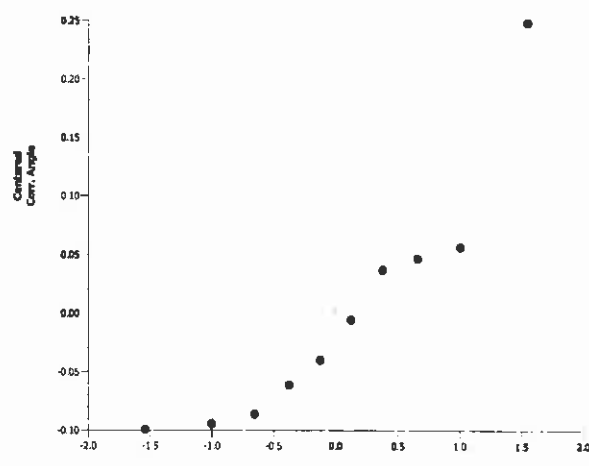
Bivalve Larval Survival and Development Test				Pacific EcoRisk			
Analysis ID:	00-5965-0086	Endpoint:	Survival Rate	CETIS Version:	CETISv1.7.0		
Analyzed:	20 Jul-10 19:01	Analysis:	Trimmed Spearman-Kärber	Official Results:	Yes		

Trimmed Spearman-Kärber Estimates							
Threshold Option	Threshold	Trim	Mu	Sigma	EC50	95% LCL	95% UCL
Control Threshold	0.0934	2.26%	1.54	0.000777	35.1	34.9	35.2

Survival Rate Summary			Calculated Variate(A/B)								
Conc-%	Control Type	Count	Mean	Min	Max	Std Err	Std Dev	CV%	Diff%	A	B
0	Lab Water Contr	5	0.907	0.863	1	0.0103	0.0564	6.23%	0.0%	825	910
1		5	0.876	0.824	0.945	0.0103	0.0565	6.45%	3.39%	797	910
10		5	0.885	0.841	0.951	0.00894	0.049	5.54%	2.42%	805	910
25		5	0.898	0.863	0.951	0.00645	0.0353	3.93%	0.97%	817	910
50		5	0	0	0	0	0		100.0%	0	910
100		5	0	0	0	0	0		100.0%	0	910

Survival Rate Detail						
Conc-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Lab Water Control	0.885	0.868	1	0.918	0.863
1		0.846	0.929	0.824	0.835	0.945
10		0.857	0.923	0.951	0.841	0.852
25		0.951	0.901	0.907	0.863	0.868
50		0	0	0	0	0
100		0	0	0	0	0



Bivalve Larval Survival and Development Test							Pacific EcoRisk				
Analysis ID: 17-3724-4183		Endpoint: Survival Rate		CETIS Version: CETISv1.7.0							
Analyzed: 20 Jul-10 15:59		Analysis: Parametric-Two Sample		Official Results: Yes							
Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD			
Angular (Corrected)	0	C > T	Not Run	0	>0			7.77%			
Equal Variance t Two-Sample Test											
Control	vs	Control	Test Stat	Critical	MSD	P-Value	Decision(5%)				
Lab Water Control		Site Water	0.88	1.86	0.131	0.2022	Non-Significant Effect				
ANOVA Table											
Source	Sum Squares		Mean Square		DF	F Stat	P-Value	Decision(5%)			
Between	0.009684817		0.009684817		1	0.775	0.4043	Non-Significant Effect			
Error	0.09996058		0.01249507		8						
Total	0.1096454		0.02217989		9						
ANOVA Assumptions											
Attribute	Test		Test Stat	Critical	P-Value	Decislon(1%)					
Variances	Variance Ratio F		4.49	23.2	0.1746	Equal Variances					
Distribution	Shapiro-Wilk Normality		0.847		0.0532	Normal Distribution					
Survival Rate Summary											
Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
0	Site Water	5	0.881	0.864	0.898	0.813	0.918	0.00837	0.0451	5.11%	0.0%
0	Lab Water Contr	5	0.907	0.885	0.928	0.863	1	0.0105	0.0564	6.23%	-2.87%
Angular (Corrected) Transformed Summary											
Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
0	Site Water	5	1.22	1.2	1.25	1.12	1.28	0.0125	0.0674	5.51%	0.0%
0	Lab Water Cont	5	1.29	1.23	1.34	1.19	1.53	0.0265	0.143	11.1%	-5.09%
Graphics											
<div><div></div><div></div></div>											

CETIS Analytical Report

Report Date: 20 Jul-10 16:01 (p 4 of 4)
Test Code: 18-6831-4622/39436

Bivalve Larval Survival and Development Test							Pacific EcoRisk																																
Analysis ID: 06-7674-0949		Endpoint: Development Rate		CETIS Version: CETISv1.7.0																																			
Analyzed: 20 Jul-10 15:57		Analysis: Parametric-Two Sample		Official Results: Yes																																			
Data Transform	Zeta	All Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD																															
Angular (Corrected)	0	C > T	Not Run	0	>0			1.83%																															
Equal Variance t Two-Sample Test																																							
Control	vs	Control	Test Stat	Critical	MSD	P-Value	Decision(5%)																																
Lab Water Control		Site Water	-2.43	1.86	0.0556	0.9793	Non-Significant Effect																																
ANOVA Table																																							
Source	Sum Squares		Mean Square		DF	F Stat	P-Value	Decision(5%)																															
Between	0.01315582		0.01315582		1	5.89	0.0413	Significant Effect																															
Error	0.01785393		0.002231742		8																																		
Total	0.03100976		0.01538756		9																																		
ANOVA Assumptions																																							
Attribute	Test		Test Stat	Critical	P-Value	Decision(1%)																																	
Variances	Variance Ratio F		1.26	23.2	0.8272	Equal Variances																																	
Distribution	Shapiro-Wilk Normality		0.849		0.0569	Normal Distribution																																	
Development Rate Summary																																							
Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%																												
0	Site Water	5	0.992	0.989	0.996	0.98	1	0.00157	0.00846	0.85%	0.0%																												
0	Lab Water Contr	5	0.975	0.968	0.981	0.952	0.988	0.00299	0.0161	1.65%	1.8%																												
Angular (Corrected) Transformed Summary																																							
Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%																												
0	Site Water	5	1.49	1.47	1.51	1.43	1.53	0.00825	0.0444	2.98%	0.0%																												
0	Lab Water Cont	5	1.42	1.4	1.44	1.35	1.46	0.00927	0.0499	3.52%	4.87%																												
Graphics																																							
<div><div><table><caption>Development Rate Data</caption><thead><tr><th>Conc-%</th><th>Mean</th><th>95% LCL</th><th>95% UCL</th></tr></thead><tbody><tr><td>0</td><td>0.992</td><td>0.989</td><td>0.996</td></tr><tr><td>1</td><td>0.975</td><td>0.968</td><td>0.981</td></tr></tbody></table></div><div><table><caption>Transformed Conc. Angle Data</caption><thead><tr><th>Rankits</th><th>Transformed Conc. Angle</th></tr></thead><tbody><tr><td>-1.5</td><td>-0.055</td></tr><tr><td>-1.0</td><td>-0.060</td></tr><tr><td>-0.5</td><td>-0.038</td></tr><tr><td>0.0</td><td>0.005</td></tr><tr><td>0.5</td><td>0.020</td></tr><tr><td>1.0</td><td>0.040</td></tr><tr><td>1.5</td><td>0.042</td></tr></tbody></table></div></div>												Conc-%	Mean	95% LCL	95% UCL	0	0.992	0.989	0.996	1	0.975	0.968	0.981	Rankits	Transformed Conc. Angle	-1.5	-0.055	-1.0	-0.060	-0.5	-0.038	0.0	0.005	0.5	0.020	1.0	0.040	1.5	0.042
Conc-%	Mean	95% LCL	95% UCL																																				
0	0.992	0.989	0.996																																				
1	0.975	0.968	0.981																																				
Rankits	Transformed Conc. Angle																																						
-1.5	-0.055																																						
-1.0	-0.060																																						
-0.5	-0.038																																						
0.0	0.005																																						
0.5	0.020																																						
1.0	0.040																																						
1.5	0.042																																						

Mytilus sp. Development Toxicity Test Count Data

Client: ACOE - San Rafael Channel
 Test Material: SRC-2010-05
 Test ID #: 39441
 Project #: 16087
 Sample Salinity adjusted with: Crystal Sea Salts

Test Start Date: 7-7-10
 Test End Date: 7-9-10
 Enumeration Date: 7/20/10 10 am
 Investigator: Jm
 Inoculation Count: 182

Concentration	Replicate	Number of Normal Larvae	Number of Abnormal Larvae	Total Number Larvae	Percent Normal Development	Percent Survival
Control	A	161	2	163	99	88
	B	158	8	166	95	87
	C	186	7	193	96	100
	D	167	3	170	98	92
	E	157	2	159	99	86
1.0%	A	154	1	155	99	85
	B	169	2	171	99	93
	C	150	1	151	99	82
	D	152	4	156	97	84
	E	172	1	173	99	95
10%	A	156	2	158	99	86
	B	168	3	171	98	92
	C	173	3	176 ^{gm}	98	95
	D	153	4	157	98	84
	E	165	6	161	99 ⁹⁶	85
25%	A	173	3	176	98	95
	B	164	1	165	99	90
	C	165	2	167	99	91
	D	157	3	160	98	86
	E	158	1	159	99	87
50%	A	0	122	122	0	0
	B	0	153	153	0	0
	C	0	144	144	0	0
	D	0	146	146	0	0
	E	0	128	128	0	0
100%	A	0	175	175	0	0
	B	0	151	151	0	0
	C	0	161	161	0	0
	D	0	148	148	0	0
	E	0	155	155	0	0

Mytilus sp. Development Toxicity Test Water Chemistry Data

Client: ACOE - San Rafael Channel
 Test Material: SRC-2010-05
 Test ID#: 39441 Project #: 16087
 Test Date: 7.7.10 Randomization: —
 Sample Salinity adjusted with: Crystal Sea Salts

Organism Log#: 3286 Age: N/A
 Organism Supplier: Cutler
 Control/Diluent: 30ppt FSW

Day 0					
Treatment	Temperature (°C)	pH	D.O. (mg/L)	Salinity (ppt)	Signoff
Control	16.4	7.80	8.7	30.7	Test Solution Prep. <u>mm</u>
1%	16.4	7.93	8.1	31.0	New WQ: <u>008</u>
10%	16.4	7.89	8.5	30.7	Inoculation Date: <u>7-7-10</u>
25%	16.4	7.95	8.4	30.2	Inoculation Time: <u>1510</u>
50%	16.4	8.01	8.1	29.5	Inoculation Signoff: <u>mm</u>
100%	16.4	8.07	7.8 7.6	28.0	
Meter ID	23	PH14	RD03	EC03	

Day 1					
Treatment	Temperature (°C)	pH	D.O. (mg/L)	Salinity (ppt)	Signoff
Control	16.3				Date: <u>7/8/10</u>
1%	16.3				Signoff: <u>mm</u>
10%	16.3				
25%	16.3				
50%	16.3				
100%	16.3				
Meter ID	23				

Day 2					
Treatment	Temperature (°C)	pH	D.O. (mg/L)	Salinity (ppt)	Signoff
Control	16.2	8.00	8.8	31.1	Termination Signoff: <u>AB</u>
1%	16.2	8.01	8.9	31.0	Termination Date: <u>7-9-10</u>
10%	16.2	8.08	9.1	31.0	Termination Time: <u>1550</u>
25%	16.2	8.17	9.1	30.5	Old WQ: <u>NVS</u>
50%	16.2	8.27	9.0	29.7	
100%	16.2	8.40	9.0	28.2	
Meter ID	23	PH14	RD03	EC05	

CETIS Summary Report

Report Date: 21 Jul-10 12:42 (p 1 of 2)
 Test Code: 06-8490-2457/39442

Bivalve Larval Survival and Development Test							Pacific EcoRisk				
Batch ID:	18-8220-2847		Test Type:		Development-Survival		Analyst:	Jason Walker			
Start Date:	07 Jul-10 15:10		Protocol:		ASTM E724-98 (Bivalve)		Diluent:	Diluted Seawater			
Ending Date:	09 Jul-10 15:50		Species:		Mytilus galloprovincialis		Brine:	Crystal Sea			
Duration:	49h		Source:		Dave Gutoff		Age:	N/A			
Sample ID:	15-6585-2712		Code:		SRC-2010-06		Client:	ACOE			
Sample Date:	09 Jun-10 15:30		Material:		Elutriate		Project:	16087			
Receive Date:	09 Jun-10 19:00		Source:		San Rafael Channel						
Sample Age:	28d (3.7 °C)		Station:		SRC-2010-06						
Comparison Summary											
Analysis ID	Endpoint	NOEL	LOEL	TOEL	PMSD	TU	Method				
00-7563-4510	Development Rate	25	50	35.4	1.82%	4	Steel Many-One Rank Test				
02-5291-4165	Survival Rate	25	50	35.4	13.2%	4	Dunnett's Multiple Comparison Test				
Point Estimate Summary											
Analysis ID	Endpoint	Level	%	95% LCL	95% UCL	TU	Method				
10-2774-7116	Development Rate	EC5	26.3	26.1	26.3	3.81	Linear Interpolation (ICPIN)				
		EC10	27.5	27.3	27.5	3.64					
		EC15	28.8	28.6	28.8	3.48					
		EC20	30	29.9	30	3.33					
		EC25	31.3	31.1	31.3	3.2					
		EC40	35	34.9	35	2.86					
		EC50	37.5	37.4	37.5	2.67					
02-2778-1281	Survival Rate	EC50	34.8	34.6	35.1	2.87	Spearman-Kärber				
Development Rate Summary											
Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
0	Lab Water Contr	5	0.975	0.969	0.981	0.952	0.988	0.00294	0.0161	1.65%	0.0%
0	Site Water	5	0.992	0.989	0.996	0.98	1	0.00155	0.00846	0.85%	-1.83%
1		5	0.983	0.979	0.987	0.969	0.994	0.00201	0.011	1.12%	-0.83%
10		5	0.982	0.979	0.986	0.968	0.994	0.00185	0.0101	1.03%	-0.8%
25		5	0.985	0.982	0.989	0.975	1	0.00176	0.00966	0.98%	-1.1%
50		5	0	0	0	0	0	0	0		100.0%
100		5	0	0	0	0	0	0	0		100.0%
Survival Rate Summary											
Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
0	Lab Water Contr	5	0.907	0.886	0.928	0.863	1	0.0103	0.0564	6.23%	0.0%
0	Site Water	5	0.881	0.864	0.898	0.813	0.918	0.00823	0.0451	5.11%	2.79%
1		5	0.908	0.876	0.94	0.797	0.995	0.0156	0.0852	9.39%	-0.12%
10		5	0.938	0.912	0.965	0.835	1	0.013	0.0712	7.58%	-3.52%
25		5	0.901	0.875	0.927	0.841	1	0.0125	0.0687	7.63%	0.61%
50		5	0	0	0	0	0	0	0		100.0%
100		5	0	0	0	0	0	0	0		100.0%

CETIS Summary Report

Report Date:

21 Jul-10 12:42 (p 2 of 2)

Test Code:

06-8490-2457/39442

Bivalve Larval Survival and Development Test						Pacific EcoRisk
Development Rate Detail						
Conc-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Lab Water Contr	0.988	0.952	0.964	0.982	0.987
0	Site Water	1	0.988	0.994	0.98	1
1		0.973	0.994	0.988	0.969	0.989
10		0.989	0.978	0.982	0.994	0.968
25		0.981	1	0.99	0.975	0.981
50		0	0	0	0	0
100		0	0	0	0	0
Survival Rate Detail						
Conc-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Lab Water Contr	0.885	0.868	1	0.918	0.863
0	Site Water	0.907	0.918	0.912	0.813	0.857
1		0.797	0.989	0.901	0.857	0.995
10		1	0.995	0.896	0.967	0.835
25		0.841	0.945	1	0.868	0.852
50		0	0	0	0	0
100		0	0	0	0	0

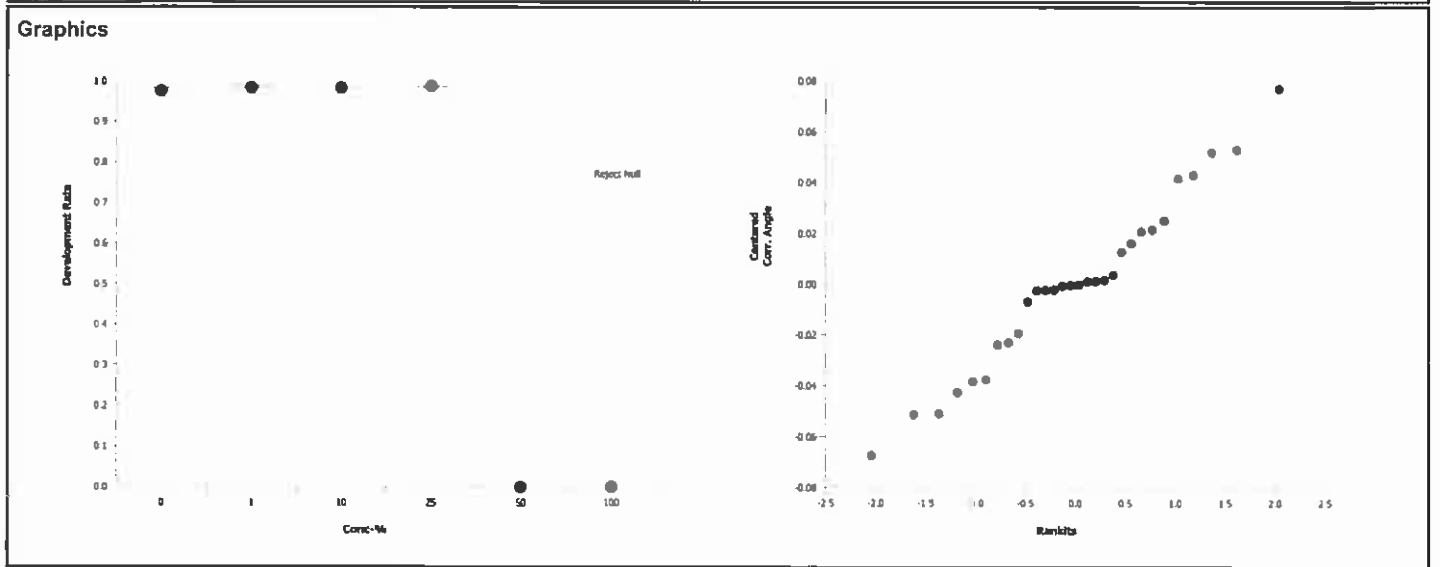


CETIS Analytical Report

Report Date: 21 Jul-10 12:40 (p 3 of 4)
Test Code: 06-8490-2457/39442

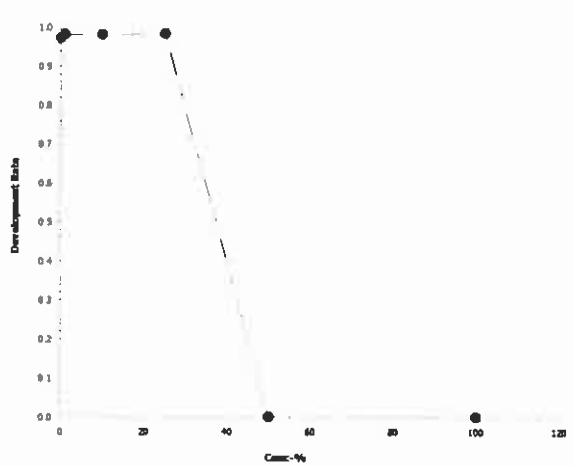
Bivalve Larval Survival and Development Test							Pacific EcoRisk				
Analysis ID: 00-7563-4510		Endpoint: Development Rate		CETIS Version: CETISv1.7.0							
Analyzed: 21 Jul-10 12:40		Analysis: Nonparametric-Control vs Treatments		Official Results: Yes							
Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD			
Angular (Corrected)	0	C > T	Not Run	25	50	35.4	4	1.82%			
Steel Many-One Rank Test											
Control	vs	Conc-%	Test Stat	Critical	Ties	P-Value	Decision(5%)				
Lab Water Control	1		34	16	0	0.9954	Non-Significant Effect				
	10		31	16	0	0.9676	Non-Significant Effect				
	25		31	16	0	0.9676	Non-Significant Effect				
	50*		15	16	0	0.0191	Significant Effect				
	100*		15	16	0	0.0191	Significant Effect				
ANOVA Table											
Source	Sum Squares		Mean Square		DF	F Stat	P-Value	Decision(5%)			
Between	13.04121		2.608241		5	1900	<0.0001	Significant Effect			
Error	0.03297758		0.001374066		24						
Total	13.07418		2.609615		29						
ANOVA Assumptions											
Attribute	Test		Test Stat	Critical	P-Value	Declslon(1%)					
Variances	Bartlett Equality of Variance		36.8	15.1	<0.0001	Unequal Variances					
Distribution	Shapiro-Wilk Normality		0.974		0.6653	Normal Distribution					
Development Rate Summary											
Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
0	Lab Water Contr	5	0.975	0.968	0.981	0.952	0.988	0.00299	0.0161	1.65%	0.0%
1		5	0.983	0.979	0.987	0.969	0.994	0.00205	0.011	1.12%	-0.83%
10		5	0.982	0.979	0.986	0.968	0.994	0.00188	0.0101	1.03%	-0.8%
25		5	0.985	0.982	0.989	0.975	1	0.00179	0.00966	0.98%	-1.1%
50		5	0	0	0	0	0	0	0		100.0%
100		5	0	0	0	0	0	0	0		100.0%
Angular (Corrected) Transformed Summary											
Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
0	Lab Water Cont	5	1.42	1.4	1.44	1.35	1.46	0.00927	0.0499	3.52%	0.0%
1		5	1.44	1.43	1.46	1.39	1.5	0.00803	0.0432	2.99%	-1.96%
10		5	1.44	1.43	1.46	1.39	1.5	0.00747	0.0403	2.79%	-1.83%
25		5	1.46	1.44	1.47	1.41	1.53	0.00882	0.0475	3.26%	-2.74%
50		5	0.0429	0.0419	0.0439	0.0404	0.0466	0.000476	0.00257	5.98%	97.0%
100		5	0.0403	0.0397	0.0409	0.038	0.042	0.000292	0.00157	3.91%	97.2%

Bivalve Larval Survival and Development Test			Pacific EcoRisk
Analysis ID: 00-7563-4510	Endpoint: Development Rate	CETIS Version: CETISv1.7.0	
Analyzed: 21 Jul-10 12:40	Analysis: Nonparametric-Control vs Treatments	Official Results: Yes	



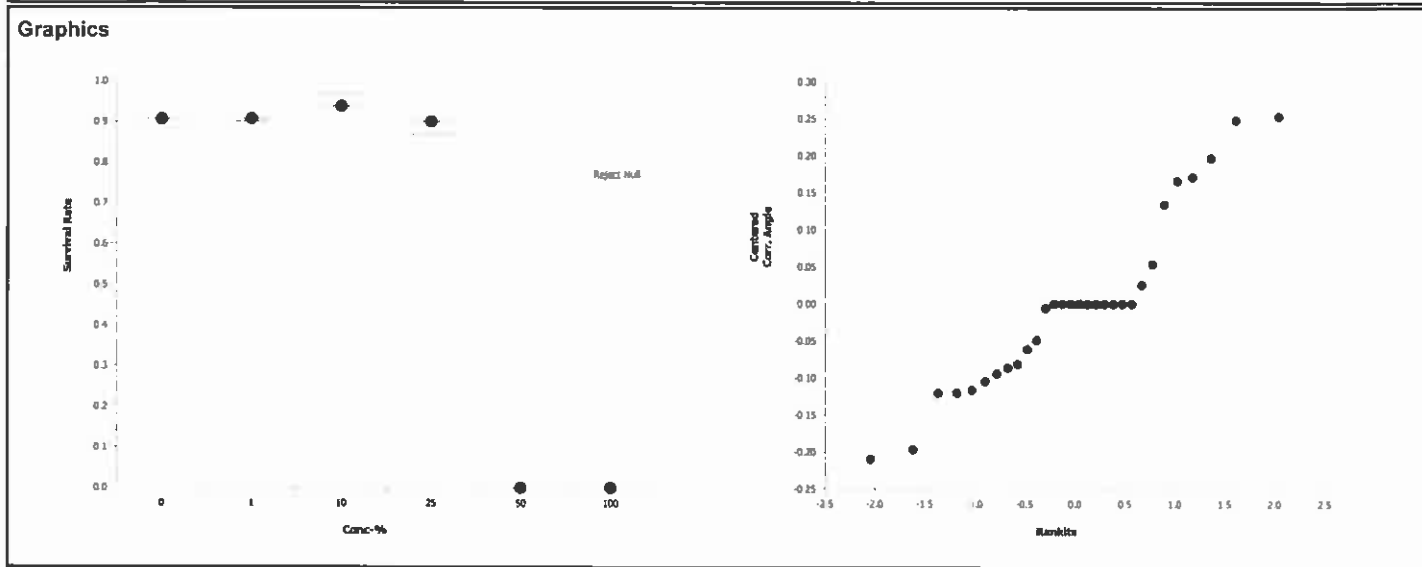
CETIS Analytical Report

Report Date: 21 Jul-10 12:40 (p 1 of 1)
 Test Code: 06-8490-2457/39442

Bivalve Larval Survival and Development Test										Pacific EcoRisk		
Analysis ID: 10-2774-7116		Endpoint: Development Rate				CETIS Version: CETISv1.7.0						
Analyzed: 21 Jul-10 12:40		Analysis: Linear Interpolation (ICPIN)				Official Results: Yes						
Linear Interpolation Options												
X Transform	Y Transform	Seed	Resamples	Exp 95% CL	Method							
Linear	Linear	57951	200	Yes	Two-Point Interpolation							
Point Estimates												
Level	%	95% LCL	95% UCL	TU	95% LCL	95% UCL						
EC5	26.3	26.1	26.3	3.81	3.81	3.84						
EC10	27.5	27.3	27.5	3.64	3.64	3.66						
EC15	28.8	28.6	28.8	3.48	3.48	3.5						
EC20	30	29.9	30	3.33	3.33	3.35						
EC25	31.3	31.1	31.3	3.2	3.2	3.21						
EC40	35	34.9	35	2.86	2.86	2.87						
EC50	37.5	37.4	37.5	2.67	2.67	2.67						
Development Rate Summary				Calculated Variate(A/B)								
Conc-%	Control Type	Count	Mean	Min	Max	Std Err	Std Dev	CV%	Diff%	A	B	
0	Lab Water Contr	5	0.975	0.952	0.988	0.00294	0.0161	1.65%	0.0%	829	851	
1		5	0.983	0.969	0.994	0.00201	0.011	1.12%	-0.83%	826	840	
10		5	0.982	0.968	0.994	0.00185	0.0101	1.03%	-0.8%	859	874	
25		5	0.985	0.975	1	0.00176	0.00966	0.98%	-1.1%	828	840	
50		5	0	0	0	0	0		100.0%	0	686	
100		5	0	0	0	0	0		100.0%	0	774	
Development Rate Detail												
Conc-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5						
0	Lab Water Control	0.988	0.952	0.964	0.982	0.987						
1		0.973	0.994	0.988	0.969	0.989						
10		0.989	0.978	0.982	0.994	0.968						
25		0.981	1	0.99	0.975	0.981						
50		0	0	0	0	0						
100		0	0	0	0	0						
Graphics												
												

Bivalve Larval Survival and Development Test							Pacific EcoRisk				
Analysis ID: 02-5291-4165		Endpoint: Survival Rate		CETIS Version: CETISv1.7.0							
Analyzed: 21 Jul-10 12:40		Analysis: Parametric-Control vs Treatments		Official Results: Yes							
Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD			
Angular (Corrected)	0	C > T	Not Run	25	50	35.4	4	13.2%			
Dunnett's Multiple Comparison Test											
Control	vs	Conc-%	Test Stat	Critical	MSD	P-Value	Decision(5%)				
Lab Water Control	1		-0.174	2.36	0.195	0.8795	Non-Significant Effect				
	10		-0.934	2.36	0.195	0.9800	Non-Significant Effect				
	25		0.061	2.36	0.195	0.8147	Non-Significant Effect				
	50*		15.1	2.36	0.195	<0.0001	Significant Effect				
	100*		15.1	2.36	0.195	<0.0001	Significant Effect				
ANOVA Table											
Source	Sum Squares		Mean Square		DF	F Stat	P-Value	Decision(5%)			
Between	10.77557		2.155115		5	127	<0.0001	Significant Effect			
Error	0.4084326		0.01701803		24						
Total	11.18401		2.172133		29						
ANOVA Assumptions											
Attribute	Test			Test Stat	Critical	P-Value	Decision(1%)				
Variances	Mod Levene Equality of Variance			2.9	4.25	0.0429	Equal Variances				
Distribution	Shapiro-Wilk Normality			0.924		0.0345	Normal Distribution				
Survival Rate Summary											
Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
0	Lab Water Contr	5	0.907	0.885	0.928	0.863	1	0.0105	0.0564	6.23%	0.0%
1		5	0.908	0.875	0.94	0.797	0.995	0.0158	0.0852	9.39%	-0.12%
10		5	0.938	0.911	0.966	0.835	1	0.0132	0.0712	7.58%	-3.52%
25		5	0.901	0.875	0.927	0.841	1	0.0128	0.0687	7.63%	0.61%
50		5	0	0	0	0	0	0	0		100.0%
100		5	0	0	0	0	0	0	0		100.0%
Angular (Corrected) Transformed Summary											
Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
0	Lab Water Cont	5	1.29	1.23	1.34	1.19	1.53	0.0265	0.143	11.1%	0.0%
1		5	1.3	1.23	1.37	1.1	1.5	0.0323	0.174	13.4%	-1.11%
10		5	1.36	1.3	1.42	1.15	1.53	0.0303	0.163	12.0%	-5.99%
25		5	1.28	1.22	1.34	1.16	1.53	0.0292	0.157	12.3%	0.39%
50		5	0.0371	0.0371	0.0371	0.0371	0.0371	0	0	0.0%	97.1%
100		5	0.0371	0.0371	0.0371	0.0371	0.0371	0	0	0.0%	97.1%

Bivalve Larval Survival and Development Test			Pacific EcoRisk
Analysis ID: 02-5291-4165	Endpoint: Survival Rate	CETIS Version: CETISv1.7.0	
Analyzed: 21 Jul-10 12:40	Analysis: Parametric-Control vs Treatments	Official Results: Yes	



CETIS Analytical Report

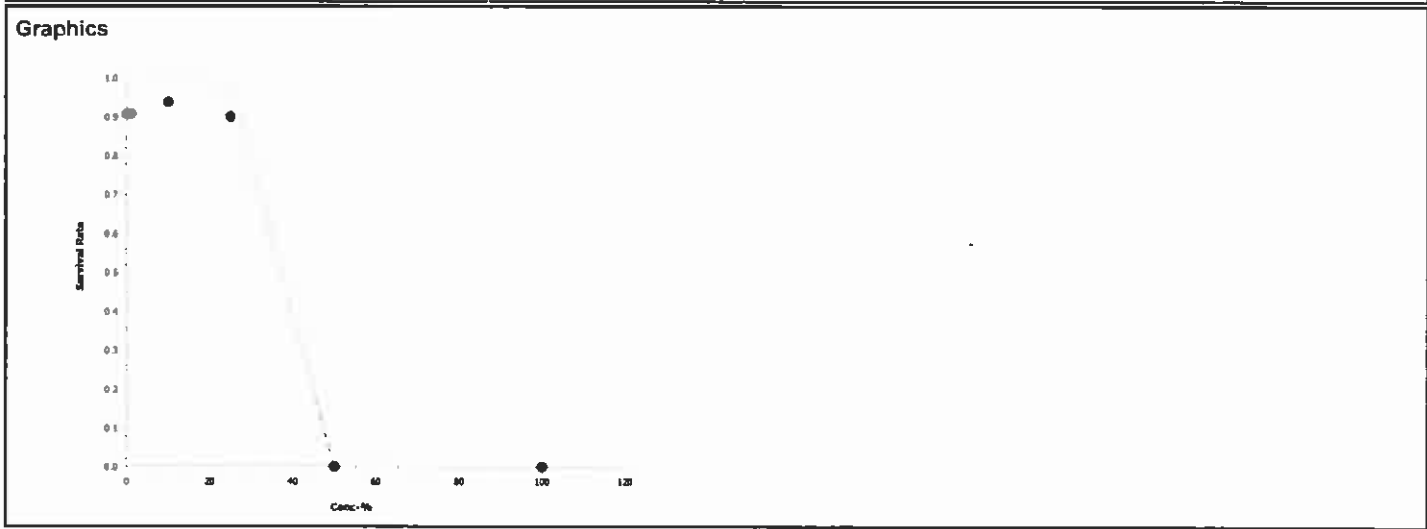
Report Date: 21 Jul-10 12:40 (p 1 of 1)
 Test Code: 06-8490-2457/39442

Bivalve Larval Survival and Development Test				Pacific EcoRisk			
Analysis ID:	02-2778-1281	Endpoint:	Survival Rate	CETIS Version:	CETISv1.7.0		
Analyzed:	21 Jul-10 12:40	Analysis:	Untrimmed Spearman-Kärber	Official Results:	Yes		

Spearman-Kärber Estimates							
Threshold Option	Threshold	Trim	Mu	Sigma	EC50	95% LCL	95% UCL
Control Threshold	0.0934	0.00%	1.54	0.00154	34.8	34.6	35.1

Survival Rate Summary			Calculated Variate(A/B)								
Conc-%	Control Type	Count	Mean	Min	Max	Std Err	Std Dev	CV%	Diff%	A	B
0	Lab Water Contr	5	0.907	0.863	1	0.0103	0.0564	6.23%	0.0%	825	910
1		5	0.908	0.797	0.995	0.0156	0.0852	9.39%	-0.12%	826	910
10		5	0.938	0.835	1	0.013	0.0712	7.58%	-3.52%	854	910
25		5	0.901	0.841	1	0.0125	0.0687	7.63%	0.61%	820	910
50		5	0	0	0	0	0		100.0%	0	910
100		5	0	0	0	0	0		100.0%	0	910

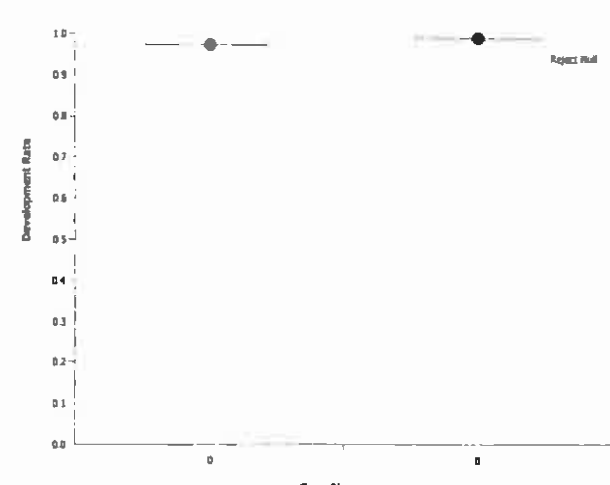
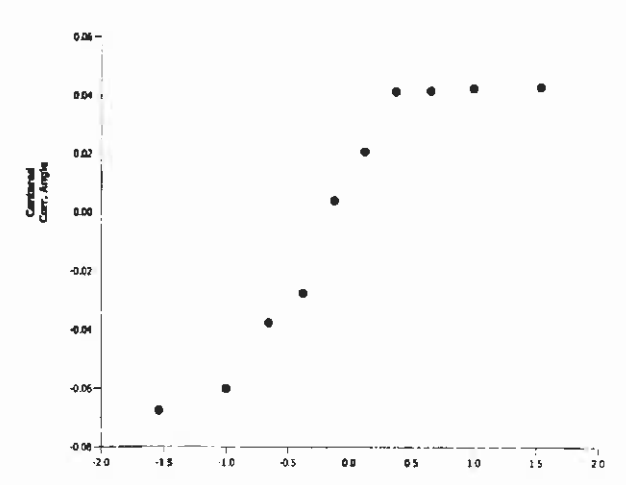
Survival Rate Detail						
Conc-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Lab Water Control	0.885	0.868	1	0.918	0.863
1		0.797	0.989	0.901	0.857	0.995
10		1	0.995	0.896	0.967	0.835
25		0.841	0.945	1	0.868	0.852
50		0	0	0	0	0
100		0	0	0	0	0

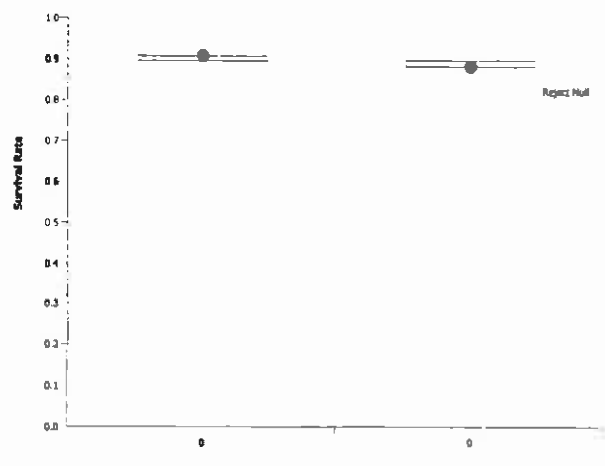
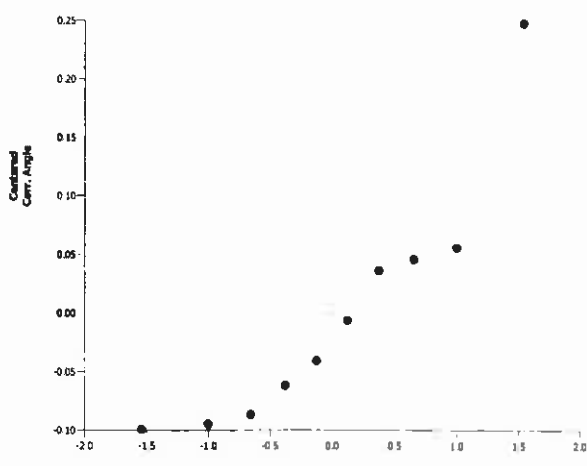


CETIS Analytical Report

Report Date: 20 Jul-10 16:01 (p 4 of 4)

Test Code: 18-6831-4622/39436

Bilvalve Larval Survival and Development Test								Pacific EcoRisk			
Analysis ID: 06-7674-0949		Endpoint: Development Rate		CETIS Version: CETISv1.7.0							
Analyzed: 20 Jul-10 15:57		Analysis: Parametric-Two Sample		Official Results: Yes							
Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD			
Angular (Corrected)	0	C > T	Not Run	0	>0			1.83%			
Equal Variance t Two-Sample Test											
Control	vs	Control	Test Stat	Critical	MSD	P-Value	Decision(5%)				
Lab Water Control		Site Water	-2.43	1.86	0.0556	0.9793	Non-Significant Effect				
ANOVA Table											
Source	Sum Squares		Mean Square		DF	F Stat	P-Value	Decision(5%)			
Between	0.01315582		0.01315582		1	5.89	0.0413	Significant Effect			
Error	0.01785393		0.002231742		8						
Total	0.03100976		0.01538756		9						
ANOVA Assumptions											
Attribute	Test		Test Stat	Critical	P-Value	Decision(1%)					
Variances	Variance Ratio F		1.26	23.2	0.8272	Equal Variances					
Distribution	Shapiro-Wilk Normality		0.849		0.0569	Normal Distribution					
Development Rate Summary											
Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
0	Site Water	5	0.992	0.989	0.996	0.98	1	0.00157	0.00846	0.85%	0.0%
0	Lab Water Contr	5	0.975	0.968	0.981	0.952	0.988	0.00299	0.0161	1.65%	1.8%
Angular (Corrected) Transformed Summary											
Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
0	Site Water	5	1.49	1.47	1.51	1.43	1.53	0.00825	0.0444	2.98%	0.0%
0	Lab Water Cont	5	1.42	1.4	1.44	1.35	1.46	0.00927	0.0499	3.52%	4.87%
Graphics											
<div><div></div><div></div></div>											

Bivalve Larval Survival and Development Test								Pacific EcoRisk			
Analysis ID: 17-3724-4183		Endpoint: Survival Rate		CETIS Version: CETISv1.7.0							
Analyzed: 20 Jul-10 15:59		Analysis: Parametric-Two Sample		Official Results: Yes							
Data Transform		Zeta	Alt Hyp	Monte Carlo		NOEL	LOEL	TOEL	TU	PMSD	
Angular (Corrected)		0	C > T	Not Run		0	>0			7.77%	
Equal Variance t Two-Sample Test											
Control vs Control		Test Stat		Critical	MSD	P-Value	Decision(5%)				
Lab Water Control Site Water		0.88		1.86	0.131	0.2022	Non-Significant Effect				
ANOVA Table											
Source		Sum Squares		Mean Square		DF	F Stat	P-Value	Decision(5%)		
Between		0.009684817		0.009684817		1	0.775	0.4043	Non-Significant Effect		
Error		0.09996058		0.01249507		8					
Total		0.1096454		0.02217989		9					
ANOVA Assumptions											
Attribute		Test		Test Stat		Critical	P-Value	Decision(1%)			
Variances		Variance Ratio F		4.49		23.2	0.1746	Equal Variances			
Dltribution		Shapiro-Wilk Normality		0.847			0.0532	Normal Distribution			
Survival Rate Summary											
Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
0	Site Water	5	0.881	0.864	0.898	0.813	0.918	0.00837	0.0451	5.11%	0.0%
0	Lab Water Contr	5	0.907	0.885	0.928	0.863	1	0.0105	0.0564	6.23%	-2.87%
Angular (Corrected) Transformed Summary											
Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
0	Site Water	5	1.22	1.2	1.25	1.12	1.28	0.0125	0.0674	5.51%	0.0%
0	Lab Water Cont	5	1.29	1.23	1.34	1.19	1.53	0.0265	0.143	11.1%	-5.09%
Graphics											
<div><div><p>Survival Rate</p><p>Conc-%</p><p>Reject Null</p></div><div><p>Transformed Conc. Angle</p><p>Rankits</p></div></div>											

Mytilus sp. Development Toxicity Test Count Data

Client: ACOE - San Rafael Channel
 Test Material: SRC-2010-06
 Test ID #: 39442
 Project #: 16087
 Sample Salinity adjusted with: Crystal Sea salts

Test Start Date: 7-7-10
 Test End Date: 7-9-10
 Enumeration Date: 7/21/10
 Investigator: Jm
 Inoculation Count: 182

Concentration	Replicate	Number of Normal Larvae	Number of Abnormal Larvae	Total Number Larvae	Percent Normal Development	Percent Survival
Control	A	161	2	163	99	88
	B	158	8	166	95	87
	C	186	1	193	96	100
	D	167	3	170	98	92
	E	157	2	159	99	86
1.0%	A	145	4	149	97	80
	B	180	1	181	99	99
	C	164	2	166	99	90
	D	156	5	161	97	86
	E	181	2	183	99	99
10%	A	187	2	189	99	100
	B	181	4	185	98	99
	C	163	3	166	98	90
	D	176	1	177	99	97
	E	152 Jm	5	157	97	84
25%	A	153	3	156	98	84
	B	172	0	172	100	95
	C	190	2	192	99	100
	D	158	4	162	98	87
	E	155	3	158	98	85
50%	A	0	153	153	0	0
	B	0	129	129	0	0
	C	0	138	138	0	0
	D	0	115	115	0	0
	E	0	151	151	0	0
100%	A	0	173	173	0	0
	B	0	145	145	0	0
	C	0	155	155	0	0
	D	0	159	159	0	0
	E	0	142	142	0	0

Mytilus sp. Development Toxicity Test Water Chemistry Data

Client: ACOE - San Rafael Channel
 Test Material: SRC-2010-06
 Test ID#: 39442 Project #: 16087
 Test Date: 7-7-10 Randomization:
 Sample Salinity adjusted with: Crystal Sea Salts

Organism Log#: 5286 Age: N/A
 Organism Supplier: Gutell
 Control/Diluent: 30ppt FSW

Day 0					
Treatment	Temperature (°C)	pH	D.O. (mg/L)	Salinity (ppt)	Signoff
Control	16.4	7.80	8.7	30.7	Test Solution Prep: <u>mm</u>
1%	16.4	7.96	8.0	31.0	New WQ: <u>000</u>
10%	16.4	7.88	8.3	30.7	Inoculation Date: <u>7-7-10</u>
25%	16.4	7.90	8.4	30.1	Inoculation Time: <u>15:10</u>
50%	16.4	7.92	8.2	29.2	Inoculation Signoff: <u>[Signature]</u>
100%	16.4	7.96	7.7	27.5 ^{28.5}	
Meter ID	23	PH14	RD03	EC03	

Day 1					
Treatment	Temperature (°C)	pH	D.O. (mg/L)	Salinity (ppt)	Signoff
Control	16.3				Date: <u>7/8/10</u>
1%	16.3				Signoff: <u>[Signature]</u>
10%	16.3				
25%	16.3				
50%	16.3				
100%	16.3				
Meter ID	23				

Day 2					
Treatment	Temperature (°C)	pH	D.O. (mg/L)	Salinity (ppt)	Signoff
Control	16.2	8.00	8.8	31.0	Termination Signoff: <u>AB</u>
1%	16.2	7.99	8.8	31.2	Termination Date: <u>7-9-10</u>
10%	16.2	8.04	7.6	30.0	Termination Time: <u>1550</u>
25%	16.2	8.21	7.5	29.9	Old WQ: <u>NVS</u>
50%	16.2	8.31	7.6	29.4	
100%	16.2	8.42	7.4	28.9	
Meter ID	23	PH14	RD03	EC05	

CETIS Summary Report

Report Date: 21 Jul-10 12:49 (p 1 of 2)
 Test Code: 01-7487-9027/39443

Bivalve Larval Survival and Development Test							Pacific EcoRisk				
Batch ID:	18-8220-2847	Test Type:	Development-Survival				Analyst:	Jason Walker			
Start Date:	07 Jul-10 15:10	Protocol:	ASTM E724-98 (Bivalve)				Diluent:	Diluted Seawater			
Ending Date:	09 Jul-10 15:50	Species:	Mytilus galloprovincialis				Brine:	Crystal Sea			
Duration:	49h	Source:	Dave Gutoff				Age:	N/A			
Sample ID:	08-0994-4638	Code:	SRC-2010-07				Client:	ACOE			
Sample Date:	10 Jun-10 09:00	Material:	Elutriate				Project:	16087			
Receive Date:	10 Jun-10 17:00	Source:	San Rafael Channel								
Sample Age:	27d 6h (0.6 °C)	Station:	SRC-2010-07								
Comparison Summary											
Analysis ID	Endpoint	NOEL	LOEL	TOEL	PMSD	TU	Method				
07-4182-3272	Development Rate	25	50	35.4	1.58%	4	Steel Many-One Rank Test				
05-3315-9020	Survival Rate	25	50	35.4	14.5%	4	Dunnett's Multiple Comparison Test				
Point Estimate Summary											
Analysis ID	Endpoint	Level	%	95% LCL	95% UCL	TU	Method				
06-1661-2033	Development Rate	EC5	26.3	26.1	26.3	3.81	Linear Interpolation (ICPIN)				
		EC10	27.5	27.3	27.5	3.64					
		EC15	28.8	28.6	28.8	3.48					
		EC20	30	29.8	30	3.33					
		EC25	31.3	31.1	31.3	3.2					
		EC40	35	34.9	35	2.86					
		EC50	37.5	37.4	37.5	2.67					
10-2015-9743	Survival Rate	EC50	35.2	35.1	35.4	2.84	Spearman-Kärber				
Development Rate Summary											
Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
0	Lab Water Contr	5	0.975	0.969	0.981	0.952	0.988	0.00294	0.0161	1.65%	0.0%
0	Site Water	5	0.992	0.989	0.996	0.98	1	0.00155	0.00846	0.85%	-1.83%
1		5	0.99	0.987	0.993	0.982	1	0.00132	0.00723	0.73%	-1.56%
10		5	0.983	0.979	0.987	0.967	0.993	0.00192	0.0105	1.07%	-0.89%
25		5	0.989	0.986	0.991	0.977	0.994	0.00129	0.00706	0.71%	-1.43%
50		5	0	0	0	0	0	0	0		100.0%
100		5	0	0	0	0	0	0	0		100.0%
Survival Rate Summary											
Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
0	Lab Water Contr	5	0.907	0.886	0.928	0.863	1	0.0103	0.0564	6.23%	0.0%
0	Site Water	5	0.881	0.864	0.898	0.813	0.918	0.00823	0.0451	5.11%	2.79%
1		5	0.889	0.85	0.929	0.709	0.989	0.0193	0.106	11.9%	1.94%
10		5	0.93	0.897	0.963	0.791	1	0.0161	0.0884	9.51%	-2.55%
25		5	0.904	0.86	0.949	0.698	0.984	0.0218	0.119	13.2%	0.24%
50		5	0	0	0	0	0	0	0		100.0%
100		5	0	0	0	0	0	0	0		100.0%

CETIS Summary Report

Report Date: 21 Jul-10 12:49 (p 2 of 2)
 Test Code: 01-7487-9027/39443

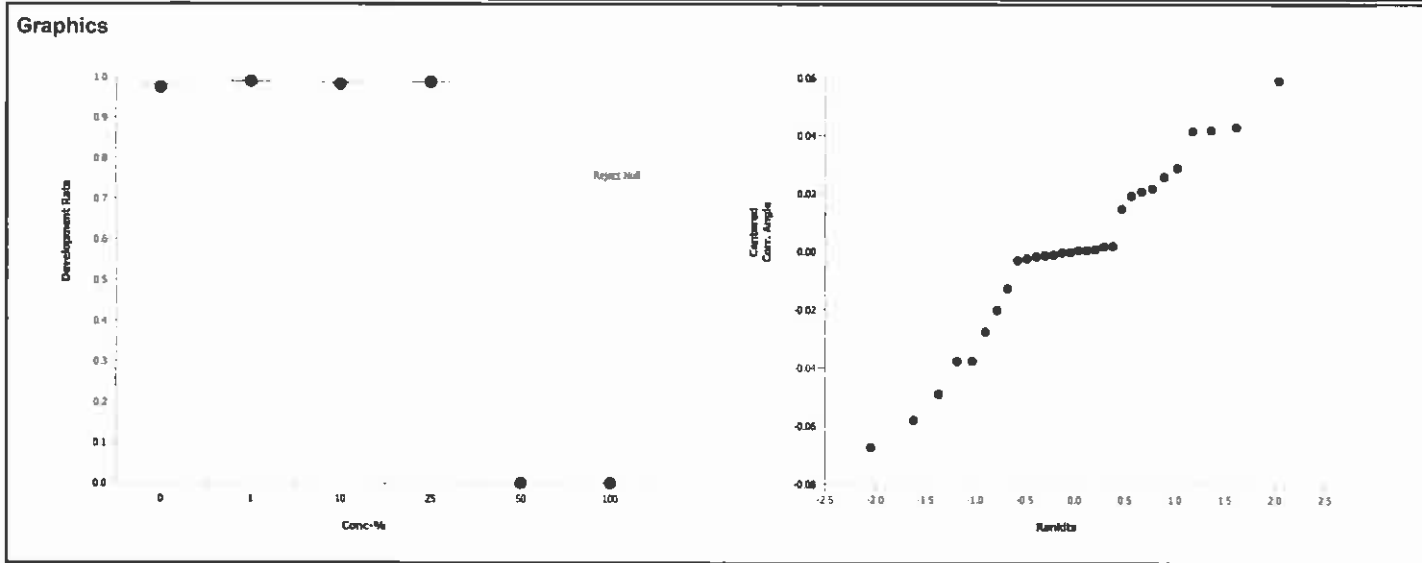
Bivalve Larval Survival and Development Test						Pacific EcoRisk
Development Rate Detail						
Conc-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Lab Water Contr	0.988	0.952	0.964	0.982	0.987
0	Site Water	1	0.988	0.994	0.98	1
1		1	0.982	0.994	0.985	0.988
10		0.979	0.989	0.988	0.993	0.967
25		0.977	0.994	0.989	0.989	0.994
50		0	0	0	0	0
100		0	0	0	0	0
Survival Rate Detail						
Conc-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Lab Water Contr	0.885	0.868	1	0.918	0.863
0	Site Water	0.907	0.918	0.912	0.813	0.857
1		0.989	0.907	0.923	0.709	0.918
10		1	1	0.896	0.791	0.962
25		0.698	0.984	0.962	0.973	0.907
50		0	0	0	0	0
100		0	0	0	0	0

CETIS Analytical Report

Report Date: 21 Jul-10 12:49 (p 3 of 4)
 Test Code: 01-7487-9027/39443

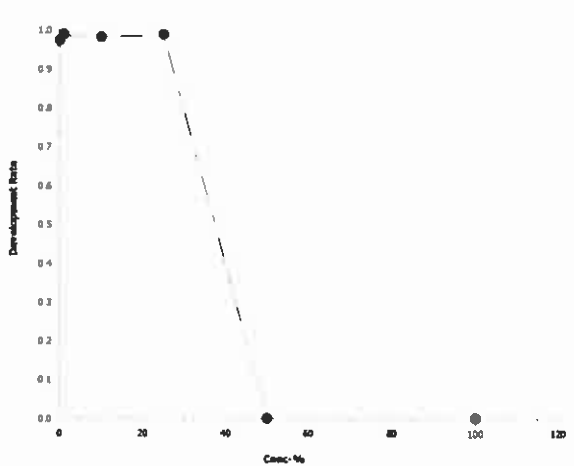
Bivalve Larval Survival and Development Test								Pacific EcoRisk			
Analysis ID: 07-4182-3272		Endpoint: Development Rate		CETIS Version: CETISv1.7.0							
Analyzed: 21 Jul-10 12:48		Analysis: Nonparametric-Control vs Treatments		Official Results: Yes							
Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD			
Angular (Corrected)	0	C > T	Not Run	25	50	35.4	4	1.58%			
Steel Many-One Rank Test											
Control	vs	Conc-%	Test Stat	Critical	Ties	P-Value	Decision(5%)				
Lab Water Control		1	35	16	0	0.9979	Non-Significant Effect				
		10	34	16	0	0.9954	Non-Significant Effect				
		25	37	16	0	0.9996	Non-Significant Effect				
		50*	15	16	0	0.0191	Significant Effect				
		100*	15	16	0	0.0191	Significant Effect				
ANOVA Table											
Source	Sum Squares		Mean Square		DF	F Stat	P-Value	Decision(5%)			
Between	13.29794		2.659589		5	2430	<0.0001	Significant Effect			
Error	0.02631366		0.001096403		24						
Total	13.32426		2.660685		29						
ANOVA Assumptions											
Attribute	Test			Test Stat	Critical	P-Value	Decision(1%)				
Variances	Bartlett Equality of Variance			43.9	15.1	<0.0001	Unequal Variances				
Distribution	Shapiro-Wilk Normality			0.957		0.2631	Normal Distribution				
Development Rate Summary											
Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
0	Lab Water Contr	5	0.975	0.968	0.981	0.952	0.988	0.00299	0.0161	1.65%	0.0%
1		5	0.99	0.987	0.993	0.982	1	0.00134	0.00724	0.73%	-1.56%
10		5	0.983	0.979	0.987	0.967	0.993	0.00195	0.0105	1.07%	-0.89%
25		5	0.989	0.986	0.991	0.977	0.994	0.00131	0.00706	0.71%	-1.43%
50		5	0	0	0	0	0	0	0		100.0%
100		5	0	0	0	0	0	0	0		100.0%
Angular (Corrected) Transformed Summary											
Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
0	Lab Water Cont	5	1.42	1.4	1.44	1.35	1.46	0.00927	0.0499	3.52%	0.0%
1		5	1.47	1.46	1.49	1.44	1.53	0.00731	0.0394	2.67%	-4.07%
10		5	1.45	1.43	1.46	1.39	1.49	0.00732	0.0394	2.73%	-2.04%
25		5	1.47	1.46	1.48	1.42	1.5	0.00581	0.0313	2.13%	-3.56%
50		5	0.038	0.0377	0.0383	0.0368	0.0387	0.000144	0.000778	2.05%	97.3%
100		5	0.0407	0.0401	0.0414	0.0389	0.0426	0.000317	0.00171	4.19%	97.1%

Bivalve Larval Survival and Development Test			Pacific EcoRisk
Analysis ID: 07-4182-3272	Endpoint: Development Rate	CETIS Version: CETISv1.7.0	
Analyzed: 21 Jul-10 12:48	Analysis: Nonparametric-Control vs Treatments	Official Results: Yes	



CETIS Analytical Report

Report Date: 21 Jul-10 12:49 (p 1 of 1)
Test Code: 01-7487-9027/39443

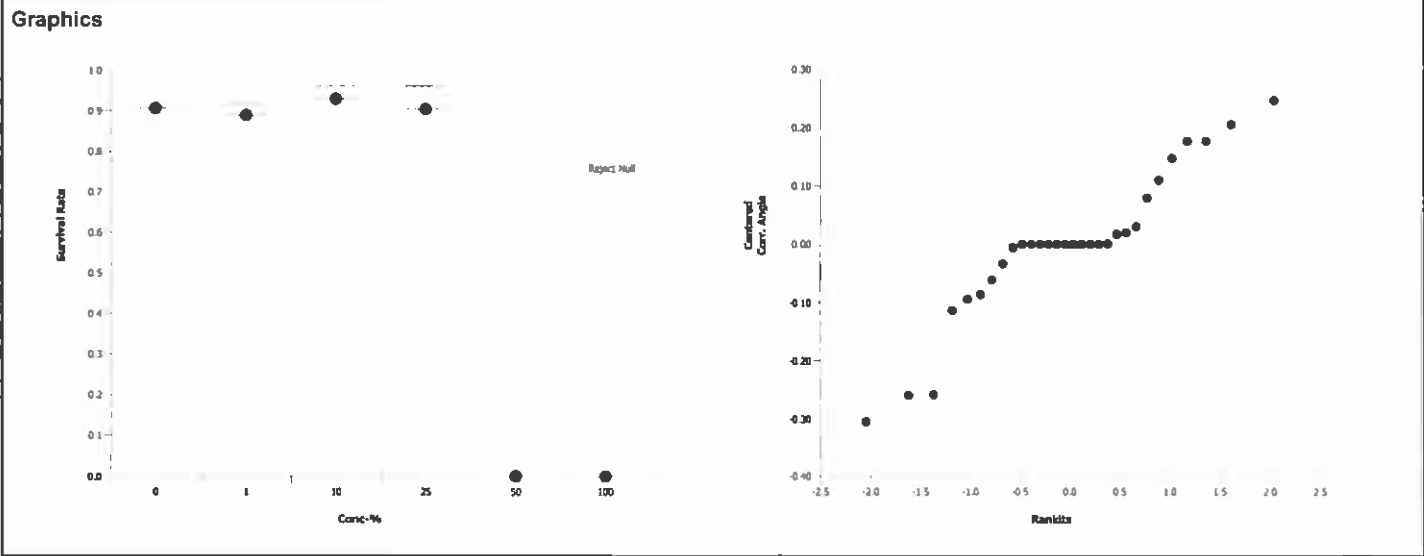
Bivalve Larval Survival and Development Test										Pacific EcoRisk	
Analysis ID: 06-1661-2033		Endpoint: Development Rate		CETIS Version: CETISv1.7.0							
Analyzed: 21 Jul-10 12:48		Analysis: Linear Interpolation (ICPIN)		Official Results: Yes							
Linear Interpolation Options											
X Transform	Y Transform	Seed	Resamples	Exp 95% CL	Method						
Linear	Linear	57951	200	Yes	Two-Point Interpolation						
Point Estimates											
Level	%	95% LCL	95% UCL	TU	95% LCL	95% UCL					
EC5	26.3	26.1	26.3	3.81	3.81	3.84					
EC10	27.5	27.3	27.5	3.64	3.64	3.66					
EC15	28.8	28.6	28.8	3.48	3.48	3.5					
EC20	30	29.8	30	3.33	3.33	3.35					
EC25	31.3	31.1	31.3	3.2	3.2	3.21					
EC40	35	34.9	35	2.86	2.86	2.87					
EC50	37.5	37.4	37.5	2.67	2.67	2.67					
Development Rate Summary				Calculated Variate(A/B)							
Conc-%	Control Type	Count	Mean	Min	Max	Std Err	Std Dev	CV%	Diff%	A	B
0	Lab Water Contr	5	0.975	0.952	0.988	0.00294	0.0161	1.65%	0.0%	829	851
1		5	0.99	0.982	1	0.00132	0.00724	0.73%	-1.56%	809	817
10		5	0.983	0.967	0.993	0.00192	0.0105	1.07%	-0.89%	855	870
25		5	0.989	0.977	0.994	0.00129	0.00706	0.71%	-1.43%	823	832
50		5	0	0	0	0	0		100.0%	0	869
100		5	0	0	0	0	0		100.0%	0	757
Development Rate Detail											
Conc-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
0	Lab Water Control	0.988	0.952	0.964	0.982	0.987					
1		1	0.982	0.994	0.985	0.988					
10		0.979	0.989	0.988	0.993	0.967					
25		0.977	0.994	0.989	0.989	0.994					
50		0	0	0	0	0					
100		0	0	0	0	0					
Graphics											
											

CETIS Analytical Report

Report Date: 21 Jul-10 12:48 (p 1 of 4)
Test Code: 01-7487-9027/39443

Blvalve Larval Survival and Development Test										Pacific EcoRisk	
Analysis ID: 05-3315-9020		Endpoint: Survival Rate					CETIS Version: CETISv1.7.0				
Analyzed: 21 Jul-10 12:48		Analysis: Parametric-Control vs Treatments					Official Results: Yes				
Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD			
Angular (Corrected)	0	C > T	Not Run	25	50	35.4	4	14.5%			
Dunnett's Multiple Comparison Test											
Control	vs	Conc-%	Test Stat	Critical	MSD	P-Value	Decision(5%)				
Lab Water Control		1	0.297	2.36	0.209	0.7310	Non-Significant Effect				
		10	-0.792	2.36	0.209	0.9708	Non-Significant Effect				
		25	-0.0922	2.36	0.209	0.8591	Non-Significant Effect				
		50*	14.1	2.36	0.209	<0.0001	Significant Effect				
		100*	14.1	2.36	0.209	<0.0001	Significant Effect				
ANOVA Table											
Source	Sum Squares		Mean Square		DF	F Stat	P-Value	Decision(5%)			
Between	10.6344		2.12688		5	108	<0.0001	Significant Effect			
Error	0.4712581		0.01963575		24						
Total	11.10566		2.146516		29						
ANOVA Assumptions											
Attribute	Test			Test Stat	Critical	P-Value	Decision(1%)				
Variances	Mod Levene Equality of Variance			2.16	4.25	0.1049	Equal Variances				
Distribution	Shapiro-Wilk Normality			0.906		0.0120	Normal Distribution				
Survival Rate Summary											
Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
0	Lab Water Contr	5	0.907	0.885	0.928	0.863	1	0.0105	0.0564	6.23%	0.0%
1		5	0.889	0.849	0.929	0.709	0.989	0.0196	0.106	11.9%	1.94%
10		5	0.93	0.896	0.963	0.791	1	0.0164	0.0884	9.51%	-2.55%
25		5	0.904	0.859	0.95	0.698	0.984	0.0221	0.119	13.2%	0.24%
50		5	0	0	0	0	0	0	0		100.0%
100		5	0	0	0	0	0	0	0		100.0%
Angular (Corrected) Transformed Summary											
Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
0	Lab Water Cont	5	1.29	1.23	1.34	1.19	1.53	0.0265	0.143	11.1%	0.0%
1		5	1.26	1.2	1.32	1	1.47	0.0309	0.166	13.2%	2.05%
10		5	1.36	1.28	1.43	1.1	1.53	0.0352	0.19	14.0%	-5.46%
25		5	1.29	1.22	1.36	0.989	1.44	0.0341	0.184	14.2%	-0.64%
50		5	0.0371	0.0371	0.0371	0.0371	0.0371	0	0	0.0%	97.1%
100		5	0.0371	0.0371	0.0371	0.0371	0.0371	0	0	0.0%	97.1%

Bivalve Larval Survival and Development Test			Pacific EcoRisk
Analysis ID: 05-3315-9020	Endpoint: Survival Rate	CETIS Version: CETISv1.7.0	
Analyzed: 21 Jul-10 12:48	Analysis: Parametric-Control vs Treatments	Official Results: Yes	



CETIS Analytical Report

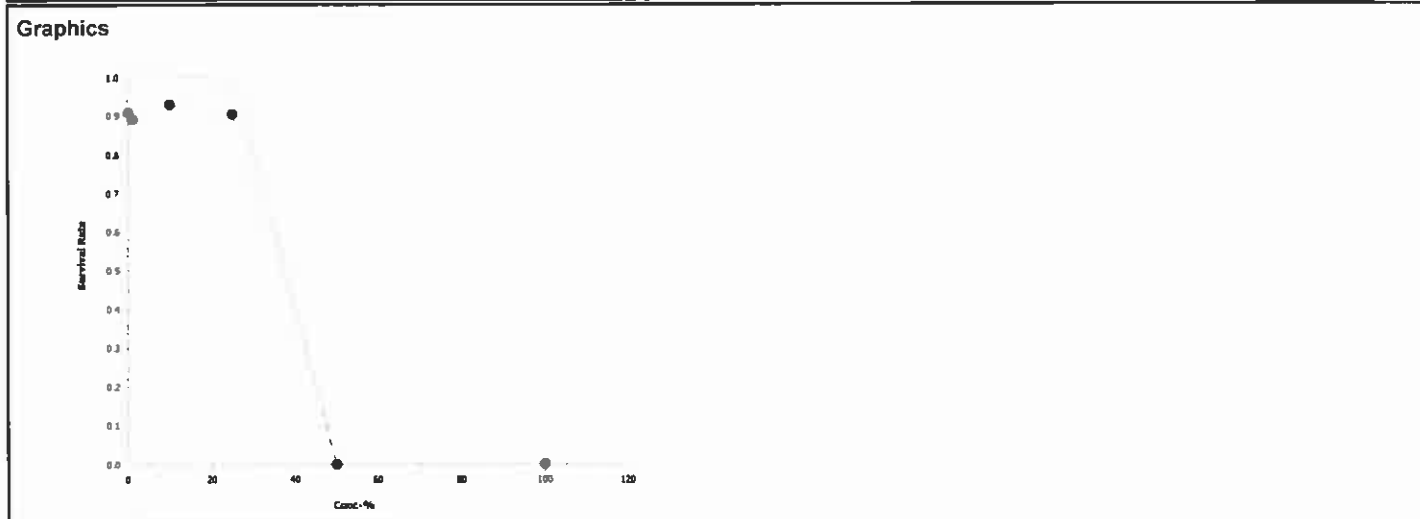
Report Date: 21 Jul-10 12:49 (p 1 of 1)
 Test Code: 01-7487-9027/39443

Bivalve Larval Survival and Development Test				Pacific EcoRisk
Analysis ID: 10-2015-9743	Endpoint: Survival Rate	CETIS Version: CETISv1.7.0		
Analyzed: 21 Jul-10 12:48	Analysis: Untrimmed Spearman-Kärber	Official Results: Yes		

Spearman-Kärber Estimates							
Threshold Option	Threshold	Trim	Mu	Sigma	EC50	95% LCL	95% UCL
Control Threshold	0.0934	0.00%	1.55	0.00077	35.2	35.1	35.4

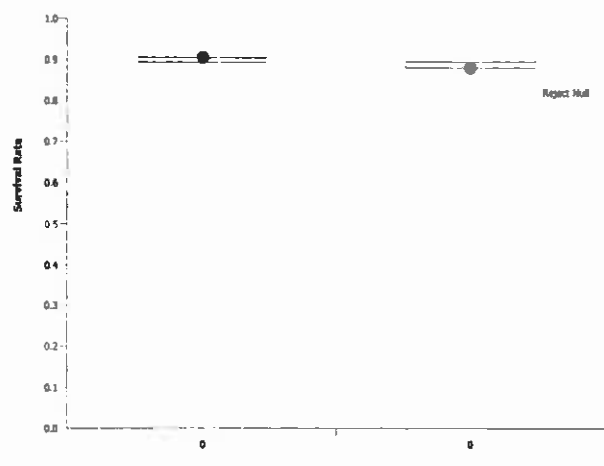
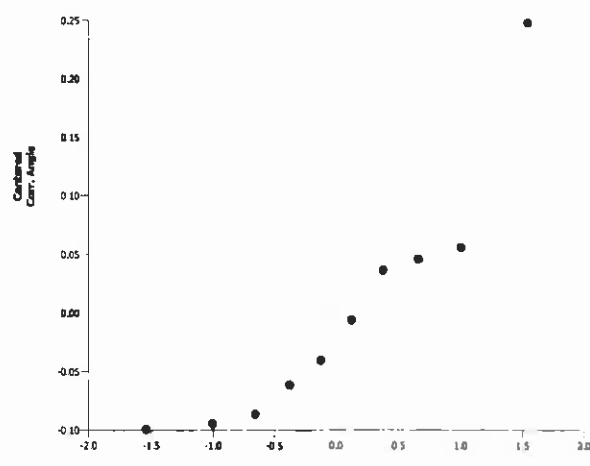
Survival Rate Summary		Calculated Variate(A/B)									
Conc-%	Control Type	Count	Mean	Min	Max	Std Err	Std Dev	CV%	Diff%	A	B
0	Lab Water Contr	5	0.907	0.863	1	0.0103	0.0564	6.23%	0.0%	825	910
1		5	0.889	0.709	0.989	0.0193	0.106	11.9%	1.94%	809	910
10		5	0.93	0.791	1	0.0161	0.0884	9.51%	-2.55%	846	910
25		5	0.904	0.698	0.984	0.0218	0.119	13.2%	0.24%	823	910
50		5	0	0	0	0	0		100.0%	0	910
100		5	0	0	0	0	0		100.0%	0	910

Survival Rate Detail						
Conc-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Lab Water Control	0.885	0.868	1	0.918	0.863
1		0.989	0.907	0.923	0.709	0.918
10		1	1	0.896	0.791	0.962
25		0.698	0.984	0.962	0.973	0.907
50		0	0	0	0	0
100		0	0	0	0	0



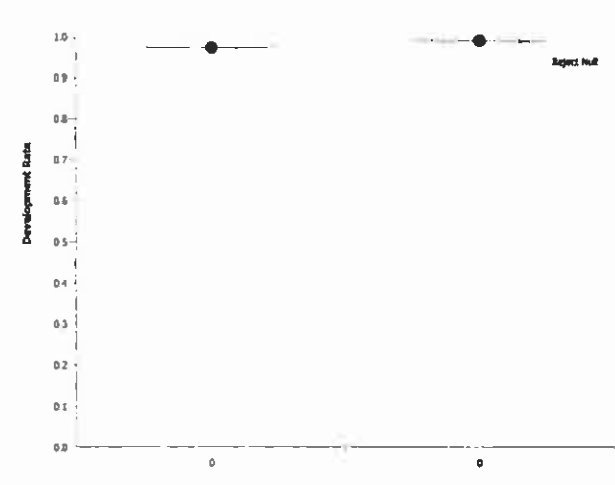
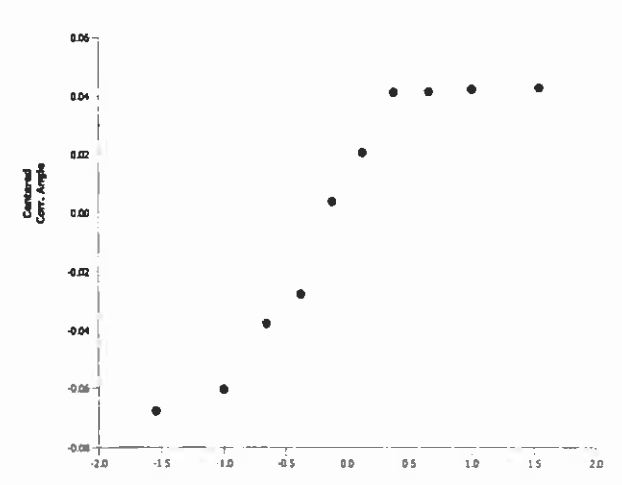
CETIS Analytical Report

Report Date: 20 Jul-10 16:01 (p 2 of 4)
Test Code: 18-6831-4622/39436

Bivalve Larval Survival and Development Test							Pacific EcoRisk				
Analysis ID: 17-3724-4183		Endpoint: Survival Rate		CETIS Version: CETISv1.7.0							
Analyzed: 20 Jul-10 15:59		Analysis: Parametric-Two Sample		Official Results: Yes							
Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD			
Angular (Corrected)	0	C > T	Not Run	0	>0			7.77%			
Equal Variance t Two-Sample Test											
Control	vs	Control	Test Stat	Critical	MSD	P-Value	Decision(5%)				
Lab Water Control		Site Water	0.88	1.86	0.131	0.2022	Non-Significant Effect				
ANOVA Table											
Source	Sum Squares		Mean Square		DF	F Stat	P-Value	Decision(5%)			
Between	0.009684817		0.009684817		1	0.775	0.4043	Non-Significant Effect			
Error	0.09996058		0.01249507		8						
Total	0.1096454		0.02217989		9						
ANOVA Assumptions											
Attribute	Test		Test Stat	Critical	P-Value	Decision(1%)					
Variances	Variance Ratio F		4.49	23.2	0.1746	Equal Variances					
Distribution	Shapiro-Wilk Normality		0.847		0.0532	Normal Distribution					
Survival Rate Summary											
Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
0	Site Water	5	0.881	0.864	0.898	0.813	0.918	0.00837	0.0451	5.11%	0.0%
0	Lab Water Contr	5	0.907	0.885	0.928	0.863	1	0.0105	0.0564	6.23%	-2.87%
Angular (Corrected) Transformed Summary											
Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
0	Site Water	5	1.22	1.2	1.25	1.12	1.28	0.0125	0.0674	5.51%	0.0%
0	Lab Water Cont	5	1.29	1.23	1.34	1.19	1.53	0.0265	0.143	11.1%	-5.09%
Graphics											
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CETIS Analytical Report

Report Date: 20 Jul-10 16:01 (p 4 of 4)
Test Code: 18-6831-4622/39436

Blvalve Larval Survival and Development Test							Pacific EcoRisk				
Analysis ID: 06-7674-0949		Endpoint: Development Rate		CETIS Version: CETISv1.7.0							
Analyzed: 20 Jul-10 15:57		Analysis: Parametric-Two Sample		Official Results: Yes							
Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD			
Angular (Corrected)	0	C > T	Not Run	0	>0			1.83%			
Equal Variance t Two-Sample Test											
Control	vs	Control	Test Stat	Critical	MSD	P-Value	Decision(5%)				
Lab Water Control		Site Water	-2.43	1.86	0.0556	0.9793	Non-Significant Effect				
ANOVA Table											
Source	Sum Squares		Mean Square		DF	F Stat	P-Value	Decision(5%)			
Between	0.01315582		0.01315582		1	5.89	0.0413	Significant Effect			
Error	0.01785393		0.002231742		8						
Total	0.03100976		0.01538756		9						
ANOVA Assumptions											
Attribute	Test		Test Stat	Critical	P-Value	Decision(1%)					
Variances	Variance Ratio F		1.26	23.2	0.8272	Equal Variances					
Distribution	Shapiro-Wilk Normality		0.849		0.0569	Normal Distribution					
Development Rate Summary											
Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
0	Site Water	5	0.992	0.989	0.996	0.98	1	0.00157	0.00846	0.85%	0.0%
0	Lab Water Contr	5	0.975	0.968	0.981	0.952	0.988	0.00299	0.0161	1.65%	1.8%
Angular (Corrected) Transformed Summary											
Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
0	Site Water	5	1.49	1.47	1.51	1.43	1.53	0.00825	0.0444	2.98%	0.0%
0	Lab Water Cont	5	1.42	1.4	1.44	1.35	1.46	0.00927	0.0499	3.52%	4.87%
Graphics											
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Mytilus sp. Development Toxicity Test Count Data

Client: ACOE - San Rafael Channel
 Test Material: SRC-2010-07
 Test ID #: 39443
 Project #: 16087
 Sample Salinity adjusted with: Crystal Sea Salt + S

Test Start Date: 7-7-10
 Test End Date: 7-9-10
 Enumeration Date: 7/21/10
 Investigator: Jim
 Inoculation Count: 182

Concentration	Replicate	Number of Normal Larvae	Number of Abnormal Larvae	Total Number Larvae	Percent Normal Development	Percent Survival
Control	A	161	2	163	99	88
	B	158	8	166	95	87
	C	186	7	193	96	100
	D	167	3	170	98	92
	E	157	2	159	99	86
1.0%	A	180	0	180	100	99
	B	165	3	168	98	91
	C	168	1	169	99	92
	D	129	2	131	98	71
	E	167	2	169	99	92
10%	A	187	4	191	98	100
	B	186	2	188	99	100
	C	163	2	165	99	90
	D	144	1	145	99	79
	E	175	6	181	97	96
25%	A	127	3	130	98	70
	B	179	1	180	99	98
	C	175	2	177	99	96
	D	177	2	179	99	97
	E	165	1	166	99	91
50%	A	0	170	170	0	0
	B	0	167	167	0	0
	C	0	177	177	0	0
	D	0	185	185	0	0
	E	0	170	170	0	0
100%	A	0	165	165	0	0
	B	0	153	153	0	0
	C	0	162	162	0	0
	D	0	139	139	0	0
	E	0	138	138	0	0

Mytilus sp. Development Toxicity Test Water Chemistry Data

Client: ACOE - San Rafael Channel
 Test Material: SRC-2010-07
 Test ID#: 39443 Project #: 16087
 Test Date: 7-7-10 Randomization:
 Sample Salinity adjusted with: Crystal Sea Salts

Organism Log#: 5286 Age: N/A
 Organism Supplier: Cutler
 Control/Diluent: 30ppt FSW

Day 0					
Treatment	Temperature (°C)	pH	D.O. (mg/L)	Salinity (ppt)	Signoff
Control	16.4	7.80	8.7	30.7	Test Solution Prep: <u>MM</u>
1%	16.4	7.91	8.1	30.9	New WQ: <u>008</u>
10%	16.4	7.89	8.3	30.7	Inoculation Date: <u>7-7-10</u>
25%	16.4	7.92	8.3	30.2	Inoculation Time: <u>15:10</u>
50%	16.4	7.98	8.2	29.6	Inoculation Signoff: <u>MM</u>
100%	16.4	8.03	7.7	28.2	
Meter ID	23	PH14	RD03	EC03	

Day 1					
Treatment	Temperature (°C)	pH	D.O. (mg/L)	Salinity (ppt)	Signoff
Control	16.3				Date: <u>7/8/10</u>
1%	16.3				Signoff: <u>MM</u>
10%	16.3				
25%	16.3				
50%	16.3				
100%	16.3				
Meter ID	23				

Day 2					
Treatment	Temperature (°C)	pH	D.O. (mg/L)	Salinity (ppt)	Signoff
Control	16.2	8.05	7.5	30.6	Termination Signoff: <u>MM</u>
1%	16.2	8.08	7.4	31.2	Termination Date: <u>7-9-10</u>
10%	16.2	8.14	7.5	30.9	Termination Time: <u>15:50</u>
25%	16.2	8.24	7.6	30.5	Old WQ: <u>NVS</u>
50%	16.2	8.33	7.7	29.8	
100%	16.2	8.45	7.6	28.3	
Meter ID	23	PH12	RD02	EC03	

CETIS Summary Report

Report Date: 21 Jul-10 13:48 (p 1 of 2)
Test Code: 16-3870-4796/39444

Bivalve Larval Survival and Development Test							Pacific EcoRisk				
Batch ID:	18-8220-2847	Test Type:	Development-Survival				Analyst:	Jason Walker			
Start Date:	07 Jul-10 15:10	Protocol:	ASTM E724-98 (Bivalve)				Diluent:	Diluted Seawater			
Ending Date:	09 Jul-10 15:50	Species:	Mytilus galloprovincialis				Brine:	Crystal Sea			
Duration:	49h	Source:	Dave Gutoff				Age:	N/A			
Sample ID:	08-9351-2460	Code:	SRC-2010-08				Client:	ACOE			
Sample Date:	10 Jun-10 11:55	Material:	Elutriate				Project:	16087			
Receive Date:	10 Jun-10 17:00	Source:	San Rafael Channel								
Sample Age:	27d 3h (1.4 °C)	Station:	SRC-2010-08								
Comparison Summary											
Analysis ID	Endpoint	NOEL	LOEL	TOEL	PMSD	TU	Method				
04-3063-4737	Development Rate	25	50	35.4	1.32%	4	Steel Many-One Rank Test				
03-2070-2854	Survival Rate	25	50	35.4	10.5%	4	Steel Many-One Rank Test				
Point Estimate Summary											
Analysis ID	Endpoint	Level	%	95% LCL	95% UCL	TU	Method				
16-1956-6211	Development Rate	EC5	25.9	25.6	26.3	3.86	Linear Interpolation (ICPIN)				
		EC10	27.2	26.9	27.5	3.68					
		EC15	28.4	28.2	28.8	3.52					
		EC20	29.7	29.5	30	3.37					
		EC25	31	30.7	31.3	3.23					
		EC40	34.8	34.6	35	2.88					
		EC50	37.3	37.2	37.5	2.68					
06-5533-4642	Survival Rate	EC50	32.5	32	33.1	3.07	Spearman-Kärber				
Development Rate Summary											
Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
0	Lab Water Contr	5	0.975	0.969	0.981	0.952	0.988	0.00294	0.0161	1.65%	0.0%
0	Site Water	5	0.992	0.989	0.996	0.98	1	0.00155	0.00846	0.85%	-1.83%
1		5	0.986	0.983	0.989	0.971	0.994	0.00157	0.0086	0.87%	-1.14%
10		5	0.986	0.984	0.988	0.982	0.994	0.000936	0.00513	0.52%	-1.16%
25		5	0.967	0.964	0.97	0.962	0.982	0.00156	0.00855	0.89%	0.77%
50		5	0	0	0	0	0	0	0		100.0%
100		5	0	0	0	0	0	0	0		100.0%
Survival Rate Summary											
Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
0	Lab Water Contr	5	0.907	0.886	0.928	0.863	1	0.0103	0.0564	6.23%	0.0%
0	Site Water	5	0.881	0.864	0.898	0.813	0.918	0.00823	0.0451	5.11%	2.79%
1		5	0.902	0.891	0.913	0.852	0.923	0.00542	0.0297	3.29%	0.49%
10		5	0.921	0.902	0.94	0.874	1	0.00926	0.0507	5.51%	-1.58%
25		5	0.815	0.771	0.86	0.703	0.973	0.0218	0.119	14.6%	10.1%
50		5	0	0	0	0	0	0	0		100.0%
100		5	0	0	0	0	0	0	0		100.0%

CETIS Summary Report

Report Date:

21 Jul-10 13:48 (p 2 of 2)

Test Code:

16-3870-4796/39444

Bivalve Larval Survival and Development Test

Pacific EcoRisk

Development Rate Detail

Conc-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Lab Water Contr	0.988	0.952	0.964	0.982	0.987
0	Site Water	1	0.988	0.994	0.98	1
1		0.987	0.971	0.988	0.994	0.988
10		0.982	0.982	0.988	0.994	0.984
25		0.962	0.964	0.982	0.965	0.962
50		0	0	0	0	0
100		0	0	0	0	0

Survival Rate Detail

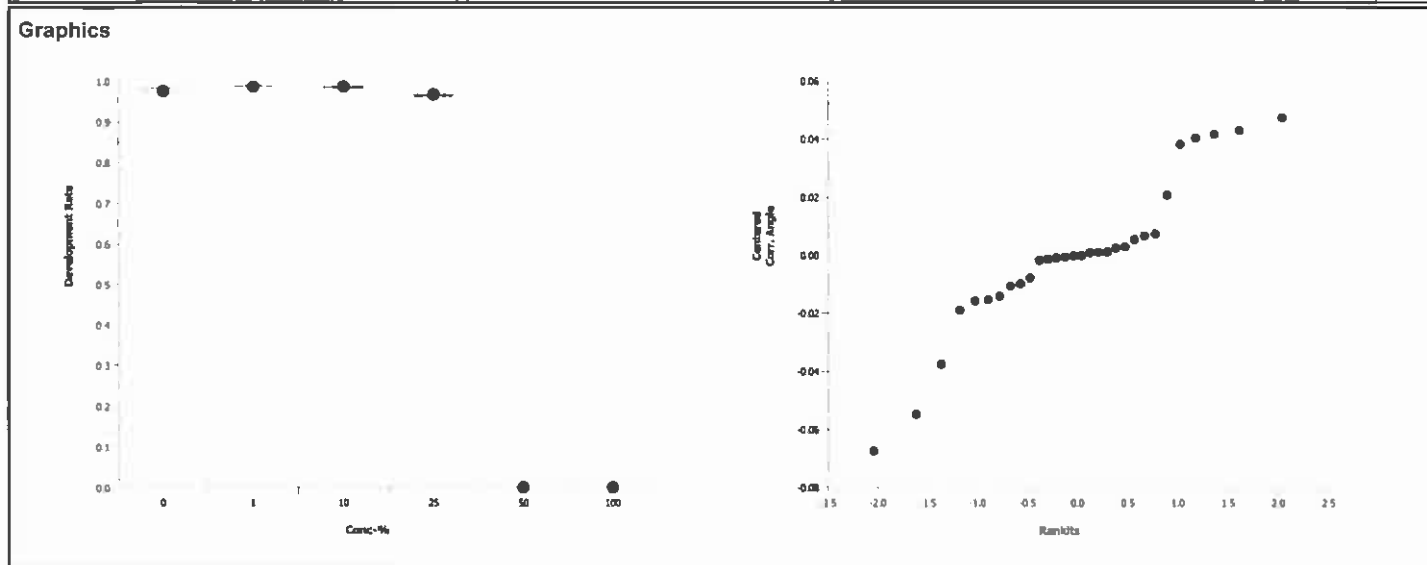
Conc-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Lab Water Contr	0.885	0.868	1	0.918	0.863
0	Site Water	0.907	0.918	0.912	0.813	0.857
1		0.852	0.923	0.912	0.901	0.923
10		0.923	0.879	0.874	0.929	1
25		0.703	0.736	0.912	0.753	0.973
50		0	0	0	0	0
100		0	0	0	0	0

CETIS Analytical Report

Report Date: 21 Jul-10 13:48 (p 3 of 4)
Test Code: 16-3870-4796/39444

Bivalve Larval Survival and Development Test								Pacific EcoRisk			
Analysis ID: 04-3063-4737		Endpoint: Development Rate		CETIS Version: CETISv1.7.0							
Analyzed: 21 Jul-10 13:46		Analysis: Nonparametric-Control vs Treatments		Official Results: Yes							
Data Transform		Zeta	Alt Hyp	Monte Carlo		NOEL	LOEL	TOEL	TU	PMSD	
Angular (Corrected)		0	C > T	Not Run		25	50	35.4	4	1 32%	
Steel Many-One Rank Test											
Control		vs	Conc-%	Test Stat	Critical	Ties	P-Value	Decision(5%)			
Lab Water Control	1		35	16	0	0.9979	Non-Significant Effect				
	10		32	16	0	0.9821	Non-Significant Effect				
	25		23	16	0	0.4415	Non-Significant Effect				
	50*		15	16	0	0.0191	Significant Effect				
	100*		15	16	0	0.0191	Significant Effect				
ANOVA Table											
Source		Sum Squares		Mean Square		DF	F Stat	P-Value	Decision(5%)		
Between		12.84129		2.568257		5	3120	<0.0001	Significant Effect		
Error		0.01974867		0.0008228612		24					
Total		12.86104		2.56908		29					
ANOVA Assumptions											
Attribute		Test		Test Stat	Critical	P-Value	Decision(1%)				
Variances		Bartlett Equality of Variance		42.1	15.1	<0.0001	Unequal Variances				
Distribution		Shapiro-Wilk Normality		0.912		0.0167	Normal Distribution				
Development Rate Summary											
Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
0	Lab Water Contr	5	0.975	0.968	0.981	0.952	0.988	0.00299	0.0161	1.65%	0.0%
1		5	0.986	0.982	0.989	0.971	0.994	0.0016	0.0086	0.87%	-1.14%
10		5	0.986	0.984	0.988	0.982	0.994	0.000953	0.00513	0.52%	-1.16%
25		5	0.967	0.964	0.97	0.962	0.982	0.00159	0.00856	0.89%	0.77%
50		5	0	0	0	0	0	0	0		100.0%
100		5	0	0	0	0	0	0	0		100.0%
Angular (Corrected) Transformed Summary											
Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
0	Lab Water Cont	5	1.42	1.4	1.44	1.35	1.46	0.00927	0.0499	3.52%	0.0%
1		5	1.45	1.44	1.47	1.4	1.49	0.00627	0.0338	2.32%	-2.68%
10		5	1.45	1.44	1.46	1.43	1.49	0.00453	0.0244	1.68%	-2.6%
25		5	1.39	1.38	1.4	1.37	1.44	0.00494	0.0266	1.92%	1.91%
50		5	0.042	0.0413	0.0426	0.0402	0.0444	0.000325	0.00175	4.17%	97.0%
100		5	0.0416	0.0412	0.0419	0.0406	0.0426	0.000169	0.00091	2.19%	97.1%

Bivalve Larval Survival and Development Test			Pacific EcoRisk
Analysis ID: 04-3063-4737	Endpoint: Development Rate	CETIS Version: CETISv1.7.0	
Analyzed: 21 Jul-10 13:46	Analysis: Nonparametric-Control vs Treatments	Official Results: Yes	



CETIS Analytical Report

Report Date: 21 Jul-10 13:48 (p 1 of 1)
 Test Code: 16-3870-4796/39444

Bivalve Larval Survival and Development Test

Pacific EcoRisk

Analysis ID: 16-1956-6211 Endpoint: Development Rate CETIS Version: CETISv1.7.0
 Analyzed: 21 Jul-10 13:47 Analysis: Linear Interpolation (ICPIN) Official Results: Yes

Linear Interpolation Options

X Transform	Y Transform	Seed	Resamples	Exp 95% CL	Method
Linear	Linear	57951	200	Yes	Two-Point Interpolation

Point Estimates

Level	%	95% LCL	95% UCL	TU	95% LCL	95% UCL
EC5	25.9	25.6	26.3	3.86	3.81	3.9
EC10	27.2	26.9	27.5	3.68	3.63	3.72
EC15	28.4	28.2	28.8	3.52	3.48	3.55
EC20	29.7	29.5	30	3.37	3.33	3.39
EC25	31	30.7	31.3	3.23	3.2	3.25
EC40	34.8	34.6	35	2.88	2.86	2.89
EC50	37.3	37.2	37.5	2.68	2.67	2.69

Development Rate Summary

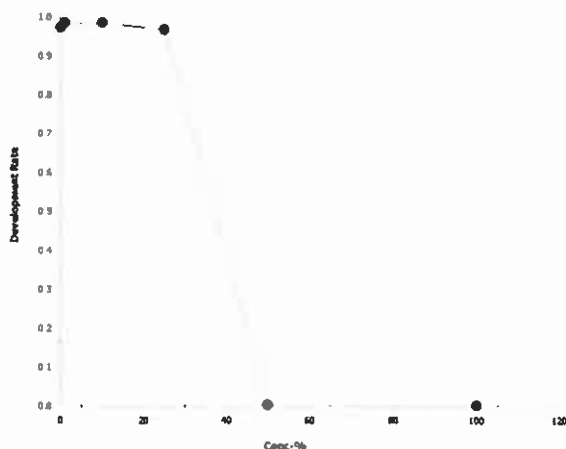
Calculated Variate(A/B)

Conc-%	Control Type	Count	Mean	Min	Max	Std Err	Std Dev	CV%	Diff%	A	B
0	Lab Water Contr	5	0.975	0.952	0.988	0.00294	0.0161	1.65%	0.0%	829	851
1		5	0.986	0.971	0.994	0.00157	0.0086	0.87%	-1.14%	821	833
10		5	0.986	0.982	0.994	0.000937	0.00513	0.52%	-1.16%	838	850
25		5	0.967	0.962	0.982	0.00156	0.00856	0.89%	0.77%	742	767
50		5	0	0	0	0	0		100.0%	0	713
100		5	0	0	0	0	0		100.0%	0	725

Development Rate Detail

Conc-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Lab Water Control	0.988	0.952	0.964	0.982	0.987
1		0.987	0.971	0.988	0.994	0.988
10		0.982	0.982	0.988	0.994	0.984
25		0.962	0.964	0.982	0.965	0.962
50		0	0	0	0	0
100		0	0	0	0	0

Graphics



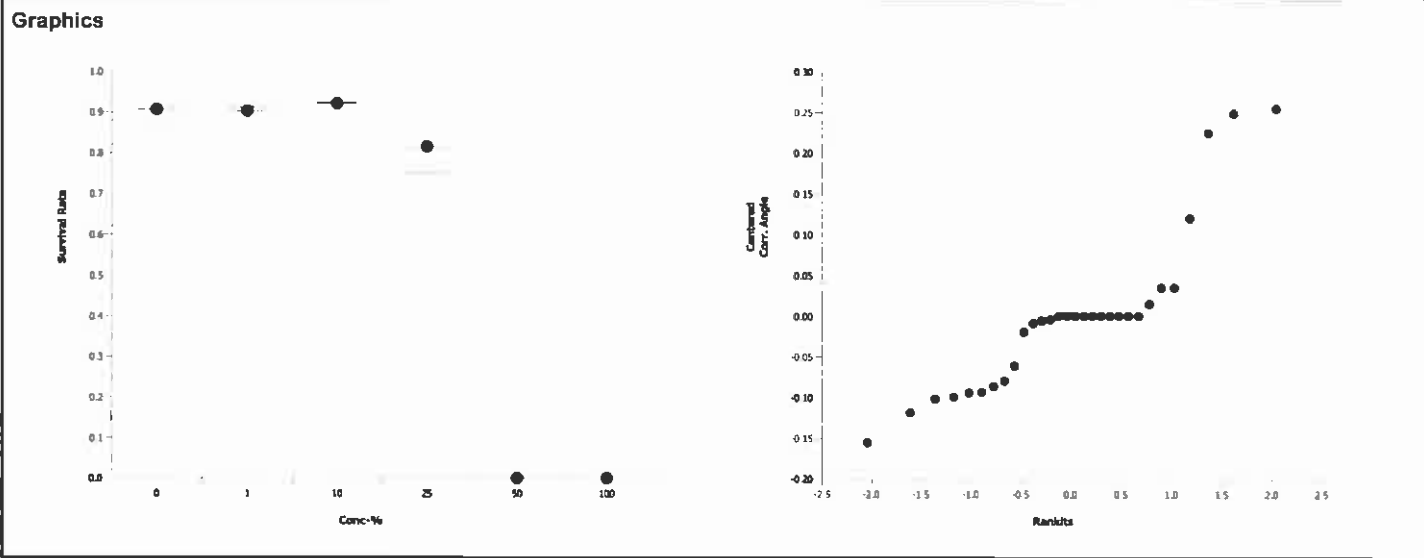
CETIS Analytical Report

Report Date: 21 Jul-10 13:48 (p 1 of 4)

Test Code: 16-3870-4796/39444

Bivalve Larval Survival and Development Test							Pacific EcoRisk				
Analysis ID: 03-2070-2854		Endpoint: Survival Rate			CETIS Version: CETISv1.7.0						
Analyzed: 21 Jul-10 13:47		Analysis: Nonparametric-Control vs Treatments			Official Results: Yes						
Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD			
Angular (Corrected)	0	C > T	Not Run	25	50	35.4	4	10.5%			
Steel Many-One Rank Test											
Control	vs	Conc-%	Test Stat	Critical	Ties	P-Value	Decision(5%)				
Lab Water Control		1	29	16	0	0.9103	Non-Significant Effect				
		10	31.5	16	1	0.9757	Non-Significant Effect				
		25	22	16	0	0.3476	Non-Significant Effect				
		50*	15	16	0	0.0191	Significant Effect				
		100*	15	16	0	0.0191	Significant Effect				
ANOVA Table											
Source	Sum Squares		Mean Square		DF	F Stat	P-Value	Decision(5%)			
Between	9.88263		1.976526		5	165	<0.0001	Significant Effect			
Error	0.2878133		0.01199222		24						
Total	10.17044		1.988518		29						
ANOVA Assumptions											
Attribute	Test			Test Stat	Critical	P-Value	Decision(1%)				
Variances	Mod Levene Equality of Variance			1.92	4.25	0.1402	Equal Variances				
Distribution	Shapiro-Wilk Normality			0.831		0.0003	Non-normal Distribution				
Survival Rate Summary											
Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
0	Lab Water Contr	5	0.907	0.885	0.928	0.863	1	0.0105	0.0564	6.23%	0.0%
1		5	0.902	0.891	0.913	0.852	0.923	0.00551	0.0297	3.29%	0.49%
10		5	0.921	0.902	0.94	0.874	1	0.00942	0.0507	5.51%	-1.58%
25		5	0.815	0.77	0.861	0.703	0.973	0.0221	0.119	14.6%	10.1%
50		5	0	0	0	0	0	0	0		100.0%
100		5	0	0	0	0	0	0	0		100.0%
Angular (Corrected) Transformed Summary											
Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
0	Lab Water Cont	5	1.29	1.23	1.34	1.19	1.53	0.0265	0.143	11.1%	0.0%
1		5	1.26	1.24	1.27	1.18	1.29	0.0088	0.0474	3.78%	2.37%
10		5	1.31	1.26	1.36	1.21	1.53	0.0246	0.132	10.1%	-1.85%
25		5	1.15	1.08	1.22	0.995	1.4	0.0331	0.178	15.5%	10.5%
50		5	0.0371	0.0371	0.0371	0.0371	0.0371	0	0	0.0%	97.1%
100		5	0.0371	0.0371	0.0371	0.0371	0.0371	0	0	0.0%	97.1%

Bivalve Larval Survival and Development Test			Pacific EcoRisk
Analysis ID: 03-2070-2854	Endpoint: Survival Rate	CETIS Version: CETISv1.7.0	
Analyzed: 21 Jul-10 13:47	Analysis: Nonparametric-Control vs Treatments	Official Results: Yes	



CETIS Analytical Report

Report Date: 21 Jul-10 13:48 (p 1 of 1)
Test Code: 16-3870-4796/39444

Bivalve Larval Survival and Development Test				Pacific EcoRisk			
Analysis ID: 06-5533-4642	Endpoint: Survival Rate			CETIS Version: CETISv1.7.0			
Analyzed: 21 Jul-10 13:47	Analysis: Untrimmed Spearman-Kärber			Official Results: Yes			

Spearman-Kärber Estimates							
Threshold Option	Threshold	Trim	Mu	Sigma	EC50	95% LCL	95% UCL
Control Threshold	0.0934	0.00%	1.51	0.00353	32.5	32	33.1

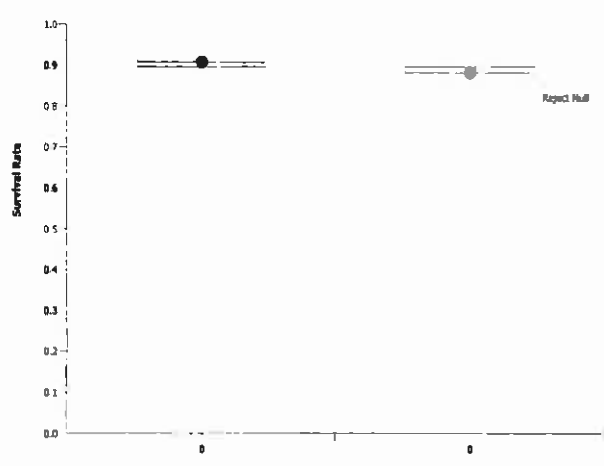
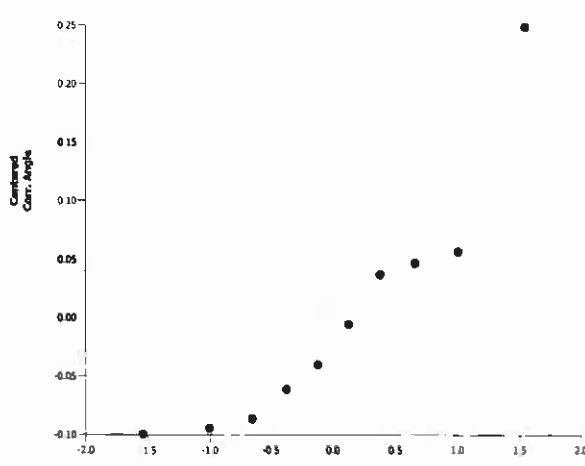
Survival Rate Summary			Calculated Variate(A/B)								
Conc-%	Control Type	Count	Mean	Min	Max	Std Err	Std Dev	CV%	Diff%	A	B
0	Lab Water Contr	5	0.907	0.863	1	0.0103	0.0564	6.23%	0.0%	825	910
1		5	0.902	0.852	0.923	0.00542	0.0297	3.29%	0.49%	821	910
10		5	0.921	0.874	1	0.00926	0.0507	5.51%	-1.58%	838	910
25		5	0.815	0.703	0.973	0.0218	0.119	14.6%	10.1%	742	910
50		5	0	0	0	0	0		100.0%	0	910
100		5	0	0	0	0	0		100.0%	0	910

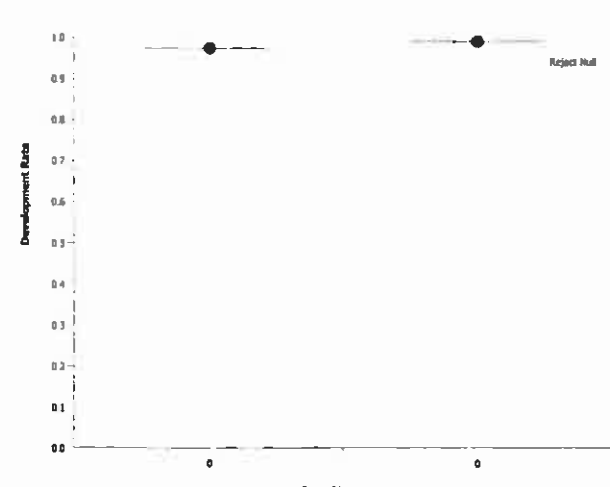
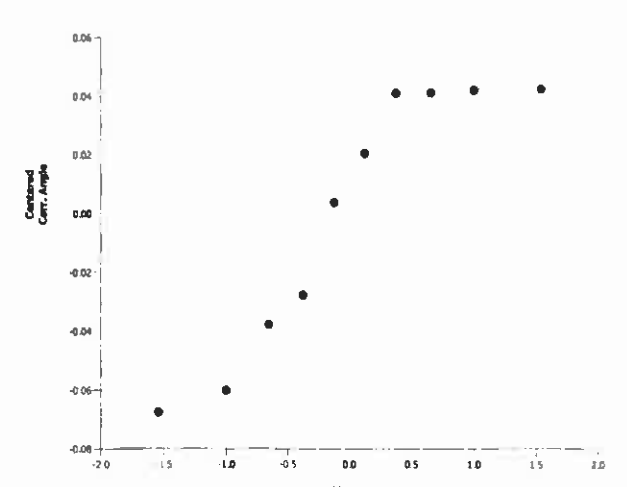
Survival Rate Detail						
Conc-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Lab Water Control	0.885	0.868	1	0.918	0.863
1		0.852	0.923	0.912	0.901	0.923
10		0.923	0.879	0.874	0.929	1
25		0.703	0.736	0.912	0.753	0.973
50		0	0	0	0	0
100		0	0	0	0	0



CETIS Analytical Report

Report Date: 20 Jul-10 16:01 (p 2 of 4)
Test Code: 18-6831-4622/39436

Bivalve Larval Survival and Development Test								Pacific EcoRisk			
Analysis ID: 17-3724-4183		Endpoint: Survival Rate		CETIS Version: CETISv1.7.0							
Analyzed: 20 Jul-10 15:59		Analysis: Parametric-Two Sample		Official Results: Yes							
Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD			
Angular (Corrected)	0	C > T	Not Run	0	>0			7.77%			
Equal Variance t Two-Sample Test											
Control	vs	Control	Test Stat	Critical	MSD	P-Value	Decision(5%)				
Lab Water Control		Site Water	0.88	1.86	0.131	0.2022	Non-Significant Effect				
ANOVA Table											
Source	Sum Squares		Mean Square		DF	F Stat	P-Value	Decision(5%)			
Between	0.009684817		0.009684817		1	0.775	0.4043	Non-Significant Effect			
Error	0.09996058		0.01249507		8						
Total	0.1096454		0.02217989		9						
ANOVA Assumptions											
Attribute	Test		Test Stat	Critical	P-Value	Decision(1%)					
Variances	Variance Ratio F		4.49	23.2	0.1746	Equal Variances					
Distribution	Shapiro-Wilk Normality		0.847		0.0532	Normal Distribution					
Survival Rate Summary											
Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
0	Site Water	5	0.881	0.864	0.898	0.813	0.918	0.00837	0.0451	5.11%	0.0%
0	Lab Water Contr	5	0.907	0.885	0.928	0.863	1	0.0105	0.0564	6.23%	-2.87%
Angular (Corrected) Transformed Summary											
Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
0	Site Water	5	1.22	1.2	1.25	1.12	1.28	0.0125	0.0674	5.51%	0.0%
0	Lab Water Cont	5	1.29	1.23	1.34	1.19	1.53	0.0265	0.143	11.1%	-5.09%
Graphics											
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Bivalve Larval Survival and Development Test								Pacific EcoRisk			
Analysis ID: 06-7674-0949		Endpoint: Development Rate		CETIS Version: CETISv1.7.0							
Analyzed: 20 Jul-10 15:57		Analysis: Parametric-Two Sample		Official Results: Yes							
Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD			
Angular (Corrected)	0	C > T	Not Run	0	>0			1.83%			
Equal Variance t Two-Sample Test											
Control	vs	Control	Test Stat	Critical	MSD	P-Value	Decision(5%)				
Lab Water Control		Site Water	-2.43	1.86	0.0556	0.9793	Non-Significant Effect				
ANOVA Table											
Source	Sum Squares		Mean Square		DF	F Stat	P-Value	Decision(5%)			
Between	0.01315582		0.01315582		1	5.89	0.0413	Significant Effect			
Error	0.01785393		0.002231742		8						
Total	0.03100976		0.01538756		9						
ANOVA Assumptions											
Attribute	Test		Test Stat	Critical	P-Value	Decision(1%)					
Variances	Variance Ratio F		1.26	23.2	0.8272	Equal Variances					
Distribution	Shapiro-Wilk Normality		0.849		0.0569	Normal Distribution					
Development Rate Summary											
Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
0	Site Water	5	0.992	0.989	0.996	0.98	1	0.00157	0.00846	0.85%	0.0%
0	Lab Water Contr	5	0.975	0.968	0.981	0.952	0.988	0.00299	0.0161	1.65%	1.8%
Angular (Corrected) Transformed Summary											
Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
0	Site Water	5	1.49	1.47	1.51	1.43	1.53	0.00825	0.0444	2.98%	0.0%
0	Lab Water Cont	5	1.42	1.4	1.44	1.35	1.46	0.00927	0.0499	3.52%	4.87%
Graphics											
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Mytilus sp. Development Toxicity Test Count Data

Client: ACOE - San Rafael Channel
 Test Material: SRC-2010-08
 Test ID #: 39444
 Project #: 16087
 Sample Salinity adjusted with: Crystal Sea Salts

Test Start Date: 7-7-10
 Test End Date: 7-9-10
 Enumeration Date: 7/21/10
 Investigator: Jm
 Inoculation Count: 182

Concentration	Replicate	Number of Normal Larvae	Number of Abnormal Larvae	Total Number Larvae	Percent Normal Development	Percent Survival
Control	A	161	2	163	99	88
	B	158	8	166	95	87
	C	186	7	193	96	100
	D	167	3	170	98	92
	E	157	2	159	97	86
1.0%	A	155	2	157	99	85
	B	168	5	173	97	92
	C	166	2	168	99	91
	D	164	1	165	99	90
	E	168	2	170	99	92
10%	A	168	3	171	98	92
	B	160	3	163	98	88
	C	159	2	161	99	87
	D	169	1	170	99	93
	E	182	3	185	98	100
25%	A	128	5	133	96	70
	B	134	5	139	96	74
	C	166	3	169	98	91
	D	137	5	142	96	75
	E	177	7	184	96	97
50%	A	0	138	138	0	0
	B	0	155	155	0	0
	C	0	152	152	0	0
	D	0	144	144	0	0
	E	0	127	127	0	0
100%	A	0	146	146	0	0
	B	0	150	150	0	0
	C	0	152	152	0	0
	D	0	139	139	0	0
	E	0	138	138	0	0

Mytilus sp. Development Toxicity Test Water Chemistry Data

Client: ACOE - San Rafael Channel
 Test Material: SRC-2010-08
 Test ID#: 39444 Project #: 16087
 Test Date: 7-7-10 Randomization: _____
 Sample Salinity adjusted with: Crystal Sea Salts

Organism Log#: S286 Age: N/A
 Organism Supplier: Cutall
 Control/Diluent: 30ppt FSW

Day 0					
Treatment	Temperature (°C)	pH	D.O. (mg/L)	Salinity (ppt)	Signoff
Control	16.4	7.80	8.7	30.7	Test Solution Prep. <u>mm</u>
1%	16.4	8.00	8.0	31.0	New WQ: <u>808</u>
10%	16.4	7.89	8.4	30.9	Inoculation Date: <u>7-7-10</u>
25%	16.4	7.92	8.4	30.4	Inoculation Time: <u>1510</u>
50%	16.4	7.95	8.2	29.9	Inoculation Signoff: <u>mm</u>
100%	16.4	8.00	7.6	28.6	
Meter ID	23	PH 14	RD03	EC03	

Day 1					
Treatment	Temperature (°C)	pH	D.O. (mg/L)	Salinity (ppt)	Signoff
Control	16.3				Date: <u>7/8/10</u>
1%	16.3				Signoff: <u>mm</u>
10%	16.3				
25%	16.3				
50%	16.3				
100%	16.3				
Meter ID	23				

Day 2					
Treatment	Temperature (°C)	pH	D.O. (mg/L)	Salinity (ppt)	Signoff
Control	16.2	8.06	7.5	31.3	Termination Signoff: <u>AB</u>
1%	16.2	8.07	7.4	31.2	Termination Date: <u>7-9-10</u>
10%	16.2	8.14	7.7	31.0	Termination Time: <u>1550</u>
25%	16.2	8.25	7.5	30.6	Old WQ: <u>NVS</u>
50%	16.2	8.36	7.5	30.1	
100%	16.2	8.47	7.7	28.7	
Meter ID	23	PH 12	RD02	EC03	

Appendix K

SET Elutriate Suitability Concentration Determination Calculations

Table K-1. Calculation of the Elutriate Suitability Concentration (ESC)

Site: SRC-2010-01
 Species: *Mytilus sp.*
 Disposal Site: SF-10

Mixing Zone Estimation	SRC-2010-01
Depth of disposal site (m)=	15
Pi=	3.14159
Width of vessel (m)=	10
Length of vessel(m)=	25
Speed of vessel (m/sec)=	0.5
Time of discharge (sec)=	30
Depth of vessel (m)=	4
Mixing Zone Volume(cu.m)=	627239

Volume of Liquid Phase	
Bulk density (constant) =	1.3
Particle density (constant) =	2.6
Density of liquid phase (constant) =	1
Vol of disposal vessel (cu.m)=	1000
Liquid phase volume (cu.m)=	813

Concentration of suspended phase	
Percent Silt=	31.5
Percent Clay=	36.1
Volume of Suspended Phase (cu.m)=	127

Projected Concentration (percent SP) =	0.0202
Lowest LC50 or EC50 from bioassay=	48.6
Factor LC50 or EC 50 X 0.01=	0.486

The factored LC50 or EC50 is higher than the projected concentration; therefore the Elutriate Suitability Concentration is not exceeded for dredged material from this site for the disposal site specified (SF-10). This assumes that sediment will be disposed of by barge at the disposal site, using a barge meeting the listed parameters. Elutriate tests were also performed on SF-10 and SF-11 sediment.

Table K-2. Calculation of the Elutriate Suitability Concentration (ESC)

Site: SRC-2010-02
 Species: *Mytilus sp.*
 Disposal Site: SF-10

Mixing Zone Estimation	SRC-2010-02
Depth of disposal site (m)=	15
Pi=	3.14159
Width of vessel (m)=	10
Length of vessel(m)=	25
Speed of vessel (m/sec)=	0.5
Time of discharge (sec)=	30
Depth of vessel (m)=	4
Mixing Zone Volume(cu.m)=	627239

Volume of Liquid Phase	
Bulk density (constant) =	1.3
Particle density (constant) =	2.6
Density of liquid phase (constant) =	1
Vol of disposal vessel (cu.m)=	1000
Liquid phase volume (cu.m)=	813

Concentration of suspended phase	
Percent Silt=	19.5
Percent Clay=	18.5
Volume of Suspended Phase (cu.m)=	71

Projected Concentration (percent SP) =	0.0114
Lowest LC50 or EC50 from bioassay=	35.4
Factor LC50 or EC 50 X 0.01=	0.354

The factored LC50 or EC50 is higher than the projected concentration; therefore the Elutriate Suitability Concentration is not exceeded for dredged material from this site for the disposal site specified (SF-10). This assumes that sediment will be disposed of by barge at the disposal site, using a barge meeting the listed parameters. Elutriate tests were also performed on SF-10 and SF-11 sediment.

Table K-3. Calculation of the Elutriate Suitability Concentration (ESC)

Site: SRC-2010-03
Species: *Mytilus sp.*
Disposal Site: SF-10

Mixing Zone Estimation	SRC-2010-03
Depth of disposal site (m)=	15
Pi=	3.14159
Width of vessel (m)=	10
Length of vessel(m)=	25
Speed of vessel (m/sec)=	0.5
Time of discharge (sec)=	30
Depth of vessel (m)=	4
Mixing Zone Volume(cu.m)=	627239

Volume of Liquid Phase	
Bulk density (constant) =	1.3
Particle density (constant) =	2.6
Density of liquid phase (constant) =	1
Vol of disposal vessel (cu.m)=	1000
Liquid phase volume (cu.m)=	813

Concentration of suspended phase	
Percent Silt=	30.8
Percent Clay=	30
Volume of Suspended Phase (cu.m)=	114

Projected Concentration (percent SP) =	0.0182
Lowest LC50 or EC50 from bioassay=	39.2
Factor LC50 or EC 50 X 0.01=	0.392

The factored LC50 or EC50 is higher than the projected concentration; therefore the Elutriate Suitability Concentration is not exceeded for dredged material from this site for the disposal site specified (SF-10). This assumes that sediment will be disposed of by barge at the disposal site, using a barge meeting the listed parameters. Elutriate tests were also performed on SF-10 and SF-11 sediment.

Table K-4. Calculation of the Elutriate Suitability Concentration (ESC)

Site: SRC-2010-04
 Species: *Mytilus sp.*
 Disposal Site: SF-10

Mixing Zone Estimation	SRC-2010-04
Depth of disposal site (m)=	15
Pi=	3.14159
Width of vessel (m)=	10
Length of vessel(m)=	25
Speed of vessel (m/sec)=	0.5
Time of discharge (sec)=	30
Depth of vessel (m)=	4
Mixing Zone Volume(cu.m)=	627239

Volume of Liquid Phase	
Bulk density (constant) =	1.3
Particle density (constant) =	2.6
Density of liquid phase (constant) =	1
Vol of disposal vessel (cu.m)=	1000
Liquid phase volume (cu.m)=	813

Concentration of suspended phase	
Percent Silt=	19.3
Percent Clay=	21.8
Volume of Suspended Phase (cu.m)=	77

Projected Concentration (percent SP) =	0.0123
Lowest LC50 or EC50 from bioassay=	35.0
Factor LC50 or EC 50 X 0.01=	0.350

The factored LC50 or EC50 is higher than the projected concentration; therefore the Elutriate Suitability Concentration is not exceeded for dredged material from this site for the disposal site specified (SF-10). This assumes that sediment will be disposed of by barge at the disposal site, using a barge meeting the listed parameters. Elutriate tests were also performed on SF-10 and SF-11 sediment.

Table K-5. Calculation of the Elutriate Suitability Concentration (ESC)

Site: SRC-2010-05
 Species: *Mytilus sp.*
 Disposal Site: SF-10

Mixing Zone Estimation	SRC-2010-05
Depth of disposal site (m)=	15
Pi=	3.14159
Width of vessel (m)=	10
Length of vessel(m)=	25
Speed of vessel (m/sec)=	0.5
Time of discharge (sec)=	30
Depth of vessel (m)=	4
Mixing Zone Volume(cu.m)=	627239

Volume of Liquid Phase	
Bulk density (constant) =	1.3
Particle density (constant) =	2.6
Density of liquid phase (constant) =	1
Vol of disposal vessel (cu.m)=	1000
Liquid phase volume (cu.m)=	813

Concentration of suspended phase	
Percent Silt=	25.6
Percent Clay=	26.9
Volume of Suspended Phase (cu.m)=	98

Projected Concentration (percent SP) =	0.0157
Lowest LC50 or EC50 from bioassay=	35.1
Factor LC50 or EC 50 X 0.01=	0.351

The factored LC50 or EC50 is higher than the projected concentration; therefore the Elutriate Suitability Concentration is not exceeded for dredged material from this site for the disposal site specified (SF-10). This assumes that sediment will be disposed of by barge at the disposal site, using a barge meeting the listed parameters. Elutriate tests were also performed on SF-10 and SF-11 sediment.

Table K-6. Calculation of the Elutriate Suitability Concentration (ESC)

Site: SRC-2010-06
 Species: *Mytilus sp.*
 Disposal Site: SF-10

Mixing Zone Estimation	SRC-2010-06
Depth of disposal site (m)=	15
Pi=	3.14159
Width of vessel (m)=	10
Length of vessel(m)=	25
Speed of vessel (m/sec)=	0.5
Time of discharge (sec)=	30
Depth of vessel (m)=	4
Mixing Zone Volume(cu.m)=	627239

Volume of Liquid Phase	
Bulk density (constant) =	1.3
Particle density (constant) =	2.6
Density of liquid phase (constant) =	1
Vol of disposal vessel (cu.m)=	1000
Liquid phase volume (cu.m)=	813

Concentration of suspended phase	
Percent Silt=	24.5
Percent Clay=	41.8
Volume of Suspended Phase (cu.m)=	124

Projected Concentration (percent SP) =	0.0198
Lowest LC50 or EC50 from bioassay=	34.8
Factor LC50 or EC 50 X 0.01=	0.348

The factored LC50 or EC50 is higher than the projected concentration; therefore the Elutriate Suitability Concentration is not exceeded for dredged material from this site for the disposal site specified (SF-10). This assumes that sediment will be disposed of by barge at the disposal site, using a barge meeting the listed parameters. Elutriate tests were also performed on SF-10 and SF-11 sediment.

Table K-7. Calculation of the Elutriate Suitability Concentration (ESC)

Site: SRC-2010-07
 Species: *Mytilus sp.*
 Disposal Site: SF-10

Mixing Zone Estimation	SRC-2010-07
Depth of disposal site (m)=	15
Pi=	3.14159
Width of vessel (m)=	10
Length of vessel(m)=	25
Speed of vessel (m/sec)=	0.5
Time of discharge (sec)=	30
Depth of vessel (m)=	4
Mixing Zone Volume(cu.m)=	627239

Volume of Liquid Phase	
Bulk density (constant) =	1.3
Particle density (constant) =	2.6
Density of liquid phase (constant) =	1
Vol of disposal vessel (cu.m)=	1000
Liquid phase volume (cu.m)=	813

Concentration of suspended phase	
Percent Silt=	10.4
Percent Clay=	41.9
Volume of Suspended Phase (cu.m)=	98

Projected Concentration (percent SP) =	0.0156
Lowest LC50 or EC50 from bioassay=	35.2
Factor LC50 or EC 50 X 0.01=	0.352

The factored LC50 or EC50 is higher than the projected concentration; therefore the Elutriate Suitability Concentration is not exceeded for dredged material from this site for the disposal site specified (SF-10). This assumes that sediment will be disposed of by barge at the disposal site, using a barge meeting the listed parameters. Elutriate tests were also performed on SF-10 and SF-11 sediment.

Table K-8. Calculation of the Elutriate Suitability Concentration (ESC)

Site: SRC-2010-08
 Species: *Mytilus sp.*
 Disposal Site: SF-10

Mixing Zone Estimation	SRC-2010-08
Depth of disposal site (m)=	15
Pi=	3.14159
Width of vessel (m)=	10
Length of vessel(m)=	25
Speed of vessel (m/sec)=	0.5
Time of discharge (sec)=	30
Depth of vessel (m)=	4
Mixing Zone Volume(cu.m)=	627239

Volume of Liquid Phase	
Bulk density (constant) =	1.3
Particle density (constant) =	2.6
Density of liquid phase (constant) =	1
Vol of disposal vessel (cu.m)=	1000
Liquid phase volume (cu.m)=	813

Concentration of suspended phase	
Percent Silt=	14.4
Percent Clay=	8.5
Volume of Suspended Phase (cu.m)=	43

Projected Concentration (percent SP) =	0.0068
Lowest LC50 or EC50 from bioassay=	32.5
Factor LC50 or EC 50 X 0.01=	0.325

The factored LC50 or EC50 is higher than the projected concentration; therefore the Elutriate Suitability Concentration is not exceeded for dredged material from this site for the disposal site specified (SF-10). This assumes that sediment will be disposed of by barge at the disposal site, using a barge meeting the listed parameters. Elutriate tests were also performed on SF-10 and SF-11 sediment.

Appendix L

Test Data and Summary of Statistics for the Reference Toxicant Evaluation of the *Mytilus galloprovincialis* Embryos

CETIS Summary Report

Report Date: 21 Jul-10 15:40 (p 1 of 1)
 Test Code: 13-0749-0991/39294

Bivalve Larval Survival and Development Test							Pacific EcoRisk				
Batch ID:	18-8220-2847	Test Type:	Development-Survival				Analyst:	Jason Walker			
Start Date:	07 Jul-10 15:10	Protocol:	ASTM E724-98 (Bivalve)				Diluent:	Diluted Seawater			
Ending Date:	09 Jul-10 15:50	Species:	Mytilus galloprovincialis				Brine:	Crystal Sea			
Duration:	49h	Source:	Dave Gutoff				Age:	N/A			
Sample ID:	10-1790-5333	Code:	KCl				Client:	Reference Toxicant			
Sample Date:	07 Jul-10 15:10	Material:	Potassium chloride				Project:	17090			
Receive Date:	07 Jul-10 15:10	Source:	Reference Toxicant								
Sample Age:	N/A (17.6 °C)	Station:	In House								
Comparison Summary											
Analysis ID	Endpoint	NOEL	LOEL	TOEL	PMSD	TU	Method				
03-4067-8690	Development Rate	1	2	1.41	1.01%		Dunnett's Multiple Comparison Test				
Point Estimate Summary											
Analysis ID	Endpoint	Level	g/L	95% LCL	95% UCL	TU	Method				
04-1953-3457	Development Rate	EC5	1.78	1.52	2.15		Linear Interpolation (ICPIN)				
		EC10	2.04	2.02	2.07						
		EC15	2.09	2.07	2.12						
		EC20	2.15	2.13	2.17						
		EC25	2.2	2.18	2.22						
		EC40	2.36	2.35	2.38						
		EC50	2.47	2.45	2.48						
Development Rate Summary											
Conc-g/L	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
0	Lab Water Contr	4	0.989	0.987	0.99	0.982	0.994	0.000848	0.00464	0.47%	0.0%
0.5		4	0.977	0.975	0.98	0.968	0.983	0.00122	0.00667	0.68%	1.14%
1		4	0.984	0.981	0.987	0.974	0.994	0.0015	0.00824	0.84%	0.43%
2		4	0.926	0.919	0.933	0.913	0.953	0.00337	0.0184	1.99%	6.32%
3		4	0	0	0	0	0	0			100.0%
4		4	0	0	0	0	0	0			100.0%
Development Rate Detail											
Conc-g/L	Control Type	Rep 1	Rep 2	Rep 3	Rep 4						
0	Lab Water Contr	0.989	0.994	0.989	0.982						
0.5		0.981	0.978	0.983	0.968						
1		0.974	0.982	0.994	0.987						
2		0.953	0.918	0.92	0.913						
3		0	0	0	0						
4		0	0	0	0						

Mytilus sp. Development Toxicity Test Count Data

Client: Reference Toxicant
 Test Material: Potassium Chloride
 Test ID #: 39294
 Project #: 17090

Test Start Date: 7/7/10
 Test End Date: 7/11/10
 Enumeration Date: 7/12/10
 Investigator: JA

Concentration	Replicate	Number of Normal Larvae	Number of Abnormal Larvae	Total Number Larvae	Percent Normal Development
Control	A	188	2	190	98.9
	B	155	1	156	99.4
	C	176	2	178	98.9
	D	167	3	170	98.2
0.5	A	154	3	157	98.1
	B	177	4	181	97.8
	C	170	3	173	98.3
	D	150	5	155	96.8
1	A	150	4	150 154	97.4
	B	167	3	170	98.2
	C	154	1	155	99.4
	D	153	2	157	98.7
2	A	143	7	150	95.3
	B	112	10	122	91.8
	C	150	13	163	92.0
	D	115	11	165 126	91.3
3	A	0	77	77	0
	B	0	130	130	0
	C	0	120	120	0
	D	0	100	100	0
4	A	0	102	102	0
	B	0	58	58	0
	C	0	69	69	0
	D	0	79	79	0

Mytilus sp. Development Toxicity Test Water Chemistry Data

Client: Reference Toxicant
 Test Material: Potassium Chloride
 Test ID#: 39294 Project #: 17090
 Test Date: 7/7/10

Organism Log#: 5286 Age: N/A
 Organism Supplier: Envia
 Control/Diluent: FSW @ 30 ppt ± 2

Day 0					
Treatment (g/L)	Temperature (°C)	pH	D.O. (mg/L)	Salinity (ppt)	Signoff
Control	17.6	7.73	9.1	30.7	Ref Tox Stock #
0.5	17.6	7.70	7.7	31.2	Test Solution Prep
1	17.6	7.78	8.4	31.8	New WQ: <u>OK</u>
2	17.6	7.80	8.7	32.9	Innoculation Date: <u>7/7/10</u>
3	17.6	7.81	8.9	33.9	Innoculation Time: <u>1510</u>
4	17.6	7.81	8.8	35.0	Innoculation Signoff: <u>OK</u>
Meter ID	45	PH14	RD03	EC03	

Day 1					
Treatment	Temperature (°C)	pH	D.O. (mg/L)	Salinity (ppt)	Signoff
Control	17.0				WQ <u>OK</u>
0.5	17.0				
1	17.0				
2	17.0				
3	17.0				
4	17.0				
Meter ID	45				

Day 2					
Treatment	Temperature (°C)	pH	D.O. (mg/L)	Salinity (ppt)	Signoff
Control	17.5	7.99	8.7	31.0	Termination Date: <u>7-9-10</u>
0.5	17.5	8.01	9.2	31.9	Termination Time: <u>1550</u>
1	17.5	8.03	9.1	32.2	Termination Signoff: <u>MB</u>
2	17.5	8.03	8.9	33.4	Old WQ: <u>NVS</u>
3	17.5	8.04	9.0	34.2	
4	17.5	8.04	8.9	35.3	
Meter ID	45	PH14	RD03	EC05	

CETIS Summary Report

Report Date: 21 Jul-10 15:40 (p 1 of 1)
 Test Code: 13-0749-0991/39294

Bivalve Larval Survival and Development Test							Pacific EcoRisk				
Batch ID:	18-8220-2847		Test Type:		Development-Survival		Analyst:	Jason Walker			
Start Date:	07 Jul-10 15:10		Protocol:		ASTM E724-98 (Bivalve)		Diluent:	Diluted Seawater			
Ending Date:	09 Jul-10 15:50		Species:		Mytilus galloprovincialis		Brine:	Crystal Sea			
Duration:	49h		Source:		Dave Gutoff		Age:	N/A			
Sample ID:	10-1790-5333		Code:		KCl		Client:	Reference Toxicant			
Sample Date:	07 Jul-10 15:10		Material:		Potassium chloride		Project:	17090			
Receive Date:	07 Jul-10 15:10		Source:		Reference Toxicant						
Sample Age:	N/A (17.6 °C)		Station:		In House						
Comparison Summary											
Analysis ID	Endpoint	NOEL	LOEL	TOEL	PMSD	TU	Method				
03-4067-8690	Development Rate	1	2	1.41	1.01%	Dunnett's Multiple Comparison Test					
Point Estimate Summary											
Analysis ID	Endpoint	Level	g/L	95% LCL	95% UCL	TU	Method				
04-1953-3457	Development Rate	EC5	1.78	1.52	2.15	Linear Interpolation (ICPIN)					
		EC10	2.04	2.02	2.07						
		EC15	2.09	2.07	2.12						
		EC20	2.15	2.13	2.17						
		EC25	2.2	2.18	2.22						
		EC40	2.36	2.35	2.38						
		EC50	2.47	2.45	2.48						
Development Rate Summary											
Conc-g/L	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
0	Lab Water Contr	4	0.989	0.987	0.99	0.982	0.994	0.000848	0.00464	0.47%	0.0%
0.5		4	0.977	0.975	0.98	0.968	0.983	0.00122	0.00667	0.68%	1.14%
1		4	0.984	0.981	0.987	0.974	0.994	0.0015	0.00824	0.84%	0.43%
2		4	0.926	0.919	0.933	0.913	0.953	0.00337	0.0184	1.99%	6.32%
3		4	0	0	0	0	0	0			100.0%
4		4	0	0	0	0	0	0			100.0%
Development Rate Detail											
Conc-g/L	Control Type	Rep 1	Rep 2	Rep 3	Rep 4						
0	Lab Water Contr	0.989	0.994	0.989	0.982						
0.5		0.981	0.978	0.983	0.968						
1		0.974	0.982	0.994	0.987						
2		0.953	0.918	0.92	0.913						
3		0	0	0	0						
4		0	0	0	0						

Mytilus sp. Development Toxicity Test Count Data

Client: Reference Toxicant
 Test Material: Potassium Chloride
 Test ID #: 39294
 Project #: 17090

Test Start Date: 7/7/10
 Test End Date: 7/11/10
 Enumeration Date: 7/12/10
 Investigator: JA

Concentration	Replicate	Number of Normal Larvae	Number of Abnormal Larvae	Total Number Larvae	Percent Normal Development
Control	A	188	2	190	98.9
	B	155	1	156	99.4
	C	176	2	178	98.9
	D	167	3	170	98.2
0.5	A	154	3	157	98.1
	B	177	4	181	97.8
	C	170	3	173	98.3
	D	150	5	155	96.8
1	A	150	4	150 154	97.4
	B	167	3	170	98.2
	C	154	1	155	99.4
	D	153	2	157	98.7
2	A	143	7	150	95.3
	B	112	10	122	91.8
	C	150	13	163	92.0
	D	115	11	165 126	91.3
3	A	0	77	77	0
	B	0	130	130	0
	C	0	120	120	0
	D	0	100	100	0
4	A	0	102	102	0
	B	0	58	58	0
	C	0	69	69	0
	D	0	79	79	0

Mytilus sp. Development Toxicity Test Water Chemistry Data

Client: Reference Toxicant
 Test Material: Potassium Chloride
 Test ID#: 39294 Project #: 17090
 Test Date: 7/7/10

Organism Log#: 5286 Age: N/A
 Organism Supplier: Envia
 Control/Diluent: Seawater @ 30 ppt ± 2

Day 0					
Treatment (g/L)	Temperature (°C)	pH	D.O. (mg/L)	Salinity (ppt)	Signoff
Control	17.6	7.73	9.1	30.7	Ref Tox Stock #
0.5	17.6	7.70	7.7	31.2	Test Solution Prep
1	17.6	7.78	8.4	31.8	New WQ: <u>OK</u>
2	17.6	7.80	8.7	32.9	Innoculation Date: <u>7/7/10</u>
3	17.6	7.81	8.9	33.9	Innoculation Time: <u>1510</u>
4	17.6	7.81	8.8	35.0	Innoculation Signoff: <u>OK</u>
Meter ID	45	PH14	RD03	EC03	

Day 1					
Treatment	Temperature (°C)	pH	D.O. (mg/L)	Salinity (ppt)	Signoff
Control	17.0				WQ <u>OK</u>
0.5	17.0				
1	17.0				
2	17.0				
3	17.0				
4	17.0				
Meter ID	45				

Day 2					
Treatment	Temperature (°C)	pH	D.O. (mg/L)	Salinity (ppt)	Signoff
Control	17.5	7.99	8.7	31.0	Termination Date: <u>7-9-10</u>
0.5	17.5	8.01	9.2	31.9	Termination Time: <u>1550</u>
1	17.5	8.03	9.1	32.2	Termination Signoff: <u>MB</u>
2	17.5	8.03	8.9	33.4	Old WQ: <u>NVS</u>
3	17.5	8.04	9.0	34.2	
4	17.5	8.04	8.9	35.3	
Meter ID	45	PH14	RD03	EC05	

Appendix M

Test Data and Summary of Statistics for the Evaluation of the Toxicity of the San Rafael Channel Modified Elutriate Test (MET) Sediment Elutriates to Mysids (*Americamysis bahia*)

CETIS Summary Report

Report Date: 20 Jul-10 11:15 (p 1 of 1)
 Test Code: 08-5029-1491/39407-11

Acute Mysid Survival Test						Pacific EcoRisk				
Batch ID:	00-4837-8514	Test Type:	Survival (96h)			Analyst:	Jason Walker			
Start Date:	07 Jul-10 15:00	Protocol:	EPA-821-R-02-012 (2002)			Diluent:	Not Applicable			
Ending Date:	11 Jul-10 14:15	Species:	Americamysis bahia			Brine:	Crystal Sea			
Duration:	95h	Source:	Aquatic Biosystems, CO			Age:	4			
Sample Code	Sample ID	Sample Date	Receive Date	Sample Age	Client Name	Project				
Lab Control 1	01-9805-7660	07 Jul-10 15:00	07 Jul-10 15:00	N/A (20.7 °C)	ACOE	16087				
Site Water	10-5440-7198	11 Jun-10 10:40	11 Jun-10 17:00	26d 4h (0.2 °C						
SRC-2010-01	17-0782-1094	08 Jun-10 09:20	08 Jun-10 19:00	29d 6h (2.4 °C						
SRC-2010-02	21-4363-5601	09 Jun-10 08:00	09 Jun-10 19:00	28d 7h (1.6 °C						
SRC-2010-03	15-3808-8719	09 Jun-10 11:05	09 Jun-10 19:00	28d 4h (1.6 °C						
SRC-2010-04	03-3478-6159	11 Jun-10 08:40	11 Jun-10 17:00	26d 6h (0.2 °C						
Sample Code	Material Type	Sample Source		Station Location		Latitude	Longitude			
Lab Control 1	Lab Water	San Rafael Channel		Lab Control						
Site Water	Site Water Control	San Rafael Channel		SRC-2010-SW						
SRC-2010-01	Elutriate	San Rafael Channel		SRC-2010-01						
SRC-2010-02	Elutriate	San Rafael Channel		SRC-2010-02						
SRC-2010-03	Elutriate	San Rafael Channel		SRC-2010-03						
SRC-2010-04	Elutriate	San Rafael Channel		SRC-2010-04						
96h Survival Rate Summary										
Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
Lab Control 1	5	0.96	0.94	0.98	0.9	1	0.01	0.0548	5.71%	0.0%
Site Water	5	0.96	0.94	0.98	0.9	1	0.01	0.0548	5.71%	0.0%
SRC-2010-01	5	0.98	0.963	0.997	0.9	1	0.00816	0.0447	4.56%	-2.08%
SRC-2010-02	5	0.96	0.94	0.98	0.9	1	0.01	0.0548	5.71%	0.0%
SRC-2010-03	5	0.98	0.963	0.997	0.9	1	0.00816	0.0447	4.56%	-2.08%
SRC-2010-04	5	0.98	0.963	0.997	0.9	1	0.00816	0.0447	4.56%	-2.08%
96h Survival Rate Detail										
Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
Lab Control 1	1	0.9	0.9	1	1					
Site Water	0.9	1	1	1	0.9					
SRC-2010-01	1	0.9	1	1	1					
SRC-2010-02	1	0.9	1	0.9	1					
SRC-2010-03	0.9	1	1	1	1					
SRC-2010-04	1	0.9	1	1	1					

CETIS Analytical Report

Report Date: 20 Jul-10 11:15 (p 5 of 5)
Test Code: 08-5029-1491/39407-11

Acute Mysid Survival Test							Pacific EcoRisk				
Analysis ID: 00-8041-4609		Endpoint: 96h Survival Rate			CETIS Version: CETISv1.7.0						
Analyzed: 20 Jul-10 11:14		Analysis: Nonparametric-Two Sample			Official Results: Yes						
Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD			
Angular (Corrected)	0	C > T	Not Run				N/A	6.7%			
Wilcoxon Rank Sum Two-Sample Test											
Sample Code	vs	Sample Code	Test Stat	Critical	Ties	P-Value	Decision(5%)				
Lab Control 1		Site Water	27.5		2	0.5000	Non-Significant Effect				
ANOVA Table											
Source	Sum Squares		Mean Square		DF	F Stat	P-Value	Decision(5%)			
Between	0		0		1	0	1.0000	Non-Significant Effect			
Error	0.0637424		0.0079678		8						
Total	0.0637424		0.0079678		9						
ANOVA Assumptions											
Attribute	Test		Test Stat		Critical	P-Value	Decision(1%)				
Variances	Variance Ratio F		1		23.2	1.0000	Equal Variances				
Distribution	Shapiro-Wilk Normality		0.64			0.0002	Non-normal Distribution				
96h Survival Rate Summary											
Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%	
Lab Control 1	5	0.96	0.939	0.981	0.9	1	0.0102	0.0548	5.71%	0.0%	
Site Water	5	0.96	0.939	0.981	0.9	1	0.0102	0.0548	5.71%	0.0%	
Angular (Corrected) Transformed Summary											
Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%	
Lab Control 1	5	1.35	1.31	1.38	1.25	1.41	0.0166	0.0893	6.63%	0.0%	
Site Water	5	1.35	1.31	1.38	1.25	1.41	0.0166	0.0893	6.63%	0.0%	
Graphics											
<div><div><p>96h Survival Rate</p><p>Sample Code</p><p>Lab Control 1</p><p>Site Water</p><p>0.0 0.1 0.2 0.3 0.4 0.5 0.6 0.7 0.8 0.9 1.0</p><p>0.96 0.96</p></div><div><p>Angular (Corrected) Transformed</p><p>Rankits</p><p>-2.0 -1.5 -1.0 -0.5 0.0 0.5 1.0 1.5 2.0</p><p>-0.10 -0.08 -0.06 -0.04 -0.02 0.00 0.02 0.04 0.06 0.08</p><p>-0.09 -0.09 -0.09 -0.09 0.06 0.06 0.06 0.06 0.06 0.06</p></div></div>											

CETIS Analytical Report

Report Date: 20 Jul-10 11:15 (p 4 of 5)
Test Code: 08-5029-1491/39407-11

Acute Mysid Survival Test							Pacific EcoRisk																									
Analysis ID: 04-7446-8581		Endpoint: 96h Survival Rate			CETIS Version: CETISv1.7.0																											
Analyzed: 20 Jul-10 11:14		Analysis: Nonparametric-Two Sample			Official Results: Yes																											
Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD																								
Angular (Corrected)	0	C > T	Not Run				N/A	6.13%																								
Wilcoxon Rank Sum Two-Sample Test																																
Sample Code	vs	Sample Code	Test Stat	Critical	Ties	P-Value	Decision(5%)																									
Lab Control 1		SRC-2010-01	30		2	0.6548	Non-Significant Effect																									
ANOVA Table																																
Source	Sum Squares		Mean Square		DF	F Stat	P-Value	Decision(5%)																								
Between	0.002655933		0.002655933		1	0.4	0.5447	Non-Significant Effect																								
Error	0.05311866		0.006639833		8																											
Total	0.0557746		0.009295766		9																											
ANOVA Assumptions																																
Attribute	Test		Test Stat	Critical	P-Value	Decision(1%)																										
Variances	Variance Ratio F		1.5	23.2	0.7040	Equal Variances																										
Distribution	Shapiro-Wilk Normality		0.759		0.0045	Non-normal Distribution																										
96h Survival Rate Summary																																
Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%																						
Lab Control 1	5	0.96	0.939	0.981	0.9	1	0.0102	0.0548	5.71%	0.0%																						
SRC-2010-01	5	0.98	0.963	0.997	0.9	1	0.0083	0.0447	4.56%	-2.08%																						
Angular (Corrected) Transformed Summary																																
Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%																						
Lab Control 1	5	1.35	1.31	1.38	1.25	1.41	0.0166	0.0893	6.63%	0.0%																						
SRC-2010-01	5	1.38	1.35	1.41	1.25	1.41	0.0135	0.0729	5.28%	-2.42%																						
Graphics																																
<div><div><p>96h Survival Rate</p><p>Sample Code</p><table border="1"><caption>96h Survival Rate Data</caption><thead><tr><th>Sample Code</th><th>Survival Rate</th></tr></thead><tbody><tr><td>Lab Control 1</td><td>0.96</td></tr><tr><td>SRC 2010-01</td><td>0.98</td></tr></tbody></table></div><div><p>Centered Corr. Angle</p><p>Rankits</p><table border="1"><caption>Centered Corr. Angle Data</caption><thead><tr><th>Rankits</th><th>Centered Corr. Angle</th></tr></thead><tbody><tr><td>-1.5</td><td>-0.13</td></tr><tr><td>-1.0</td><td>-0.10</td></tr><tr><td>-0.5</td><td>-0.10</td></tr><tr><td>0.0</td><td>0.03</td></tr><tr><td>0.5</td><td>0.03</td></tr><tr><td>1.0</td><td>0.07</td></tr><tr><td>1.5</td><td>0.07</td></tr></tbody></table></div></div>											Sample Code	Survival Rate	Lab Control 1	0.96	SRC 2010-01	0.98	Rankits	Centered Corr. Angle	-1.5	-0.13	-1.0	-0.10	-0.5	-0.10	0.0	0.03	0.5	0.03	1.0	0.07	1.5	0.07
Sample Code	Survival Rate																															
Lab Control 1	0.96																															
SRC 2010-01	0.98																															
Rankits	Centered Corr. Angle																															
-1.5	-0.13																															
-1.0	-0.10																															
-0.5	-0.10																															
0.0	0.03																															
0.5	0.03																															
1.0	0.07																															
1.5	0.07																															

96 Hour Acute *Americamysis bahia* Water Column Toxicity Test

Client: ACOE - San Rafael Channel
 Test Material: Site Water
 Test ID#: 39407-14 Project #: 16087
 Test Date: 7-7-10 Randomization: 6.5.1

Organism Log #: 5293 Age: 4 days
 Organism Supplier: ABS
 Control/Diluent: 25 ppt Lab Water
 Control Water Batch: 768

Treatment (% Elutriate)	Temp (°C)	pH		D.O. (mg/L)		Salinity (ppt)		# Live Organisms					SIGN-OFF
		new	old	new	old	new	old	Rep A	Rep B	Rep C	Rep D	Rep E	
Control	20.7	8.09		8.1		24.8		10	10	10	10	10	Test Solution Prep: <u>MM</u> New WQ: <u>PT</u> Initiation Date: <u>7-7-10</u> Initiation Time: <u>1500</u> Initiation Signoff: <u>EMK</u>
Site Water	20.7	7.61		9.1		24.0		10	10	10	10	10	
Meter ID	34A	PH04		PD05		EL04							
Control	20.6		7.96		7.4	24.5		10	10	9	10	10	Count Date: <u>7-8-10</u> Count Time: <u>0955</u> Count Signoff: <u>PT</u> Old WQ: <u>EMK</u>
Site Water	20.6		7.97		7.4	24.2		9	10	10	10	9	
Meter ID	34A		PH03		PD03	EL04							
Control	20.8		7.96		7.2	24.7		10	10	9	10	10	Count Date: <u>7/9/10</u> Count Time: <u>0915</u> Count Signoff: <u>JT</u> Old WQ: <u>OT</u>
Site Water	20.8		7.92		7.2	24.0		9	10	10	10	9	
Meter ID	34A		PH14		PD03	EL05							
Control	20.9		7.91		7.1	24.6		10	9	9	10	10	Count Date: <u>7/10/10</u> Count Time: <u>0900</u> Count Signoff: <u>JT</u> Old WQ: <u>MS</u>
Site Water	20.9		7.88		7.1	24.2		9	10	10	10	9	
Meter ID	34A		PH12		PD03	EL03							
Control	20.8		7.81		6.9	25.5		10	9	9	10	10	Termination Date: <u>7/11/10</u> Termination Time: <u>1415</u> Termination Signoff: <u>JP</u> Old WQ: <u>EL</u>
Site Water	20.8		7.77		6.9	24.4		9	10	10	10	9	
Meter ID	34A		PH03		PD03	EL05							

96 Hour Acute *Americamysis bahia* Water Column Toxicity Test

Client: ACOE - San Rafael Channel
 Test Material: SRC-2010-01
 Test ID#: 39407 Project #: 16087
 Test Date: 7-7-10 Randomization: 6.5.1

Organism Log #: 5293 Age: 4 days
 Organism Supplier: A-BS
 Control/Diluent: 25 ppt Lab Water
 Control Water Batch: 768

Treatment (% Elutriate)	Temp (°C)	pH		D.O. (mg/L)		Salinity (ppt)		# Live Organisms					SIGN-OFF
		new	old	new	old	new	old	Rep A	Rep B	Rep C	Rep D	Rep E	
Control	20.7	8.07		9.5		24.0		10	10	10	10	10	Test Solution Prep: <u>W</u> New WQ: <u>DT</u> Initiation Date: <u>7-7-10</u> Initiation Time: <u>1500</u> Initiation Signoff: <u>BMM</u>
100%	20.7	7.88		7.9		24.2		10	10	10	10	10	
Meter ID	34A	PHM		PD03		EC04							
Control	20.6		7.96		7.4	24.5		10	10	9	10	10	Count Date: <u>7-8-10</u> Count Time: <u>0955</u> Count Signoff: <u>PA</u> Old WQ: <u>W</u>
100%	20.6		8.12		7.3	24.7		10	10	10	10	10	
Meter ID	34A		PH03		PD03	EC04							
Control	20.8		7.96		7.2	24.7		10	10	9	10	10	Count Date: <u>7/9/10</u> Count Time: <u>0915</u> Count Signoff: <u>JT</u> Old WQ: <u>DT</u>
100%	20.8		8.18		7.3	25.0		10	10	10	10	10	
Meter ID	34A		PHM		PD03	EC05							
Control	20.9		7.91		7.1	24.6		10	9	9	10	10	Count Date: <u>7/10/10</u> Count Time: <u>0900</u> Count Signoff: <u>JT</u> Old WQ: <u>W</u>
100%	20.9		8.19		7.3	24.8		10	9	10	10	10	
Meter ID	34A		PH12		PD03	EC03							
Control	20.8		7.81		6.9	25.5		10	9	9	10	10	Termination Date: <u>7/11/10</u> Termination Time: <u>1415</u> Termination Signoff: <u>Jo</u> Old WQ: <u>W</u>
100%	20.8		8.08		6.7	25.0		10	9	10	10	10	
Meter ID	34A		PH03		PD03	EC05							

CETIS Analytical Report

Report Date: 20 Jul-10 11:15 (p 3 of 5)
Test Code: 08-5029-1491/39407-11

Acute Mysid Survival Test							Pacific EcoRisk			
Analysis ID: 00-7501-9266		Endpoint: 96h Survival Rate		CETIS Version: CETISv1.7.0						
Analyzed: 20 Jul-10 11:14		Analysis: Nonparametric-Two Sample		Official Results: Yes						
Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD		
Angular (Corrected)	0	C > T	Not Run				N/A	6.7%		
Wilcoxon Rank Sum Two-Sample Test										
Sample Code	vs	Sample Code	Test Stat	Critical	Ties	P-Value	Decision(5%)			
Lab Control 1		SRC-2010-02	27.5		2	0.5000	Non-Significant Effect			
ANOVA Table										
Source	Sum Squares		Mean Square		DF	F Stat	P-Value	Decision(5%)		
Between	0		0		1	0	1.0000	Non-Significant Effect		
Error	0.0637424		0.0079678		8					
Total	0.0637424		0.0079678		9					
ANOVA Assumptions										
Attribute	Test		Test Stat	Critical	P-Value	Decision(1%)				
Variances	Variance Ratio F		1	23.2	1.0000	Equal Variances				
Distribution	Shapiro-Wilk Normality		0.64		0.0002	Non-normal Distribution				
96h Survival Rate Summary										
Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
Lab Control 1	5	0.96	0.939	0.981	0.9	1	0.0102	0.0548	5.71%	0.0%
SRC-2010-02	5	0.96	0.939	0.981	0.9	1	0.0102	0.0548	5.71%	0.0%
Angular (Corrected) Transformed Summary										
Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
Lab Control 1	5	1.35	1.31	1.38	1.25	1.41	0.0166	0.0893	6.63%	0.0%
SRC-2010-02	5	1.35	1.31	1.38	1.25	1.41	0.0166	0.0893	6.63%	0.0%
Graphics										
<div><div><p>A dot plot showing the 96h Survival Rate for two sample codes: Lab Control 1 and SRC-2010-02. The y-axis is labeled '96h Survival Rate' and ranges from 0.0 to 1.0. Both sample codes have a survival rate of approximately 0.96, indicated by black dots. Horizontal error bars represent the 95% confidence intervals, which are very narrow and centered around the mean.</p></div><div><p>A Q-Q plot for the Angular (Corrected) Transformed data. The x-axis is labeled 'Ranks' and ranges from -2.0 to 2.0. The y-axis is labeled 'Combined Quantiles, Angular' and ranges from -0.10 to 0.08. Data points are plotted as black dots along a horizontal line at approximately y = 0.065, indicating a normal distribution.</p></div></div>										

96 Hour Acute *Americamysis bahia* Water Column Toxicity Test

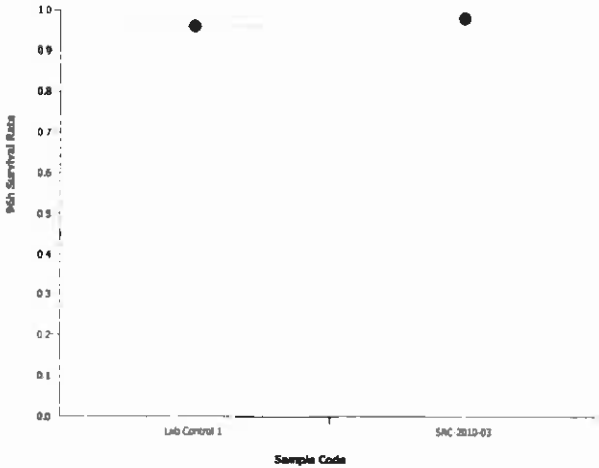
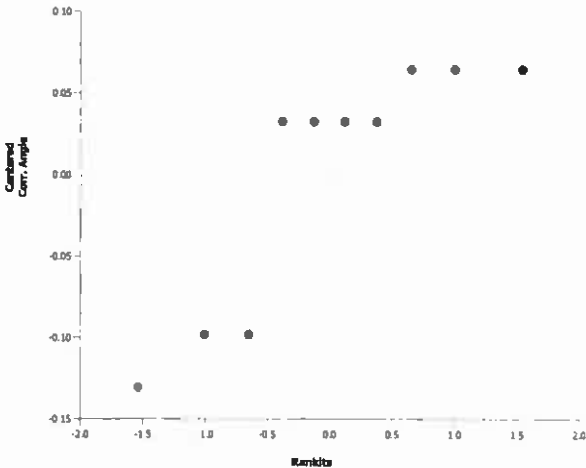
Client: ACOE - San Rafael Channel
 Test Material: SRC-2010-02
 Test ID#: 39408 Project #: 16087
 Test Date: 7-7-10 Randomization: 6.5.1

Organism Log #: 5293 Age: 4 days
 Organism Supplier: ABS
 Control/Diluent: 25 ppt Lab Water
 Control Water Batch: 768

Treatment (% Elutriate)	Temp (°C)	pH		D.O. (mg/L)		Salinity (ppt)		# Live Organisms					SIGN-OFF
		new	old	new	old	new	old	Rep A	Rep B	Rep C	Rep D	Rep E	
Control	20.7	6.09		8.1		24.8		10	10	10	10	10	Test Solution Prep New WQ: DT Initiation Date: 7-7-10 Initiation Time: 1500 Initiation Signoff: GMR
100%	20.7	7.91		7.9		24.0		10	10	10	10	10	
Meter ID	34A	pH4		p003		EC04							
Control	20.6		7.96		7.1	24.5		10	10	9	10	10	Count Date: 7-8-10 Count Time: 0955 Count Signoff: PA Old WQ: YU
100%	20.6		8.24		7.1	24.3		10	9	10	9	10	
Meter ID	34A		pH03		p003	EC04							
Control	20.8		7.76		7.2	24.7		10	10	9	10	10	Count Date: 7/9/10 Count Time: 0915 Count Signoff: DT Old WQ: DT
100%	20.8		8.23		7.1	27.0		10	9	10	9	10	
Meter ID	34A		pH4		p003	EC05							
Control	20.9		7.91		7.1	24.6		10	9	9	10	10	Count Date: 7/10/10 Count Time: 0900 Count Signoff: DT Old WQ: KLO
100%	20.9		8.24		7.1	24.6		10	9	10	9	10	
Meter ID	34A		pH2		p003	EC03							
Control	20.8		7.81		6.9	25.5		10	9	9	10	10	Termination Date: 7/11/10 Termination Time: 1415 Termination Signoff: Old WQ:
100%	20.9		8.12		6.7	24.5		10	9	10	9	10	
Meter ID	34A		pH03		p003	EC05							

CETIS Analytical Report

Report Date: 20 Jul-10 11:15 (p 2 of 5)
Test Code: 08-5029-1491/39407-11

Acute Mysid Survival Test							Pacific EcoRisk																		
Analysis ID: 19-4968-7753		Endpoint: 96h Survival Rate		CETIS Version: CETISv1.7.0																					
Analyzed: 20 Jul-10 11:14		Analysis: Nonparametric-Two Sample		Official Results: Yes																					
Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD																	
Angular (Corrected)	0	C > T	Not Run				N/A	6.13%																	
Wilcoxon Rank Sum Two-Sample Test																									
Sample Code	vs	Sample Code	Test Stat	Critical	Ties	P-Value	Decision(5%)																		
Lab Control 1		SRC-2010-03	30		2	0.6548	Non-Significant Effect																		
ANOVA Table																									
Source	Sum Squares		Mean Square		DF	F Stat	P-Value	Decision(5%)																	
Between	0.002655933		0.002655933		1	0.4	0.5447	Non-Significant Effect																	
Error	0.05311866		0.006639833		8																				
Total	0.0557746		0.009295766		9																				
ANOVA Assumptions																									
Attribute	Test		Test Stat		Critical	P-Value	Decision(1%)																		
Variances	Variance Ratio F		1.5		23.2	0.7040	Equal Variances																		
Distribution	Shapiro-Wilk Normality		0.759			0.0045	Non-normal Distribution																		
96h Survival Rate Summary																									
Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%															
Lab Control 1	5	0.96	0.939	0.981	0.9	1	0.0102	0.0548	5.71%	0.0%															
SRC-2010-03	5	0.98	0.963	0.997	0.9	1	0.0083	0.0447	4.56%	-2.08%															
Angular (Corrected) Transformed Summary																									
Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%															
Lab Control 1	5	1.35	1.31	1.38	1.25	1.41	0.0166	0.0893	6.63%	0.0%															
SRC-2010-03	5	1.38	1.35	1.41	1.25	1.41	0.0135	0.0729	5.28%	-2.42%															
Graphics																									
<div><div><table><caption>96h Survival Rate Data</caption><thead><tr><th>Sample Code</th><th>Survival Rate</th></tr></thead><tbody><tr><td>Lab Control 1</td><td>0.96</td></tr><tr><td>SRC-2010-03</td><td>0.98</td></tr></tbody></table></div><div><table><caption>Combined Corr. Angles Data</caption><thead><tr><th>Sample Code</th><th>Rankits</th><th>Combined Corr. Angles</th></tr></thead><tbody><tr><td>Lab Control 1</td><td>-1.35</td><td>0.03</td></tr><tr><td>SRC-2010-03</td><td>-1.38</td><td>0.04</td></tr></tbody></table></div></div>											Sample Code	Survival Rate	Lab Control 1	0.96	SRC-2010-03	0.98	Sample Code	Rankits	Combined Corr. Angles	Lab Control 1	-1.35	0.03	SRC-2010-03	-1.38	0.04
Sample Code	Survival Rate																								
Lab Control 1	0.96																								
SRC-2010-03	0.98																								
Sample Code	Rankits	Combined Corr. Angles																							
Lab Control 1	-1.35	0.03																							
SRC-2010-03	-1.38	0.04																							

96 Hour Acute *Americamysis bahia* Water Column Toxicity Test

Client: ACOE - San Rafael Channel
 Test Material: SRC-2010-03
 Test ID#: 39409 Project #: 16087
 Test Date: 7-7-10 Randomization: 6.5.1

Organism Log #: 5293 Age: 4 days
 Organism Supplier: AB
 Control/Diluent: 25 ppt Lab Water
 Control Water Batch: 768

Treatment (% Elutriate)	Temp (°C)	pH		D.O. (mg/L)		Salinity (ppt)		# Live Organisms					SIGN-OFF
		new	old	new	old	new	old	Rep A	Rep B	Rep C	Rep D	Rep E	
Control	20.7	8.07		8.1		24.8		10	10	10	10	10	Test Solution Prep. New WQ: Initiation Date: 7-7-10 Initiation Time: 1500 Initiation Signoff: [Signature]
100%	20.7	7.97		7.9		24.2		10	10	10	10	10	
Meter ID	34A	PH14		PH03		EC04							
Control	20.6		7.96		7.4		24.5	10	10	9	10	10	Count Date: 7-8-10 Count Time: 0955 Count Signoff: [Signature] Old WQ: [Signature]
100%	20.6		8.14		7.1		24.5	10	10	10	10	10	
Meter ID	34A		PH03		PH03		EC04						
Control	20.8		7.96		7.2		24.7	10	10	9	10	10	Count Date: 7/9/10 Count Time: 0915 Count Signoff: [Signature] Old WQ: [Signature]
100%	20.8		8.14		7.2		24.4	10	10	10	10	10	
Meter ID	34A		PH14		PH03		EC05						
Control	20.9		7.91		7.1		24.6	10	9	10	10	10	Count Date: 7/10/10 Count Time: 0900 Count Signoff: [Signature] Old WQ: [Signature]
100%	20.9		8.17		7.0		25.3	9	10	10	10	10	
Meter ID	34A		PH12		PH03		EC03						
Control	20.8		7.81		6.9		25.5	10	9	10	10	10	Termination Date: 7/11/10 Termination Time: 1415 Termination Signoff: [Signature] Old WQ: [Signature]
100%	20.8		8.09		6.7		24.9	9	10	10	10	10	
Meter ID	34A		PH03		PH03		EC05						

Acute Mysid Survival Test							Pacific EcoRisk																																								
Analysis ID: 16-8703-9771		Endpoint: 96h Survival Rate		CETIS Version: CETISv1.7.0																																											
Analyzed: 20 Jul-10 11:14		Analysis: Nonparametric-Two Sample		Official Results: Yes																																											
Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD																																							
Angular (Corrected)	0	C > T	Not Run				N/A	6.13%																																							
Wilcoxon Rank Sum Two-Sample Test																																															
Sample Code	vs	Sample Code	Test Stat	Critical	Ties	P-Value	Decision(5%)																																								
Lab Control 1		SRC-2010-04	30		2	0.6548	Non-Significant Effect																																								
ANOVA Table																																															
Source	Sum Squares		Mean Square		DF	F Stat	P-Value	Decision(5%)																																							
Between	0.002655933		0.002655933		1	0.4	0.5447	Non-Significant Effect																																							
Error	0.05311866		0.006639833		8																																										
Total	0.0557746		0.009295766		9																																										
ANOVA Assumptions																																															
Attribute	Test		Test Stat		Critical	P-Value	Decision(1%)																																								
Variances	Variance Ratio F		1.5		23.2	0.7040	Equal Variances																																								
Distribution	Shapiro-Wilk Normality		0.759			0.0045	Non-normal Distribution																																								
96h Survival Rate Summary																																															
Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%																																					
Lab Control 1	5	0.96	0.939	0.981	0.9	1	0.0102	0.0548	5.71%	0.0%																																					
SRC-2010-04	5	0.98	0.963	0.997	0.9	1	0.0083	0.0447	4.56%	-2.08%																																					
Angular (Corrected) Transformed Summary																																															
Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%																																					
Lab Control 1	5	1.35	1.31	1.38	1.25	1.41	0.0166	0.0893	6.63%	0.0%																																					
SRC-2010-04	5	1.38	1.35	1.41	1.25	1.41	0.0135	0.0729	5.28%	-2.42%																																					
Graphics																																															
<div><div><p>96h Survival Rate</p><p>Sample Codes</p><table border="1"><thead><tr><th>Sample Code</th><th>Count</th><th>Mean</th><th>95% LCL</th><th>95% UCL</th></tr></thead><tbody><tr><td>Lab Control 1</td><td>5</td><td>0.96</td><td>0.939</td><td>0.981</td></tr><tr><td>SRC-2010-04</td><td>5</td><td>0.98</td><td>0.963</td><td>0.997</td></tr></tbody></table></div><div><p>Continuum Corr. Angle</p><p>Rankits</p><table border="1"><thead><tr><th>Rankits</th><th>Continuum Corr. Angle</th></tr></thead><tbody><tr><td>-1.5</td><td>-0.13</td></tr><tr><td>-1.0</td><td>-0.10</td></tr><tr><td>-0.5</td><td>-0.10</td></tr><tr><td>0.0</td><td>0.03</td></tr><tr><td>0.5</td><td>0.03</td></tr><tr><td>1.0</td><td>0.03</td></tr><tr><td>1.5</td><td>0.03</td></tr><tr><td>1.5</td><td>0.06</td></tr><tr><td>1.0</td><td>0.06</td></tr><tr><td>0.5</td><td>0.06</td></tr></tbody></table></div></div>											Sample Code	Count	Mean	95% LCL	95% UCL	Lab Control 1	5	0.96	0.939	0.981	SRC-2010-04	5	0.98	0.963	0.997	Rankits	Continuum Corr. Angle	-1.5	-0.13	-1.0	-0.10	-0.5	-0.10	0.0	0.03	0.5	0.03	1.0	0.03	1.5	0.03	1.5	0.06	1.0	0.06	0.5	0.06
Sample Code	Count	Mean	95% LCL	95% UCL																																											
Lab Control 1	5	0.96	0.939	0.981																																											
SRC-2010-04	5	0.98	0.963	0.997																																											
Rankits	Continuum Corr. Angle																																														
-1.5	-0.13																																														
-1.0	-0.10																																														
-0.5	-0.10																																														
0.0	0.03																																														
0.5	0.03																																														
1.0	0.03																																														
1.5	0.03																																														
1.5	0.06																																														
1.0	0.06																																														
0.5	0.06																																														

96 Hour Acute *Americamysis bahia* Water Column Toxicity Test

Client: ACOE - San Rafael Channel
 Test Material: SRC-2010-04
 Test ID#: 39410 Project #: 16087
 Test Date: 7.7.10 Randomization: 6.5.1

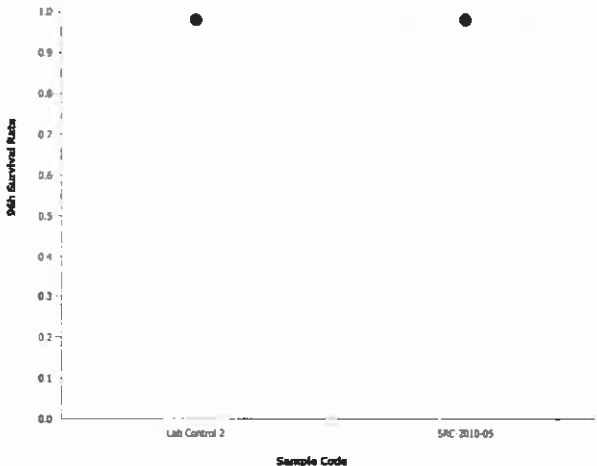
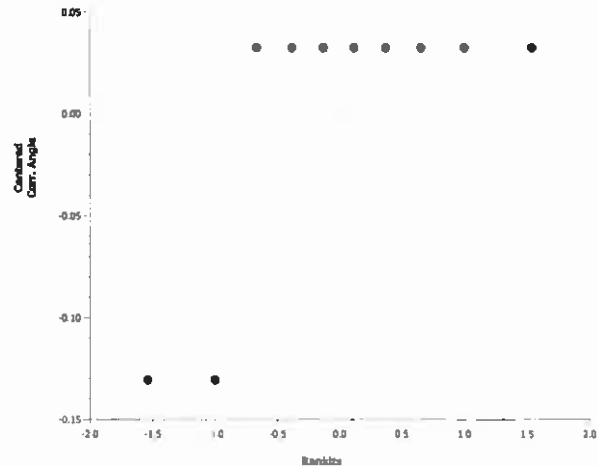
Organism Log #: 5213 Age: 4 days
 Organism Supplier: AIBS
 Control/Diluent: 25 ppt Lab Water
 Control Water Batch: 768

Treatment (% Elutriate)	Temp (°C)	pH		D.O. (mg/L)		Salinity (ppt)		# Live Organisms					SIGN-OFF
		new	old	new	old	new	old	Rep A	Rep B	Rep C	Rep D	Rep E	
Control	20.7	8.01		8.1		24.8		10	10	10	10	10	Test Solution Prep: New WQ: DT Initiation Date: 7.7.10 Initiation Time: 1500 Initiation Signoff: BKH
100%	20.7	7.86		7.9		24.0		10	10	10	10	10	
Meter ID	34A	PHM		R003		EC04							
Control	20.6		7.46		7.4	24.5		10	10	9	10	10	Count Date: 7.9.10 Count Time: 0955 Count Signoff: PA Old WQ: VHK
100%	20.6		8.18		7.1	24.2		10	9	10	10	10	
Meter ID	34A		PH03		R003	EC04							
Control	20.8		7.96		7.2	24.7		10	10	9	10	10	Count Date: 7/9/10 Count Time: 0915 Count Signoff: JT Old WQ: DT
100%	20.8		8.19		7.2	21.2		10	9	10	10	10	
Meter ID	34A		PH14		R003	EC05							
Control	20.9		7.91		7.1	24.6		10	9	9	10	10	Count Date: 7/10/10 Count Time: 0900 Count Signoff: JT Old WQ: MD
100%	20.9		8.21		6.9	24.4		10	9	10	10	10	
Meter ID	34A		PH12		R003	EC03							
Control	20.8		7.81		6.9	25.5		10	9	9	10	10	Termination Date: 7/11/10 Termination Time: 1415 Termination Signoff: Old WQ:
100%	20.8		8.10		6.8	25.0		10	9	10	10	10	
Meter ID	34A		PH03		R003	EC05							

CETIS Summary Report

Report Date: 20 Jul-10 11:20 (p 1 of 1)
Test Code: 10-7365-4865/39411-14

Acute Mysid Survival Test						Pacific EcoRisk				
Batch ID:	21-3643-2395	Test Type: Survival (96h)			Analyst:	Jason Walker				
Start Date:	07 Jul-10 15:00	Protocol: EPA-821-R-02-012 (2002)			Diluent:	Not Applicable				
Ending Date:	11 Jul-10 14:30	Species: Americamysis bahia			Brine:	Crystal Sea				
Duration:	95h	Source: Aquatic Biosystems, CO			Age:	4				
Sample Code	Sample ID	Sample Date	Receive Date	Sample Age	Client Name	Project				
Lab Control 2	17-0967-8032	07 Jul-10 15:00	07 Jul-10 15:00	N/A (20.7 °C)	ACOE	16087				
SRC-2010-05	02-1820-9844	08 Jun-10 14:45	08 Jun-10 19:00	29d 0h (2.4 °C						
SRC-2010-06	15-6585-2712	09 Jun-10 15:30	09 Jun-10 19:00	27d 23h (3.7 °						
SRC-2010-07	08-0994-4638	10 Jun-10 09:00	10 Jun-10 17:00	27d 6h (0.6 °C						
SRC-2010-08	08-9351-2460	10 Jun-10 11:55	10 Jun-10 17:00	27d 3h (1.4 °C						
Sample Code	Material Type	Sample Source		Station Location		Latitude	Longitude			
Lab Control 2	Lab Water	San Rafael Channel		Lab Control						
SRC-2010-05	Elutriate	San Rafael Channel		SRC-2010-05						
SRC-2010-06	Elutriate	San Rafael Channel		SRC-2010-06						
SRC-2010-07	Elutriate	San Rafael Channel		SRC-2010-07						
SRC-2010-08	Elutriate	San Rafael Channel		SRC-2010-08						
96h Survival Rate Summary										
Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
Lab Control 2	5	0.98	0.963	0.997	0.9	1	0.00816	0.0447	4.56%	0.0%
SRC-2010-05	5	0.98	0.963	0.997	0.9	1	0.00816	0.0447	4.56%	0.0%
SRC-2010-06	5	1	1	1	1	1	0	0	0.0%	-2.04%
SRC-2010-07	5	0.98	0.963	0.997	0.9	1	0.00816	0.0447	4.56%	0.0%
SRC-2010-08	5	0.96	0.94	0.98	0.9	1	0.01	0.0548	5.71%	2.04%
96h Survival Rate Detail										
Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
Lab Control 2	0.9	1	1	1	1					
SRC-2010-05	0.9	1	1	1	1					
SRC-2010-06	1	1	1	1	1					
SRC-2010-07	0.9	1	1	1	1					
SRC-2010-08	0.9	1	1	1	0.9					

Acute Mysid Survival Test							Pacific EcoRisk			
Analysis ID: 11-7501-7883		Endpoint: 96h Survival Rate		CETIS Version: CETISv1.7.0						
Analyzed: 20 Jul-10 11:19		Analysis: Nonparametric-Two Sample		Official Results: Yes						
Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD		
Angular (Corrected)	0	C > T	Not Run				N/A	5.6%		
Wilcoxon Rank Sum Two-Sample Test										
Sample Code	vs	Sample Code	Test Stat	Critical	Ties	P-Value	Decision(5%)			
Lab Control 2		SRC-2010-05	27.5		2	0.5000	Non-Significant Effect			
ANOVA Table										
Source	Sum Squares		Mean Square		DF	F Stat	P-Value	Decision(5%)		
Between	0		0		1	0	1.0000	Non-Significant Effect		
Error	0.04249493		0.005311866		8					
Total	0.04249493		0.005311866		9					
ANOVA Assumptions										
Attribute	Test		Test Stat	Critical	P-Value	Decision(1%)				
Variances	Variance Ratio F		1	23.2	1.0000	Equal Variances				
Distribution	Shapiro-Wilk Normality		0.509		<0.0001	Non-normal Distribution				
96h Survival Rate Summary										
Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
Lab Control 2	5	0.98	0.963	0.997	0.9	1	0.0083	0.0447	4.56%	0.0%
SRC-2010-05	5	0.98	0.963	0.997	0.9	1	0.0083	0.0447	4.56%	0.0%
Angular (Corrected) Transformed Summary										
Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
Lab Control 2	5	1.38	1.35	1.41	1.25	1.41	0.0135	0.0729	5.28%	0.0%
SRC-2010-05	5	1.38	1.35	1.41	1.25	1.41	0.0135	0.0729	5.28%	0.0%
Graphics										
<div><div><p>96h Survival Rate</p><p>Sample Code</p></div><div><p>Centered Corr. Angle</p><p>Ranks</p></div></div>										

96 Hour Acute *Americamysis bahia* Water Column Toxicity Test

Client: ACOE - San Rafael Channel
 Test Material: SRC-2010-05
 Test ID#: 39411 Project #: 16087
 Test Date: 7-7-10 Randomization: 5.5.1

Organism Log #: 5113 Age: 4 days
 Organism Supplier: ABS
 Control/Diluent: 15 ppt Lab Water
 Control Water Batch: 768

Treatment (% Elutriate)	Temp (°C)	pH		D.O. (mg/L)		Salinity (ppt)		# Live Organisms					SIGN-OFF
		new	old	new	old	new	old	Rep A	Rep B	Rep C	Rep D	Rep E	
Control	20.7	8.04		8.1		24.8		10	10	10	10	10	Test Solution Prep New WQ DT Initiation Date: 7-7-10 Initiation Time: 1500 Initiation Signoff: CLK
100%	20.7	7.86		8.0		24.1		10	10	10	10	10	
Meter ID	34A	PH04		PH03		EC04							
Control	20.6		7.98		7.5	24.8		10	10	10	10	10	Count Date: 7-8-10 Count Time: 1025 Count Signoff: PHS Old WQ: DT
100%	20.6		8.22		7.3	24.6		9	10	10	10	10	
Meter ID	34A		PH03		PH03	EC04							
Control	20.8		7.91		7.3	24.9		10	10	10	10	10	Count Date: 7/9/10 Count Time: 0945 Count Signoff: JT Old WQ: DT
100%	20.8		8.34		7.0	24.2		9	10	10	10	10	
Meter ID	34A		PH04		PH03	EC05							
Control	20.9		7.91		7.1	25.0		9	10	10	10	10	Count Date: 7/10/10 Count Time: 0930 Count Signoff: JT Old WQ: ST
100%	20.9		8.29		7.1	24.9		9	10	10	10	10	
Meter ID	34A		PH03		PH02	EC04							
Control	20.8		7.81		6.7	24.8		9	10	10	10	10	Termination Date: 7/11/10 Termination Time: 1430 Termination Signoff: Old WQ:
100%	20.8		8.28		6.7	24.4		9	10	10	10	10	
Meter ID	34A		PH03		PH03	EC05							

CETIS Analytical Report

Report Date: 20 Jul-10 11:19 (p 3 of 4)

Test Code: 10-7365-4865/39411-14

Acute Mysid Survival Test							Pacific EcoRisk			
Analysis ID: 05-0558-7041		Endpoint: 96h Survival Rate			CETIS Version: CETISv1.7.0					
Analyzed: 20 Jul-10 11:19		Analysis: Nonparametric-Two Sample			Official Results: Yes					
Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD		
Angular (Corrected)	0	C > T	Not Run				N/A	4.3%		
Wilcoxon Rank Sum Two-Sample Test										
Sample Code	vs	Sample Code	Test Stat	Critical	Ties	P-Value	Decision(5%)			
Lab Control 2		SRC-2010-06	30		1	0.6548	Non-Significant Effect			
ANOVA Table										
Source	Sum Squares		Mean Square		DF	F Stat	P-Value	Decision(5%)		
Between	0.002655933		0.002655933		1	1	0.3466	Non-Significant Effect		
Error	0.02124747		0.002655933		8					
Total	0.0239034		0.005311866		9					
ANOVA Assumptions										
Attribute	Test		Test Stat	Critical	P-Value	Decision(1%)				
Variances	Mod Levene Equality of Variance		1	13.7	0.3559	Equal Variances				
Distribution	Shapiro-Wilk Normality		0.625		0.0001	Non-normal Distribution				
96h Survival Rate Summary										
Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
Lab Control 2	5	0.98	0.963	0.997	0.9	1	0.0083	0.0447	4.56%	0.0%
SRC-2010-06	5	1	1	1	1	1	0	0	0.0%	-2.04%
Angular (Corrected) Transformed Summary										
Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
Lab Control 2	5	1.38	1.35	1.41	1.25	1.41	0.0135	0.0729	5.28%	0.0%
SRC-2010-06	5	1.41	1.41	1.41	1.41	1.41	0	0	0.0%	-2.36%
Graphics										

96 Hour Acute *Americamysis bahia* Water Column Toxicity Test

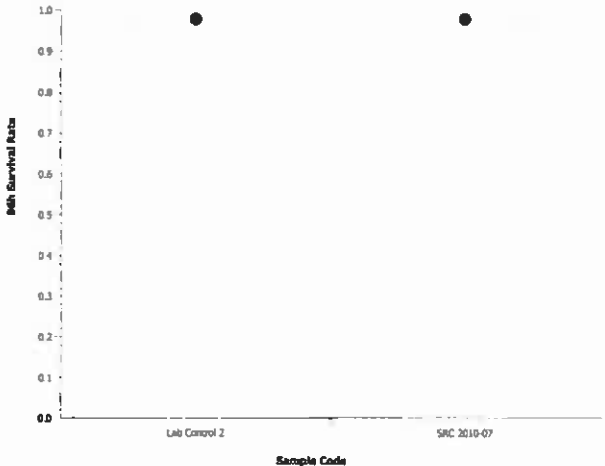
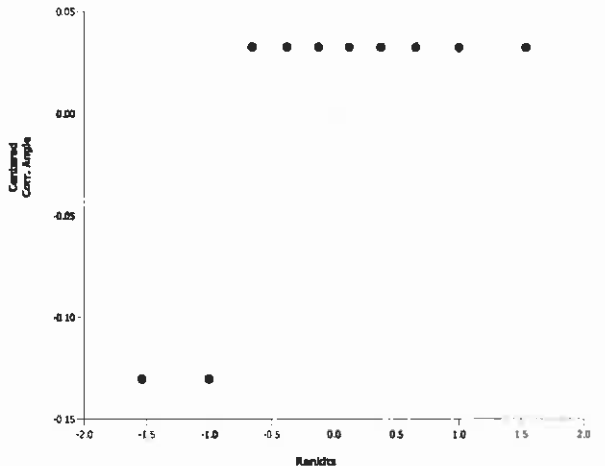
Client: ACOE - San Rafael Channel
 Test Material: SRC-2010-06
 Test ID#: 39412 Project #: 16087
 Test Date: 7-7-10 Randomization: 5.5.1

Organism Log #: 5193 Age: 4 days
 Organism Supplier: ABS
 Control/Diluent: 25 ppt Lab Water
 Control Water Batch: 768

Treatment (% Elutriate)	Temp (°C)	pH		D.O. (mg/L)		Salinity (ppt)		# Live Organisms					SIGN-OFF
		new	old	new	old	new	old	Rep A	Rep B	Rep C	Rep D	Rep E	
Control	20.7	8.5		8.1		24.8		10	10	10	10	10	Test Solution Prep: New WQ: DT Initiation Date: 7-7-10 Initiation Time: 1500 Initiation Signoff: EMM
100%	20.7	8.7		7.5		24.2		10	10	10	10	10	
Meter ID	43A	PH14		PD03		EC04							
Control	20.5	7.94		7.5		24.8		10	10	10	10	10	Count Date: 7-8-10 Count Time: 1025 Count Signoff: RA Old WQ: DT
100%	20.4	8.03		6.7		24.8		10	10	10	10	10	
Meter ID	34A	PH03		PD03		EC04							
Control	20.8	7.91		7.3		24.9		10	10	10	10	10	Count Date: 7/9/10 Count Time: 0945 Count Signoff: JT Old WQ: DT
100%	20.8	8.55		7.1		24.8		10	10	10	10	10	
Meter ID	34A	PH14		PD03		EC05							
Control	20.9	7.91		7.1		25.0		9	10	10	10	10	Count Date: 7/10/10 Count Time: 0930 Count Signoff: JT Old WQ: SG
100%	20.9	8.29		6.9		25.5		10	10	10	10	10	
Meter ID	34A	PH03		PD02		EC04							
Control	20.8	7.81		6.7		24.8		9	10	10	10	10	Termination Date: 7/11/10 Termination Time: 1430 Termination Signoff: JAW Old WQ: ED
100%	20.8	8.30		6.8		25.6		10	10	10	10	10	
Meter ID	34B	PH03		PD03		EC05							

CETIS Analytical Report

Report Date: 20 Jul-10 11:19 (p 2 of 4)
 Test Code: 10-7365-4865/39411-14

Acute Mysid Survival Test							Pacific EcoRisk																																	
Analysis ID: 19-3976-2848		Endpoint: 96h Survival Rate			CETIS Version: CETISv1.7.0																																			
Analyzed: 20 Jul-10 11:19		Analysis: Nonparametric-Two Sample			Official Results: Yes																																			
Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD																																
Angular (Corrected)	0	C > T	Not Run				N/A	5.6%																																
Wilcoxon Rank Sum Two-Sample Test																																								
Sample Code	vs	Sample Code	Test Stat	Critical	Ties	P-Value	Decision(5%)																																	
Lab Control 2		SRC-2010-07	27.5		2	0.5000	Non-Significant Effect																																	
ANOVA Table																																								
Source	Sum Squares		Mean Square		DF	F Stat	P-Value	Decision(5%)																																
Between	0		0		1	0	1.0000	Non-Significant Effect																																
Error	0.04249493		0.005311866		8																																			
Total	0.04249493		0.005311866		9																																			
ANOVA Assumptions																																								
Attribute	Test		Test Stat	Critical	P-Value	Decision(1%)																																		
Variances	Variance Ratio F		1	23.2	1.0000	Equal Variances																																		
Distribution	Shapiro-Wilk Normality		0.509		<0.0001	Non-normal Distribution																																		
96h Survival Rate Summary																																								
Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%																														
Lab Control 2	5	0.98	0.963	0.997	0.9	1	0.0083	0.0447	4.56%	0.0%																														
SRC-2010-07	5	0.98	0.963	0.997	0.9	1	0.0083	0.0447	4.56%	0.0%																														
Angular (Corrected) Transformed Summary																																								
Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%																														
Lab Control 2	5	1.38	1.35	1.41	1.25	1.41	0.0135	0.0729	5.28%	0.0%																														
SRC-2010-07	5	1.38	1.35	1.41	1.25	1.41	0.0135	0.0729	5.28%	0.0%																														
Graphics																																								
<div><div><table><caption>96h Survival Rate Data</caption><thead><tr><th>Sample Code</th><th>Count</th><th>Mean</th><th>95% LCL</th><th>95% UCL</th></tr></thead><tbody><tr><td>Lab Control 2</td><td>5</td><td>0.98</td><td>0.963</td><td>0.997</td></tr><tr><td>SRC-2010-07</td><td>5</td><td>0.98</td><td>0.963</td><td>0.997</td></tr></tbody></table></div><div><table><caption>Angular (Corrected) Transformed Data</caption><thead><tr><th>Sample Code</th><th>Count</th><th>Mean</th><th>95% LCL</th><th>95% UCL</th></tr></thead><tbody><tr><td>Lab Control 2</td><td>5</td><td>1.38</td><td>1.35</td><td>1.41</td></tr><tr><td>SRC-2010-07</td><td>5</td><td>1.38</td><td>1.35</td><td>1.41</td></tr></tbody></table></div></div>											Sample Code	Count	Mean	95% LCL	95% UCL	Lab Control 2	5	0.98	0.963	0.997	SRC-2010-07	5	0.98	0.963	0.997	Sample Code	Count	Mean	95% LCL	95% UCL	Lab Control 2	5	1.38	1.35	1.41	SRC-2010-07	5	1.38	1.35	1.41
Sample Code	Count	Mean	95% LCL	95% UCL																																				
Lab Control 2	5	0.98	0.963	0.997																																				
SRC-2010-07	5	0.98	0.963	0.997																																				
Sample Code	Count	Mean	95% LCL	95% UCL																																				
Lab Control 2	5	1.38	1.35	1.41																																				
SRC-2010-07	5	1.38	1.35	1.41																																				

96 Hour Acute *Americamysis bahia* Water Column Toxicity Test

Client: ACOE - San Rafael Channel
 Test Material: SRC-2010-07
 Test ID#: 39413 Project #: 16087
 Test Date: 7-7-10 Randomization: 5.5.1

Organism Log #: 5293 Age: 4 days
 Organism Supplier: AB S
 Control/Diluent: 25 ppt Lab Water
 Control Water Batch: 768

Treatment (% Elutriate)	Temp (°C)	pH		D.O. (mg/L)		Salinity (ppt)		# Live Organisms					SIGN-OFF
		new	old	new	old	new	old	Rep A	Rep B	Rep C	Rep D	Rep E	
Control	20.7	8.09		8.1		24.8		10	10	10	10	10	Test Solution Prep New WQ: Initiation Date: Initiation Time: Initiation Signoff:
100%	20.7	8.00		1.9		24.0		10	10	10	10	10	
Meter ID	34A	PH04		R003		EL04							
Control	20.6		7.98		7.5		24.8	10	10	10	10	10	Count Date: Count Time: Count Signoff: Old WQ:
100%	20.6		8.29		7.2		25.3	10	10	10	10	10	
Meter ID	34A	PH03		R003		EL04							
Control	20.8		7.91		7.3		24.9	10	10	10	10	10	Count Date: Count Time: Count Signoff: Old WQ:
100%	20.8		8.34		7.1		25.2	10	10	10	10	10	
Meter ID	34A	PH04		R003		EL05							
Control	20.9		7.91		7.1		25.0	9	10	10	10	10	Count Date: Count Time: Count Signoff: Old WQ:
100%	20.9		8.34		7.1		26.3	10	10	10	10	10	
Meter ID	34A	PH03		R002		EL04							
Control	20.8		7.81		6.7		24.8	9	10	10	10	10	Termination Date: Termination Time: Termination Signoff: Old WQ:
100%	20.8		8.34		6.7		26.3	9	10	10	10	10	
Meter ID	34A	PH03		R003		EL05							

Acute Mysid Survival Test

Pacific EcoRisk

Analysis ID: 13-5418-7932
Analyzed: 20 Jul-10 11:19Endpoint: 96h Survival Rate
Analysis: Nonparametric-Two SampleCETIS Version: CETISv1.7.0
Official Results: Yes

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Angular (Corrected)	0	C > T	Not Run				N/A	6.15%

Wilcoxon Rank Sum Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	Ties	P-Value	Decision(5%)
Lab Control 2		SRC-2010-08	25		2	0.3452	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	0.002655933	0.002655933	1	0.4	0.5447	Non-Significant Effect
Error	0.05311866	0.006639833	8			
Total	0.0557746	0.009295766	9			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Variance Ratio F	1.5	23.2	0.7040	Equal Variances
Distribution	Shapiro-Wilk Normality	0.759		0.0045	Non-normal Distribution

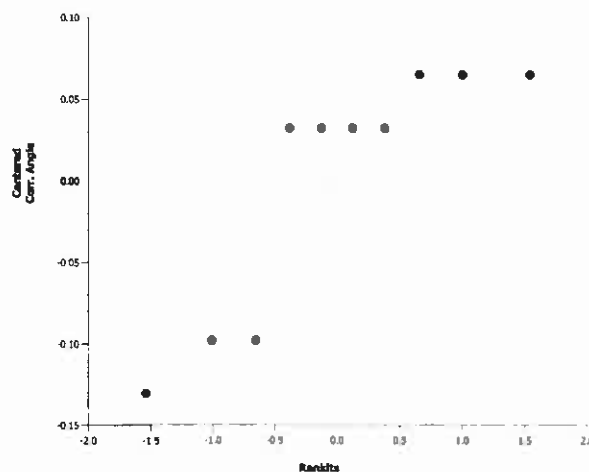
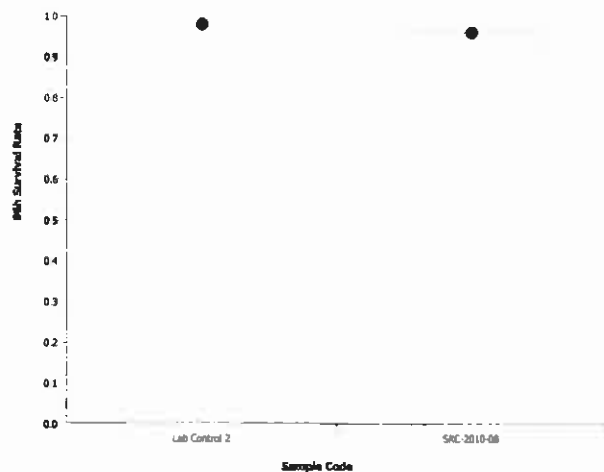
96h Survival Rate Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
Lab Control 2	5	0.98	0.963	0.997	0.9	1	0.0083	0.0447	4.56%	0.0%
SRC-2010-08	5	0.96	0.939	0.981	0.9	1	0.0102	0.0548	5.71%	2.04%

Angular (Corrected) Transformed Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
Lab Control 2	5	1.38	1.35	1.41	1.25	1.41	0.0135	0.0729	5.28%	0.0%
SRC-2010-08	5	1.35	1.31	1.38	1.25	1.41	0.0166	0.0893	6.63%	2.36%

Graphics



96 Hour Acute *Americamysis bahia* Water Column Toxicity Test

Client: ACOE - San Rafael Channel
 Test Material: SRC-2010-08
 Test ID#: 39414 Project #: 16087
 Test Date: 7-7-10 Randomization: 5.5.1

Organism Log #: 5213 Age: 4 days
 Organism Supplier: ABS
 Control/Diluent: 25 ppt Lab Water
 Control Water Batch: 768

Treatment (% Elutriate)	Temp (°C)	pH		D.O. (mg/L)		Salinity (ppt)		# Live Organisms					SIGN-OFF
		new	old	new	old	new	old	Rep A	Rep B	Rep C	Rep D	Rep E	
Control	20.7	8.09		8.1		24.8		10	10	10	10	10	Test Solution Prep: AM New WQ: Initiation Date: 7-7-10 Initiation Time: 1500 Initiation Signoff: EKK
100%	20.7	7.99		7.7		24.3		10	10	10	10	10	
Meter ID	34A	PH14		PH03		EC04							
Control	20.6		7.98		7.5	24.8		10	10	10	10	10	Count Date: 7-8-10 Count Time: 1025 Count Signoff: JTA Old WQ: DT
100%	20.6		8.30		7.3	25.1		10	10	10	10	10	
Meter ID	34A		PH03		PH03	EC04							
Control	20.8		7.91		7.3	24.4		10	10	10	10	10	Count Date: 7/9/10 Count Time: 0945 Count Signoff: JT Old WQ: DT
100%	20.8		8.39		7.2	24.7		10	10	10	9	10	
Meter ID	344		PH14		PH03	EC05							
Control	20.9		7.91		7.1	25.0		9	10	10	10	10	Count Date: 7/10/10 Count Time: 0930 Count Signoff: JT Old WQ: ST
100%	20.9		8.32		6.4	25.8		9	10	10	10	10	
Meter ID	344		PH03		PH03	EC04							
Control	20.8		7.81		6.7	24.8		9	10	10	10	10	Termination Date: 7/10/10 Termination Time: 1230 Termination Signoff: Old WQ:
100%	20.9		8.32		6.4	25.5		9	10	10	10	9	
Meter ID	34A		PH03		PH03	EC05							

Appendix N

Test Data and Summary of Statistics for the Reference Toxicant Evaluation of the Mysid, *Americamysis bahia*

CETIS Summary Report

Report Date: 21 Jul-10 14:07 (p 1 of 1)
 Test Code: 01-7903-4604/39406

Acute Mysid Survival Test							Pacific EcoRisk				
Batch ID:	01-3803-2496	Test Type:	Survival (96h)				Analyst:	Jason Walker			
Start Date:	07 Jul-10 15:30	Protocol:	EPA-821-R-02-012 (2002)				Diluent:	Laboratory Water			
Ending Date:	11 Jul-10 14:40	Species:	Americamysis bahia				Brine:	Crystal Sea			
Duration:	95h	Source:	Aquatic Biosystems, CO				Age:	4			
Sample ID:	20-5463-2528	Code:	KCl				Client:	Reference Toxicant			
Sample Date:	07 Jul-10 15:30	Material:	Potassium chloride				Project:	17107			
Receive Date:	07 Jul-10 15:30	Source:	Reference Toxicant								
Sample Age:	N/A (20.7 °C)	Station:	In House								
Comparison Summary											
Analysis ID	Endpoint	NOEL	LOEL	TOEL	PMSD	TU	Method				
17-1545-1965	96h Survival Rate	0.25	0.5	0.354	17.5%		Steel Many-One Rank Test				
Point Estimate Summary											
Analysis ID	Endpoint	Level	g/L	95% LCL	95% UCL	TU	Method				
04-7802-6139	96h Survival Rate	EC50	0.394	0.352	0.442		Spearman-Kärber				
96h Survival Rate Summary											
Conc-g/L	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
0	Lab Water Contr	4	0.95	0.913	0.987	0.8	1	0.0183	0.1	10.5%	0.0%
0.125		4	0.9	0.857	0.943	0.8	1	0.0211	0.115	12.8%	5.26%
0.25		4	1	1	1	1	1	0	0	0.0%	-5.26%
0.5		4	0.15	0.0785	0.222	0	0.4	0.035	0.191	128.0%	84.2%
1		4	0	0	0	0	0	0	0		100.0%
2		4	0	0	0	0	0	0	0		100.0%
96h Survival Rate Detail											
Conc-g/L	Control Type	Rep 1	Rep 2	Rep 3	Rep 4						
0	Lab Water Contr	1	1	0.8	1						
0.125		1	1	0.8	0.8						
0.25		1	1	1	1						
0.5		0	0.2	0	0.4						
1		0	0	0	0						
2		0	0	0	0						

96 Hour Acute *Americamysis bahia* Reference Toxicant Test

Client: Reference Toxicant
 Test Material: Potassium chloride
 Test ID#: 39406 Project #: 17107
 Test Date: 7.7.10 Randomization: 6.4.1

Organism Log #: 5293 Age: 4 days
 Organism Supplier: ABS
 Control/Diluent: DI + Crystal Sea @ 25 ppt
 Control Water Batch: 768

Treatment (g/L KCl)	Temp (°C)	pH		D.O. (mg/L)		Salinity (ppt)		# Live Organisms				SIGN-OFF
		new	old	new	old	new	old	Rep A	Rep B	Rep C	Rep D	
Control	20.7	8.11		7.8		24.3		5	5	5	5	Test Solution Prep: <u>ENR</u>
0.125	20.7	8.12		7.9		24.3		5	5	5	5	New WQ: <u>ENR</u>
0.25	20.7	8.12		8.1		24.5		5	5	5	5	Initiation Date: <u>7.7.10</u>
0.5	20.7	8.12		8.4		24.8		5	5	5	5	Initiation Time: <u>1530</u>
1	20.7	8.10		9.0		25.3		5	5	5	5	Initiation Signoff: <u>ENR</u>
2	20.7	8.07		10.1		26.4		5	5	5	5	RT Batch #: <u>30</u>
Meter ID	34A	PH11		RD03		EC03						
Control	21.0		8.09		7.5		25.0	5	5	5	5	Count Date: <u>7/8/10</u>
0.125	21.0		8.11		7.4		25.6	5	5	5	5	Count Time: <u>1000</u>
0.25	21.0		8.12		7.4		25.6	5	5	5	5	Count Signoff: <u>ENR</u>
0.5	21.0		8.12		7.5		25.9	5	5	5	5	Old WQ: <u>410</u>
1	21.0		8.12		7.5		26.4	0	0	0	0	
2	21.0		8.10		7.5		27.9	0	0	0	0	
Meter ID	34A		PH03		RD03		EC04					
Control	20.8	8.14	8.02	7.4	7.4	24.0	25.0	5	5	5	5	Test Solution Prep: <u>ENR</u>
0.125	20.8	8.15	8.02	7.7	7.4	24.4	25.0	5	5	5	5	New WQ: <u>NVS</u>
0.25	20.8	8.16	8.02	7.8	7.4	24.5	25.5	5	5	5	5	Renewal Date: <u>7-9-10</u>
0.5	20.8	8.14	8.04	8.0	7.5	24.9	25.6	2	2	0	3	Renewal Time: <u>1250</u>
1	-	-	-	-	-	-	-	-	-	-	-	Renewal Signoff: <u>ENR</u>
2	-	-	-	-	-	-	-	-	-	-	-	Old WQ: <u>410</u>
Meter ID	41A	PH12	PH14	RD02	RD03	EC03	EC05					RT Batch #: <u>30</u>
Control	20.3		7.96		7.1		24.1	5	5	4	5	Count Date: <u>7-10-10</u>
0.125	20.3		7.95		7.1		24.6	5	5	5	4	Count Time: <u>1005</u>
0.25	20.3		7.95		7.1		24.9	5	5	5	5	Count Signoff: <u>ENR</u>
0.5	20.3		7.95		7.2		25.5	0	1	-	2	Old WQ: <u>410</u>
1	-		-		-		-	-	-	-	-	
2	-		-		-		-	-	-	-	-	
Meter ID	41A		PH12		RD03		EC03					
Control	20.8		7.84		7.0		25.0	5	5	4	5	Termination Date: <u>7/11/10</u>
0.125	20.8		7.87		7.1		24.7	5	5	4	4	Termination Time: <u>1440</u>
0.25	20.8		7.85		6.9		24.8	5	5	5	5	Termination Signoff: <u>ENR</u>
0.5	20.8		7.81		7.2		25.2	-	1	-	2	Old WQ: <u>410</u>
1	-		-		-		-	-	-	-	-	
2	-		-		-		-	-	-	-	-	
Meter ID	41A		PH03		RD03		EC05					

Appendix O

Bioassay Standard Test Conditions

Summary of Test Conditions and Acceptability Criteria for the Amphipod (<i>Ampelisca abdita</i>) 10-Day Sediment Toxicity Test	
1. Test type	Static non-renewal
2. Test duration	10 d
3. Temperature	20 ± 1°C
4. Salinity	20 – 35 ppt
5. Light quality	Ambient Laboratory
6. Light intensity	50 – 100 ft c.
7. Photoperiod	Continuous
8. Test chamber size	1 L
9. Seawater volume	800 mL
10. Sediment depth	40 mm
11. Renewal of seawater	None
12. Age of test organisms	Wild population, immature juveniles
13. # of organisms per test chamber	20
14. # of replicate chambers/concentration	5
15. # of organisms per sediment type	100
16. Feeding regime	None
17. Test chamber cleaning	Lab washing prior to test
18. Test solution aeration	Low bubble (~100/minute)
19. Overlying water	0.45 µm-filtered seawater (at test salinity)
20. Test materials	Test sites, reference and control
21. Dilution series	None
22. Endpoint	% Survival
23. Sample holding requirements	< 8 weeks
24. Sample volume required	4 L
25. Test acceptability criteria	≥ 90% survival in the Control treatment
26. Reference toxicant results	Within 2 SD of laboratory mean

Summary of Test Conditions and Acceptability Criteria for the Marine Polychaete (<i>Neanthes arenaceodentata</i>) 10-Day Sediment Toxicity Test		
1.	Test type	Static-renewal
2.	Test duration	10 d
3.	Temperature	20 ± 1°C
4.	Salinity	20 – 35 ppt
5.	Light quality	Ambient Laboratory
6.	Light intensity	50 – 100 ft c.
7.	Photoperiod	12L/12D
8.	Test chamber size	1 L glass beakers
9.	Test solution volume	800 L
10.	Sediment depth	25 mm (200 mL)
11.	Renewal of seawater	None, unless needed. If needed, renew 80% of overlying water at 48 hour intervals
12.	Age of test organisms	2-3 weeks
13.	# of organisms per test chamber	5
14.	# of replicate chambers/concentration	5
15.	# of organisms per sediment type	25
16.	Feeding regime	None
17.	Test chamber cleaning	Lab washing prior to test
18.	Test solution aeration	Low bubble (~100/minute)
19.	Overlying water	0.45 µm-filtered seawater, at test salinity
20.	Test concentrations	Test sites, reference and Control
21.	Dilution series	None
22.	Endpoint	Survival
23.	Sample holding requirements	< 8 weeks
24.	Sample volume required	4 L
25.	Test acceptability criteria	≥ 90% survival in the Control treatment
26.	Reference toxicant results	Within 2 SD of laboratory mean

Summary of Test Conditions and Acceptability Criteria for the Mussel (<i>Mytilus sp.</i>) Water Column Toxicity Test	
1. Test type	Static non-renewal
2. Test duration	48 hours
3. Salinity	28 – 32 ppt
4. Temperature	16 ± 1°C (mussels)
5. Light quality	Ambient Laboratory
6. Light intensity	50 – 100 ft c.
7. Photoperiod	16L/8D
8. Test chamber size	20 mL vials
9. Test solution volume	10 mL
10. Renewal of seawater	None
11. Age of test organisms	Embryo ≤ 4h old
12. # of organisms per test chamber	150 – 300
13. # of replicate chambers per concentration	5
14. # of organisms per concentration	750 – 1,500
15. Feeding regime	None
16. Test chamber cleaning	Lab washing prior to test
17. Test chamber aeration	None
18. Elutriate preparation water	Site water
19. Test concentrations	Test sites, and Lab Control
20. Dilution series	Four concentrations (1, 10, 50, 100%) and a Lab Control.
21. Dilution water	Natural seawater
22. Endpoints	%Survival and %normal development
23. Sampling holding requirements	< 8 weeks
24. Sample volume required	2L
25. Test acceptability criteria	≥70% survival and normal development in the Lab Controls, <10% abnormal in Lab Control

Summary of Test Conditions and Acceptability Criteria for the Mysid (<i>Americamysis bahia</i>) Water Column Toxicity Test	
1. Test type	Static non-renewal
2. Test duration	96 hours
3. Salinity	25-30 ppt \pm 10 ppt
4. Temperature	20 \pm 1°C
5. Light quality	Ambient Laboratory
6. Light intensity	50 –100 ft c.
7. Photoperiod	16L/8D
8. Test chamber size	400 mL beaker
9. Test solution volume	200 mL
10. Renewal of seawater	None
11. Age of test organisms	1-5 days; 24 hour range in age
12. # of organisms per test chamber	10
13. # of replicate chambers per concentration	5
14. # of organisms per concentration	50
15. Feeding regime	daily
16. Test chamber cleaning	Lab washing prior to test
17. Test chamber aeration	If needed to maintain >40% saturation
18. Elutriate preparation water	Site water or Clean sea water
19. Test concentrations	Test sites, and Lab Control
20. Dilution series	Four concentrations (1, 10, 50, 100%) and a Lab Control.
21. Dilution water	Natural seawater/artificial seawater
22. Endpoints	% Survival
23. Sampling holding requirements	< 8 weeks
24. Sample volume required	2L
25. Test acceptability criteria	\geq 90% survival in the Lab Controls