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Mr. Brett Wilson
Warm Springs Hatchery
3246 Skaggs Springs Road
Geyserville, CA 95441-9643

Columbia Analytical Services Report
Coyote Valley
D0209277/D9277

January 21, 2003

Submitted by:

Karen Sellers for:

Robert DeMarr
Project Manager/Client Services

This report contains a total of 97 pages.

0001

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CAS Lab Reference No.: D9277
Level II

Current CAS Redding Accreditation Programs

Federal and National Programs

- U.S Air Force, Air Force Center for Environmental Excellence (AFCEE)
  Approved laboratory for Wastewater and Hazardous Waste
- U.S. Army Corps of Engineers – MRD, HTRW Mandatory Center of Expertise
  Validated for Wastewater and Hazardous Waste
- Department of the Navy, Naval Facilities Engineering Service Center (NFESC)
  Approved laboratory for Wastewater and Hazardous Waste

State and Local Programs

- State of Arizona, Department of Health Services
  Approved laboratory for Hazardous Waste
  Lab ID# AZ0604
- State of Arkansas, Department of Environmental Quality
  Approved laboratory for Wastewater and Hazardous Waste
  Lab ID# None
- State of California, Department of Health Services, National Environmental Laboratory Accreditation Program **(NELAP)**
  Approved laboratory for Drinking Water, Wastewater and Hazardous Waste
  Lab ID# 01105CA
- State of Florida, Department of Health **(NELAP)**
  Approved Environmental Testing Laboratory for Wastewater and Hazardous Waste
  Lab ID# E87203
- State of Kansas, Department of Health and Environment **(NELAP)**
  Approved laboratory for Hazardous Waste
  Lab ID# E-10323
- State of New Hampshire, Department of Environmental Services **(NELAP)**
  Approved laboratory for Drinking Water, Wastewater
  Lab ID# 296202
- State of Massachusetts, Department of Environmental Protection
  Approved laboratory for Drinking Water, Wastewater
  Lab ID# M-CA025
- State of Oregon, Department of Human Resources, Health Division **(ORELAP)**
  Approved laboratory for Drinking Water, Wastewater, and Hazardous Waste
  Lab ID# CA200004
- State of Utah, Department of Health, Division of Laboratory Services **(NELAP)**
  Approved laboratory for Wastewater and Hazardous Waste
  Lab ID# QUAL1
- State of Washington, Department of Ecology, Environmental Laboratory Accreditation Program
  Approved laboratory for Wastewater and Hazardous Waste
  Lab ID# C037
- State of Wisconsin, Department of Ecology
  Approved laboratory for Wastewater and Hazardous Waste
  Lab ID# 999767340

Organic Data Qualifiers

A -- This qualifier indicates that a TIC is a suspected aldol-condensation product

B -- This flag is used when the analyte is found in the associated blank as well as the sample. This notation indicates possible blank contamination and suggests that the data user evaluate these compounds and their amounts carefully.

C -- The "C" flag indicates the presence of this compound has been confirmed by the GC/MS analysis.

D -- This qualifier is used for all the compounds identified in an analysis at a secondary dilution factor. "D" qualifiers are used only for the samples reported at more than one dilution factor.

E -- This flag indicates that the value reported exceeds the linear calibration range for that compound. Therefore, the sample should be reanalyzed at the appropriate dilution. The "E" qualified amount is an estimated concentration, and the results of the dilution will be reported on a separate Form I.

I -- The qualifier indicates that the reporting limit to the "I" qualifier has been raised. It is used when the chromatographic interference prohibits detection of a compound at a level below the concentration expressed on the Form I.

J -- Indicates an estimated value. It is used when the data indicates the presence of a target compound below the reporting limit or the presence of a Tentatively Identified Compound (TIC).

N -- This qualifier indicates presumptive evidence of a compound. This flag is only used for Tentatively Identified Compounds (TIC), where the identification is based on a mass spectral library research. It is applied to all TIC results. For generic characterization of a TIC, such as chlorinated hydrocarbon, the "N" qualifier is not used.

P -- This qualifier is used for target analytes when there is a greater than 40% difference for detected concentrations between the two columns or detectors. The concentration value is reported on Form I and flagged with a "P".

U -- Indicates the compound was analyzed for but not detected. The number adjacent to the "U" qualifier indicates the reporting limit for that compound. The reporting limit can vary from sample to sample depending on dilution factors or percent moisture adjustments when indicated.

Organic Sample ID Qualifiers

The qualifiers that may be appended to the Lab Sample ID and/or the Client Sample ID for organic analysis are defined below:

DL -- Diluted reanalysis. Indicates that the results were determined in an analysis of a secondary dilution of a sample or extract. A digit to indicate multiple dilutions of the sample or extract may follow the "DL" suffix. The results of more than one diluted reanalysis may be reported.

MS -- Matrix spike (may be followed by a digit to indicate multiple matrix spikes within a sample set).

MSD -- Matrix spike duplicate (may be followed by a digit to indicate multiple matrix spikes within a sample set).

R -- Reanalysis. The extract was reanalyzed without re-extraction. The "R" is not used if the sample was also re-extracted. May be followed by a digit to indicate multiple reanalysis of the sample at the same dilution.

RE -- Re-extraction analysis. The sample was re-extracted and reanalyzed. May be followed by a digit to indicate multiple re-extracted analysis of the same sample at the same dilution.

Inorganic Data Qualifiers
Cations

C (Concentration) Qualifier:

B -- The reported value obtained was less than the CRDL, but greater than or equal to the MDL/IDL.

U -- The value was less than the MDL/IDL or was not detected.

Q Qualifier:

E -- The reported value is estimate because of interference.

M -- Duplicate injection precision was not met. (Two analyses of the sample did not agree).

N -- Spiked sample recovery not within control limits.

S -- The reported value was determined by the Method of Standard Additions (MSA).

J -- Post digestion spike for Graphite Furnace AA analyses is out of control limits (85% - 115%), while sample absorbance is less than 50% of spike absorbance.

***** -- Duplicate analysis not within control limits.

+ -- Correlation coefficient for the MSA is less than 0.995.

M (Method) Qualifier:

P -- ICP

A -- Flame AA

F -- Furnace AA

CV -- Cold Vapor

AV -- Automated Cold Vapor

NR -- Analyte was not required

C -- Manual spectrophotometric

RRL (Reliable Reporting Limit):

RRL -- The reliable reporting limit was established to qualify analytical results for which no CRDL was Available, or did not apply. The RRL is a concentration approximately four times the Method Detection Limit (MDL).

INORGANIC ANALYSIS METHODS

_ Check appropriate analysis method(s) and/or sample preparation method(s)

CAS Lab Reference No. D9277

Metals/Cyanide Analyses

Parameter		Method	Method Source
Acid Digestion	☐	3005A	SW-846, 3rd Ed.
	☑	3010A	SW-846, 3rd Ed.
	☑	3020A	SW-846, 3rd Ed.
	☐	3050B	SW-846, 3rd Ed.
	☐	200.2	EPA-600/R94/111. 05/94
	☐	CLP	SOW ILM02.1
Antimony	☐	200.7 (ICP)	EPA-600/R94/111, 05/94
	☐	204.2 (GFAA)	EPA-600/4-79-020, 03/83
	☐	6010B (ICP)	SW-846, 3rd Ed.
	☐	7041 (GFAA)	SW-846, 3rd Ed.
Arsenic	☐	200.7 (ICP)	EPA-600/R94/111, 05/94
	☐	206.2 (GFAA)	EPA-600/4-79-020, 03/83
	☐	6010B (ICP)	SW-846, 3rd Ed.
	☑	7060A (GFAA)	SW-846, 3rd Ed.
Cadmium	☐	200.7 (ICP)	EPA-600/R94/111, 05/94
	☐	213.2 (GFAA)	EPA-600/4-79-020, 03/83
	☐	6010B (ICP)	SW-846, 3rd Ed.
	☐	7131A (GFAA)	SW-846, 3rd Ed.
Chromium	☐	200.7 (ICP)	EPA-600/R94/111, 05/94
	☐	218.2 (GFAA)	EPA-600/4-79-020, 03/83
	☐	6010B (ICP)	SW-846, 3rd Ed.
	☐	7191 (GFAA)	SW-846, 3rd Ed.
Copper	☐	200.7 (ICP)	EPA-600/R94/111, 05/94
	☐	220.2 (GFAA)	EPA-600/4-79-020, 03/83
	☐	6010B (ICP)	SW-846, 3rd Ed.
	☐	7211 (GFAA)	SW-846, 3rd Ed.
Lead	☐	200.7 (ICP)	EPA-600/R94/111, 05/94
	☐	239.2 (GFAA)	EPA-600/4-79-020, 03/83
	☐	6010B (ICP)	SW-846, 3rd Ed.
	☑	7421 (GFAA)	SW-846, 3rd Ed.

Parameter		Method	Method Source
Mercury	☐	245.1 (CVAA)/Liquid	EPA MCAWW
	☐	245.5 (CVAA)/Solid	EPA MCAWW
	☑	7470A (CVAA)/Liquid	SW-846, 3rd Ed.
	☐	7471A (CVAA)/Solid	SW-846, 3rd Ed.
Selenium	☐	200.7 (ICP)	EPA-600/R94/111, 05/94
	☐	270.2 (GFAA)	EPA-600/4-79-020, 03/83
	☐	6010B (ICP)	SW-846, 3rd Ed.
	☑	7740 (GFAA)	SW-846, 3rd Ed.
Silver	☐	200.7 (ICP)	EPA-600/R94/111, 05/94
	☐	272.2 (GFAA)	EPA-600/4-79-020, 03/83
	☐	6010B (ICP)	SW-846, 3rd Ed.
	☐	7761 (GFAA)	SW-846, 3rd Ed.
Thallium	☐	200.7 (ICP)	EPA-600/R94/111, 05/94
	☐	279.2 (GFAA)	EPA-600/4-79-020, 03/83
	☐	6010B (ICP)	SW-846, 3rd Ed.
	☑	7841 (GFAA)	SW-846, 3rd Ed.
All Other Metals	☐	200.7 (ICP)	EPA-600/R94/111, 05/94
	☑	6010B (ICP)	SW-846, 3rd Ed.
TCLP Extraction	☐	1311	SW-846, 3rd Ed.
SPLP Extraction	☐	1312	SW-846, 3rd Ed.
STLC Extraction	☐	Waste Extraction Test (WET) Title 22, CA Code of Reg. (CCR)	
Cyanide	☐	335.2 CLP-M (Midi Dist.). SOW ILM02.1	

Note:
Each of the digestion methods applies only to samples analyzed by the corresponding analytical method.

Sample ID Cross-reference Table

CAS Lab Sample ID		Client Sample ID	Receive Date	Collect Date	Sample Matrix	Additional Description
FS = Field Sample						
* D9277001	FS	INFLUENT	12/27/02	12/26/02 14:00	Water	
* D9277002	FS	EFFLUENT	12/27/02	12/26/02 15:00	Water	

* = Analyses Subcontracted. See the following Subcontracted Sample Identification Cross-reference Table.

Subcontracted Sample ID Cross-reference Table

CAS Lab Sample ID	Analysis Description	Subcontracted Laboratory	Subcontracted Laboratory Sample ID
D9277001	Asbestos (Method TEM)	MACS/SANTA CLARA	
D9277002	Asbestos (Method TEM)	MACS/SANTA CLARA	

The above lab sample ID's and cross reference information apply to samples as received by the laboratory. Modifiers to the lab sample ID may be added for internal tracking purposes. Any modified sample ID will be reflected in the appropriate case narrative only.

GC/MS VOLATILE ORGANICS

CASE NARRATIVE
GC/MS VOLATILE ORGANICS

CAS Lab Reference No.: D9277

I. **RECEIPT**

No exceptions were encountered unless a Sample Receipt Exception Report is attached to the Chain-of-Custody included with this data package.

II. **HOLDING TIMES**

A. Sample Preparation: All holding times were met.

B. Sample Analysis: All holding times were met.

III. **METHOD**

Preparation: SW-846 5030B
Cleanup: N/A
Analysis: SW-846 8260B

IV. **PREPARATION**

Sample preparation proceeded normally.

V. **ANALYSIS**

A. Calibration: In the Initial Calibration from 01/07/03 on MSJ, one or more compounds yielded an RSD >15%. However the mean RSD for all analytes was <15%, thus meeting all acceptance criteria.

B. Blanks: All acceptance criteria were met.

C. Internal Standards: All acceptance criteria were met.

D. Surrogates: All acceptance criteria were met.

E. Spikes: All acceptance criteria were met.

F. Samples: All samples proceeded normally.

I certify that this data package is in compliance with the terms and conditions agreed to by the client and CAS, Inc., both technically and for completeness, except for the conditions noted above. Release of the data contained in this hardcopy data package has been authorized by the Laboratory Manager or designated person, as verified by the following signature.

SIGNED/DATE: Gina Rivera 01-08-03 Reviewed: Kathryn Graham 1-8-3
Gina Rivera
Volatile Organics

Columbia Analytical Services
5090 Caterpillar Road
Redding, CA 96003-1412
Phone: (530) 244-5227
Fax: (530) 244-4109

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT ID.

INFLUENT

Lab Name: COLUMBIA ANALYTICAL SERVICES - REDDING

Case No.: D9277 SDG No.: D9277 Lab Sample ID: D9277001

Matrix: WATER Level: LOW Lab File ID: J030073

Sample Volume: 10.0 ML Date Received: 12/27/02

Date Analyzed: 01/07/03

Dilution Factor: 1.0

CAS NO.	COMPOUND	Units: UG/L	MDL	RL	RESULT	Q
74-87-3	Chloromethane		0.41	1.0	1.0	U
75-01-4	Vinyl chloride		0.25	1.0	1.0	U
74-83-9	Bromomethane		0.33	1.0	1.0	U
75-00-3	Chloroethane		0.38	1.0	1.0	U
107-02-8	Acrolein		4.3	10	10	U
75-35-4	1,1-Dichloroethene		0.37	1.0	1.0	U
75-09-2	Methylene chloride		0.16	2.0	2.0	U
107-13-1	Acrylonitrile		3.9	10	10	U
156-60-5	trans-1,2-Dichloroethene		0.22	1.0	1.0	U
75-34-3	1,1-Dichloroethane		0.080	1.0	1.0	U
67-66-3	Chloroform		0.10	1.0	1.0	U
71-55-6	1,1,1-Trichloroethane		0.22	1.0	1.0	U
56-23-5	Carbon tetrachloride		0.25	1.0	1.0	U
71-43-2	Benzene		0.13	1.0	1.0	U
107-06-2	1,2-Dichloroethane		0.26	1.0	1.0	U
79-01-6	Trichloroethene		0.44	1.0	1.0	U
78-87-5	1,2-Dichloropropane		0.14	1.0	1.0	U
75-27-4	Bromodichloromethane		0.25	1.0	1.0	U
110-75-8	2-Chloroethylvinyl ether		4.2	10	10	U
108-88-3	Toluene		0.26	1.0	0.32	J
127-18-4	Tetrachloroethene		0.26	1.0	1.0	U
79-00-5	1,1,2-Trichloroethane		0.41	1.0	1.0	U
124-48-1	Dibromochloromethane		0.090	1.0	1.0	U
108-90-7	Chlorobenzene		0.080	1.0	1.0	U
542-75-6	1,3-Dichloropropene (Total)		0.14	1.0	1.0	U
100-41-4	Ethylbenzene		0.28	1.0	1.0	U
75-25-2	Bromoform		0.41	1.0	1.0	U
79-34-5	1,1,2,2-Tetrachloroethane		0.12	1.0	1.0	U

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT ID.

EFFLUENT

Lab Name: COLUMBIA ANALYTICAL SERVICES - REDDING

Case No.: D9277 SDG No.: D9277 Lab Sample ID: D9277002

Matrix: WATER Level: LOW Lab File ID: J030074

Sample Volume: 10.0 ML Date Received: 12/27/02

Date Analyzed: 01/07/03

Dilution Factor: 1.0

CAS NO.	COMPOUND	Units: UG/L	MDL	RL	RESULT	Q
74-87-3	Chloromethane		0.41	1.0	1.0	U
75-01-4	Vinyl chloride		0.25	1.0	1.0	U
74-83-9	Bromomethane		0.33	1.0	1.0	U
75-00-3	Chloroethane		0.38	1.0	1.0	U
107-02-8	Acrolein		4.3	10	10	U
75-35-4	1,1-Dichloroethene		0.37	1.0	1.0	U
75-09-2	Methylene chloride		0.16	2.0	0.17	J
107-13-1	Acrylonitrile		3.9	10	10	U
156-60-5	trans-1,2-Dichloroethene		0.22	1.0	1.0	U
75-34-3	1,1-Dichloroethane		0.080	1.0	1.0	U
67-66-3	Chloroform		0.10	1.0	1.0	U
71-55-6	1,1,1-Trichloroethane		0.22	1.0	1.0	U
56-23-5	Carbon tetrachloride		0.25	1.0	1.0	U
71-43-2	Benzene		0.13	1.0	1.0	U
107-06-2	1,2-Dichloroethane		0.26	1.0	1.0	U
79-01-6	Trichloroethene		0.44	1.0	1.0	U
78-87-5	1,2-Dichloropropane		0.14	1.0	1.0	U
75-27-4	Bromodichloromethane		0.25	1.0	1.0	U
110-75-8	2-Chloroethylvinyl ether		4.2	10	10	U
108-88-3	Toluene		0.26	1.0	1.0	U
127-18-4	Tetrachloroethene		0.26	1.0	1.0	U
79-00-5	1,1,2-Trichloroethane		0.41	1.0	1.0	U
124-48-1	Dibromochloromethane		0.090	1.0	1.0	U
108-90-7	Chlorobenzene		0.080	1.0	1.0	U
542-75-6	1,3-Dichloropropene (Total)		0.14	1.0	1.0	U
100-41-4	Ethylbenzene		0.28	1.0	1.0	U
75-25-2	Bromoform		0.41	1.0	1.0	U
79-34-5	1,1,2,2-Tetrachloroethane		0.12	1.0	1.0	U

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT ID.

J0107W01
METHOD BLANK

Lab Name: COLUMBIA ANALYTICAL SERVICES - REDDING

Case No.: D9277 SDG No.: D9277 Lab Sample ID: J0107W01

Matrix: WATER Level: LOW Lab File ID: J030070

Sample Volume: 10.0 ML Date Received:

Date Analyzed: 01/07/03

Dilution Factor: 1.0

CAS NO.	COMPOUND	Units: UG/L	MDL	RL	RESULT	Q
74-87-3	Chloromethane		0.41	1.0	1.0	U
75-01-4	Vinyl chloride		0.25	1.0	1.0	U
74-83-9	Bromomethane		0.33	1.0	1.0	U
75-00-3	Chloroethane		0.38	1.0	1.0	U
107-02-8	Acrolein		4.3	10	10	U
75-35-4	1,1-Dichloroethene		0.37	1.0	1.0	U
75-09-2	Methylene chloride		0.16	2.0	2.0	U
107-13-1	Acrylonitrile		3.9	10	10	U
156-60-5	trans-1,2-Dichloroethene		0.22	1.0	1.0	U
75-34-3	1,1-Dichloroethane		0.080	1.0	1.0	U
67-66-3	Chloroform		0.10	1.0	1.0	U
71-55-6	1,1,1-Trichloroethane		0.22	1.0	1.0	U
56-23-5	Carbon tetrachloride		0.25	1.0	1.0	U
71-43-2	Benzene		0.13	1.0	1.0	U
107-06-2	1,2-Dichloroethane		0.26	1.0	1.0	U
79-01-6	Trichloroethene		0.44	1.0	1.0	U
78-87-5	1,2-Dichloropropane		0.14	1.0	1.0	U
75-27-4	Bromodichloromethane		0.25	1.0	1.0	U
110-75-8	2-Chloroethylvinyl ether		4.2	10	10	U
108-88-3	Toluene		0.26	1.0	1.0	U
127-18-4	Tetrachloroethene		0.26	1.0	1.0	U
79-00-5	1,1,2-Trichloroethane		0.41	1.0	1.0	U
124-48-1	Dibromochloromethane		0.090	1.0	1.0	U
108-90-7	Chlorobenzene		0.080	1.0	1.0	U
542-75-6	1,3-Dichloropropene (Total)		0.14	1.0	1.0	U
100-41-4	Ethylbenzene		0.28	1.0	1.0	U
75-25-2	Bromoform		0.41	1.0	1.0	U
79-34-5	1,1,2,2-Tetrachloroethane		0.12	1.0	1.0	U

2A
WATER VOLATILE SURROGATE RECOVERY

Lab Name: COLUMBIA ANALYTICAL SERVICES - REDDING

Case No.: D9277 SDG No.: D9277

	LAB ID.	CLIENT ID.	S1 (DBM) #	S2 (DCA) #	S3 (TOL) #	S4 (BFB) #	TOT OUT
01	J0107W01LCS	J0107W01LCS	103	101	104	103	0
02	J0107W01	J0107W01	96	94	100	96	0
03	D9277001	INFLUENT	100	99	96	90	0
04	D9277002	EFFLUENT	96	93	96	105	0
05							
06							
07							
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32							

	QC LIMITS
S1 (DBM) = Dibromofluoromethane	(81-124)
S2 (DCA) = 1,2-Dichloroethane-d4	(74-129)
S3 (TOL) = Toluene-d8	(75-120)
S4 (BFB) = Bromofluorobenzene	(74-125)

Column to be used to flag recovery values

* Values outside of contract required QC limits

D Surrogates diluted out

3A
WATER VOLATILE LAB CONTROL SAMPLE

Lab Name: COLUMBIA ANALYTICAL SERVICES - REDDING

Case No.: D9277 SDG No.: D9277

LCS - associated with Method Blank: J0107W01

COMPOUND	SPIKE ADDED (ug/L)	SAMPLE CONC. (ug/L)	LCS CONC. (ug/L)	LCS % REC #	QC. LIMITS REC.
Chloromethane	10.0	N/A	10.3	103	64-133
Vinyl chloride	10.0	N/A	10.5	105	70-124
Bromomethane	10.0	N/A	10.6	106	66-138
Chloroethane	10.0	N/A	10.4	104	77-124
Acrolein	100	N/A	82.0	82	25-175
1,1-Dichloroethene	10.0	N/A	11.1	111	74-129
Methylene chloride	10.0	N/A	10.6	106	67-131
Acrylonitrile	100	N/A	97.4	97	79-121
trans-1,2-Dichloroethene	10.0	N/A	10.1	101	79-121
1,1-Dichloroethane	10.0	N/A	10.6	106	78-123
Chloroform	10.0	N/A	9.4	94	88-121
1,1,1-Trichloroethane	10.0	N/A	9.6	96	80-122
Carbon tetrachloride	10.0	N/A	9.8	98	78-119
Benzene	10.0	N/A	9.8	98	81-121
1,2-Dichloroethane	10.0	N/A	10.0	100	79-126
Trichloroethene	10.0	N/A	9.6	96	77-122
1,2-Dichloropropane	10.0	N/A	9.4	94	80-119
Bromodichloromethane	10.0	N/A	9.6	96	77-119
2-Chloroethylvinyl ether	100	N/A	124	124	43-168
Toluene	10.0	N/A	9.8	98	80-120
Tetrachloroethene	10.0	N/A	9.4	94	78-121
1,1,2-Trichloroethane	10.0	N/A	9.5	95	74-124
Dibromochloromethane	10.0	N/A	9.3	93	74-119
Chlorobenzene	10.0	N/A	9.5	95	80-119
1,3-Dichloropropene (Total)	20.0	N/A	19.2	96	79-114
Ethylbenzene	10.0	N/A	9.5	95	80-119
Bromoform	10.0	N/A	7.9	79	68-120
1,1,2,2-Tetrachloroethane	10.0	N/A	9.4	94	71-130

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

RPD: 0 out of 0 outside limits
Spike Recovery: 0 out of 28 outside limits

4A
VOLATILE METHOD BLANK SUMMARY

Client ID.

J0107W01

Lab Name: COLUMBIA ANALYTICAL SERVICES - REDDING

Case No.: D9277 SDG No.: D9277

Lab File ID: J030070 Lab Sample ID: J0107W01

Date Analyzed: 01/07/03 Time Analyzed: 1607

Matrix: WATER Level: LOW

Instrument ID: MSJ

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, MS and MSD:

	CLIENT ID.	LAB SAMPLE ID	LAB FILE ID	TIME ANALYZED
01	J0107W01LCS	J0107W01LCS	J030068	1455
02	INFLUENT	D9277001	J030073	1752
03	EFFLUENT	D9277002	J030074	1828
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GC/MS SEMIVOLATILE ORGANICS

CASE NARRATIVE
GC/MS SEMIVOLATILE ORGANICS

CAS Lab Reference No./SDG: D9277

I. **RECEIPT**

No exceptions were encountered unless a Sample Receipt Exception Report is attached to the Chain-of-Custody included with this data package.

II. **HOLDING TIMES**

A. Sample Preparation: All holding times were met.

B. Sample Analysis: All holding times were met.

III. **METHOD**

Preparation: SW-846 3520C
Cleanup: N/A
Analysis: SW-846 8270C

IV. **PREPARATION**

Sample preparation proceeded normally.

V. **ANALYSIS**

A. Calibration: All acceptance criteria were met.

B. Blanks: All acceptance criteria were met.

C. Internal Standards: All acceptance criteria were met.

D. Surrogates: All acceptance criteria were met.

E. Spikes: In the Laboratory Control Spike two compounds exceeded upper laboratory control limits. In the Laboratory Control Spike Duplicate one compound exceeded upper laboratory control limits and two compounds exceeded the lower laboratory control limits. Corrective action is not recommended.

F. Samples: All acceptance criteria were met.

I certify that this data package is in compliance with the terms and conditions agreed to by the client and CAS, Inc., both technically and for completeness, except for the conditions noted above. Release of the data contained in this hardcopy data package has been authorized by the Laboratory Manager or designated person, as verified by the following signature.

SIGNED/DATE: EBurrough 1/16/03 REVIEWED BY: KGraham 1/16/3

Erica Burrough
Scientist GC/MS Organics

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT ID.

INFLUENT

Lab Name: COLUMBIA ANALYTICAL SERVICES - REDDING

Case No.: D9277 SDG No.: D9277 Lab Sample ID: D9277001

Matrix: WATER Level: LOW Lab File ID: H030098

Sample Volume: 1050 ML Date Received: 12/27/02

Extract Vol: 1 ML Date Extracted: 01/02/03

Date Analyzed: 01/14/03

Extraction: CONT GPC Cleanup: N Dilution Factor: 1.0

CAS NO.	COMPOUND	Units: UG/L	MDL	RL	RESULT	Q
62-75-9	N-nitrosodimethylamine		1.4	10	10	U
108-95-2	Phenol		1.3	10	10	U
62-53-3	Aniline		1.8	10	10	U
111-44-4	Bis(2-Chloroethyl)ether		1.4	10	10	U
95-57-8	2-Chlorophenol		1.0	10	10	U
541-73-1	1,3-Dichlorobenzene		1.2	10	10	U
106-46-7	1,4-Dichlorobenzene		1.0	10	10	U
100-51-6	Benzyl Alcohol		1.7	10	10	U
95-50-1	1,2-Dichlorobenzene		0.68	10	10	U
108-60-1	2,2'-oxybis(1-Chloropropane)		1.0	10	10	U
95-48-7	2-Methylphenol		1.1	10	10	U
67-72-1	Hexachloroethane		0.61	10	10	U
621-64-7	N-Nitroso-di-n-propylamine		1.3	10	10	U
106-44-5	4-Methylphenol		1.3	10	10	U
98-95-3	Nitrobenzene		1.2	10	10	U
78-59-1	Isophorone		1.0	10	10	U
88-75-5	2-Nitrophenol		1.0	10	10	U
105-67-9	2,4-Dimethyphenol		1.4	10	10	U
65-85-0	Benzoic Acid		8.0	50	50	U
111-91-1	Bis(2-Chloroethoxy)methane		1.5	10	10	U
120-83-2	2,4-Dichlorophenol		1.5	10	10	U
120-82-1	1,2,4-Trichlorobenzene		1.4	10	10	U
91-20-3	Naphthalene		1.2	10	10	U
106-47-8	4-Chloroaniline		1.1	10	10	U
87-68-3	Hexachlorobutadiene		0.97	10	10	U
59-50-7	4-Chloro-3-methylphenol		0.95	10	10	U
91-57-6	2-Methylnaphthalene		1.2	10	10	U
77-47-4	Hexachlorocyclopentadiene		3.3	10	10	U
88-06-2	2,4,6-Trichlorophenol		1.4	10	10	U
95-95-4	2,4,5-Trichlorophenol		5.2	50	50	U
91-58-7	2-Chloronaphthalene		1.9	10	10	U
88-74-4	2-Nitroaniline		4.9	50	50	U
208-96-8	Acenaphthylene		1.3	10	10	U
131-11-3	Dimethylphthalate		1.6	10	10	U
606-20-2	2,6-Dinitrotoluene		1.9	10	10	U

1C

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT ID.

INFLUENT

Lab Name: COLUMBIA ANALYTICAL SERVICES - REDDING

Case No.: D9277 SDG No.: D9277 Lab Sample ID: D9277001

Matrix: WATER Level: LOW Lab File ID: H030098

Sample Volume: 1050 ML Date Received: 12/27/02

Extract Vol: 1 ML Date Extracted: 01/02/03

Date Analyzed: 01/14/03

Extraction: CONT GPC Cleanup: N Dilution Factor: 1.0

CAS NO.	COMPOUND	Units: UG/L	MDL	RL	RESULT	Q
83-32-9	Acenaphthene		1.3	10	10	U
99-09-2	3-Nitroaniline		6.0	50	50	U
51-28-5	2,4-Dinitrophenol		6.5	50	50	U
132-64-9	Dibenzofuran		1.4	10	10	U
100-02-7	4-Nitrophenol		5.7	50	50	U
121-14-2	2,4-Dinitrotoluene		2.1	10	10	U
86-73-7	Fluorene		1.4	10	10	U
7005-72-3	4-Chlorophenyl-phenylether		1.4	10	10	U
84-66-2	Diethylphthalate		1.9	10	10	U
100-01-6	4-Nitroaniline		6.0	50	50	U
534-52-1	4,6-Dinitro-2-methylphenol		5.3	50	50	U
86-30-6	N-Nitrosodiphenylamine (1)		1.4	10	10	U
122-66-7	1,2-Diphenylhydrazine		1.1	10	10	U
101-55-3	4-Bromophenyl-phenylether		1.3	10	10	U
118-74-1	Hexachlorobenzene		1.2	10	10	U
87-86-5	Pentachlorophenol		4.2	50	50	U
85-01-8	Phenanthrene		1.2	10	10	U
120-12-7	Anthracene		1.4	10	10	U
84-74-2	Di-n-butylphthalate		1.5	10	10	U
206-44-0	Fluoranthene		1.1	10	10	U
129-00-0	Pyrene		1.2	10	10	U
85-68-7	Butylbenzylphthalate		1.2	10	10	U
56-55-3	Benzo(a)anthracene		1.2	10	10	U
91-94-1	3,3'-Dichlorobenzidine		2.6	10	10	U
218-01-9	Chrysene		1.3	10	10	U
117-81-7	bis(2-Ethylhexyl)phthalate		1.1	10	10	U
117-84-0	Di-n-octylphthalate		1.0	10	10	U
205-99-2	Benzo(b)fluoranthene		1.5	10	10	U
207-08-9	Benzo(k)fluoranthene		1.3	10	10	U
50-32-8	Benzo(a)pyrene		1.3	10	10	U
193-39-5	Indeno(1,2,3-cd)pyrene		1.4	10	10	U
53-70-3	Dibenzo(a,h)anthracene		1.3	10	10	U
191-24-2	Benzo(g,h,i)perylene		1.0	10	10	U

(1) - Cannot be separated from Diphenylamine

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT ID.

EFFLUENT

Lab Name: COLUMBIA ANALYTICAL SERVICES - REDDING

Case No.: D9277 SDG No.: D9277 Lab Sample ID: D9277002

Matrix: WATER Level: LOW Lab File ID: H030099

Sample Volume: 1050 ML Date Received: 12/27/02

Extract Vol: 1 ML Date Extracted: 01/02/03

Date Analyzed: 01/14/03

Extraction: CONT GPC Cleanup: N Dilution Factor: 1.0

CAS NO.	COMPOUND	Units: UG/L	MDL	RL	RESULT	Q
62-75-9	N-nitrosodimethylamine		1.4	10	10	U
108-95-2	Phenol		1.3	10	10	U
62-53-3	Aniline		1.8	10	10	U
111-44-4	Bis(2-Chloroethyl)ether		1.4	10	10	U
95-57-8	2-Chlorophenol		1.0	10	10	U
541-73-1	1,3-Dichlorobenzene		1.2	10	10	U
106-46-7	1,4-Dichlorobenzene		1.0	10	10	U
100-51-6	Benzyl Alcohol		1.7	10	10	U
95-50-1	1,2-Dichlorobenzene		0.68	10	10	U
108-60-1	2,2'-oxybis(1-Chloropropane)		1.0	10	10	U
95-48-7	2-Methylphenol		1.1	10	10	U
67-72-1	Hexachloroethane		0.61	10	10	U
621-64-7	N-Nitroso-di-n-propylamine		1.3	10	10	U
106-44-5	4-Methylphenol		1.3	10	10	U
98-95-3	Nitrobenzene		1.2	10	10	U
78-59-1	Isophorone		1.0	10	10	U
88-75-5	2-Nitrophenol		1.0	10	10	U
105-67-9	2,4-Dimethyphenol		1.4	10	10	U
65-85-0	Benzoic Acid		8.0	50	50	U
111-91-1	Bis(2-Chloroethoxy)methane		1.5	10	10	U
120-83-2	2,4-Dichlorophenol		1.5	10	10	U
120-82-1	1,2,4-Trichlorobenzene		1.4	10	10	U
91-20-3	Naphthalene		1.2	10	10	U
106-47-8	4-Chloroaniline		1.1	10	10	U
87-68-3	Hexachlorobutadiene		0.97	10	10	U
59-50-7	4-Chloro-3-methylphenol		0.95	10	10	U
91-57-6	2-Methylnaphthalene		1.2	10	10	U
77-47-4	Hexachlorocyclopentadiene		3.3	10	10	U
88-06-2	2,4,6-Trichlorophenol		1.4	10	10	U
95-95-4	2,4,5-Trichlorophenol		5.2	50	50	U
91-58-7	2-Chloronaphthalene		1.9	10	10	U
88-74-4	2-Nitroaniline		4.9	50	50	U
208-96-8	Acenaphthylene		1.3	10	10	U
131-11-3	Dimethylphthalate		1.6	10	10	U
606-20-2	2,6-Dinitrotoluene		1.9	10	10	U

1C

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT ID.

EFFLUENT

Lab Name: COLUMBIA ANALYTICAL SERVICES - REDDING

Case No.: D9277 SDG No.: D9277 Lab Sample ID: D9277002

Matrix: WATER Level: LOW Lab File ID: H030099

Sample Volume: 1050 ML Date Received: 12/27/02

Extract Vol: 1 ML Date Extracted: 01/02/03

Date Analyzed: 01/14/03

Extraction: CONT GPC Cleanup: N Dilution Factor: 1.0

CAS NO.	COMPOUND	Units: UG/L	MDL	RL	RESULT	Q
83-32-9	Acenaphthene		1.3	10	10	U
99-09-2	3-Nitroaniline		6.0	50	50	U
51-28-5	2,4-Dinitrophenol		6.5	50	50	U
132-64-9	Dibenzofuran		1.4	10	10	U
100-02-7	4-Nitrophenol		5.7	50	50	U
121-14-2	2,4-Dinitrotoluene		2.1	10	10	U
86-73-7	Fluorene		1.4	10	10	U
7005-72-3	4-Chlorophenyl-phenylether		1.4	10	10	U
84-66-2	Diethylphthalate		1.9	10	10	U
100-01-6	4-Nitroaniline		6.0	50	50	U
534-52-1	4,6-Dinitro-2-methylphenol		5.3	50	50	U
86-30-6	N-Nitrosodiphenylamine (1)		1.4	10	10	U
122-66-7	1,2-Diphenylhydrazine		1.1	10	10	U
101-55-3	4-Bromophenyl-phenylether		1.3	10	10	U
118-74-1	Hexachlorobenzene		1.2	10	10	U
87-86-5	Pentachlorophenol		4.2	50	50	U
85-01-8	Phenanthrene		1.2	10	10	U
120-12-7	Anthracene		1.4	10	10	U
84-74-2	Di-n-butylphthalate		1.5	10	10	U
206-44-0	Fluoranthene		1.1	10	10	U
129-00-0	Pyrene		1.2	10	10	U
85-68-7	Butylbenzylphthalate		1.2	10	10	U
56-55-3	Benzo(a)anthracene		1.2	10	10	U
91-94-1	3,3'-Dichlorobenzidine		2.6	10	10	U
218-01-9	Chrysene		1.3	10	10	U
117-81-7	bis(2-Ethylhexyl)phthalate		1.1	10	10	U
117-84-0	Di-n-octylphthalate		1.0	10	10	U
205-99-2	Benzo(b)fluoranthene		1.5	10	10	U
207-08-9	Benzo(k)fluoranthene		1.3	10	10	U
50-32-8	Benzo(a)pyrene		1.3	10	10	U
193-39-5	Indeno(1,2,3-cd)pyrene		1.4	10	10	U
53-70-3	Dibenzo(a,h)anthracene		1.3	10	10	U
191-24-2	Benzo(g,h,i)perylene		1.0	10	10	U

(1) - Cannot be separated from Diphenylamine

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT ID.

H0102WA1
METHOD BLANK

Lab Name: COLUMBIA ANALYTICAL SERVICES - REDDING

Case No.: D9277 SDG No.: D9277 Lab Sample ID: H0102WA1

Matrix: WATER Level: LOW Lab File ID: H030089

Sample Volume: 1000 ML Date Received:

Extract Vol: 1 ML Date Extracted: 01/02/03

Date Analyzed: 01/14/03

Extraction: CONT GPC Cleanup: N Dilution Factor: 1.0

CAS NO.	COMPOUND	Units: UG/L	MDL	RL	RESULT	Q
62-75-9	N-nitrosodimethylamine		1.4	10	10	U
108-95-2	Phenol		1.3	10	10	U
62-53-3	Aniline		1.8	10	10	U
111-44-4	Bis(2-Chloroethyl)ether		1.4	10	10	U
95-57-8	2-Chlorophenol		1.0	10	10	U
541-73-1	1,3-Dichlorobenzene		1.2	10	10	U
106-46-7	1,4-Dichlorobenzene		1.0	10	10	U
100-51-6	Benzyl Alcohol		1.7	10	10	U
95-50-1	1,2-Dichlorobenzene		0.68	10	10	U
108-60-1	2,2'-oxybis(1-Chloropropane)		1.0	10	10	U
95-48-7	2-Methylphenol		1.1	10	10	U
67-72-1	Hexachloroethane		0.61	10	10	U
621-64-7	N-Nitroso-di-n-propylamine		1.3	10	10	U
106-44-5	4-Methylphenol		1.3	10	10	U
98-95-3	Nitrobenzene		1.2	10	10	U
78-59-1	Isophorone		1.0	10	10	U
88-75-5	2-Nitrophenol		1.0	10	10	U
105-67-9	2,4-Dimethyphenol		1.4	10	10	U
65-85-0	Benzoic Acid		8.0	50	50	U
111-91-1	Bis(2-Chloroethoxy)methane		1.5	10	10	U
120-83-2	2,4-Dichlorophenol		1.5	10	10	U
120-82-1	1,2,4-Trichlorobenzene		1.4	10	10	U
91-20-3	Naphthalene		1.2	10	10	U
106-47-8	4-Chloroaniline		1.1	10	10	U
87-68-3	Hexachlorobutadiene		0.97	10	10	U
59-50-7	4-Chloro-3-methylphenol		0.95	10	10	U
91-57-6	2-Methylnaphthalene		1.2	10	10	U
77-47-4	Hexachlorocyclopentadiene		3.3	10	10	U
88-06-2	2,4,6-Trichlorophenol		1.4	10	10	U
95-95-4	2,4,5-Trichlorophenol		5.2	50	50	U
91-58-7	2-Chloronaphthalene		1.9	10	10	U
88-74-4	2-Nitroaniline		4.9	50	50	U
208-96-8	Acenaphthylene		1.3	10	10	U
131-11-3	Dimethylphthalate		1.6	10	10	U
606-20-2	2,6-Dinitrotoluene		1.9	10	10	U

1C

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT ID.

H0102WA1
METHOD BLANK

Lab Name: COLUMBIA ANALYTICAL SERVICES - REDDING

Case No.: D9277 SDG No.: D9277 Lab Sample ID: H0102WA1

Matrix: WATER Level: LOW Lab File ID: H030089

Sample Volume: 1000 ML Date Received:

Extract Vol: 1 ML Date Extracted: 01/02/03

Date Analyzed: 01/14/03

Extraction: CONT GPC Cleanup: N Dilution Factor: 1.0

CAS NO.	COMPOUND	Units: UG/L	MDL	RL	RESULT	Q
83-32-9	Acenaphthene		1.3	10	10	U
99-09-2	3-Nitroaniline		6.0	50	50	U
51-28-5	2,4-Dinitrophenol		6.5	50	50	U
132-64-9	Dibenzofuran		1.4	10	10	U
100-02-7	4-Nitrophenol		5.7	50	50	U
121-14-2	2,4-Dinitrotoluene		2.1	10	10	U
86-73-7	Fluorene		1.4	10	10	U
7005-72-3	4-Chlorophenyl-phenylether		1.4	10	10	U
84-66-2	Diethylphthalate		1.9	10	10	U
100-01-6	4-Nitroaniline		6.0	50	50	U
534-52-1	4,6-Dinitro-2-methylphenol		5.3	50	50	U
86-30-6	N-Nitrosodiphenylamine (1)		1.4	10	10	U
122-66-7	1,2-Diphenylhydrazine		1.1	10	10	U
101-55-3	4-Bromophenyl-phenylether		1.3	10	10	U
118-74-1	Hexachlorobenzene		1.2	10	10	U
87-86-5	Pentachlorophenol		4.2	50	50	U
85-01-8	Phenanthrene		1.2	10	10	U
120-12-7	Anthracene		1.4	10	10	U
84-74-2	Di-n-butylphthalate		1.5	10	10	U
206-44-0	Fluoranthene		1.1	10	10	U
129-00-0	Pyrene		1.2	10	10	U
85-68-7	Butylbenzylphthalate		1.2	10	10	U
56-55-3	Benzo(a)anthracene		1.2	10	10	U
91-94-1	3,3'-Dichlorobenzidine		2.6	10	10	U
218-01-9	Chrysene		1.3	10	10	U
117-81-7	bis(2-Ethylhexyl)phthalate		1.1	10	10	U
117-84-0	Di-n-octylphthalate		1.0	10	10	U
205-99-2	Benzo(b)fluoranthene		1.5	10	10	U
207-08-9	Benzo(k)fluoranthene		1.3	10	10	U
50-32-8	Benzo(a)pyrene		1.3	10	10	U
193-39-5	Indeno(1,2,3-cd)pyrene		1.4	10	10	U
53-70-3	Dibenzo(a,h)anthracene		1.3	10	10	U
191-24-2	Benzo(g,h,i)perylene		1.0	10	10	U

(1) - Cannot be separated from Diphenylamine

2C
WATER SEMIVOLATILE SURROGATE RECOVERY

Lab Name: COLUMBIA ANALYTICAL SERVICES - REDDING

Case No.: D9277 SDG No.: D9277

	CLIENT ID.	S1 (2FP)#	S2 (PHL)#	S3 (NBZ)#	S4 (FBP)#	S5 (TBP)#	S6 (TPH)#	TOT OUT
01	H0102WA1	78	84	85	84	79	92	0
02	H0102WA1LCS	102	107	102	99	100	99	0
03	H0102WA1LCSD	83	90	87	84	89	83	0
04	INFLUENT	77	80	80	75	68	65	0
05	EFFLUENT	80	84	81	75	67	54	0
06								
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	QC LIMITS
S1 (2FP) = 2-Fluorophenol	(49-115)
S2 (PHL) = Phenol-d5	(48-115)
S3 (NBZ) = Nitrobenzene-d5	(67-112)
S4 (FBP) = 2-Fluorobiphenyl	(66-114)
S5 (TBP) = 2,4,6-Tribromophenol	(51-123)
S6 (TPH) = Terphenyl-d14	(30-154)

Column to be used to flag recovery values
* Values outside of contract required QC limits
D Surrogates diluted out

3C
WATER SEMIVOLATILE LAB CONTROL SAMPLE

Lab Name: COLUMBIA ANALYTICAL SERVICES - REDDING

Case No.: D9277 SDG No.: D9277

LCS - associated with Method Blank: H0102WA1

COMPOUND	SPIKE ADDED (ug/L)	SAMPLE CONC. (ug/L)	LCS CONC. (ug/L)	LCS % REC #	QC. LIMITS REC.
N-nitrosodimethylamine	50.0	N/A	40.5	81	37-125
Phenol	50.0	N/A	43.8	88	58-118
Aniline	50.0	N/A	82.4	165*	25-125
Bis(2-Chloroethyl)ether	50.0	N/A	44.3	89	56-124
2-Chlorophenol	50.0	N/A	44.3	89	60-118
1,3-Dichlorobenzene	50.0	N/A	33.2	66	46- 91
1,4-Dichlorobenzene	50.0	N/A	33.9	68	45- 95
Benzyl Alcohol	50.0	N/A	48.7	97	68-116
1,2-Dichlorobenzene	50.0	N/A	34.4	69	50- 98
2,2'-oxybis(1-Chloropropane	50.0	N/A	44.8	90	55-126
2-Methylphenol	50.0	N/A	41.9	84	60-128
Hexachloroethane	50.0	N/A	32.1	64	40- 91
N-Nitroso-di-n-propylamine	50.0	N/A	46.2	92	61-123
4-Methylphenol	50.0	N/A	44.3	89	58-119
Nitrobenzene	50.0	N/A	43.0	86	61-115
Isophorone	50.0	N/A	44.9	90	65-119
2-Nitrophenol	50.0	N/A	44.2	88	62-115
2,4-Dimethyphenol	50.0	N/A	47.9	96	63-120
Benzoic Acid	50.0	N/A	15.4	31	10-100
Bis(2-Chloroethoxy)methane	50.0	N/A	45.1	90	65-116
2,4-Dichlorophenol	50.0	N/A	44.8	90	61-113
1,2,4-Trichlorobenzene	50.0	N/A	35.6	71	49- 98
Naphthalene	50.0	N/A	40.0	80	58-102
4-Chloroaniline	50.0	N/A	62.3	125*	60-120
Hexachlorobutadiene	50.0	N/A	31.8	64	42- 92
4-Chloro-3-methylphenol	50.0	N/A	46.0	92	61-116
2-Methylnaphthalene	50.0	N/A	41.5	83	60-105
Hexachlorocyclopentadiene	50.0	N/A	21.3	43	19- 67
2,4,6-Trichlorophenol	50.0	N/A	41.1	82	59-115
2,4,5-Trichlorophenol	50.0	N/A	36.8	74	61-117
2-Chloronaphthalene	50.0	N/A	39.9	80	62-109
2-Nitroaniline	50.0	N/A	44.2	88	67-116
Acenaphthylene	50.0	N/A	39.7	79	65-107
Dimethylphthalate	50.0	N/A	40.7	81	67-112
2,6-Dinitrotoluene	50.0	N/A	41.2	82	61-116
Acenaphthene	50.0	N/A	40.7	81	67-113

Column to be used to flag recovery and RPD values with an asterisk
* Values outside of QC limits

3C
WATER SEMIVOLATILE LAB CONTROL SAMPLE

Lab Name: COLUMBIA ANALYTICAL SERVICES - REDDING

Case No.: D9277 SDG No.: D9277

LCS - associated with Method Blank: H0102WA1

COMPOUND	SPIKE ADDED (ug/L)	SAMPLE CONC. (ug/L)	LCS CONC. (ug/L)	LCS % REC #	QC. LIMITS REC.
3-Nitroaniline	50.0	N/A	43.2	86	61-114
2,4-Dinitrophenol	50.0	N/A	26.6	53	41-117
Dibenzofuran	50.0	N/A	42.3	85	65-110
4-Nitrophenol	50.0	N/A	37.7	75	57-113
2,4-Dinitrotoluene	50.0	N/A	40.2	80	60-116
Fluorene	50.0	N/A	41.7	83	68-113
4-Chlorophenyl-phenylether	50.0	N/A	41.3	83	60-119
Diethylphthalate	50.0	N/A	42.4	85	67-114
4-Nitroaniline	50.0	N/A	40.7	81	62-121
4,6-Dinitro-2-methylphenol	50.0	N/A	32.7	65	55-114
N-Nitrosodiphenylamine	50.0	N/A	32.0	64	62-112
1,2-Diphenylhydrazine	50.0	N/A	41.6	83	41-125
4-Bromophenyl-phenylether	50.0	N/A	40.2	80	62-117
Hexachlorobenzene	50.0	N/A	40.4	81	62-114
Pentachlorophenol	50.0	N/A	28.3	57	55-109
Phenanthrene	50.0	N/A	41.6	83	68-112
Anthracene	50.0	N/A	40.6	81	68-111
Di-n-butylphthalate	50.0	N/A	42.3	85	64-122
Fluoranthene	50.0	N/A	40.5	81	66-113
Pyrene	50.0	N/A	43.2	86	63-119
Butylbenzylphthalate	50.0	N/A	44.1	88	64-121
Benzo(a)anthracene	50.0	N/A	42.8	86	67-111
3,3'-Dichlorobenzidine	50.0	N/A	40.5	81	29-142
Chrysene	50.0	N/A	42.4	85	66-110
bis(2-Ethylhexyl)phthalate	50.0	N/A	44.5	89	64-121
Di-n-octylphthalate	50.0	N/A	42.0	84	57-120
Benzo(b)fluoranthene	50.0	N/A	41.0	82	61-113
Benzo(k)fluoranthene	50.0	N/A	40.8	82	60-114
Benzo(a)pyrene	50.0	N/A	38.9	78	60-107
Indeno(1,2,3-cd)pyrene	50.0	N/A	39.6	79	51-118
Dibenzo(a,h)anthracene	50.0	N/A	41.5	83	48-121
Benzo(g,h,i)perylene	50.0	N/A	41.3	83	51-119

Column to be used to flag recovery and RPD values with an asterisk
* Values outside of QC limits

3C
WATER SEMIVOLATILE LAB CONTROL SAMPLE

Lab Name: COLUMBIA ANALYTICAL SERVICES - REDDING

Case No.: D9277 SDG No.: D9277

LCS - associated with Method Blank: H0102WA1

COMPOUND	SPIKE ADDED (ug/L)	LCSD CONC. (ug/L)	LCSD % REC #	% RPD #	QC LIMITS RPD	QC LIMITS REC.
N-nitrosodimethylamine	50.0	35.2	70	14	20	37-125
Phenol	50.0	38.5	77	13	20	58-118
Aniline	50.0	72.5	145*	13	20	25-125
Bis(2-Chloroethyl)ether	50.0	38.0	76	15	20	56-124
2-Chlorophenol	50.0	37.4	75	17	20	60-118
1,3-Dichlorobenzene	50.0	29.6	59	11	20	46- 91
1,4-Dichlorobenzene	50.0	30.0	60	12	20	45- 95
Benzyl Alcohol	50.0	41.0	82	17	20	68-116
1,2-Dichlorobenzene	50.0	30.6	61	12	20	50- 98
2,2'-oxybis(1-Chloropropane	50.0	38.2	76	16	20	55-126
2-Methylphenol	50.0	36.8	74	13	20	60-128
Hexachloroethane	50.0	28.6	57	12	20	40- 91
N-Nitroso-di-n-propylamine	50.0	41.7	83	10	20	61-123
4-Methylphenol	50.0	39.3	79	12	20	58-119
Nitrobenzene	50.0	38.1	76	12	20	61-115
Isophorone	50.0	38.5	77	15	20	65-119
2-Nitrophenol	50.0	38.3	77	14	20	62-115
2,4-Dimethyphenol	50.0	41.5	83	14	20	63-120
Benzoic Acid	50.0	13.2	26	15	20	10-100
Bis(2-Chloroethoxy)methane	50.0	38.3	77	16	20	65-116
2,4-Dichlorophenol	50.0	37.4	75	18	20	61-113
1,2,4-Trichlorobenzene	50.0	30.8	62	14	20	49- 98
Naphthalene	50.0	34.8	70	14	20	58-102
4-Chloroaniline	50.0	54.2	108	14	20	60-120
Hexachlorobutadiene	50.0	27.7	55	14	20	42- 92
4-Chloro-3-methylphenol	50.0	39.4	79	15	20	61-116
2-Methylnaphthalene	50.0	35.6	71	15	20	60-105
Hexachlorocyclopentadiene	50.0	18.4	37	15	20	19- 67
2,4,6-Trichlorophenol	50.0	37.7	75	9	20	59-115
2,4,5-Trichlorophenol	50.0	33.8	68	8	20	61-117
2-Chloronaphthalene	50.0	34.6	69	14	20	62-109
2-Nitroaniline	50.0	38.9	78	13	20	67-116
Acenaphthylene	50.0	35.2	70	12	20	65-107
Dimethylphthalate	50.0	36.9	74	10	20	67-112
2,6-Dinitrotoluene	50.0	37.2	74	10	20	61-116
Acenaphthene	50.0	37.0	74	10	20	67-113

Column to be used to flag recovery and RPD values with an asterisk
* Values outside of QC limits

3C
WATER SEMIVOLATILE LAB CONTROL SAMPLE

Lab Name: COLUMBIA ANALYTICAL SERVICES - REDDING

Case No.: D9277 SDG No.: D9277

LCS - associated with Method Blank: H0102WA1

COMPOUND	SPIKE ADDED (ug/L)	LCSD CONC. (ug/L)	LCSD % REC #	% RPD #	QC LIMITS RPD	QC LIMITS REC.
3-Nitroaniline	50.0	39.0	78	10	20	61-114
2,4-Dinitrophenol	50.0	24.7	49	7	20	41-117
Dibenzofuran	50.0	36.7	73	14	20	65-110
4-Nitrophenol	50.0	35.9	72	5	20	57-113
2,4-Dinitrotoluene	50.0	36.2	72	10	20	60-116
Fluorene	50.0	37.2	74	11	20	68-113
4-Chlorophenyl-phenylether	50.0	36.7	73	12	20	60-119
Diethylphthalate	50.0	38.3	77	10	20	67-114
4-Nitroaniline	50.0	38.7	77	5	20	62-121
4,6-Dinitro-2-methylphenol	50.0	31.6	63	3	20	55-114
N-Nitrosodiphenylamine	50.0	29.3	59*	9	20	62-112
1,2-Diphenylhydrazine	50.0	39.0	78	6	20	41-125
4-Bromophenyl-phenylether	50.0	36.4	73	10	20	62-117
Hexachlorobenzene	50.0	37.7	75	7	20	62-114
Pentachlorophenol	50.0	26.9	54*	5	20	55-109
Phenanthrene	50.0	38.3	77	8	20	68-112
Anthracene	50.0	37.5	75	8	20	68-111
Di-n-butylphthalate	50.0	38.7	77	9	20	64-122
Fluoranthene	50.0	37.8	76	7	20	66-113
Pyrene	50.0	37.3	75	15	20	63-119
Butylbenzylphthalate	50.0	37.4	75	16	20	64-121
Benzo(a)anthracene	50.0	37.3	75	14	20	67-111
3,3'-Dichlorobenzidine	50.0	36.5	73	10	20	29-142
Chrysene	50.0	36.7	73	14	20	66-110
bis(2-Ethylhexyl)phthalate	50.0	38.3	77	15	20	64-121
Di-n-octylphthalate	50.0	37.8	76	10	20	57-120
Benzo(b)fluoranthene	50.0	36.6	73	11	20	61-113
Benzo(k)fluoranthene	50.0	35.6	71	14	20	60-114
Benzo(a)pyrene	50.0	34.7	69	11	20	60-107
Indeno(1,2,3-cd)pyrene	50.0	38.4	77	3	20	51-118
Dibenzo(a,h)anthracene	50.0	37.8	76	9	20	48-121
Benzo(g,h,i)perylene	50.0	37.4	75	10	20	51-119

Column to be used to flag recovery and RPD values with an asterisk
* Values outside of QC limits

RPD: 0 out of 68 outside limits
Spike Recovery: 5 out of 136 outside limits

GC ORGANOCHLORINE PESTICIDES

CASE NARRATIVE
GC ORGANOCHLORINE PESTICIDES

CAS Lab Reference No./SDG.: D9277

I. **RECEIPT**

No exceptions were encountered unless a Sample Receipt Exception Report is attached to the Chain-of-Custody included with this data package.

II. **HOLDING TIMES**

A. Sample Preparation: All holding times were met.

B. Sample Analysis: All holding times were met.

III. **METHOD**

Preparation: SW-846 3520C
Cleanup: NA
Analysis: SW-846 8081A

IV. **PREPARATION**

Water sample volumes may vary based on the amount of sample received per container. Reporting limits have been adjusted accordingly for volumes less than 1 liter. Sample preparation proceeded normally.

V. **ANALYSIS**

A. Calibration: All acceptance criteria were met.

1. Retention Time Windows: All analytes were within criteria.

2. Degradation: All acceptance criteria were met.

B. Blanks: All acceptance criteria were met.

C. Surrogates: All acceptance criteria were met.

D. Internal Standards: All acceptance criteria were met.

E. Spikes: All acceptance criteria were met.

F. Samples: Sample analysis proceeded normally.

G. Other: Insufficient sample was received to perform matrix QC on this sample. A duplicate LCS was used to determine the precision of the method.

I certify that this data package is in compliance with the terms and conditions agreed to by the client and CAS, Inc., both technically and for completeness, except for the conditions noted above. Release of the data contained in this hardcopy data package has been authorized by the Laboratory Manager or designated person, as verified by the following signature.

SIGNED: _____ Reviewer: _____

Jerry Watega
Scientist, GC Organics

1D

PESTICIDE ORGANICS ANALYSIS DATA SHEET

CLIENT ID.

INFLUENT

Lab Name: COLUMBIA ANALYTICAL SERVICES - REDDING

Case No.: D9277 SDG No.: D9277 Lab Sample ID: D9277001

Matrix: WATER Level: LOW Lab File ID: B0115023

Sample Wt/Vol: 1.050 L Date Received: 12/27/02

Extract Vol: 10 ML Date Extracted: 01/02/03

Column: DB5 Date Analyzed: 01/16/03

Extraction Type: CONTINUOUS Dilution Factor: 1.0

CAS NO.	COMPOUND	Units: ug/L	MDL	RL	RESULT	Q
319-84-6	alpha-BHC		0.0055	0.050	0.050	U
319-85-7	beta-BHC		0.0063	0.050	0.050	U
319-86-8	delta-BHC		0.019	0.050	0.050	U
58-89-9	gamma-BHC (Lindane)		0.0027	0.050	0.050	U
76-44-8	Heptachlor		0.0031	0.050	0.050	U
309-00-2	Aldrin		0.0039	0.050	0.050	U
1024-57-3	Heptachlor epoxide		0.0039	0.050	0.050	U
959-98-8	Endosulfan I		0.0035	0.050	0.050	U
60-57-1	Dieldrin		0.0035	0.10	0.10	U
72-55-9	4,4'-DDE		0.0058	0.10	0.10	U
72-20-8	Endrin		0.0035	0.10	0.10	U
33213-65-9	Endosulfan II		0.0061	0.10	0.10	U
72-54-8	4,4'-DDD		0.0089	0.10	0.10	U
1031-07-8	Endosulfan sulfate		0.0079	0.10	0.10	U
50-29-3	4,4'-DDT		0.0051	0.10	0.10	U
72-43-5	Methoxychlor		0.011	0.10	0.10	U
53494-70-5	Endrin ketone		0.017	0.10	0.10	U
7421-93-4	Endrin aldehyde		0.0071	0.10	0.10	U
5103-71-9	alpha-Chlordane		0.0038	0.050	0.050	U
5103-74-2	gamma-Chlordane		0.0036	0.050	0.050	U
8001-35-2	Toxaphene		0.055	2.0	2.0	U

1D

PESTICIDE ORGANICS ANALYSIS DATA SHEET

CLIENT ID.

EFFLUENT

Lab Name: COLUMBIA ANALYTICAL SERVICES - REDDING

Case No.: D9277 SDG No.: D9277 Lab Sample ID: D9277002

Matrix: WATER Level: LOW Lab File ID: B0115024

Sample Wt/Vol: 1.050 L Date Received: 12/27/02

Extract Vol: 10 ML Date Extracted: 01/02/03

Column: DB5 Date Analyzed: 01/16/03

Extraction Type: CONTINUOUS Dilution Factor: 1.0

CAS NO.	COMPOUND	Units: ug/L	MDL	RL	RESULT	Q
319-84-6	alpha-BHC		0.0055	0.050	0.050	U
319-85-7	beta-BHC		0.0063	0.050	0.050	U
319-86-8	delta-BHC		0.019	0.050	0.050	U
58-89-9	gamma-BHC (Lindane)		0.0027	0.050	0.050	U
76-44-8	Heptachlor		0.0031	0.050	0.050	U
309-00-2	Aldrin		0.0039	0.050	0.050	U
1024-57-3	Heptachlor epoxide		0.0039	0.050	0.050	U
959-98-8	Endosulfan I		0.0035	0.050	0.050	U
60-57-1	Dieldrin		0.0035	0.10	0.10	U
72-55-9	4,4'-DDE		0.0058	0.10	0.10	U
72-20-8	Endrin		0.0035	0.10	0.10	U
33213-65-9	Endosulfan II		0.0061	0.10	0.10	U
72-54-8	4,4'-DDD		0.0089	0.10	0.10	U
1031-07-8	Endosulfan sulfate		0.0079	0.10	0.10	U
50-29-3	4,4'-DDT		0.0051	0.10	0.10	U
72-43-5	Methoxychlor		0.011	0.10	0.10	U
53494-70-5	Endrin ketone		0.017	0.10	0.10	U
7421-93-4	Endrin aldehyde		0.0071	0.10	0.10	U
5103-71-9	alpha-Chlordane		0.0038	0.050	0.050	U
5103-74-2	gamma-Chlordane		0.0036	0.050	0.050	U
8001-35-2	Toxaphene		0.055	2.0	2.0	U

1D

PESTICIDE ORGANICS ANALYSIS DATA SHEET

CLIENT ID.

PWB10102
METHOD BLANK

Lab Name: COLUMBIA ANALYTICAL SERVICES - REDDING

Case No.: D9277 SDG No.: D9277 Lab Sample ID: PWB10102

Matrix: WATER Level: LOW Lab File ID: B0115020

Sample Wt/Vol: 1.000 L Date Received:

Extract Vol: 10 ML Date Extracted: 01/02/03

Column: DB5 Date Analyzed: 01/16/03

Extraction Type: CONTINUOUS Dilution Factor: 1.0

CAS NO.	COMPOUND	Units: ug/L	MDL	RL	RESULT	Q
319-84-6	alpha-BHC		0.0055	0.050	0.050	U
319-85-7	beta-BHC		0.0063	0.050	0.050	U
319-86-8	delta-BHC		0.019	0.050	0.050	U
58-89-9	gamma-BHC (Lindane)		0.0027	0.050	0.050	U
76-44-8	Heptachlor		0.0031	0.050	0.050	U
309-00-2	Aldrin		0.0039	0.050	0.050	U
1024-57-3	Heptachlor epoxide		0.0039	0.050	0.050	U
959-98-8	Endosulfan I		0.0035	0.050	0.050	U
60-57-1	Dieldrin		0.0035	0.10	0.10	U
72-55-9	4,4'-DDE		0.0058	0.10	0.10	U
72-20-8	Endrin		0.0035	0.10	0.10	U
33213-65-9	Endosulfan II		0.0061	0.10	0.10	U
72-54-8	4,4'-DDD		0.0089	0.10	0.10	U
1031-07-8	Endosulfan sulfate		0.0079	0.10	0.10	U
50-29-3	4,4'-DDT		0.0051	0.10	0.10	U
72-43-5	Methoxychlor		0.011	0.10	0.10	U
53494-70-5	Endrin ketone		0.017	0.10	0.10	U
7421-93-4	Endrin aldehyde		0.0071	0.10	0.10	U
5103-71-9	alpha-Chlordane		0.0038	0.050	0.050	U
5103-74-2	gamma-Chlordane		0.0036	0.050	0.050	U
8001-35-2	Toxaphene		0.055	2.0	2.0	U

2C
WATER PESTICIDE SURROGATE RECOVERY

Lab Name: COLUMBIA ANALYTICAL SERVICES - REDDING

Case No.: D9277 SDG No.: D9277

	LAB ID	CLIENT ID.	S1 #	S2 #	S2	TOT OUT
01	PWB10102LCS	PWB10102LCS	71	56		0
02	PWB10102	PWB10102	66	58		0
03	D9277001	INFLUENT	70	52		0
04	D9277002	EFFLUENT	65	42		0
05						
06						
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32						
33						
34						
35						

		QC LIMITS
S1	= Tetrachloro-m-xylene	(51-100)
S2	= Decachlorobiphenyl	(10-102)

Column to be used to flag recovery values
* Values outside of contract required QC limits
D Surrogates diluted out

3E
PESTICIDE LAB CONTROL SAMPLE

Lab Name: COLUMBIA ANALYTICAL SERVICES - REDDING

Case No.: D9277 SDG No.: D9277 Column: DB5

LCS - Sample No.: PWB10102

COMPOUND	SPIKE ADDED (ug/L)	SAMPLE CONCENTRATION (ug/L)	LCS CONCENTRATION (ug/L)	LCS % REC #	QC. LIMITS REC.
alpha-BHC	0.5000	N/A	0.4383	88	65-106
beta-BHC	0.5000	N/A	0.4116	82	67-101
delta-BHC	0.5000	N/A	0.4505	90	70-111
gamma-BHC (Lindane)	0.5000	N/A	0.4498	90	68-111
Heptachlor	0.5000	N/A	0.4204	84	56-111
Aldrin	0.5000	N/A	0.4059	81	60-101
Heptachlor epoxide	0.5000	N/A	0.4255	85	68-106
Endosulfan I	0.5000	N/A	0.4034	81	46-111
Dieldrin	0.5000	N/A	0.4259	85	70-104
4,4'-DDE	0.5000	N/A	0.4172	83	69-101
Endrin	0.5000	N/A	0.4227	84	73-102
Endosulfan II	0.5000	N/A	0.4151	83	56-105
4,4'-DDD	0.5000	N/A	0.4183	84	66-102
Endosulfan sulfate	0.5000	N/A	0.4158	83	60-110
4,4'-DDT	0.5000	N/A	0.4247	85	65-103
Methoxychlor	0.5000	N/A	0.4364	87	71-102
Endrin ketone	0.5000	N/A	0.4292	86	71-110
Endrin aldehyde	0.5000	N/A	0.3995	80	64-103
alpha-Chlordane	0.5000	N/A	0.4189	84	66-105
gamma-Chlordane	0.5000	N/A	0.4224	84	66-105

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

RPD: 0 out of 0 outside limits
Spike Recovery: 0 out of 20 outside limits

COMMENTS: _____

GC ORGANOCHLORINE PCBS

CASE NARRATIVE
GC ORGANOCHLORINE PCBS

CAS Lab Reference No./SDG.: D9277

I. **RECEIPT**

No exceptions were encountered unless a Sample Receipt Exception Report is attached to the Chain-of-Custody included with this data package.

II. **HOLDING TIMES**

A. Sample Preparation: All holding times were met.

B. Sample Analysis: All holding times were met.

III. **METHOD**

Preparation: SW-846 3520C
Cleanup: N/A
Analysis: SW-846 8082

IV. **PREPARATION**

Water sample volumes may vary based on the amount of sample received per container. Reporting limits have not been adjusted accordingly.

V. **ANALYSIS**

A. Calibration: All acceptance criteria were met.

B. Blanks: All acceptance criteria were met.

C. Surrogates: All acceptance criteria were met.

D. Spikes: Insufficient sample was received to performed matrix QC. Duplicate LCS have been used to determine method precision.

E. Samples: Sample analysis proceeded normally.

I certify that this data package is in compliance with the terms and conditions agreed to by the client and Columbia Analytical Services, both technically and for completeness, except for the conditions noted above. Release of the data contained in this hardcopy data package has been authorized by the Laboratory Manager or designated person, as verified by the following signature.

SIGNED: _____ REVIEWER: _____

Jia Yah
Scientist I, GC Organics

Columbia Analytical Services
5090 Caterpillar Road
Redding, CA 96003-1412
Phone: (530) 244-5227
Fax: (530) 244-4109

1D

PCB ORGANICS ANALYSIS DATA SHEET

CLIENT ID.

INFLUENT

Lab Name: COLUMBIA ANALYTICAL SERVICES - REDDING

Case No.: D9277 SDG No.: D9277 Lab Sample ID: D9277001

Matrix: WATER Level: LOW Lab File ID: A0107008

Sample Wt/Vol: 1.050 L Date Received: 12/27/02

Extract Vol: 10 ML Date Extracted: 01/02/03

Column: RTX-CLP2 Date Analyzed: 01/07/03

Extraction Type: CONTINUOUS Dilution Factor: 1.0

CAS NO.	COMPOUND	Units: ug/L	MDL	RL	RESULT	Q
12674-11-2	Aroclor-1016		0.044	1.0	1.0	U
11104-28-2	Aroclor-1221		0.12	1.0	1.0	U
11141-16-5	Aroclor-1232		0.030	1.0	1.0	U
53469-21-9	Aroclor-1242		0.038	1.0	1.0	U
12672-29-6	Aroclor-1248		0.044	1.0	1.0	U
11097-69-1	Aroclor-1254		0.039	1.0	1.0	U
11096-82-5	Aroclor-1260		0.023	1.0	1.0	U

1D

PCB ORGANICS ANALYSIS DATA SHEET

CLIENT ID.

EFFLUENT

Lab Name: COLUMBIA ANALYTICAL SERVICES - REDDING

Case No.: D9277 SDG No.: D9277 Lab Sample ID: D9277002

Matrix: WATER Level: LOW Lab File ID: A0107009

Sample Wt/Vol: 1.050 L Date Received: 12/27/02

Extract Vol: 10 ML Date Extracted: 01/02/03

Column: RTX-CLP2 Date Analyzed: 01/07/03

Extraction Type: CONTINUOUS Dilution Factor: 1.0

CAS NO.	COMPOUND	Units: ug/L	MDL	RL	RESULT	Q
12674-11-2	Aroclor-1016		0.044	1.0	1.0	U
11104-28-2	Aroclor-1221		0.12	1.0	1.0	U
11141-16-5	Aroclor-1232		0.030	1.0	1.0	U
53469-21-9	Aroclor-1242		0.038	1.0	1.0	U
12672-29-6	Aroclor-1248		0.044	1.0	1.0	U
11097-69-1	Aroclor-1254		0.039	1.0	1.0	U
11096-82-5	Aroclor-1260		0.023	1.0	0.36	J

PCB ORGANICS ANALYSIS DATA SHEET

CLIENT ID.

PWB10102
METHOD BLANK

Lab Name: COLUMBIA ANALYTICAL SERVICES - REDDING

Case No.: D9277 SDG No.: D9277 Lab Sample ID: PWB10102

Matrix: WATER Level: LOW Lab File ID: A0107003

Sample Wt/Vol: 1.000 L Date Received:

Extract Vol: 10 ML Date Extracted: 01/02/03

Column: RTX-CLP2 Date Analyzed: 01/07/03

Extraction Type: CONTINUOUS Dilution Factor: 1.0

CAS NO.	COMPOUND	Units: ug/L	MDL	RL	RESULT	Q
12674-11-2	Aroclor-1016		0.044	1.0	1.0	U
11104-28-2	Aroclor-1221		0.12	1.0	1.0	U
11141-16-5	Aroclor-1232		0.030	1.0	1.0	U
53469-21-9	Aroclor-1242		0.038	1.0	1.0	U
12672-29-6	Aroclor-1248		0.044	1.0	1.0	U
11097-69-1	Aroclor-1254		0.039	1.0	1.0	U
11096-82-5	Aroclor-1260		0.023	1.0	1.0	U

2C
WATER PCB SURROGATE RECOVERY

Lab Name: COLUMBIA ANALYTICAL SERVICES - REDDING

Case No.: D9277 SDG No.: D9277

	LAB ID	CLIENT ID.	S1 #	S2 #	S2	TOT OUT
01	PWB10102	PWB10102	88			0
02	PWB10102LCS	PWB10102LCS	64			0
03	D9277001	INFLUENT	77			0
04	D9277002	EFFLUENT	63			0
05						
06						
07						
08						
09						
10						
11						
12						
13						
14						
15						
16						
17						
18						
19						
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21						
22						
23						
24						
25						
26						
27						
28						
29						
30						
31						
32						
33						
34						
35						

		QC LIMITS
S1	= Decachlorobiphenyl	(10-102)

Column to be used to flag recovery values
* Values outside of contract required QC limits
D Surrogates diluted out

3E
PESTICIDE LAB CONTROL SAMPLE

Lab Name: COLUMBIA ANALYTICAL SERVICES - REDDING

Case No.: D9277 SDG No.: D9277 Column: RTX-CLP2

LCS - Sample No.: PWB10102

COMPOUND	SPIKE ADDED (ug/L)	SAMPLE CONCENTRATION (ug/L)	LCS CONCENTRATION (ug/L)	LCS % REC #	QC. LIMITS REC.
Aroclor-1016	5.000	N/A	4.690	94	76-119
Aroclor-1260	5.000	N/A	4.708	94	75-117

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

RPD: 0 out of 0 outside limits
Spike Recovery: 0 out of 2 outside limits

COMMENTS: _____

4B
PCB METHOD BLANK SUMMARY

Client ID.

PWB10102

Lab Name: COLUMBIA ANALYTICAL SERVICES - REDDING

Case No.: D9277 SDG No.: D9277

Lab File ID:	A0107003	Lab Sample ID:	PWB10102
Date Extracted:	01/02/03	Extraction Type:	CONT
Date Analyzed:	01/07/03	Time Analyzed:	1320
Matrix:	WATER	Level:(low/med)	LOW
Instrument ID:	GCA		

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, MS and MSD:

	CLIENT ID.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED
01	PWB10102LCS	PWB10102LCS	A0107004	01/07/03
02	INFLUENT	D9277001	A0107008	01/07/03
03	EFFLUENT	D9277002	A0107009	01/07/03
04				
05				
06				
07				
08				
09				
10				
11				
12				
13				
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20				
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24				
25				
26				
27				

CATIONS

Case Narrative
Cations

CAS Lab Reference No./SDG. D9277

I. RECEIPT

No exceptions were encountered unless a Sample Receipt Exception Report is attached to the Chain-of-Custody included with this data package.

II. HOLDING TIMES

All holding times were met.

III. METHOD

The method used is cited on the attached Inorganics Analysis Methods sheet.

IV. PREPARATION

Sample preparation proceeded normally, if applicable.

V. ANALYSIS

A. Calibration: All acceptance criteria were met.

B. Blanks: All acceptance criteria were met.

C. ICP Interference Check Samples: All acceptance criteria were met.

D. Spikes: All acceptance criteria were met.

E. Duplicates: All acceptance criteria were met.

F. Laboratory Control Samples: All acceptance criteria were met.

G. ICP and GFAA Serial Dilutions: All acceptance criteria were met.

H. Post Digestion Spike: All acceptance criteria were met.

I. Other: Results are reported to the MDL.

I certify that this data package is in compliance with the terms and conditions agreed to by the client and CAS, both technically and for completeness, except for the conditions noted above. Release of the data contained in this hardcopy data package has been authorized by the Laboratory Manager or designated person, as verified by the following signature.

SIGNED: Carol Shillum for DATE: 1-6-03
Ricky D. Jensen
Resource Chemist

Columbia Analytical Services
5090 Caterpillar Rd, Redding, CA 96003-1412
(530) 244-5227
Fax No. (530) 244-4109

Client: DEPT. FISH & GAME
Project: COYOTE VALLEY
Sample Matrix: WATER

Service Request: D9277
Date Collected: 12/26/02
Date Received: 12/27/02
Date Extracted: 01/02/03

Total Metals

Units: µg/L

Sample Name: INFLUENT
Lab Code: D9277001

Analyte	EPA Method	Date Analyzed	MRL	Results	Result Notes
Antimony	6010B	01/13/03	45.0	ND	U
Arsenic	7060	01/08/03	2.0	1.3	B
Beryllium	6010B	01/13/03	5.0	ND	U
Cadmium	6010B	01/13/03	5.0	ND	U
Chromium	6010B	01/13/03	10.0	11.4	
Copper	6010B	01/13/03	10.0	8.0	B
Lead	7421	01/06/03	2.0	3.5	
Mercury	245.1	01/06/03	0.30	0.14	B
Nickel	6010B	01/13/03	20.0	17.7	B
Selenium	7740	01/09/03	2.0	ND	U
Silver	6010B	01/13/03	10.0	1.3	B
Thallium	7841	01/09/03	5.0	ND	U
Zinc	6010B	01/13/03	20.0	11.7	B

Approved By: C Skillern Date: 1-16-03

Client: DEPT. FISH & GAME
Project: COYOTE VALLEY
Sample Matrix: WATER

Service Request: D9277
Date Collected: 12/26/02
Date Received: 12/27/02
Date Extracted: 01/02/03

Total Metals

Units: µg/L

Sample Name: EFFLUENT
Lab Code: D9277002

Analyte	EPA Method	Date Analyzed	MRL	Results	Result Notes
Antimony	6010B	01/13/03	45.0	ND	U
Arsenic	7060	01/08/03	2.0	8.5	
Beryllium	6010B	01/13/03	5.0	ND	U
Cadmium	6010B	01/13/03	5.0	ND	U
Chromium	6010B	01/13/03	10.0	107	
Copper	6010B	01/13/03	10.0	52.6	
Lead	7421	01/06/03	2.0	12.2	
Mercury	245.1	01/06/03	0.30	0.17	B
Nickel	6010B	01/13/03	20.0	152	
Selenium	7740	01/09/03	2.0	ND	U
Silver	6010B	01/13/03	10.0	ND	U
Thallium	7841	01/09/03	5.0	1.1	B
Zinc	6010B	01/13/03	20.0	168	

Approved By: C Skillern Date: 1-16-03

Client: DEPT. FISH & GAME
Project: COYOTE VALLEY
Sample Matrix: WATER

Service Request: D9277
Date Collected:
Date Received:
Date Extracted: 01/02/03

Total Metals

Units: µg/L

Sample Name: PBW
Lab Code: PBW

Analyte	EPA Method	Date Analyzed	MRL	Results	Result Notes
Antimony	6010B	01/13/03	45.0	ND	U
Arsenic	7060	01/08/03	2.0	ND	U
Beryllium	6010B	01/13/03	5.0	ND	U
Cadmium	6010B	01/13/03	5.0	ND	U
Chromium	6010B	01/13/03	10.0	ND	U
Copper	6010B	01/13/03	10.0	ND	U
Lead	7421	01/06/03	2.0	ND	U
Mercury	245.1	01/06/03	0.30	ND	U
Nickel	6010B	01/13/03	20.0	ND	U
Selenium	7740	01/09/03	2.0	ND	U
Silver	6010B	01/13/03	10.0	ND	U
Thallium	7841	01/09/03	5.0	1.3	B
Zinc	6010B	01/13/03	20.0	ND	U

Approved By: C Shellum Date: 1-16-03

Client: DEPT. FISH & GAME
Project:
LCS Matrix: WATER

Service Request: D9277
Date Collected: NA
Date Received: NA
Date Extracted: 01/02/03
Date Analyzed: 1/13/03

Laboratory Control Sample Summary
Total Metals

Sample Name: LCSW
Test Notes: LCSW
Lab Code: RDD

Units: µg/L
Basis: NA

LCS LAB

Analyte	Prep Method	Analysis Method	True Value	Result	Percent Recovery	CAS Percent Recovery Acceptance Limits	Result Notes
Antimony		6010B	1000	1070	107.5	80 - 120	
Arsenic		7060	20.0	19.6	98.2	80 - 120	
Beryllium		6010B	1000	1050	105.2	80 - 120	
Cadmium		6010B	1000	1050	104.9	80 - 120	
Chromium		6010B	500	529	105.9	80 - 120	
Copper		6010B	1000	1070	106.8	80 - 120	
Lead		7421	20.0	22.0	109.8	80 - 120	
Mercury		245.1	2.00	2.10	105.0	80 - 120	
Nickel		6010B	500	535	107.0	80 - 120	
Selenium		7740	20.0	20.7	103.8	80 - 120	
Silver		6010B	250	262	104.8	80 - 120	
Thallium		7841	20.0	22.7	113.7	80 - 120	
Zinc		6010B	1000	1060	106.4	80 - 120	

Approved By: CSkillman

Date: 1-16-03

GENERAL CHEMISTRY

Case Narrative
General Chemistry

CAS Lab Reference No./SDG.: D9277

I. **RECEIPT**
No exceptions were encountered unless a Sample Receipt Exception Report is attached to the Chain-of-Custody included with this data package.

II. **HOLDING TIMES**
All holding times were met.

III. **METHOD**
The method used is cited in the corresponding Form I.

IV. **PREPARATION**
Sample preparation proceeded normally, if applicable.

V. **ANALYSIS**

A. Calibration: All acceptance criteria were met.

B. Blanks: All acceptance criteria were met.

C. Spikes: All acceptance criteria were met.

D. Duplicates: All acceptance criteria were met.

E. Laboratory Control Samples: All acceptance criteria were met.

F. Samples: Sample analyses proceeded normally.

G. Other: No QA/QC was reported except client requested QA/QC.

Sample D9277002 required dilution for Hexavalent Chromium analysis due to matrix interferernce.

Sample results were reported to the RL.

I certify that this data package is in compliance with the terms and conditions agreed to by the client and CAS, Inc., both technically and for completeness, except for the conditions noted above. Release of the data contained in this hardcopy data package has been authorized by the Laboratory Manager or designated person, as verified by the following signature.

SIGNED: _____ DATE: 1/10/05

Ricky Jensen
Resource Chemist

Report of Analytical Results

Client Sample ID: INFLUENT
Sample Description: None
Sample Matrix: Water
Site: N/A

Date Collected: 12/26/02 14:00 (Thu)
Date Received: 12/27/02 09:40 (Fri)

Reference No: D9277
Lab Sample ID: D9277001

CATEGORY NAME Analytical Parameter	Result	Units	Reporting Level	Date/Time of Analysis	Analytical Method(s)
GENERAL					
Chromium, hexavalent	23	ug/L	20	12/27/02 11:15	SM312B/SW7196
Hardness as CaCO3	61	mg/L	10	12/30/02 15:30	EPA130.2
pH	7.69	units		12/27/02 11:00	EPA150.1
ANIONS					
Cyanide, Distilled	< 2	ug/L	10	12/31/02 17:05	EPA335.2

(19443)

Report of Analytical Results

Client Sample ID: EFFLUENT
Sample Description: None
Sample Matrix: Water
Site: N/A

Date Collected: 12/26/02 15:00 (Thu)
Date Received: 12/27/02 09:40 (Fri)

Reference No: D9277
Lab Sample ID: D9277002

CATEGORY NAME Analytical Parameter	Result	Units	Reporting Level	Date/Time of Analysis	Analytical Method(s)
GENERAL					
Chromium, hexavalent	< 50	ug/L	50	12/27/02 11:15	SM312B/SW7196
Hardness as CaCO3	85	mg/L	10	12/30/02 15:30	EPA130.2
pH	7.67	units		12/27/02 11:00	EPA150.1
ANIONS					
Cyanide, Distilled	< 2	ug/L	10	12/31/02 17:05	EPA335.2

(19443)

Report of Analytical Results

Client Sample ID: LCS
Sample Description: None
Sample Matrix: Water
Site: N/A

Date Collected: None
Date Received: None

Reference No: LABQC
Lab Sample ID: Various

CATEGORY NAME Analytical Parameter	Result	Units	Reporting Level	Date/Time of Analysis	Analytical Method(s)
GENERAL					
Chromium, hexavalent	100.6	%rec	N/A	12/27/02 11:15	SM312B/SW7196
Hardness as CaCO3	99.0	%rec	N/A	12/30/02 15:30	EPA130.2
ANIONS					
Cyanide, Distilled	95.9	%rec	N/A	12/31/02 17:05	EPA335.2

(19443)

Report of Analytical Results

Client Sample ID: METHOD BLANK
Sample Description: None
Sample Matrix: Water
Site: N/A

Date Collected: None
Date Received: None

Reference No: LABQC
Lab Sample ID: Various

CATEGORY NAME / Analytical Parameter	Result	Units	Reporting Level	Date/Time of Analysis	Analytical Method(s)
GENERAL					
Chromium, hexavalent	< 20	ug/L	20	12/27/02 11:15	SM312B/SW7196
Hardness as CaCO3	< 10	mg/L	10	12/30/02 15:30	EPA130.2
ANIONS					
Cyanide, Distilled	< 2	ug/L	10	12/31/02 17:05	EPA335.2

(19443)

CHAIN OF CUSTODY DOCUMENTATION

Columbia Analytical Services, Inc.
An Employee-Owned Company
www.caslab.com

CHAIN OF CUSTODY/LABORATORY ANALYSIS REQUEST FORM

5090 Caterpillar Road • Redding, CA 96003 • (530) 244-5227 • 800-695-7222 x10 • FAX (530) 244-4109

COC# 4665

PAGE 1 OF 1

SR #

CAS Contact D9272

Project Name: Coyote Valley DFG	Project Number:
Project Manager: JEFF METTEER	Report CC:
Company/Address: COLUMBIA ANALYTICAL SRVCS.	
Phone #: (530)244-5262x109	FAX#: (530)244-4109
Sampler's Signature:	Sampler's Printed Name: Jacqueline Lee

ANALYSIS REQUESTED *(Include Method Number and Container Preservative)*

	CLIENT SAMPLE ID	LAB ID	SAMPLING DATE	SAMPLING TIME	MATRIX	NUMBER OF CONTAINERS	METALS: CIRCLE ON LIST BELOW	VOCs	Cyanide	SVOCs	Asbestos	2,3,7,8-TCDD Dioxin	organoPesticides	Hex Cr + pH	REMARKS/ ALTERNATE DESCRIPTION
PRESERVATIVE							2	1	4	0	0	0	0	0	
	Influent	1	12/27/02	1400	WTR	13	X	X	X	X	X	X	X	X	
	Effluent	2	12/27/02	1500	WTR	13	X	X	X	X	X	X	X	X	

Preservative Key
0. NONE
1. HCL
2. HNO_3
3. H_2SO_4
4. NaOH
5. Zn. Acetate
6. MeOH
7. $NaHSO_4$
8. Other _____

* Circle which metals are to be analyzed

Total Metals/6010: Al (As) (Sb) Ba (Be) Ca (Cd) Cu Co Fe (Pb) Mg Mn Mo (Ni) K (Ag) Na (Se) (Tl) Sn V (Zn) (Ag) (Cr) + Hardness
Total Metals/7000 series: As Sb Cu Pb Se Tl (Hg)

Dissolved Metals/6010: Al As Sb Ba Be Ca Cd Cu Co Fe Pb Mg Mn Mo Ni K Ag Na Se Tl Sn V Zn
Dissolved Metals/7000 series: As Sb Cu Pb Se Tl Hg

SPECIAL INSTRUCTIONS/COMMENTS
SUB 1613 for Dioxin, Dioxin Toxic Equivalent

Hg. Verified KS 12/27/02

Call Jeff for Report Requirements

REPORT REQUIREMENTS

____ I. Results Only
____ II. Results + QC Summaries (LCS, DUP, MS/MSD as required)
____ III. Results + QC and Calibration Summaries
____ IV. Data Validation Report with Raw Data
____ V. Speicalized Forms / Custom Report

Edata ____ Yes ____ No

INVOICE INFORMATION

PO# _____

BILL TO: _____

TURNAROUND REQUIREMENTS

____ 24 hr ____ 48 hr
____ 5 Day
____ Standard (10-15 working days)
____ Provide FAX Results

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
Signature:	Signature:	Signature:	Signature:
Date/Time: 12/27/02 16:00	Date/Time: 12/27/02 0940	Date/Time:	Date/Time:
Printed Name:	Printed Name: SANCHEZ	Printed Name:	Printed Name:
Firm:	Firm: CAS/REDDING	Firm:	Firm:

Distribution: White - Return to Originator; Yellow - Lab Copy; Pink - Retained by Client

SCOC-0302-11

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Columbia Analytical Services inc.
An Employee-Owned Company
5090 Caterpillar Road
Redding, CA 96003

COOLER RECEIPT FORM

Project/Client Coyote Valley DFG/ESS Work Order D020 9277

1. Cooler(s)/Sample(s) received on: 12/27/02 Shipped via: Fed Ex

   Shipping Bill # (s): 8377 1666 2377

2. Cooler(s) / Samples screened by: [signature] (Acceptable) Rejected

3. Custody seals on outside of cooler. YES (NO) N/A
   If yes, where? Front_____ Rear_____ Lt Side_____ Rt Side_____

   Seals intact. YES NO

COOLER/SAMPLE PROCESSING

4. Sample Processing/Tagging by: [signature]

5. Cooler(s)/Sample(s) Temp.'s 4°c x 3 COOLERS _____ _____
   (or)
   Temp. Blank (if present) 4°c x 3 COOLERS _____ _____

6. Type of packing material present: ICE, WEDDING, BUBBLE WRAP

7. Custody papers properly filled out (ink, signed, dated, released, etc.)? YES (NO)

8. Containers arrived in good condition (unbroken, leaking, etc.)? (YES) NO

9. Container labels complete (i.e. analysis, preservation, date/time, etc.)? YES (NO)

10. Container labels and tags agree with custody papers? (YES) NO

11. Correct types of containers used for the tests indicated? (YES) NO

    a.) Adequate sample received? If not, note on Exception Report. (YES) NO

12. Containers supplied by: (CAS) Other

13. Preserved containers received with the appropriate preservative? (YES) NO N/A

    pH:_____ (or) (See pH log.)

14. VOA vials free of air bubbles? (YES) NO N/A

15. Trip Blank preparation date: _____ CAS Other (N/A)

16. Soil samples transferred to the freezer: Date:_____ Time: _____ (N/A)

See Exception Report for discrepancies.

Rev. 8/1/2002/ds

0060

Columbia Analytical Services inc.
An Employee-Owned Company

pH Log

5090 Caterpillar Road
Redding Ca., 96003
Phone: 530-244-5227
Fax: 530-244-4109

Reference No.: D9277 | By: DB | Date: 12/27/02

Project/Client: Coyote Valley DFG/ESS

Test: ⇨	METALS	—	—	CYANIDE	8260
Sample No.	HNO3 pH<2	H2SO4 pH<2	ZnAc2/NaOH pH>9	NaOH pH>12	HCl pH<2
-001	<2			>12	<2 Per Doc
-002	<2			>12	<2 Per Doc
-003					
-004					
-005					
-006					
-007					
-008					
-009					
-010					
-011					
-012					
-013					
-014					
-015					
-016					
-017					
-018					
-019					
-020					

Adjusted in Lab*

Sample No.					
	mL	mL	mL	mL	mL
	mL	mL	mL	mL	mL
	mL	mL	mL	mL	mL
	mL	mL	mL	mL	mL
	mL	mL	mL	mL	mL

*note the sample number below and the quantity of preservative added in the appropriate column

Columbia Analytical Services inc.
An Employee-Owned Company

5090 Caterpillar Road
Redding, Ca. 96003
Phone: 530-244-5227 Fax: 530-244-4109

SAMPLE RECEIPT EXCEPTION REPORT

Sample Batch Number: D9277

Client/Project: Coyote Valley DFG/ ESS

		COMMENTS
	1. No custody seal as required by project.	2)(a) COC, LABELS, RELINQUISH DATE ARE 12/27/02. PER CLIENT CONTACT, SHOULD ALL BE 12/26/02.
X	2. Analysis, description, date/time of collection not provided.	
	3. Temperature of samples inappropriate for analysis requested.	2)(b) ONE, 500 mL Poly, UNPRESERVED RCD WITHOUT A LABEL. BY PROCESS OF ELIMINATION, SHOULD BE CLIENT ID, EFFLUENT, FOR "CAHEX" & "AH" ANALYSIS.
	4. Samples broken or leaking on receipt.	
	5. Container inappropriate for analysis requested.	
	6. Inadequate sample volume.	10) Per established contract, added Cu (6010B) and PCBs to login.
	7. Preservation inappropriate for analysis requested.	
	8. Samples received out of holding time for analysis requested.	
	9. Discrepancies between COC form and container labels.	
X	10. Other	

Corrective Actions Taken:

No further action required.

RSD 1-4-03

Notified:
___ Client
✓ Client Services RSD 12-27-02

By: [signature]
Date: 12/27/02

APPENDIX A

MACS Lab, Inc.
2070A Walsh Avenue
Santa Clara, CA 95050-2542

(408) 727-9727

Asbestos in Water by TEM
EPA 600/R-94/134
aka Method 100.2
Report

Columbia Analytical Lab. Inc.
5090 Caterpiller Road

Redding CA 96003

Person to contact: Karen Sellers

Contact phone: 530-244-5227

FAX phone: 530-244-4109

Corresponding invoice number: 117595

Purchase Order Number: D0209276

Job:

Note: This sample may or may not be a drinking water sample. Please see the chain of custody from the party that sampled the water. The detection limit may not meet the requirements of drinking water if the sample contains large amounts of particulates. Therefore if the Detection limit is >0.2 mf/l this analysis is NOT valid for drinking water.

Sample:

MACS Lab Sample Number: H117595-1 **Client Sample Number:** D9277001

Client Sample Description: Influent

Filter type and size: MCE 0.2µm pore size
Filter Diameter = 25 mm Filter lot no.: H1PNO5363
Filter Manufacturer: MILLIPORE
Received OK: Yes Accepted for analysis: No

Date and time sampled (from client): December 26, 2002 at 14:00
Sampled by:
Sample received: December 31, 2002 at 10:30
Sample ozonated: December 31, 2002 at 12:00
Sample filtered on: January 2, 2003 at 08:30
Analyzed on: January 5, 2003 at 13:20
Analyzed on: January 5, 2003 at 13:20

Analysis Results:

Type of Asbestos:	million fibers/liter	Detection limit, mf/l
Total asbestos	<	

Remarks: Sample is overloaded.

TEM magnification:	10,000 X
Grid area analyzed:	0.000 mm^2
Grids counted:	0
Sonication time:	15 min
Filter area:	225 mm^2
Total fibers counted:	0
Volume filtered:	1.0 ml

Approximate volume of sample received: 1000 milliliters

Fiber Concentration in Water in Million Fibers per Liter $= \frac{\text{fibers/mm}^2 \text{ X filter area (mm}^2\text{)}}{\text{sample volume filtered in L}} \text{ X } 0.000001$

fibers/mm^2 = total fibers / grid area analyzed

Blank Vol. filtered:	100.0 ml
Blank concentration:	< 0.049 mf/l

95% confidence interval: to mf/l

Microscopist: _____ Laboratory manager: _____
(signature)

C064

MACS Lab, Inc.
2070A Walsh Avenue
Santa Clara, CA 95050-2542

(408) 727-9727

Asbestos in Water by TEM
EPA 600/R-94/134
aka Method 100.2
Report

Job:

Note: This sample may or may not be a drinking water sample. Please see the chain of custody from the party that sampled the water. The detection limit may not meet the requirements of drinking water if the sample contains large amounts of particulates. Therefore if the Detection limit is >0.2 mf/l this analysis is NOT valid for drinking water.

Sample:

MACS Lab Sample Number: H117595-2 **Client Sample Number:** D9277002

Client Sample Description: Effluent

Filter type and size: MCE 0.2µm pore size
Filter Diameter = 25 mm Filter lot no.: H1PNO5363
Filter Manufacturer: MILLIPORE
Received OK: Yes Accepted for analysis: No

Date and time sampled (from client): December 26, 2002 at 15:00
Sampled by:
Sample received: December 31, 2002 at 10:30
Sample ozonated: December 31, 2002 at 12:00
Sample filtered on: January 2, 2003 at 08:30
Analyzed on: January 5, 2003 at 13:20

Analyzed on: January 5, 2003 at 13:20

Analysis Results:

Type of Asbestos:	million fibers/liter	Detection limit, mf/l
Total asbestos	<	

Remarks: Sample is overloaded.

TEM magnification:	10,000 X
Grid area analyzed:	0.000 mm^2
Grids counted:	0
Sonication time:	15 min
Filter area:	225 mm^2
Total fibers counted:	0
Volume filtered:	1.0 ml

Approximate volume of sample received: 1000 milliliters

$$\text{Fiber Concentration in Water in Million Fibers per Liter} = \frac{\text{fibers/mm}^2 \times \text{filter area (mm}^2\text{)}}{\text{sample volume filtered in L}} \times 0.000001$$

fibers/mm^2 = total fibers / grid area analyzed

Blank Vol. filtered:	100.0 ml
Blank concentration:	< 0.049 mf/l

95% confidence interval: to mf/l

End of report.

Microscopist: _____ Laboratory manager: _____
(signature)

0065

H117595

Subcontract Detail Report

Date: 31-DEC-02
Time: 09:03 am

To: MACS/SANTA CLARA
Date Due: 15-JAN-02 (Tuesday)

Batch: D9277
QA Level: 2
Batch Comments: ~~*REPORT TO MDL*~~ CS 12-31-02

Test Description	Reporting List ID	Method	Quick Turn Around Req Days	Date
Sample: D9277001 FS Matrix: Water Collected: 26-DEC-02 02:00 pm	Sample Comments: None Client Sample ID: INFLUENT	Client Sample Description: None		
Asbestos (Method TEM)	NULL	EPA600/M4/82-020	N	
Sample: D9277002 FS Matrix: Water Collected: 26-DEC-02 03:00 pm	Sample Comments: None Client Sample ID: EFFLUENT	Client Sample Description: None		
Asbestos (Method TEM)	NULL	EPA600/M4/82-020	N	

Key: FS - Field Sample

Relinquished by (Date/Time): Rae DeMan 12-30-02 1400 Received by (Date/Time): 12-31-2 Airbill Number: _____

Send Report to: No 'REPORT' Address information was found for ACCOUNT: 'SUBCONTRACT LABS' and PROJECT: 'LRD'.

9900

APPENDIX B

ACCREDITED IN ACCORDANCE WITH nelac

Columbia Analytical Services INC.
An Employee-Owned Company

January 13, 2003

Mr. Robert DeMarr
Columbia Analytical Services, Inc.
5090 Caterpillar Road
Redding, CA 96003

CAS/HOU SR#: ***E2200584***
CAS/RDD SR#: ***D0209277***

Dear Rob,

Enclosed please find the analytical report for the environmental samples we received on December 31, 2002. Your water samples were tested by Method 1613, as requested.

Our Florida/NELAP certification number is E87611. Our State of California certification number is 2452.

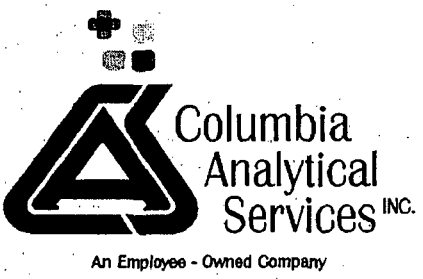
All analyses were performed according to our laboratory's quality assurance program, which includes NELAP. All results are to be considered in their entirety and Columbia Analytical Services, Inc. is not responsible for use of less than the complete report. Your report contains 30 pages.

Thank you for using our laboratory for your dioxin testing.

Sincerely,
COLUMBIA ANALYTICAL SERVICES, INC.

Jane Freemyer

Jane Freemyer
Senior Chemist: Projects and QA
713-266-1599
jfreemyer@houston.caslab.com



Dioxin/Furan Report

10655 Richmond Avenue, Suite 130-A, Houston, TX 77042
Phone (713)266-1599 Fax (713)266-0130
www.caslab.com

CASE NARRATIVE
Method 1613B – Dioxins/Furans

CAS/Houston SR No.: E2200584
CAS-RDD SR No: D0209277
Project: MACS Lab, Inc.

Sample ID:	Laboratory ID:	Sample Matrix:
Influent	E2200584-001	water
Effluent	E2200584-002	water

I. RECEIPT

No exceptions are noted.

II. HOLDING TIMES

Sample Preparation: All holding times were met.
Sample Analysis: All holding times were met.

III. METHOD

Preparation: Included in Method 1613B
Cleanup: Silica Gel; Carbon
Analysis: Method 1613B

IV. ANALYSIS

A. Calibration: The initial calibration response factors were used to calculate the concentrations of all target analytes and internal standards.

B. Retention Time Windows: All acceptance criteria were met.

C. Blanks: All acceptance criteria were met.

D. Spikes: All acceptance criteria were met.

V. CERTIFICATION

I certify this data package complies with the terms and conditions agreed to by the client and Columbia Analytical Services, Inc., both technically and for completeness, except for the conditions noted above. Release of the data contained in this hardcopy data package has been authorized by the Laboratory Director or designated person, as verified by the following signature.

SIGNED: Xiangqiu Liang DATE: 1/12/05

Xiangqiu 'Sam' Liang
Laboratory Director, HRMS

CAS/HOU Data Review Documentation

SR# Unique ID: E2202589 (RE)

First Level Data Review - to be filled by person doing the initial package assembly

Date 01/10/03 Reviewer [signature]

Second Level Data Review – to be filled by person doing the second level analytical review

Date 01/10/03 Reviewer cee

Project Level Review - to be filled by Project Chemist

Date 1/13/3 Reviewer [signature]

Method 1613B/Dioxins & Furans
Compound Reporting Limits
(last updated: 12/05/02)

Congener	Congener Abbreviation	CAS RN	REPORTING LIMITS aqueous	REPORTING LIMITS non-aqueous
			PG/L	NG/KG
2,3,7,8-Tetrachlorodibenzo-p-dioxin	2378-TCDD	1746-01-6	10	1
1,2,3,7,8-Pentachlorodibenzo-p-dioxins	12378-PeCDD	40321-76-4	50	5
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin	123478-HxCDD	39227-28-6	50	5
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin	123678-HxCDD	57653-85-7	50	5
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin	123789-HxCDD	19408-74-3	50	5
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin	1234678-HpCDD	35822-39-4	50	5
Octachlorodibenzo-p-dioxin	OCDD	3268-87-9	100	10
2,3,7,8-Tetrachlorodibenzofuran	2378-TCDF	51207-31-9	10	1
1,2,3,7,8-Pentachlorodibenzofuran	12378-PeCDF	57117-41-6	50	5
2,3,4,7,8-Pentachlorodibenzofuran	23478-PeCDF	57117-31-4	50	5
1,2,3,6,7,8-Hexachlorodibenzofuran	123478-HxCDF	70648-26-9	50	5
1,2,3,7,8,9-Hexachlorodibenzofuran	123678-HxCDF	57117-44-9	50	5
1,2,3,4,7,8-Hexachlorodibenzofuran	123789-HxCDF	72918-21-9	50	5
2,3,4,6,7,8-Hexachlorodibenzofuran	234678-HxCDF	60851-34-5	50	5
1,2,3,4,6,7,8-Heptachlorodibenzofuran	1234678-HpCDF	67562-39-4	50	5
1,2,3,4,7,8,9-Heptachlorodibenzofuran	1234789-HpCDF	55673-89-7	50	5
Octachlorodibenzofuran	OCDF	39001-02-0	100	10

NOTE:
Soil samples are reported on a dry-weight basis and tissue samples are reported on a wet-weight basis.

ABBREVIATIONS, ACRONYMS AND FLAGS

Abbreviations, acronyms and definitions

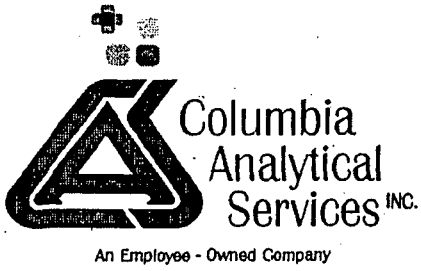
Cal	Calibration
Conc	Concentration
Dioxins	Polychlorinated dibenzo-p-dioxin(s)
EDL	Estimated detection limit
EMPC	Estimated maximum possible concentration
Flags	Data qualifiers
Furans	Polychlorinated dibenzofuran(s)
g	Grams
ICAL	Initial calibration
ID	Identifier
Ions	Masses monitored for the analyte during data acquisition
L	Liter (s)
LCS	Laboratory control sample
LCSD	Laboratory control spike duplicate
MB	Method blank
MCL	Method calibration limit
MDL	Method detection limit
ML	Mililiters
MS	Matrix spike sample
MSD	Matrix spiked sample duplicate
NO	Number of peaks meeting all identification criteria
PCDD	Polychlorinated dibenzo-p-dioxin(s)
PCDF	Polychlorinated dibenzofuran(s)
ppm	Parts per million
ppb	Parts per billion
ppt	Parts per trillion
ppq	Parts per quadrillion
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
SDG	Sample delivery group
S/N	Signal-to-noise ratio
TEF	Toxicity equivalence factor
TEQ	Toxicity equivalence

(Flags – see next page)

Flags

CAS/Houston Data Qualifiers*

B	Used when the analyte is found in the extraction or analysis blank, as well as in the sample.
C	Indicates the value for 2,3,7,8-Tetrachlorodibenzofuran (2378-TCDF) required confirmation using a DB-225 column. The value reported from the DB-225 column should be used when calculating the Toxicity Equivalent Quotient (TEQ.)
E	Indicates an estimated value. Used when the analyte concentration is above 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), but above the detection limit (MDL.)
K	EMPC; estimated maximum possible concentration
U	Indicates the compound was analyzed for but not detected.
Y	Indicates the recovery of labeled standard is outside the range specified by the method. When labeled standards are outside the QC limits, the signal-to-noise ratio is evaluated. If the signal-to-noise ratio is greater than 10:1, the compound is reported.



Chain-of-Custody

10655 Richmond Avenue, Suite 130-A, Houston, TX 77042
Phone (713)266-1599 Fax (713)266-0130
www.caslab.com

Lab Incorporated
2070A WALSH AVENUE, SANTA CLARA, CA 95050
(408) 727-9727 • 1(800) MACS LAB
FAX: (408) 727-7065

CHAIN OF CUSTODY RECORD

To Be Used For All Types Of Analysis

Macs Lab # _____
Customer Code _____

Required Turn-Around Time
4 Hour _____
8 Hour _____
24 Hour _____
48 Hour _____
72 Hour _____

BILLED TO		PROJECT INFORMATION	
NAME:	CAS	PROJECT NAME:	
ADDRESS:	5090 CATERPILLAR RD	PROJECT LOCATION:	
CITY:	REDDING	PROJECT NO.:	
STATE:	CA ZIP: 96003	PROJECT CONTACT:	ROBERT DEMARR
PHONE NO.:	(530) 244-5227	PHONE NO.:	(530) 244-5262 X104
FAX NO.:	(530) 244-4109	FAX NO.:	(530) 244-4109

SAMPLED BY: _____ SAMPLES PRESERVED: ☐ YES ☐ NO
DATE SAMPLED: _____ TIME: _____ RECEIVED COLD: ☐ YES ☐ NO

SAMPLE NO	SAMPLE DESCRIPTION / TYPE OF WORK	TIME ON / TIME OFF	TOTAL TIME	FLOW RATES START	STOP	AVG.	PCM (Air)	PLM (Bulk)	Lead (Wipes, Air, Paint, Soil)	TEM (~~Air~~, Bulk) WATER	SEM	Drinking Water Asbestos*/Lead	Waste Water TEM/Lead		COMMENTS/ SOCIAL SECURITY #
	INFLUENT	: :								X					D9277-001
	EFFLUENT	: :								X					↓ -002
		: :													
		: :													
		: :													
		: :													
		: :													
		: :													
		: :													
		: :													
		: :													

TRANSACTIONS		DATE	TIME	COMMENTS/DRAWING
RELINQUISHED BY (SIGNATURE) Christine E Sutton 12/30/02 1600	ACCEPTED BY (SIGNATURE)	12/30/02	10:00	Net 30 Days.
RELINQUISHED BY (SIGNATURE)	ACCEPTED BY (SIGNATURE)			Check # _____
				Credit Card # _____

*TEM asbestos in water analysis requires 2 one-liter bottles shipped @ 4°C in dark containers for each sample.

PCM - NIOSH 7400
PLM - 40 CFR - Chap. 1, Part 763, Subpart F Appendix A or current EPA method 600R-93/116
TEM - AHERA or Yamate Level II

LEAD - USEPA 7420
- AIR NIOSH 7082
- Soil EPA 7000/7420
- Wipes NIOSH 9100
- Water AIHA (method 3113B) EPA 200.9)

WHITE – LABORATORY YELLOW – TEST RESULTS PINK – CUSTOMER

10

To: MACS/SANTA CLARA
Date Due: 15-JAN-03 (Wednesday)

Batch: D9277
QA Level: 2
Batch Comments: None

Test Description	Reporting List ID	Method	Quick Turn Around Req Days Date
Sample: D9277001 FS Matrix: Water	Sample Comments: None		
Collected: 26-DEC-02 02:00 pm	Client Sample ID: INFLUENT	Client Sample Description: None	
Asbestos (Method TEM)	NULL	EPA600/M4/82-020	N
Sample: D9277002 FS Matrix: Water	Sample Comments: None		
Collected: 26-DEC-02 03:00 pm	Client Sample ID: EFFLUENT	Client Sample Description: None	
Asbestos (Method TEM)	NULL	EPA600/M4/82-020	N

11

Key: FS = Field Sample

Relinquished by (Date/Time): Christine E Sutton 12/30/02 1600

Received by (Date/Time): _____

Airbill Number: _____

Send Report to: No 'REPORT' Address information was found for ACCOUNT: 'SUBCONTRACT LABS' and PROJECT: 'LRD'.

Distribute SR to:	Sam	Rolando	Alex	Karen	Jane	DL6	DL7	DL8
	X	X	X					

Service Request #: E2200584

RUSH: ☐

Project Chemist: Xiangqiu Liang
Sample Recipient: Rolando Diaz
Customer Name: CAS-Redding
Date Received: 12/31/02 Time Received: 10:00
Customer Phone: 530-244-5227
Date Required: 1/21/03
Project Name: Subcontracted Dioxins
Internal Due Date: 1/21/03
Project Number: D0209277
Report To: Robert DeMarr
Reviewed by: *Jane Freemyer* JF 1/3/3
Fax Number: 530-244-4109

Tier: I EDD (y/n): n ARF (y/n): n TAT: 21 days Other:

Chain of Custody: Yes: X No:

Samples Stored:
A 2 X C
4 E

Comments:

Bottles Received			
1-L Amber	4	White plastic	
500 Amber		Red plastic	
16 oz glass		Yellow plastic	
9 oz glass		Green plastic	
4 oz glass		500 ml Poly	
2 oz glass		Brass Sleeves	
VOA soil			
VOA vial sets			

1 1613 PCDD/PCDF	9	17
2 Archive	10	18
3	11	19
4	12	20
5	13	21
6	14	22
7	15	23
8	16	24

Hazardous Samples
None
Some (Circle Lab Code)
All
Intended Disposal Date: __/__/__
Approval from Client:

Sample ID	Lab Code	Test(s) Required	Time Collected	Date Collected	Holding Time	Matrix
Influent	E2200584-001A	1	02:00	12/26/2002	30 DAYS	WATER
Influent	E2200584-001B	2	02:00	12/26/2002	30 DAYS	WATER
Effluent	E2200584-002A	1	03:00	12/26/2002	30 DAYS	WATER
Effluent	E2200584-002B	2	03:00	12/26/2002	30 DAYS	WATER

Columbia Analytical Services, Inc.
Cooler Receipt and Preservation From

Client: CAS Redding Work order: E2200584
Project: Subcontracted Dioxins/D0209277
Cooler received on: 12/31/02 and opened on 12/31/02 by Rolando Diaz

		Yes	No	N/A
1	Were custody seals on outside of cooler?	☒	☐	☐
	If yes, how many and where?	One outside cooler.		
	Were signature and date correct?	☒	☐	☐
2	Were custody papers properly filled out (ink, signed, etc....)?	☒	☐	☐
3	Did all bottles arrive in good condition (unbroken, etc....)?	☒	☐	☐
4	Were all bottle labels correct (analysis, preservation, etc....)?	☒	☐	☐
5	Did all bottle labels and tags agree with custody papers?	☒	☐	☐
6	Were correct bottles used for test indicated?	☒	☐	☐
7	Were VOA vials checked for absence of air bubbles, and noted?	☐	☐	☒
8	Temperature of cooler upon receipt	5 Degrees C		

Explain any discrepancies:

		Yes	No
pH	Reagent		
12	NaOH	x	
2	HNO_3	x	
2	H_2SO_4	x	

Yes = all samples OK
No = Samples were preserved at lab as listed

Comments:

Sample I.D.	Reagent	Vol.
Influent		
Effluent		

No	Project ID	Lab ID	Client ID	Sample Size	Tare Vial	Tare & Wet Sample	Tare & Dry Sample	Calculated Percent Solid	Calculated Percent Moisture	pH	Sample Description
MB		EB13027-MB	Method Blank	1000							
LCS		EB13027-LCS	Lab Control Spike	1000							
LCD		EB13027-LCSD	Lab Control Spike Dup	1000							
1	E2200583	E2200583-001A	Influent	990						6	Yellow opaque liquid.
2	E2200583	E2200583-002A	Effluent	1020						6	Yellow opaque liquid.
3	E2200584	E2200584-001A	Influent	1010						6	Yellow opaque liquid.
4	E2200584	E2200584-002A	Effluent	1050						6	Yellow opaque liquid.
5	E2300001	E2300001-001	A Line Bleach Plant	1000						5	Yellow opaque liquid.
6	E2300001	E2300001-002	B Line Bleach Plant	990						6	Tan opaque liquid.
7	E2300002	E2300002-001	Bleach Plant	1050						4	Yellow opaque liquid..
8	E2300002	E2300002-002	Final Effluent	1050						7	Amber clear liquid.
9	E2300003	E2300003-002	025735-01	1020						6	Amber opaque liquid.
10	E2300003	E2300003-003	025735-01	1020						7	Dark amber opaque liquid.
11	E2300004	E2300004-001A	MW-9-W	1000						7	Light grey slightly opaque liquid.
12											
13											
14											
15											
16											
17											
18											
19											
20											
21											
22											
23											
24											

SODIUM SULFATE S1-6-5
ACETONE C1-36-3
HPLC WATER C1-35-3
TOLUENE C1-51-3
GLASS WOOL GW1-1-2
METHYLENE CHLORIDE C1-51-2
ETHYL ACETATE C1-42-1
NONANE C1-49-4
HEXANE C1-49-5

SAND C1-33-1
TRIDECANE C1-49-3
SULFURIC ACID C1-50-4
BASIC SILICA GEL SG1-13-3
CARBON : CC1-51-1
ACIDIC SILICA GEL SG1-13-2
SILICA GEL SG1-50-4
BASIC SILICA GEL SG1-13-3
SODIUM CHLORIDE C1-50-2

Standard:	Internal	Matrix
Solution ID:	D6-5-5	D5-94-5
Volume:	1000 ul	100 ul
Spiker:	RD	RD
Witness:	CID	CID
Date:	1/6/2003	1/6/2003
Standard:	Cleanup	Recovery
Solution ID:	D6-5-4	D6-87-1
Volume:	100 ul	100 ul
Spiker:	RD	RD
Witness:	CID	CID
Date:	1/7/2003	

EXTRACTION START: 1/6/03
EXTRACTION STOP: 1/6/03
EXTRACTION METHOD (1): Sep Funnel
TIME STARTED: 11:00
TIME FINISHED: 15:00
EXTRACTS RECEIVED BY YC
DATE RECEIVED 1/8/03

Columbia Analytical Services, INC.

EB13027 **1613**

Sulfuric Acid Cleanup: 1/7/03
Silica Gel/Carbon Cleanup: 1/7/03

DIOXIN GC/MS RUN LOG

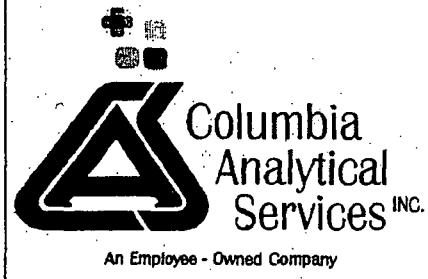
CAS HOUSTON 10655 Richmond Avenue, Suite 130-A Houston, TX 77042

Columbia Analytical Services inc.
An Employee Owned Company

Acq Method: 1613 Result File: C1097R2RES Archive Tape: _____
GC Method: 1613 EDD File: _____ Instrument ID: VG 70C

Date	Time	File	CAS ID	Client ID	Batch #	Analyst	Comments	RE
1/8/03	9:31	C1097#1	HRMSCheck					
	9:35	C1097#2#1	Window Define	D4-90-2				
	10:25	C1097#2#2	Ccal CS3	D4-96-2				
	11:14	C1097#2#3	EB13027-LCS	Lab Spk	EB13027			
	12:82	C1097#3#1	EB13027-MB	Method Blank				
	13:42	C1097#3#2	E220583-001A	Influent				
	14:31	C1097#3#3	E220583-002A	Effluent				
	15:21	C1097#3#4	E220584-001A	Influent				
	16:10	C1097#3#5	E220584-002A	Effluent				
	17:00	C1097#3#6	E23004-001A	MW-9-W				
	17:49	C1097#3#7	EB13027-LCD	Lab Spk Dup				
	18:39	C1097#3#8	Ccal CS3	D4-96-2				
		~~C1097#3#9~~	VC 1/8/03					
	19:29	C1097#4#1	HRMSAPQL					

Reviewed by: CDR



Analytical Report

10655 Richmond Avenue, Suite 130-A, Houston, TX 77042
Phone (713)266-1599 Fax (713)266-0130
www.caslab.com

Form 1

PCDD/PCDF ANALYSIS DATA SHEET
Use for Sample and Blank Results

CLIENT ID.
METHOD BLANK

Lab Name: Columbia Analytical Services Contract: SDG No:

Lab Code: CAS Method:1613 Case No: Client No: Lab ID: EB13027-MB

Client Name: Sample Wt/Vol: 1000 g or mL: mL

Matrix (Solid/Aqueous/Waste/Ash): Aqueous Initial Calibration Date: 03/07/02

Sample Receipt Date: Instrument ID: 70S

Ext. Date: 01/06/03 GC Column:DB-5

Ext. Vol(ul):20.0 Inj. Vol(ul):1.0 Sample Data Filename: C10973#1

Analysis Date: 8-JAN-03 Time: 12:52:54 Blank Data Filename: C10973#1

Dilution Factor: 1 Cal. Ver. Data Filename: C0972#2

Concentration Units (pg/L or ng/Kg dry weight): pg/L % Solids/Lipids:

ANALYTE	CONCENTRATION FOUND	DETECTION LIMIT	Qual. (1)	ION ABUND. RATIO (2)	RRT (2)	MEAN RRF
2,3,7,8-TCDD	*	2.299	U	*	*	1.04
1,2,3,7,8-PeCDD	*	2.802	U	*	*	1.12
1,2,3,4,7,8-HxCDD	*	3.036	U	*	*	1.17
1,2,3,6,7,8-HxCDD	*	3.356	U	*	*	1.01
1,2,3,7,8,9-HxCDD	*	3.124	U	*	*	1.11
1,2,3,4,6,7,8-HpCDD	*	2.973	U	*	*	1.03
OCDD	*	4.607	U	*	*	1.08
2,3,7,8-TCDF	*	3.211	U	*	*	1.05
1,2,3,7,8-PeCDF	*	2.188	U	*	*	1.03
2,3,4,7,8-PeCDF	*	1.970	U	*	*	1.12
1,2,3,4,7,8-HxCDF	*	1.510	U	*	*	1.39
1,2,3,6,7,8-HxCDF	*	1.552	U	*	*	1.34
1,2,3,7,8,9-HxCDF	*	2.012	U	*	*	1.43
2,3,4,6,7,8-HxCDF	*	1.749	U	*	*	1.28
1,2,3,4,6,7,8-HpCDF	*	2.414	U	*	*	1.44
1,2,3,4,7,8,9-HpCDF	*	3.506	U	*	*	1.34
OCDF	*	4.858	U	*	*	1.37
Total Tetra-Dioxins	*	2.299	U			
Total Penta-Dioxins	*	2.802	U			
Total Hexa-Dioxins	*	3.356	U			
Total Hepta-Dioxins	*	2.973	U			
Total Tetra-Furans	*	3.211	U			
Total Penta-Furans	*	1.970	U			
Total Hexa-Furans	*	1.552	U			
Total Hepta-Furans	*	2.414	U			

(1) Qualifier U indicates not detected; The K indicates EMPC. The C needs value from second column analysis. The B indicates possible blank contamination.
(2) RRTs and ion ratios are specified in Tables 2 and 9, Method 1613.

USEPA, EAD

FORM 2: PCDD/PCDF LABELED COMPOUND AND CLEANUP STANDARD RECOVERIES

CLIENT ID.
METHOD BLANK

Lab Name: Columbia Analytical Services Contract: SDG No:

Lab Code: CAS Method:1613 Case No: Client No: Lab ID:EB13027-MB

Client Name: Sample Wt/Vol: 1000 g or mL: mL

Matrix (Solid/Aqueous/Waste/Ash): Aqueous Initial Calibration Date: 03/07/02

Sample Receipt Date: Instrument ID: 70S

Ext. Date: 01/06/03 GC Column ID: DB-5

Analysis Date: 8-JAN-03 Time: 12:52:54 Sample Data Filename: C10973#1

Ext. Vol(uL): 20.0 Inj. Vol(uL): 1.0 Blank Data Filename: C10973#1

Dilution Factor: 1 Cal. Ver. Data Filename: C0972#2

Concentration Units (pg/L or ng/Kg dry weight): pg/L % Solid/Lipids:

	SPIKE CONC.	CONC. FOUND	R(%) (1)	QC Limite(1)	ION ABUND. RATIO (2)	RRT (2)
LABELED COMPOUNDS						
13C-2,3,7,8-TCDD	4000	3060.07	76.50	25-164	0.79	1.011
13C-1,2,3,7,8-PeCDD	4000	2798.94	69.97	25-181	1.53	1.204
13C-1,2,3,4,7,8-HxCDD	4000	2996.64	74.92	32-141	1.22	0.989
13C-1,2,3,6,7,8-HxCDD	4000	3080.17	77.00	28-130	1.21	0.991
13C-1,2,3,4,6,7,8-HpCDD	4000	2991.16	74.78	23-140	1.03	1.077
13C-OCDD	8000	5695.85	71.20	17-157	0.89	1.167
13C-2,3,7,8-TCDF	4000	2324.97	58.12	24-169	0.78	0.975
13C-1,2,3,7,8-PeCDF	4000	2371.12	59.28	24-185	1.53	1.158
13C-2,3,4,7,8-PeCDF	4000	2340.74	58.52	21-178	1.53	1.189
13C-1,2,3,4,7,8-HxCDF	4000	2841.55	71.04	26-152	0.54	0.967
13C-1,2,3,6,7,8-HxCDF	4000	2733.36	68.33	26-123	0.49	0.970
13C-1,2,3,7,8,9-HxCDF	4000	3093.20	77.33	29-147	0.52	1.006
13C-2,3,4,6,7,8-HxCDF	4000	2670.36	66.76	28-136	0.53	0.985
13C-1,2,3,4,6,7,8-HpCDF	4000	2698.64	67.47	28-143	0.44	1.051
13C-1,2,3,4,7,8,9-HpCDF	4000	2994.47	74.86	26-138	0.43	1.090
CLEANUP STANDARD						
37Cl-2,3,7,8-TCDD	800	831.77	103.97	35-197		1.011

(1) Contract-required limits for percent recovery (R) are specified in Table 7, Method 1613.
(2) Contract-required limits for RRTs and ion abundance ratios are specified in Tables 2 and 9, respectively, Method 1613. NOTE: There is no ion abundance ratio for 37C14-2378-TCDD (cleanup standard).

RFP C500273T1

Form 1

PCDD/PCDF ANALYSIS DATA SHEET
Use for Sample and Blank Results

CLIENT ID.
INFLUENT

Lab Name: Columbia Analytical Services Contract: SDG No:

Lab Code: CAS Method:1613 Case No: Client No: Lab ID: E2200584-001A

Client Name: MACS LAB Sample Wt/Vol: 1010 g or mL: mL

Matrix (Solid/Aqueous/Waste/Ash): Aqueous Initial Calibration Date: 03/07/02

Sample Receipt Date: 12/31/02 Instrument ID: 70S

Ext. Date: 01/06/03 GC Column:DB-5

Ext. Vol(ul):20.0 Inj. Vol(ul):1.0 Sample Data Filename: C10973#4

Analysis Date: 8-JAN-03 Time: 15:21:14 Blank Data Filename: C10973#1

Dilution Factor: 1 Cal. Ver. Data Filename: C10972#2

Concentration Units (pg/L or ng/Kg dry weight): pg/L % Solids/Lipids:

ANALYTE	CONCENTRATION FOUND	DETECTION LIMIT	Qual. (1)	ION ABUND. RATIO (2)	RRT (2)	MEAN RRF
2,3,7,8-TCDD	*	1.662	U	*	*	1.04
1,2,3,7,8-PeCDD	*	1.993	U	*	*	1.12
1,2,3,4,7,8-HxCDD	*	1.652	U	*	*	1.17
1,2,3,6,7,8-HxCDD	*	1.999	U	*	*	1.01
1,2,3,7,8,9-HxCDD	*	1.784	U	*	*	1.11
1,2,3,4,6,7,8-HpCDD	*	2.540	U	*	*	1.03
OCDD	9.571	3.980	J	0.76	1.000	1.08
2,3,7,8-TCDF	*	2.306	U	*	*	1.05
1,2,3,7,8-PeCDF	*	1.160	U	*	*	1.03
2,3,4,7,8-PeCDF	*	1.005	U	*	*	1.12
1,2,3,4,7,8-HxCDF	*	1.094	U	*	*	1.39
1,2,3,6,7,8-HxCDF	*	1.088	U	*	*	1.34
1,2,3,7,8,9-HxCDF	*	1.334	U	*	*	1.43
2,3,4,6,7,8-HxCDF	*	1.148	U	*	*	1.28
1,2,3,4,6,7,8-HpCDF	*	1.635	U	*	*	1.44
1,2,3,4,7,8,9-HpCDF	*	2.347	U	*	*	1.34
OCDF	*	4.359	U	*	*	1.37
Total Tetra-Dioxins	*	1.662	U			
Total Penta-Dioxins	*	1.993	U			
Total Hexa-Dioxins	*	1.999	U			
Total Hepta-Dioxins	*	2.540	U			
Total Tetra-Furans	*	2.306	U			
Total Penta-Furans	*	1.005	U			
Total Hexa-Furans	*	1.088	U			
Total Hepta-Furans	*	1.635	U			

(1) Qualifier U indicates not detected; The K indicates EMPC. The C needs value from second column analysis. The B indicates possible blank contamination.
(2) RRTs and ion ratios are specified in Tables 2 and 9, Method 1613.

USEPA, EAD

FORM 2: PCDD/PCDF LABELED COMPOUND AND CLEANUP STANDARD RECOVERIES

CLIENT ID.
INFLUENT

Lab Name: Columbia Analytical Services Contract: SDG No:

Lab Code: CAS Method:1613 Case No: Client No: Lab ID:E2200584-001A

Client Name: MACS LAB Sample Wt/Vol: 1010 g or mL: mL

Matrix (Solid/Aqueous/Waste/Ash): Aqueous Initial Calibration Date: 03/07/02

Sample Receipt Date: 12/31/02 Instrument ID: 70S

Ext. Date: 01/06/03 GC Column ID: DB-5

Analysis Date: 8-JAN-03 Time: 15:21:14 Sample Data Filename: C10973#4

Ext. Vol(uL): 20.0 Inj. Vol(uL): 1.0 Blank Data Filename: C10973#1

Dilution Factor: 1 Cal. Ver. Data Filename: C10972#2

Concentration Units (pg/L or ng/Kg dry weight): pg/L % Solid/Lipids:

	SPIKE CONC.	CONC. FOUND	R(%) (1)	QC Limite(1)	ION ABUND. RATIO (2)	RRT (2)
LABELED COMPOUNDS						
13C-2,3,7,8-TCDD	4000	3058.45	76.46	25-164	0.77	1.010
13C-1,2,3,7,8-PeCDD	4000	2866.82	71.67	25-181	1.55	1.203
13C-1,2,3,4,7,8-HxCDD	4000	3137.66	78.44	32-141	1.23	0.989
13C-1,2,3,6,7,8-HxCDD	4000	2830.52	70.76	28-130	1.23	0.991
13C-1,2,3,4,6,7,8-HpCDD	4000	2917.52	72.94	23-140	1.03	1.078
13C-OCDD	8000	5180.34	64.75	17-157	0.88	1.167
13C-2,3,7,8-TCDF	4000	2298.79	57.47	24-169	0.76	0.974
13C-1,2,3,7,8-PeCDF	4000	2361.23	59.03	24-185	1.52	1.157
13C-2,3,4,7,8-PeCDF	4000	2356.68	58.92	21-178	1.52	1.189
13C-1,2,3,4,7,8-HxCDF	4000	2787.40	69.68	26-152	0.51	0.968
13C-1,2,3,6,7,8-HxCDF	4000	2733.87	68.35	26-123	0.51	0.970
13C-1,2,3,7,8,9-HxCDF	4000	3275.52	81.89	29-147	0.51	1.006
13C-2,3,4,6,7,8-HxCDF	4000	2817.50	70.44	28-136	0.52	0.986
13C-1,2,3,4,6,7,8-HpCDF	4000	2633.39	65.83	28-143	0.44	1.051
13C-1,2,3,4,7,8,9-HpCDF	4000	2901.19	72.53	26-138	0.44	1.090
CLEANUP STANDARD						
37Cl-2,3,7,8-TCDD	800	759.41	94.93	35-197		1.011

(1) Contract-required limits for percent recovery (R) are specified in Table 7, Method 1613.
(2) Contract-required limits for RRTs and ion abundance ratios are specified in Tables 2 and 9, respectively, Method 1613. NOTE: There is no ion abundance ratio for 37C14-2378-TCDD (cleanup standard).

RFP C500273T1

Form 3

PCDD/PCDF TOXICITY EQUIVALENCE SUMMARY
Use for Sample and Blank Results

CLIENT ID.
INFLUENT

Lab Name: Columbia Analytical Services Contract: SDG No:

Lab Code: CAS Method:1613 Case No: Client No: Lab ID: E2200584-001A

Client Name: MACS LAB Sample Wt/Vol: 1010 g or mL: mL

Matrix (Solid/Aqueous/Waste/Ash): Aqueous Initial Calibration Date: 03/07/02

Sample Receipt Date: 12/31/02 Instrument ID: 70S

Ext. Date: 01/06/03 GC Column ID: DB-5

Ext. Vol(ul):20.0 Inj. Vol(ul):1.0 Sample Data Filename: C10973#4

Analysis Date: 8-JAN-03 Time: 15:21:14 Blank Data Filename: C10973#1

Dilution Factor: 1 Cal. Ver. Data Filename: C10972#2

Concentration Units (pg/L or ng/Kg dry weight): pg/L % Solids/Lipids:

	CONCENTRATION	TEF(1)	TEF-ADJUSTED CONCENTRATION
2,3,7,8-TCDD	*	X 1.0	*
1,2,3,7,8-PeCDD	*	X 0.5	*
1,2,3,4,7,8-HxCDD	*	X 0.1	*
1,2,3,6,7,8-HxCDD	*	X 0.1	*
1,2,3,7,8,9-HxCDD	*	X 0.1	*
1,2,3,4,6,7,8-HpCDD	*	X 0.01	*
OCDD	9.57	X 0.001	9.57e-03
2,3,7,8-TCDF	*	X 0.1	*
1,2,3,7,8-PeCDF	*	X 0.05	*
2,3,4,7,8-PeCDF	*	X 0.5	*
1,2,3,4,7,8-HxCDF	*	X 0.1	*
1,2,3,6,7,8-HxCDF	*	X 0.1	*
1,2,3,7,8,9-HxCDF	*	X 0.1	*
2,3,4,6,7,8-HxCDF	*	X 0.1	*
1,2,3,4,6,7,8-HpCDF	*	X 0.01	*
1,2,3,4,7,8,9-HpCDF	*	X 0.01	*
OCDF	*	X 0.001	*

Total: 9.571e-03

(1) Taken from 'Interim Procudures for Estimating Risks Associated with Exposures to Mixtures of Chlorinated Dibenzo-p-Dioxin and -Dibenzofurans (CDDs and CDFs) and 1989 Udate(EPA/625/3-89/016, March 1989.)

Form 1

PCDD/PCDF ANALYSIS DATA SHEET
Use for Sample and Blank Results

CLIENT ID.
EFFLUENT

Lab Name: Columbia Analytical Services Contract: SDG No:

Lab Code: CAS Method:1613 Case No: Client No: Lab ID: E2200584-002A

Client Name: MACS LAB Sample Wt/Vol: 1050 g or mL: mL

Matrix (Solid/Aqueous/Waste/Ash): Aqueous Initial Calibration Date: 03/07/02

Sample Receipt Date: 12/31/02 Instrument ID: 70S

Ext. Date: 01/06/03 GC Column:DB-5

Ext. Vol(ul):20.0 Inj. Vol(ul):1.0 Sample Data Filename: C10973#5

Analysis Date: 8-JAN-03 Time: 16:10:41 Blank Data Filename: C10973#1

Dilution Factor: 1 Cal. Ver. Data Filename: C10972#2

Concentration Units (pg/L or ng/Kg dry weight): pg/L % Solids/Lipids:

ANALYTE	CONCENTRATION FOUND	DETECTION LIMIT	Qual. (1)	ION ABUND. RATIO (2)	RRT (2)	MEAN RRF
2,3,7,8-TCDD	*	1.875	U	*	*	1.04
1,2,3,7,8-PeCDD	*	2.055	U	*	*	1.12
1,2,3,4,7,8-HxCDD	*	2.359	U	*	*	1.17
1,2,3,6,7,8-HxCDD	*	2.656	U	*	*	1.01
1,2,3,7,8,9-HxCDD	*	2.453	U	*	*	1.11
1,2,3,4,6,7,8-HpCDD	2.335	2.228	JK	1.48	1.000	1.03
OCDD	30.201	4.163	J	0.80	1.000	1.08
2,3,7,8-TCDF	*	1.776	U	*	*	1.05
1,2,3,7,8-PeCDF	*	1.221	U	*	*	1.03
2,3,4,7,8-PeCDF	*	1.039	U	*	*	1.12
1,2,3,4,7,8-HxCDF	*	1.107	U	*	*	1.39
1,2,3,6,7,8-HxCDF	*	1.129	U	*	*	1.34
1,2,3,7,8,9-HxCDF	*	1.364	U	*	*	1.43
2,3,4,6,7,8-HxCDF	*	1.161	U	*	*	1.28
1,2,3,4,6,7,8-HpCDF	*	1.651	U	*	*	1.44
1,2,3,4,7,8,9-HpCDF	*	2.377	U	*	*	1.34
OCDF	*	5.745	U	*	*	1.37
Total Tetra-Dioxins	*	1.875	U			
Total Penta-Dioxins	*	2.055	U			
Total Hexa-Dioxins	*	2.656	U			
Total Hepta-Dioxins	3.100	2.228				
Total Tetra-Furans	*	1.776	U			
Total Penta-Furans	*	1.039	U			
Total Hexa-Furans	*	1.129	U			
Total Hepta-Furans	*	1.651	U			

(1) Qualifier U indicates not detected; The K indicates EMPC. The C needs value from second column analysis. The B indicates possible blank contamination.
(2) RRTs and ion ratios are specified in Tables 2 and 9, Method 1613.

USEPA, EAD

FORM 2: PCDD/PCDF LABELED COMPOUND AND CLEANUP STANDARD RECOVERIES

CLIENT ID.
EFFLUENT

Lab Name: Columbia Analytical Services Contract: SDG No:

Lab Code: CAS Method:1613 Case No: Client No: Lab ID:E2200584-002A

Client Name: MACS LAB Sample Wt/Vol: 1050 g or mL: mL

Matrix (Solid/Aqueous/Waste/Ash): Aqueous Initial Calibration Date: 03/07/02

Sample Receipt Date: 12/31/02 Instrument ID: 70S

Ext. Date: 01/06/03 GC Column ID: DB-5

Analysis Date: 8-JAN-03 Time: 16:10:41 Sample Data Filename: C10973#5

Ext. Vol(uL): 20.0 Inj. Vol(uL): 1.0 Blank Data Filename: C10973#1

Dilution Factor: 1 Cal. Ver. Data Filename: C10972#2

Concentration Units (pg/L or ng/Kg dry weight): pg/L % Solid/Lipids:

LABELED COMPOUNDS	SPIKE CONC.	CONC. FOUND	R(%) (1)	QC Limite(1)	ION ABUND. RATIO (2)	RRT (2)
13C-2,3,7,8-TCDD	4000	2615.36	65.38	25-164	0.77	1.010
13C-1,2,3,7,8-PeCDD	4000	2323.54	58.09	25-181	1.55	1.203
13C-1,2,3,4,7,8-HxCDD	4000	2603.41	65.09	32-141	1.24	0.989
13C-1,2,3,6,7,8-HxCDD	4000	2551.25	63.78	28-130	1.23	0.991
13C-1,2,3,4,6,7,8-HpCDD	4000	2445.15	61.13	23-140	1.02	1.078
13C-OCDD	8000	4111.52	51.39	17-157	0.89	1.167
13C-2,3,7,8-TCDF	4000	1961.87	49.05	24-169	0.78	0.975
13C-1,2,3,7,8-PeCDF	4000	1963.49	49.09	24-185	1.52	1.158
13C-2,3,4,7,8-PeCDF	4000	1981.54	49.54	21-178	1.53	1.189
13C-1,2,3,4,7,8-HxCDF	4000	2406.39	60.16	26-152	0.51	0.968
13C-1,2,3,6,7,8-HxCDF	4000	2311.34	57.78	26-123	0.52	0.970
13C-1,2,3,7,8,9-HxCDF	4000	2745.54	68.64	29-147	0.51	1.007
13C-2,3,4,6,7,8-HxCDF	4000	2382.63	59.57	28-136	0.52	0.986
13C-1,2,3,4,6,7,8-HpCDF	4000	2204.96	55.12	28-143	0.45	1.051
13C-1,2,3,4,7,8,9-HpCDF	4000	2446.34	61.16	26-138	0.43	1.090
CLEANUP STANDARD						
37Cl-2,3,7,8-TCDD	800	705.06	88.13	35-197		1.011

(1) Contract-required limits for percent recovery (R) are specified in Table 7, Method 1613.
(2) Contract-required limits for RRTs and ion abundance ratios are specified in Tables 2 and 9, respectively, Method 1613. NOTE: There is no ion abundance ratio for 37C14-2378-TCDD (cleanup standard).

RFP C500273T1

Form 3

PCDD/PCDF TOXICITY EQUIVALENCE SUMMARY
Use for Sample and Blank Results

CLIENT ID.
EFFLUENT

Lab Name: Columbia Analytical Services Contract: SDG No:

Lab Code: CAS Method:1613 Case No: Client No: Lab ID: E2200584-002A

Client Name: MACS LAB Sample Wt/Vol: 1050 g or mL: mL

Matrix (Solid/Aqueous/Waste/Ash): Aqueous Initial Calibration Date: 03/07/02

Sample Receipt Date: 12/31/02 Instrument ID: 70S

Ext. Date: 01/06/03 GC Column ID: DB-5

Ext. Vol(ul):20.0 Inj. Vol(ul):1.0 Sample Data Filename: C10973#5

Analysis Date: 8-JAN-03 Time: 16:10:41 Blank Data Filename: C10973#1

Dilution Factor: 1 Cal. Ver. Data Filename: C10972#2

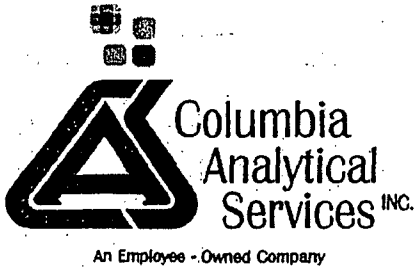
Concentration Units (pg/L or ng/Kg dry weight): pg/L % Solids/Lipids:

	CONCENTRATION	TEF(1)	TEF-ADJUSTED CONCENTRATION
2,3,7,8-TCDD	*	X 1.0	*
1,2,3,7,8-PeCDD	*	X 0.5	*
1,2,3,4,7,8-HxCDD	*	X 0.1	*
1,2,3,6,7,8-HxCDD	*	X 0.1	*
1,2,3,7,8,9-HxCDD	*	X 0.1	*
1,2,3,4,6,7,8-HpCDD	2.34	X 0.01	2.34e-02
OCDD	30.20	X 0.001	3.02e-02
2,3,7,8-TCDF	*	X 0.1	*
1,2,3,7,8-PeCDF	*	X 0.05	*
2,3,4,7,8-PeCDF	*	X 0.5	*
1,2,3,4,7,8-HxCDF	*	X 0.1	*
1,2,3,6,7,8-HxCDF	*	X 0.1	*
1,2,3,7,8,9-HxCDF	*	X 0.1	*
2,3,4,6,7,8-HxCDF	*	X 0.1	*
1,2,3,4,6,7,8-HpCDF	*	X 0.01	*
1,2,3,4,7,8,9-HpCDF	*	X 0.01	*
OCDF	*	X 0.001	*

Total: 5.355e-02

(1) Taken from 'Interim Procudures for Estimating Risks Associated with Exposures to Mixtures of Chlorinated Dibenzo-p-Dioxin and -Dibenzofurans (CDDs and CDFs) and 1989 Udate(EPA/625/3-89/016, March 1989.)

6/90



Accuracy & Precision Data

10655 Richmond Avenue, Suite 130-A, Houston, TX 77042
Phone (713)266-1599 Fax (713)266-0130
www.caslab.com

3DFA

PCDD/PCDF SPIKED SAMPLE SUMMARY

CLIENT ID: LCS&LCSD

Lab Name: COLUMBIA ANALYTICAL SERVICES

Lab Code: CAS LAB. ID: EB13027 SDG #:

Matrix: Aqueous (Solid/Aqueous/Waste/Ash)

CONCENTRATION UNITS: (pg/L or ng/Kg): pg/L

SampleVol: 1

ANALYTE	SPIKE ADDED (PG)	LCS SAMPLE CONC.	LCSD SAMPLE CONC.		LCS% RECOV. #	LCSD% RECOV. #	RPD %	QC LIMITS
2378-TCDD	200	207.717	197.353	0.000	103.9	98.7	5.12	70-130
12378-PeCDD	1000	1080.172	1072.722	0.000	108.0	107.3	0.69	70-130
123478-HxCDD	1000	1046.378	1056.187	0.000	104.6	105.6	0.93	70-130
123678-HxCDD	1000	1185.459	1181.264	0.000	118.5	118.1	0.35	70-130
123789-HxCDD	1000	1075.562	1096.926	0.000	107.6	109.7	1.97	70-130
1234678-HpCDD	1000	1064.292	1075.734	0.000	106.4	107.6	1.07	70-130
OCDD	2000	2306.220	2217.738	0.000	115.3	110.9	3.91	70-130
2378-TCDF	200	242.502	252.099	0.000	121.3	126.0	3.88	70-130
12378-PeCDF	1000	1177.544	1154.696	0.000	117.8	115.5	1.96	70-130
23478-PeCDF	1000	1055.887	1047.223	0.000	105.6	104.7	0.82	70-130
123478-HxCDF	1000	1072.258	1036.973	0.000	107.2	103.7	3.35	70-130
123678-HxCDF	1000	1029.854	1047.621	0.000	103.0	104.8	1.71	70-130
123789-HxCDF	1000	964.88	962.698	0.000	96.5	96.3	0.23	70-130
234678-HxCDF	1000	1062.635	1067.122	0.000	106.3	106.7	0.42	70-130
1234678-HpCDF	1000	1133.192	1120.005	0.000	113.3	112.0	1.17	70-130
1234789-HpCDF	1000	1185.304	1180.835	0.000	118.5	118.1	0.38	70-130
OCDF	2000	2558.724	2466.928	0.000	127.9	123.3	3.65	70-130

Form 1

PCDD/PCDF ANALYSIS DATA SHEET
Use for Sample and Blank Results

CLIENT ID.
LCS

Lab Name: Columbia Analytical Services Contract: SDG No:

Lab Code: CAS Method:1613 Case No: Client No: Lab ID: EB13027-LCS

Client Name: Sample Wt/Vol: 1000 g or mL: mL

Matrix (Solid/Aqueous/Waste/Ash): Aqueous Initial Calibration Date: 03/07/02

Sample Receipt Date: Instrument ID: 70S

Ext. Date: 01/06/03 GC Column:DB-5

Ext. Vol(ul):20.0 Inj. Vol(ul):1.0 Sample Data Filename: C10972#3

Analysis Date: 8-JAN-03 Time: 11:14:49 Blank Data Filename: C10973#1

Dilution Factor: 1 Cal. Ver. Data Filename: C10972#2

Concentration Units (pg/L or ng/Kg dry weight): pg/L % Solids/Lipids:

ANALYTE	CONCENTRATION FOUND	DETECTION LIMIT	Qual. (1)	ION ABUND. RATIO (2)	RRT (2)	MEAN RRF
2,3,7,8-TCDD	207.717	2.180		0.75	1.001	1.04
1,2,3,7,8-PeCDD	1080.172	2.096		1.59	1.001	1.12
1,2,3,4,7,8-HxCDD	1046.378	2.064		1.20	1.000	1.17
1,2,3,6,7,8-HxCDD	1185.459	2.258		1.23	1.000	1.01
1,2,3,7,8,9-HxCDD	1075.562	2.112		1.18	1.009	1.11
1,2,3,4,6,7,8-HpCDD	1064.292	2.535		1.09	1.000	1.03
OCDD	2267.558	3.853		0.88	1.000	1.08
2,3,7,8-TCDF	242.502	1.973		0.80	1.001	1.05
1,2,3,7,8-PeCDF	1177.544	2.031		1.56	1.001	1.03
2,3,4,7,8-PeCDF	1055.887	1.782		1.56	1.000	1.12
1,2,3,4,7,8-HxCDF	1072.258	1.553		1.24	1.000	1.39
1,2,3,6,7,8-HxCDF	1029.854	1.652		1.29	1.000	1.34
1,2,3,7,8,9-HxCDF	964.880	1.899		1.30	1.000	1.43
2,3,4,6,7,8-HxCDF	1062.635	1.633		1.27	1.000	1.28
1,2,3,4,6,7,8-HpCDF	1133.192	3.319		1.05	1.000	1.44
1,2,3,4,7,8,9-HpCDF	1185.304	4.719		1.05	1.000	1.34
OCDF	2558.724	5.173		0.89	1.004	1.37
Total Tetra-Dioxins	207.717	2.180				
Total Penta-Dioxins	1080.172	2.096				
Total Hexa-Dioxins	3307.399	2.258				
Total Hepta-Dioxins	1064.292	2.535				
Total Tetra-Furans	247.376	1.973				
Total Penta-Furans	2255.098	1.782				
Total Hexa-Furans	4129.628	1.652				
Total Hepta-Furans	2318.496	3.319				

(1) Qualifier U indicates not detected; The K indicates EMPC. The C needs value from second column analysis. The B indicates possible blank contamination.
(2) RRTs and ion ratios are specified in Tables 2 and 9, Method 1613.

USEPA, EAD

FORM 2: PCDD/PCDF LABELED COMPOUND AND CLEANUP STANDARD RECOVERIES

CLIENT ID.
LCS

Lab Name: Columbia Analytical Services Contract: SDG No:

Lab Code: CAS Method:1613 Case No: Client No: Lab ID:EB13027-LCS

Client Name: Sample Wt/Vol: 1000 g or mL: mL

Matrix (Solid/Aqueous/Waste/Ash): Aqueous Initial Calibration Date: 03/07/02

Sample Receipt Date: Instrument ID: 70S

Ext. Date: 01/06/03 GC Column ID: DB-5

Analysis Date: 8-JAN-03 Time: 11:14:49 Sample Data Filename: C10972#3

Ext. Vol(uL): 20.0 Inj. Vol(uL): 1.0 Blank Data Filename: C10973#1

Dilution Factor: 1 Cal. Ver. Data Filename: C10972#2

Concentration Units (pg/L or ng/Kg dry weight): pg/L % Solid/Lipids:

	SPIKE CONC.	CONC. FOUND	R(%) (1)	QC Limite(1)	ION ABUND. RATIO (2)	RRT (2)
LABELED COMPOUNDS						
13C-2,3,7,8-TCDD	4000	3359.61	83.99	25-164	0.78	1.011
13C-1,2,3,7,8-PeCDD	4000	2897.77	72.44	25-181	1.58	1.204
13C-1,2,3,4,7,8-HxCDD	4000	3350.53	83.76	32-141	1.22	0.989
13C-1,2,3,6,7,8-HxCDD	4000	3446.55	86.16	28-130	1.23	0.991
13C-1,2,3,4,6,7,8-HpCDD	4000	3413.11	85.33	23-140	1.03	1.078
13C-OCDD	8000	6124.98	76.56	17-157	0.89	1.167
13C-2,3,7,8-TCDF	4000	2705.76	67.64	24-169	0.79	0.975
13C-1,2,3,7,8-PeCDF	4000	2507.73	62.69	24-185	1.50	1.158
13C-2,3,4,7,8-PeCDF	4000	2551.53	63.79	21-178	1.53	1.189
13C-1,2,3,4,7,8-HxCDF	4000	3043.48	76.09	26-152	0.52	0.967
13C-1,2,3,6,7,8-HxCDF	4000	3013.41	75.34	26-123	0.53	0.970
13C-1,2,3,7,8,9-HxCDF	4000	3614.54	90.36	29-147	0.52	1.006
13C-2,3,4,6,7,8-HxCDF	4000	3136.16	78.40	28-136	0.52	0.985
13C-1,2,3,4,6,7,8-HpCDF	4000	3131.22	78.28	28-143	0.44	1.051
13C-1,2,3,4,7,8,9-HpCDF	4000	3498.35	87.46	26-138	0.43	1.090
CLEANUP STANDARD						
37Cl-2,3,7,8-TCDD	800	843.28	105.41	35-197		1.011

(1) Contract-required limits for percent recovery (R) are specified in Table 7, Method 1613.
(2) Contract-required limits for RRTs and ion abundance ratios are specified in Tables 2 and 9, respectively, Method 1613. NOTE: There is no ion abundance ratio for 37C14-2378-TCDD (cleanup standard).

RFP C500273T1

Form 1

PCDD/PCDF ANALYSIS DATA SHEET
Use for Sample and Blank Results

CLIENT ID.
LCSD

Lab Name: Columbia Analytical Services Contract: SDG No:

Lab Code: CAS Method:1613 Case No: Client No: Lab ID: EB13027-LCD

Client Name: Sample Wt/Vol: 1000 g or mL: mL

Matrix (Solid/Aqueous/Waste/Ash): Aqueous Initial Calibration Date: 03/07/02

Sample Receipt Date: Instrument ID: 70S

Ext. Date: 01/06/03 GC Column:DB-5

Ext. Vol(ul):20.0 Inj. Vol(ul):1.0 Sample Data Filename: C10973#7

Analysis Date: 8-JAN-03 Time: 17:49:35 Blank Data Filename: C10973#1

Dilution Factor: 1 Cal. Ver. Data Filename: C10972#2

Concentration Units (pg/L or ng/Kg dry weight): pg/L % Solids/Lipids:

ANALYTE	CONCENTRATION FOUND	DETECTION LIMIT	Qual. (1)	ION ABUND. RATIO (2)	RRT (2)	MEAN RRF
2,3,7,8-TCDD	197.353	1.533		0.74	1.001	1.04
1,2,3,7,8-PeCDD	1072.722	1.714		1.58	1.001	1.12
1,2,3,4,7,8-HxCDD	1056.187	1.545		1.22	1.000	1.17
1,2,3,6,7,8-HxCDD	1181.264	1.703		1.26	1.000	1.01
1,2,3,7,8,9-HxCDD	1096.926	1.587		1.24	1.009	1.11
1,2,3,4,6,7,8-HpCDD	1075.734	1.955		1.09	1.000	1.03
OCDD	2217.738	3.731		0.86	1.000	1.08
2,3,7,8-TCDF	252.099	1.726		0.80	1.000	1.05
1,2,3,7,8-PeCDF	1154.696	1.248		1.55	1.001	1.03
2,3,4,7,8-PeCDF	1047.223	1.102		1.58	1.001	1.12
1,2,3,4,7,8-HxCDF	1036.973	0.829		1.26	1.000	1.39
1,2,3,6,7,8-HxCDF	1047.621	0.860		1.27	1.000	1.34
1,2,3,7,8,9-HxCDF	962.698	1.016		1.27	1.000	1.43
2,3,4,6,7,8-HxCDF	1067.122	0.870		1.26	1.000	1.28
1,2,3,4,6,7,8-HpCDF	1120.005	3.039		1.06	1.000	1.44
1,2,3,4,7,8,9-HpCDF	1180.835	4.299		1.03	1.000	1.34
OCDF	2466.928	3.811		0.89	1.004	1.37
Total Tetra-Dioxins	197.353	1.533				
Total Penta-Dioxins	1072.722	1.714				
Total Hexa-Dioxins	3334.376	1.703				
Total Hepta-Dioxins	1075.734	1.955				
Total Tetra-Furans	252.099	1.726				
Total Penta-Furans	2201.920	1.102				
Total Hexa-Furans	4114.414	0.860				
Total Hepta-Furans	2300.840	3.039				

(1) Qualifier U indicates not detected; The K indicates EMPC. The C needs value from second column analysis. The B indicates possible blank contamination.
(2) RRTs and ion ratios are specified in Tables 2 and 9, Method 1613.

USEPA, EAD

FORM 2: PCDD/PCDF LABELED COMPOUND AND CLEANUP STANDARD RECOVERIES

CLIENT ID.

LCSD

Lab Name: Columbia Analytical Services Contract: SDG No:

Lab Code: CAS Method:1613 Case No: Client No: Lab ID:EB13027-LCD

Client Name: Sample Wt/Vol: 1000 g or mL: mL

Matrix (Solid/Aqueous/Waste/Ash): Aqueous Initial Calibration Date: 03/07/02

Sample Receipt Date: Instrument ID: 70S

Ext. Date: 01/06/03 GC Column ID: DB-5

Analysis Date: 8-JAN-03 Time: 17:49:35 Sample Data Filename: C10973#7

Ext. Vol(uL): 20.0 Inj. Vol(uL): 1.0 Blank Data Filename: C10973#1

Dilution Factor: 1 Cal. Ver. Data Filename: C10972#2

Concentration Units (pg/L or ng/Kg dry weight): pg/L % Solid/Lipids:

	SPIKE CONC.	CONC. FOUND	R(%) (1)	QC Limite(1)	ION ABUND. RATIO (2)	RRT (2)
LABELED COMPOUNDS						
13C-2,3,7,8-TCDD	4000	3317.86	82.95	25-164	0.80	1.010
13C-1,2,3,7,8-PeCDD	4000	2986.20	74.66	25-181	1.54	1.203
13C-1,2,3,4,7,8-HxCDD	4000	3297.75	82.44	32-141	1.21	0.989
13C-1,2,3,6,7,8-HxCDD	4000	3328.08	83.20	28-130	1.22	0.991
13C-1,2,3,4,6,7,8-HpCDD	4000	3062.66	76.57	23-140	1.03	1.078
13C-OCDD	8000	5140.39	64.25	17-157	0.88	1.167
13C-2,3,7,8-TCDF	4000	2460.90	61.52	24-169	0.79	0.975
13C-1,2,3,7,8-PeCDF	4000	2588.24	64.71	24-185	1.51	1.157
13C-2,3,4,7,8-PeCDF	4000	2593.87	64.85	21-178	1.51	1.188
13C-1,2,3,4,7,8-HxCDF	4000	3069.00	76.72	26-152	0.53	0.968
13C-1,2,3,6,7,8-HxCDF	4000	2857.66	71.44	26-123	0.50	0.970
13C-1,2,3,7,8,9-HxCDF	4000	3552.32	88.81	29-147	0.51	1.006
13C-2,3,4,6,7,8-HxCDF	4000	3115.99	77.90	28-136	0.51	0.985
13C-1,2,3,4,6,7,8-HpCDF	4000	2851.11	71.28	28-143	0.44	1.051
13C-1,2,3,4,7,8,9-HpCDF	4000	3092.73	77.32	26-138	0.44	1.090
CLEANUP STANDARD						
37Cl-2,3,7,8-TCDD	800	808.80	101.10	35-197		1.011

(1) Contract-required limits for percent recovery (R) are specified in Table 7, Method 1613.

(2) Contract-required limits for RRTs and ion abundance ratios are specified in Tables 2 and 9, respectively, Method 1613. NOTE: There is no ion abundance ratio for 37Cl4-2378-TCDD (cleanup standard).

RFP C500273T1