RBICF

Columbia Analytical Services INC.

RBI DIOXINS FORM I'S

February 6, 1995

Service Request No.: K950132

Mike Boykin
Ecology & Environment, Inc.
1500 First Interstate Center
999 3rd Avenue
Seattle, WA 98104

Re: **Project #EWA0797SBA**

Dear Mike:

Enclosed is the additional report from Alta Analytical for the sample(s) submitted to our laboratory on December 15, 1994. For your reference, these analyses have been assigned our service request number K950132.

Please call if you have any questions. My extension is 246.

Respectfully submitted,

Columbia Analytical Services, Inc.

Abbie Spielman

Abbie Spielman
Client Services Manager

AS/td

USEPA SF
1600359

1317 South 13th Avenue • P.O. Box 479 • Kelso, Washington 98626 • Telephone 206/577-7222 • Fax 206/636-1068

ALTA

February 2, 1995

Alta Batch I.D.: 14351

Ms. Abbie Spielman
Columbia Analytical Services
1317 S. 13th Avenue
Kelso, WA 98626

Dear Ms. Spielman,

Enclosed are the amended results for the two water samples and one soil sample received at Alta Analytical Laboratory on January 11, 1995. As per our phone conversation, it was requested that the TEF calculations be performed on these samples.

If you have any questions regarding this information please feel free to contact me.

Sincerely,

Robert S. Mitzel
Director of Air Toxics

Alta Analytical Laboratory Inc.
5070 Robert J. Mathews Parkway
El Dorado Hills, CA 95762
FAX (916) 933-0940
(916) 933-1640

ALTA

Section I. Sample Inventory

Date Received: 11-Jan-95

Alta Lab ID.	Client ID.
14351-1-SA	T4120219 WATER
14351-2-SA	T4120207 SOIL
14351-3-SA	T4120223 WATER

SECTION II.

ALTA

PCDD & PCDF
EPA METHOD 8290

METHOD BLANK
Lab ID: 14351-001-MB
Matrix: Aqueous
TEQ = 0.046

Date Received: NA
Date Extracted: 1/21/95
Sample Amount: 1.000 L

ICAL ID: I1613A
QC Lot: LC0111A
Units: pg/L

Compound	Conc.	D.L.	Ratio	S/N Ratio	Qualifier
2,3,7,8-TCDD	ND	1.5			
Total TCDD	ND	2.0			
1,2,3,7,8-PeCDD	ND	1.6			
Total PeCDD	ND	1.6			
1,2,3,4,7,8-HxCDD	ND	2.9			
1,2,3,6,7,8-HxCDD	ND	3.1			
1,2,3,7,8,9-HxCDD	ND	3.0			
Total HxCDD	ND	3.1			
1,2,3,4,6,7,8-HpCDD	ND	3.8			
Total HpCDD	ND	3.8			
OCDD	46		1.01	>10:1	A
2,3,7,8-TCDF	ND	1.2			
Total TCDF	ND	1.2			
1,2,3,7,8-PeCDF	ND	3.0			
2,3,4,7,8-PeCDF	ND	2.5			
Total PeCDF	ND	3.0			
1,2,3,4,7,8-HxCDF	ND	1.1			
1,2,3,6,7,8-HxCDF	ND	1.1			
2,3,4,6,7,8-HxCDF	ND	2.0			
1,2,3,7,8,9-HxCDF	ND	1.3			
Total HxCDF	ND	2.0			
1,2,3,4,6,7,8-HpCDF	ND	1.3			
1,2,3,4,7,8,9-HpCDF	ND	1.6			
Total HpCDF	ND	1.6			
OCDF	ND	2.4			

Analyst: JMW

Reviewer: GM

ALTA

PCDD & PCDF
EPA METHOD 8290

METHOD BLANK
Lab ID: 14351-001-MB

Isotopic Recovery Results

Internal Standard	% R	Ratio	Qualifier
^{13}C-2,3,7,8-TCDD	99	0.78	
^{13}C-1,2,3,7,8-PeCDD	95	1.52	
^{13}C-1,2,3,4,7,8-HxCDD	106	1.26	
^{13}C-1,2,3,6,7,8-HxCDD	71	1.26	
^{13}C-1,2,3,4,6,7,8-HpCDD	81	1.01	
^{13}C-OCDD	71	0.84	
^{13}C-2,3,7,8-TCDF	103	0.77	
^{13}C-1,2,3,7,8-PeCDF	95	1.55	
^{13}C-2,3,4,7,8-PeCDF	91	1.57	
^{13}C-1,2,3,4,7,8-HxCDF	75	0.52	
^{13}C-1,2,3,6,7,8-HxCDF	63	0.51	
^{13}C-2,3,4,6,7,8-HxCDF	67	0.52	
^{13}C-1,2,3,7,8,9-HxCDF	77	0.51	
^{13}C-1,2,3,4,6,7,8-HpCDF	65	0.44	
^{13}C-1,2,3,4,7,8,9-HpCDF	68	0.43	

Clean-up Recovery Standard:

^{37}Cl-2,3,7,8-TCDD	93	NA

Dates Analyzed:

DB-5: 1/23/95 **DB-225:** NA **SP-2331:** NA

Analyst: Reviewer:

ALTA

PCDD & PCDF

EPA METHOD 8290

Sample ID: T4120219
Lab ID: 14351-001-SA
Matrix: Aqueous
TEQ = 5.6

Date Received: 1/11/95
Date Extracted: 1/21/95
Sample Amount: 0.931 L

ICAL ID: I1613A
QC Lot: LC0111A
Units: pg/L

Compound	Conc.	D.L.	Ratio	S/N Ratio	Qualifier
2,3,7,8-TCDD	ND	1.1			
Total TCDD	ND	2.2			
1,2,3,7,8-PeCDD	ND	1.5			
Total PeCDD	ND	1.5			
1,2,3,4,7,8-HxCDD	ND	2.4			
1,2,3,6,7,8-HxCDD	15		1.36	9:1	A
1,2,3,7,8,9-HxCDD	ND	4.5			
Total HxCDD	31		1.26	>10:1	
1,2,3,4,6,7,8-HpCDD	170		1.02	>10:1	
Total HpCDD	270		1.01	>10:1	
OCDD	1300		0.86	>10:1	B
2,3,7,8-TCDF	ND	0.93			
Total TCDF	ND	0.93			
1,2,3,7,8-PeCDF	ND	1.8			
2,3,4,7,8-PeCDF	ND	1.5			
Total PeCDF	4.7		1.43	8:1	A
1,2,3,4,7,8-HxCDF	ND	3.4			
1,2,3,6,7,8-HxCDF	ND	3.3			
2,3,4,6,7,8-HxCDF	ND	3.4			
1,2,3,7,8,9-HxCDF	ND	3.6			
Total HxCDF	44		1.20	>10:1	
1,2,3,4,6,7,8-HpCDF	64		1.08	>10:1	
1,2,3,4,7,8,9-HpCDF	ND	4.0			
Total HpCDF	250		1.08	>10:1	
OCDF	460		0.88	>10:1	

Analyst: [signature]

Reviewer: [signature]

ALTA

PCDD & PCDF
EPA METHOD 8290

Sample ID: T4120219
Lab ID: 14351-001-SA

Isotopic Recovery Results

Internal Standard:	% R	Ratio	Qualifier
^{13}C-2,3,7,8-TCDD	100	0.76	
^{13}C-1,2,3,7,8-PeCDD	99	1.53	
^{13}C-1,2,3,4,7,8-HxCDD	98	1.24	
^{13}C-1,2,3,6,7,8-HxCDD	68	1.26	
^{13}C-1,2,3,4,6,7,8-HpCDD	74	1.02	
^{13}C-OCDD	62	0.86	
^{13}C-2,3,7,8-TCDF	101	0.78	
^{13}C-1,2,3,7,8-PeCDF	97	1.56	
^{13}C-2,3,4,7,8-PeCDF	93	1.56	
^{13}C-1,2,3,4,7,8-HxCDF	70	0.52	
^{13}C-1,2,3,6,7,8-HxCDF	59	0.51	
^{13}C-2,3,4,6,7,8-HxCDF	62	0.52	
^{13}C-1,2,3,7,8,9-HxCDF	77	0.51	
^{13}C-1,2,3,4,6,7,8-HpCDF	58	0.44	
^{13}C-1,2,3,4,7,8,9-HpCDF	67	0.45	

Clean-up Recovery Standard:

^{37}Cl-2,3,7,8-TCDD	97	NA

Dates Analyzed:

DB-5: 1/23/95 **DB-225:** NA **SP-2331:** NA

Analyst: [illegible] Reviewer: [illegible]

ALTA

PCDD & PCDF

EPA METHOD 8290

Sample ID: T4120223
Lab ID: 14351-003-SA
Matrix: Aqueous
TEQ = 7.0

Date Received: 1/11/95
Date Extracted: 1/21/95
Sample Amount: 0.871 L

ICAL ID: I1613A
QC Lot: LC0111A
Units: pg/L

Compound	Conc.	D.L.	Ratio	S/N Ratio	Qualifier
2,3,7,8-TCDD	ND	1.4			
Total TCDD	ND	2.3			
1,2,3,7,8-PeCDD	ND	3.3			
Total PeCDD	ND	3.3			
1,2,3,4,7,8-HxCDD	ND	3.3			
1,2,3,6,7,8-HxCDD	16		1.09	>10:1	A
1,2,3,7,8,9-HxCDD	ND	3.6			
Total HxCDD	30		1.26	>10:1	
1,2,3,4,6,7,8-HpCDD	200		1.05	>10:1	
Total HpCDD	310		1.01	>10:1	
OCDD	1700		0.86	>10:1	B
2,3,7,8-TCDF	ND	1.1			
Total TCDF	ND	1.1			
1,2,3,7,8-PeCDF	ND	2.9			
2,3,4,7,8-PeCDF	ND	2.3			
Total PeCDF	5.6		1.32	8:1	A
1,2,3,4,7,8-HxCDF	ND	3.5			
1,2,3,6,7,8-HxCDF	ND	3.3			
2,3,4,6,7,8-HxCDF	ND	3.7			
1,2,3,7,8,9-HxCDF	ND	4.2			
Total HxCDF	58		1.28	>10:1	
1,2,3,4,6,7,8-HpCDF	84		1.08	>10:1	
1,2,3,4,7,8,9-HpCDF	13		1.02	>10:1	A
Total HpCDF	410		1.08	>10:1	
OCDF	740		0.88	>10:1	

Analyst: [illegible]

Reviewer: [illegible]

ALTA

PCDD & PCDF
EPA METHOD 8290

Sample ID: T4120223
Lab ID: 14351-003-SA

Isotopic Recovery Results

Internal Standard:	% R	Ratio	Qualifier
^{13}C-2,3,7,8-TCDD	91	0.74	
^{13}C-1,2,3,7,8-PeCDD	93	1.51	
^{13}C-1,2,3,4,7,8-HxCDD	106	1.32	
^{13}C-1,2,3,6,7,8-HxCDD	78	1.19	
^{13}C-1,2,3,4,6,7,8-HpCDD	84	1.03	
^{13}C-OCDD	69	0.85	
^{13}C-2,3,7,8-TCDF	91	0.76	
^{13}C-1,2,3,7,8-PeCDF	88	1.54	
^{13}C-2,3,4,7,8-PeCDF	85	1.55	
^{13}C-1,2,3,4,7,8-HxCDF	79	0.52	
^{13}C-1,2,3,6,7,8-HxCDF	66	0.50	
^{13}C-2,3,4,6,7,8-HxCDF	68	0.52	
^{13}C-1,2,3,7,8,9-HxCDF	78	0.51	
^{13}C-1,2,3,4,6,7,8-HpCDF	67	0.45	
^{13}C-1,2,3,4,7,8,9-HpCDF	71	0.45	
Clean-up Recovery Standard:			
^{37}Cl-2,3,7,8-TCDD	82	NA	

Dates Analyzed:

DB-5: 1/23/95 **DB-225:** NA **SP-2331:** NA

Analyst: [signature] Reviewer: [signature]

ALTA

PCDD & PCDF
EPA METHOD 8290

METHOD BLANK
Lab ID: 14351-002-MB
Matrix: Soil
TEQ = 0.0

Date Received: NA
Date Extracted: 1/13/95
Sample Amount: 10.00 g

ICAL ID: I1613A
QC Lot: LC0109S
Units: pg/g

Compound	Conc.	D.L.	Ratio	S/N Ratio	Qualifier
2,3,7,8-TCDD	ND	0.22			
Total TCDD	ND	0.32			
1,2,3,7,8-PeCDD	ND	0.15			
Total PeCDD	ND	0.15			
1,2,3,4,7,8-HxCDD	ND	0.22			
1,2,3,6,7,8-HxCDD	ND	0.26			
1,2,3,7,8,9-HxCDD	ND	0.25			
Total HxCDD	ND	0.26			
1,2,3,4,6,7,8-HpCDD	ND	0.16			
Total HpCDD	ND	0.16			
OCDD	ND	0.86			
2,3,7,8-TCDF	ND	0.10			
Total TCDF	ND	0.10			
1,2,3,7,8-PeCDF	ND	0.13			
2,3,4,7,8-PeCDF	ND	0.13			
Total PeCDF	ND	0.13			
1,2,3,4,7,8-HxCDF	ND	0.058			
1,2,3,6,7,8-HxCDF	ND	0.059			
2,3,4,6,7,8-HxCDF	ND	0.23			
1,2,3,7,8,9-HxCDF	ND	0.067			
Total HxCDF	ND	0.23			
1,2,3,4,6,7,8-HpCDF	ND	0.058			
1,2,3,4,7,8,9-HpCDF	ND	0.073			
Total HpCDF	ND	0.073			
OCDF	ND	0.099			

Analyst: [illegible]

Reviewer: [illegible]

ALTA

PCDD & PCDF
EPA METHOD 8290

METHOD BLANK
Lab ID: 14351-002-MB

Isotopic Recovery Results

Internal Standard	% R	Ratio	Qualifier
^{13}C-2,3,7,8-TCDD	91	0.73	
^{13}C-1,2,3,7,8-PeCDD	133	1.55	
^{13}C-1,2,3,4,7,8-HxCDD	101	1.32	
^{13}C-1,2,3,6,7,8-HxCDD	69	1.35	
^{13}C-1,2,3,4,6,7,8-HpCDD	102	1.02	
^{13}C-OCDD	93	0.94	
^{13}C-2,3,7,8-TCDF	82	0.79	
^{13}C-1,2,3,7,8-PeCDF	107	1.61	
^{13}C-2,3,4,7,8-PeCDF	88	1.60	
^{13}C-1,2,3,4,7,8-HxCDF	91	0.53	
^{13}C-1,2,3,6,7,8-HxCDF	74	0.52	
^{13}C-2,3,4,6,7,8-HxCDF	81	0.53	
^{13}C-1,2,3,7,8,9-HxCDF	97	0.53	
^{13}C-1,2,3,4,6,7,8-HpCDF	91	0.43	
^{13}C-1,2,3,4,7,8,9-HpCDF	100	0.44	

Clean-up Recovery Standard:

^{37}Cl-2,3,7,8-TCDD	100	NA

Dates Analyzed:

DB-5: 1/21/95 **DB-225:** NA **SP-2331:** NA

Analyst: [illegible] Reviewer: [illegible]

ALTA

PCDD & PCDF

EPA METHOD 8290

Sample ID: T4120207
Lab ID: 14351-002-SA
Matrix: Soil
TEQ = 42.7

Date Received: 1/11/95
Date Extracted: 1/13/95
Sample Amount: 13.81 g
% Solid: 67

ICAL ID: I1613A
QC Lot: LC0109S
Units: pg/g

Compound	Conc.	D.L.	Ratio	S/N Ratio	Qualifier
2,3,7,8-TCDD	3.3		0.75	>10:1	
Total TCDD	25		0.79	>10:1	
1,2,3,7,8-PeCDD	2.7		1.60	>10:1	
Total PeCDD	24		1.68	>10:1	
1,2,3,4,7,8-HxCDD	9.7		1.10	>10:1	
1,2,3,6,7,8-HxCDD	49		1.26	>10:1	
1,2,3,7,8,9-HxCDD	16		1.28	>10:1	
Total HxCDD	250		1.24	>10:1	
1,2,3,4,6,7,8-HpCDD	670		1.02	>10:1	
Total HpCDD	1200		1.16	>10:1	
OCDD	5400		0.89	>10:1	
2,3,7,8-TCDF	1.1		0.80	>10:1	
Total TCDF	42		0.77	>10:1	D
1,2,3,7,8-PeCDF	2.8		1.69	>10:1	
2,3,4,7,8-PeCDF	8.8		1.58	>10:1	
Total PeCDF	84		1.61	>10:1	D
1,2,3,4,7,8-HxCDF	15		1.31	>10:1	
1,2,3,6,7,8-HxCDF	7.9		1.19	>10:1	
2,3,4,6,7,8-HxCDF	11		1.31	>10:1	
1,2,3,7,8,9-HxCDF	3.7		1.09	>10:1	
Total HxCDF	280		1.23	>10:1	D
1,2,3,4,6,7,8-HpCDF	130		1.03	>10:1	D
1,2,3,4,7,8,9-HpCDF	6.7		1.03	>10:1	
Total HpCDF	430		1.03	>10:1	D
OCDF	8700		0.86	>10:1	

Analyst: JW

Reviewer: BM

ALTA

PCDD & PCDF
EPA METHOD 8290

Sample ID: T4120207
Lab ID: 14351-002-SA

Isotopic Recovery Results

Internal Standard:	% R	Ratio	Qualifier
^{13}C-2,3,7,8-TCDD	96	0.79	
^{13}C-1,2,3,7,8-PeCDD	120	1.55	
^{13}C-1,2,3,4,7,8-HxCDD	95	1.29	
^{13}C-1,2,3,6,7,8-HxCDD	90	1.29	
^{13}C-1,2,3,4,6,7,8-HpCDD	63	1.00	
^{13}C-OCDD	32	0.79	
^{13}C-2,3,7,8-TCDF	110	0.80	
^{13}C-1,2,3,7,8-PeCDF	117	1.58	
^{13}C-2,3,4,7,8-PeCDF	115	1.61	
^{13}C-1,2,3,4,7,8-HxCDF	87	0.52	
^{13}C-1,2,3,6,7,8-HxCDF	83	0.52	
^{13}C-2,3,4,6,7,8-HxCDF	81	0.53	
^{13}C-1,2,3,7,8,9-HxCDF	88	0.52	
^{13}C-1,2,3,4,6,7,8-HpCDF	54	0.42	
^{13}C-1,2,3,4,7,8,9-HpCDF	46	0.44	

Clean-up Recovery Standard:

^{37}Cl-2,3,7,8-TCDD	104	NA

Dates Analyzed:

DB-5: 1/20/95 **DB-225:** 1/24/95 **SP-2331:** NA

Analyst: Reviewer:

APPENDIX

DATA QUALIFIERS & ABBREVIATIONS

ALTA

A	The amount detected is below the Method Calibration Limit.
B	This compound was also detected in the blank.
C	The amount detected is less than five times the Method Quantitation Limit.
D	The amount reported is the maximum possible concentration.
E	The detection limit was raised above the Method Quantitation Limit due to chemical interferences.
F	This result has been confirmed on a DB-225 column.
G	This result has been confirmed on a SP-2331 column.
H	The signal-to-noise ratio is greater than 10:1.
I	Chemical Interference

Conc.	Concentration
D.L.	Detection Limit
NA	Not applicable
S/N	Signal-to-noise
*	See Cover Letter
ND	Not Detected
MPC	Maximum Possible Concentration