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Phone: 612.607.1700
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REPORT OF: CHEMICAL ANALYSES

PROJECT: **PCDD/PCDF ANALYSES**

DATE: October 1, 2002

ISSUED TO: ATC Associates
Attn: Mr. Jim Cohn
104 East 25th Street, 10th Floor
New York, NY 10010

REPORT NO:02-1061637

INTRODUCTION

This report presents the results from the analyses performed on three samples that were submitted by a representative of ATC Associates. The samples were analyzed for the presence or absence of polychlorinated dibenzo-p-dioxins (PCDDs) and dibenzofurans (PCDFs) using a modified version of USEPA Method 8290 as described below.

SAMPLE IDENTIFICATION

Client ID	Sample Type	Date Received	Pace ID
ATC-0820-89M-DX-1	Wipe	08/22/02	103792339
ATC-0820-89M-DX-2	Wipe	08/22/02	103792347
ATC-0820-89M-DX-3	Wipe	08/22/02	103792354

DISCUSSION

The recoveries of the isotopically-labeled PCDD/PCDF internal standards in the sample extracts ranged from 45-122%. All of the labeled internal standard recoveries obtained for this project were within the target range specified in Method 8290. Also, since the quantifications of the native 2,3,7,8-substituted isomers were based on isotope dilution, the data were automatically corrected for variation in recovery and accurate values were obtained.

REPORT OF LABORATORY ANALYSIS

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DISCUSSION (Cont.)

A laboratory method blank was prepared and analyzed with the sample batch as part of our routine quality control procedures. The results, found at the beginning of Appendix B, show the blank to contain a trace level of non-2,3,7,8-substituted TCDD. The value was below the calibration range for this method. One sample contained this isomer at a level similar to that seen in the blank and is flagged "B" on the data summary sheet. In general, levels less than ten times the background are not considered statistically different from the background. This indicates that the sample processing procedures did not significantly impact the results of the analyses.

Laboratory spike samples were also prepared with the sample batch by extracting a clean wipe that had been fortified with native standard materials. The results, found at the end of Appendix B, show that the spiked native compounds were recovered at 93-106% with relative percent differences of 3.0-7.0%. This indicates high degrees of accuracy and precision for these determinations.

REMARKS

The sample extracts will be retained for a period of 30 days from the date of this report and then discarded unless other arrangements are made. The raw mass spectral data will be archived on magnetic tape for a period of not less than one year. Questions regarding the data contained in this report may be directed to the authors at the numbers provided below.

Pace Analytical Services, Inc.

Scott C. Unze
Project Manager, Dioxins
(612) 607-6383

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TABLE 1. 2,3,7,8-TCDD Equivalency Factors (TEFs) for the Polychlorinated Dibenzo-p-dioxins and Dibenzofurans

Number	Compound(s)	TEF
1	2,3,7,8-TCDD	1.00
2	1,2,3,7,8-PeCDD	0.50
3	1,2,3,6,7,8-HxCDD	0.1
4	1,2,3,7,8,9-HxCDD	0.1
5	1,2,3,4,7,8-HxCDD	0.1
6	1,2,3,4,6,7,8-HpCDD	0.01
7	OCDD	0.001
8	* Total - TCDD	0.0
9	* Total - PeCDD	0.0
10	* Total - HxCDD	0.0
11	* Total - HpCDD	0.0
12	2,3,7,8-TCDF	0.10
13	1,2,3,7,8-PeCDF	0.05
14	2,3,4,7,8-PeCDF	0.5
15	1,2,3,6,7,8-HxCDF	0.1
16	1,2,3,7,8,9-HxCDF	0.1
17	1,2,3,4,7,8-HxCDF	0.1
18	2,3,4,6,7,8-HxCDF	0.1
19	1,2,3,4,6,7,8-HpCDF	0.01
20	1,2,3,4,7,8,9-HpCDF	0.01
21	OCDF	0.001
22	* Total - TCDF	0.0
23	* Total - PeCDF	0.0
24	* Total - HxCDF	0.0
25	* Total - HpCDF	0.0

*Excluding the 2,3,7,8-substituted congeners.

Reference: 1989 ITEFs

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Appendix A

REPORT OF LABORATORY ANALYSIS

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CHAIN OF CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

647712

Page: 1 of 1

Section A — Required Client Information:

Company	ATC
Address	104 E 25th St. NY, NY 10010
Phone	212-353-8280
Fax	212-353-8306

Section B — Required Client Information:

Report To:	James Cohn
Copy To:	same
Invoice To:	↓
P.O.	
Project Name:	PS 89M
Project Number:	19125-0297

Client Information (Check quote/contract):
Requested Due Date: *TAT:

* Turn around times less than 14 days subject to laboratory and contractual obligations and may result in a Rush Turnaround Surcharge.
Turn Around Time (TAT) in calendar days.

Section C — To Be Completed by Pace Analytical and Client

Quote Reference:	
Project Manager:	
Project #:	1061637
Profile #:	

Section D — Required Client Information:

Valid Matrix Codes

MATRIX	CODE
WATER	WT
SOIL	SL
OIL	OL
WIPE	WP
AIR	AR
TISSUE	TS
OTHER	OT

ITEM #	SAMPLE ID (One character per box. (A–Z, 0–9 / –) Sample IDs MUST BE UNIQUE)	MATRIX CODE	DATE COLLECTED (mm / dd / yy)	TIME COLLECTED (hh:mm a/p)	# Containers	Preservatives: Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	Methanol	Other	Requested Analysis: DIOXIN	Remarks / Lab ID
1	ATC-0820-89M-DX-1	WP	8/20/02	2:30 p										✓	103792359 1st fl. hallway (N
2	ATC-0820-89M-DX-2	WP	↓	2:40										✓	347 " (S)
3	ATC-0820-89M-DX-3	WP	↓	2:50										✓	3541 2nd fl. hall by st (S
4															
5															
6															
7															
8															
9															
10															
11															
12															

Use the blanks from proj # 19125-0289

SHIPMENT METHOD	AIRBILL NO.	SHIPPING DATE	NO. OF COOLERS
FEDEX	- - 9957	8/21/02	1

ITEM NUMBER	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME
	Tenzin / ATC	8/21	6:10pm	K Bunk / Pace	8/22/02	10:2

SAMPLE CONDITION

Temp in °C	20
Received on Ice	Y/N
Sealed Cooler	Y/N
Samples Intact	Y/N

SAMPLE NOTES

1 meter² = area

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: TENZIN NAMGYAL

CITY_21MC100_012158286

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Appendix B

REPORT OF LABORATORY ANALYSIS

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Method 8290 Blank Analysis Results

Client - ATC ASSOCIATES

Lab Sample ID	BLANK-2163	Matrix	WIPE
Filename	U20924B_19	Dilution	NA
Total Amount Extracted	1.00 m2	Extracted	09/17/2002
ICAL Date	08/06/2002	Analyzed	09/25/2002 15:02
CCal Filename(s)	U20924B_16 & U20924B_20	Injected By	CVS

Native Isomers	Conc ng/m2	EMPC ng/m2	LRL ng/m2		Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDF	ND	-----	0.00200		2,3,7,8-TCDF-13C	2.00	60
Total TCDF	ND	-----	0.00200		2,3,7,8-TCDD-13C	2.00	59
					1,2,3,7,8-PeCDF-13C	2.00	62
2,3,7,8-TCDD	ND	-----	0.00200		2,3,4,7,8-PeCDF-13C	2.00	62
Total TCDD	0.0022	-----	0.00200	J	1,2,3,7,8-PeCDD-13C	2.00	60
					1,2,3,4,7,8-HxCDF-13C	2.00	74
1,2,3,7,8-PeCDF	ND	-----	0.01000		1,2,3,6,7,8-HxCDF-13C	2.00	68
2,3,4,7,8-PeCDF	ND	-----	0.01000		2,3,4,6,7,8-HxCDF-13C	2.00	69
Total PeCDF	ND	-----	0.01000		1,2,3,7,8,9-HxCDF-13C	2.00	65
					1,2,3,4,7,8-HxCDD-13C	2.00	87
1,2,3,7,8-PeCDD	ND	-----	0.01000		1,2,3,6,7,8-HxCDD-13C	2.00	61
Total PeCDD	ND	-----	0.01000		1,2,3,4,6,7,8-HpCDF-13C	2.00	59
					1,2,3,4,7,8,9-HpCDF-13C	2.00	49
1,2,3,4,7,8-HxCDF	ND	-----	0.01000		1,2,3,4,6,7,8-HpCDD-13C	2.00	56
1,2,3,6,7,8-HxCDF	ND	-----	0.01000		OCDD-13C	4.00	44
2,3,4,6,7,8-HxCDF	ND	-----	0.01000				
1,2,3,7,8,9-HxCDF	ND	-----	0.01000		1,2,3,4-TCDD-13C	2.00	NA
Total HxCDF	ND	-----	0.01000		1,2,3,7,8,9-HxCDD-13C	2.00	NA
1,2,3,4,7,8-HxCDD	ND	-----	0.01000		2,3,7,8-TCDD-37Cl4	0.20	67
1,2,3,6,7,8-HxCDD	ND	-----	0.01000				
1,2,3,7,8,9-HxCDD	ND	-----	0.01000				
Total HxCDD	ND	-----	0.01000				
1,2,3,4,6,7,8-HpCDF	ND	-----	0.01000		Total 2,3,7,8-TCDD		
1,2,3,4,7,8,9-HpCDF	ND	-----	0.01000		Equivalence: 0.00 ng/m2		
Total HpCDF	ND	-----	0.01000		(Using ITE Factors)		
1,2,3,4,6,7,8-HpCDD	ND	-----	0.01000				
Total HpCDD	ND	-----	0.01000				
OCDF	ND	-----	0.02000				
OCDD	ND	-----	0.02000				

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
EMPC = Estimated Maximum Possible Concentration
LRL = Lower Reporting Limit
J = Concentration detected is below the calibration range
P = Recovery outside of target range
A = Detection Limit based on signal-to-noise measurement

I = Interference
E = PCDE Interference
ND = Not Detected
NA = Not Applicable
NC = Not Calculated
* = See Discussion

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Method 8290 Analysis Results

Client - ATC ASSOCIATES

Client's Sample ID	ATC-0820-89M-DX-1		
Lab Sample ID	103792339		
Filename	F20926B_09		
Injected By	BAL		
Total Amount Extracted	1.00 m2	Matrix	WIPE
% Moisture	NA	Dilution	NA
Dry Weight Extracted	NA	Collected	08/20/2002
ICAL Date	09/26/2002	Received	08/22/2002
CCal Filename(s)	F20926B_02 & F20926B_16	Extracted	09/17/2002
Method Blank ID	BLANK-2163	Analyzed	09/27/2002 03:35

Native Isomers	Conc ng/m2	EMPC ng/m2	LRL ng/m2		Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDF	ND	-----	0.0045	A	2,3,7,8-TCDF-13C	2.00	64
Total TCDF	0.0035	-----	0.0020	J	2,3,7,8-TCDD-13C	2.00	64
					1,2,3,7,8-PeCDF-13C	2.00	70
2,3,7,8-TCDD	ND	-----	0.0068	A	2,3,4,7,8-PeCDF-13C	2.00	69
Total TCDD	0.0180	-----	0.0020	B	1,2,3,7,8-PeCDD-13C	2.00	69
					1,2,3,4,7,8-HxCDF-13C	2.00	97
1,2,3,7,8-PeCDF	ND	-----	0.0100		1,2,3,6,7,8-HxCDF-13C	2.00	70
2,3,4,7,8-PeCDF	ND	-----	0.0100		2,3,4,6,7,8-HxCDF-13C	2.00	82
Total PeCDF	ND	-----	0.0100		1,2,3,7,8,9-HxCDF-13C	2.00	76
					1,2,3,4,7,8-HxCDD-13C	2.00	93
1,2,3,7,8-PeCDD	ND	-----	0.0100		1,2,3,6,7,8-HxCDD-13C	2.00	67
Total PeCDD	ND	-----	0.0100		1,2,3,4,6,7,8-HpCDF-13C	2.00	70
					1,2,3,4,7,8,9-HpCDF-13C	2.00	71
1,2,3,4,7,8-HxCDF	ND	-----	0.0100		1,2,3,4,6,7,8-HpCDD-13C	2.00	67
1,2,3,6,7,8-HxCDF	ND	-----	0.0100		OCDD-13C	4.00	59
2,3,4,6,7,8-HxCDF	ND	-----	0.0100				
1,2,3,7,8,9-HxCDF	ND	-----	0.0100		1,2,3,4-TCDD-13C	2.00	NA
Total HxCDF	ND	-----	0.0100		1,2,3,7,8,9-HxCDD-13C	2.00	NA
1,2,3,4,7,8-HxCDD	ND	-----	0.0100		2,3,7,8-TCDD-37Cl4	0.20	68
1,2,3,6,7,8-HxCDD	ND	-----	0.0100				
1,2,3,7,8,9-HxCDD	ND	-----	0.0100				
Total HxCDD	ND	-----	0.0100				
1,2,3,4,6,7,8-HpCDF	ND	-----	0.0100		Total 2,3,7,8-TCDD		
1,2,3,4,7,8,9-HpCDF	ND	-----	0.0100		Equivalence: 0.000059 ng/m2		
Total HpCDF	ND	-----	0.0100		(Using ITE Factors)		
1,2,3,4,6,7,8-HpCDD	ND	-----	0.0100				
Total HpCDD	ND	-----	0.0100				
OCDF	ND	-----	0.0200				
OCDD	0.0590	-----	0.0200	J			

Conc = Concentration (Totals include 2,3,7,8-substituted isomers)
EMPC = Estimated Maximum Possible Concentration
A = Detection Limit based on signal-to-noise measurement
J = Concentration detected is below the calibration range
B = Less than 10 times higher than method blank level
P = Recovery outside of target range
Nn = Value obtained from additional analysis

LRL = Lower Reporting Limit
I = Interference
E = PCDE Interference
S = Saturated signal
ND = Not Detected
NA = Not Applicable
NC = Not Calculated
* = See Discussion

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Method 8290 Analysis Results

Client - ATC ASSOCIATES

Client's Sample ID	ATC-0820-89M-DX-2		
Lab Sample ID	103792347		
Filename	F20927A_14		
Injected By	MRO		
Total Amount Extracted	1.00 m2	Matrix	WIPE
% Moisture	NA	Dilution	NA
Dry Weight Extracted	NA	Collected	08/20/2002
ICAL Date	09/26/2002	Received	08/22/2002
CCal Filename(s)	F20926B_16 & F20927A_16	Extracted	09/17/2002
Method Blank ID	BLANK-2163	Analyzed	09/27/2002 21:16

Native Isomers	Conc ng/m2	EMPC ng/m2	LRL ng/m2		Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDF	ND	-----	0.0044	A	2,3,7,8-TCDF-13C	2.00	61
Total TCDF	ND	-----	0.0020		2,3,7,8-TCDD-13C	2.00	63
					1,2,3,7,8-PeCDF-13C	2.00	75
2,3,7,8-TCDD	ND	-----	0.0038	A	2,3,4,7,8-PeCDF-13C	2.00	74
Total TCDD	0.022	-----	0.0020		1,2,3,7,8-PeCDD-13C	2.00	76
					1,2,3,4,7,8-HxCDF-13C	2.00	75
1,2,3,7,8-PeCDF	ND	-----	0.0100		1,2,3,6,7,8-HxCDF-13C	2.00	58
2,3,4,7,8-PeCDF	ND	-----	0.0100		2,3,4,6,7,8-HxCDF-13C	2.00	57
Total PeCDF	ND	-----	0.0100		1,2,3,7,8,9-HxCDF-13C	2.00	61
					1,2,3,4,7,8-HxCDD-13C	2.00	88
1,2,3,7,8-PeCDD	ND	-----	0.0100		1,2,3,6,7,8-HxCDD-13C	2.00	55
Total PeCDD	ND	-----	0.0100		1,2,3,4,6,7,8-HpCDF-13C	2.00	53
					1,2,3,4,7,8,9-HpCDF-13C	2.00	47
1,2,3,4,7,8-HxCDF	ND	-----	0.0100		1,2,3,4,6,7,8-HpCDD-13C	2.00	51
1,2,3,6,7,8-HxCDF	ND	-----	0.0100		OCDD-13C	4.00	45
2,3,4,6,7,8-HxCDF	ND	-----	0.0100				
1,2,3,7,8,9-HxCDF	ND	-----	0.0100		1,2,3,4-TCDD-13C	2.00	NA
Total HxCDF	ND	-----	0.0100		1,2,3,7,8,9-HxCDD-13C	2.00	NA
1,2,3,4,7,8-HxCDD	ND	-----	0.0100		2,3,7,8-TCDD-37Cl4	0.20	67
1,2,3,6,7,8-HxCDD	ND	-----	0.0100				
1,2,3,7,8,9-HxCDD	ND	-----	0.0100				
Total HxCDD	ND	-----	0.0100				
1,2,3,4,6,7,8-HpCDF	ND	-----	0.0100		Total 2,3,7,8-TCDD		
1,2,3,4,7,8,9-HpCDF	ND	-----	0.0100		Equivalence: 0.00096 ng/m2		
Total HpCDF	ND	-----	0.0100		(Using ITE Factors)		
1,2,3,4,6,7,8-HpCDD	0.043	-----	0.0100	J			
Total HpCDD	0.074	-----	0.0100	J			
OCDF	0.078	-----	0.0200	J			
OCDD	0.450	-----	0.0200				

Conc = Concentration (Totals include 2,3,7,8-substituted isomers)
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P = Recovery outside of target range
Nn = Value obtained from additional analysis

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Method 8290 Analysis Results

Client - ATC ASSOCIATES

Client's Sample ID	ATC-0820-89M-DX-3		
Lab Sample ID	103792354		
Filename	F20926B_10		
Injected By	BAL		
Total Amount Extracted	1.00 m2	Matrix	WIPE
% Moisture	NA	Dilution	NA
Dry Weight Extracted	NA	Collected	08/20/2002
ICAL Date	09/26/2002	Received	08/22/2002
CCal Filename(s)	F20926B_02 & F20926B_16	Extracted	09/17/2002
Method Blank ID	BLANK-2163	Analyzed	09/27/2002 04:24

Native Isomers	Conc ng/m2	EMPC ng/m2	LRL ng/m2		Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDF	ND	-----	0.0028	A	2,3,7,8-TCDF-13C	2.00	77
Total TCDF	0.0068	-----	0.0020	J	2,3,7,8-TCDD-13C	2.00	79
					1,2,3,7,8-PeCDF-13C	2.00	92
2,3,7,8-TCDD	ND	-----	0.0042	A	2,3,4,7,8-PeCDF-13C	2.00	90
Total TCDD	0.0250	-----	0.0020		1,2,3,7,8-PeCDD-13C	2.00	89
					1,2,3,4,7,8-HxCDF-13C	2.00	98
1,2,3,7,8-PeCDF	ND	-----	0.0100		1,2,3,6,7,8-HxCDF-13C	2.00	88
2,3,4,7,8-PeCDF	ND	-----	0.0100		2,3,4,6,7,8-HxCDF-13C	2.00	94
Total PeCDF	ND	-----	0.0100		1,2,3,7,8,9-HxCDF-13C	2.00	94
					1,2,3,4,7,8-HxCDD-13C	2.00	122
1,2,3,7,8-PeCDD	ND	-----	0.0100		1,2,3,6,7,8-HxCDD-13C	2.00	77
Total PeCDD	ND	-----	0.0100		1,2,3,4,6,7,8-HpCDF-13C	2.00	83
					1,2,3,4,7,8,9-HpCDF-13C	2.00	73
1,2,3,4,7,8-HxCDF	ND	-----	0.0100		1,2,3,4,6,7,8-HpCDD-13C	2.00	76
1,2,3,6,7,8-HxCDF	ND	-----	0.0100		OCDD-13C	4.00	63
2,3,4,6,7,8-HxCDF	ND	-----	0.0100				
1,2,3,7,8,9-HxCDF	ND	-----	0.0100		1,2,3,4-TCDD-13C	2.00	NA
Total HxCDF	ND	-----	0.0100		1,2,3,7,8,9-HxCDD-13C	2.00	NA
1,2,3,4,7,8-HxCDD	ND	-----	0.0100		2,3,7,8-TCDD-37Cl4	0.20	82
1,2,3,6,7,8-HxCDD	ND	-----	0.0100				
1,2,3,7,8,9-HxCDD	ND	-----	0.0100				
Total HxCDD	ND	-----	0.0100				
1,2,3,4,6,7,8-HpCDF	ND	-----	0.0100		Total 2,3,7,8-TCDD		
1,2,3,4,7,8,9-HpCDF	ND	-----	0.0100		Equivalence: 0.00032 ng/m2		
Total HpCDF	ND	-----	0.0100		(Using ITE Factors)		
1,2,3,4,6,7,8-HpCDD	0.0180	-----	0.0100	J			
Total HpCDD	0.0300	-----	0.0100	J			
OCDF	ND	-----	0.0200				
OCDD	0.1500	-----	0.0200				

Conc = Concentration (Totals include 2,3,7,8-substituted isomers)
EMPC = Estimated Maximum Possible Concentration
A = Detection Limit based on signal-to-noise measurement
J = Concentration detected is below the calibration range
B = Less than 10 times higher than method blank level
P = Recovery outside of target range
Nn = Value obtained from additional analysis

LRL = Lower Reporting Limit
I = Interference
E = PCDE Interference
S = Saturated signal
ND = Not Detected
NA = Not Applicable
NC = Not Calculated
* = See Discussion

Report No.....1061637

REPORT OF LABORATORY ANALYSIS

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Pace Analytical™

Pace Analytical Services, Inc.
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
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Method 8290 Laboratory Control Spike Results

Client - ATC ASSOCIATES

Lab Sample ID	SPIKE-2164		
Filename	U20924B_17	Matrix	WIPE
Total Amount Extracted	1.00 m2	Dilution	NA
ICAL Date	08/06/2002	Extracted	09/17/2002
CCal Filename(s)	U20924B_16 & U20924B_20	Analyzed	09/25/2002 13:04
Method Blank ID	BLANK-2163	Injected By	CVS

Native Isomers	Qs (ng)	Qm (ng)	% Rec.	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDF	0.20	0.21	104	2,3,7,8-TCDF-13C	2.00	78
				2,3,7,8-TCDD-13C	2.00	78
				1,2,3,7,8-PeCDF-13C	2.00	80
2,3,7,8-TCDD	0.20	0.21	103	2,3,4,7,8-PeCDF-13C	2.00	79
				1,2,3,7,8-PeCDD-13C	2.00	76
				1,2,3,4,7,8-HxCDF-13C	2.00	94
1,2,3,7,8-PeCDF	1.00	1.02	102	1,2,3,6,7,8-HxCDF-13C	2.00	93
2,3,4,7,8-PeCDF	1.00	1.04	104	2,3,4,6,7,8-HxCDF-13C	2.00	90
				1,2,3,7,8,9-HxCDF-13C	2.00	84
				1,2,3,4,7,8-HxCDD-13C	2.00	119
1,2,3,7,8-PeCDD	1.00	1.06	106	1,2,3,6,7,8-HxCDD-13C	2.00	77
				1,2,3,4,6,7,8-HpCDF-13C	2.00	74
				1,2,3,4,7,8,9-HpCDF-13C	2.00	61
1,2,3,4,7,8-HxCDF	1.00	1.00	100	1,2,3,4,6,7,8-HpCDD-13C	2.00	71
1,2,3,6,7,8-HxCDF	1.00	1.01	101	OCDD-13C	4.00	55
2,3,4,6,7,8-HxCDF	1.00	1.03	103			
1,2,3,7,8,9-HxCDF	1.00	1.01	101	1,2,3,4-TCDD-13C	2.00	NA
				1,2,3,7,8,9-HxCDD-13C	2.00	NA
1,2,3,4,7,8-HxCDD	1.00	0.97	97	2,3,7,8-TCDD-37Cl4	0.20	85
1,2,3,6,7,8-HxCDD	1.00	1.05	105			
1,2,3,7,8,9-HxCDD	1.00	0.97	97			
1,2,3,4,6,7,8-HpCDF	1.00	1.02	102			
1,2,3,4,7,8,9-HpCDF	1.00	1.05	105			
1,2,3,4,6,7,8-HpCDD	1.00	1.03	103			
OCDF	2.00	2.04	102			
OCDD	2.00	2.13	106			

Qs = Quantity Spiked
Qm = Quantity Measured
Rec. = Recovery (Expressed as Percent)
P = Recovery outside of target range
X = Background subtracted value
Nn = Value obtained from additional analysis
NA = Not Applicable
* = See Discussion

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Method 8290 Laboratory Control Spike Results

Client - ATC ASSOCIATES

Lab Sample ID	SPIKE DUP-2165		
Filename	U20924B_18	Matrix	WIPE
Total Amount Extracted	1.00 m2	Dilution	NA
ICAL Date	08/06/2002	Extracted	09/17/2002
CCal Filename(s)	U20924B_16 & U20924B_20	Analyzed	09/25/2002 13:51
Method Blank ID	BLANK-2163	Injected By	CVS

Native Isomers	Qs (ng)	Qm (ng)	% Rec.	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDF	0.20	0.20	99	2,3,7,8-TCDF-13C	2.00	72
				2,3,7,8-TCDD-13C	2.00	71
				1,2,3,7,8-PeCDF-13C	2.00	75
2,3,7,8-TCDD	0.20	0.20	100	2,3,4,7,8-PeCDF-13C	2.00	74
				1,2,3,7,8-PeCDD-13C	2.00	72
				1,2,3,4,7,8-HxCDF-13C	2.00	83
1,2,3,7,8-PeCDF	1.00	0.97	97	1,2,3,6,7,8-HxCDF-13C	2.00	88
2,3,4,7,8-PeCDF	1.00	0.97	97	2,3,4,6,7,8-HxCDF-13C	2.00	83
				1,2,3,7,8,9-HxCDF-13C	2.00	76
				1,2,3,4,7,8-HxCDD-13C	2.00	94
1,2,3,7,8-PeCDD	1.00	1.01	101	1,2,3,6,7,8-HxCDD-13C	2.00	83
				1,2,3,4,6,7,8-HpCDF-13C	2.00	69
				1,2,3,4,7,8,9-HpCDF-13C	2.00	56
1,2,3,4,7,8-HxCDF	1.00	0.97	97	1,2,3,4,6,7,8-HpCDD-13C	2.00	65
1,2,3,6,7,8-HxCDF	1.00	0.95	95	OCDD-13C	4.00	49
2,3,4,6,7,8-HxCDF	1.00	0.99	99			
1,2,3,7,8,9-HxCDF	1.00	0.98	98	1,2,3,4-TCDD-13C	2.00	NA
				1,2,3,7,8,9-HxCDD-13C	2.00	NA
1,2,3,4,7,8-HxCDD	1.00	0.93	93	2,3,7,8-TCDD-37Cl4	0.20	76
1,2,3,6,7,8-HxCDD	1.00	1.00	100			
1,2,3,7,8,9-HxCDD	1.00	0.93	93			
1,2,3,4,6,7,8-HpCDF	1.00	0.97	97			
1,2,3,4,7,8,9-HpCDF	1.00	0.99	99			
1,2,3,4,6,7,8-HpCDD	1.00	0.99	99			
OCDF	2.00	1.95	97			
OCDD	2.00	2.03	101			

Qs = Quantity Spiked
Qm = Quantity Measured
Rec. = Recovery (Expressed as Percent)
P = Recovery outside of target range
X = Background subtracted value
Nn = Value obtained from additional analysis
NA = Not Applicable
* = See Discussion

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SPIKE RECOVERY RELATIVE PERCENT DIFFERENCE (RPD) RESULTS

Client..... ATC ASSOCIATES

SPIKE 1 ID..... SPIKE-2164
SPIKE 1 Filename..... U20924B_17
SPIKE 2 ID..... SPIKE-DUP-2165
SPIKE 2 Filename..... U20924B_18

COMPOUND	SPIKE 1 REC,%	SPIKE 2 REC,%	RPD,%
2378-TCDF	104	99	4.9
2378-TCDD	103	100	3.0
12378-PeCDF	102	97	5.0
23478-PeCDF	104	97	7.0
12378-PeCDD	106	101	4.8
123478-HxCDF	100	97	3.0
123678-HxCDF	101	95	6.1
234678-HxCDF	103	99	4.0
123789-HxCDF	101	98	3.0
123478-HxCDD	97	93	4.2
123678-HxCDD	105	100	4.9
123789-HxCDD	97	93	4.2
1234678-HpCDF	102	97	5.0
1234789-HpCDF	105	99	5.9
1234678-HpCDD	103	99	4.0
OCDF	102	97	5.0
OCDD	106	101	4.8

REC = Percent Recovered
RPD = The difference between the two values divided by the average.
NA = Not Applicable

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