N00158.AR.000243
NAS WILLOW GROVE
5090.3a

TETRA TECH NUS

PHIL-20604

TO:	RUSS TURNER	DATE:	NOVEMBER 30, 2006
FROM:	MEGAN RITCHIE	COPIES:	FILE

SUBJECT: ORGANIC DATA REVIEW – CHLORINATED DIOXINS/FURANS
SITE 05 SOIL SAMPLES – NAS JRB WILLOW GROVE, PENNSYLVANIA
SDG 67189

SAMPLES: 6/Solid/

05SS60	05SS63
05SS61	05SS64
05SS62	05SS65

OVERVIEW

The sample set for Site 5 Soil Samples, NAS JRB Willow Grove, Pennsylvania, SDG 67189, consists of 6 solid environmental samples (designated 05SS-). All samples were analyzed for polychlorinated dibenzo-p-dioxins and polychlorinated dibenzofurans. One field duplicate pair (05SS60 and 05SS65) was included in this SDG.

The samples were collected by Tetra Tech NUS on September 28, 2006 and analyzed by Eno River Labs, LLC of Durham, North Carolina.

All analyses were conducted by high resolution gas chromatography/high resolution mass spectrometry (HRGC/HRMS) using EPA SW-846 Method 8290.

SUMMARY

All analytes were successfully analyzed in all samples. The findings offered in this report are based upon a general review of all available data including data completeness, holding times until analysis, instrument performance checks, initial/continuing calibrations, laboratory and field quality control blank results, field duplicate results, compound identification, compound quantitation, and detection limits.

MINOR PROBLEMS

The laboratory qualified results for PCDDs/PCDFs as estimated maximum possible concentrations (EMPCs) if method QC requirements for compound identification were not met with respect to molecular ion ratios exceeding plus or minus 15% from the theoretical chlorine isotope-based mass abundance ratios, in cases where all other criteria were met for PCDD/PCDF peak identification (signal-to-noise, retention times coincident with expected values from calibration standards, and absence of chlorinated diphenyl ether interferences).

In accordance with Region 3 dioxin validation guidance, these EMPC values were handled during data validation in one of two ways: Those PCDD/PCDF results associated with ion ratios outside of plus or minus 25% of theoretical were not considered as positively identified concentrations and retained the EMPC qualifier. In contrast, results associated with ion ratios within the expanded ion ratio criteria of plus or minus 25% (but outside of plus or minus 15%) were considered positively identified and qualified as estimated values (J), and the EMPC qualifier was removed from results in this category.

Total PCDF values are qualified (I) if the total DPE contribution to the total PCDF value is greater than 10%. All PCDF peaks that are significantly influenced by the presence of DPE peaks are either reported as EMPC values without regard to the isotopic abundance ratio, or are included in the detection limit value.

NOTES

OCDD was detected in the laboratory method blank at a concentration of 0.62 pg/g. No results were within 10 times the blank concentration, therefore no action was taken.

The MS/MSD recoveries were outside criteria for 1,2,3,4,6,7,8-HpCDD and OCDD. No qualifications were made on MS/MSD data alone.

The laboratory reported a set of results for 2,3,7,8-TCDF in sample 05SS64 because a second column (DB-225) analysis was used after the first column (DB-5) indicated the presence of this isomer. The DB-225 column results were retained for presentation in the data summary because this column has superior performance for resolving 2,3,7,8-TCDF from potential nearby TCDF isomers.

Two laboratory results (samples 05SS61 and 05SS64) for OCDD were reported from a 10-fold dilution analysis because the detected concentrations were greater than the upper calibration limit.

The sample cooler was received at the laboratory at 7°C, which is over the temperature criteria range of 2-6°C. No qualifications were made based upon professional judgement.

EXECUTIVE SUMMARY

Laboratory Performance: One analyte was detected in the laboratory blank.

Other Factors Affecting Data Quality: Several results were considered estimated due to ion ratios outside method criteria for compound identification but within an expanded identification window. A few results did not meet expanded ion ratio criteria and were qualified as EMPCs.

The data for these analyses were reviewed to evaluate usability with reference to the EPA "National Functional Guidelines for Chlorinated Dioxin/Furan Data Review" (2005), as amended for use within EPA Region 3 following the document, "Region III Dioxin/Furan Data Validation Guidance" (1999), and the NFESC document entitled "Navy IRCDQM" (9/99).

The text of this report has been formatted to address only those problem areas affecting data quality.

"I attest that the data referenced herein were reviewed according to the agreed upon validation criteria as specified in the NFESC Guidelines and the Quality Assurance Project Plan (QAPP)."

Megan Ritchie

Tetra Tech NUS, Inc.
Megan Ritchie
Data Validator

Russell Sloboda

Tetra Tech NUS, Inc.
Russell Sloboda
Data Validation Quality Assurance Officer

Attachments:

1. Appendix A - Qualified Analytical Results
2. Appendix B - Results as Reported by the Laboratory
3. Appendix C - Support Documentation

APPENDIX A

Qualified Analytical Results

PROJ_NO: 2192

SDG: 67189 MEDIA: SOIL DATA FRACTION: DIOX

nsample	05SS60	nsample	05SS61	nsample	05SS62
samp_date	9/28/2006	samp_date	9/28/2006	samp_date	9/28/2006
lab_id	423-96-1	lab_id	423-96-2	lab_id	423-96-3
qc_type	NM	qc_type	NM	qc_type	NM
units	NG/KG	units	NG/KG	units	NG/KG
Pct_Solids	74.8	Pct_Solids	78.3	Pct_Solids	72.3
DUP_OF:		DUP_OF:		DUP_OF:	

Parameter	Result	Val Qual	Qual Code
1,2,3,4,6,7,8,9-OCDD	2060		
1,2,3,4,6,7,8,9-OCDF	0.88	J	WP
1,2,3,4,6,7,8-HPCDD	23.3		
1,2,3,4,6,7,8-HPCDF	0.72	J	WP
1,2,3,4,7,8,9-HPCDF	0.2	U	
1,2,3,4,7,8-HXCDD	0.2	U	
1,2,3,4,7,8-HXCDF	0.2	U	
1,2,3,6,7,8-HXCDD	0.52	J	
1,2,3,6,7,8-HXCDF	0.1	U	
1,2,3,7,8,9-HXCDD	0.5	J	P
1,2,3,7,8,9-HXCDF	0.2	U	
1,2,3,7,8-PECDD	0.3	U	
1,2,3,7,8-PECDF	0.2	U	
2,3,4,6,7,8-HXCDF	0.1	U	
2,3,4,7,8-PECDF	0.2	U	
2,3,7,8-TCDD	0.3	U	
2,3,7,8-TCDF	0.2	U	
TOTAL HPCDD	46.8		
TOTAL HPCDF	3.4	EMPC	W
TOTAL HXCDD	6.5	EMPC	W
TOTAL HXCDF	3.6	IEMPC	QW
TOTAL PECDD	0.3	U	
TOTAL PECDF	3.4	IEMPC	QW
TOTAL TCDD	0.3	U	
TOTAL TCDF	4.2	IEMPC	QW

Parameter	Result	Val Qual	Qual Code
1,2,3,4,6,7,8,9-OCDD	5820		
1,2,3,4,6,7,8,9-OCDF	0.52	J	P
1,2,3,4,6,7,8-HPCDD	24.4		
1,2,3,4,6,7,8-HPCDF	0.45	J	P
1,2,3,4,7,8,9-HPCDF	0.07	U	
1,2,3,4,7,8-HXCDD	0.24	EMPC	Q
1,2,3,4,7,8-HXCDF	0.12	J	P
1,2,3,6,7,8-HXCDD	0.4	J	P
1,2,3,6,7,8-HXCDF	0.05	U	
1,2,3,7,8,9-HXCDD	0.42	J	WP
1,2,3,7,8,9-HXCDF	0.05	U	
1,2,3,7,8-PECDD	0.11	EMPC	Q
1,2,3,7,8-PECDF	0.05	U	
2,3,4,6,7,8-HXCDF	0.04	U	
2,3,4,7,8-PECDF	0.05	U	
2,3,7,8-TCDD	0.07	U	
2,3,7,8-TCDF	0.06	U	
TOTAL HPCDD	45.6		
TOTAL HPCDF	2.1	IEMPC	QW
TOTAL HXCDD	8.4	EMPC	W
TOTAL HXCDF	1.8	IEMPC	QW
TOTAL PECDD	2.1	EMPC	W
TOTAL PECDF	1.4	IEMPC	QW
TOTAL TCDD	0.18	EMPC	W
TOTAL TCDF	1.9	IEMPC	QW

Parameter	Result	Val Qual	Qual Code
1,2,3,4,6,7,8,9-OCDD	3880		
1,2,3,4,6,7,8,9-OCDF	0.27	J	WP
1,2,3,4,6,7,8-HPCDD	12.6		
1,2,3,4,6,7,8-HPCDF	0.15	EMPC	Q
1,2,3,4,7,8,9-HPCDF	0.1	U	
1,2,3,4,7,8-HXCDD	0.1	U	
1,2,3,4,7,8-HXCDF	0.07	U	
1,2,3,6,7,8-HXCDD	0.1	U	
1,2,3,6,7,8-HXCDF	0.07	U	
1,2,3,7,8,9-HXCDD	0.1	U	
1,2,3,7,8,9-HXCDF	0.08	U	
1,2,3,7,8-PECDD	0.1	U	
1,2,3,7,8-PECDF	0.08	U	
2,3,4,6,7,8-HXCDF	0.06	U	
2,3,4,7,8-PECDF	0.08	U	
2,3,7,8-TCDD	0.1	U	
2,3,7,8-TCDF	0.09	U	
TOTAL HPCDD	24.7		
TOTAL HPCDF	0.15	EMPC	W
TOTAL HXCDD	4.4	EMPC	W
TOTAL HXCDF	0.11	EMPC	W
TOTAL PECDD	0.48	EMPC	W
TOTAL PECDF	2.3	IEMPC	QW
TOTAL TCDD	0.34	EMPC	W
TOTAL TCDF	6.2	IEMPC	QW

PROJ_NO: 2192

SDG: 67189 MEDIA: SOIL DATA FRACTION: DIOX

nsample	05SS63	nsample	05SS64	nsample	05SS65
samp_date	9/28/2006	samp_date	9/28/2006	samp_date	9/28/2006
lab_id	423-96-4	lab_id	423-96-5A	lab_id	423-96-6
qc_type	NM	qc_type	NM	qc_type	NM
units	NG/KG	units	NG/KG	units	NG/KG
Pct_Solids	74.9	Pct_Solids	82.7	Pct_Solids	79.5
DUP_OF:		DUP_OF:		DUP_OF:	05SS60

Parameter	Result	Val Qual	Qual Code
1,2,3,4,6,7,8,9-OCDD	3600		
1,2,3,4,6,7,8,9-OCDF	0.4	J	P
1,2,3,4,6,7,8-HPCDD	13.9		
1,2,3,4,6,7,8-HPCDF	0.2	J	P
1,2,3,4,7,8,9-HPCDF	0.09	U	
1,2,3,4,7,8-HXCDD	0.08	U	
1,2,3,4,7,8-HXCDF	0.12	J	P
1,2,3,6,7,8-HXCDD	0.18	J	WP
1,2,3,6,7,8-HXCDF	0.05	U	
1,2,3,7,8,9-HXCDD	0.08	U	
1,2,3,7,8,9-HXCDF	0.06	U	
1,2,3,7,8-PECDD	0.08	U	
1,2,3,7,8-PECDF	0.06	U	
2,3,4,6,7,8-HXCDF	0.05	U	
2,3,4,7,8-PECDF	0.06	U	
2,3,7,8-TCDD	0.08	U	
2,3,7,8-TCDF	0.07	U	
TOTAL HPCDD	26.8		
TOTAL HPCDF	0.64		
TOTAL HXCDD	5.9	EMPC	W
TOTAL HXCDF	0.45	IEMPC	QW
TOTAL PECDD	1.1	EMPC	W
TOTAL PECDF	0.86	IEMPC	QW
TOTAL TCDD	0.23	EMPC	W
TOTAL TCDF	1.5	IEMPC	QW

Parameter	Result	Val Qual	Qual Code
1,2,3,4,6,7,8,9-OCDD	8670		
1,2,3,4,6,7,8,9-OCDF	45.3		
1,2,3,4,6,7,8-HPCDD	338		
1,2,3,4,6,7,8-HPCDF	32.1		
1,2,3,4,7,8,9-HPCDF	2.6	J	P
1,2,3,4,7,8-HXCDD	4.3	J	P
1,2,3,4,7,8-HXCDF	9.4	J	
1,2,3,6,7,8-HXCDD	10.9		
1,2,3,6,7,8-HXCDF	3.9	J	P
1,2,3,7,8,9-HXCDD	6.4		
1,2,3,7,8,9-HXCDF	0.2	U	
1,2,3,7,8-PECDD	3	J	P
1,2,3,7,8-PECDF	17.1	IEMPC	QW
2,3,4,6,7,8-HXCDF	4.7	J	P
2,3,4,7,8-PECDF	2.8	J	PW
2,3,7,8-TCDD	2.7		
2,3,7,8-TCDF	2.4		
TOTAL HPCDD	695		
TOTAL HPCDF	106	IEMPC	QW
TOTAL HXCDD	128		
TOTAL HXCDF	110	IEMPC	QW
TOTAL PECDD	41.2	EMPC	W
TOTAL PECDF	79.7	IEMPC	QW
TOTAL TCDD	25.2		
TOTAL TCDF	69.4	IEMPC	QW

Parameter	Result	Val Qual	Qual Code
1,2,3,4,6,7,8,9-OCDD	2880		
1,2,3,4,6,7,8,9-OCDF	1.5	J	WP
1,2,3,4,6,7,8-HPCDD	37.4		
1,2,3,4,6,7,8-HPCDF	1.4	J	P
1,2,3,4,7,8,9-HPCDF	0.2	U	
1,2,3,4,7,8-HXCDD	0.2	U	
1,2,3,4,7,8-HXCDF	0.29	J	P
1,2,3,6,7,8-HXCDD	0.79	J	P
1,2,3,6,7,8-HXCDF	0.1	U	
1,2,3,7,8,9-HXCDD	0.63	J	P
1,2,3,7,8,9-HXCDF	0.2	U	
1,2,3,7,8-PECDD	0.2	U	
1,2,3,7,8-PECDF	0.2	U	
2,3,4,6,7,8-HXCDF	0.1	U	
2,3,4,7,8-PECDF	0.2	U	
2,3,7,8-TCDD	0.2	U	
2,3,7,8-TCDF	0.41	J	P
TOTAL HPCDD	73.8		
TOTAL HPCDF	5.2	IEMPC	QW
TOTAL HXCDD	8.9		
TOTAL HXCDF	5.3	IEMPC	QW
TOTAL PECDD	0.55		
TOTAL PECDF	5.3	IEMPC	QW
TOTAL TCDD	0.2	U	
TOTAL TCDF	6.3	IEMPC	QW

Qualifier Cod s:

a	=	Lab Blank Contamination
b	=	Field Blank Contamination
c	=	Calibration (i.e., %RSDs, %Ds, ICVs, CCVs, RPDs, RRFs, etc.) Noncompliance
d	=	MS/MSD Noncompliance
e	=	LSC/LSCD Noncompliance
f	=	Laboratory Duplicate Imprecision
g	=	Field Duplicate Imprecision
h	=	Holding Time Exceedance
i	=	ICP Serial Dilution Noncompliance
j	=	GFAA PDS – GFAA MSA's r<0.995 (correlation coefficient)
k	=	ICP Interference – include ICSAB %Rs
l	=	Instrument Calibration Range Exceedance
m	=	Sample Preservation
n	=	Internal Standard Noncompliance
n01	=	Internal Standard Recovery Noncompliance Dioxins
n02	=	Recovery Standard Noncompliance Dioxins
n03	=	Clean-up Standard Noncompliance Dioxins
o	=	Poor Instrument Performance (i.e. baseline drifting)
p	=	Uncertainty Near Detection Limit (<2 x IDL for inorganics and < CRQL for organics)
q	=	Other Problems (can encompass of number of issues)
r	=	Surrogates Recovery Noncompliance
s	=	Pesticide/PCB Resolution
t	=	% Breakdown Noncompliance for DDT and Endrin
u	=	Pesticide/PCB % Difference Between Columns for Positive Results
v	=	Non-linear Calibrations, Tuning r <0.995 (correlation coefficient)
w	=	Ratios of primary monitored ions outside of theoretical +/-15 %, within +/- 25 %
x	=	Signal to noise response drop
y	=	Percent solids <30%
z	=	Uncertainty at 2 sigma deviation is greater than sample activity

APPENDIX B

Results as Reported by the Laboratory

Tetra Tech/NUS

Lab Project: 67189
Client Sample: 05SS60

Method 8290 PCDD/PCDF Analysis (b)
Analysis File: W024202

Client Project:	CTO #003-NASJRB Willow Grove				
Sample Matrix:	SOIL	Date Received:	09/30/2006	Spike File:	SPMIT322
Lab ID:	423-96-1	Date Extracted:	10/11/2006	ICal:	WF5O166
		Date Analyzed:	10/17/2006	ConCal:	W024102
Sample Size:	13.500 g	Dilution Factor:	n/a	% Moisture:	25.2
Dry Weight:	10.098 g	Blank File:	T062495	% Lipid:	n/a
GC Column:	DB-5	Analyst:	JSY	% Solids:	74.8

Analytes	Conc. (pg/g)	DL	EMPC	Ratio	RT	Flags
2,3,7,8-TCDD	ND	0.3				___
1,2,3,7,8-PeCDD	ND	0.3				___
1,2,3,4,7,8-HxCDD	ND	0.2				___
1,2,3,6,7,8-HxCDD	0.52			1.40	34:28	J__
1,2,3,7,8,9-HxCDD	0.50			1.22	34:46	J__
1,2,3,4,6,7,8-HpCDD	23.3			1.00	37:44	___
1,2,3,4,6,7,8,9-OCDD	2060			0.87	41:24	___
2,3,7,8-TCDF	ND	0.2				___
1,2,3,7,8-PeCDF	ND	0.2				___
2,3,4,7,8-PeCDF	ND	0.2				___
1,2,3,4,7,8-HxCDF	ND	0.2				___
1,2,3,6,7,8-HxCDF	ND	0.1				___
2,3,4,6,7,8-HxCDF	ND	0.1				___
1,2,3,7,8,9-HxCDF	ND	0.2				___
1,2,3,4,6,7,8-HpCDF	EMPC		0.72			J__
1,2,3,4,7,8,9-HpCDF	ND	0.2				___
1,2,3,4,6,7,8,9-OCDF	EMPC		0.88			J__

Totals	Conc. (pg/g)	Number	DL	EMPC	Flags
Total TCDD	ND		0.3		___
Total PeCDD	ND		0.3		___
Total HxCDD	5.4	4		6.5	___
Total HpCDD	46.8	2			___
Total TCDF	0.72	1		4.2	X__
Total PeCDF	0.46	1		3.4	X__
Total HxCDF	0.60	2		3.6	X__
Total HpCDF	2.7	2		3.4	___

MIT3_PSR v1.00, LARS 6.25.06

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Tetra Tech/NUS

Lab Project: **67189** Method 8290 PCDD/PCDF Analysis (b)
Client Sample: **05SS61** Analysis File: **W024203**

Client Project:	**CTO #003-NASJRB Willow Grove**				
Sample Matrix:	**SOIL**	Date Received:	**09/30/2006**	Spike File:	**SPMIT322**
Lab ID:	**423-96-2**	Date Extracted:	**10/11/2006**	ICal:	**WF5O166**
		Date Analyzed:	**10/17/2006**	ConCal:	**W024102**
Sample Size:	**13.100 g**	Dilution Factor:	**n/a**	% Moisture:	**21.7**
Dry Weight:	**10.257 g**	Blank File:	**T062495**	% Lipid:	**n/a**
GC Column:	**DB-5**	Analyst:	**JSY**	% Solids:	**78.3**

Analytes	Conc. (pg/g)	DL	EMPC	Ratio	RT	Flags
2,3,7,8-TCDD	ND	0.07				___
1,2,3,7,8-PeCDD	EMPC		0.11			J__
1,2,3,4,7,8-HxCDD	EMPC		0.24			J__
1,2,3,6,7,8-HxCDD	0.40			1.17	34:28	J__
1,2,3,7,8,9-HxCDD	EMPC		0.42			J__
1,2,3,4,6,7,8-HpCDD	24.4			0.99	37:44	___
1,2,3,4,6,7,8,9-OCDD	5570			0.86	41:25	E__
2,3,7,8-TCDF	ND	0.06				___
1,2,3,7,8-PeCDF	ND	0.05				___
2,3,4,7,8-PeCDF	ND	0.05				___
1,2,3,4,7,8-HxCDF	0.12			1.10	33:41	J__
1,2,3,6,7,8-HxCDF	ND	0.05				___
2,3,4,6,7,8-HxCDF	ND	0.04				___
1,2,3,7,8,9-HxCDF	ND	0.05				___
1,2,3,4,6,7,8-HpCDF	0.45			1.11	36:42	J__
1,2,3,4,7,8,9-HpCDF	ND	0.07				___
1,2,3,4,6,7,8,9-OCDF	0.52			0.76	41:36	J__

Totals	Conc. (pg/g)	Number	DL	EMPC	Flags
Total TCDD	EMPC			0.18	___
Total PeCDD	1.4	3		2.1	___
Total HxCDD	6.4	3		8.4	___
Total HpCDD	45.6	2			___
Total TCDF	EMPC			1.9	X__
Total PeCDF	0.43	1		1.4	X__
Total HxCDF	0.86	4		1.8	X__
Total HpCDF	1.6	2		2.1	X__

MIT3_PSR v1.00, LARS 6.25.06

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Tetra Tech/NUS

Lab Project: **67189** Method 8290 PCDD/PCDF Analysis (b)
Client Sample: **05SS61** Analysis File: **T062557**

Client Project:	**CTO #003-NASJRB Willow Grove**				
Sample Matrix:	**SOIL**	Date Received:	**09/30/2006**	Spike File:	**SPMIT3J2**
Lab ID:	**423-96-2**	Date Extracted:	**10/11/2006**	ICal:	**TF57146**
		Date Analyzed:	**10/19/2006**	ConCal:	**T062543**
Sample Size:	**13.100 g**	Dilution Factor:	**10X**	% Moisture:	**21.7**
Dry Weight:	**10.257 g**	Blank File:	**T062495**	% Lipid:	**n/a**
GC Column:	**DB-5**	Analyst:	**JSY**	% Solids:	**78.3**

Analytes	Conc. (pg/g)	DL	EMPC	Ratio	RT	Flags
1,2,3,4,6,7,8,9-OCDD	5820			0.91	41:24	___

Internal Standard	Conc. (pg/g)	% Recovery	QC Limits	Ratio	RT	Flags
$^{13}C_{12}$-1,2,3,4,6,7,8,9-OCDD	3100	72.2	40%-135%	0.84	41:23	___

Recovery Standard	Ratio	RT	Flags
$^{13}C_{12}$-1,2,3,7,8,9-HxCDD	1.20	34:45	___

Data Reviewer: Mim 10/23/2006

MIT3_PSR v1.00, LARS 6.26.01d

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Tetra Tech/NUS

Lab Project: 67189
Client Sample: 05SS62

Method 8290 PCDD/PCDF Analysis (b)
Analysis File: W024204

Client Project:	CTO #003-NASJRB Willow Grove				
Sample Matrix:	SOIL	Date Received:	09/30/2006	Spike File:	SPMIT322
Lab ID:	423-96-3	Date Extracted:	10/11/2006	ICal:	WF5O166
		Date Analyzed:	10/17/2006	ConCal:	W024102
Sample Size:	14.100 g	Dilution Factor:	n/a	% Moisture:	27.7
Dry Weight:	10.194 g	Blank File:	T062495	% Lipid:	n/a
GC Column:	DB-5	Analyst:	JSY	% Solids:	72.3

Analytes	Conc. (pg/g)	DL	EMPC	Ratio	RT	Flags
2,3,7,8-TCDD	ND	0.1				__
1,2,3,7,8-PeCDD	ND	0.1				__
1,2,3,4,7,8-HxCDD	ND	0.1				__
1,2,3,6,7,8-HxCDD	ND	0.1				__
1,2,3,7,8,9-HxCDD	ND	0.1				__
1,2,3,4,6,7,8-HpCDD	12.6			1.06	37:44	__
1,2,3,4,6,7,8,9-OCDD	3880			0.86	41:24	__
2,3,7,8-TCDF	ND	0.09				__
1,2,3,7,8-PeCDF	ND	0.08				__
2,3,4,7,8-PeCDF	ND	0.08				__
1,2,3,4,7,8-HxCDF	ND	0.07				__
1,2,3,6,7,8-HxCDF	ND	0.07				__
2,3,4,6,7,8-HxCDF	ND	0.06				__
1,2,3,7,8,9-HxCDF	ND	0.08				__
1,2,3,4,6,7,8-HpCDF	EMPC		0.15			J__
1,2,3,4,7,8,9-HpCDF	ND	0.1				__
1,2,3,4,6,7,8,9-OCDF	EMPC		0.27			J__

Totals	Conc. (pg/g)	Number	DL	EMPC	Flags
Total TCDD	EMPC			0.34	__
Total PeCDD	EMPC			0.48	__
Total HxCDD	3.1	2		4.4	__
Total HpCDD	24.7	2			__
Total TCDF	0.69	1		6.2	X__
Total PeCDF	EMPC			2.3	X__
Total HxCDF	EMPC			0.11	__
Total HpCDF	EMPC			0.15	__

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Lab Project: **67189** Method 8290 PCDD/PCDF Analysis (b)
Client Sample: **05SS63** Analysis File: **W024205**

Client Project:	**CTO #003-NASJRB Willow Grove**				
Sample Matrix:	**SOIL**	Date Received:	**09/30/2006**	Spike File:	**SPMIT322**
Lab ID:	**423-96-4**	Date Extracted:	**10/11/2006**	ICal:	**WF5O166**
		Date Analyzed:	**10/17/2006**	ConCal:	**W024102**
Sample Size:	**13.600 g**	Dilution Factor:	**n/a**	% Moisture:	**25.1**
Dry Weight:	**10.186 g**	Blank File:	**T062495**	% Lipid:	**n/a**
GC Column:	**DB-5**	Analyst:	**JSY**	% Solids:	**74.9**

Analytes	Conc. (pg/g)	DL	EMPC	Ratio	RT	Flags
2,3,7,8-TCDD	ND	0.08				___
1,2,3,7,8-PeCDD	ND	0.08				___
1,2,3,4,7,8-HxCDD	ND	0.08				___
1,2,3,6,7,8-HxCDD	EMPC		0.18			J__
1,2,3,7,8,9-HxCDD	ND	0.08				___
1,2,3,4,6,7,8-HpCDD	13.9			0.98	37:44	___
1,2,3,4,6,7,8,9-OCDD	3600			0.86	41:24	___
2,3,7,8-TCDF	ND	0.07				___
1,2,3,7,8-PeCDF	ND	0.06				___
2,3,4,7,8-PeCDF	ND	0.06				___
1,2,3,4,7,8-HxCDF	0.12			1.15	33:42	J__
1,2,3,6,7,8-HxCDF	ND	0.05				___
2,3,4,6,7,8-HxCDF	ND	0.05				___
1,2,3,7,8,9-HxCDF	ND	0.06				___
1,2,3,4,6,7,8-HpCDF	0.20			1.15	36:42	J__
1,2,3,4,7,8,9-HpCDF	ND	0.09				___
1,2,3,4,6,7,8,9-OCDF	0.40			0.90	41:36	J__

Totals	Conc. (pg/g)	Number	DL	EMPC	Flags
Total TCDD	EMPC			0.23	___
Total PeCDD	0.74	1		1.1	___
Total HxCDD	4.1	2		5.9	___
Total HpCDD	26.8	2			___
Total TCDF	EMPC			1.5	X__
Total PeCDF	EMPC			0.86	X__
Total HxCDF	0.12	1		0.45	X__
Total HpCDF	0.64	3			___

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Lab Project: 67189 — Method 8290 PCDD/PCDF Analysis (b)
Client Sample: 05SS64 — Analysis File: T062496

Client Project:	CTO #003-NASJRB Willow Grove			ICal:	TF57146
Sample Matrix:	SOIL	Date Received:	09/30/2006	Spike File:	SPMIT322
Lab ID:	423-96-5A	Date Extracted:	10/11/2006	1st CCal:	T062493
		Date Analyzed:	10/16/2006	End CCal:	T062508
Sample Size:	12.000 g	Dilution Factor:	n/a	% Moisture:	17.3
Dry Weight:	9.924 g	Blank File:	T062495	% Lipid:	n/a
GC Column:	DB-5	Analyst:	JSY	% Solids:	82.7

Analytes	Conc. (pg/g)	DL	EMPC	Ratio	RT	Flags
2,3,7,8-TCDD	2.7			0.66	26:58	___
1,2,3,7,8-PeCDD	3.0			1.60	31:11	J__
1,2,3,4,7,8-HxCDD	4.3			1.30	34:18	J__
1,2,3,6,7,8-HxCDD	10.9			1.27	34:23	___
1,2,3,7,8,9-HxCDD	6.4			1.22	34:42	___
1,2,3,4,6,7,8-HpCDD	338			1.01	37:40	___
1,2,3,4,6,7,8,9-OCDD	8710			0.83	41:20	E__
2,3,7,8-TCDF	8.1			0.82	26:17	___
1,2,3,7,8-PeCDF	EMPC		17.1			X__
2,3,4,7,8-PeCDF	EMPC		2.8			J__
1,2,3,4,7,8-HxCDF	9.4			1.31	33:35	___
1,2,3,6,7,8-HxCDF	3.9			1.28	33:42	J__
2,3,4,6,7,8-HxCDF	4.7			1.23	34:12	J__
1,2,3,7,8,9-HxCDF	ND	0.2				___
1,2,3,4,6,7,8-HpCDF	32.1			1.04	36:37	___
1,2,3,4,7,8,9-HpCDF	2.6			0.97	38:11	J__
1,2,3,4,6,7,8,9-OCDF	45.3			0.90	41:31	___

Totals	Conc. (pg/g)	Number	DL	EMPC	Flags
Total TCDD	25.2	10			___
Total PeCDD	40.4	9		41.2	___
Total HxCDD	128	8			___
Total HpCDD	695	2			___
Total TCDF	49.1	14		69.4	X__
Total PeCDF	47.7	13		79.7	X__
Total HxCDF	68.9	10		110	X__
Total HpCDF	85.6	3		106	X__

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Lab Project: 67189 — Method 8290 PCDD/PCDF Analysis (b)
Client Sample: 05SS64 — Analysis File: T062573

Client Project:	CTO #003-NASJRB Willow Grove				
Sample Matrix:	SOIL	Date Received:	09/30/2006	Spike File:	SPMIT3J2
Lab ID:	423-96-5A	Date Extracted:	10/11/2006	ICal:	TF57146
		Date Analyzed:	10/20/2006	ConCal:	T062561
Sample Size:	12.000 g	Dilution Factor:	10X	% Moisture:	17.3
Dry Weight:	9.924 g	Blank File:	T062495	% Lipid:	n/a
GC Column:	DB-5	Analyst:	MCM	% Solids:	82.7

Analytes	Conc. (pg/g)	DL	EMPC	Ratio	RT	Flags
1,2,3,4,6,7,8,9-OCDD	8670			0.85	41:17	___

Internal Standard	Conc. (pg/g)	% Recovery	QC Limits	Ratio	RT	Flags
$^{13}C_{12}$-1,2,3,4,6,7,8,9-OCDD	2710	61.1	40%-135%	0.87	41:17	___

Recovery Standard	Ratio	RT	Flags
$^{13}C_{12}$-1,2,3,7,8,9-HxCDD	1.18	34:40	___

Data Reviewer: MCM 10/23/2006

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Tetra Tech/NUS

Lab Project: **67189** Method 8290 TCDD/TCDF Analysis (DB-225)
Client Sample: **05SS64** Analysis File: **P061018**

Client Project:	**CTO #003-NASJRB Willow Grove**				
Sample Matrix:	**SOIL**	Date Received:	**09/30/2006**	Spike File:	**SPC2NF22**
Lab ID:	**423-96-5A**	Date Extracted:	**10/11/2006**	ICal:	**PF27176**
		Date Analyzed:	**10/18/2006**	ConCal:	**P061015**
Sample Size:	**12.000 g**	Dilution Factor:	**n/a**	% Moisture:	**17.3**
Dry Weight:	**9.924 g**	Blank File:	**T062495**	% Lipid:	**n/a**
GC Column:	**DB-225**	Analyst:	**JSY**	% Solids:	**82.7**

Analytes	Conc. (pg/g)	DL	EMPC	Ratio	RT	Flags
2,3,7,8-TCDF	2.4			0.82	22:10	—

Internal Standard	Conc. (pg/g)	% Recovery	QC Limits	Ratio	RT	Flags
$^{13}C_{12}$-2,3,7,8-TCDF	153	75.9	40%-130%	0.78	22:10	—

Recovery Standard	Ratio	RT	Flags
$^{13}C_{12}$-1,2,3,4-TCDD	0.81	21:05	—

Data Reviewer: _____ 10/20/2006

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Lab Project: 67189
Client Sample: 05SS65

Method 8290 PCDD/PCDF Analysis (b)
Analysis File: T062499

Client Project:	CTO #003-NASJRB Willow Grove			ICal:	TF57146
Sample Matrix:	SOIL	Date Received:	09/30/2006	Spike File:	SPMIT322
Lab ID:	423-96-6	Date Extracted:	10/11/2006	1st CCal:	T062493
		Date Analyzed:	10/16/2006	End CCal:	T062508
Sample Size:	12.700 g	Dilution Factor:	n/a	% Moisture:	20.5
Dry Weight:	10.097 g	Blank File:	T062495	% Lipid:	n/a
GC Column:	DB-5	Analyst:	JSY	% Solids:	79.5

Analytes	Conc. (pg/g)	DL	EMPC	Ratio	RT	Flags
2,3,7,8-TCDD	ND	0.2				__
1,2,3,7,8-PeCDD	ND	0.2				__
1,2,3,4,7,8-HxCDD	ND	0.2				__
1,2,3,6,7,8-HxCDD	0.79			1.34	34:22	J__
1,2,3,7,8,9-HxCDD	0.63			1.36	34:42	J__
1,2,3,4,6,7,8-HpCDD	37.4			1.02	37:40	__
1,2,3,4,6,7,8,9-OCDD	2880			0.83	41:20	__
2,3,7,8-TCDF	0.41			0.70	26:16	J__
1,2,3,7,8-PeCDF	ND	0.2				__
2,3,4,7,8-PeCDF	ND	0.2				__
1,2,3,4,7,8-HxCDF	0.29			1.22	33:35	J__
1,2,3,6,7,8-HxCDF	ND	0.1				__
2,3,4,6,7,8-HxCDF	ND	0.1				__
1,2,3,7,8,9-HxCDF	ND	0.2				__
1,2,3,4,6,7,8-HpCDF	1.4			1.12	36:37	J__
1,2,3,4,7,8,9-HpCDF	ND	0.2				__
1,2,3,4,6,7,8,9-OCDF	EMPC		1.5			J__

Totals	Conc. (pg/g)	Number	DL	EMPC	Flags
Total TCDD	ND		0.2		__
Total PeCDD	0.55	1			__
Total HxCDD	8.9	4			__
Total HpCDD	73.8	2			__
Total TCDF	0.41	1		6.3	X__
Total PeCDF	0.71	1		5.3	X__
Total HxCDF	1.7	3		5.3	X__
Total HpCDF	3.7	2		5.2	X__

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APPENDIX C

Support Documentation

Overview

The samples and associated QC samples were extracted and analyzed according to procedures described in EPA Method 8290 Rev. 0 (9/94). Any particular difficulties encountered during sample handling will be discussed in the QC Remarks section below. This report contains results from only the 8290 dioxin/furan analyses of six soil samples.

Quality Control Samples

A laboratory method blank was prepared along with each batch of samples.

A laboratory control spike (LCS) sample was extracted and analyzed along with the sample. A report summarizing the analyte recoveries for this sample is included in the data package.

Matrix spike (MS) and matrix spike duplicate (MSD) samples were extracted and analyzed along with the samples. A report summarizing the analyte recoveries and relative percent differences for these samples is included in the data package.

Quality Control Remarks

This release of this particular set of Tetra tech/NUS analytical data by Eno River Labs was authorized by the Quality Control Chemist who has reviewed each sample data package following a series of inspections/reviews. When applicable, general deviations from acceptable QC requirements are identified below and comments are made on the effect of these deviations upon the validity and reliability of the results. Specific QC issues associated with this particular project are:

Sample receipt: Six soil samples were received from Tetra tech/NUS at 7 °C in good condition on September 30, 2006 and stored in a refrigerator at 4°C. The client's chain-of-custody did not indicate whether chemical preservatives were utilized prior to shipment.

Sample Preparation Laboratory: None

Mass Spectrometry: None

Data Review: The concentration of the OCDD analytes (flagged "E") in samples 05SS61 and 05SS64 are above the calibration range in the DB-5 column analyses. The samples were diluted by adding internal standards to obtain analyte responses that are within the calibration range. As a result the concentrations for dilutions are not recovery corrected. Only those analytes that exceeded the calibration range are reported on the diluted analyses.

The percent recoveries for the 1,2,3,4,6,7,8-HpCDD and OCDD analyte in the matrix spike (MS) and matrix spike duplicate (MSD) analyses are outside method requirements. These variances are due to high levels of these analytes in the native sample. When the amounts in the native sample approaches more than one-forth the spiked analyte level, statistical analysis becomes unreliable and the percent recoveries can not be assessed using the QC samples.

Other Comments: No 2,3,7,8-substituted target analytes were detected in the laboratory blank above the target detection limit (TDL).

Method 8290 contains separate criteria for beginning and ending continuing calibrations. When the ending calibration meets criteria established for the beginning calibration, the average response factor from the initial calibration is used. When the ending calibration only meets the less stringent criteria specified for an ending calibration, the average of the response factor from the beginning and ending calibration is used for analyte and internal standard calculations. Affected samples are identified by the listing of both the beginning and ending calibration filename on the sample report.

EMPC stands for **E**stimated **M**aximum **P**ossible **C**oncentration. A dioxin or furan analyte is quantitated as an EMPC when the detected analyte meets the retention time criteria of a dioxin or furan, but not the isotopic ratio criteria. Interferences, such as PCBs, may co-elute or cause quantitative interference, causing a peak ratio to be outside criteria. Low level peaks that are close to the detection limits can be significantly affected by instrument and chemical noise, causing the ratio to be outside criteria. As a result, the reported value(s) should be considered estimated at the highest level possible.

The analytical results presented in this report are consistent with the guidelines of EPA Method 8290 Rev. 0 (9/94) and NELAC standards. Any exceptions have been discussed in the QC Remarks section of this case narrative with emphasis on their effect on the results. Should Tetra tech/NUS have any questions or comments regarding this data package, please feel free to contact our customer service at (919) 281-4013.

Released by,

Kenneth Varley

Kenneth Varley

Report Preparation Chemist
Eno River Labs

The total number of pages in the data package is : _____ .

CLIENT CHAIN OF CUSTODY **SAMPLER'S SIGNATURE** Donald Whalen **Quote 0600000302**

From (1): Tetra Tech/NUS
600 Clark Avenue
Suite 3
King of Prussia, PA 19406-1433

Project (1): CTO-003, NAS JRB Willow Grove

(BRE07 /UN)

Contact: Meg Price/~~Daniel Braccia~~
Phone: 610/491-9688
Fax: 610/491-9645
P.O.# (1): _____

Please provide any special reporting instructions.

Analysis Wanted (2): 8290:T-O

Total Number of Containers: 7

Turn Around Time (In Calendar Days):

Sample ID (3)	Date / Time	Preservation (4)	Matrix	Sample Amt.						Remarks
055560	9-28-06/1430	ICE	Soil	4 oz	✓					
055561	9-28-06/1615	ICE	Soil	4 oz	✓					COPY
055562	9-28-06/1555	ICE	Soil	4 oz	✓					
055563	9-28-06/1607	ICE	Soil	4 oz	✓					
055564	9-28-06/1622	ICE	Soil	2 x 4 oz	✓					Do MS/MSD
055565	9-28-06/1628	ICE	Soil	4 oz	✓					

Relinquished By/Sign.	Date/Time	Received By/Sign.	Relinquished By/Sign.	Date/Time	Received By/Sign.
Donald Whalen	1700 9-29-06				

Received for Laboratory By/Signature	Date/Time	Send Samples to:
C Thurston	9-30-06 945	Eno River Labs, LLC Attn: Sample Management Group 2445 S. Alston Ave. Durham, NC 27713 USA Phone: (919) 281-4040 • Fax: (919) 281-4070

Directions:
(1) Provide and/or correct client and project information.
(2) Verify analysis, check approriate boxes for each sample.
(3) Please be sure that this matches the ID on the sample container.
(4) Please indicate the preservation used for each sample.

+7

Tetra Tech/NUS

Lab Project: **67189** Method 8290 PCDD/PCDF Analysis (b)
Client Sample: **BLANK** Analysis File: **T062495**

Client Project:	**CTO #003-NASJRB Willow Grove**			ICal:	**TF57146**
Sample Matrix:	**SAND**	Date Received:	/ /	Spike File:	**SPMIT32S**
Lab ID:	**BLANK**	Date Extracted:	**10/11/2006**	1st CCal:	**T062493**
		Date Analyzed:	**10/16/2006**	End CCal:	**T062508**
Sample Size:	**10.000 g**	Dilution Factor:	**n/a**	% Moisture:	**n/a**
Dry Weight:	**n/a**	Blank File:	**T062495**	% Lipid:	**n/a**
GC Column:	**DB-5**	Analyst:	**JSY**	% Solids:	**n/a**

Analytes	Conc. (pg/g)	DL	EMPC	Ratio	RT	Flags
2,3,7,8-TCDD	ND	0.2				
1,2,3,7,8-PeCDD	ND	0.3				
1,2,3,4,7,8-HxCDD	ND	0.2				
1,2,3,6,7,8-HxCDD	ND	0.2				
1,2,3,7,8,9-HxCDD	ND	0.2				
1,2,3,4,6,7,8-HpCDD	ND	0.3				
1,2,3,4,6,7,8,9-OCDD	0.62			0.98	41:22	J
2,3,7,8-TCDF	ND	0.1				
1,2,3,7,8-PeCDF	ND	0.2				
2,3,4,7,8-PeCDF	ND	0.2				
1,2,3,4,7,8-HxCDF	ND	0.2				
1,2,3,6,7,8-HxCDF	ND	0.1				
2,3,4,6,7,8-HxCDF	ND	0.2				
1,2,3,7,8,9-HxCDF	ND	0.2				
1,2,3,4,6,7,8-HpCDF	ND	0.2				
1,2,3,4,7,8,9-HpCDF	ND	0.2				
1,2,3,4,6,7,8,9-OCDF	ND	0.4				

Totals	Conc. (pg/g)	Number	DL	EMPC	Flags
Total TCDD	ND		0.2		
Total PeCDD	ND		0.3		
Total HxCDD	ND		0.2		
Total HpCDD	ND		0.3		
Total TCDF	ND		0.1		
Total PeCDF	ND		0.2		
Total HxCDF	ND		0.2		
Total HpCDF	ND		0.2		

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USEPA
3DFA - Form III-HR CDD
CDD/CDF LAB CONTROL SAMPLE SUMMARY
HIGH RESOLUTION

SAMPLE No.
05SS64 MS

Lab Name: Eno River Labs Contract No: _____

Lab Code: ENORVR Case No.: _____ TO No.: _____ SDG No.: _____

Matrix: (SOIL/WATER/ASH/TISSUE/OIL) SOIL Lab Sample ID: 423-96-5AMS

Sample wt/vol: 9.924 (g/ml) G Lab File ID: T062497

Water Sample Prep: SEPF (SEPF/SPE) Date Received: 09/30/2006

Concentrated Extract Volume: 20 (uL) Date Extracted: 10/11/2006

Injection Volume: 2(uL) % Solids/Lipids: 82.7 Date Analyzed: 10/16/2006

GC Column: DB-5 ID: 0.25 (mm) Dilution Factor: _____

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

SPIKE ANALYTE	SPIKE ADDED	AMOUNT RECOVERED	PERCENT RECOVERY	#	QC LIMITS
2378-TCDD	400	360	83.4		70-130
12378-PeCDD	2000	1697	83.2		70-130
123478-HxCDD	2000	1925	94.2		70-130
123678-HxCDD	2000	2054	97.4		70-130
123789-HxCDD	2000	2005	96.8		70-130
1234678-HpCDD	2000	4238	43.9	#	70-130
OCDD	4000	64407	-551	#	70-130
2378-TCDF	400	431	87.5		70-130
12378-PeCDF	2000	1886	85.7		70-130
23478-PeCDF	2000	1747	85.8		70-130
123478-HxCDF	2000	1915	90.9		70-130
123678-HxCDF	2000	1945	95.1		70-130
234678-HxCDF	2000	1846	90.1		70-130
123789-HxCDF	2000	1757	87.9		70-130
1234678-HpCDF	2000	2263	97.2		70-130
1234789-HpCDF	2000	2114	105		70-130
OCDF	4000	3612	79.0		70-130

Column to be used to flag values outside Quality Control (QC) limits.

Laboratory Control Sample Recovery: 2 Outside limits out of 17 total.

USEPA
3DFA - Form III-HR CDD
CDD/CDF LAB CONTROL SAMPLE SUMMARY
HIGH RESOLUTION

SAMPLE No.
05SS64 MSD

Lab Name: Eno River Labs Contract No: _____

Lab Code: ENORVR Case No.: _____ TO No.: _____ SDG No.: _____

Matrix: (SOIL/WATER/ASH/TISSUE/OIL) SOIL Lab Sample ID: 423-96-5AMSD

Sample wt/vol: 9.924 (g/ml) G Lab File ID: T062498

Water Sample Prep: SEPF (SEPF/SPE) Date Received: 09/30/2006

Concentrated Extract Volume: 20 (uL) Date Extracted: 10/11/2006

Injection Volume: 2(uL) % Solids/Lipids: 82.7 Date Analyzed: 10/16/2006

GC Column: DB-5 ID: 0.25 (mm) Dilution Factor: _____

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

SPIKE ANALYTE	SPIKE ADDED	AMOUNT RECOVERED	PERCENT RECOVERY	#	QC LIMITS
2378-TCDD	400	358	82.7		70-130
12378-PeCDD	2000	1707	83.6		70-130
123478-HxCDD	2000	1945	95.2		70-130
123678-HxCDD	2000	2134	101		70-130
123789-HxCDD	2000	1955	94.6		70-130
1234678-HpCDD	2000	4128	38.6	#	70-130
OCDD	4000	62223	-604	#	70-130
2378-TCDF	400	436	88.7		70-130
12378-PeCDF	2000	1886	86.0		70-130
23478-PeCDF	2000	1647	81.0		70-130
123478-HxCDF	2000	1905	90.7		70-130
123678-HxCDF	2000	1945	95.1		70-130
234678-HxCDF	2000	1776	86.3		70-130
123789-HxCDF	2000	1737	86.9		70-130
1234678-HpCDF	2000	2263	97.2		70-130
1234789-HpCDF	2000	2074	102		70-130
OCDF	4000	2699	81.0		70-130

Column to be used to flag values outside Quality Control (QC) limits.

Laboratory Control Sample Recovery: 2 Outside limits out of 17 total.

ENO RIVER LABS, LLC
MATRIX SPIKE RECOVERY ANALYSIS AND COMPARISON

Project: 67189
Matrix: SOIL
Method: 8290

Isomer	T062496 ID: 423-96-5A Sample (pg/g)	T062497 ID: 423-96-5AMS With Spike (pg/g)	Percent Recovery	T062498 ID: 423-96-5AMSD Spike Dup (pg/g)	Percent Recovery	Relative Percent Difference
2378-TCDD	2.7	36.3	83.4	36.1	82.7	0.84
12378-PeCDD	3.0	171	83.2	172	83.6	0.48
123478-HxCDD	4.3	194	94.2	196	95.2	1.06
123678-HxCDD	10.9	207	97.4	215	101	3.63
123789-HxCDD	6.4	202	96.8	197	94.6	2.30
1234678-HpCDD	338	427	43.9	416	38.6	12.8
OCDD	8710	6490	-551	6270	-604	9.18
2378-TCDF	8.1	43.4	87.5	43.9	88.7	1.36
12378-PeCDF	[17.1]	190	85.7	190	86.0	0.35
23478-PeCDF	[2.8]	176	85.8	166	81.0	5.76
123478-HxCDF	9.4	193	90.9	192	90.7	0.22
123678-HxCDF	3.9	196	95.1	196	95.1	0.0
234678-HxCDF	4.7	186	90.1	179	86.3	4.31
123789-HxCDF	ND	177	87.9	175	86.9	1.14
1234678-HpCDF	32.1	228	97.2	228	97.2	0.0
1234789-HpCDF	2.6	213	105	209	102	2.90
OCDF	45.3	364	79.0	372	81.0	2.50

ND: Not Detected
NA: Not Applicable
[..]: EMPC Value

MILES 4.22.39
GRY_PSUM v1.12

Processed By: KhJ Date: 10/23/06

Percent Recovery QC Limits: 70 to 130 percent.
Relative Percent Difference QC Limits: +/- 20 percent.

Nominal Spike Levels:
TCDD/TCDF..: 0.4 ng
PeCDD/PeCDF: 2.0 ng
HxCDD/HxCDF: 2.0 ng
HpCDD/HpCDF: 2.0 ng
OCDD/OCDF..: 4.0 ng

ENO RIVER LABS, LLC -- LOG IN RECORD/CHAIN OF CUSTODY

Custody Seal : Present/Intact
Chain of Custody : Present
Sample Tags : Absent
Sample Tag Numbers: Not Listed on Chain of Custody
SMO Forms : N/A

Sample Seals: Present
Container...: Intact

Lab Project Number 67189
Client: BRE07 - Tetra Tech/NUS

Date Received 09/30/06 By

Carrier and Number FEDEX 854568657730

Book 423

Page 96

Ice Chest ICE Temp 7.0 C

Lab Number.. mR/H:CPM.	Client Sample ID..... Client COC ID.....*	Location.....	Matrix	To LAB Date/Init	To STORAGE Date/Init	To LAB Date/Init	To STORAGE Date/Init	To LAB Date/Init	To STORAGE Date/Init	To LAB Date/Init	To STORAGE Date/Init	DISPOSED Date/Init
423-96-1	05SS60		SOIL									
	05SS60	C02										
423-96-2	05SS61		SOIL									
	05SS61	C02										
423-96-3	05SS62		SOIL									
	05SS62	C02										
423-96-4	05SS63		SOIL									
	05SS63	C02										
423-96-5A	05SS64		SOIL									
	05SS64	C02										
423-96-5B	05SS64		SOIL									
	05SS64	C02										
423-96-6	05SS65		SOIL									
	05SS65	C02										

CV

10/6/06

All samples OK 11/10/06

Receiving Remarks:

Archive Remarks:

Form Revised 05/27/1997 -- Page 1 OF 1

USEPA
1DFA - Form I-HR CDD-1
CDD/CDF SAMPLE DATA SUMMARY
HIGH RESOLUTION

SAMPLE No.
05SS60

Lab Name: Eno River Labs Contract No: _____

Lab Code: ENORVR Case No.: _____ TO No.: _____ SDG No.: _____

Matrix: (SOIL/WATER/ASH/TISSUE/OIL) SOIL Lab Sample ID: 423-96-1

Sample wt/vol: 10.098 (g/ml) G Lab File ID: W024202

Water Sample Prep: SEPF (SEPF/SPE) Date Received: 09/30/2006

Concentrated Extract Volume: 20 (uL) Date Extracted: 10/11/2006

Injection Volume: 2(uL) % Solids/Lipids: 74.8 Date Analyzed: 10/17/2006

GC Column: DB-5 ID: 0.25 (mm) Dilution Factor: _____

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

TARGET ANALYTE	SELECTED IONS	PEAK RT	ION RATIO #	CONCENTRATION	Q	EMPC/EDL
2378-TCDD	320/322				U	0.3
12378-PeCDD	356/358				U	0.3
123478-HxCDD	390/392				U	0.2
123678-HxCDD	390/392	34:28	1.40	0.52	J	
123789-HxCDD	390/392	34:46	1.22	0.50	J	
1234678-HpCDD	424/426	37:44	1.00 OK	23.3		
OCDD	458/460	41:24	0.87	2060		
2378-TCDF	304/306				U	0.2
12378-PeCDF	340/342				U	0.2
23478-PeCDF	340/342				U	0.2
123478-HxCDF	374/376				U	0.2
123678-HxCDF	374/376				U	0.1
234678-HxCDF	374/376				U	0.1
123789-HxCDF	374/376		*		U	0.2
1234678-HpCDF	408/410	36:42	1.27 #	within 0.76-1.30	J	0.72
1234789-HpCDF	408/410				U	0.2
OCDF	442/444	41:36	1.09 # *	within 0.67-1.13	J	0.88

NOTE: Concentrations, Estimated Maximum Possible Concentrations (EMPCs), and Estimated Detection Levels (EDLs) for solid samples are calculated on a dry weight basis (except tissues, which are reported on a wet weight basis with % Lipids).

INTERNAL LABELED COMPOUNDS	SELECTED IONS	PEAK RT	ION RATIO #	ION RATIO LIMITS	%REC #	RECOVERY LIMITS
37Cl-2378-TCDD	328/NA	27:06	NA	NA	82.2	40-135
13C-2378-TCDF	316/318	26:23	0.79	0.65-0.89	84.8	40-135
13C-2378-TCDD	332/334	27:05	0.83	0.65-0.89	81.0	40-135
13C12-PeCDF 123	352/354	30:16	1.55	1.32-1.78	87.4	40-135
13C12-PeCDD 123	368/370	31:16	1.50	1.32-1.78	85.9	40-135
13C12-HxCDF 678	384/386	33:46	0.50	0.43-0.59	103	40-135
13C-123678-HxCDD	402/404	34:27	1.23	1.05-1.43	98.3	40-135
13C-1234678-HpCDF	418/420	36:41	0.45	0.37-0.51	106	40-135
13C12-HpCDD 678	436/438	37:44	1.04	0.88-1.20	102	40-135
13C-OCDD	470/472	41:23	0.89	0.76-1.02	102	40-135

Column to be used to flag values outside QC limits.

* within expanded window ±25% of theoretical

USEPA
1DFA - Form I-HR CDD-1
CDD/CDF SAMPLE DATA SUMMARY
HIGH RESOLUTION

SAMPLE No.
05SS61

Lab Name: Eno River Labs Contract No: _____

Lab Code: ENORVR Case No.: _____ TO No.: _____ SDG No.: _____

Matrix: (SOIL/WATER/ASH/TISSUE/OIL) SOIL Lab Sample ID: 423-96-2

Sample wt/vol: 10.257 (g/ml) G Lab File ID: W024203

Water Sample Prep: SEPF (SEPF/SPE) Date Received: 09/30/2006

Concentrated Extract Volume: 20 (uL) Date Extracted: 10/11/2006

Injection Volume: 2(uL) % Solids/Lipids: 78.3 Date Analyzed: 10/17/2006

GC Column: DB-5 ID: 0.25 (mm) Dilution Factor: _____

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

TARGET ANALYTE	SELECTED IONS	PEAK RT	ION RATIO #	CONCENTRATION	Q	EMPC/EDL
2378-TCDD	320/322				U	0.07
12378-PeCDD	356/358	31:16	2.79 #	outside ±25%	J	0.11
123478-HxCDD	390/392	34:22	1.60	outside ±25%	J	0.24
123678-HxCDD	390/392	34:28	1.17	0.40	J	
123789-HxCDD	390/392	34:46	1.02 #	*0.93-1.55 within		0.42
1234678-HpCDD	424/426	37:44	0.99	24.4		
OCDD	458/460	41:25	0.86	5570	E	
2378-TCDF	304/306				U	0.06
12378-PeCDF	340/342				U	0.05
23478-PeCDF	340/342				U	0.05
123478-HxCDF	374/376	33:41	1.10	0.12	J	
123678-HxCDF	374/376				U	0.05
234678-HxCDF	374/376				U	0.04
123789-HxCDF	374/376				U	0.05
1234678-HpCDF	408/410	36:42	1.11	0.45	J	
1234789-HpCDF	408/410				U	0.07
OCDF	442/444	41:36	0.76	0.52	J	

NOTE: Concentrations, Estimated Maximum Possible Concentrations (EMPCs), and Estimated Detection Levels (EDLs) for solid samples are calculated on a dry weight basis (except tissues, which are reported on a wet weight basis with % Lipids).

INTERNAL LABELED COMPOUNDS	SELECTED IONS	PEAK RT	ION RATIO #	ION RATIO LIMITS	%REC #	RECOVERY LIMITS
37Cl-2378-TCDD	328/NA	27:06	NA	NA	86.4	40-135
13C-2378-TCDF	316/318	26:22	0.76	0.65-0.89	87.1	40-135
13C-2378-TCDD	332/334	27:05	0.82	0.65-0.89	88.1	40-135
13C12-PeCDF 123	352/354	30:14	1.56	1.32-1.78	86.7	40-135
13C12-PeCDD 123	368/370	31:15	1.52	1.32-1.78	90.1	40-135
13C12-HxCDF 678	384/386	33:46	0.51	0.43-0.59	97.6	40-135
13C-123678-HxCDD	402/404	34:27	1.22	1.05-1.43	93.4	40-135
13C-1234678-HpCDF	418/420	36:41	0.43	0.37-0.51	95.9	40-135
13C12-HpCDD 678	436/438	37:44	1.03	0.88-1.20	102	40-135
13C-OCDD	470/472	41:24	0.88	0.76-1.02	125	40-135

Column to be used to flag values outside QC limits.

* within expanded window ±25% of theoretical

USEPA
1DFA - Form I-HR CDD-1
CDD/CDF SAMPLE DATA SUMMARY
HIGH RESOLUTION

SAMPLE No.
05SS62

Lab Name: Eno River Labs Contract No: _____

Lab Code: ENORVR Case No.: _____ TO No.: _____ SDG No.: _____

Matrix: (SOIL/WATER/ASH/TISSUE/OIL) SOIL Lab Sample ID: 423-96-3

Sample wt/vol: 10.194 (g/ml) G Lab File ID: W024204

Water Sample Prep: SEPF (SEPF/SPE) Date Received: 09/30/2006

Concentrated Extract Volume: 20 (uL) Date Extracted: 10/11/2006

Injection Volume: 2(uL) % Solids/Lipids: 72.3 Date Analyzed: 10/17/2006

GC Column: DB-5 ID: 0.25 (mm) Dilution Factor: _____

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

TARGET ANALYTE	SELECTED IONS	PEAK RT	ION RATIO #	CONCENTRATION	Q	EMPC/EDL
2378-TCDD	320/322				U	0.1
12378-PeCDD	356/358				U	0.1
123478-HxCDD	390/392				U	0.1
123678-HxCDD	390/392				U	0.1
123789-HxCDD	390/392				U	0.1
1234678-HpCDD	424/426	37:44	1.06	12.6		
OCDD	458/460	41:24	0.86	3880		
2378-TCDF	304/306				U	0.09
12378-PeCDF	340/342				U	0.08
23478-PeCDF	340/342				U	0.08
123478-HxCDF	374/376				U	0.07
123678-HxCDF	374/376				U	0.07
234678-HxCDF	374/376				U	0.06
123789-HxCDF	374/376				U	0.08
1234678-HpCDF	408/410	36:41	1.45 #	outside ±25%	J	0.15
1234789-HpCDF	408/410				U	0.1
OCDF	442/444	41:36	1.03 #	ok 0.67-1.13 *	J within	0.27

NOTE: Concentrations, Estimated Maximum Possible Concentrations (EMPCs), and Estimated Detection Levels (EDLs) for solid samples are calculated on a dry weight basis (except tissues, which are reported on a wet weight basis with % Lipids).

INTERNAL LABELED COMPOUNDS	SELECTED IONS	PEAK RT	ION RATIO #	ION RATIO LIMITS	%REC #	RECOVERY LIMITS
37Cl-2378-TCDD	328/NA	27:05	NA	NA	76.9	40-135
13C-2378-TCDF	316/318	26:22	0.76	0.65-0.89	81.9	40-135
13C-2378-TCDD	332/334	27:04	0.80	0.65-0.89	77.3	40-135
13C12-PeCDF 123	352/354	30:15	1.53	1.32-1.78	81.2	40-135
13C12-PeCDD 123	368/370	31:15	1.53	1.32-1.78	76.8	40-135
13C12-HxCDF 678	384/386	33:46	0.51	0.43-0.59	93.7	40-135
13C-123678-HxCDD	402/404	34:26	1.25	1.05-1.43	90.0	40-135
13C-1234678-HpCDF	418/420	36:41	0.43	0.37-0.51	91.3	40-135
13C12-HpCDD 678	436/438	37:43	1.04	0.88-1.20	92.7	40-135
13C-OCDD	470/472	41:23	0.88	0.76-1.02	102	40-135

Column to be used to flag values outside QC limits.

* within expanded window ±25% of theoretical

USEPA
1DFA - Form I-HR CDD-1
CDD/CDF SAMPLE DATA SUMMARY
HIGH RESOLUTION

SAMPLE No.
05SS63

Lab Name: Eno River Labs Contract No: _____

Lab Code: ENORVR Case No.: _____ TO No.: _____ SDG No.: _____

Matrix: (SOIL/WATER/ASH/TISSUE/OIL) SOIL Lab Sample ID: 423-96-4

Sample wt/vol: 10.186 (g/ml) G Lab File ID: W024205

Water Sample Prep: SEPF (SEPF/SPE) Date Received: 09/30/2006

Concentrated Extract Volume: 20 (uL) Date Extracted: 10/11/2006

Injection Volume: 2(uL) % Solids/Lipids: 74.9 Date Analyzed: 10/17/2006

GC Column: DB-5 ID: 0.25 (mm) Dilution Factor: _____

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

TARGET ANALYTE	SELECTED IONS	PEAK RT	ION RATIO #	CONCENTRATION	Q	EMPC/EDL
2378-TCDD	320/322				U	0.08
12378-PeCDD	356/358				U	0.08
123478-HxCDD	390/392				U	0.08
123678-HxCDD	390/392	34:27	1.55 #	* within 0.93-1.55	J	0.18
123789-HxCDD	390/392				U	0.08
1234678-HpCDD	424/426	37:44	0.98	13.9		
OCDD	458/460	41:24	0.86	3600		
2378-TCDF	304/306				U	0.07
12378-PeCDF	340/342				U	0.06
23478-PeCDF	340/342				U	0.06
123478-HxCDF	374/376	33:42	1.15	0.12	J	
123678-HxCDF	374/376				U	0.05
234678-HxCDF	374/376				U	0.05
123789-HxCDF	374/376				U	0.06
1234678-HpCDF	408/410	36:42	1.15	0.20	J	
1234789-HpCDF	408/410				U	0.09
OCDF	442/444	41:36	0.90	0.40	J	

NOTE: Concentrations, Estimated Maximum Possible Concentrations (EMPCs), and Estimated Detection Levels (EDLs) for solid samples are calculated on a dry weight basis (except tissues, which are reported on a wet weight basis with % Lipids).

INTERNAL LABELED COMPOUNDS	SELECTED IONS	PEAK RT	ION RATIO #	ION RATIO LIMITS	%REC #	RECOVERY LIMITS
37Cl-2378-TCDD	328/NA	27:05	NA	NA	75.8	40-135
13C-2378-TCDF	316/318	26:22	0.78	0.65-0.89	84.1	40-135
13C-2378-TCDD	332/334	27:04	0.82	0.65-0.89	79.0	40-135
13C12-PeCDF 123	352/354	30:14	1.55	1.32-1.78	83.6	40-135
13C12-PeCDD 123	368/370	31:16	1.52	1.32-1.78	88.5	40-135
13C12-HxCDF 678	384/386	33:46	0.51	0.43-0.59	98.5	40-135
13C-123678-HxCDD	402/404	34:27	1.23	1.05-1.43	90.8	40-135
13C-1234678-HpCDF	418/420	36:41	0.44	0.37-0.51	100	40-135
13C12-HpCDD 678	436/438	37:44	1.04	0.88-1.20	99.8	40-135
13C-OCDD	470/472	41:24	0.88	0.76-1.02	104	40-135

Column to be used to flag values outside QC limits.

* within expanded window ±25% of theoretical

USEPA
1DFA - Form I-HR CDD-1
CDD/CDF SAMPLE DATA SUMMARY
HIGH RESOLUTION

SAMPLE No.
05SS64

Lab Name: Eno River Labs Contract No: _____

Lab Code: ENORVR Case No.: _____ TO No.: _____ SDG No.: _____

Matrix: (SOIL/WATER/ASH/TISSUE/OIL) SOIL Lab Sample ID: 423-96-5A

Sample wt/vol: 9.924 (g/ml) G Lab File ID: T062496

Water Sample Prep: SEPF (SEPF/SPE) Date Received: 09/30/2006

Concentrated Extract Volume: 20 (uL) Date Extracted: 10/11/2006

Injection Volume: 2(uL) % Solids/Lipids: 82.7 Date Analyzed: 10/16/2006

GC Column: DB-5 ID: 0.25 (mm) Dilution Factor: _____

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

TARGET ANALYTE	SELECTED IONS	PEAK RT	ION RATIO #	CONCENTRATION	Q	EMPC/EDL
2378-TCDD	320/322	26:58	0.66	2.7		
12378-PeCDD	356/358	31:11	1.60	3.0	J	
123478-HxCDD	390/392	34:18	1.30	4.3	J	
123678-HxCDD	390/392	34:23	1.27	10.9		
123789-HxCDD	390/392	34:42	1.22	6.4		
1234678-HpCDD	424/426	37:40	1.01	338		
OCDD	458/460	41:20	0.83	8710	E	
2378-TCDF	304/306	26:17	0.82	8.1		
12378-PeCDF	340/342	30:12	1.42 * within 1.16-1.94		X	17.1
23478-PeCDF	340/342	30:52	1.29 * within 1.16-1.94		J	2.8
123478-HxCDF	374/376	33:35	1.31	9.4		
123678-HxCDF	374/376	33:42	1.28	3.9	J	
234678-HxCDF	374/376	34:12	1.23	4.7	J	
123789-HxCDF	374/376				U	0.2
1234678-HpCDF	408/410	36:37	1.04	32.1		
1234789-HpCDF	408/410	38:11	0.97	2.6	J	
OCDF	442/444	41:31	0.90	45.3		

NOTE: Concentrations, Estimated Maximum Possible Concentrations (EMPCs), and Estimated Detection Levels (EDLs) for solid samples are calculated on a dry weight basis (except tissues, which are reported on a wet weight basis with % Lipids).

INTERNAL LABELED COMPOUNDS	SELECTED IONS	PEAK RT	ION RATIO #	ION RATIO LIMITS	%REC #	RECOVERY LIMITS
37Cl-2378-TCDD	328/NA	26:58	NA	NA	85.8	40-135
13C-2378-TCDF	316/318	26:14	0.73	0.65-0.89	81.6	40-135
13C-2378-TCDD	332/334	26:56	0.84	0.65-0.89	86.6	40-135
13C12-PeCDF 123	352/354	30:09	1.44	1.32-1.78	95.5	40-135
13C12-PeCDD 123	368/370	31:11	1.50	1.32-1.78	108	40-135
13C12-HxCDF 678	384/386	33:41	0.50	0.43-0.59	93.6	40-135
13C-123678-HxCDD	402/404	34:22	1.14	1.05-1.43	97.1	40-135
13C-1234678-HpCDF	418/420	36:36	0.44	0.37-0.51	102	40-135
13C12-HpCDD 678	436/438	37:39	1.05	0.88-1.20	105	40-135
13C-OCDD	470/472	41:19	0.88	0.76-1.02	120	40-135

Column to be used to flag values outside QC limits.

* within expanded window of ±25 % theoretical

USEPA
1DFA - Form I-HR CDD-1
CDD/CDF SAMPLE DATA SUMMARY
HIGH RESOLUTION

SAMPLE No.
05SS65

Lab Name: Eno River Labs Contract No: _____

Lab Code: ENORVR Case No.: _____ TO No.: _____ SDG No.: _____

Matrix: (SOIL/WATER/ASH/TISSUE/OIL) SOIL Lab Sample ID: 423-96-6

Sample wt/vol: 10.097 (g/ml) G Lab File ID: T062499

Water Sample Prep: SEPF (SEPF/SPE) Date Received: 09/30/2006

Concentrated Extract Volume: 20 (uL) Date Extracted: 10/11/2006

Injection Volume: 2(uL) % Solids/Lipids: 79.5 Date Analyzed: 10/16/2006

GC Column: DB-5 ID: 0.25 (mm) Dilution Factor: _____

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

TARGET ANALYTE	SELECTED IONS	PEAK RT	ION RATIO #	CONCENTRATION	Q	EMPC/EDL
2378-TCDD	320/322				U	0.2
12378-PeCDD	356/358				U	0.2
123478-HxCDD	390/392				U	0.2
123678-HxCDD	390/392	34:22	1.34	0.79	J	
123789-HxCDD	390/392	34:42	1.36	0.63	J	
1234678-HpCDD	424/426	37:40	1.02	37.4		
OCDD	458/460	41:20	0.83	2880		
2378-TCDF	304/306	26:16	0.70	0.41	J	
12378-PeCDF	340/342				U	0.2
23478-PeCDF	340/342				U	0.2
123478-HxCDF	374/376	33:35	1.22	0.29	J	
123678-HxCDF	374/376				U	0.1
234678-HxCDF	374/376				U	0.1
123789-HxCDF	374/376				U	0.2
1234678-HpCDF	408/410	36:37	1.12	1.4	J	
1234789-HpCDF	408/410				U	0.2
OCDF	442/444	41:31	1.06	* within 0.67-1.43	J	1.5

NOTE: Concentrations, Estimated Maximum Possible Concentrations (EMPCs), and Estimated Detection Levels (EDLs) for solid samples are calculated on a dry weight basis (except tissues, which are reported on a wet weight basis with % Lipids).

INTERNAL LABELED COMPOUNDS	SELECTED IONS	PEAK RT	ION RATIO #	ION RATIO LIMITS	%REC #	RECOVERY LIMITS
37Cl-2378-TCDD	328/NA	26:58	NA	NA	91.6	40-135
13C-2378-TCDF	316/318	26:14	0.75	0.65-0.89	88.6	40-135
13C-2378-TCDD	332/334	26:56	0.85	0.65-0.89	90.8	40-135
13C12-PeCDF 123	352/354	30:09	1.48	1.32-1.78	104	40-135
13C12-PeCDD 123	368/370	31:11	1.53	1.32-1.78	112	40-135
13C12-HxCDF 678	384/386	33:41	0.50	0.43-0.59	95.7	40-135
13C-123678-HxCDD	402/404	34:21	1.19	1.05-1.43	99.8	40-135
13C-1234678-HpCDF	418/420	36:36	0.45	0.37-0.51	101	40-135
13C12-HpCDD 678	436/438	37:39	1.03	0.88-1.20	103	40-135
13C-OCDD	470/472	41:18	0.88	0.76-1.02	98.8	40-135

Column to be used to flag values outside QC limits.

* within expanded window ±25% of theoretical