



Hercules Incorporated
Hercules Plaza
1313 North Market Street
Wilmington, DE 19894-0001
(302) 594-5000

December 28, 1994

CERTIFIED MAIL - RETURN RECEIPT REQUESTED

Mr. M. S. Ramesh
Superfund Enforcement Branch (6H-EA)
U.S. EPA Region VI
1445 Ross Avenue
Dallas, TX 75202-2733

Mr. M. Arjmandi
Arkansas Department of Pollution Control and Ecology
Hazardous Waste Division
P.O. Box 9583
Little Rock, AR 72219

Gentlemen:

Subject: Vertac Site Soil TEQ Ratio

Aliquots of the five soil samples from the Vertac Site used in a study of dioxin bioavailability were analyzed using Method 8280 to determine dioxin and furan congener concentrations. The approximate sample locations are shown on the attached figure. The analytical results for each sample was used to calculate a Toxic Equivalency (TEQ) concentration for the sample. Then the ratio of 2,3,7,8 TCDD to TEQ was determined. The results of these calculations are presented in the attached table. The laboratory results are enclosed as Attachment 1.

The ratio of 2,3,7,8 TCDD to TEQ ranged between 0.73 and 1.00. This indicates that the accuracy of the remedial cost estimates included in the Operable Unit II Feasibility Study, which are based on the concentration of 2,3,7,8 TCDD in site soils, will not be seriously impacted if EPA determines that remediation must be based on TEQs.

Please contact me if you have any questions regarding this matter.

Sincerely,

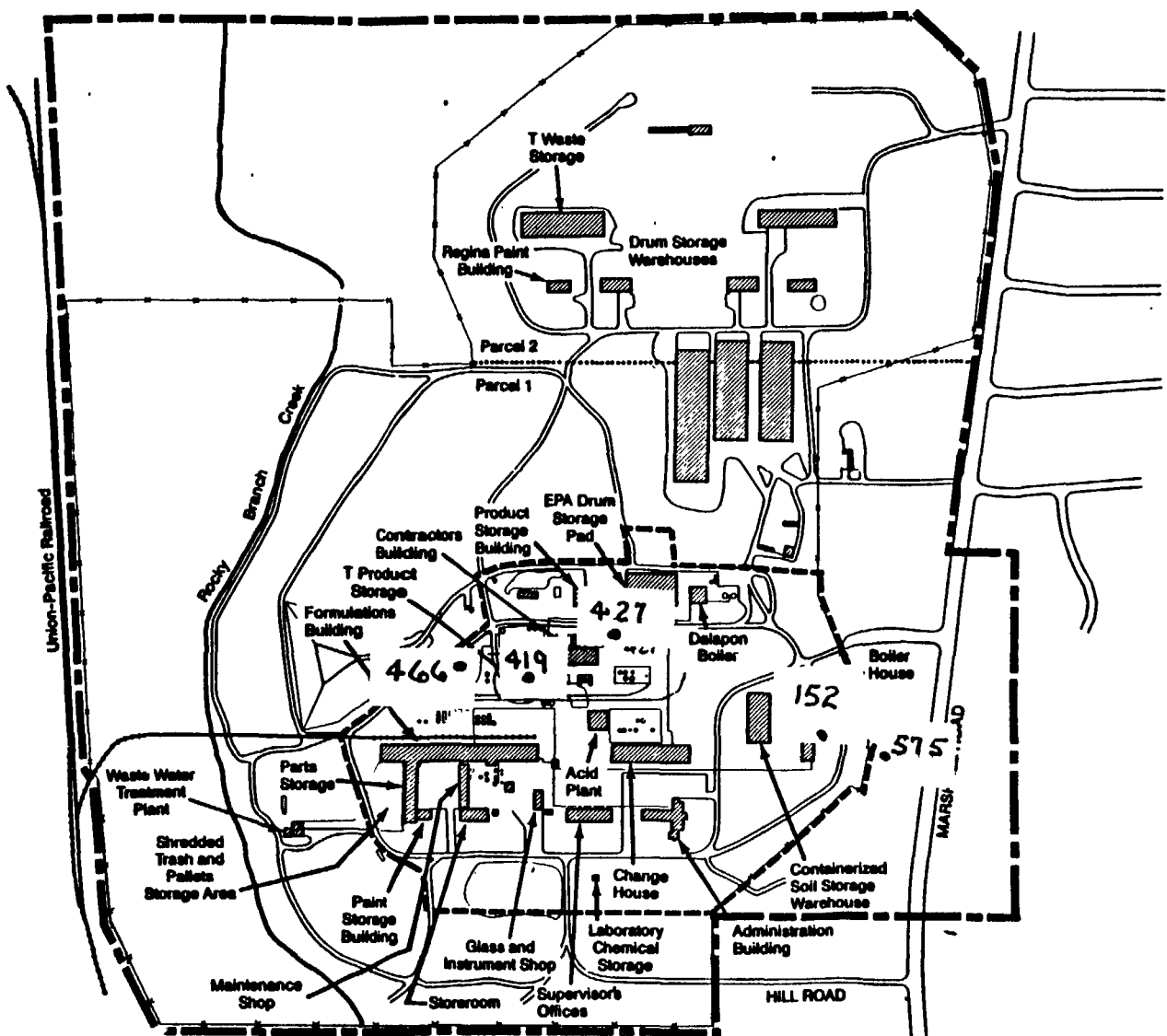
Douglas J. Keilman
Director, Environmental Affairs

DJK/lar
Enclosures
wp/i:soilteq.ltr
cc: R. Kapuscinski, ENVIRON Corporation

TABLE 1

Summary of Vertac Soil TEQ Adjusted Concentrations

Sample ID	Soil Grid	Plant Location	2,3,7,8 TCDD/ PPB	Total TEQ/ PPB	2,3,7,8 TCDD/ Total TEQ
HE-TS-466-SSX-01	466	West of T Product Storage	9.39	12.76	0.736
HE-TS-152-SSX-0	152	East of Boiler House	11.84	11.87	0.997
HE-TS-427-SSX-01	427	South of Product Storage	14.48	18.08	0.801
HE-TS-575-SSX-01	575	East of Boiler House	71.37	71.37	1.000
HE-TS-419-SSX-01	419	East of T Product Storage	262.78	336.80	0.780



Approximate
Location of soil
Samples

- Legend
- Boundary Between
Parcels 1 and 2
 - Central Process Area
 - ==== Property Line
 - ~~~~~ Rocky Branch Creek
 - ▨ Buildings and Foundations
 - Railroad
 - Fence



Revised February 1993

FIGURE 1-2 SITE MAP, VERTAC SITE
JACKSONVILLE, ARKANSAS
1-7

Source: Hercules Incorporated, Personal Communication, 1989
Base Map Adapted from Map by CH2M Hill

ATTACHMENT 1

001530

IK1518

Five soil samples for this case were received on October 31, 1994. These samples were checked for integrity, logged and assigned laboratory identification numbers per the current Standard Operating Procedures (SOP). Any discrepancies noted during this process have been documented on the chain of custody.

The samples were extracted, prepared and analyzed according to the current Statement of Work for Analysis of PCDD/PCDF (Document Number DFLM01.1). Only ten (10) grams were sent per sample, so five (5) grams were used for extraction. This was done in case reextraction would be necessary at a later date. All detection limits were met using the smaller sample size. The samples were found to contain some analytes. No particular problems were encountered during the analytical process.

All QC samples (method blank, laboratory control and laboratory control duplicate) were within established control limits.

If any questions arise concerning this analysis, please contact your Project Manager at 317-875-5894.

RJA
12-1-94

1DFA
PCDD/PCDF SAMPLE DATA SUMMARY

SAMPLE NO.

MB

Lab Name: PACE-INDIANAPOLIS Contract:

Lab Code: IN 049 Case No.: IK1518 SDG No.:

Matrix: SOIL (Soil/Water/Waste/Ash) SAS No:

Sample wt/vol: 5.01 (g/mL) g Lab Sample ID: MB

Water Sample Prep: (Sept/Cont) Lab File ID: 0401005.D

Concentrated Extract Volume: 50 (uL) Date Received:

Injection Volume: 2 (uL) % Solids: 0.0 Date Extracted: 11/14/94

GC Column: DB-5 ID: 0.25 (mm) Date Analyzed: 11/30/94

Dilution Factor: 1

Concentration Units: (ng/L or ug/Kg) ug/Kg

001533

ANALYTE	SELECTED IONS	PEAK RT	ION RATIO	#	CONCENTRATION	Q	EMPC/EDL
2378-TCDD	320/322					U	0.0249
2378-TCDF	304/306					U	0.0208
12378-PeCDF	340/342					U	0.0189
12378-PeCDD	356/358					U	0.0303
23478-PeCDF	340/342					U	0.0182
123478-HxCDF	374/376					U	0.0197
123678-HxCDF	374/376					U	0.0172
123478-HxCDD	390/392					U	0.0202
123678-HxCDD	390/392					U	0.0205
123789-HxCDD	390/392					U	0.0188
234678-HxCDF	374/376					U	0.0198
123789-HxCDF	374/376					U	0.0226
1234678-HpCDF	408/410					U	0.0153
1234678-HpCDD	424/426					U	0.0163
1234789-HpCDF	408/410					U	0.0176
OCDD	458/460					U	0.0260
OCDF	442/444					U	0.0274

NOTE: Concentrations, EMPC's, and EDL's are calculated on a wet weight basis.

INTERNAL STANDARDS	SELECTED IONS	PEAK RT	ION RATIO	#	ION RATIO LIMITS	% REC	RECOVERY # LIMITS
13C-2378-TCDF	316/318	16.77	0.79		0.65-0.89	72.0	25-150
13C-2378-TCDD	332/334	17.31	0.78		0.65-0.89	67.0	25-150
13C-123678-HxCDD	402/404	26.07	1.22		1.05-1.43	74.3	25-150
13C-1234678-HpCDF	420/422	29.69	1.00		0.88-1.20	71.5	25-150
13C-OCDD	470/472	37.17	0.92		0.76-1.01	60.2	25-150
37Cl-2378-TCDD	328/NA	17.33	NA		NA	61.7	25-150

Column to be used to flag values outside QC limits.

1DFA
PCDD/PCDF SAMPLE DATA SUMMARY

SAMPLE NO.

HE-TS-152-SSX-01

001539

Lab Name: PACE-INDIANAPOLIS Contract:
 Lab Code: IN 049 Case No.: IK1518 SDG No.:
 Matrix: SOIL (Soil/Water/Waste/Ash) SAS No.:
 Sample wt/vol: 5.01 (g/mL) g Lab Sample ID: IK1518-1
 Water Sample Prep: (Sept/Cont) Lab File ID: 0701010.D
 Concentrated Extract Volume: 50 (uL) Date Received: 10/31/94
 Injection Volume: 2 (uL) % Solids: 0.0 Date Extracted: 11/14/94
 GC Column: DB-5 ID: 0.25 (mm) Date Analyzed: 11/30/94
 Dilution Factor: 1
 Concentration Units: (ng/L or ug/Kg) ug/Kg

ANALYTE	SELECTED IONS	PEAK RT	ION RATIO	#	CONCENTRATION	Q	EMPC/EDL
2378-TCDD	320/322	17.35	0.75		11.8414		
2378-TCDF	304/306	16.84	0.82		0.1646	J	
12378-PeCDF	340/342					U	0.0298
12378-PeCDD	356/358					U	0.0474
23478-PeCDF	340/342					U	0.0286
123478-HxCDF	374/376					U	0.0290
123678-HxCDF	374/376					U	0.0253
123478-HxCDD	390/392					U	0.0250
123678-HxCDD	390/392					U	0.0253
123789-HxCDD	390/392					U	0.0232
234678-HxCDF	374/376					U	0.0291
123789-HxCDF	374/376					U	0.0333
1234678-HpCDF	408/410					U	0.0216
1234678-HpCDD	424/426					U	0.0201
1234789-HpCDF	408/410					U	0.0248
OCDD	458/460	37.23	0.92		7.7878		
OCDF	442/444					U	0.0529

NOTE: Concentrations, EMPC's, and EDL's are calculated on a wet weight basis.

INTERNAL STANDARDS	SELECTED IONS	PEAK RT	ION RATIO	#	ION RATIO LIMITS	% REC	RECOVERY # LIMITS
13C-2378-TCDF	316/318	16.82	0.83		0.65-0.89	65.0	25-150
13C-2378-TCDD	332/334	17.35	0.79		0.65-0.89	58.2	25-150
13C-123678-HxCDD	402/404	26.09	1.22		1.05-1.43	70.8	25-150
13C-1234678-HpCDF	420/422	29.71	0.99		0.88-1.20	63.4	25-150
13C-OCDD	470/472	37.21	0.92		0.76-1.01	46.4	25-150
37Cl-2378-TCDD	328/NA	17.35	NA		NA	56.5	25-150

Column to be used to flag values outside QC limits.

1DFA
PCDD/PCDF SAMPLE DATA SUMMARY

SAMPLE NO.

HE-TS-419-SSX-01

001534

Lab Name: PACE-INDIANAPOLIS Contract: _____

Lab Code: IN 049 Case No.: IK1518 SDG No.: _____

Matrix: SOIL (Soil/Water/Waste/Ash) SAS No.: _____

Sample wt/vol: 5.05 (g/mL) g Lab Sample ID: IK1518-2

Water Sample Prep: (Sepf/Cont) Lab File ID: 1101014.D

Concentrated Extract Volume: 50 (uL) Date Received: 10/31/94

Injection Volume: 2 (uL) % Solids: 0.0 Date Extracted: 11/14/94

GC Column: DB-5 ID: 0.25 (mm) Date Analyzed: 12/01/94

Dilution Factor: 1

Concentration Units: (ng/L or ug/Kg) ug/Kg

ANALYTE	SELECTED IONS	PEAK RT	ION RATIO	#	CONCENTRATION	Q	EMPC/EDL
2378-TCDD	320/322	17.42	0.80		262.7751		
2378-TCDF	304/306	16.88	0.79		145.7234		
12378-PeCDF	340/342	20.54	1.54		786.7279		
12378-PeCDD	356/358	21.68	1.58		3.9385		
23478-PeCDF	340/342	21.31	1.52		2.2140	J	
123478-HxCDF	374/376	24.97	1.26		127.8360		
123678-HxCDF	374/376	25.07	1.23		1.2300	J	
123478-HxCDD	390/392	26.00	1.30		1.6443	J	
123678-HxCDD	390/392	26.11	1.26		11.8290		
123789-HxCDD	390/392	26.60	1.27		3.2689		
234678-HxCDF	374/376	25.84	1.33		1.7723	J	
123789-HxCDF	374/376	27.12	1.25		16.5522		
1234678-HpCDF	408/410	29.75	1.04		34.6877		
1234678-HpCDD	424/426	31.65	1.02		22.5332		
1234789-HpCDF	408/410	32.52	1.10		0.5082	J	
OCDD	458/460	37.23	0.91		46.7362		
OCDF	442/444	37.45	0.77		4.5880	J	

NOTE: Concentrations, EMPC's, and EDL's are calculated on a wet weight basis.

INTERNAL STANDARDS	SELECTED IONS	PEAK RT	ION RATIO	#	ION RATIO LIMITS	% REC	RECOVERY # LIMITS
13C-2378-TCDF	316/318	16.86	0.76		0.65-0.89	65.0	25-150
13C-2378-TCDD	332/334	17.40	0.70		0.65-0.89	86.5	25-150
13C-123678-HxCDD	402/404	26.09	1.22		1.05-1.43	73.0	25-150
13C-1234678-HpCDF	420/422	29.73	0.99		0.88-1.20	60.0	25-150
13C-OCDD	470/472	37.21	0.94		0.76-1.01	36.9	25-150
37Cl-2378-TCDD	328/NA	17.42	NA		NA	84.4	25-150

Column to be used to flag values outside QC limits.

1DFA
PCDD/PCDF SAMPLE DATA SUMMARY

SAMPLE NO.

HE-TS-427-SSX-01

Lab Name: PACE-INDIANAPOLIS Contract:

Lab Code: IN 049 Case No.: IK1518 SDG No.:

Matrix: SOIL (Soil/Water/Waste/Ash) SAS No.:

Sample wt/vol: 5.09 (g/mL) g Lab Sample ID: IK1518-3

Water Sample Prep: (Sepf/Cont) Lab File ID: 0801011.D

Concentrated Extract Volume: 50 (uL) Date Received: 10/31/94

Injection Volume: 2 (uL) % Solids: 0.0 Date Extracted: 11/14/94

GC Column: DB-5 ID: 0.25 (mm) Date Analyzed: 11/30/94

Dilution Factor: 1

Concentration Units: (ng/L or ug/Kg) ug/Kg

015015

ANALYTE	SELECTED IONS	PEAK RT	ION RATIO	#	CONCENTRATION	Q	EMPC/EDL
2378-TCDD	320/322	17.33	0.80		14.4820		
2378-TCDF	304/306	16.82	0.79		33.2367		
12378-PeCDF	340/342					U	0.0264
12378-PeCDD	356/358	21.68	1.74		0.5096	J	
23478-PeCDF	340/342					U	0.0253
123478-HxCDF	374/376					U	0.0316
123678-HxCDF	374/376					U	0.0276
123478-HxCDD	390/392					U	0.0200
123678-HxCDD	390/392	26.09	1.28		0.1499	J	
123789-HxCDD	390/392					U	0.0186
234678-HxCDF	374/376					U	0.0318
123789-HxCDF	374/376					U	0.0363
1234678-HpCDF	408/410	29.73	1.11		0.1058	J	
1234678-HpCDD	424/426	31.67	1.05		0.2100	J	
1234789-HpCDF	408/410					U	0.0325
OCDD	458/460	37.23	0.93		6.0815		
OCDF	442/444					U	0.0903

NOTE: Concentrations, EMPC's, and EDL's are calculated on a wet weight basis.

INTERNAL STANDARDS	SELECTED IONS	PEAK RT	ION RATIO	#	ION RATIO LIMITS	% REC	RECOVERY # LIMITS
13C-2378-TCDF	316/318	16.79	0.80		0.65-0.89	69.1	25-150
13C-2378-TCDD	332/334	17.33	0.78		0.65-0.89	68.2	25-150
13C-123678-HxCDD	402/404	26.09	1.22		1.05-1.43	74.2	25-150
13C-1234678-HpCDF	420/422	29.73	1.00		0.88-1.20	64.5	25-150
13C-OCDD	470/472	37.21	0.92		0.76-1.01	45.1	25-150
37Cl-2378-TCDD	328/NA	17.33	NA		NA	64.2	25-150

Column to be used to flag values outside QC limits.

1DFA
PCDD/PCDF SAMPLE DATA SUMMARY

SAMPLE NO.

HE-TS-466-SSX-01

Lab Name: PACE-INDIANAPOLIS Contract: _____

Lab Code: IN 049 Case No.: IK1518 SDG No.: _____

Matrix: SOIL (Soil/Water/Waste/Ash) SAS No: _____

Sample wt/vol: 5.14 (g/mL) g Lab Sample ID: IK1518-4

Water Sample Prep: (Sept/Cont) Lab File ID: 0901012.D

Concentrated Ext: act Volume: 50 (uL) Date Received: 10/31/94

Injection Volume: 2 (uL) % Solids: 0.0 Date Extracted: 11/14/94

GC Column: DB-5 ID: 0.25 (mm) Date Analyzed: 11/30/94

Dilution Factor: 1

Concentration Units: (ng/L or ug/Kg) ug/Kg

001530

ANALYTE	SELECTED IONS	PEAK RT	ION RATIO	#	CONCENTRATION	Q	EMPC/EDL
2378-TCDD	320/322	17.33	0.81		9.3935		
2378-TCDF	304/306	16.82	0.78		17.2265		
12378-PeCDF	340/342					U	0.0590
12378-PeCDD	356/358	21.68	1.84		0.6243	J	
23478-PeCDF	340/342	21.29	1.78		0.6277	J	
123478-HxCDF	374/376	24.93	1.27		3.0229		
123678-HxCDF	374/376					U	0.0392
123478-HxCDD	390/392	25.98	1.35		0.3851	J	
123678-HxCDD	390/392	26.11	1.32		1.2110	J	
123789-HxCDD	390/392	26.60	1.30		0.6344	J	
234678-HxCDF	374/376	25.78	1.26		0.4191	J	
123789-HxCDF	374/376	27.12	1.11		1.4647	J	
1234678-HpCDF	408/410	29.75	1.05		1.4905	J	
1234678-HpCDD	424/426	31.65	1.03		8.4002		
1234789-HpCDF	408/410					U	0.0440
OCDD	458/460	37.27	0.91		201.8769		
OCDF	442/444	37.47	0.77		1.7108	J	

NOTE: Concentrations, EMPC's, and EDL's are calculated on a wet weight basis.

INTERNAL STANDARDS	SELECTED IONS	PEAK RT	ION RATIO	#	ION RATIO LIMITS	% REC	RECOVERY # LIMITS
13C-2378-TCDF	316/318	16.79	0.80		0.65-0.89	66.4	25-150
13C-2378-TCDD	332/334	17.33	0.75		0.65-0.89	72.4	25-150
13C-123678-HxCDD	402/404	26.09	1.22		1.05-1.43	78.8	25-150
13C-1234678-HpCDF	420/422	29.73	0.99		0.88-1.20	67.5	25-150
13C-OCDD	470/472	37.25	0.94		0.76-1.01	50.9	25-150
37Cl-2378-TCDD	328/NA	17.33	NA		NA	57.6	25-150

Column to be used to flag values outside QC limits.

1DFA
PCDD/PCDF SAMPLE DATA SUMMARY

SAMPLE NO.

HE-TS-575-SSX-01

Lab Name: PACE-INDIANAPOLIS Contract: SDG No.:
 Lab Code: IN 049 Case No.: IK1518 SAS No.:
 Matrix: SOIL (Soil/Water/Waste/Ash) Lab Sample ID: IK1518-5
 Sample wt/vol: 5.02 (g/mL) g Lab File ID: 1001013.D
 Water Sample Prep: (Sept/Cont) Date Received: 10/31/94
 Concentrated Extract Volume: 50 (uL) Date Extracted: 11/14/94
 Injection Volume: 2 (uL) % Solids: 0.0 Date Analyzed: 12/01/94
 GC Column: DB-5 ID: 0.25 (mm) Dilution Factor: 1

Concentration Units: (ng/L or ug/Kg) ug/Kg

ANALYTE	SELECTED IONS	PEAK RT	ION RATIO	#	CONCENTRATION	Q	EMPC/EDL
2378-TCDD	320/322	17.33	0.78		71.3723		
2378-TCDF	304/306					U	0.0131
12378-PeCDF	340/342					U	0.0158
12378-PeCDD	356/358					U	0.0265
23478-PeCDF	340/342					U	0.0152
123478-HxCDF	374/376					U	0.0213
123678-HxCDF	374/376					U	0.0186
123478-HxCDD	390/392					U	0.0182
123678-HxCDD	390/392					U	0.0184
123789-HxCDD	390/392					U	0.0169
234678-HxCDF	374/376					U	0.0214
123789-HxCDF	374/376					U	0.0244
1234678-HpCDF	408/410					U	0.0187
1234678-HpCDD	424/426					U	0.0096
1234789-HpCDF	408/410					U	0.0215
OCDD	458/460	37.21	0.93		1.8555	J	
OCDF	442/444					U	0.0345

NOTE: Concentrations, EMPC's, and EDL's are calculated on a wet weight basis.

INTERNAL STANDARDS	SELECTED IONS	PEAK RT	ION RATIO	#	ION RATIO LIMITS	% REC	RECOVERY # LIMITS
13C-2378-TCDF	316/318	16.79	0.80		0.65-0.89	68.9	25-150
13C-2378-TCDD	332/334	17.33	0.79		0.65-0.89	63.5	25-150
13C-123678-HxCDD	402/404	26.07	1.22		1.05-1.43	75.8	25-150
13C-1234678-HpCDF	420/422	29.71	0.99		0.88-1.20	65.3	25-150
13C-OCDD	470/472	37.19	0.93		0.76-1.01	42.7	25-150
37Cl-2378-TCDD	328/NA	17.33	NA		NA	64.0	25-150

Column to be used to flag values outside QC limits.

001537

1DFA
PCDD/PCDF SAMPLE DATA SUMMARY

SAMPLE NO.

LCS

001538

Lab Name: PACE-INDIANAPOLIS Contract: _____

Lab Code: IN 049 Case No.: IK1518 SDG No.: _____

Matrix: SOIL (Soil/Water/Waste/Ash) SAS No.: _____

Sample wt/vol: 5.04 (g/mL) g Lab Sample ID: LCS

Water Sample Prep: (Sepf/Cont) Lab File ID: 0501007.D

Concentrated Extract Volume: 50 (uL) Date Received: _____

Injection Volume: 2 (uL) % Solids: 0.0 Date Extracted: 11/14/94

GC Column: DB-5 ID: 0.25 (mm) Date Analyzed: 11/30/94

Dilution Factor: 1

Concentration Units: (ng/L or ug/Kg) ug/Kg

ANALYTE	SELECTED IONS	PEAK RT	ION RATIO	#	CONCENTRATION	Q	EMPC/EDL
2378-TCDD	320/322	17.33	0.78		5.1727		
2378-TCDF	304/306	16.79	0.76		4.9997		
12378-PeCDF	340/342	20.48	1.49		14.6239		
12378-PeCDD	356/358	21.64	1.50		14.2110		
23478-PeCDF	340/342					U	0.0164
123478-HxCDF	374/376					U	0.0155
123678-HxCDF	374/376	25.05	1.25		13.1712		
123478-HxCDD	390/392					U	0.0157
123678-HxCDD	390/392	26.07	1.28		12.6211		
123789-HxCDD	390/392	26.58	1.31		0.5681	J	
234678-HxCDF	374/376					U	0.0156
123789-HxCDF	374/376					U	0.0178
1234678-HpCDF	408/410	29.71	1.04		12.5573		
1234678-HpCDD	424/426	31.61	1.03		10.9339		
1234789-HpCDF	408/410					U	0.0165
OCDD	458/460	37.21	0.93		25.1712		
OCDF	442/444	37.41	0.91		23.2625		

NOTE: Concentrations, EMPC's, and EDL's are calculated on a wet weight basis.

INTERNAL STANDARDS	SELECTED IONS	PEAK RT	ION RATIO	#	ION RATIO LIMITS	% REC	RECOVERY # LIMITS
13C-2378-TCDF	316/318	16.77	0.80		0.65-0.89	70.0	25-150
13C-2378-TCDD	332/334	17.31	0.79		0.65-0.89	62.6	25-150
13C-123678-HxCDD	402/404	26.07	1.21		1.05-1.43	75.2	25-150
13C-1234678-HpCDF	420/422	29.69	1.00		0.88-1.20	70.3	25-150
13C-OCDD	470/472	37.19	0.93		0.76-1.01	57.2	25-150
37Cl-2378-TCDD	328/NA	17.33	NA		NA	59.8	25-150

Column to be used to flag values outside QC limits.

1DFA
PCDD/PCDF SAMPLE DATA SUMMARY

SAMPLE NO.

LCSD

001539

Lab Name: PACE-INDIANAPOLIS Contract: _____
 Lab Code: IN 049 Case No.: IK1518 SDG No.: _____
 Matrix: SOIL (Soil/Water/Waste/Ash) SAS No.: _____
 Sample wt/vol: 5.08 (g/mL) g Lab Sample ID: LCSD
 Water Sample Prep: (Sep/Cont) Lab File ID: 0601008.D
 Concentrated Extract Volume: 50 (uL) Date Received: _____
 Injection Volume: 2 (uL) % Solids: 0.0 Date Extracted: 11/14/94
 GC Column: DB-5 ID: 0.25 (mm) Date Analyzed: 11/30/94
 Dilution Factor: 1
 Concentration Units: (ng/L or ug/Kg) ug/Kg

ANALYTE	SELECTED IONS	PEAK RT	ION RATIO	#	CONCENTRATION	Q	EMPC/EDL
2378-TCDD	320/322	17.33	0.77		4.7685		
2378-TCDF	304/306	16.79	0.78		4.8305		
12378-PeCDF	340/342	20.50	1.49		14.2278		
12378-PeCDD	356/358	21.66	1.52		13.3308		
23478-PeCDF	340/342					U	0.0228
123478-HxCDF	374/376					U	0.0261
123678-HxCDF	374/376	25.05	1.27		12.7712		
123478-HxCDD	390/392					U	0.0192
123678-HxCDD	390/392	26.07	1.26		12.0212		
123789-HxCDD	390/392	26.58	1.28		0.5221	J	
234678-HxCDF	374/376					U	0.0262
123789-HxCDF	374/376					U	0.0300
1234678-HpCDF	408/410	29.71	1.05		12.0118		
1234678-HpCDD	424/426	31.61	1.03		10.1408		
1234789-HpCDF	408/410					U	0.0223
OCDD	458/460	37.19	0.92		24.1307		
OCDF	442/444	37.41	0.91		21.9396		

NOTE: Concentrations, EMPC's, and EDL's are calculated on a wet weight basis.

INTERNAL STANDARDS	SELECTED IONS	PEAK RT	ION RATIO	#	ION RATIO LIMITS	% RECOVERY REC #	RECOVERY LIMITS
13C-2378-TCDF	316/318	16.79	0.79		0.65-0.89	73.1	25-150
13C-2378-TCDD	332/334	17.33	0.78		0.65-0.89	68.5	25-150
13C-123678-HxCDD	402/404	26.07	1.21		1.05-1.43	80.2	25-150
13C-1234678-HpCDF	420/422	29.69	0.99		0.88-1.20	74.3	25-150
13C-OCDD	470/472	37.17	0.93		0.76-1.01	56.4	25-150
37Cl-2378-TCDD	328/NA	17.33	NA		NA	61.4	25-150

Column to be used to flag values outside QC limits.

1DFB
PCDD/PCDF TOXICITY EQUIVALENCE SUMMARY

SAMPLE NO.

MB

001540

Lab Name: PACE-INDIANAPOLIS Contract:
 Lab Code: IN 049 Case No.: IK1518 SAS No.:
 Matrix: SOIL (Soil/Water/Waste/Ash) SDG No.:
 Sample wt/vol: 5.01 (g/mL) g Lab Sample ID: MB
 Water Sample Prep: (Sep/Cont) Lab File ID: 0401005.D
 Concentrated Extract Volume: 50 (uL) Date Received:
 Injection Volume: 2 (uL) % Solids: 0 Date Extracted: 11/14/94
 GC Column: DB-5 ID: 0.25 (mm) Date Analyzed: 11/30/94
 Dilution Factor: 1

Concentration Units: ug/Kg (ng/L or ug/Kg)

ANALYTE	CONCENTRATION	TEF	TEF-ADJUSTED CONCENTRATION
2378-TCDD	00.0000	x 1.0 =	0.000
2378-TCDF	00.0000	x 0.1 =	0.000
12378-PeCDF	00.0000	x 0.05 =	0.000
12378-PeCDD	00.0000	x 0.5 =	0.000
23478-PeCDF	00.0000	x 0.5 =	0.000
123478-HxCDF	00.0000	x 0.1 =	0.000
123678-HxCDF	00.0000	x 0.1 =	0.000
123478-HxCDD	00.0000	x 0.1 =	0.000
123678-HxCDD	00.0000	x 0.1 =	0.000
123789-HxCDD	00.0000	x 0.1 =	0.000
234678-HxCDF	00.0000	x 0.1 =	0.000
123789-HxCDF	00.0000	x 0.1 =	0.000
1234678-HpCDF	00.0000	x 0.01 =	0.000
1234678-HpCDD	00.0000	x 0.01 =	0.000
1234789-HpCDF	00.0000	x 0.01 =	0.000
OCDD	00.0000	x 0.001 =	0.000
OCDF	00.0000	x 0.001 =	0.000
		TOTAL =	0.00

NOTE: Do NOT include EMPC or EDL values in the TEF-adjusted Concentration.

If the Total Toxic Equivalent Concentration of the sample is greater than 7 ng/L for an aqueous sample, greater than 0.7 ug/Kg for any solid matrix, or greater than 7 ug/Kg for a chemical waste sample, then second column confirmation of the results may be required.

1DFB
PCDD/PCDF TOXICITY EQUIVALENCE SUMMARY

SAMPLE NO.

HE-TS-152-SSX-01

001521

Lab Name: PACE-INDIANAPOLIS Contract:
 Lab Code: IN 049 Case No.: IK1518 SAS No.:
 Matrix: SOIL (Soil/Water/Waste/Ash) SDG No.:
 Sample wt/vol: 5.01 (g/mL) g Lab Sample ID: IK1518-1
 Water Sample Prep: (Sept/Cont) Lab File ID: 0701010.D
 Concentrated Extract Volume: 50 (uL) Date Received: 10/31/94
 Injection Volume: 2 (uL) % Solids: 0 Date Extracted: 11/14/94
 GC Column: DB-5 ID: 0.25 (mm) Date Analyzed: 11/30/94
 Dilution Factor: 1

Concentration Units: ug/hg (ng/L or ug/Kg)

ANALYTE	CONCENTRATION	TEF	TEF-ADJUSTED CONCENTRATION
2378-TCDD	11.8414	x 1.0 =	11.841
2378-TCDF	00.1646	x 0.1 =	0.016
12378-PeCDF	00.0000	x 0.05 =	0.000
12378-PeCDD	00.0000	x 0.5 =	0.000
23478-PeCDF	00.0000	x 0.5 =	0.000
123478-HxCDF	00.0000	x 0.1 =	0.000
123678-HxCDF	00.0000	x 0.1 =	0.000
123478-HxCDD	00.0000	x 0.1 =	0.000
123678-HxCDD	00.0000	x 0.1 =	0.000
123789-HxCDD	00.0000	x 0.1 =	0.000
234678-HxCDF	00.0000	x 0.1 =	0.000
123789-HxCDF	00.0000	x 0.1 =	0.000
1234678-HpCDF	00.0000	x 0.01 =	0.000
1234678-HpCDD	00.0000	x 0.01 =	0.000
1234789-HpCDF	00.0000	x 0.01 =	0.000
OCDD	07.7878	x 0.001 =	0.008
OCDF	00.0000	x 0.001 =	0.000
		TOTAL =	11.87

NOTE: Do NOT include EMPC or EDL values in the TEF-adjusted Concentration.

If the Total Toxic Equivalent Concentration of the sample is greater than 7 ng/L for an aqueous sample, greater than 0.7 ug/Kg for any solid matrix, or greater than 7 ug/Kg for a chemical waste sample, then second column confirmation of the results may be required.

1DFB /
PCDD/PCDF TOXICITY EQUIVALENCE SUMMARY

SAMPLE NO.
HE-TS-419-SSX-01

0015 1100

Lab Name: PACE-INDIANAPOLIS Contract:
 Lab Code: IN 049 Case No.: IK1518 SAS No.:
 Matrix: SOIL (Soil/Water/Waste/Ash) SDG No.:
 Sample wt/vol: 5.05 (g/mL) g Lab Sample ID: IK1518-2
 Water Sample Prep: (Sepf/Cont) Lab File ID: 1101014.D
 Concentrated Extract Volume: 50 (uL) Date Received: 10/31/94
 Injection Volume: 2 (uL) % Solids: 0 Date Extracted: 11/14/94
 GC Column: DB-5 ID: 0.25 (mm) Date Analyzed: 12/01/94
 Dilution Factor: 1

Concentration Units: ug/Kg (ng/L or ug/Kg)

ANALYTE	CONCENTRATION	TEF	TEF-ADJUSTED CONCENTRATION
2378-TCDD	262.775	x 1.0 =	262.775
2378-TCDF	145.723	x 0.1 =	14.572
12378-PeCDF	786.728	x 0.05 =	39.336
12378-PeCDD	03.9385	x 0.5 =	1.969
23478-PeCDF	02.2140	x 0.5 =	1.107
123478-HxCDF	127.836	x 0.1 =	12.784
123678-HxCDF	01.2300	x 0.1 =	0.123
123478-HxCDD	01.6443	x 0.1 =	0.164
123678-HxCDD	11.8290	x 0.1 =	1.183
123789-HxCDD	03.2689	x 0.1 =	0.327
234678-HxCDF	01.7723	x 0.1 =	0.177
123789-HxCDF	16.5522	y 0.1 =	1.655
1234678-HpCDF	34.6877	x 0.01 =	0.347
1234678-HpCDD	22.5332	x 0.01 =	0.225
1234789-HpCDF	00.5082	x 0.01 =	0.005
OCDD	46.7362	x 0.001 =	0.047
OCDF	04.5880	x 0.001 =	0.005
		TOTAL =	336.80

NOTE: Do NOT include EMPC or EDL values in the TEF-adjusted Concentration.

If the Total Toxic Equivalent Concentration of the sample is greater than 7 ng/L for an aqueous sample, greater than 0.7 ug/Kg for any solid matrix, or greater than 7 ug/Kg for a chemical waste sample, then second column confirmation of the results may be required.

**1DFB
PCDD/PCDF TOXICITY EQUIVALENCE SUMMARY**

SAMPLE NO.

HE-TS-427-SSX-01

Lab Name: PACE-INDIANAPOLIS **Contract:**

Lab Code: IN 049 **Case No.:** IK1518 **SAS No.:**

Matrix: SOIL (Soil/Water/Waste/Ash) **SDG No.:**

Sample wt/vol: 5.09 (g/mL) g **Lab Sample ID:** IK1518-3

Water Sample Prep: (Sept/Cont) **Lab File ID:** 0801011.D

Concentrated Extract Volume: 50 (uL) **Date Received:** 10/31/94

Injection Volume: 2 (uL) % Solids: 0 **Date Extracted:** 11/14/94

GC Column: DB-5 **ID:** 0.25 (mm) **Date Analyzed:** 11/30/94

Dilution Factor: 1

Concentration Units: ug/Kg (ng/L or ug/Kg)

ANALYTE	CONCENTRATION	TEF	TEF-ADJUSTED CONCENTRATION
2378-TCDD	14.4820	x 1.0 =	14.482
2378-TCDF	33.2367	x 0.1 =	3.324
12378-PeCDF	00.0000	x 0.05 =	0.000
12378-PeCDD	00.5096	x 0.5 =	0.255
23478-PeCDF	00.0000	x 0.5 =	0.000
123478-HxCDF	00.0000	x 0.1 =	0.000
123678-HxCDF	00.0000	x 0.1 =	0.000
123478-HxCDD	00.0000	x 0.1 =	0.000
123678-HxCDD	00.1499	x 0.1 =	0.015
123789-HxCDD	00.0000	x 0.1 =	0.000
234678-HxCDF	00.0000	x 0.1 =	0.000
123789-HxCDF	00.0000	x 0.1 =	0.000
1234678-HpCDF	00.1058	x 0.01 =	0.001
1234678-HpCDD	00.2100	x 0.01 =	0.002
1234789-HpCDF	00.0000	x 0.01 =	0.000
OCDD	06.0815	x 0.001 =	0.006
OCDF	00.0000	x 0.001 =	0.000
		TOTAL =	18.08

NOTE: Do NOT include EMPC or EDL values in the TEF-adjusted Concentration.

If the Total Toxic Equivalent Concentration of the sample is greater than 7 ng/L for an aqueous sample, greater than 0.7 ug/Kg for any solid matrix, or greater than 7 ug/Kg for a chemical waste sample, then second column confirmation of the results may be required.

001535

1DFB
PCDD/PCDF TOXICITY EQUIVALECE SUMMARY

SAMPLE NO.

HE-TS-466-SSX-01

005234

Lab Name: PACE-INDIANAPOLIS Contract:
 Lab Code: IN 049 Case No.: IK1518 SAS No.:
 Matrix: SOIL (Soil/Water/Waste/Ash) SDG No.:
 Sample wt/vol: 5.14 (g/mL) g Lab Sample ID: IK1518-4
 Water Sample Prep: (Sep/Cont) Lab File ID: 0901012.D
 Concentrated Extract Volume: 50 (uL) Date Received: 10/31/94
 Injection Volume: 2 (uL) % Solids: 0 Date Extracted: 11/14/94
 GC Column: DB-5 ID: 0.25 (mm) Date Analyzed: 11/30/94
 Dilution Factor: 1

Concentration Units: ug/Kg (ng/L or ug/Kg)

ANALYTE	CONCENTRATION	TEF	TEF-ADJUSTED CONCENTRATION
2378-TCDD	09.3935	x 1.0 =	9.393
2378-TCDF	17.2265	x 0.1 =	1.723
12378-PeCDF	00.0000	x 0.05 =	0.000
12378-PeCDD	00.6243	x 0.5 =	0.312
23478-PeCDF	00.6277	x 0.5 =	0.314
123478-HxCDF	03.0229	x 0.1 =	0.302
123678-HxCDF	00.0000	x 0.1 =	0.000
123478-HxCDD	00.3851	x 0.1 =	0.039
123678-HxCDD	01.2110	x 0.1 =	0.121
123789-HxCDD	00.6344	x 0.1 =	0.063
234678-HxCDF	00.4191	x 0.1 =	0.042
123789-HxCDF	01.4647	x 0.1 =	0.146
1234678-HpCDF	01.4905	x 0.01 =	0.015
1234678-HpCDD	08.4002	x 0.01 =	0.084
1234789-HpCDF	00.0000	x 0.01 =	0.000
OCDD	201.877	x 0.001 =	0.202
OCDF	01.7108	x 0.001 =	0.002
		TOTAL =	12.76

NOTE: Do NOT include EMPC or EDL values in the TEF-adjusted Concentration.

If the Total Toxic Equivalent Concentration of the sample is greater than 7 ng/L for an aqueous sample, greater than 0.7 ug/Kg for any solid matrix, or greater than 7 ug/Kg for a chemical waste sample, then second column confirmation of the results may be required.

1DFB
PCDD/PCDF TOXICITY EQUIVALENCE SUMMARY

SAMPLE NO.

HE-TS-575-SSX-01

Lab Name: PACE-INDIANAPOLIS Contract: 00000000
 Lab Code: IN 049 Case No.: IK1518 SAS No.:
 Matrix: SOIL (Soil/Water/Waste/Ash) SDG No.:
 Sample wt/vol: 5.02 (g/mL) g Lab Sample ID: IK1518-5
 Water Sample Prep: (Sepf/Cont) Lab File ID: 1001013.D
 Concentrated Extract Volume: 50 (uL) Date Received: 10/31/94
 Injection Volume: 2 (uL) % Solids: 0 Date Extracted: 11/14/94
 GC Column: DB-5 ID: 0.25 (mm) Date Analyzed: 12/01/94
 Dilution Factor: 1

Concentration Units: ug/Kg (ng/L or ug/Kg)

ANALYTE	CONCENTRATION	TEF	TEF-ADJUSTED CONCENTRATION
2378-TCDD	71.3723	x 1.0 =	71.372
2378-TCDF	00.0000	x 0.1 =	0.000
12378-PeCDF	00.0000	x 0.05 =	0.000
12378-PeCDD	00.0000	x 0.5 =	0.000
23478-PeCDF	00.0000	x 0.5 =	0.000
123478-HxCDF	00.0000	x 0.1 =	0.000
123678-HxCDF	00.0000	x 0.1 =	0.000
123478-HxCDD	00.0000	x 0.1 =	0.000
123678-HxCDD	00.0000	x 0.1 =	0.000
123789-HxCDD	00.0000	x 0.1 =	0.000
234678-HxCDF	00.0000	x 0.1 =	0.000
123789-HxCDF	00.0000	x 0.1 =	0.000
1234678-HpCDF	00.0000	x 0.01 =	0.000
1234678-HpCDD	00.0000	x 0.01 =	0.000
1234789-HpCDF	00.0000	x 0.01 =	0.000
OCDD	01.8555	x 0.001 =	0.002
OCDF	00.0000	x 0.001 =	0.000
		TOTAL =	71.37

NOTE: Do NOT include EMPC or EDL values in the TEF-adjusted Concentration.

If the Total Toxic Equivalent Concentration of the sample is greater than 7 ng/L for an aqueous sample, greater than 0.7 ug/Kg for any solid matrix, or greater than 7 ug/Kg for a chemical waste sample, then second column confirmation of the results may be required.

1DFB
PCDD/PCDF TOXICITY EQUIVALENCE SUMMARY

SAMPLE NO.

LCS

001546

Lab Name: PACE-INDIANAPOLIS Contract:
 Lab Code: IN 049 Case No.: IK1518 SAS No.:
 Matrix: SOIL (Soil/Water/Waste/Ash) SDG No.:
 Sample wt/vol: 5.04 (g/mL) g Lab Sample ID: LCS
 Water Sample Prep: (Sept/Cont) Lab File ID: 0501007.D
 Concentrated Extract Volume: 50 (uL) Date Received:
 Injection Volume: 2 (uL) % Solids: 0 Date Extracted: 11/14/94
 GC Column: DB-5 ID: 0.25 (mm) Date Analyzed: 11/30/94
 Dilution Factor: 1

Concentration Units: ug/Kg (ng/L or ug/Kg)

ANALYTE	CONCENTRATION	TEF	TEF-ADJUSTED CONCENTRATION
2378-TCDD	05.1727	x 1.0 =	5.173
2378-TCDF	04.9997	x 0.1 =	0.500
12378-PeCDF	14.6239	x 0.05 =	0.731
12378-PeCDD	14.2110	x 0.5 =	7.106
23478-PeCDF	00.0000	x 0.5 =	0.000
123478-HxCDF	00.0000	x 0.1 =	0.000
123678-HxCDF	13.1712	x 0.1 =	1.317
123478-HxCDD	00.0000	x 0.1 =	0.000
123678-HxCDD	12.6211	x 0.1 =	1.262
123789-HxCDD	00.5681	x 0.1 =	0.057
234678-HxCDF	00.0000	x 0.1 =	0.000
123789-HxCDF	00.0000	x 0.1 =	0.000
1234678-HpCDF	12.5573	x 0.01 =	0.126
1234678-HpCDD	10.9339	x 0.01 =	0.109
1234789-HpCDF	00.0000	x 0.01 =	0.000
OCDD	25.1712	x 0.001 =	0.025
OCDF	23.2625	x 0.001 =	0.023
		TOTAL =	16.43

NOTE: Do NOT include EMPC or EDL values in the TEF-adjusted Concentration.

If the Total Toxic Equivalent Concentration of the sample is greater than 7 ng/L for an aqueous sample, greater than 0.7 ug/Kg for any solid matrix, or greater than 7 ug/Kg for a chemical waste sample, then second column confirmation of the results may be required.

1DFB
PCDD/PCDF TOXICITY EQUIVALENCE SUMMARY

SAMPLE NO.

LCSD

001547

Lab Name: PACE-INDIANAPOLIS Contract:
 Lab Code: IN 049 Case No.: IK1518 SAS No.:
 Matrix: SOIL (Soil/Water/Waste/Ash) SDG No.:
 Sample wt/vol: 5.08 (g/mL) g Lab Sample ID: LCSD
 Water Sample Prep: (Sept/Cont) Lab File ID: 0601008.D
 Concentrated Extract Volume: 50 (uL) Date Received:
 Injection Volume: 2 (uL) % Solids: 0 Date Extracted: 11/14/94
 GC Column: DB-5 ID: 0.25 (mm) Date Analyzed: 11/30/94
 Dilution Factor: 1

Concentration Units: ug/Kg (ng/L or ug/Kg)

ANALYTE	CONCENTRATION	TEF	TEF-ADJUSTED CONCENTRATION
2378-TCDD	04.7685	x 1.0 =	4.768
2378-TCDF	04.8305	x 0.1 =	0.483
12378-PeCDF	14.2278	x 0.05 =	0.711
12378-PeCDD	13.3308	x 0.5 =	6.665
23478-PeCDF	00.0000	x 0.5 =	0.000
123478-HxCDF	00.0000	x 0.1 =	0.000
123678-HxCDF	12.7712	x 0.1 =	1.277
123478-HxCDD	00.0000	x 0.1 =	0.000
123678-HxCDD	12.0212	x 0.1 =	1.202
123789-HxCDD	00.5221	x 0.1 =	0.052
234678-HxCDF	00.0000	x 0.1 =	0.000
123789-HxCDF	00.0000	x 0.1 =	0.000
1234678-HpCDF	12.0118	x 0.01 =	0.120
1234678-HpCDD	10.1408	x 0.01 =	0.101
1234789-HpCDF	00.0000	x 0.01 =	0.000
OCDD	24.1307	x 0.001 =	0.024
OCDF	21.9396	x 0.001 =	0.022
		TOTAL =	15.43

NOTE: Do NOT include EMPC or EDL values in the TEF-adjusted Concentration.

If the Total Toxic Equivalent Concentration of the sample is greater than 7 ng/L for an aqueous sample, greater than 0.7 ug/Kg for any solid matrix, or greater than 7 ug/Kg for a chemical waste sample, then second column confirmation of the results may be required.