BLASLAND, BOUCK & LEE, INC.
engineers & scientists

Transmitted Via U.S. Mail

July 18, 2003

Mr. James Hosch
Wisconsin Department of Natural Resources
1401 Tower Avenue
Superior, WI 54880

Re: Koppers Inc. Superior, Wisconsin Facility – Crawford Creek Sediment Sampling Results
BBL Project #: 388.42.006#2

Dear Mr. Hosch:

On behalf of Beazer East, Inc. (Beazer), this letter summarizes the scope and findings of the Crawford Creek sediment sampling that was performed by Blasland, Bouck & Lee, Inc. (BBL) at the above-referenced Site on May 21, 2003. A total of six sediment samples were collected and analyzed for polychlorinated dibenzo-p-dioxins (PCDDs) and polychlorinated dibenzofurans (PCDFs). The sediment sampling activities were performed in accordance with a Work Plan that was submitted to the Wisconsin Department of Natural Resources (WDNR) on July 25, 2001 and conditionally approved by the WDNR in a letter to Beazer dated April 11, 2002. The other investigation activities included in the Work Plan have already been completed and reported to the WDNR[1]. The Crawford Creek sediment sampling was anticipated to occur in February 2003 (in conjunction with the Crawford Creek floodplain investigations), but could not be completed at that time due to the presence of ice and frozen sediment conditions within the creek.

The purposes of the sediment sampling and analysis were to provide additional PCDD/PCDF data to:

- support the future development of a Corrective Measures Study (CMS) (as necessary) and modeling of PCDD/PCDF concentrations in Crawford Creek fish; and

- address the WDNR's concern that PCDDs/PCDFs may be present in non-visibly-impacted materials.

To this end, six sediment samples (CC-SED-01 through CC-SED-06) were collected from Crawford Creek on May 21, 2003. As proposed in the Work Plan, five of the sediment samples (CC-SED-02 through CC-SED-06) were collected from portions of Crawford Creek not previously sampled for PCDD/PCDFs:

[1] The scope and findings of the other investigations proposed in the July 25, 2001 Work Plan were previously submitted to the WDNR in letters dated September 21, 2001 (bedrock groundwater monitoring), April 12, 2002 (fire pond sediment probing/sampling and former penta storage tank area soil sampling), and June 26, 2003 (Crawford Creek floodplain investigations).

approximately 50 feet upstream of the railroad crossing (CC-SED-02);
approximately 50 feet downstream of the railroad crossing (CC-SED-03);
approximately one-third of the way between the railroad crossing and the Nemadji River (CC-SED-04);
approximately two-thirds of the way between the railroad crossing and the Nemadji River (CC-SED-05); and
approximately 50 feet upstream of the confluence with the Nemadji River (CC-SED-06).

A sixth sediment sample (CC-SED-01) was collected from an upstream location approximately 450 feet south of Hammond Avenue. This sample was collected to provide another background sample in addition to the background sample collected as part of the 1999 Crawford Creek sediment investigations.

At each of the six locations discussed above, samples were collected from the 0- to 6-inch depth interval by manually pushing Lexan® tubes into the depositional materials. To the extent possible, sampling locations targeted depositional materials located on the inside of bends in the creek. At each location, up to six discrete samples were collected from a section of the creek spanning no more than 10 feet. The discrete samples were then composited into a single sample representative of that portion of the creek. Visual descriptions of each sediment sample were recorded in a field notebook. Quality assurance/quality control (QA/QC) samples collected included one blind duplicate sample and one matrix spike/matrix spike duplicate (MS/MSD) sample. The samples were submitted to Severn Trent Laboratories, Inc. in West Sacramento, California for PCDD/PCDF analysis using United States Environmental Protection Agency (USEPA) Method 8290.

The approximate location of each discrete sample group (comprising each of the six composite samples) was staked and subsequently surveyed. The surveyed sediment sample locations are shown on Figure 1.

Validated PCDD/PCDF analytical results for the Crawford Creek sediment samples are summarized in Table 1 and the associated Data Review Report (including laboratory analytical data sheets) is provided in Attachment A. In addition to presenting the PCDD/PCDF data, Table 1 includes 2,3,7,8-TCDD toxicity equivalence (TEQ) concentrations for each sample. The TEQ concentrations were calculated following the 1998 World Health Organization (WHO) guidelines, as summarized below:

> Each PCDD/PCDF congener is assigned a toxicity equivalency factor (TEF) ranging from 0.0001 to 1, based on its toxicity relative to the congener 2,3,7,8-TCDD.
>
> The concentration of each individual PCDD/PCDF congener is multiplied by its respective TEF.
>
> The sum of these values for each PCDD/PCDF congener represents the TEQ concentration for a sample.

For each of the six composite sediment samples, the following table summarizes the visual descriptions and calculated TEQ concentrations in micrograms per kilogram (ug/kg).

Sample ID	Depth Interval	Visual Description	TEQ (ug/kg)[1]
CC-SED-01	0-6 in	Brown silty clay, trace fine sand, trace organic matter	0.00049
CC-SED-02	0-6 in	Brown silty clay, little organic matter, sheen and moderate to strong odor	0.00050 [0.0055][2]
CC-SED-03	0-1.5 in	Organic matter, sheen with trace product and moderate odor	0.0057
	1.5-6 in	Brown silty clay, trace organic matter, slight sheen and odor	
CC-SED-04	0-6 in	Brown silty clay, little organic matter, slight odor	0.020
CC-SED-05	0-0.5 in	Organic matter	0.0099
	0.5-6 in	Brown silty clay with organic matter	
CC-SED-06	0-6 in	Brown silty clay with organic matter	0.0011

Notes:

1. One-half the analytical detection limit was used for non-detect results when calculating the TEQ concentrations.
2. Duplicate results presented in brackets. The difference in TEQ concentrations between sample CC-SED-02 (0-6") and its duplicate is attributable to elevated detection limits in the duplicate sample (resulting from sample dilution) and the use of 1/2 the detection limits for non-detect values when calculating the TEQs.

Based on the results summarized above, there does not appear to be a consistent correlation between the degree of visible impacts and detected TEQ concentrations. Specifically, the most visibly-impacted sample (CC-SED-03) represented the median TEQ concentration among the five samples collected downstream of the Outfall 001 drainage ditch. The sample exhibiting the highest TEQ concentration (CC-SED-04) exhibited only a slight odor. The lack of correlation between visible impacts and TEQ concentrations is consistent with the findings of previous sediment investigations, as reported in the *Supplemental Surface Water and Streambed Sediment Investigation Report* (BBL, July 2000). It is also consistent with the recent floodplain soil investigations, as indicated in a letter from BBL to the WDNR dated June 26, 2003.

Regardless of the correlation to visual impacts, these results indicate that PCDD/PCDF concentrations are low throughout Crawford Creek. In fact, the average TEQ concentration for the five samples collected downstream of the Outfall 001 drainage ditch confluence (0.0079 ug/kg) is very close to "background" sediment values reported by the USEPA (0.0053[2] ug/kg and 0.0039[3] ug/kg) and well below the 1.0 ug/kg human-health guideline recommended by the USEPA for residential soils (USEPA, 1998). Also, these results are consistent with previous Crawford Creek sediment sampling performed in 1999. For three Crawford Creek sediment samples collected in 1999 downstream of the Outfall 001 drainage ditch and upstream of the railroad crossing, TEQ concentrations were 0.0063, 0.0076, and 0.011 ug/kg (BBL, July 2001)[4]. Those results all fall within the range of TEQ concentrations detected in the May 2003 samples.

---

[2] USEPA, 2000. Based on 11 samples, WHO-1998 TEFs, and ½ detection limits for non-detect congeners.

[3] USEPA, 1994. Based on seven samples, USEPA-1989 TEFs, and ½ detection limits for non-detect congeners.

[4] Data for samples T34-C, T29-C, and T18-C, respectively. For consistency, these TEQs were calculated using WHO-1998 TEFs instead of USEPA-1989 TEFs as originally reported in the *Supplemental Surface Water and Streambed Sediment Investigation Report.*

The results of the May 2003 sediment sampling, in conjunction with previous Crawford Creek sediment sampling results, are spatially representative of Crawford Creek downstream of the Outfall 001 drainage ditch. These results will be included in the Crawford Creek sediment database to support future evaluations for this portion of the Site. In addition, AMEC will update the previous modeling of PCDD/PCDF concentrations in Crawford Creek fish to include these data. A separate letter will be submitted to the WDNR to discuss those findings.

Please feel free to call me (860-653-9101) or Ms. Jane Patarcity of Beazer (412-208-8813) with any questions or comments regarding the results summarized herein.

Sincerely,

BLASLAND, BOUCK & LEE, INC.

David Bessinger
For
Jeffrey S. Holden, P.E.
Manager

DGB/csc
Enclosures
U:\CSC03\51432196Ltr.doc

cc: Steve LaValley, WDNR
Mark Gordon, WDNR
John Robinson, WDNR
Michael Kolanczyk
Jane Patarcity, Beazer
Patrick Stark, Koppers
Tim Ries, Koppers
Brian Magee, AMEC
Robert Anderson, BBL

Table 1

Beazer East, Inc.
Koppers Superior, Wisconsin Facility

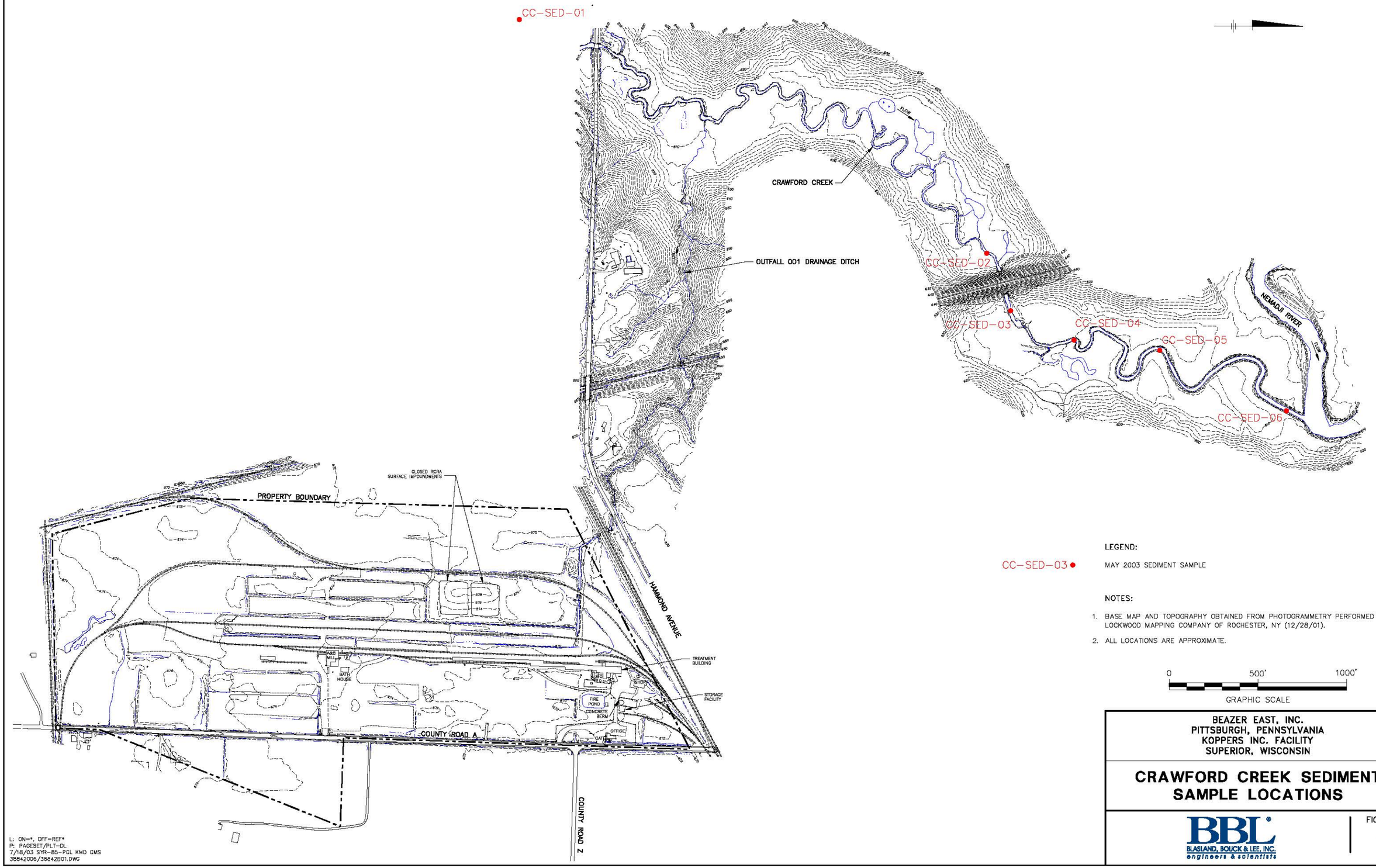
Summary of Crawford Creek Sediment Sample Analytical Results - PCDDs/PCDFs[1] (ug/kg dry weight)

Constituent	CC-SED-01 (0-6") 5/21/2003	CC-SED-02 (0-6") 5/21/2003	CC-SED-02 (0-6") Duplicate [2]	CC-SED-03 (0-6") 5/21/2003	CC-SED-04 (0-6") 5/21/2003	CC-SED-05 (0-6") 5/21/2003	CC-SED-06 (0-6") 5/21/2003
Polychlorinated Dibenzo-p-Dioxins (PCDDs)							
2,3,7,8-TCDD	ND (0.00019)	ND (0.00025)	ND (0.0018) D	ND (0.00047)	ND (0.00032)	ND (0.00018)	ND (0.00018)
Total TCDD	**0.00037**	ND (0.00099)	ND (0.0018)	**0.0043**	**0.013**	**0.011**	**0.011**
1,2,3,7,8-PeCDD	ND (0.00043)	ND (0.00028)	ND (0.0049) D	ND (0.00075)	ND (0.0015)	ND (0.00037 EMPC)	ND (0.00029)
Total PeCDD	ND (0.0013 EMPC)	**0.0036**	ND (0.0073 EMPC)	**0.0017**	**0.0064**	**0.0072**	**0.009**
1,2,3,4,7,8-HxCDD	ND (0.00025)	ND (0.00022)	ND (0.0041) D	**0.001 J**	**0.0024 J**	ND (0.0018 EMPC)	ND (0.00038)
1,2,3,6,7,8-HxCDD	ND (0.00025)	**0.0003 J**	ND (0.004) D	**0.0077 J**	**0.029**	**0.015**	ND (0.0011 EMPC)
1,2,3,7,8,9-HxCDD	ND (0.00023)	ND (0.0002)	ND (0.0038) D	ND (0.0016 EMPC)	**0.0045 J**	**0.0032 J**	**0.00073 J**
Total HxCDD	ND (0.00093 EMPC)	**0.0032**	ND (0.0041)	**0.029**	**0.063**	**0.06**	**0.0022**
1,2,3,4,6,7,8-HpCDD	**0.0018 J**	**0.0032**	**0.006 J**	**0.24**	**0.84**	**0.46 J**	**0.028**
Total HpCDD	**0.0073**	**0.0068 J**	**0.012**	**0.47**	**1.6**	**0.88**	**0.056**
OCDD	**0.012 J**	**0.03**	**0.067**	**2.9**	**10 E,J**	**4.9**	**0.31**
Polychlorinated Dibenzofurans (PCDFs)							
2,3,7,8-TCDF	ND (0.00011)	ND (0.00011 EMPC)	ND (0.0018) D	ND (0.00045)	ND (0.00024)	ND (0.00038 EMPC)	**0.00023 J**
Total TCDF	**0.00019**	**0.00015**	ND (0.0018)	ND (0.00045)	**0.0003**	**0.0011**	**0.00023**
1,2,3,7,8-PeCDF	ND (0.00026)	ND (0.00032)	ND (0.0031) D	ND (0.00048)	**0.0011 J**	ND (0.00047 EMPC)	**0.00038 J**
2,3,4,7,8-PeCDF	ND (0.00026)	ND (0.00032)	ND (0.0031) D	ND (0.00048)	ND (0.0015 EMPC)	ND (0.00078)	ND (0.00021)
Total PeCDF	ND (0.00026)	ND (0.00032)	ND (0.0035)	**0.00056**	**0.015**	**0.0091**	**0.00082**
1,2,3,4,7,8-HxCDF	ND (0.00019)	ND (0.00024 EMPC)	ND (0.0026) D	**0.0039 J**	**0.021**	**0.007 J**	**0.001 J**
1,2,3,6,7,8-HxCDF	ND (0.00017)	ND (0.00017)	ND (0.0025) D	ND (0.00066 EMPC)	**0.0041 J**	**0.0018 J**	ND (0.00044)
2,3,4,6,7,8-HxCDF	ND (0.00019)	ND (0.0002)	ND (0.0027) D	ND (0.00059)	**0.0021 J**	ND (0.0017 EMPC)	ND (0.00048)
1,2,3,7,8,9-HxCDF	ND (0.0002 EMPC)	ND (0.0002)	ND (0.0029) D	ND (0.00063)	ND (0.0012)	ND (0.00065)	ND (0.00051)
Total HxCDF	ND (0.0002)	ND (0.00079 EMPC)	ND (0.0029)	**0.072**	**0.33**	**0.16**	**0.011**
1,2,3,4,6,7,8-HpCDF	ND (0.00068)	**0.0013 J**	**0.0021 J**	**0.07**	**0.27**	**0.13 J**	**0.0086**
1,2,3,4,7,8,9-HpCDF	ND (0.00074)	ND (0.00055)	ND (0.0014)	**0.0043 J**	**0.021**	**0.0087**	**0.0011 J**
Total HpCDF	ND (0.00074)	**0.0055**	**0.011**	**0.37**	**1.5**	**0.7**	**0.034**
OCDF	ND (0.0004)	**0.004**	**0.007 J**	**0.32**	**1.1**	**0.58 J**	**0.028**
2,3,7,8-TCDD TEQ [3]	0.00049	0.00050	0.0055	0.0057	0.020	0.0099	0.0011

Notes:

D = Result obtained from analysis of a dilution
E = Result exceeded calibration range
EMPC = Estimated maximum possible concentration
J = Estimated value
ND = Non-detect (detection limit in parentheses)

1. PCDD/PCDF analyses performed by Severn Trent Laboratories, Inc. of West Sacramento, California using USEPA SW-846 Method 8290.
2. CC-SED-02 duplicate is identified as CC-SED-DUP in the laboratory analytical data sheets. The difference in TEQ concentrations between sample CC-SED-02 (0-6") and its duplicate is attributable to elevated detection limits in the duplicate sample (resulting from sample dilution) and the use of 1/2 the detection limits for non-detect values when calculating the TEQs (see Note 3).
3. 2,3,7,8-TCDD toxicity equivalence (TEQ) values calculated by assigning each PCDD/PCDF congener a Toxic Equivalency Factor (TEF) according to its toxicity relative to 2,3,7,8-TCDD (ranging from 0.0001 to 1.0; WHO, 1998). The concentration of each congener (1/2 detection limit for non-detect values) is multiplied by its respective TEF. The sum of these values is the TEQ for the sample.



CC-SED-03 ● MAY 2003 SEDIMENT SAMPLE

LEGEND:

NOTES:

1. BASE MAP AND TOPOGRAPHY OBTAINED FROM PHOTOGRAMMETRY PERFORMED BY LOCKWOOD MAPPING COMPANY OF ROCHESTER, NY (12/28/01).
2. ALL LOCATIONS ARE APPROXIMATE.

0 500' 1000'

GRAPHIC SCALE

BEAZER EAST, INC.
PITTSBURGH, PENNSYLVANIA
KOPPERS INC. FACILITY
SUPERIOR, WISCONSIN

CRAWFORD CREEK SEDIMENT SAMPLE LOCATIONS

BBL BLASLAND, BOUCK & LEE, INC. engineers & scientists

FIGURE 1

L: ON=*, OFF=REF*
P: PAGESET/PLT-DL
7/18/03 SYR-85-PGL KMD GMS
38842006/38842B01.DWG

Attachment A

Data Review Report

BBL®
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

DATA REVIEW REPORT

BEAZER EAST, INC.
KOPPERS INC. WOOD-TREATING FACILITY

SUPERIOR, WISCONSIN

SDG# G3E230258

PCDD/PCDF ANALYSES

Analyses performed by:

Severn Trent Laboratories, Inc.
West Sacramento, California

Review performed by:

BBL
BLASLAND BOUCK & LEE, INC.
engineers & scientists

Blasland, Bouck & Lee, Inc.
Syracuse, New York

Summary

The following is an assessment of the data package for SDG# G3E230258, which includes sediment samples collected at the Koppers Inc. Wood-Treating Facility in Superior, Wisconsin. Included with this assessment are the data review check sheets used in the review of the package and corrected sample results. Analyses were performed on the following samples:

Sample ID	Lab ID	Matrix	Sample Date				
				SVOC	PCB	MET	MISC[1]
CC-SED-01 (0-6")	G3E230258-001	Sediment	5/21/03				x
CC-SED-02 (0-6")	G3E230258-002	Sediment	5/21/03				x
CC-SED-03 (0-6")	G3E230258-003	Sediment	5/21/03				x
CC-SED-04 (0-6")	G3E230258-004	Sediment	5/21/03				x
CC-SED-05 (0-6")[2]	G3E230258-005	Sediment	5/21/03				x
CC-SED-06 (0-6")	G3E230258-006	Sediment	5/21/03				x
CC-SED-DUP	G3E230258-00	Sediment	5/21/03				x

1 PCDD/PCDF analysis.
2. MS/MSD analysis performed on sample.

PCDD/PCDF ANALYSES

Introduction

Analyses were performed according to the USEPA Method 8290.

The data review process is intended to evaluate the data on a technical basis. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with National Functional Guidelines:

Concentration qualifiers:

ND — The compound was analyzed for but not detected. The associated value is the compound quantitation limit.

EMPC — The "estimated maximum possible concentration" is reported when GC/MS signals eluting within the established retention time window have a signal-to-noise ratio in excess of 2.5 but do not meet the ion abundance ratio criteria.

Quantitation qualifiers:

B — The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.

E — The reported concentration is based on an analyte to internal standard ratio which exceeds the range of the calibration curve. The value should be considered estimated only.

Validation qualifiers:

J — The compound was positively identified; however, the associated numerical value is an estimated concentration only.

R — The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant QC problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC test, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

Data Assessment

1. Holding Time

The method-specified holding times for PCDD/PCDF analysis of sediment samples are 30 days from sample collection to extraction and 45 days from extraction to analysis.

All samples were extracted and analyzed within the specified holding times.

2. Blank Contamination

Quality assurance blanks (i.e., method, field, or rinse blanks) are prepared to identify any contamination which may have been introduced into the samples during sample preparation or field activity. Method blanks measure laboratory contamination. Field and rinse blanks measure cross contamination of samples during field operations.

Compounds were identified in the method blank. Associated sample results were less than method blank action levels; therefore no additional data qualification was required beyond that provided by the laboratory.

3. Mass Spectrometer Resolution Check

The window-defining mix and chromatograph resolution were acceptable.

4. Calibration

Satisfactory instrument calibration is established to insure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

4.1 Initial Calibration

The % relative standard deviation (%RSD) was less than 15% for all non-labeled compounds (targets) and less than 20% for all labeled compounds (internal standards and recovery standards). All isotope abundance ratios were within the defined limits.

4.2 Continuing Calibration

All continuing calibration target standards were within the 20% difference (%D) of the initial calibration.

5. Recovery Standard Performance

All samples to be analyzed for PCDD/PCDF compounds are spiked with recovery standard prior to injection. The concentrations of all the labeled standards (internal standards) are determined by using the recovery standard.

All recovery standard isotopic ratios were acceptable.

6. Internal Standard Performance and Recovery

All samples to be analyzed for PCDD/PCDF compounds are spiked with internal standards prior to extraction, which eliminates the need to correct quantitative data for extraction efficiency.

Recovery for internal standards were within the acceptable control limits

7. Compound Identification

PCDD/PCDF compounds are identified by using the analyte's ion abundance ratios, signal-to-noise values, and relative retention times.

An EMPC or "estimated maximum possible concentration" designation is given to compounds which have signals eluting within the established retention time window which would, if positively identified, be above the detection limit. The signals do not, however, meet the ion abundance ratio criteria and cannot be positively identified as the compound of interest. The EMPC value is the estimated concentration of the interferant quantitated "as" the compound of interest. This value should be considered an elevated detection limit based on potential compound identification and quantitation interference.

8. Matrix Spike/Matrix Spike Duplicate Samples (MS/MSD)

MS/MSD data are used to assess the precision and accuracy of the analytical method.

The reported recovery for the MS and the MS/MSD RPD of 1,2,3,4,6,7,8-HpCDD, 1,2,3,4,6,7,8-HpCDF, and OCDF were above the control limits. The sample results for these compounds in sample CC-SED-05 (0"-6") have been qualified as estimated (J).

9. Field Duplicates

Results for duplicate samples are summarized as follows:

Sample ID/ Duplicate ID	Analyte	Sample Result	Duplicate Result	RPD
CC-SED-02 (0-6")/ CC-SED-DUP	2,3,7,8-TCDD	ND	ND	NA
	Total TCDD	ND	ND	NA
	1,2,3,7,8-PeCDD	ND	ND	NA
	Total PeCDD	3.6	ND	NA
	1,2,3,4,7,8-HxCDD	ND	ND	NA
	1,2,3,6,7,8-HxCDD	0.30 J	ND	NA
	1,2,3,7,8,9-HxCDD	ND	ND	NA
	Total HxCDD	3.2	ND	NA
	1,2,3,4,6,7,8-HpCDD	3.2	6.0 J	60.9%
	Total HpCDD	6.8 J	12	55.3%
	OCDD	30	67	76.3%
	2,3,7,8-TCDF	ND	ND	NA
	Total TCDF	0.15	ND	NA
	1,2,3,7,8-PeCDF	ND	ND	NA
	2,3,4,7,8-PeCDF	ND	ND	NA
	Total PeCDF	ND	ND	NA
	1,2,3,4,7,8-HxCDF	ND	ND	NA
	1,2,3,6,7,8-HxCDF	ND	ND	NA
	2,3,4,6,7,8-HxCDF	ND	ND	NA
	1,2,3,7,8,9-HxCDF	ND	ND	NA
	Total HxCDF	ND	ND	NA
	1,2,3,4,6,7,8-HpCDF	1.3 J	2.1	47.1%
	1,2,3,4,7,8,9-HpCDF	ND	ND	NA
	Total HpCDF	5.5	11	66.7%
	OCDF	4.0	7.0	54.5%

ND Not detected.
NA Analyte not detected in sample and/or duplicate. RPD not applicable.

The duplicate results are acceptable.

Although the duplicate results are acceptable, it should be noted that the Toxicity Equivalence (TEQ) values calculated for CC-SED-02 (0-6") and CC-SED-DUP did not correlate well. This was due to elevated detection limits of several PCDD/PCDF congeners in the duplicate sample as a result of analyzing the sample at a dilution (the original sample was not analyzed at a dilution and had lower detection limits). Since one-half the analytical detection limit is used for non-detect congeners when calculating TEQs, the TEQ calcuated for CC-SED-DUP was higher than the TEQ calculated for CC-SED-02 (0-6").

10. System Performance and Overall Assessment

For sample CC-SED-04 (0-6"), the concentration of OCDD was above the linear calibration range. This sample result has been qualified as estimated (J).

The EMPC data qualifier was not used by the laboratory as specified in Method 8290. This qualifier has been added to the sample results where applicable.

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines listed in the analytical method.

Data Validation Checklist

PCDD/PCDF Data Validation Checklist

	YES	NO	NA
Data Completeness and Deliverables			
Is there a narrative or cover letter present?	X		
Are the samples numbers included in the narrative?	X		
Are the sample chain-of-custodies present?	X		
Do the chain-of-custodies indicate any problems with sample receipt or sample condition?		X	
Holding Times			
Have any holding times been exceeded?		X	
Internal Standard Performance			
Was internal standard data submitted?	X		
Was one or more internal standard recovery outside control limits for any sample or blank?		X	
If yes, were the samples reanalyzed?			X
Was one or more ion abundance ratio or retention time outside control limits?		X	
Recovery Standard Performance			
Was recovery standard data submitted?	X		
Was one or more ion abundance ratio or retention time outside control limits for any sample or blank?		X	
If yes, were the samples reanalyzed?			X
Matrix Spikes			
Is there matrix spike recovery data submitted?	X		
Were matrix spikes analyzed at the required frequency?	X		
Were any spike recoveries outside control limits?	X		
Blanks			
Is the method blank data submitted?	X		
Has a method blank been analyzed for each set of samples or for each 20 samples, whichever is more frequent?	X		
Is the chromatographic performance acceptable for each instrument?	X		
Do any method/reagent/instrument blanks have positive results?	X		
Are field/equipment blanks associated with every sample?			X
Do any field/equipment blanks have positive results?			X

PCDD/PCDF Data Validation Checklist - Page 2

	YES	NO	NA
Mass Spectrometer Resolution			
Are the GC/MS resolution check data submitted?	X		
Was the resolution acceptable?	X		
Target Analytes			
Is a PCDD/PCDF analysis results sheet present for each of the following:			
Samples	X		
Matrix spikes	X		
Blanks	X		
Are the selected ion chromatograms present for each of the following:			
Samples	X		
Matrix spikes	X		
Blanks	X		
Is the chromatographic performance acceptable with respect to:			
Baseline stability	X		
Resolution	X		
Peak shape	X		
Quantitation and Detection Limits			
Are the reporting limits adjusted to reflect sample dilutions and for soils, sample moisture?	X		
Standard Data			
Are the quantitation reports and selected ion chromatograms present for the initial and continuing calibration standards?		X	
Initial Calibration			
Was the initial calibration data submitted for each instrument used?	X		
Are the response factor RSDs within specified limits?	X		
Were the ion abundance ratios within specifications?	X		
Was the signal-to-noise ratio $\geq$ 10:1 for the ion current profiles?	X		
Continuing Calibration			
Was the continuing calibration data submitted for each instrument?	X		

PCDD/PCDF Data Validation Checklist - Page 3

	YES	NO	NA
Has a continuing calibration standard been analyzed for each twelve hours of analysis per instrument?	X		
All %D within acceptable limits?	X		
Were the ion abundance ratios within specifications?	X		
Was the signal-to-noise ratio ≥ 10:1 for the ion current profiles?	X		
Field Duplicates			
Where field duplicates submitted with the samples?	X		

Corrected Sample Analysis Data Sheets

BLASLAND BOUCK & LEE INC

Client Sample ID: CC-SED-01 (0-6")

Trace Level Organic Compounds

Lot-Sample #...: G3E230258-001 Work Order #...: FPCAK1AA Matrix.....: SOLID
Date Sampled...: 05/21/03 Date Received..: 05/23/03
Prep Date.....: 05/27/03 Analysis Date..: 05/31/03
Prep Batch #...: 3147607
Dilution Factor: 1

PARAMETER	RESULT	DETECTION LIMIT	UNITS	METHOD
2,3,7,8-TCDD	ND	0.19	pg/g	SW846 8290
Total TCDD	**0.37**		**pg/g**	**SW846 8290**
1,2,3,7,8-PeCDD	ND	0.43	pg/g	SW846 8290
Total PeCDD	ND	1.3 EMPC	pg/g	SW846 8290
1,2,3,4,7,8-HxCDD	ND	0.25	pg/g	SW846 8290
1,2,3,6,7,8-HxCDD	ND	0.25	pg/g	SW846 8290
1,2,3,7,8,9-HxCDD	ND	0.23	pg/g	SW846 8290
Total HxCDD	ND	0.93 EMPC	pg/g	SW846 8290
1,2,3,4,6,7,8-HpCDD	**1.8 J**		**pg/g**	**SW846 8290**
Total HpCDD	**7.3**		**pg/g**	**SW846 8290**
OCDD	**12 J,B**		**pg/g**	**SW846 8290**
2,3,7,8-TCDF	ND	0.11	pg/g	SW846 8290
Total TCDF	**0.19**		**pg/g**	**SW846 8290**
1,2,3,7,8-PeCDF	ND	0.26	pg/g	SW846 8290
2,3,4,7,8-PeCDF	ND	0.26	pg/g	SW846 8290
Total PeCDF	ND	0.26	pg/g	SW846 8290
1,2,3,4,7,8-HxCDF	ND	0.19	pg/g	SW846 8290
1,2,3,6,7,8-HxCDF	ND	0.17	pg/g	SW846 8290
2,3,4,6,7,8-HxCDF	ND	0.19	pg/g	SW846 8290
1,2,3,7,8,9-HxCDF	ND	0.20 EMPC	pg/g	SW846 8290
Total HxCDF	ND	0.20	pg/g	SW846 8290
1,2,3,4,6,7,8-HpCDF	ND	0.68	pg/g	SW846 8290
1,2,3,4,7,8,9-HpCDF	ND	0.74	pg/g	SW846 8290
Total HpCDF	ND	0.74	pg/g	SW846 8290
OCDF	ND	0.40	pg/g	SW846 8290

INTERNAL STANDARDS	PERCENT RECOVERY	RECOVERY LIMITS
13C-2,3,7,8-TCDD	66	(40 - 135)
13C-1,2,3,7,8-PeCDD	68	(40 - 135)
13C-1,2,3,6,7,8-HxCDD	64	(40 - 135)
13C-1,2,3,4,6,7,8-HpCDD	58	(40 - 135)
13C-OCDD	57	(40 - 135)
13C-2,3,7,8-TCDF	64	(40 - 135)
13C-1,2,3,7,8-PeCDF	58	(40 - 135)
13C-1,2,3,4,7,8-HxCDF	57	(40 - 135)
13C-1,2,3,4,6,7,8-HpCDF	56	(40 - 135)

NOTE(S):

Results and reporting limits have been adjusted for dry weight.

J Estimated result. Result is less than the reporting limit.

B Method blank contamination. The associated method blank contains the target analyte at a reportable level.

BLASLAND BOUCK & LEE INC

Client Sample ID: CC-SED-02 (0-6")

Trace Level Organic Compounds

Lot-Sample #...: G3E230258-002 Work Order #...: FPCAW1AA Matrix.....: SOLID
Date Sampled...: 05/21/03 Date Received..: 05/23/03
Prep Date.....: 05/27/03 Analysis Date..: 05/31/03
Prep Batch #...: 3147607
Dilution Factor: 1

PARAMETER	RESULT	DETECTION LIMIT	UNITS	METHOD
2,3,7,8-TCDD	ND	0.25	pg/g	SW846 8290
Total TCDD	ND	0.99	pg/g	SW846 8290
1,2,3,7,8-PeCDD	ND	0.28	pg/g	SW846 8290
Total PeCDD	**3.6**		**pg/g**	**SW846 8290**
1,2,3,4,7,8-HxCDD	ND	0.22	pg/g	SW846 8290
1,2,3,6,7,8-HxCDD	**0.30 J**		**pg/g**	**SW846 8290**
1,2,3,7,8,9-HxCDD	ND	0.20	pg/g	SW846 8290
Total HxCDD	**3.2**		**pg/g**	**SW846 8290**
1,2,3,4,6,7,8-HpCDD	**3.2**		**pg/g**	**SW846 8290**
Total HpCDD	**6.8 J**		**pg/g**	**SW846 8290**
OCDD	**30 B**		**pg/g**	**SW846 8290**
2,3,7,8-TCDF	ND	0.11 EMPC	pg/g	SW846 8290
Total TCDF	**0.15**		**pg/g**	**SW846 8290**
1,2,3,7,8-PeCDF	ND	0.32	pg/g	SW846 8290
2,3,4,7,8-PeCDF	ND	0.32	pg/g	SW846 8290
Total PeCDF	ND	0.32	pg/g	SW846 8290
1,2,3,4,7,8-HxCDF	ND	0.24 EMPC	pg/g	SW846 8290
1,2,3,6,7,8-HxCDF	ND	0.17	pg/g	SW846 8290
2,3,4,6,7,8-HxCDF	ND	0.20	pg/g	SW846 8290
1,2,3,7,8,9-HxCDF	ND	0.20	pg/g	SW846 8290
Total HxCDF	ND	0.79 EMPC	pg/g	SW846 8290
1,2,3,4,6,7,8-HpCDF	**1.3 J**		**pg/g**	**SW846 8290**
1,2,3,4,7,8,9-HpCDF	ND	0.55	pg/g	SW846 8290
Total HpCDF	**5.5**		**pg/g**	**SW846 8290**
OCDF	**4.0**		**pg/g**	**SW846 8290**

INTERNAL STANDARDS	PERCENT RECOVERY	RECOVERY LIMITS
13C-2,3,7,8-TCDD	94	(40 - 135)
13C-1,2,3,7,8-PeCDD	107	(40 - 135)
13C-1,2,3,6,7,8-HxCDD	69	(40 - 135)
13C-1,2,3,4,6,7,8-HpCDD	57	(40 - 135)
13C-OCDD	59	(40 - 135)
13C-2,3,7,8-TCDF	73	(40 - 135)
13C-1,2,3,7,8-PeCDF	76	(40 - 135)
13C-1,2,3,4,7,8-HxCDF	61	(40 - 135)
13C-1,2,3,4,6,7,8-HpCDF	53	(40 - 135)

NOTE(S):

Results and reporting limits have been adjusted for dry weight.

J Estimated result. Result is less than the reporting limit.

B Method blank contamination. The associated method blank contains the target analyte at a reportable level.

BLASLAND BOUCK & LEE INC

Client Sample ID: CC-SED-DUP

Trace Level Organic Compounds

Lot-Sample #...: G3E230258-007 Work Order #...: FPCA41AA Matrix.....: SOLID
Date Sampled...: 05/21/03 Date Received..: 05/23/03
Prep Date.....: 05/27/03 Analysis Date..: 06/03/03
Prep Batch #...: 3147607
Dilution Factor: 1

PARAMETER	RESULT	DETECTION LIMIT	UNITS	METHOD
2,3,7,8-TCDD	ND D	1.8	pg/g	SW846 8290
Total TCDD	ND	1.8	pg/g	SW846 8290
1,2,3,7,8-PeCDD	ND D	4.9	pg/g	SW846 8290
Total PeCDD	ND	7.3 EMPC	pg/g	SW846 8290
1,2,3,4,7,8-HxCDD	ND D	4.1	pg/g	SW846 8290
1,2,3,6,7,8-HxCDD	ND D	4.0	pg/g	SW846 8290
1,2,3,7,8,9-HxCDD	ND D	3.8	pg/g	SW846 8290
Total HxCDD	ND	4.1	pg/g	SW846 8290
1,2,3,4,6,7,8-HpCDD	**6.0 J**		**pg/g**	**SW846 8290**
Total HpCDD	**12**		**pg/g**	**SW846 8290**
OCDD	**67 B**		**pg/g**	**SW846 8290**
2,3,7,8-TCDF	ND D	1.8	pg/g	SW846 8290
Total TCDF	ND	1.8	pg/g	SW846 8290
1,2,3,7,8-PeCDF	ND D	3.1	pg/g	SW846 8290
2,3,4,7,8-PeCDF	ND D	3.1	pg/g	SW846 8290
Total PeCDF	ND	3.5	pg/g	SW846 8290
1,2,3,4,7,8-HxCDF	ND D	2.6	pg/g	SW846 8290
1,2,3,6,7,8-HxCDF	ND D	2.5	pg/g	SW846 8290
2,3,4,6,7,8-HxCDF	ND D	2.7	pg/g	SW846 8290
1,2,3,7,8,9-HxCDF	ND D	2.9	pg/g	SW846 8290
Total HxCDF	ND	2.9	pg/g	SW846 8290
1,2,3,4,6,7,8-HpCDF	**2.1 J**		**pg/g**	**SW846 8290**
1,2,3,4,7,8,9-HpCDF	ND	1.4	pg/g	SW846 8290
Total HpCDF	**11**		**pg/g**	**SW846 8290**
OCDF	**7.0 J**		**pg/g**	**SW846 8290**

INTERNAL STANDARDS	PERCENT RECOVERY	RECOVERY LIMITS
13C-2,3,7,8-TCDD	70	(40 - 135)
13C-1,2,3,7,8-PeCDD	64	(40 - 135)
13C-1,2,3,6,7,8-HxCDD	61	(40 - 135)
13C-1,2,3,4,6,7,8-HpCDD	67	(40 - 135)
13C-OCDD	77	(40 - 135)
13C-2,3,7,8-TCDF	65	(40 - 135)
13C-1,2,3,7,8-PeCDF	61	(40 - 135)
13C-1,2,3,4,7,8-HxCDF	70	(40 - 135)
13C-1,2,3,4,6,7,8-HpCDF	50	(40 - 135)

NOTE(S):

Results and reporting limits have been adjusted for dry weight.

D Result was obtained from the analysis of a dilution.

J Estimated result. Result is less than the reporting limit.

B Method blank contamination. The associated method blank contains the target analyte at a reportable level.

BLASLAND BOUCK & LEE INC

Client Sample ID: CC-SED-03 (0-6")

Trace Level Organic Compounds

Lot-Sample #...: G3E230258-003 Work Order #...: FPCAX1AA Matrix.....: SOLID
Date Sampled...: 05/21/03 Date Received..: 05/23/03
Prep Date.....: 05/27/03 Analysis Date..: 05/31/03
Prep Batch #...: 3147607
Dilution Factor: 1

PARAMETER	RESULT	DETECTION LIMIT	UNITS	METHOD
2,3,7,8-TCDD	ND	0.47	pg/g	SW846 8290
Total TCDD	4.3		pg/g	SW846 8290
1,2,3,7,8-PeCDD	ND	0.75	pg/g	SW846 8290
Total PeCDD	1.7		pg/g	SW846 8290
1,2,3,4,7,8-HxCDD	1.0 J		pg/g	SW846 8290
1,2,3,6,7,8-HxCDD	7.7 J		pg/g	SW846 8290
1,2,3,7,8,9-HxCDD	ND	1.6 EMPC	pg/g	SW846 8290
Total HxCDD	29		pg/g	SW846 8290
1,2,3,4,6,7,8-HpCDD	240		pg/g	SW846 8290
Total HpCDD	470		pg/g	SW846 8290
OCDD	2900 B		pg/g	SW846 8290
2,3,7,8-TCDF	ND	0.45	pg/g	SW846 8290
Total TCDF	ND	0.45	pg/g	SW846 8290
1,2,3,7,8-PeCDF	ND	0.48	pg/g	SW846 8290
2,3,4,7,8-PeCDF	ND	0.48	pg/g	SW846 8290
Total PeCDF	0.56		pg/g	SW846 8290
1,2,3,4,7,8-HxCDF	3.9 J,B		pg/g	SW846 8290
1,2,3,6,7,8-HxCDF	ND	0.66 EMPC	pg/g	SW846 8290
2,3,4,6,7,8-HxCDF	ND	0.59	pg/g	SW846 8290
1,2,3,7,8,9-HxCDF	ND	0.63	pg/g	SW846 8290
Total HxCDF	72		pg/g	SW846 8290
1,2,3,4,6,7,8-HpCDF	70		pg/g	SW846 8290
1,2,3,4,7,8,9-HpCDF	4.3 J		pg/g	SW846 8290
Total HpCDF	370		pg/g	SW846 8290
OCDF	320		pg/g	SW846 8290

INTERNAL STANDARDS	PERCENT RECOVERY	RECOVERY LIMITS
13C-2,3,7,8-TCDD	62	(40 - 135)
13C-1,2,3,7,8-PeCDD	85	(40 - 135)
13C-1,2,3,6,7,8-HxCDD	64	(40 - 135)
13C-1,2,3,4,6,7,8-HpCDD	62	(40 - 135)
13C-OCDD	68	(40 - 135)
13C-2,3,7,8-TCDF	61	(40 - 135)
13C-1,2,3,7,8-PeCDF	68	(40 - 135)
13C-1,2,3,4,7,8-HxCDF	60	(40 - 135)
13C-1,2,3,4,6,7,8-HpCDF	55	(40 - 135)

NOTE(S):

Results and reporting limits have been adjusted for dry weight.

J Estimated result. Result is less than the reporting limit.

B Method blank contamination. The associated method blank contains the target analyte at a reportable level.

BLASLAND BOUCK & LEE INC

Client Sample ID: CC-SED-04 (0-6")

Trace Level Organic Compounds

Lot-Sample #...: G3E230258-004 Work Order #...: FPCA01AA Matrix.....: SOLID
Date Sampled...: 05/21/03 Date Received..: 05/23/03
Prep Date.....: 05/27/03 Analysis Date..: 05/31/03
Prep Batch #...: 3147607
Dilution Factor: 1

PARAMETER	RESULT	DETECTION LIMIT	UNITS	METHOD
2,3,7,8-TCDD	ND	0.32	pg/g	SW846 8290
Total TCDD	13		pg/g	SW846 8290
1,2,3,7,8-PeCDD	ND	1.5	pg/g	SW846 8290
Total PeCDD	6.4		pg/g	SW846 8290
1,2,3,4,7,8-HxCDD	2.4 J		pg/g	SW846 8290
1,2,3,6,7,8-HxCDD	29		pg/g	SW846 8290
1,2,3,7,8,9-HxCDD	4.5 J		pg/g	SW846 8290
Total HxCDD	63		pg/g	SW846 8290
1,2,3,4,6,7,8-HpCDD	840		pg/g	SW846 8290
Total HpCDD	1600		pg/g	SW846 8290
OCDD	10000 E,BJ		pg/g	SW846 8290
2,3,7,8-TCDF	ND	0.24	pg/g	SW846 8290
Total TCDF	0.30		pg/g	SW846 8290
1,2,3,7,8-PeCDF	1.1 J		pg/g	SW846 8290
2,3,4,7,8-PeCDF	ND	1.5 EMPC	pg/g	SW846 8290
Total PeCDF	15		pg/g	SW846 8290
1,2,3,4,7,8-HxCDF	21 B		pg/g	SW846 8290
1,2,3,6,7,8-HxCDF	4.1 J		pg/g	SW846 8290
2,3,4,6,7,8-HxCDF	2.1 J		pg/g	SW846 8290
1,2,3,7,8,9-HxCDF	ND	1.2	pg/g	SW846 8290
Total HxCDF	330		pg/g	SW846 8290
1,2,3,4,6,7,8-HpCDF	270		pg/g	SW846 8290
1,2,3,4,7,8,9-HpCDF	21		pg/g	SW846 8290
Total HpCDF	1500		pg/g	SW846 8290
OCDF	1100		pg/g	SW846 8290

INTERNAL STANDARDS	PERCENT RECOVERY	RECOVERY LIMITS
13C-2,3,7,8-TCDD	68	(40 - 135)
13C-1,2,3,7,8-PeCDD	77	(40 - 135)
13C-1,2,3,6,7,8-HxCDD	68	(40 - 135)
13C-1,2,3,4,6,7,8-HpCDD	60	(40 - 135)
13C-OCDD	64	(40 - 135)
13C-2,3,7,8-TCDF	58	(40 - 135)
13C-1,2,3,7,8-PeCDF	65	(40 - 135)
13C-1,2,3,4,7,8-HxCDF	61	(40 - 135)
13C-1,2,3,4,6,7,8-HpCDF	47	(40 - 135)

NOTE(S):

Results and reporting limits have been adjusted for dry weight.

J Estimated result. Result is less than the reporting limit.

E Estimated result. Result concentration exceeds the calibration range.

B Method blank contamination. The associated method blank contains the target analyte at a reportable level.

BLASLAND BOUCK & LEE INC

Client Sample ID: CC-SED-05 (0-6")

Trace Level Organic Compounds

Lot-Sample #...: G3E230258-005 Work Order #...: FPCA11AA Matrix.....: SOLID
Date Sampled...: 05/21/03 Date Received..: 05/23/03
Prep Date.....: 05/27/03 Analysis Date..: 05/31/03
Prep Batch #...: 3147607
Dilution Factor: 1

PARAMETER	RESULT	DETECTION LIMIT	UNITS	METHOD
2,3,7,8-TCDD	ND	0.18	pg/g	SW846 8290
Total TCDD	11		pg/g	SW846 8290
1,2,3,7,8-PeCDD	ND	0.37 EMPC	pg/g	SW846 8290
Total PeCDD	7.2		pg/g	SW846 8290
1,2,3,4,7,8-HxCDD	ND	1.8 EMPC	pg/g	SW846 8290
1,2,3,6,7,8-HxCDD	15		pg/g	SW846 8290
1,2,3,7,8,9-HxCDD	3.2 J		pg/g	SW846 8290
Total HxCDD	60		pg/g	SW846 8290
1,2,3,4,6,7,8-HpCDD	460 J		pg/g	SW846 8290
Total HpCDD	880		pg/g	SW846 8290
OCDD	4900 B		pg/g	SW846 8290
2,3,7,8-TCDF	ND	0.38 EMPC	pg/g	SW846 8290
Total TCDF	1.1		pg/g	SW846 8290
1,2,3,7,8-PeCDF	ND	0.47 EMPC	pg/g	SW846 8290
2,3,4,7,8-PeCDF	ND	0.78	pg/g	SW846 8290
Total PeCDF	9.1		pg/g	SW846 8290
1,2,3,4,7,8-HxCDF	7.0 J,B		pg/g	SW846 8290
1,2,3,6,7,8-HxCDF	1.8 J		pg/g	SW846 8290
2,3,4,6,7,8-HxCDF	ND	1.7 EMPC	pg/g	SW846 8290
1,2,3,7,8,9-HxCDF	ND	0.65	pg/g	SW846 8290
Total HxCDF	160		pg/g	SW846 8290
1,2,3,4,6,7,8-HpCDF	130 J		pg/g	SW846 8290
1,2,3,4,7,8,9-HpCDF	8.7		pg/g	SW846 8290
Total HpCDF	700		pg/g	SW846 8290
OCDF	580 J		pg/g	SW846 8290

INTERNAL STANDARDS	PERCENT RECOVERY	RECOVERY LIMITS
13C-2,3,7,8-TCDD	69	(40 - 135)
13C-1,2,3,7,8-PeCDD	81	(40 - 135)
13C-1,2,3,6,7,8-HxCDD	73	(40 - 135)
13C-1,2,3,4,6,7,8-HpCDD	64	(40 - 135)
13C-OCDD	70	(40 - 135)
13C-2,3,7,8-TCDF	65	(40 - 135)
13C-1,2,3,7,8-PeCDF	70	(40 - 135)
13C-1,2,3,4,7,8-HxCDF	60	(40 - 135)
13C-1,2,3,4,6,7,8-HpCDF	53	(40 - 135)

NOTE(S):

Results and reporting limits have been adjusted for dry weight.

J Estimated result. Result is less than the reporting limit.

B Method blank contamination. The associated method blank contains the target analyte at a reportable level.

BLASLAND BOUCK & LEE INC

Client Sample ID: CC-SED-06 (0-6")

Trace Level Organic Compounds

Lot-Sample #...: G3E230258-006 Work Order #...: FPCA31AA Matrix.....: SOLID
Date Sampled...: 05/21/03 Date Received..: 05/23/03
Prep Date.....: 05/27/03 Analysis Date..: 05/31/03
Prep Batch #...: 3147607
Dilution Factor: 1

PARAMETER	RESULT	DETECTION LIMIT	UNITS	METHOD
2,3,7,8-TCDD	ND	0.18	pg/g	SW846 8290
Total TCDD	11		pg/g	SW846 8290
1,2,3,7,8-PeCDD	ND	0.29	pg/g	SW846 8290
Total PeCDD	9.0		pg/g	SW846 8290
1,2,3,4,7,8-HxCDD	ND	0.38	pg/g	SW846 8290
1,2,3,6,7,8-HxCDD	ND	1.1 Emax	pg/g	SW846 8290
1,2,3,7,8,9-HxCDD	0.73 J		pg/g	SW846 8290
Total HxCDD	2.2		pg/g	SW846 8290
1,2,3,4,6,7,8-HpCDD	28		pg/g	SW846 8290
Total HpCDD	56		pg/g	SW846 8290
OCDD	310 B		pg/g	SW846 8290
2,3,7,8-TCDF	0.23 J		pg/g	SW846 8290
Total TCDF	0.23		pg/g	SW846 8290
1,2,3,7,8-PeCDF	0.38 J		pg/g	SW846 8290
2,3,4,7,8-PeCDF	ND	0.21	pg/g	SW846 8290
Total PeCDF	0.82		pg/g	SW846 8290
1,2,3,4,7,8-HxCDF	1.0 J,B		pg/g	SW846 8290
1,2,3,6,7,8-HxCDF	ND	0.44	pg/g	SW846 8290
2,3,4,6,7,8-HxCDF	ND	0.48	pg/g	SW846 8290
1,2,3,7,8,9-HxCDF	ND	0.51	pg/g	SW846 8290
Total HxCDF	11		pg/g	SW846 8290
1,2,3,4,6,7,8-HpCDF	8.6		pg/g	SW846 8290
1,2,3,4,7,8,9-HpCDF	1.1 J		pg/g	SW846 8290
Total HpCDF	34		pg/g	SW846 8290
OCDF	28		pg/g	SW846 8290

INTERNAL STANDARDS	PERCENT RECOVERY	RECOVERY LIMITS
13C-2,3,7,8-TCDD	67	(40 - 135)
13C-1,2,3,7,8-PeCDD	69	(40 - 135)
13C-1,2,3,6,7,8-HxCDD	75	(40 - 135)
13C-1,2,3,4,6,7,8-HpCDD	70	(40 - 135)
13C-OCDD	72	(40 - 135)
13C-2,3,7,8-TCDF	68	(40 - 135)
13C-1,2,3,7,8-PeCDF	66	(40 - 135)
13C-1,2,3,4,7,8-HxCDF	52	(40 - 135)
13C-1,2,3,4,6,7,8-HpCDF	61	(40 - 135)

NOTE(S):

Results and reporting limits have been adjusted for dry weight.

J Estimated result. Result is less than the reporting limit.

B Method blank contamination. The associated method blank contains the target analyte at a reportable level.