

APPENDICES

Appendix A
2005 Sample Locations

APPENDIX A

2005 SAMPLE LOCATIONS, CYPRESS CREEK SUB-AREA III

Approximate Location (Feet downstream of Scott St.)	Sample ID	Side of Creek	Location with Respect to Construction Easement	Sample Notes
9,725	1984 EDWARD - A	South	A	MEC, hand auger, 8/11/2005, south side, within construction easement, 1984 Edward Ave.
9,725	1984 EDWARD - B	South	B	MEC, hand auger, 8/11/2004, south side, outside construction easement, 1984 Edward Ave.
9,480	UNIVERSITY PARK - BOTTOM	NA	A	MEC, grab sample under broken concrete from creek bottom, 8/11/2005, approximately 225 feet upstream from University St. bridge
9,470	UNIVERSITY PARK - OVERBANK	South	A	MEC, hand auger, 8/11/2005, approximately 250 feet upstream from University St. bridge, 3 feet from channel wall
6,445	2297 DEXTER - B	North	B	MEC, hand auger, 8/12/2005, north side, outside construction easement, 2297 Dexter Ave.
6,370	2307 DEXTER - C	North	C	MEC, hand auger, 8/12/2005, north side, remote from creek, 2307 Dexter Ave.
3,235	1005 MEAGHER - C1	North	C	MEC, hand auger, 8/12/05, north side, remote from creek, 1005 Meagher St. Sample collected inside fenced playground area beneath several inches of washed pea gravel.
3,155	1005 MEAGHER - C2	North	C	MEC, hand auger, 8/12/05, north side, remote from creek, 1005 Meagher St
3,155	2481 VOLLINTINE CV. - C	South	C	MEC, hand auger, 8/12/2005, south side, remote from creek, 2481 Vollintine Cv.
3,120	2482 DANA DR. - C	South	C	MEC, hand auger, 8/12/2005, south side, remote from creek, 2482 Dane Cv.
3,120	2482 DANA DR. - D	South	C	Duplicate to 2482 DANA DR - C
2,970	2487 DANA DR. - C	South	C	MEC, hand auger, 8/12/2005, south side, remote from creek, 2487 Dane Cv.

Appendix B
Data Quality Review Report



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To: Joe Ricker, Premier Environmental Services
From: Carol Cummins, Project Scientist
Date: September 27, 2005
Project: Cypress Creek Soil Sampling, Memphis, Tennessee
Re: Data Quality Review

The following details a data quality review of 12 soil samples and one rinsate blank sample collected on August 11th and 12th, 2005 from locations along Cypress Creek in Memphis, Tennessee. The samples were analyzed for moisture content and chlorinated pesticides (pesticides) using EPA SW-846 Method 3550B/8081A (USEPA 1996). GTW Analytical Services, LLC (GTW), located in Memphis, Tennessee performed the analyses. The criteria used to qualify data are from the associated *Sampling and Analysis Procedures (SAP) for Velsicol Chemical Corporation – Memphis, Tennessee*, as revised in January 2003, the *Contract Laboratory Program National Functional Guidelines for Organic and Inorganic Data Review* (USEPA 1999 and USEPA 1994), the analytical methods, and the professional judgment of the validation chemist. The following laboratory deliverables were evaluated during the review process:

- Chain-of-custody (COC) documentation to assess holding times and verify report completeness
- Laboratory quality control (QC) sample results, including method blanks, surrogate spikes, blank spike samples, and matrix spike/matrix spike duplicates (MS/MSDs)
- Analytical results to verify reporting limits
- Field QC samples to assess field blank contamination

The sample identification numbers and the associated laboratory sample numbers are listed in Table 1. The qualified data are summarized in Table 2. The QA/QC summaries provided by the laboratory are included in Attachment A. Copies of the chain-of-custody forms are included in Attachment B. Data qualifier flags have been added to the sample results in the original laboratory reports and the Premier data tables.

Sample Custody – Acceptable

All samples were collected, transported, handled, and analyzed maintaining chain-of-custody protocols. Documentation relative to the collection of samples and laboratory analyses was listed on the chain-of-custody forms that accompanied the samples to the laboratory. Upon review of the chain-of-custody forms, it is noted that the samples were received at the laboratory on ice.

Holding Time Evaluation – Acceptable

All soil samples were extracted for chlorinated pesticides within the method holding time of 14 days from collection and analyzed within the holding time of 40 days from extraction. All soil samples were analyzed within 14 days for moisture content.

Laboratory Blank Analyses – Acceptable

Sample contamination contributed by laboratory conditions or procedures was monitored by the concurrent preparation and analysis of a method blank sample. A method blank sample was analyzed as required by the SAP. No target analytes were detected, indicating no laboratory contamination occurred.

Field Blank Analysis – Acceptable

A rinsate blank sample was collected and analyzed to monitor contamination contributed by field conditions or procedures. No target analytes were detected, indicating no field contamination occurred.

Surrogate Compound Percent Recovery – Acceptable with Discussion

The recoveries of surrogate compounds are used to assess the individual sample performance achieved by the laboratory for organic analyses. Surrogate recovery values are within laboratory acceptance criteria for all analyses, with the following exceptions.

- The tetrachlorometaxylene (TCMX) surrogate recovery value is unavailable for sample 1984 Edward – A. Data qualifiers are not required because dilution of the sample reduced the surrogate concentration below the detection limit.
- The TCMX surrogate recovery value is above the laboratory control limit (150 percent) for sample Blank Spike at 160 percent. Data qualifiers are not required for QC samples.

Blank Spike Analyses – Acceptable

The recovery values of blank spike analyses are used to assess the analytical accuracy achieved by the laboratory. As the blank spike analyses are independent of potential matrix effects, they give a true indication of the analytical accuracy achieved by the laboratory for the respective analyses performed. The blank spike recovery values are within the laboratory acceptance criteria.

Matrix Spike/Matrix Spike Duplicate (MS/MSD) Analyses – Acceptable with Qualification

The recovery values of MS/MSD analyses are used to assess the analytical accuracy on an individual sample basis, while the relative percent difference (RPD) between the MS and the MSD indicates the analytical precision achieved for that sample. MS/MSD samples were analyzed as required by the SAP. The MS/MSD percent recovery data provided are within the laboratory acceptance criteria for all analyses with the following exceptions:

- The MS/MSD recovery values for dieldrin and endrin in the spiked analysis of sample University Park – Overbank are unavailable because the concentrations in the sample are significantly higher than the added spike concentration, preventing accurate evaluation of the spike recoveries. Blank spike data for dieldrin and endrin are in-control, indicating the analytical system was in-control; therefore, no qualification is required.
- The MS/MSD recovery values for 4,4'-DDT and aldrin in the spiked analysis of sample University Park – Overbank are below the SAP criteria at zero percent. Blank spike data for 4,4'-DDT and aldrin are in-control, indicating the analytical system was in-control and the matrix interference is likely limited to the spike sample. Functional Guidelines recommends rejecting results associated with recoveries less than 10 percent; therefore, 4,4'-DDT and aldrin results for sample University Park – Overbank are qualified as rejected (R).

Laboratory Duplicate Sample Analysis – Acceptable

A duplicate sample was analyzed for moisture content as required. The RPD value is within the laboratory acceptance limit of less than 20.

Field Duplicate Analyses

A field duplicate sample was not collected for analysis.

Laboratory Reporting Limits – Acceptable with Discussion

The reporting limits used by the laboratory are reasonable for the analytical method. All samples met the required reporting limits with the following exception:

- The detection limit for toxaphene was raised in all samples due to matrix interferences. No qualifiers are required as a result of this action.

Miscellaneous Quality Assurance/Quality Control – Acceptable with Qualification

The following QC anomalies are not usually addressed in a data quality review as defined by the SAP. It is assumed these QC parameters are acceptable, unless noted otherwise in the case narrative. The following items were addressed in the case narratives and are discussed here.

- The confirmation comparison criterion of 40 percent difference was exceeded for the following samples and target compounds.

Sample	Target Analyte
University Park – Overbank	alpha-chlordane
1984 Edward – A	chlordene
1984 Edward – B	chlordene and endrin ketone
2481 Vollintine Cv. – C	endrin ketone
2482 Dana Dr. – D	endrin ketone

The higher of the two values is reported as required by Method 8000B because no evidence of matrix interference was observed. The results for the samples and analytes are qualified as estimated (J).

Completeness – Acceptable

Completeness is a measure of the amount of valid data collected for the sampling event, and is expressed as the ratio of valid results to the amount of data expected to be obtained under normal conditions. Valid results are results that are determined to be usable during the data validation review process. The completeness of the Cypress Creek monitoring data reviewed in this report is 99.5 percent, which achieves the requirement of greater than 85 percent. The completeness is less than 100 percent because two chlorinated pesticide results were rejected based on very low MS/MSD recoveries.

Data Qualifier Flags

Organic Data Qualifiers

The following data validation qualifiers were used in the review of this data set. These qualifiers are from the USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review (USEPA 1999). The bias indicators H and L were used to maintain consistency with historical database usage.

- U The analyte was analyzed for but not detected above the reported sample quantitation limit.
- J The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.
- UJ The analyte was not detected above the reported sample quantitation limit. However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample.
- N The analysis indicates the presence of an analyte for which there is presumptive evidence to make a "tentative identification".
- NJ The analysis indicates the presence of an analyte that has been "tentatively identified" and the associated numerical value represents its approximate concentration.
- R The sample results are rejected due to serious deficiencies in the ability to analyze the samples and meet quality control criteria. The presence or absence of the analyte cannot be verified.

References

Memphis Environmental Center. MEC 2003. Sampling and Analysis Procedures (SAP) for Velsicol Chemical Corporation – Memphis, Tennessee, January 2003.

USEPA. 1999. Contract Laboratory Program National Functional Guidelines for Organic Data Review. United States Environmental Protection Agency Office of Emergency and Remedial Response. EPA540/R-99/008. October 1999.

USEPA. 1996. Test Methods for Evaluating Solid Waste, Physical/Chemical Methods (SW-846) Third Edition, Updates I, II, IIA, IIB, and III. United States Environmental Protection Agency Office of Solid Waste. December 1996.

Table 1—Sample Data Reviewed

Sample ID	Laboratory ID
University Park - Overbank	2502398
University Park - Bottom	2502399
1984 Edward - A	2502400
1984 Edward - B	2502401
2487 Dana Dr. - C	2502402
2482 Dana Dr. - C	2502403
2481 Vollintine Cv. - C	2502404
2297 Dexter - B	2502405
1307 Dexter - C	2502406
1005 Meagher - C1	2502407
1005 Meagher - C2	2502408
2482 Dana Dr. - D	2502409
081205 Rinse	2502410

Table 2—Summary of Qualified Data

Sample ID	Analyte	Qualifier	Quality Control Exceedance
University Park - Overbank	4,4'-DDT and aldrin	R	MS/MSD recovery values less than 10 percent
University Park - Overbank	alpha-chlordane	J	Confirmation column difference greater than 40%
1984 Edward - A	chlordene	J	Confirmation column difference greater than 40%
1984 Edward - B	chlordene and endrin ketone	J	Confirmation column difference greater than 40%
2481 Vollintine Cv. - C	endrin ketone	J	Confirmation column difference greater than 40%
2482 Dana Dr. - D	endrin ketone	J	Confirmation column difference greater than 40%

ATTACHMENT A LABORATORY QA/QC SUMMARIES

GTW ANALYTICAL SERVICES, LLC

3715 S. Perkins, Suite 7
Memphis, Tennessee 38118
(901) 323-5554

FILE COPY

LABORATORY REPORT

Client Contact: Gary Hermann
Project: MEC
Cypress Creek
Sample(s) Type: Soil

Report Date: 08/22/05
Report No: R-250719

All sample results reported on an "as-received" basis unless otherwise indicated.

Quality Assurance Summary:

<u>Type of Analysis</u>	<u>Method</u>	<u>Holding Time</u>	<u>Surrogate Recoveries</u>	<u>Matrix Spike Recoveries</u>	<u>Blanks</u>	<u>Overall Summary</u>
PESTICIDES	SW-846 3550B/8081A	A	A (N-1)	A (N-2)	A	A (See N-1 and N-2)
MOISTURE CONTENT	SW-846 3550B	NA	NA	NA	NA	A


N-1: The recovery for sample #2502400 was unavailable due to dilution.

N-2: Due to the level of contamination that was present in the sample that was spiked, no valid recoveries could be determined for Dieldrin and Endrin. Recoveries for 4,4'-DDT and Aldrin were unavailable due to matrix interferences. However, a blank spike was analyzed that had acceptable recoveries.

A = Requirements by method were met
NA = Not applicable



QA Officer



Technical Manager

GTW ANALYTICAL SERVICES, LLC

3715 S. Perkins, Suite 7
Memphis, Tennessee 38118
(901) 323-5554

FILE COPY

LABORATORY REPORT

Client Contact: Gary Hermann
Project: MEC
Cypress Creek
Sample(s) Type: Soil

Report Date: 08/22/05
Report No: R-250720

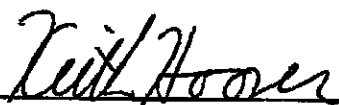
All sample results reported on an "as-received" basis unless otherwise indicated.

Quality Assurance Summary (Page 1 of 2):

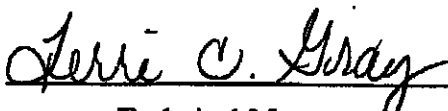
<u>Type of Analysis</u>	<u>Method</u>	<u>Holding Time</u>	<u>Surrogate Recoveries</u>	<u>Matrix Spike Recoveries</u>	<u>Blanks</u>	<u>Overall Summary</u>
PESTICIDES	SW-846 3550B/8081A	A	A	A (N-1)	A	A (See N-1)
MOISTURE CONTENT	SW-846 3550B	NA	NA	NA	NA	A

N-1: These samples were analyzed as part of a larger set which included matrix spikes. Recoveries were acceptable except for 4,4'-DDT and Aldrin, which were unavailable due to matrix interferences, and Dieldrin and Endrin, which were unavailable due to the level of contamination that was present in the sample that was spiked; however, the blank spike had acceptable recoveries.

A = Requirements by method were met
NA = Not applicable



QA Officer



Technical Manager

GTW ANALYTICAL SERVICES, LLC

3715 S. Perkins, Suite 7
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LABORATORY REPORT

Client Contact: Gary Hermann
Project: MEC
Cypress Creek
Sample(s) Type: Water

Report Date: 08/22/05
Report No: R-250720

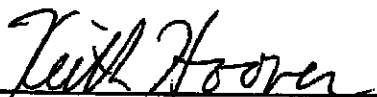
All sample results reported on an "as-received" basis unless otherwise indicated.

Quality Assurance Summary (Page 2 of 2):

<u>Type of Analysis</u>	<u>Method</u>	<u>Holding Time</u>	<u>Surrogate Recoveries</u>	<u>Matrix Spike Recoveries</u>	<u>Blanks</u>	<u>Overall Summary</u>
PESTICIDES	SW-846 3510C/8081A	A	A	N-2	A	A (See N-2)

N-2: Insufficient sample volume was received to perform matrix spikes; however, a blank spike was analyzed that had acceptable recoveries.

A = Requirements by method were met
NA = Not applicable



QA Officer



Technical Manager

ATTACHMENT B
CHAIN OF CUSTODY FORM

CHAIN OF CUSTODY RECORD

REPORT NO. **250720**

GTW ANALYTICAL SERVICES, LLC.

3715 S. PERKINS, STE. 7, MEMPHIS, TN 38118

PHONE 901-323-5554 FAX 901-323-5573

SUBMIT REPORT TO:

COMPANY: **MK**

CONTACT: **Gary Ferrman**

PERMIT/PROJECT NO.: **003-10**

PROJECT NAME: **Cypress Creek**

SAMPLER'S SIGNATURE: *J. Craig Swearingen*

LAB NO.	SEQ NO.	SAMPLE NO.	DATE	TIME	SAMPLE LOCATION	MATRIX	NO. OF CONTAINERS	REMARKS (ANALYSES, ETC.)	TAT: Normal (7-10 days) 2-3 days 24-hours	Same Day
2402		2487 Dams Dr.-C	8-12-05	9:05	2487 Dams Dr.	S	1	Pesticides & Microbes Contact		LAB PH
2403		2482 Dams Dr.-C	"	9:35	2482 Dams Drive	S				
2404		2481 Vallintown Co. E	"	10:05	2481 Vallintown Dr.	S				
2405		2297 Dexter -B	"	10:30	2297 Dexter Ave.	S				
2406		2307 Dexter -C	"	11:00	2307 Dexter Ave.	S				
2407		1005 Memphis -C1	"	12:15pm	1005 Memphis St.	S				
2408		1005 Memphis -C2	"	12:35pm	1005 Memphis St.	S				
2409		2482 Dams Dr.-D	"	9:40	2482 Dams Dr.	S				
2410		091205 Rinse	"	8:30am	Rinse Blank	W	2	Pesticides		6

RELINQUISHED BY: *J. Craig Swearingen*

DATE/TIME: 8/12/05 1440

RECEIVED BY:

METHOD OF SHIPMENT:

RELINQUISHED TO LAB BY:

DATE/TIME:

RECEIVED FOR LAB BY: *Leah Adams*

DATE/TIME: 8-12-05/2:35 PM

CONDITION OF COOLER/SEAL: *OK*

COOLER OPENED BY: *Leah Adams*

DATE/TIME:

SHADED AREAS FOR LABORATORY USE ONLY!