AECOM

**AECOM**
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April 27, 2009

Mr. Ryan Benefield
Chief of Hazardous Waste Division
Arkansas Department of Environmental Quality
5301 Northshore Drive
North Little Rock, AR 72118-5317

Subject: **Response to Comments on the Wormald Site Investigation Report**
**Tyco Safety Products – Former Cedar Chemical Facility**
**Helena – West Helena, Arkansas**
**State EPA ID No. ARD990660649**

Dear Mr. Benefield:

This letter is in response to written comments on the *Wormald Site Investigation Report* (AECOM, March 30, 2009) (Wormald SIR) provided by the Arkansas Department of Environmental Quality (ADEQ) in correspondence to AECOM dated April 9, 2009 and will be included with the *Revised Wormald SIR* in response to ADEQ's comments.

1) **Comment:** *Table 1 – The sample results for TSB-1-a, TSB-3, TSB-4, and TSB-5 presented in Table 1 do not match the results in the laboratory report. Also, the results presented in this table for these same samples are presented with either a "J" or "JQ" flag. The laboratory report does not show any flags for these samples. Furthermore, the data validation report states the results for dinoseb by Method 8151A are acceptable and no data flags are required. Please address and correct these discrepancies.*

**Response:** Preliminary laboratory results received from the analytical laboratory (included as Attachment 1 to this Response to Comments) contained samples qualified with a "J" or "JQ" flag, indicating the results between the Method Detection Limit (MDL) and the Method Quantization Limit (MQL). The preliminary results were inadvertently included in Table 1 instead of the final results. The "J" flagged samples were subsequently analyzed at a lesser dilution factor prior to completion of the final laboratory package (included in Appendix C of the *Wormald SIR*). The statement that "no data flags are required" in the Data Validation Report (DVR) is correct. The table has been updated to reflect the final laboratory results and is included as Table 1 of the *Revised Wormald SIR*.

2) **Comment:** *The Medium-Specific Screening Level of 680 mg/kg for dinoseb is incorrect. This value is taken from an outdated version of the Region 6 Medium-Specific Screening Tables and applies to an industrial outdoor worker with direct exposure to surface soil. The most*

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*current version of the Region 6 Medium-Specific Screening Tables is dated September 2008. In this case, the correct soil screening level for dinoseb is 0.051 mg/kg, which is a maximum contaminant level (MCL)-based screening level for protection of groundwater. All dinoseb concentrations collected from the 4'-8' soil interval exceed this screening level. Laboratory analysis for the samples being held that were collected from the 8'-12' soil interval would provide additional information in regards to potential impacts to groundwater. Please amend the narrative accordingly.*

**Response:** A screening level of 680 mg/kg was used in reliance on a review of previous information provided by ADEQ and in two Geomatrix reports as follows:

(1) The screening level used in ADEQ's *Risk Evaluation* included as Appendix D of the *Cedar Chemical Company: Request for Proposal Packet* (ADEQ, August 23, 2005). Page 4 of the *Risk Evaluation* provides a risk based clean-up level of 680 mg/kg for "dry sediment" at Site 3.

(2) The tables in the *Interim Facility Investigation Report* (AMEC Geomatrix, October 2008) and the *Draft Facility Investigation Report* (AMEC Geomatrix, January 2009) list 680 mg/kg as the screening level for dinoseb in soil based on the Industrial Outdoor Worker exposure scenario. The MCL-based Soil Screening Level (SSL) for dinoseb was listed as "NA" on the tables and figures of both the *Interim FIR* (October 2008) and the *Draft FIR* (January 2009). Our understanding was that the *Interim FIR* or this SSL for dinoseb was not objected to by ADEQ.

However, based on ADEQ comment #2, it is now our current understanding that ADEQ has commented that the risk based clean-up level for dinoseb presented in its *Risk Evaluation* and in the AMEC Geomatrix Reports is not the correct SSL

As a result, Table 1 of the *Wormald SIR* has been amended to include the EPA Region 6 screening level (SL) for dinoseb in industrial soil (620 mg/kg) and the MCL-based SSL for dinoseb (5.1E-02 mg/kg) presented on the EPA Region 6 Medium-Specific Screening Level (MSL) tables dated September 2008. The revised table is included as Table 1 of the *Revised Wormald SIR*. Figure 2 of the *Wormald SIR* has also been revised to include the current EPA Region 6 MSL. The text will be amended to reflect comparisons to these screening criteria.

Soil samples collected from the 8-12 foot interval at TSB-1 were extracted on March 9, 2009 and are past the recommended holding time (40 days) specified in the analytical method; therefore, these samples will not be analyzed.

3) **Comment:** *The statement in the conclusions that designates the dinoseb concentration of 13,000 mg/kg for 3SB-6 (4-8') in the 1996 FI as*

*being erroneous is subjective. Several factors would cause variance in sample results. These would include, but not limited to, sampling methodologies, analytical procedures, exact duplication of sample locations, and infiltration over a 13 year period. In this case, years of infiltration and duplication of sample locations are likely to be two of the main reasons for differences in dinoseb concentrations from the two sampling events. Please note that concentrations of dinoseb vary throughout the site and will increase and decrease within the borehole. Samples taken at shallow depths may exhibit lower concentrations of dinoseb. The range of dinoseb may increase as the hole advances and then decrease again at the base of the hole. ADEQ does not concur with the statement that the 1996 data is erroneous. There is not sufficient information available to qualify this statement. Please remove this statement from the final SIR and amend the narrative accordingly.*

**Response:** Our rationale for our opinion was based upon the following: The detected dinoseb concentration (13,000 mg/kg) in historic soil sample 3SB-6 (4-8') was more than two orders of magnitude greater than detected concentrations (0.63 mg/kg to 560 mg/kg) in other Site 3 soil samples collected during the Ensafe FI (1996). Based on the range of historic dinoseb detections in soil in the vicinity of Site 3, the concentration detected in historic soil sample 3SB-6 (4-8') appeared anomalous. Therefore, a confirmation soil sampling program was developed for Site 3 in the vicinity of 3SB-6. Detected dinoseb concentrations for the five soil samples collected from the 4-8 foot interval in the vicinity of 3SB-6 range from 31.3 mg/kg to 80.4 mg/kg. Based on these results, the detected dinoseb concentration in historic soil sample 3SB-6 (4-8') does not appear to be consistent with the current Conceptual Site Model (CSM) and is not representative of current Site 3 conditions.

However, sentence two of the last paragraph on page 3 of the *Wormald SIR*, which reads *"confirmation sampling at TSB-1, which is co-located with historic soil sample 3SB-6, indicates that the dinoseb concentration of 13,000 mg/kg reported for 3SB-6 (4 – 8 feet) in the FI (EnSafe, 1996), is erroneous"*, will be revised to say *"confirmation sampling at TSB-1, which is co-located with historic soil sample 3SB-6, indicates that the dinoseb concentration of 13,000 mg/kg reported for 3SB-6 (4 – 8 feet) in the FI (EnSafe, 1996) is not representative of current Site 3 soil conditions.*

4) **Comment:** *The sample location map included with the SIR is the same map that was included with the work plan. The actual surveyed location of the sample collected for this investigation is not included in the SIR. Please provide an updated map showing the surveyed location of each sample location.*

**Response:** Prior to soil boring installation, historic soil sample 3SB-6 was located and staked by Smith and Weiland Surveyors as the location for TSB-1 using survey coordinates extracted from the basemap. A 10 foot by 10 foot grid centered on TSB-1 was established by the surveyor and the locations for TSB-2 through TSB-5 were staked on this grid as proposed on Figure 3 of the *Wormald Investigation Work Plan* and as shown on Figure 2 of the *Wormald SIR*.

No changes to the established sample grid were necessary. Sample location TSB-1 was installed at the location of historic sample 3SB-6 and sample locations TSB-2 through TSB-5 were installed 5-feet away from TSB-1 as shown on Figure 2 of the *Wormald SIR* and as proposed in the work plan. The sample locations and spatial relationships shown on Figure 2 are correct. However, to avoid confusion, Figure 2 has been revised to include an inset table listing the northing and easting of the sample locations referenced to Arkansas State Plane North American Datum 1983 (NAD83). The revised Figure is included as Figure 2 of the *Revised Wormald SIR*.

If you have any questions or require additional information, please contact me at 864-234-2282 or Ms. Ann Faitz at (501)831-5637.

Sincerely,

**AECOM**

Leslee J. Alexander, P.G.
Project Manager

Attachments: Attachment 1 – Preliminary Results for Dinoseb in Subsurface Soil

c: Mr. Dara Hall, ADEQ Counsel (letter only)
Mr. John Perkins, Tyco Safety Products
Ms. Ann Faitz, Tyco Counsel
Mr. Allan Gates, HCC legal counsel
Mr. Joe Ghormley, Exxon legal counsel
Project File 104366

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# ATTACHMENT 1

# PRELIMINARY RESULTS FOR DINOSEB IN SUBSURFACE SOIL

ETC ENVIRONMENTAL TESTING & CONSULTING, INC.
www.etcmemphis.com 2709 Whitton Road Memphis, Tennessee 38133 (901) 213-2400 Fax (901) 213-2440
"A Laboratory Management Partner"

**CLIENT:** AECOM EARTH TECH
**Project:** Cedar Chemicals
**Lab Order Number:**

# CASE NARRATIVE

**Date: 03/19/09**

ETCAL

Herbicides by Method 8151A

Sample Analysis
Samples were initially analyzed without dilution. The levels of Dinoseb present indicated that a dilution factor of 1:1000 would be required. Both the un-diluted and diluted sample extracts were analyzed in the same analytical batch. The high levels of Dinoseb caused an elevated result for this target analyte in the ending calibration verification standard for the confirmation column.

Data presented consists of preliminary results. All dilutions will be re-analyzed to ensure data within the calibration range. Some sample results are flagged with the data qualifier J, to indicate results between the MDL and MQL. These samples will be analyzed at a lesser dilution factor.

Method Blank
Dinoseb was detected in the method blank at a concentration of 6.90 J ug/kg. This concentration had no impact on the final sample data and will be re-analyzed to confirm this result.

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**AECOM EARTH TECH**
10 Patewood Drive
Building VI, Suite 500
Greenville, SC 29615

Project Description **Cedar Chemicals**
Project No. **104336**
Site **W. Helena, AR**

Lab Order Number **0903061**
Lab ID **0903061-001A**
Field ID **TSB-1**

**Report of Analysis**
Received **03/05/09**
Matrix **Soil**
Sampled **03/05/09 10:10**

**Analytical Method 8151A**

**Prep Method** 8151A **Prep Batch(s)** 23743 **Date/Time Prepped** 03/09/09 15:03

| Compound | Result | Units | | MQL | DF | Date/Time Analyzed | By | Analytical Batch |
|---|---|---|---|---|---|---|---|---|
| **Dinoseb** | **44,200** | **µg/Kg** | | **15,000** | **1,000** | **03/19/09 8:57** | **DPC** | **38386** |
| Surrogate: DCAA | | 70 % | Limits: | 20-150 | 1 | 03/19/09 4:28 | DPC | 38386 |

**Qualifiers/ Definitions**

| | | | |
|---|---|---|---|
| * | Surrogate Recovery outside accepted limits | * I | Recoveries affected by interferences or high background |
| B | Analyte detected in the associated Method Blank | DF | Dilution Factor |
| E | Value exceeds method calibration range | H | Prepped / Analyzed out of holding time. |
| J | Estimated Value Analyte below reported detection limit | M | Minimum value |
| MDL | Method Dection Limit (unadjusted) | MQL | Method Quantitation Limit (adjusted) |
| MRL | Method Reporting Limit | N | Refer to attached Non-Compliance Report |
| Q | RPD >40% between primary and confirmation columns | SQL | Sample Quantitation Limit (adjusted MDL) |

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**AECOM EARTH TECH**
10 Patewood Drive
Building VI, Suite 500
Greenville, SC 29615

Project Description **Cedar Chemicals**
Project No. **104336**
Site **W. Helena, AR**

Lab Order Number **0903061**
Lab ID **0903061-002A**
Field ID **TSB-1a**

**Report of Analysis**
Received **03/05/09**
Matrix **Soil**
Sampled **03/05/09 10:10**

## Analytical Method 8151A

**Prep Method** 8151A **Prep Batch(s)** 23743 **Date/Time Prepped** 03/09/09 15:03

| Compound | Result | Units | MQL | DF | Date/Time Analyzed | By | Analytical Batch |
|---|---|---|---|---|---|---|---|
| **Dinoseb** | **12100 JQ** | **µg/Kg** | **15,000** | **1,000** | **03/19/09 9:29** | **DPC** | **38386** |
| Surrogate: DCAA | | 65 % | Limits: 20-150 | 1 | 03/19/09 5:35 | DPC | 38386 |

**Qualifiers/ Definitions**

| | | | |
|---|---|---|---|
| * | Surrogate Recovery outside accepted limits | * I | Recoveries affected by interferences or high background |
| B | Analyte detected in the associated Method Blank | DF | Dilution Factor |
| E | Value exceeds method calibration range | H | Prepped / Analyzed out of holding time. |
| J | Estimated Value Analyte below reported detection limit | M | Minimum value |
| MDL | Method Dection Limit (unadjusted) | MQL | Method Quantitation Limit (adjusted) |
| MRL | Method Reporting Limit | N | Refer to attached Non-Compliance Report |
| Q | RPD >40% between primary and confirmation columns | SQL | Sample Quantitation Limit (adjusted MDL) |

03/19/09 5087 AECOM_GREENVILLE

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**AECOM EARTH TECH**
10 Patewood Drive
Building VI, Suite 500
Greenville, SC 29615

Project Description **Cedar Chemicals** Site **W. Helena, AR**

Project No. **104336**

Lab Order Number **0903061**
Lab ID **0903061-003A**
Field ID **TSB-2**

**Report of Analysis**
Received **03/05/09**
Matrix **Soil**
Sampled **03/05/09 9:38**

**Analytical Method 8151A**

**Prep Method** 8151A **Prep Batch(s)** 23743 **Date/Time Prepped** 03/09/09 15:03

| Compound | Result | Units | | MQL | DF | Date/Time Analyzed | By | Analytical Batch |
|---|---|---|---|---|---|---|---|---|
| **Dinoseb** | **31,300** | **µg/Kg** | | **15,000** | **1,000** | **03/19/09 9:51** | **DPC** | **38386** |
| Surrogate: DCAA | | 79 % | Limits: | 20-150 | 1 | 03/19/09 5:58 | DPC | 38386 |

**Qualifiers/ Definitions**

| | | | |
|---|---|---|---|
| * | Surrogate Recovery outside accepted limits | * I | Recoveries affected by interferences or high background |
| B | Analyte detected in the associated Method Blank | DF | Dilution Factor |
| E | Value exceeds method calibration range | H | Prepped / Analyzed out of holding time. |
| J | Estimated Value Analyte below reported detection limit | M | Minimum value |
| MDL | Method Dection Limit (unadjusted) | MQL | Method Quantitation Limit (adjusted) |
| MRL | Method Reporting Limit | N | Refer to attached Non-Compliance Report |
| Q | RPD >40% between primary and confirmation columns | SQL | Sample Quantitation Limit (adjusted MDL) |

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10 Patewood Drive
Building VI, Suite 500
Greenville, SC 29615

Project Description **Cedar Chemicals** Site **W. Helena, AR**

Project No. **104336**

Lab Order Number **0903061**
Lab ID **0903061-004A**
Field ID **TSB-3**

**Report of Analysis**
Received **03/05/09**
Matrix **Soil**
Sampled **03/05/09 9:50**

**Analytical Method 8151A**

**Prep Method** 8151A **Prep Batch(s)** 23743 **Date/Time Prepped** 03/09/09 15:03

| Compound | Result | Units | MQL | DF | Date/Time Analyzed | By | Analytical Batch |
|---|---|---|---|---|---|---|---|
| **Dinoseb** | **13400 J** | **µg/Kg** | **15,000** | **1,000** | **03/19/09 10:14** | **DPC** | **38386** |
| Surrogate: DCAA | | 87 % | Limits: 20-150 | 1 | 03/19/09 6:20 | DPC | 38386 |

| **Qualifiers/ Definitions** | | | | |
|---|---|---|---|---|
| | * | Surrogate Recovery outside accepted limits | * I | Recoveries affected by interferences or high background |
| | B | Analyte detected in the associated Method Blank | DF | Dilution Factor |
| | E | Value exceeds method calibration range | H | Prepped / Analyzed out of holding time. |
| | J | Estimated Value Analyte below reported detection limit | M | Minimum value |
| | MDL | Method Dection Limit (unadjusted) | MQL | Method Quantitation Limit (adjusted) |
| | MRL | Method Reporting Limit | N | Refer to attached Non-Compliance Report |
| | Q | RPD >40% between primary and confirmation columns | SQL | Sample Quantitation Limit (adjusted MDL) |

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Building VI, Suite 500
Greenville, SC 29615

Project Description: **Cedar Chemicals**
Site: **W. Helena, AR**
Project No. **104336**

Lab Order Number **0903061**
Lab ID **0903061-005A**
Field ID **TSB-4**

**Report of Analysis**
Received **03/05/09**
Matrix **Soil**
Sampled **03/05/09 9:25**

**Analytical Method 8151A**

**Prep Method** 8151A **Prep Batch(s)** 23743 **Date/Time Prepped** 03/09/09 15:03

| Compound | Result | Units | MQL | DF | Date/Time Analyzed | By | Analytical Batch |
|---|---|---|---|---|---|---|---|
| **Dinoseb** | **10600 J** | **µg/Kg** | **15,000** | **1,000** | **03/19/09 10:36** | **DPC** | **38386** |
| Surrogate: DCAA | | 79 % | Limits: 20-150 | 1 | 03/19/09 6:43 | DPC | 38386 |

**Qualifiers/ Definitions**

| | | | |
|---|---|---|---|
| * | Surrogate Recovery outside accepted limits | * I | Recoveries affected by interferences or high background |
| B | Analyte detected in the associated Method Blank | DF | Dilution Factor |
| E | Value exceeds method calibration range | H | Prepped / Analyzed out of holding time. |
| J | Estimated Value Analyte below reported detection limit | M | Minimum value |
| MDL | Method Dection Limit (unadjusted) | MQL | Method Quantitation Limit (adjusted) |
| MRL | Method Reporting Limit | N | Refer to attached Non-Compliance Report |
| Q | RPD >40% between primary and confirmation columns | SQL | Sample Quantitation Limit (adjusted MDL) |

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**Building VI, Suite 500**
**Greenville, SC 29615**

Project Description **Cedar Chemicals**
Project No. **104336**
Site **W. Helena, AR**

Lab Order Number **0903061**
Lab ID **0903061-006A**
Field ID **TSB-5**

**Report of Analysis**
Received **03/05/09**
Matrix **Soil**
Sampled **03/05/09 9:10**

**Analytical Method 8151A**

**Prep Method** 8151A **Prep Batch(s)** 23743 **Date/Time Prepped** 03/09/09 15:03

| Compound | Result | Units | MQL | DF | Date/Time Analyzed | By | Analytical Batch |
|---|---|---|---|---|---|---|---|
| **Dinoseb** | **34,500** | **µg/Kg** | **15,000** | **1,000** | **03/19/09 10:59** | **DPC** | **38386** |
| Surrogate: DCAA | | 100 % | Limits: 20-150 | 1 | 03/19/09 7:05 | DPC | 38386 |

| **Qualifiers/ Definitions** | | | | |
|---|---|---|---|---|
| | * | Surrogate Recovery outside accepted limits | * I | Recoveries affected by interferences or high background |
| | B | Analyte detected in the associated Method Blank | DF | Dilution Factor |
| | E | Value exceeds method calibration range | H | Prepped / Analyzed out of holding time. |
| | J | Estimated Value Analyte below reported detection limit | M | Minimum value |
| | MDL | Method Dection Limit (unadjusted) | MQL | Method Quantitation Limit (adjusted) |
| | MRL | Method Reporting Limit | N | Refer to attached Non-Compliance Report |
| | Q | RPD >40% between primary and confirmation columns | SQL | Sample Quantitation Limit (adjusted MDL) |

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April 27, 2009

Mr. Ryan Benefield
Chief of Hazardous Waste Division
Arkansas Department of Environmental Quality
5301 Northshore Drive
North Little Rock, AR 72118-5317

Subject: **Revised Wormald Site Investigation Report**
**Tyco Safety Products – Former Cedar Chemical Facility**
**Helena – West Helena, Arkansas**
**State EPA ID No. ARD990660649**

Dear Mr. Benefield:

On behalf of Tyco Safety Products – Ansul Incorporated, AECOM is pleased to submit two copies of this *Revised Wormald Site Investigation Report* (Revised SIR) that summarizes the subsurface soil sampling activities and analytical results for soil samples collected from Site 3 - Stormwater Ditches at the Former Cedar Chemicals Facility located in Helena – West Helena, Arkansas (Figure 1). The Wormald Site Investigation was conducted in accordance with the *Wormald Site Investigation Work Plan* dated January 22, 2009, the subsequent Arkansas Department of Environmental Quality approval letter dated January 29, 2009, and the *Wormald Separate Agreement Pursuant to Consent Administrative Order LIS No. 07-027 for the Conduct of a Site Investigation and Feasibility Study* (Wormald Separate Agreement) between the Arkansas Department of Environmental Quality (ADEQ), and Ansul Incorporated, Wormald U.S., Inc dated January 9, 2009. This Revised SIR is submitted pursuant to comments provided by ADEQ to AECOM by letter dated April 9, 2009 and received by AECOM on April 13, 2009; and AECOM's letter response to the comments dated April 27, 2009. The comment and response letters are attached and incorporated in Appendix A of this Revised SIR. A summary of field activities, soil sampling procedures, and analytical results is provided below.

## Investigation Objectives

During the 1996 Facility Investigation, dinoseb was reported at a concentration of 13,000 milligrams per kilogram (mg/kg) in subsurface soil sample 3SB-6 (4 to 8 feet below ground surface (bgs)) and identified as a contaminant of concern (COC) for Site 3 in the Risk Assessment (EnSafe, 1996; ADEQ, 2005). The Wormald Site Investigation focused on the collection of additional subsurface soil samples at Site 3 to confirm the concentration of dinoseb in subsurface soil at historic sample location 3SB-6 and to evaluate possible dinoseb concentrations in the vicinity of 3SB-6.

## Site Reconnaissance

Prior to soil boring installation, historic soil sample 3SB-6 was located and staked by Smith and Weiland Surveyors, an Arkansas licensed land surveyor, as the location for TSB-1 using survey coordinates extracted from the basemap. A 10 foot by 10 foot grid centered on TSB-1 was established by the surveyor and the locations for TSB-2 through TSB-5 were staked on this grid as proposed on Figure 3 of the *Wormald*

*Investigation Work Plan*. Utility clearance for all environmental sample locations was provided by Arkansas One-Call prior to intrusive work. Site surveying and utility clearance activities were conducted on March 4, 2009 and were overseen by the AECOM Project Geologist/Field Manager as documented in the Daily Quality Control Report included in Appendix B.

**Borehole Installation, Lithologic Sampling and Headspace Screening**

On March 5, 2009, five soil borings (TSB-1 through TSB-5) were installed within Site 3 for the collection of soil samples for dinoseb analysis (Figure 2). The additional analytical data were needed to confirm the reported concentration of dinoseb (13,000 mg/kg) at historical sample location 3SB-6 (EnSafe, 1996) and to assess the occurrence of dinoseb concentrations in the subsurface.

Soil borings were installed by Tri-State Testing Services, Inc., located in Memphis, Tennessee, using a Direct Push Technology (DPT) Geoprobe® rig. Continuous soil samples were collected from each soil boring and were logged for lithology by an AECOM Geologist. Lithologic classification was conducted in accordance with the Unified Soil Classification System (USCS) and soil descriptions were recorded on Test Boring Reports (Appendix B). A Photo Ionization Detector (PID) Organic Vapor Analyzer (OVA) was used to assess the qualitative concentration of potential volatile organic vapors present in vadose zone soil core samples. PID headspace results were recorded on Test Boring Reports (Appendix B).

**Soil Sampling Program**

Five soil borings, designated TSB-1 through TSB-5 (Figure 2), were installed at Site 3 to confirm and/or assess the occurrence of dinoseb concentrations in subsurface soil at historic soil sample location 3SB-6, collected from 4-8 feet bgs in lithologic boring LB-6 during the 1996 *Facility Investigation* (EnSafe). One primary soil sample was collected from 4-8 feet bgs at each boring for analysis of dinoseb. Two additional soil samples, one from 1-4 feet bgs and one from 8-12 feet bgs, were collected from TSB-1 and held for analysis pending dinoseb results from the 4-8 foot interval.

Soil was collected from the desired sample interval at each boring using DPT Geoprobe® rig with disposable acetate sample sleeves lining the core barrel. Soil samples were collected from the acetate sleeve using a decontaminated stainless steel spoon, were placed new, disposable zip-lock bags, and were thoroughly homogenized in the bags prior to containerization. A portion of the sample was later screened for organic vapors utilizing a PID OVA. Soil samples for laboratory analysis were containerized in laboratory supplied bottleware and placed in an ice filled cooler pending delivery to the laboratory.

Soil samples were analyzed for dinoseb by Environmental Testing and Consulting, Inc., located in Memphis, Tennessee, using Environmental Protection Agency (EPA) SW846 Method 8151A. Environmental Testing and Consulting, Inc. has been certified under the ADEQ Laboratory Certification Program and a copy of the certification is provided in Appendix C.

**QA/QC Program**

The quality assurance/quality control (QA/QC) program was implemented to provide a system of documented checks that ensures the authenticity and validity of the environmental data. QA/QC samples, including one field duplicate (soil) sample, one equipment rinsate blank sample, and one matrix spike/matrix spike duplicate (MS/MSD) sample, were collected and analyzed for dinoseb by EPA SW-846 Method

8151A. Results from the QA/QC samples were used during the data validation process as discussed in Data Validation Report (DVR) in Appendix D.

**Analytical Test Results**

Table 1 summarizes the results for dinoseb in subsurface soil samples collected from the 4 to 8 foot depth interval at Site 3. Dinoseb was reported in all samples at concentrations ranging from 31.3 milligrams per kilogram (mg/kg) in TSB-2 to 80.4 mg/kg at TSB-3. All results were significantly below the EPA Region 6 Medium-Specific Screening Level (MSL; 620 mg/kg) for dinoseb in industrial soil; however, the soil samples exceeded the EPA Region 6 Maximum Contaminant Level (MCL)-based soil screening level (SSL; 5.10E-02 mg/kg) for dinoseb (US EPA Region 6, September 2008).

Soil samples from the 1 to 4 foot and 8 to 12 foot interval at TSB-1 were prepped and held pending the analysis of the 4 to 8 foot sample but were not analyzed since the concentration of dinoseb at TSB-1 (4 to 8 foot) was less than the EPA Region 6 MSL and required no further delineation.

The relative percent difference between the primary sample (TSB-1) and the field duplicate sample (TSB-1-a) was calculated and was less than the threshold established in the Data Quality Objectives of the *Wormald Site Investigation Work Plan* (AECOM, January 22, 2009). Results of the data validation indicate the data associated with this laboratory batch should be considered compliant and adequate for its intended use. The Data Validation Report is provided in Appendix D along with the Chain of Custody forms and analytical laboratory Certificate of Analysis.

**Solid IDW Characterization and Management**

All sampling equipment was pre-cleaned and wrapped in plastic prior to mobilization; therefore, on-Site equipment decontamination was not necessary. Used PPE, disposable sampling equipment, and other miscellaneous trash was consolidated in trash bags at the end of each day and sealed for subsequent off-Site disposal.

Soil generated during soil sampling activities was contained in a new 55-gallon drum approved by the Department of Transportation (DOT) and staged at a central location in accordance with all Federal, State and local requirements. The drum was labeled to indicate the type of material contained, place of origin, Site number and location, boring numbers, and date on which materials were initially placed in the container. An Investigation Derived Waste (IDW) Management Form was completed to document IDW generated during field activities and is include in Appendix B.

At the completion of field activities, a representative sample of solid IDW was collected for analysis of toxicity characteristic leaching procedure (TCLP) volatile organic compounds (VOCs) by EPA SW-846 Method 8260B, TCLP semi-volatile organic compounds (SVOCs) by EPA SW-846 Method 8270C, TCLP pesticides by EPA SW-846 Method 8081A, TCLP herbicides by EPA SW-846 8151A, and TCLP metals by EPA SW-846 Methods 6010B/7470A to evaluate disposal options. The TCLP results are presented in Table 2 and Certificates of Analysis are presented in Appendix D. The IDW soil sample results were below the Hazardous Waste Characterization Thresholds for all constituents analyzed. The drum of IDW soil is currently staged on Site pending the selection and scheduling of an IDW disposal contractor. Once the disposal contractor has been procured, the drum of soil will be disposed of in accordance with Federal, State, and local requirements.

**Conclusions**

Although dinoseb was detected in soil samples from borings TSB-1 through TSB-5, all reported concentrations were below the EPA Region 6 MSL for industrial soil. Furthermore, confirmation sampling at TSB-1, which is co-located with historic soil sample 3SB-6, indicates that the dinoseb concentration of 13,000 mg/kg reported for 3SB-6 (4 – 8 feet) in the FI (EnSafe, 1996), is not representative of current Site 3 soil conditions. Based on this information, the assessment of dinoseb in soil at Site 3 is complete and all results are below the EPA Region 6 MSL.

Upon approval of this Revised SIR, Tyco Safety Products – Ansul Incorporated will prepare a Feasibility Study for submittal to the ADEQ on or before June 30, 2009. If you have any questions or require additional information, please contact me at 864-234-2282 or Ms. Ann Faitz at (501)831-5637.

Sincerely,

**AECOM**

Leslee J. Alexander

Leslee J. Alexander, P.G.
Project Manager

Attachments:
- Figure 1 – Site Location Map
- Figure 2 – Results for Dinoseb in Subsurface Soil at Site 3
- Table 1 – Summary of Dinoseb Results in Soil Samples
- Table 2 – Summary of TCLP Results in IDW Soil Sample
- Appendix A – Comments and Response to Comments on the *Wormald Site Investigation Report*
- Appendix B – Field Investigation Forms
- Appendix C – Analytical Laboratory Certification
- Appendix D - Data Validation Report/Certificates of Analysis

c:
- Mr. Dara Hall, ADEQ Counsel (letter only)
- Mr. John Perkins, Tyco Safety Products
- Ms. Ann Faitz, Tyco Counsel
- Mr. Allan Gates, HCC legal counsel
- Mr. Joe Ghormley, Exxon legal counsel
- Project File 104366

*104336:\ADMIN\Reports\Wormald SI\Revised Final\Revised Wormald SIR (Rev00).doc*

# FIGURES

Source: TerraServer DRG
(West Helena, Arkansas, United States)

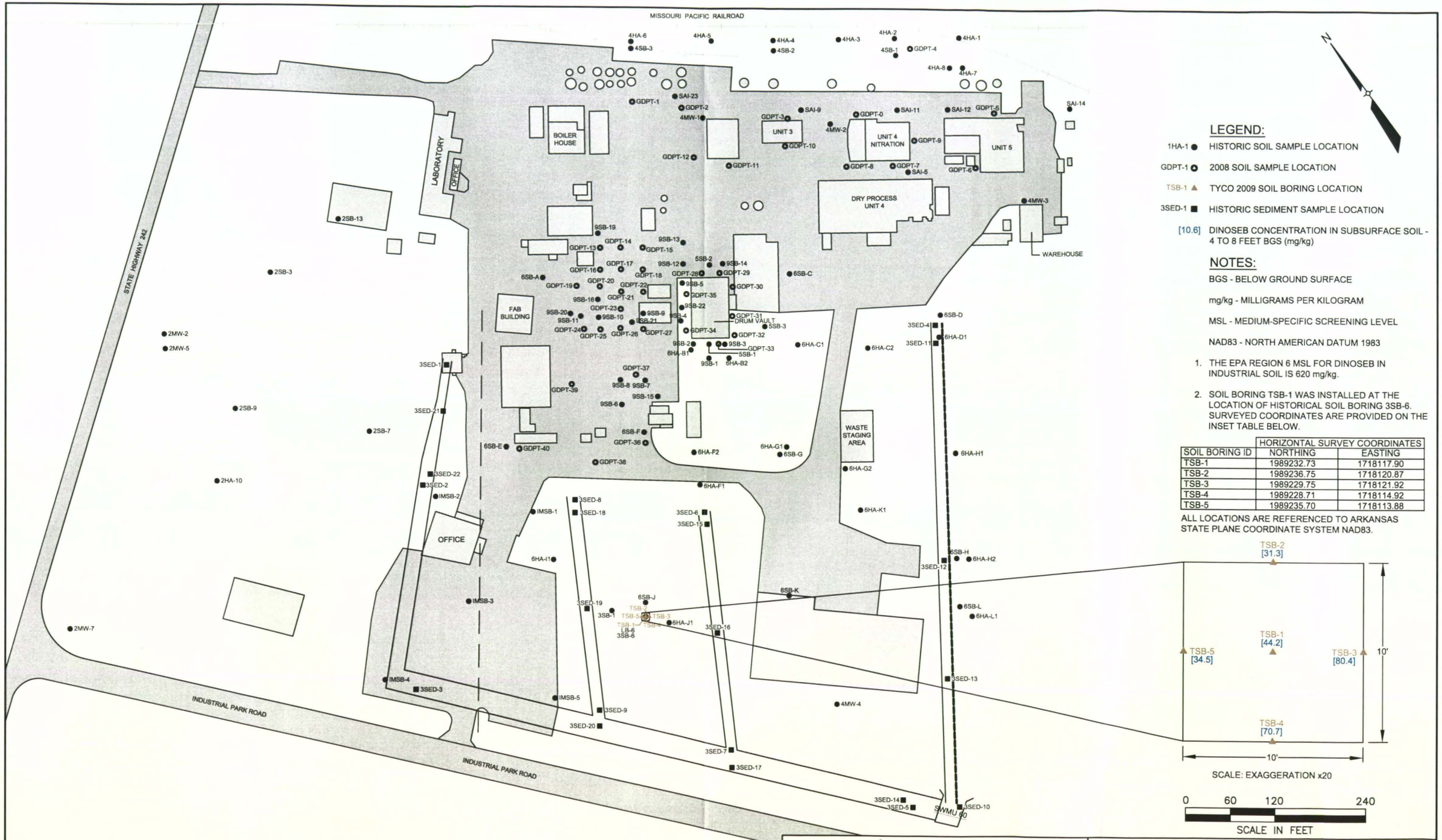
AECOM

**FIGURE 1**
**SITE LOCATION MAP**

**FORMER CEDAR CHEMICAL FACILITY**
**HELENA – WEST HELENA, ARKANSAS**

APRIL 2009 104336

work\104336\ADMIN\Workplans\Tyco SI\Figures\For Site Location Map\Fig._1 SiteLocMap(2).doc




AECOM

FIGURE 2
RESULTS FOR DINOSEB IN SUBSURFACE SOIL AT SITE 3

FORMER CEDAR CHEMICAL FACILITY
HELENA - WEST HELENA, ARKANSAS

APRIL 2009

104336

\\USGRNS01\data\work\104336\CADD\104336_013 Results for Dinoseb in Subsurface Soil at Site 3.dwg, 4/22/2009 11:26:19 AM, mandy.splawn

# TABLES

**Table 1**
**Summary of Dinoseb Results in Soil Samples**
**Former Cedar Chemicals Facility**
**Helena-West Helena, Arkansas**

| **Sample ID** | EPA | EPA | TSB-1 | TSB-1-a | TSB-2 | TSB-3 | TSB-4 | TSB-5 |
|---|---|---|---|---|---|---|---|---|
| **Lab Sample ID** | Region 6 | Region 6 | 0903061-001A | 0903061-002A | 0903061-003A | 0903061-004A | 0903061-005A | 0903061-006A |
| **Sample Depth (feet bgs)** | MSL | MCL-based | 4 - 8 | 4 - 8 | 4 - 8 | 4 - 8 | 4 - 8 | 4 - 8 |
| **Date Collected** | (Industrial Soil) | SSL | 3/5/2009 | 3/5/2009 | 3/5/2009 | 3/5/2009 | 3/5/2009 | 3/5/2009 |
| **Herbicides by Method 8151A (mg/kg)** | | | | | | | | |
| Dinoseb | 680 | 5.10E-02 | **44.2** | **33.8** | **31.3** | **80.4** | **70.7** | **34.5** |

**Notes:**
-a - Indicates a field duplicate sample.
bgs - below ground surface
EPA - Environmental Protection Agency
MSL - Medium Specific Screening Level for Subsurface Soil
MCL - Maximum Contaminant Level
SSL - Soil Screening Level
Bold font indicates the analyte was detected.
Gray shading indicates the detected concentration exceeded the EPA Region 6 MCL-based SSL.

1. The 1 - 4 foot bgs and 8 - 12 foot bgs soil samples from TSB-1 were collected, prepped, and held for analysis pending the results from the 4 - 8 foot sample. These samples were not analyzed since the 4 - 8 foot sample results were less than the EPA Region 6 MSL for dinoseb in industrial soil.
2. EPA Region 6 MSL and SSL for dinoseb were downloaded from the EPA Region 6 Human Health MSL web site - http://www.epa.gov/region6/6pd/rcra_c/pd-n/screen.htm. These screening levels included in these tables were finalized in September 2008.

**Table 2**
**Summary of TCLP Results in IDW Soil Sample**
**Former Cedar Chemicals Facility**
**Helena-West Helena, Arkansas**

| **Sample ID**<br>**Lab Sample ID**<br>**Date Collected** | EPA Hazardous Waste Characterization Threshold | IDW-4<br>0903061-010B<br>3/5/2009 | |
|---|---|---|---|
| **TCLP Volatile Organic Compounds by Method 8260B (mg/L)** | | | |
| Benzene | 0.5 | < | 0.01 |
| 2-Butanone (MEK) | 200 | < | 0.2 |
| Carbon tetrachloride | 0.5 | < | 0.01 |
| Chlorobenzene | 100 | < | 0.01 |
| Chloroform | 6 | < | 0.01 |
| 1,4-Dichlorobenzene | 7.5 | < | 0.01 |
| 1,2-Dichloroethane | 0.5 | < | 0.01 |
| 1,1-Dichloroethene | 0.7 | < | 0.01 |
| Tetrachloroethene | 0.7 | < | 0.01 |
| Trichloroethene | 0.5 | < | 0.01 |
| Vinyl chloride | 0.2 | < | 0.01 |
| **TCLP Semivolatile Organic Compounds by Method 8270C (mg/L)** | | | |
| 2,4-Dinitrotoluene | 0.13 | < | 0.02 |
| Hexachlorobenzene | 0.13 | < | 0.02 |
| Hexachlorobutadiene | 0.5 | < | 0.02 |
| Hexachloroethane | 3 | < | 0.02 |
| 2-Methylphenol | 200 | < | 0.02 |
| 3&4-Methylphenol | 200 | < | 0.02 |
| Nitrobenzene | 2 | < | 0.02 |
| Pentachlorophenol | 100 | < | 0.04 |
| Pyridine | 5 | < | 0.04 |
| 2,4,5-Trichlorophenol | 400 | < | 0.02 |
| 2,4,6-Trichlorophenol | 2 | < | 0.02 |
| **TCLP Pesticides by Method 8081A (mg/L)** | | | |
| gamma-BHC | 0.4 | < | 0.00016 |
| Chlordane | 0.03 | < | 0.001 |
| Endrin | 0.02 | < | 0.00016 |
| Heptachlor | 0.008 | < | 0.00016 |
| Heptachlor epoxide | 0.008 | < | 0.00016 |
| Methoxychlor | 10 | | **0.00704** Q |
| Toxaphene | 0.5 | < | 0.0012 |
| **TCLP Herbicides by Method 8151A (mg/L)** | | | |
| 2,4-D | 10 | < | 0.002 |
| 2,4,5-TP (Silvex) | 1 | < | 0.0006 |
| **TCLP Metals by Method 6010B (mg/L)** | | | |
| Arsenic | 5 | < | 0.025 |
| Barium | 100 | | **1.02** |
| Cadmium | 1 | < | 0.005 |
| Chromium | 5 | < | 0.01 |
| Lead | 5 | < | 0.01 |
| Selenium | 1 | < | 0.05 |
| Silver | 5 | < | 0.005 |
| **TCLP Mercury by Method 7470A (mg/L)** | | | |
| Mercury | 0.2 | < | 0.001 |

**Notes:**
EPA - Environmental Protection Agency
TCLP - Toxicity Characteristic Leaching Procedure
Bold font and shading indicates the analyte was detected.
Q - RPD >40% between primary and confirmation columns.

# APPENDIX A

## COMMENTS AND RESPONSE TO COMMENTS ON THE *WORMALD SITE INVESTIGATION REPORT*

# ADEQ

A R K A N S A S
Department of Environmental Quality

April 9, 2009

AECOM
Attn: Leslee J. Alexander, P.G.
Project Manager
10 Patewood Drive, Building VI, Suite 500
Greenville, South Carolina 29615

RE: Wormald Site Investigation Report for Cedar Chemical Company (March 30, 2009)
EPA ID Number ARD990660649; AFIN 54-00068

Dear Ms. Alexander:

The Arkansas Department of Environmental Quality – Hazardous Waste Division (ADEQ) has reviewed the Wormald Site Investigation Report (SIR) dated March 30, 2009. Based on ADEQ review, the following deficiencies and/or concerns have been noted:

- Table 1 – The sample results for TSB-1-a, TSB-3, TSB-4, and TSB-5 presented in Table 1 do not match the results in the laboratory report. Also, the results presented in this table for these same samples are presented with either a "J" or "JQ" flag. The laboratory report does not show any flags for these samples. Furthermore, the data validation report states the results for dinoseb by Method 8151A are acceptable and no data flags are required. Please address and correct these discrepancies.

- The Medium-Specific Screening Level of 680 mg/kg for dinoseb is incorrect. This value is taken from an outdated version of the Region 6 Medium-Specific Screening Tables and applies to an industrial outdoor worker with direct exposure to surface soil. The most current version of the Region 6 Medium-Specific Screening Tables is dated September 2008. In this case, the correct soil screening level for dinoseb is 0.051 mg/kg, which is a maximum contaminant level (MCL)-based screening level for protection of groundwater. All dinoseb concentrations collected from the 4'-8' soil interval exceed this screening level. Laboratory analysis for the samples being held that were collected from the 8'- 12' soil interval would provide additional information in regards to potential impacts to groundwater. Please amend the narrative accordingly.

- The statement in the conclusions that designates the dinoseb concentration of 13,000 mg/kg for 3SB-6 (4'-8') in the 1996 FI as being erroneous is subjective. Several factors would cause variance in sample results. These would include, but not limited to, sampling methodologies, analytical procedures, exact duplication of sample locations, and infiltration over a 13 year period. In this case, years of infiltration and duplication of sample locations are likely to be two of the main reasons for differences in dinoseb concentrations from the two sampling events. Please note that concentrations of dinoseb vary throughout the site and will increase and decrease within the borehole. Samples

taken at shallow depths may exhibit lower concentrations of dinoseb. The range of dinoseb may increase as the hole advances and then decrease again at the base of the hole. ADEQ does not concur with the statement that the 1996 data is erroneous. There is not sufficient information available to qualify this statement. Please remove this statement from the final SIR and amend the narrative accordingly.

- The sample location map included with the SIR is the same map that was included with the workplan. The actual surveyed location of the sample collected for this investigation is not included in SIR. Please provide an updated map showing the surveyed location of each sampling location.

Please prepare a response to each of the items noted above and submit to ADEQ within fifteen (15) days of receipt of this letter. If you have any questions or need additional information, please feel free to contact Tammie J. Hynum of my staff at (501) 682-0856 or hynum@adeq.state.ar.us or myself at (501) 682-0831 or at benefield@adeq.state.ar.us.

Sincerely,

J. Ryan Benefield, P.E.
Acting Hazardous Waste Division Chief

cc: Mark Hemingway, P.G., (Amec Consultants, Inc.; 5725 Hwy 290 West, Suite 200B, Austin, TX 78735)
Kelly Beck, P.G., (Amec Consultants, Inc.; 5725 Hwy 290 West, Suite 200B, Austin, TX 78735)
Dave Roberson (DeMaximis, Inc. 2203 Timberloch Place, Suite 213 The Woodlands, TX 77380)
Anne Weinstein, Attorney Specialist, ADEQ
Dara Hall, Attorney Specialist, ADEQ
Allan Gates (Mitchell Williams Selig Gates & Woodyard, PLLC, 425 West Capitol Avenue, Suite 1800, Little Rock, AR 72201-3525)
Joe Ghormley (Quattlebaum, Grooms, Tull & Burrow, PLLC, 111 Center Street, Suite 1900, Little Rock, AR 72201
Deborah D. Kuchler (Abbott, Simeses & Kuicher, 400 Lafayette St. Suite 200, New Orleans, LA 70130)
Edward Brister (Helena Chemical Co., 225 Schilling Blvd. , Suite 300, Collierville, TN 38017)
Dan Burnham (3225 Gallows Road, Suite 8B 0607, Fairfax, VA 22037)
Ann Faitz (Attorney at Law, 585 Silverwood, North Little Rock, AR 72116)
David Hawkins (General Counsel & Assistant Secretary, 225 Schilling Blvd., Suite 300, Collierville, TN 38017)
Kim Burke (Taft, Stettinius & Hollister LLP, 425 Walnut Street, Suite 1800, Cincinnati, OH 45202-3957)
Mark Zuschek (3225 Gallows Road, Suite 3D 2110, Fairfax, VA 22039)

AECOM

**AECOM**
10 Patewood Drive, Building VI, Suite 500, Greenville, SC 29615
T 864.234.3000 F 864.234.3069 www.aecom.com

April 27, 2009

Mr. Ryan Benefield
Chief of Hazardous Waste Division
Arkansas Department of Environmental Quality
5301 Northshore Drive
North Little Rock, AR 72118-5317

Subject: **Response to Comments on the Wormald Site Investigation Report**
**Tyco Safety Products – Former Cedar Chemical Facility**
**Helena – West Helena, Arkansas**
**State EPA ID No. ARD990660649**

Dear Mr. Benefield:

This letter is in response to written comments on the *Wormald Site Investigation Report* (AECOM, March 30, 2009) (Wormald SIR) provided by the Arkansas Department of Environmental Quality (ADEQ) in correspondence to AECOM dated April 9, 2009 and will be included with the *Revised Wormald SIR* in response to ADEQ's comments.

1) **Comment:** *Table 1 – The sample results for TSB-1-a, TSB-3, TSB-4, and TSB-5 presented in Table 1 do not match the results in the laboratory report. Also, the results presented in this table for these same samples are presented with either a "J" or "JQ" flag. The laboratory report does not show any flags for these samples. Furthermore, the data validation report states the results for dinoseb by Method 8151A are acceptable and no data flags are required. Please address and correct these discrepancies.*

**Response:** Preliminary laboratory results received from the analytical laboratory (included as Attachment 1 to this Response to Comments) contained samples qualified with a "J" or "JQ" flag, indicating the results between the Method Detection Limit (MDL) and the Method Quantization Limit (MQL). The preliminary results were inadvertently included in Table 1 instead of the final results. The "J" flagged samples were subsequently analyzed at a lesser dilution factor prior to completion of the final laboratory package (included in Appendix C of the *Wormald SIR*). The statement that "no data flags are required" in the Data Validation Report (DVR) is correct. The table has been updated to reflect the final laboratory results and is included as Table 1 of the *Revised Wormald SIR*.

2) **Comment:** *The Medium-Specific Screening Level of 680 mg/kg for dinoseb is incorrect. This value is taken from an outdated version of the Region 6 Medium-Specific Screening Tables and applies to an industrial outdoor worker with direct exposure to surface soil. The most*

*current version of the Region 6 Medium-Specific Screening Tables is dated September 2008. In this case, the correct soil screening level for dinoseb is 0.051 mg/kg, which is a maximum contaminant level (MCL)-based screening level for protection of groundwater. All dinoseb concentrations collected from the 4'-8' soil interval exceed this screening level. Laboratory analysis for the samples being held that were collected from the 8'-12' soil interval would provide additional information in regards to potential impacts to groundwater. Please amend the narrative accordingly.*

**Response:** A screening level of 680 mg/kg was used in reliance on a review of previous information provided by ADEQ and in two Geomatrix reports as follows:

(1) The screening level used in ADEQ's *Risk Evaluation* included as Appendix D of the *Cedar Chemical Company: Request for Proposal Packet* (ADEQ, August 23, 2005). Page 4 of the *Risk Evaluation* provides a risk based clean-up level of 680 mg/kg for "dry sediment" at Site 3.

(2) The tables in the *Interim Facility Investigation Report* (AMEC Geomatrix, October 2008) and the *Draft Facility Investigation Report* (AMEC Geomatrix, January 2009) list 680 mg/kg as the screening level for dinoseb in soil based on the Industrial Outdoor Worker exposure scenario. The MCL-based Soil Screening Level (SSL) for dinoseb was listed as "NA" on the tables and figures of both the *Interim FIR* (October 2008) and the *Draft FIR* (January 2009). Our understanding was that the *Interim FIR* or this SSL for dinoseb was not objected to by ADEQ.

However, based on ADEQ comment #2, it is now our current understanding that ADEQ has commented that the risk based clean-up level for dinoseb presented in its *Risk Evaluation* and in the AMEC Geomatrix Reports is not the correct SSL

As a result, Table 1 of the *Wormald SIR* has been amended to include the EPA Region 6 screening level (SL) for dinoseb in industrial soil (620 mg/kg) and the MCL-based SSL for dinoseb (5.1E-02 mg/kg) presented on the EPA Region 6 Medium-Specific Screening Level (MSL) tables dated September 2008. The revised table is included as Table 1 of the *Revised Wormald SIR*. Figure 2 of the *Wormald SIR* has also been revised to include the current EPA Region 6 MSL. The text will be amended to reflect comparisons to these screening criteria.

Soil samples collected from the 8-12 foot interval at TSB-1 were extracted on March 9, 2009 and are past the recommended holding time (40 days) specified in the analytical method; therefore, these samples will not be analyzed.

3) **Comment:** *The statement in the conclusions that designates the dinoseb concentration of 13,000 mg/kg for 3SB-6 (4-8') in the 1996 FI as*

*being erroneous is subjective. Several factors would cause variance in sample results. These would include, but not limited to, sampling methodologies, analytical procedures, exact duplication of sample locations, and infiltration over a 13 year period. In this case, years of infiltration and duplication of sample locations are likely to be two of the main reasons for differences in dinoseb concentrations from the two sampling events. Please note that concentrations of dinoseb vary throughout the site and will increase and decrease within the borehole. Samples taken at shallow depths may exhibit lower concentrations of dinoseb. The range of dinoseb may increase as the hole advances and then decrease again at the base of the hole. ADEQ does not concur with the statement that the 1996 data is erroneous. There is not sufficient information available to qualify this statement. Please remove this statement from the final SIR and amend the narrative accordingly.*

**Response:** Our rationale for our opinion was based upon the following: The detected dinoseb concentration (13,000 mg/kg) in historic soil sample 3SB-6 (4-8') was more than two orders of magnitude greater than detected concentrations (0.63 mg/kg to 560 mg/kg) in other Site 3 soil samples collected during the Ensafe FI (1996). Based on the range of historic dinoseb detections in soil in the vicinity of Site 3, the concentration detected in historic soil sample 3SB-6 (4-8') appeared anomalous. Therefore, a confirmation soil sampling program was developed for Site 3 in the vicinity of 3SB-6. Detected dinoseb concentrations for the five soil samples collected from the 4-8 foot interval in the vicinity of 3SB-6 range from 31.3 mg/kg to 80.4 mg/kg. Based on these results, the detected dinoseb concentration in historic soil sample 3SB-6 (4-8') does not appear to be consistent with the current Conceptual Site Model (CSM) and is not representative of current Site 3 conditions.

However, sentence two of the last paragraph on page 3 of the *Wormald SIR*, which reads *"confirmation sampling at TSB-1, which is co-located with historic soil sample 3SB-6, indicates that the dinoseb concentration of 13,000 mg/kg reported for 3SB-6 (4 – 8 feet) in the FI (EnSafe, 1996), is erroneous"*, will be revised to say *"confirmation sampling at TSB-1, which is co-located with historic soil sample 3SB-6, indicates that the dinoseb concentration of 13,000 mg/kg reported for 3SB-6 (4 – 8 feet) in the FI (EnSafe, 1996) is not representative of current Site 3 soil conditions.*

4) **Comment:** *The sample location map included with the SIR is the same map that was included with the work plan. The actual surveyed location of the sample collected for this investigation is not included in the SIR. Please provide an updated map showing the surveyed location of each sample location.*

**Response:** Prior to soil boring installation, historic soil sample 3SB-6 was located and staked by Smith and Weiland Surveyors as the location for TSB-1 using survey coordinates extracted from the basemap. A 10 foot by 10 foot grid centered on TSB-1 was established by the surveyor and the locations for TSB-2 through TSB-5 were staked on this grid as proposed on Figure 3 of the *Wormald Investigation Work Plan* and as shown on Figure 2 of the *Wormald SIR*.

No changes to the established sample grid were necessary. Sample location TSB-1 was installed at the location of historic sample 3SB-6 and sample locations TSB-2 through TSB-5 were installed 5-feet away from TSB-1 as shown on Figure 2 of the *Wormald SIR* and as proposed in the work plan. The sample locations and spatial relationships shown on Figure 2 are correct. However, to avoid confusion, Figure 2 has been revised to include an inset table listing the northing and easting of the sample locations referenced to Arkansas State Plane North American Datum 1983 (NAD83). The revised Figure is included as Figure 2 of the *Revised Wormald SIR*.

If you have any questions or require additional information, please contact me at 864-234-2282 or Ms. Ann Faitz at (501)831-5637.

Sincerely,

**AECOM**

Leslee J. Alexander

Leslee J. Alexander, P.G.
Project Manager

Attachments: Attachment 1 – Preliminary Results for Dinoseb in Subsurface Soil

c: Mr. Dara Hall, ADEQ Counsel (letter only)
Mr. John Perkins, Tyco Safety Products
Ms. Ann Faitz, Tyco Counsel
Mr. Allan Gates, HCC legal counsel
Mr. Joe Ghormley, Exxon legal counsel
Project File 104366

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# ATTACHMENT 1

# PRELIMINARY RESULTS FOR DINOSEB IN SUBSURFACE SOIL

ETC ENVIRONMENTAL TESTING & CONSULTING, INC.
www.etcmemphis.com 2700 Whitten Road Memphis, Tennessee 38133 (901) 213-2400 Fax (901) 213-2440
"A Laboratory Management Partner"

**CLIENT:** AECOM EARTH TECH
**Project:** Cedar Chemicals
**Lab Order Number:**

# CASE NARRATIVE

**Date: 03/19/09**

ETCAL

Herbicides by Method 8151A

Sample Analysis
Samples were initially analyzed without dilution. The levels of Dinoseb present indicated that a dilution factor of 1:1000 would be required. Both the un-diluted and diluted sample extracts were analyzed in the same analytical batch. The high levels of Dinoseb caused an elevated result for this target analyte in the ending calibration verification standard for the confirmation column.

Data presented consists of preliminary results. All dilutions will be re-analyzed to ensure data within the calibration range. Some sample results are flagged with the data qualifier J, to indicate results between the MDL and MQL. These samples will be analyzed at a lesser dilution factor.

Method Blank
Dinoseb was detected in the method blank at a concentration of 6.90 J ug/kg. This concentration had no impact on the final sample data and will be re-analyzed to confirm this result.

ETC ENVIRONMENTAL TESTING & CONSULTING, INC.
www.etcmemphis.com 2790 Whitten Road Memphis, Tennessee 38133 (901) 213-2400 Fax (901) 213-2440
"A Laboratory Management Partner"

**AECOM EARTH TECH**
10 Patewood Drive
Building VI, Suite 500
Greenville, SC 29615

Project Description **Cedar Chemicals**
Project No. **104336**
Site **W. Helena, AR**

Lab Order Number **0903061**
Lab ID **0903061-001A**
Field ID **TSB-1**

**Report of Analysis**
Received **03/05/09**
Matrix **Soil**
Sampled **03/05/09 10:10**

## Analytical Method 8151A

**Prep Method** 8151A **Prep Batch(s)** 23743 **Date/Time Prepped** 03/09/09 15:03

| Compound | Result | Units | | MQL | DF | Date/Time Analyzed | By | Analytical Batch |
|---|---|---|---|---|---|---|---|---|
| **Dinoseb** | **44,200** | **µg/Kg** | | **15,000** | **1,000** | **03/19/09 8:57** | **DPC** | **38386** |
| Surrogate: DCAA | | 70 % | Limits: | 20-150 | 1 | 03/19/09 4:28 | DPC | 38386 |

**Qualifiers/ Definitions**

| | | | |
|---|---|---|---|
| * | Surrogate Recovery outside accepted limits | * I | Recoveries affected by interferences or high background |
| B | Analyte detected in the associated Method Blank | DF | Dilution Factor |
| E | Value exceeds method calibration range | H | Prepped / Analyzed out of holding time. |
| J | Estimated Value Analyte below reported detection limit | M | Minimum value |
| MDL | Method Dection Limit (unadjusted) | MQL | Method Quantitation Limit (adjusted) |
| MRL | Method Reporting Limit | N | Refer to attached Non-Compliance Report |
| Q | RPD >40% between primary and confirmation columns | SQL | Sample Quantitation Limit (adjusted MDL) |

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www.etcmemphis.com 2790 Winnan Road Memphis, Tennessee 38133 (901) 213-2400 Fax (901) 213-2440
"A Laboratory Management Partner"

**AECOM EARTH TECH**
10 Patewood Drive
Building VI, Suite 500
Greenville, SC 29615

Project Description **Cedar Chemicals**
Site **W. Helena, AR**
Project No. **104336**

Lab Order Number **0903061**
Lab ID **0903061-002A**
Field ID **TSB-1a**

**Report of Analysis**
Received **03/05/09**
Matrix **Soil**
Sampled **03/05/09 10:10**

**Analytical Method 8151A**

**Prep Method** 8151A **Prep Batch(s)** 23743 **Date/Time Prepped** 03/09/09 15:03

| Compound | Result | Units | | MQL | DF | Date/Time Analyzed | By | Analytical Batch |
|---|---|---|---|---|---|---|---|---|
| **Dinoseb** | **12100 JQ** | **µg/Kg** | | **15,000** | **1,000** | **03/19/09 9:29** | **DPC** | **38386** |
| Surrogate: DCAA | | 65 % | Limits: | 20-150 | 1 | 03/19/09 5:35 | DPC | 38386 |

| Qualifiers/ Definitions | | | | |
|---|---|---|---|---|
| | * | Surrogate Recovery outside accepted limits | * I | Recoveries affected by interferences or high background |
| | B | Analyte detected in the associated Method Blank | DF | Dilution Factor |
| | E | Value exceeds method calibration range | H | Prepped / Analyzed out of holding time. |
| | J | Estimated Value Analyte below reported detection limit | M | Minimum value |
| | MDL | Method Dection Limit (unadjusted) | MQL | Method Quantitation Limit (adjusted) |
| | MRL | Method Reporting Limit | N | Refer to attached Non-Compliance Report |
| | Q | RPD >40% between primary and confirmation columns | SQL | Sample Quantitation Limit (adjusted MDL) |

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www.etcmemphis.com 2790 Whitten Road Memphis, Tennessee 38133 (901) 213-2400 Fax (901) 213-2440
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**AECOM EARTH TECH**
10 Patewood Drive
Building VI, Suite 500
Greenville, SC 29615

Project Description **Cedar Chemicals**
Site **W. Helena, AR**
Project No. **104336**

Lab Order Number **0903061**
Lab ID **0903061-003A**
Field ID **TSB-2**

**Report of Analysis**
Received **03/05/09**
Matrix **Soil**
Sampled **03/05/09 9:38**

## Analytical Method 8151A

**Prep Method** 8151A **Prep Batch(s)** 23743 **Date/Time Prepped** 03/09/09 15:03

| Compound | Result | Units | | MQL | DF | Date/Time Analyzed | By | Analytical Batch |
|---|---|---|---|---|---|---|---|---|
| **Dinoseb** | **31,300** | **µg/Kg** | | **15,000** | **1,000** | **03/19/09 9:51** | **DPC** | **38386** |
| Surrogate: DCAA | | 79 % | Limits: | 20-150 | 1 | 03/19/09 5:58 | DPC | 38386 |

**Qualifiers/ Definitions**

| | | | |
|---|---|---|---|
| * | Surrogate Recovery outside accepted limits | * I | Recoveries affected by interferences or high background |
| B | Analyte detected in the associated Method Blank | DF | Dilution Factor |
| E | Value exceeds method calibration range | H | Prepped / Analyzed out of holding time. |
| J | Estimated Value Analyte below reported detection limit | M | Minimum value |
| MDL | Method Dection Limit (unadjusted) | MQL | Method Quantitation Limit (adjusted) |
| MRL | Method Reporting Limit | N | Refer to attached Non-Compliance Report |
| Q | RPD >40% between primary and confirmation columns | SQL | Sample Quantitation Limit (adjusted MDL) |

ETC ENVIRONMENTAL TESTING & CONSULTING, INC.
www.etcmemphis.com 2700 Whitten Road Memphis, Tennessee 38133 (901) 213-2400 Fax (901) 213-2440
"A Laboratory Management Partner"

**AECOM EARTH TECH**
10 Patewood Drive
Building VI, Suite 500
Greenville, SC 29615

Project Description **Cedar Chemicals**
Project No. **104336**
Site **W. Helena, AR**

Lab Order Number **0903061**
Lab ID **0903061-004A**
Field ID **TSB-3**

**Report of Analysis**
Received **03/05/09**
Matrix **Soil**
Sampled **03/05/09 9:50**

**Analytical Method 8151A**

**Prep Method** 8151A **Prep Batch(s)** 23743 **Date/Time Prepped** 03/09/09 15:03

| Compound | Result | Units | | MQL | DF | Date/Time Analyzed | By | Analytical Batch |
|---|---|---|---|---|---|---|---|---|
| **Dinoseb** | **13400 J** | **µg/Kg** | | **15,000** | **1,000** | **03/19/09 10:14** | **DPC** | **38386** |
| Surrogate: DCAA | | 87 % | Limits: | 20-150 | 1 | 03/19/09 6:20 | DPC | 38386 |

**Qualifiers/ Definitions**

| | | | |
|---|---|---|---|
| * | Surrogate Recovery outside accepted limits | * I | Recoveries affected by interferences or high background |
| B | Analyte detected in the associated Method Blank | DF | Dilution Factor |
| E | Value exceeds method calibration range | H | Prepped / Analyzed out of holding time. |
| J | Estimated Value Analyte below reported detection limit | M | Minimum value |
| MDL | Method Dection Limit (unadjusted) | MQL | Method Quantitation Limit (adjusted) |
| MRL | Method Reporting Limit | N | Refer to attached Non-Compliance Report |
| Q | RPD >40% between primary and confirmation columns | SQL | Sample Quantitation Limit (adjusted MDL) |

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"A Laboratory Management Partner"

**AECOM EARTH TECH**
10 Patewood Drive
Building VI, Suite 500
Greenville, SC 29615

Project Description **Cedar Chemicals**
Project No. **104336**
Site **W. Helena, AR**

Lab Order Number **0903061**
Lab ID **0903061-005A**
Field ID **TSB-4**

**Report of Analysis**
Received **03/05/09**
Matrix **Soil**
Sampled **03/05/09 9:25**

## Analytical Method 8151A

**Prep Method** 8151A **Prep Batch(s)** 23743 **Date/Time Prepped** 03/09/09 15:03

| Compound | Result | Units | MQL | DF | Date/Time Analyzed | By | Analytical Batch |
|---|---|---|---|---|---|---|---|
| **Dinoseb** | **10600 J** | **µg/Kg** | **15,000** | **1,000** | **03/19/09 10:36** | **DPC** | **38386** |
| Surrogate: DCAA | | 79 % | Limits: 20-150 | 1 | 03/19/09 6:43 | DPC | 38386 |

**Qualifiers/ Definitions**

| | | | |
|---|---|---|---|
| * | Surrogate Recovery outside accepted limits | * I | Recoveries affected by interferences or high background |
| B | Analyte detected in the associated Method Blank | DF | Dilution Factor |
| E | Value exceeds method calibration range | H | Prepped / Analyzed out of holding time. |
| J | Estimated Value Analyte below reported detection limit | M | Minimum value |
| MDL | Method Dection Limit (unadjusted) | MQL | Method Quantitation Limit (adjusted) |
| MRL | Method Reporting Limit | N | Refer to attached Non-Compliance Report |
| Q | RPD >40% between primary and confirmation columns | SQL | Sample Quantitation Limit (adjusted MDL) |

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"A Laboratory Management Partner"

**AECOM EARTH TECH**
10 Patewood Drive
Building VI, Suite 500
Greenville, SC 29615

Project Description **Cedar Chemicals**
Project No. **104336**
Site **W. Helena, AR**

Lab Order Number **0903061**
Lab ID **0903061-006A**
Field ID **TSB-5**

**Report of Analysis**
Received **03/05/09**
Matrix **Soil**
Sampled **03/05/09 9:10**

## Analytical Method 8151A

**Prep Method** 8151A **Prep Batch(s)** 23743 **Date/Time Prepped** 03/09/09 15:03

| Compound | Result | Units | MQL | DF | Date/Time Analyzed | By | Analytical Batch |
|---|---|---|---|---|---|---|---|
| **Dinoseb** | **34,500** | **µg/Kg** | **15,000** | **1,000** | **03/19/09 10:59** | **DPC** | **38386** |
| Surrogate: DCAA | | 100 % | Limits: 20-150 | 1 | 03/19/09 7:05 | DPC | 38386 |

**Qualifiers/ Definitions**

| | | | |
|---|---|---|---|
| * | Surrogate Recovery outside accepted limits | * I | Recoveries affected by interferences or high background |
| B | Analyte detected in the associated Method Blank | DF | Dilution Factor |
| E | Value exceeds method calibration range | H | Prepped / Analyzed out of holding time. |
| J | Estimated Value Analyte below reported detection limit | M | Minimum value |
| MDL | Method Dection Limit (unadjusted) | MQL | Method Quantitation Limit (adjusted) |
| MRL | Method Reporting Limit | N | Refer to attached Non-Compliance Report |
| Q | RPD >40% between primary and confirmation columns | SQL | Sample Quantitation Limit (adjusted MDL) |

# APPENDIX B

## FIELD INVESTIGATION FORMS

**Test Boring Reports**

**Daily Quality Control Reports**

**Investigation Derived Waste Management Form**

AECOM

# Test Boring Report

BORING NO. TSB-1
PAGE 1 OF 1

PROJECT: Cedar Chemical
CLIENT: Tyco
CONTRACTOR: Tri-State Testing
EQUIPMENT: 54DT - Track-mounted DPT Rig

PROJECT NO: 104336
LOCATION:
ELEVATION:
DATE START: 03/05/09
DATE FINISH: 03/05/09
DRILLER: Ken Boles
PREPARED BY: K.E. Owens

GROUND WATER NA DEPTH TO: —

| DATE | HRS AFTER COMP | WATER | BOTTOM OF CASING | BOTTOM OF HOLE | | CASING | SAMPLER | CORE BARREL |
|---|---|---|---|---|---|---|---|---|
| | | | | | TYPE | | | |
| | | | | | SIZE ID | | | |
| | | | | | HAMMER WT | | | |
| | | | | | HAMMER FALL | | | |

| DEPTH IN FEET | ORGANIC VAPOR SCREENING (PPM) | SAMPLER BLOWS PER 6 INCHES | SAMPLE NUMBER | SAMPLE DEPTH RANGE | FIELD CLASSIFICATION AND REMARKS |
|---|---|---|---|---|---|
| | 0.6 | | | 0-0.3 | Dk Brown silty clay, moist |
| | | | | 0.3-4.5 | Brown silty clay, some fine sand, damp |
| | | | | | 1" gravel @ 3' BGS |
| 5.0 | | | | 4.5-4.8 | SAND, sm gravel, tan-white, moist |
| | | | | 4.8-7.5 | Dk Brown silt, fine sand, wet |
| | | | | 7.5-8.0 | Brown silty clay, orange & gray mottles, damp |
| | | | | 8-9.5 | Dk Brown silty clay |
| 10.0 | | | | 9.5-12 | Light Brown (yellow?) silt, wet |
| | | | | | TD 12.0' BGS |
| 15.0 | | | | | |
| 20.0 | | | | | |

| BLOWS/FT. | DENSITY | BLOWS/FT. | CONSISTENCY | SAMPLER ID. | | DESCRIPTIONS | | NOTES | |
|---|---|---|---|---|---|---|---|---|---|
| 0-4 | VERY LOOSE | 0-2 | VERY SOFT | SS | SPLIT SPOON | MOSTLY | 50-100% | WD | WHILE DRILLING |
| 5-10 | LOOSE | 3-4 | SOFT | ST | SHELBY TUBE | SOME | 30-45% | NE | NOT ENCOUNTERED |
| 11-30 | MEDIUM DENSE | 5-8 | MEDIUM STIFF | G | GRAB SAMPLE | LITTLE | 15-25% | UR | NOT READ |
| 31-50 | DENSE | 9-15 | STIFF | MC | MACRO-CORE | FEW | 5-10% | NR | NO RECOVERY |
| 50+ | VERY DENSE | 16-30 | VERY STIFF | | | TRACE | <5% | | |
| | | 31+ | HARD | | | | | | |

AECOM

# Test Boring Report

BORING NO. TSB-2
PAGE 1 OF 1

PROJECT: Cedar Chemical
CLIENT: Tyco
CONTRACTOR: Tri-State Testing
EQUIPMENT: 54DT - Track-mounted DPT Rig

PROJECT NO: 104336
LOCATION:
ELEVATION:
DATE START: 03/05/09
DATE FINISH: 03/05/09
DRILLER: Ken Boles
PREPARED BY: K.E. Owens

GROUND WATER: NA DEPTH TO: —

| DATE | HRS AFTER COMP | WATER | BOTTOM OF CASING | BOTTOM OF HOLE |
|---|---|---|---|---|
| | | | | |
| | | | | |
| | | | | |

| | CASING | SAMPLER | CORE BARREL |
|---|---|---|---|
| TYPE | | | |
| SIZE ID | | | |
| HAMMER WT | | | |
| HAMMER FALL | | | |

| DEPTH IN FEET | ORGANIC VAPOR SCREENING (PPM) | SAMPLER BLOWS PER 6 INCHES | SAMPLE NUMBER | SAMPLE DEPTH RANGE | FIELD CLASSIFICATION AND REMARKS |
|---|---|---|---|---|---|
| | 0.2 | | | 0-0.2 | OH Brown silt moist |
| | | | | 0.2-3.0 | Brown silt, damp |
| | | | | 3.0-5.0 | Brown clay, yellow mottles - Damp |
| 5.0 | 0.0 | | | 5.0-5.3 | Black sand, 1/2" gravel |
| | | | | 5.3-6.2 | Brown silt, moist |
| | | | | 6.2-8.0 | Gray & Black silty clay, orange brown mottles, moist |
| | | | | | TD 8.0' BGS |
| 10.0 | | | | | |
| 15.0 | | | | | |
| 20.0 | | | | | |

| BLOWS/FT. | DENSITY |
|---|---|
| 0-4 | VERY LOOSE |
| 5-10 | LOOSE |
| 11-30 | MEDIUM DENSE |
| 31-50 | DENSE |
| 50+ | VERY DENSE |

| BLOWS/FT. | CONSISTENCY |
|---|---|
| 0-2 | VERY SOFT |
| 3-4 | SOFT |
| 5-8 | MEDIUM STIFF |
| 9-15 | STIFF |
| 16-30 | VERY STIFF |
| 31+ | HARD |

| SAMPLER ID. | |
|---|---|
| SS | SPLIT SPOON |
| ST | SHELBY TUBE |
| G | GRAB SAMPLE |
| MC | MACRO-CORE |

| DESCRIPTIONS | |
|---|---|
| MOSTLY | 50-100% |
| SOME | 30-45% |
| LITTLE | 15-25% |
| FEW | 5-10% |
| TRACE | <5% |

| NOTES | |
|---|---|
| WD | WHILE DRILLING |
| NE | NOT ENCOUNTERED |
| UR | NOT READ |
| NR | NO RECOVERY |

AECOM

# Test Boring Report

BORING NO. TSB-3
PAGE 1 OF 1

PROJECT: Cedar Chemical
CLIENT: Tyco
CONTRACTOR: Tri-State Testing
EQUIPMENT: 54DT - Track-mounted DPT Rig

PROJECT NO: 104336
LOCATION:
ELEVATION:
DATE START: 03/05/09
DATE FINISH: 03/05/09
DRILLER: Ken Boles
PREPARED BY: K.E. Owens

GROUND WATER: NA DEPTH TO: —

| DATE | HRS AFTER COMP | WATER | BOTTOM OF CASING | BOTTOM OF HOLE | | CASING | SAMPLER | CORE BARREL |
|---|---|---|---|---|---|---|---|---|
| | | | | | TYPE | | | |
| | | | | | SIZE ID | | | |
| | | | | | HAMMER WT | | | |
| | | | | | HAMMER FALL | | | |

| DEPTH IN FEET | ORGANIC VAPOR SCREENING (PPM) | SAMPLER BLOWS PER 6 INCHES | SAMPLE NUMBER | SAMPLE DEPTH RANGE | FIELD CLASSIFICATION AND REMARKS |
|---|---|---|---|---|---|
| | 0.4 | | | 0-0.3 | Dk Brown silt, damp |
| | | | | 0.3-7.0 | Brown silt, trace clay, damp |
| 5.0 | 1.0 | | | | |
| | | | | 7-7.5 | Black to Gray silty clay, moist |
| | | | | 7.5-8.0 | Brown silty clay, some V. fine sand, moist |
| | | | | | TD 8.0' BGS |
| 10.0 | | | | | |
| 15.0 | | | | | |
| 20.0 | | | | | |

| BLOWS/FT. | DENSITY | BLOWS/FT. | CONSISTENCY | SAMPLER ID. | | DESCRIPTIONS | | NOTES | |
|---|---|---|---|---|---|---|---|---|---|
| 0-4 | VERY LOOSE | 0-2 | VERY SOFT | SS | SPLIT SPOON | MOSTLY | 50-100% | WD | WHILE DRILLING |
| 5-10 | LOOSE | 3-4 | SOFT | ST | SHELBY TUBE | SOME | 30-45% | NE | NOT ENCOUNTERED |
| 11-30 | MEDIUM DENSE | 5-8 | MEDIUM STIFF | G | GRAB SAMPLE | LITTLE | 15-25% | UR | NOT READ |
| 31-50 | DENSE | 9-15 | STIFF | MC | MACRO-CORE | FEW | 5-10% | NR | NO RECOVERY |
| 50+ | VERY DENSE | 16-30 | VERY STIFF | | | TRACE | <5% | | |
| | | 31+ | HARD | | | | | | |

AECOM

# Test Boring Report

BORING NO. TSB-4
PAGE 1 OF 1

PROJECT: Cedar Chemical
CLIENT: Tyco
CONTRACTOR: Tri-State Testing
EQUIPMENT: 54DT - Track-mounted DPT Rig

PROJECT NO: 104336
LOCATION:
ELEVATION:
DATE START: 03/05/09
DATE FINISH: 03/05/09
DRILLER: Ken Boles
PREPARED BY: K.E. Owens

GROUND WATER NA DEPTH TO: —

| DATE | HRS AFTER COMP | WATER | BOTTOM OF CASING | BOTTOM OF HOLE |
|---|---|---|---|---|
| | | | | |
| | | | | |
| | | | | |

| | CASING | SAMPLER | CORE BARREL |
|---|---|---|---|
| TYPE | | | |
| SIZE ID | | | |
| HAMMER WT | | | |
| HAMMER FALL | | | |

| DEPTH IN FEET | ORGANIC VAPOR SCREENING (PPM) | SAMPLER BLOWS PER 6 INCHES | SAMPLE NUMBER | SAMPLE DEPTH RANGE | FIELD CLASSIFICATION AND REMARKS |
|---|---|---|---|---|---|
| | 0.4 | | | 0-0.3 | ~~0-0.3~~ DK BROWN SILTY CLAY |
| | | | | 0.3-5.5 | Brown silty clay, v. fine sand, damp |
| 5.0 | | | | | |
| | | | | 5.5-6.0 | Brown ~~gray~~ silty-clay moist |
| | | | | 6-6.5 | GRAY TO BLACK SILT |
| | 0.2 | | | | Brown silty clay - moist |
| | | | | | TD 8.0' BGS |
| 10.0 | | | | | |
| 15.0 | | | | | |
| 20.0 | | | | | |

| BLOWS/FT. | DENSITY |
|---|---|
| 0-4 | VERY LOOSE |
| 5-10 | LOOSE |
| 11-30 | MEDIUM DENSE |
| 31-50 | DENSE |
| 50+ | VERY DENSE |

| BLOWS/FT. | CONSISTENCY |
|---|---|
| 0-2 | VERY SOFT |
| 3-4 | SOFT |
| 5-8 | MEDIUM STIFF |
| 9-15 | STIFF |
| 16-30 | VERY STIFF |
| 31+ | HARD |

| SAMPLER ID. | |
|---|---|
| SS | SPLIT SPOON |
| ST | SHELBY TUBE |
| G | GRAB SAMPLE |
| MC | MACRO-CORE |

| DESCRIPTIONS | |
|---|---|
| MOSTLY | 50-100% |
| SOME | 30-45% |
| LITTLE | 15-25% |
| FEW | 5-10% |
| TRACE | <5% |

| NOTES | |
|---|---|
| WD | WHILE DRILLING |
| NE | NOT ENCOUNTERED |
| UR | NOT READ |
| NR | NO RECOVERY |

AECOM

# Test Boring Report

BORING NO. TSB-5
PAGE 1 OF 1

PROJECT: Cedar Chemical
CLIENT: Tyco
CONTRACTOR: Tri-State Testing
EQUIPMENT: 54DT - Track-Mounted DPT Rig

PROJECT NO: 104336
LOCATION:
ELEVATION:
DATE START: 03/05/09
DATE FINISH: 03/05/09
DRILLER: Ken Boles
PREPARED BY: K.E. Owens

GROUND WATER: NA DEPTH TO: —

| DATE | HRS AFTER COMP | WATER | BOTTOM OF CASING | BOTTOM OF HOLE | | CASING | SAMPLER | CORE BARREL |
|---|---|---|---|---|---|---|---|---|
| | | | | | TYPE | | | |
| | | | | | SIZE ID | | | |
| | | | | | HAMMER WT | | | |
| | | | | | HAMMER FALL | | | |

| DEPTH IN FEET | ORGANIC VAPOR SCREENING (PPM) | SAMPLER BLOWS PER 6 INCHES | SAMPLE NUMBER | SAMPLE DEPTH RANGE | FIELD CLASSIFICATION AND REMARKS |
|---|---|---|---|---|---|
| | 1.0 | | | 0-0.5 | 0-0.5' DK BROWN SILTY CLAY |
| | | | | 0.5-7.0 | 0.5-4' BROWN SILTY CLAY, V. FINE SAND, DAMP |
| 5.0 | 1.2 | | | | |
| | | | | 7.0-7.5 | 7.0-7.5 - Brown gray clay - Moist |
| | | | | 7.5-8.0 | 7.5-8.0 - Mottled Brown clayey silt - Moist |
| | | | | | TD - 8.0' BGS |
| 10.0 | | | | | |
| 15.0 | | | | | |
| 20.0 | | | | | |

| BLOWS/FT. | DENSITY | BLOWS/FT. | CONSISTENCY | SAMPLER ID. | | DESCRIPTIONS | | NOTES | |
|---|---|---|---|---|---|---|---|---|---|
| 0-4 | VERY LOOSE | 0-2 | VERY SOFT | SS | SPLIT SPOON | MOSTLY | 50-100% | WD | WHILE DRILLING |
| 5-10 | LOOSE | 3-4 | SOFT | ST | SHELBY TUBE | SOME | 30-45% | NE | NOT ENCOUNTERED |
| 11-30 | MEDIUM DENSE | 5-8 | MEDIUM STIFF | G | GRAB SAMPLE | LITTLE | 15-25% | UR | NOT READ |
| 31-50 | DENSE | 9-15 | STIFF | MC | MACRO-CORE | FEW | 5-10% | NR | NO RECOVERY |
| 50+ | VERY DENSE | 16-30 | VERY STIFF | | | TRACE | <5% | | |
| | | 31+ | HARD | | | | | | |

AECOM

# DAILY QUALITY CONTROL REPORT

Page ___ of ___

JOB NUMBER 104336 DATE 03/04/09 REPORT NUMBER

PROJECT & LOCATION Cedar Chemical Facility, Helena, AR

WEATHER Sunny TEMPERATURE RANGE — WIND —

EARTH TECH PERSONNEL ON SITE Keith E Owens TIME ON SITE 3-4 hrs

SUMMARY OF SITE ACTIVITIES Provided escort to utility locators and surveyors

LEVEL OF HEALTH & SAFETY PROTECTION D

INSTRUMENTATION USED N/A

CALIBRATION(S) PERFORMED N/A

INSTRUMENT PROBLEMS/REMEDIES N/A

SAMPLES COLLECTED* N/A

SAMPLE COLLECTION METHOD(S) N/A

QUALITY CONTROL SAMPLES* N/A

ADDITIONAL REMARKS Cindy Greenway of ADEQ also on site

SIGNATURE: Keith E Owens

* INDICATE SAMPLE MEDIA: SOIL OR QA/QC.

AECOM

# DAILY QUALITY CONTROL REPORT



JOB NUMBER 104336 DATE 03/05/09 REPORT NUMBER

PROJECT & LOCATION Cedar Chemical Facility, Helena, AR

WEATHER Mostly clear TEMPERATURE RANGE 60-72 WIND 5-15

EARTH TECH PERSONNEL ON SITE Keith E Avery TIME ON SITE 5 hrs

SUMMARY OF SITE ACTIVITIES Completed 5 soil borings

LEVEL OF HEALTH & SAFETY PROTECTION D

INSTRUMENTATION USED PID, LEL

CALIBRATION(S) PERFORMED

INSTRUMENT PROBLEMS/REMEDIES N/A

SAMPLES COLLECTED* Soil TSB-1, TSB-2, TSB-3, TSB-4, TSB-5 (all @ 4-8' Bgs)
Soil TSB-1 (1-4), TSB-1 (8-12) Held for analysis
Soil IDW-1

SAMPLE COLLECTION METHOD(S) DPT-GRAB

QUALITY CONTROL SAMPLES* Soil TSB-1A, TSB-MS, TSB-MSD
water TSB-1D

ADDITIONAL REMARKS Cindy Greenway (ADEQ) provided escort
Geomatrix on-site to observe & collect split-samples
(Adam Taylor, Kelly Beck)

SIGNATURE: Keith E Avery

* INDICATE SAMPLE MEDIA: SOIL OR QA/QC.

AECOM

# IDW MANAGEMENT FORM



COMPANY Tyco

PROJECT Nonaqueous Site Investigation

SITE NAME Former Cedar Chemicals Facility

LOCATION Helena-West Helena, Arkansas

| CONTAINER NUMBER | MEDIA DESCRIPTION | MEDIA ORIGIN | DATE FILLED | DATE SAMPLED | DATE DISPOSED | COMMENTS |
|---|---|---|---|---|---|---|
| 1 | soil from borings | subsurface soil | 3/5/09 | 3/5/09 | | soil from borings TSB-1 through TSB-5 |
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# APPENDIX C
# ANALYTICAL LABORATORY CERTIFCATION

*State of Arkansas*
*Department of Environmental Quality*
*Laboratory Certification Program*

# Environmental Testing & Consulting

**Memphis, TN**

*has earned certification by law in accordance with Code Annotated §8-2-201 et seq., the State Environmental Laboratory Certification Program Act for the following parameters:*

| | | | | |
|---|---|---|---|---|
| Alkalinity | pH | Beryllium | Potassium | TPH |
| Ammonia | Phenol | Boron | Selenium | Acute Toxicity |
| BOD | Sulfate | Cadmium | Silver | Chronic Toxicity |
| CBOD | Surfactants | Calcium | Sodium | Herbicides |
| Chloride | TDS | Chromium | Strontium | Pesticides & PCBs |
| Chlorine | TKN | Cobalt | Thallium | Semi-volatiles |
| COD | TOC | Copper | Tin | Volatile Organics |
| Conductivity | Total Phosphorus | Hex. Chromium | Titanium | |
| Cyanide | Total Solids | Iron | Vanadium | |
| Fluoride | TSS | Lead | Zinc | |
| Hardness | Turbidity | Magnesium | Fecal Coliform | |
| Nitrate | Aluminum | Manganese | DRO | |
| Nitrite | Antimony | Mercury | Explosives | |
| Oil & Grease | Arsenic | Molybdenum | GRO | |
| Orthophosphate | Barium | Nickel | TOX | |

Laboratory ID: **88-0650**

Certificate Number: **09-010-0**

Issued Date: **7 February 2009**

Expired Date: **7 February 2010**

Teresa Marks

ADEQ Director

© 00ES 746

# APPENDIX D

# DATA VALIDATION REPORT/CERTIFICATES OF ANALYSIS

# DATA VALIDATION REPORT

Data assessment is a systematic process for reviewing a body of data against a predefined set of criteria to provide assurance that the data meet project Data Quality Objective (DQO) requirements. The purpose of the data assessment process is to determine if and how the usability of the analytical data is affected by the overall analytical processes and sample collection and handling procedures. If specific DQOs are not met, the data are qualified (i.e., data flags are assigned to sample results) in accordance with guidelines established by the United States Environmental Protection Agency (USEPA). Data assessment allows the data user to adequately determine if the data can be used for its intended purpose. The data acceptance criteria are established according to Standard Operating Procedures (SOPs) and Statements of Work (SOWs) provided to the contracted analytical laboratory. The assessment of data quality and usability involves five components, as described below.

1) **Field Sampling Check** is a process to ensure that all samples were collected and the laboratory analyses were performed as stipulated in the applicable site-specific Work Plan or Field Sampling Plan (FSP). Inspection of sample preservation procedures, sample handling, analysis requested, sample description and ID, cooler receipt forms, holding time evaluation, and Chain of Custody procedures are all evaluated to ensure that the evidentiary nature of the samples and the resulting analytical data have not been compromised.

2) **Data Verification** is a process for determining the completeness, correctness, consistency, and compliance of a data package in accordance with requirements contained in the applicable SOW and/or contract-specific requirements. This is a review of the data package, electronic data deliverable (EDD), and invoice received from the contract laboratory to ensure that the contract required information is present and complete prior to data validation.

3) **Data Review** is a process of reviewing the primary quality control (QC) data provided by the laboratory and the results of any internal quality assurance (QA)/QC samples, such as field blanks, trip blanks, equipment blanks or ambient blanks, field split samples, and duplicate samples, to ascertain any effect the laboratory's procedures or the sample collection process has on the data.

4) **Data Evaluation** is a process to determine if the data meet project-specific DQOs and contract requirements. This evaluation may involve a review of field sampling and sample management procedures, laboratory audits, Performance Evaluation (PE) sample results, and any other data quality indicators that are available.

5) **Data Validation** is a process to determine the accuracy and precision of analytical data generated and to identify any anomalies encountered. The validation process is performed in accordance with USEPA regional or national functional guidelines, project-specific guidelines, and compliance with the requirements of each analytical method. Two major components of data

validation are laboratory performance and matrix interferences. Evaluation of laboratory performance is a check for compliance for each analytical method to determine if the samples were analyzed within the prescribed acceptance criteria of the method. Evaluation of matrix interferences involves the analysis of surrogate spike recoveries, matrix spike recoveries, and duplicate sample results. Data not meeting project-specific DQOs or the requirements of the analytical method are qualified with data flags according to referenced guidelines.

**Data Assessment Procedures**

AECOM performed independent QC checks of field and laboratory procedures that were used in collecting and analyzing the data. The QC checks verify that the data collected are of appropriate quality for the intended data use and that the DQOs were met. The steps and guidelines followed during the data validation process were modeled on the *USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review* (USEPA, July 2004), *USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review* (USEPA, October 1999), and *Data Validation Standard Operating Procedures for Contract Laboratory Program Routine Analytical Services* (USEPA, July 1999). In addition, method-specific criteria set forth in the compendium of analytical methods found in the *Test Methods for Evaluation Solid Waste (SW-846), Update III* (USEPA, June 1997) are also evaluated during the validation process. This validation process has been adapted to meet the DQO requirements for generation of definitive critical data.

**Data Validation Results**

The analytical data (5 soil samples – TSB-1, TSB-2, TSB-3, TSB-4, and TSB-5 and 1 waste sample – IDW-4) plus QA/QC data (1 field duplicate sample – TSB-1-a, 1 matrix spike sample – TSB-1-ms/ matrix spike duplicate sample – TSB-1-msd, and 1 rinsate blank sample – TSB-1-d) were collected on March 5, 2009 for the Former Cedar Chemicals Facility. The analytical data were validated according to the procedures outlined above. Where data flags have been applied to this data set, they are separated by a slash "/" and presented in the following format:

**Laboratory Flag / Result Flags / Analysis Flags**

- Laboratory Flag: This flag precedes the first slash and is added by the laboratory as a result of QC excursions from the analytical method. These flags are laboratory-specific and are described in the associated laboratory report.

- Result Flags: These are presented after the first slash and are added by AECOM based on data validation procedures and guidelines. They tell how and if the data should be used.

- Analysis Flags: These flags are presented after the second slash and are added by AECOM to inform the data user of any specific QA/QC problems that were encountered.

Any data requiring qualification as a result of the validation process were assigned data flags, as discussed below. The validation flags indicate how any QC excursions may have impacted the usability of the data.

**Dinoseb by Method 8151A**

Results of the validation process indicate that the data analyzed for this method are acceptable for their intended use and no data flags are required.

**TCLP Volatile Organic Compounds by Method 8260B**

Results of the validation process indicate that the data analyzed for this method are acceptable for their intended use and no data flags are required.

**TCLP Semivolatile Organic Compounds by Method 8270C**

Results of the validation process indicate that the data analyzed for this method are acceptable for their intended use and no data flags are required.

**TCLP Pesticides by Method 8081A**

Results of the validation process indicate that the data analyzed for this method are acceptable for their intended use and no data flags are required.

**TCLP Herbicides by Method 8151A**

Results of the validation process indicate that the data analyzed for this method are acceptable for their intended use and no data flags are required.

**TCLP Metals by Methods 6010B/7470A**

Results of the validation process indicate that the data analyzed for this method are acceptable for their intended use and no data flags are required.

**Data Summary and Usability**

None of the QC excursions encountered during the validation of this data set resulted in any of the data being rejected. Therefore, the data associated with this laboratory batch should be considered compliant and adequate for its intended use.

## References

United States Environmental Protection Agency (USEPA), June 1997. *Test Methods for Evaluating Solid Waste (SW-846), 3rd Edition, Update III.*

United States Environmental Protection Agency (USEPA), July 1999. *Data Validation Standard Operating Procedures for Contract Laboratory Program Routine Analytical Services, Revision 2.1,* EPA Region IV.

United States Environmental Protection Agency (USEPA), October 1999. *USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review.* Publication #EPA540/R-99/008.

United States Environmental Protection Agency (USEPA), July 2004. *USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review.* Publication #EPA540/R-04/004.

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"A Laboratory Management Partner"

March 25, 2009

Ms. Doria Cullom
AECOM EARTH TECH
10 Patewood Drive
Building VI, Suite 500
Greenville, SC 29615

| Ref: | Analytical Testing | |
|---|---|---|
| | Lab Order Number | 0903061 |
| | Project Description | Cedar Chemicals |
| | Site | W. Helena, AR |
| | Project Number | 104336 |

Environmental Testing and Consulting, Inc. received 8 sample(s) on 3/5/2009 for the analyses presented in the following report.

The above referenced project has been analyzed per your instructions. The analyses were performed in our laboratory in accordance with Standard Methods, The Solid Waste Manual SW-846, EPA Methods for Chemical Analysis of Water and Wastes and /or 40 CFR part 136. Results are reported wet weight unless otherwise indicated.

The EPA requires that water samples analyzed for pH, dissolved oxygen and total residual chlorine be analyzed in the field. Analyses and results reported which do not indicate "Field" for these parameters were analyzed outside the holding time as specified in Table II of 40 CFR Part 136.3.

The analytical data has been validated using standard quality control measures performed as required by the analytical method. Quality Assurance, instrumentation maintenance and calibration were performed in accordance with guidelines established by the USEPA and NELAP.

The results are shown on the attached analysis sheet(s).

Please do not hesitate to contact me or client services if you have any questions or need additional information.

Sincerely,

Nathan Pera IV
Laboratory Project Manager

Attachment
AECOM_GREENVILLE

***Certifications***

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Alabama | #40750 | Louisiana | #04015 | Florida | #E87943 | California | #05240CA |
| Arkansas | #88-0650 | Mississippi | | Pennsylvania | #68-3195 | Texas | #T104704180-05-TX |
| Illinois | #200015 | Oklahoma | #9311 | USDA | #S-46279 | | |
| Kentucky | #90047 | Tennessee | #02027 | EPA | #TN00012 | | |
| Kentucky UST | #41 | Virginia | #00106 | NELAP | #100456 | nelac | |

# Login

# Chain-of-Custody

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# Analytical Summary / Cross Reference Table

**CLIENT**
**Project**
**Site**

**ETC Order Number**
**Date Received**

| ETC Sample ID | Field ID | Sample ID | Date/Time Sampled | Matrix | Method | Method Description |
|---|---|---|---|---|---|---|

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# Cooler Receipt Form

Client Name **AECOM EARTH TECH**

Order Number: **0903061**

Project ID: **Cedar Chemicals**

Reserved for Barcode

Carrier name: **Client Delivery**

Carrier Bill No.:

| | | | |
|---|---|---|---|
| Shipping container/cooler uncompromised? | ◉ Yes | ○ No | ○ Not Present |
| Custody seals intact on shipping container/cooler? | ○ Yes | ○ No | ◉ Not Required |
| Custody seals intact on sample bottles? | ○ Yes | ○ No | ◉ Not Required |
| Chain of custody present? | ◉ Yes | ○ No | |
| Other documentation present? | ○ Yes | ◉ No | |
| Special precautions or instructions included? | ○ Yes | ◉ No | |
| Chain of custody agrees with sample labels? | ◉ Yes | ○ No | |
| Samples in proper container/bottle? | ◉ Yes | ○ No | |
| Sample containers intact? | ◉ Yes | ○ No | |
| Containers in separate bags? | ○ Yes | ◉ No | |
| Sufficient sample volume for indicated test? | ◉ Yes | ○ No | |
| All samples received within holding time? | ◉ Yes | ○ No | |
| Lab able to analyze samples within holding time? | ◉ Yes | ○ No | |
| Cooler temperature in compliance? | ◉ Yes | ○ No | |
| Water - VOA vials have zero headspace? | ○ Yes | ○ No | ◉ No VOA vials submitted |
| Water - Preservation acceptable upon receipt? | ◉ Yes | ○ No | |
| Samples screened for radioactivity? | ○ Yes | ○ No | ◉ Not Checked |

Person Contacted: Date Contacted:

Comment:

Resolution:

Non-compliance issues will be recorded on a non-compliance report.

(VDTSR) Date Received: **03/05/09 14:20**

Received by: **Rebekah Ross**

Login Coordinator: RBarger

ETC
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Memphis, TN 38133 (901) 213-2400 Fax (901)213-2440
clientservices@etcmemphis.com

# CHAIN OF CUSTODY RECORD

ETC Work Order 0903061
ETC Quote No.

Company Name: AECOM Technical Services
Phone # 864.234.8939 | RUSH[2] | PO # | Ice | FID # | E-Mail
Project/Site (Include State): Cedar Chemicals, Whitehaven AR
Type of Event[1] : Single Daily Weekly Monthly Quarterly Semi-Annual Annual
Project # 104336
Project Manager/Contact: L. Alexander

Matrix: 1 Wastewater 2 Aqueous 3 Soil/Sediment 4 Sludge 5 Oil/Solvent 6 Other

Analysis Requested (Note special detection limits / methods): Dinoseb by 8151

Which Regs Apply? NPDES, Wastewater, RCRA, UST, Risk Based Limits, TRRP 13, LA RECAP, USACE

| # of Cont. | Sample ID/ Number | Depth | Sample Date | Sample Time | Matrix | Type Grab/Comp | Dinoseb by 8151 | Comments |
|---|---|---|---|---|---|---|---|---|
| 1 | TSB-1 ~~Ca~~ kw | 4-8 | 03/05/09 | 1010 | 3 | Grab | X | |
| 1 | TSB-1a | 4-8 | ↓ | 1010 | ↓ | ↓ | X | |
| 1 | TSB-1MS | 4-8 | ↓ | 1010 | ↓ | ↓ | X | |
| 1 | TSB-1MSD | 4-8 | ↓ | 1010 | ↓ | ↓ | X | |
| 1 | TSB-2 | 4-8 | ↓ | 0938 | ↓ | ↓ | X | |
| 1 | TSB-3 | 4-8 | ↓ | 0950 | ↓ | ↓ | X | |
| 1 | TSB-4 | 4-8 | ↓ | 0925 | ↓ | ↓ | X | |
| 1 | TSB-5 | 4-8 | ↓ | 0910 | ↓ | ↓ | X | |
| 1 | TSB-1 | 1-4 | ↓ | 1000 | ↓ | ↓ | X | HOLD |
| 1 | TSB-1 | 8-12 | ↓ | 1015 | ↓ | ↓ | X | HOLD |
| 2 | TSB-1D | | 03/05/09 | 1100 | 2 | GRAB | X | |

Sampled By: Keith E Owens
Method of Shipment: Drop-off
Blank/Cooler Temp: <4C
Remarks:

| RELINQUISHED BY (sign) | DATE | TIME | RECEIVED BY (sign) | DATE | TIME |
|---|---|---|---|---|---|
| Keith E Owens | 03/05/09 | 1330 | J Smith | 3.5.09 | 1330 |
| J Smith | 3.5.09 | | | | |
| | | | RECEIVED BY LAB (print/sign) | 3/5/09 | 1420 |

1 - Routine Sampling Events Only
2 - Surcharges may apply

Please return ETC Sample Kit Request Form with chain of custody.
Distribution: Original accompanies samples to the laboratory.

Page ____ of ____



SAFEGUARD LITHO USA Form No. 811-2/L05CS000147 1/09

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Memphis, TN 38133 (901) 213-2400 Fax (901)213-2440
clientservices@etcmemphis.com

# CHAIN OF CUSTODY RECORD

ETC Work Order: 0903061
ETC Quote No.:

Company Name: AECOM TECHNICAL SERVICES
Phone #: 864-234-8439
RUSH[2]:
PO #:
Ice:
FID #:
E-Mail:
Project/Site (Include State): Cedar Chemical, Wilhelmina, Ark
Type of Event[1]: Single Daily Weekly Monthly Quarterly Semi-Annual Annual
Project #:
Project Manager/Contact:

Matrix: 1 Wastewater 2 Aqueous 3 Soil/Sediment 4 Sludge 5 Oil/Solvent 6 Other

Analysis Requested (Note special detection limits / methods): 8 Full TCLP

Which Regs Apply?: NPDES, Wastewater, RCRA, UST, Risk Based Limits, TRRP 13, LA RECAP, USACE

| # of Cont. | Sample ID/ Number | Depth | Sample Date | Sample Time | Matrix | Type Grab/Comp | 8 Full TCLP | Comments |
|---|---|---|---|---|---|---|---|---|
| 5 | 1DW-4 | | 03/05/09 | 1030 | 3 | Grab | X | |

Page 6 of 61

Sampled By: Keith E Owen
Method of Shipment: Drop-off
Blank/Cooler Temp: <4°C
Remarks:

| RELINQUISHED BY (sign) | DATE | TIME | RECEIVED BY (sign) | DATE | TIME |
|---|---|---|---|---|---|
| Keith E Owen | 03/05/09 | 1330 | J Smith | 3.5.09 | 1330 |
| J Smith | 3.5.09 | | | | |
| | | | RECEIVED BY LAB (print/sign) | 3/5/09 | 1420 |

1 - Routine Sampling Events Only
2 - Surcharges may apply

Please return ETC Sample Kit Request Form with chain of custody.
Distribution: Original accompanies samples to the laboratory.

Page ____ of ____

SAFEGUARD LITHO USA Form No. 811-2/L05CS000147 1/09

# Sample Reports

**CLIENT:**
**Project:**
**Lab Order Number:**

# CASE NARRATIVE

**Date: 03/26/09**

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Greenville, SC 29615

**Cedar Chemicals** **W. Helena, AR**

**104336**

**0903061**
**0903061-001A**
**TSB-1**

**Report of Analysis**
**03/05/09**
**Soil**
**03/05/09 10:10**

## Analytical Method 8151A

**Prep Method** 8151A **Prep Batch(s)** 23743 **Date/Time Prepped** 03/09/09 15:03

| Compound | Result | Units | MQL | DF | Date/Time Analyzed | By | Analytical Batch |
|---|---|---|---|---|---|---|---|
| **Dinoseb** | **44,200** | **µg/Kg** | **15,000** | **1,000** | **03/19/09 8:57** | **DPC** | **38386** |
| Surrogate: DCAA | | 70 % | Limits: 20-150 | 1 | 03/19/09 4:28 | DPC | 38386 |

**Qualifiers/ Definitions**

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**104336**

**0903061**
**0903061-002A**
**TSB-1a**

**Report of Analysis**
**03/05/09**
**Soil**
**03/05/09 10:10**

**Analytical Method 8151A**

Prep Method 8151A Prep Batch(s) 23743 Date/Time Prepped 03/09/09 15:03

| Compound | Result | Units | MQL | DF | Date/Time Analyzed | By | Analytical Batch |
|---|---|---|---|---|---|---|---|
| **Dinoseb** | **33,800** | **µg/Kg** | **15,000** | **1,000** | **03/23/09 15:52** | **DPC** | **38386** |
| Surrogate: DCAA | | 65 % | Limits: 20-150 | 1 | 03/19/09 5:35 | DPC | 38386 |

**Qualifiers/ Definitions**

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**104336**

**0903061**
**0903061-003A**
**TSB-2**

**Report of Analysis**
**03/05/09**
**Soil**
**03/05/09 9:38**

## Analytical Method 8151A

**Prep Method** 8151A **Prep Batch(s)** 23743 **Date/Time Prepped** 03/09/09 15:03

| Compound | Result | Units | MQL | DF | Date/Time Analyzed | By | Analytical Batch |
|---|---|---|---|---|---|---|---|
| **Dinoseb** | **31,300** | **µg/Kg** | **15,000** | **1,000** | **03/19/09 9:51** | **DPC** | **38386** |
| Surrogate: DCAA | | 79 % | Limits: 20-150 | 1 | 03/19/09 5:58 | DPC | 38386 |

**Qualifiers/ Definitions**

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**104336**

**0903061**
**0903061-004A**
**TSB-3**

**Report of Analysis**
**03/05/09**
**Soil**
**03/05/09 9:50**

## Analytical Method 8151A

**Prep Method** 8151A **Prep Batch(s)** 23743 **Date/Time Prepped** 03/09/09 15:03

| Compound | Result | Units | MQL | DF | Date/Time Analyzed | By | Analytical Batch |
|---|---|---|---|---|---|---|---|
| **Dinoseb** | **80,400** | **µg/Kg** | **15,000** | **1,000** | **03/23/09 16:15** | **DPC** | **38386** |
| Surrogate: DCAA | | 87 % | Limits: 20-150 | 1 | 03/19/09 6:20 | DPC | 38386 |

**Qualifiers/ Definitions**

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**104336**

**0903061**
**0903061-005A**
**TSB-4**

**Report of Analysis**
**03/05/09**
**Soil**
**03/05/09 9:25**

## Analytical Method 8151A

**Prep Method** 8151A **Prep Batch(s)** 23743 **Date/Time Prepped** 03/09/09 15:03

| Compound | Result | Units | MQL | DF | Date/Time Analyzed | By | Analytical Batch |
|---|---|---|---|---|---|---|---|
| **Dinoseb** | **70,700** | **µg/Kg** | **15,000** | **1,000** | **03/23/09 16:38** | **DPC** | **38386** |
| Surrogate: DCAA | | 79 % | Limits: 20-150 | 1 | 03/19/09 6:43 | DPC | 38386 |

**Qualifiers/ Definitions**

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**104336**

**0903061**
**0903061-006A**
**TSB-5**

**Report of Analysis**
**03/05/09**
**Soil**
**03/05/09 9:10**

## Analytical Method 8151A

**Prep Method** 8151A **Prep Batch(s)** 23743 **Date/Time Prepped** 03/09/09 15:03

| Compound | Result | Units | MQL | DF | Date/Time Analyzed | By | Analytical Batch |
|---|---|---|---|---|---|---|---|
| **Dinoseb** | **34,500** | **µg/Kg** | **15,000** | **1,000** | **03/19/09 10:59** | **DPC** | **38386** |
| Surrogate: DCAA | | 100 % | Limits: 20-150 | 1 | 03/19/09 7:05 | DPC | 38386 |

**Qualifiers/ Definitions**

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**104336**

**0903061**
**0903061-009A**
**TSB-1D**

**Report of Analysis**
**03/05/09**
**Aqueous**
**03/05/09 11:00**

**Analytical Method 8151A**

**Prep Method** 8151A **Prep Batch(s)** 23796 **Date/Time Prepped** 03/12/09 17:05

| Compound | Result | Units | | MQL | DF | Date/Time Analyzed | By | Analytical Batch |
|---|---|---|---|---|---|---|---|---|
| Dinoseb | < 0.00270 | mg/L | | 0.00270 | 1 | 03/17/09 2:03 | KS | 38333 |
| Surrogate: DCAA | | 81 % | Limits: | 20-150 | 1 | 03/17/09 2:03 | KS | 38333 |

**Qualifiers/ Definitions**

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**104336**

**0903061**
**0903061-010A**
**IDW-4**

**Report of Analysis**
**03/05/09**
**Soil**
**03/05/09 10:30**

## 1311 TCLP Characterization

**Prep Batch** 23741 **Date/Time** 03/09/09 14:00 Leachate

### Analytical Method 8081A

**Prep Method** 608 **Prep Batch(s)** 23770 **Date/Time Prepped** 03/11/09 11:57

| Compound | Result | Units | MQL | DF | Date/Time Analyzed | By | Analytical Batch |
|---|---|---|---|---|---|---|---|
| gamma-BHC | < 0.000160 | mg/L | 0.000160 | 10 | 03/19/09 15:46 | DPC | 38388 |
| Chlordane | < 0.00100 | mg/L | 0.00100 | 10 | 03/19/09 15:46 | DPC | 38388 |
| Endrin | < 0.000160 | mg/L | 0.000160 | 10 | 03/19/09 15:46 | DPC | 38388 |
| Heptachlor | < 0.000160 | mg/L | 0.000160 | 10 | 03/19/09 15:46 | DPC | 38388 |
| Heptachlor epoxide | < 0.000160 | mg/L | 0.000160 | 10 | 03/19/09 15:46 | DPC | 38388 |
| **Methoxychlor** | **0.00704 Q** | **mg/L** | **0.000160** | **10** | **03/19/09 15:46** | **DPC** | **38388** |
| Toxaphene | < 0.00120 | mg/L | 0.00120 | 10 | 03/19/09 15:46 | DPC | 38388 |
| Surrogate: Decachlorobiphenyl | | 95 % | Limits: 36-116 | 10 | 03/19/09 15:46 | DPC | 38388 |
| Surrogate: Tetrachloro-m-xylene | | 56 % | Limits: 25-123 | 10 | 03/19/09 15:46 | DPC | 38388 |

**Qualifiers/ Definitions**

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Greenville, SC 29615

**Cedar Chemicals** **W. Helena, AR**

**104336**

**0903061**
**0903061-010A**
**IDW-4**

**Report of Analysis**
**03/05/09**
**Soil**
**03/05/09 10:30**

## 1311 TCLP Characterization

**Prep Batch** 23741 **Date/Time** 03/09/09 14:00 Leachate

### Analytical Method 8151A

**Prep Method** 8151A **Prep Batch(s)** 23796 **Date/Time Prepped** 03/12/09 17:05

| Compound | Result | Units | MQL | DF | Date/Time Analyzed | By | Analytical Batch |
|---|---|---|---|---|---|---|---|
| 2,4-D | < 0.00200 | mg/L | 0.00200 | 1 | 03/17/09 2:25 | KS | 38333 |
| 2,4,5-TP (Silvex) | < 0.000600 | mg/L | 0.000600 | 1 | 03/17/09 2:25 | KS | 38333 |
| Surrogate: DCAA | | 59 % | Limits: 20-150 | 1 | 03/17/09 2:25 | KS | 38333 |

**Qualifiers/ Definitions**

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ETC ENVIRONMENTAL TESTING & CONSULTING, INC.
2790 Whitten Road Memphis Tennessee 38133 (901) 213-2400 Fax (901) 213-2440
"A Laboratory Management Partner"

**AECOM EARTH TECH**
10 Patewood Drive
Building VI, Suite 500
Greenville, SC 29615

**Cedar Chemicals** **W. Helena, AR**

**104336**

**0903061**
**0903061-010A**
**IDW-4**

**Report of Analysis**
**03/05/09**
**Soil**
**03/05/09 10:30**

## 1311 TCLP Characterization

**Prep Batch** 23741 **Date/Time** 03/09/09 14:00 Leachate

### Analytical Method 8270C

**Prep Method** 3510C **Prep Batch(s)** 23751 **Date/Time Prepped** 03/10/09 10:29

| Compound | Result | Units | | MQL | DF | Date/Time Analyzed | By | Analytical Batch |
|---|---|---|---|---|---|---|---|---|
| 2,4-Dinitrotoluene | < 0.0200 | mg/L | | 0.0200 | 1 | 03/16/09 21:42 | MJ | 38235 |
| Hexachlorobenzene | < 0.0200 | mg/L | | 0.0200 | 1 | 03/16/09 21:42 | MJ | 38235 |
| Hexachlorobutadiene | < 0.0200 | mg/L | | 0.0200 | 1 | 03/16/09 21:42 | MJ | 38235 |
| Hexachloroethane | < 0.0200 | mg/L | | 0.0200 | 1 | 03/16/09 21:42 | MJ | 38235 |
| 2-Methylphenol | < 0.0200 | mg/L | | 0.0200 | 1 | 03/16/09 21:42 | MJ | 38235 |
| 3&4-Methylphenol | < 0.0200 | mg/L | | 0.0200 | 1 | 03/16/09 21:42 | MJ | 38235 |
| Nitrobenzene | < 0.0200 | mg/L | | 0.0200 | 1 | 03/16/09 21:42 | MJ | 38235 |
| Pentachlorophenol | < 0.0400 | mg/L | | 0.0400 | 1 | 03/16/09 21:42 | MJ | 38235 |
| Pyridine | < 0.0400 | mg/L | | 0.0400 | 1 | 03/16/09 21:42 | MJ | 38235 |
| 2,4,5-Trichlorophenol | < 0.0200 | mg/L | | 0.0200 | 1 | 03/16/09 21:42 | MJ | 38235 |
| 2,4,6-Trichlorophenol | < 0.0200 | mg/L | | 0.0200 | 1 | 03/16/09 21:42 | MJ | 38235 |
| Surrogate: Nitrobenzene-d5 | | 56 % | Limits: | 29-110 | 1 | 03/16/09 21:42 | MJ | 38235 |
| Surrogate: 2-Fluorobiphenyl | | 58 % | Limits: | 38-107 | 1 | 03/16/09 21:42 | MJ | 38235 |
| Surrogate: 4-Terphenyl-d14 | | 78 % | Limits: | 33-122 | 1 | 03/16/09 21:42 | MJ | 38235 |
| Surrogate: Phenol-d6 | | 34 % | Limits: | 10-115 | 1 | 03/16/09 21:42 | MJ | 38235 |
| Surrogate: 2,4,6-Tribromophenol | | 59 % | Limits: | 40-125 | 1 | 03/16/09 21:42 | MJ | 38235 |
| Surrogate: 2-Fluorophenol | | 39 % | Limits: | 20-110 | 1 | 03/16/09 21:42 | MJ | 38235 |

**Qualifiers/ Definitions**

| | | | |
|---|---|---|---|
| * | Surrogate Recovery outside accepted limits | * I | Recoveries affected by interferences or high background |
| B | Analyte detected in the associated Method Blank | DF | Dilution Factor |
| E | Value exceeds method calibration range | H | Prepped / Analyzed out of holding time. |
| J | Estimated Value Analyte below reported detection limit | M | Minimum value |
| MDL | Method Dection Limit (unadjusted) | MQL | Method Quantitation Limit (adjusted) |
| MRL | Method Reporting Limit | N | Refer to attached Non-Compliance Report |
| Q | RPD >40% between primary and confirmation columns | SQL | Sample Quantitation Limit (adjusted MDL) |

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**AECOM EARTH TECH**
10 Patewood Drive
Building VI, Suite 500
Greenville, SC 29615

Project Description **Cedar Chemicals** Site **W. Helena, AR**

Project No. **104336**

Lab Order Number **0903061**
Lab ID **0903061-010B**
Field ID **IDW-4**

**Report of Analysis**
Received **03/05/09**
Matrix **Soil**
Sampled **03/05/09 10:30**

## 1311 TCLP Zero Headspace for Volatiles

**Prep Batch** 23740 **Date/Time** 03/09/09 14:00 Leachate

**Analytical Method 8260B**

**Prep Method** 5030B **Prep Batch(s)** 23771 **Date/Time Prepped** 03/11/09 12:02

| Compound | Result | Units | MQL | DF | Date/Time Analyzed | By | Analytical Batch |
|---|---|---|---|---|---|---|---|
| Benzene | < 0.0100 | mg/L | 0.0100 | 10 | 03/11/09 18:54 | LS | 38225 |
| 2-Butanone (MEK) | < 0.200 | mg/L | 0.200 | 10 | 03/11/09 18:54 | LS | 38225 |
| Carbon tetrachloride | < 0.0100 | mg/L | 0.0100 | 10 | 03/11/09 18:54 | LS | 38225 |
| Chlorobenzene | < 0.0100 | mg/L | 0.0100 | 10 | 03/11/09 18:54 | LS | 38225 |
| Chloroform | < 0.0100 | mg/L | 0.0100 | 10 | 03/11/09 18:54 | LS | 38225 |
| 1,4-Dichlorobenzene | < 0.0100 | mg/L | 0.0100 | 10 | 03/11/09 18:54 | LS | 38225 |
| 1,2-Dichloroethane | < 0.0100 | mg/L | 0.0100 | 10 | 03/11/09 18:54 | LS | 38225 |
| 1,1-Dichloroethene | < 0.0100 | mg/L | 0.0100 | 10 | 03/11/09 18:54 | LS | 38225 |
| Tetrachloroethene | < 0.0100 | mg/L | 0.0100 | 10 | 03/11/09 18:54 | LS | 38225 |
| Trichloroethene | < 0.0100 | mg/L | 0.0100 | 10 | 03/11/09 18:54 | LS | 38225 |
| Vinyl chloride | < 0.0100 | mg/L | 0.0100 | 10 | 03/11/09 18:54 | LS | 38225 |
| Surrogate: Dibromofluoromethane | | 109 % | Limits: 75-125 | 10 | 03/11/09 18:54 | LS | 38225 |
| Surrogate: Toluene-d8 | | 106 % | Limits: 85-120 | 10 | 03/11/09 18:54 | LS | 38225 |
| Surrogate: 4-Bromofluorobenzene | | 98 % | Limits: 85-118 | 10 | 03/11/09 18:54 | LS | 38225 |
| Surrogate: 1,2-Dichloroethane-d4 | | 112 % | Limits: 72-132 | 10 | 03/11/09 18:54 | LS | 38225 |

**Qualifiers/ Definitions**

| | | | |
|---|---|---|---|
| * | Surrogate Recovery outside accepted limits | * I | Recoveries affected by interferences or high background |
| B | Analyte detected in the associated Method Blank | DF | Dilution Factor |
| E | Value exceeds method calibration range | H | Prepped / Analyzed out of holding time. |
| J | Estimated Value Analyte below reported detection limit | M | Minimum value |
| MDL | Method Dection Limit (unadjusted) | MQL | Method Quantitation Limit (adjusted) |
| MRL | Method Reporting Limit | N | Refer to attached Non-Compliance Report |
| Q | RPD >40% between primary and confirmation columns | SQL | Sample Quantitation Limit (adjusted MDL) |

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**AECOM EARTH TECH**
10 Patewood Drive
Building VI, Suite 500
Greenville, SC 29615

Project Description **Cedar Chemicals**
Project No. **104336**
Site **W. Helena, AR**

Lab Order Number **0903061**
Lab ID **0903061-010A**
Field ID **IDW-4**

**Report of Analysis**
Received **03/05/09**
Matrix **Soil**
Sampled **03/05/09**

## 1311 TCLP Characterization

**Prep Batch** 23741 **Date/Time** 03/09/09 14:00 Leachate

**Analytical Method 6010B**

**Prep Method** 3005A **Prep Batch** 23753 **Date/Time Prepped** 03/10/09 11:53

| Compound | Result | Units | MQL | DF | Date/Time Analyzed | By | Analytical Batch |
|---|---|---|---|---|---|---|---|
| Silver | < 0.005 | mg/L | 0.005 | 1 | 03/11/09 21:37 | JTR | 38221 |
| Arsenic | < 0.025 | mg/L | 0.025 | 1 | 03/11/09 21:37 | JTR | 38221 |
| **Barium** | **1.02** | **mg/L** | **0.025** | **1** | **03/11/09 21:37** | **JTR** | **38221** |
| Cadmium | < 0.005 | mg/L | 0.005 | 1 | 03/11/09 21:37 | JTR | 38221 |
| Chromium | < 0.010 | mg/L | 0.010 | 1 | 03/11/09 21:37 | JTR | 38221 |
| Lead | < 0.010 | mg/L | 0.010 | 1 | 03/11/09 21:37 | JTR | 38221 |
| Selenium | < 0.050 | mg/L | 0.050 | 1 | 03/11/09 21:37 | JTR | 38221 |

**Analytical Method 7470A**

**Prep Method** 7470A **Prep Batch** 23748 **Date/Time Prepped** 03/10/09 9:27

| Compound | Result | Units | MQL | DF | Date/Time Analyzed | By | Analytical Batch |
|---|---|---|---|---|---|---|---|
| Mercury | < 0.0010 | mg/L | 0.0010 | 1 | 03/10/09 10:13 | TJ | 38286 |

**Qualifiers/ Definitions**

| | | | |
|---|---|---|---|
| * | Surrogate Recovery outside accepted limits | * I | Recoveries affected by interferences or high background |
| B | Analyte detected in the associated Method Blank | DF | Dilution Factor |
| E | Value exceeds method calibration range | H | Prepped / Analyzed out of holding time. |
| J | Estimated Value Analyte below reported detection limit | M | Minimum value |
| MDL | Method Dection Limit (unadjusted) | MQL | Method Quantitation Limit (adjusted) |
| MRL | Method Reporting Limit | N | Refer to attached Non-Compliance Report |
| Q | RPD >40% between primary and confirmation columns | SQL | Sample Quantitation Limit (adjusted MDL) |

# Level II

# Quality Control Reports

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# Analytical QC Summary Report
## Form 4
## Method Blank Summary

**Soil**

**Herbicides**

**AECOM EARTH TECH**
Order Number **0903061**

Project Description: Cedar Chemicals

**Batch ID** **23743**
**Instrument ID** **PEST3**

**23743-LB**

**This Method Blank applies to the following batch samples:**

| Lab Sample ID | Lab File ID | Analyzed Date | / Time | Dilution Factor |
|---|---|---|---|---|
| 23743-LB | P3031809AHRB | 03/19/09 | 3:43 | 1 |
| 23743-LCS | P3031809AHRB | 03/19/09 | 4:05 | 1 |
| 0903061-001A | P3031809AHRB | 03/19/09 | 4:28 | 1 |
| 0903061-001AMS | P3031809AHRB | 03/19/09 | 4:50 | 1 |
| 0903061-001AMSD | P3031809AHRB | 03/19/09 | 5:13 | 1 |
| 0903061-002A | P3031809AHRB | 03/19/09 | 5:35 | 1 |
| 0903061-003A | P3031809AHRB | 03/19/09 | 5:58 | 1 |
| 0903061-004A | P3031809AHRB | 03/19/09 | 6:20 | 1 |
| 0903061-005A | P3031809AHRB | 03/19/09 | 6:43 | 1 |
| 0903061-006A | P3031809AHRB | 03/19/09 | 7:05 | 1 |
| 0903061-001A | P3031809AHRB | 03/19/09 | 8:57 | 1000 |
| 0903061-002A | P3031809AHRB | 03/19/09 | 9:29 | 1000 |
| 0903061-003A | P3031809AHRB | 03/19/09 | 9:51 | 1000 |
| 0903061-004A | P3031809AHRB | 03/19/09 | 10:14 | 1000 |
| 0903061-005A | P3031809AHRB | 03/19/09 | 10:36 | 1000 |
| 0903061-006A | P3031809AHRB | 03/19/09 | 10:59 | 1000 |
| 0903061-002A | P3031909Bhrb | 03/20/09 | 3:47 | 100 |
| 0903061-004A | P3031909Bhrb | 03/20/09 | 4:10 | 100 |
| 0903061-005A | P3031909Bhrb | 03/20/09 | 4:32 | 100 |
| 0903061-002A | P3032309Bhrb | 03/23/09 | 15:52 | 1000 |
| 0903061-004A | P3032309Bhrb | 03/23/09 | 16:15 | 1000 |

**Qualifiers:**

| | | | |
|---|---|---|---|
| * | Surrogate Recovery outside accepted limits | * I | Recoveries affected by interferences or high background |
| B | Analyte detected in the associated Method Blank | DF | Dilution Factor |
| E | Value exceeds method calibration range | H | Prepped / Analyzed out of holding time. |
| J | Estimated Value Analyte below reported detection limit | M | Minimum value |
| MDL | Method Dection Limit (unadjusted) | MQL | Method Quantitation Limit (adjusted) |
| MRL | Method Reporting Limit | N | Refer to attached Non-Compliance Report |

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# Analytical QC Summary Report
## Form 4
## Method Blank Summary

### Soil

### Herbicides

**AECOM EARTH TECH**
Order Number **0903061**

Project Description Cedar Chemicals

| | | | | |
|---|---|---|---|---|
| 0903061-005A | P3032309Bhrb | 03/23/09 | 16:38 | 1000 |

| | | | | |
|---|---|---|---|---|
| **Qualifiers:** | * | Surrogate Recovery outside accepted limits | * I | Recoveries affected by interferences or high background |
| | B | Analyte detected in the associated Method Blank | DF | Dilution Factor |
| | E | Value exceeds method calibration range | H | Prepped / Analyzed out of holding time. |
| | J | Estimated Value Analyte below reported detection limit | M | Minimum value |
| | MDL | Method Dection Limit (unadjusted) | MQL | Method Quantitation Limit (adjusted) |
| | MRL | Method Reporting Limit | N | Refer to attached Non-Compliance Report |

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# Analytical QC Summary Report

**AECOM EARTH TECH**
Order Number **0903061**

Project Description: Cedar Chemicals

| **Organics** | **Method Blank** | | | | **23743-LB** | | **Soil** |
|---|---|---|---|---|---|---|---|
| **Prep Method** | 8151A | **Batch** | 23743 | **Date** | 03/09/09 15:03 | | |
| **Analytical Method** | 8151A | **Batch** | 38386 | **Date** | 03/19/09 3:43 | **Dilution Factor** 1 | **By** DPC |

| Compound | Result | Units | MQL |
|---|---|---|---|
| Dinoseb | < 15.0 | µg/Kg | 15.0 |
| Surrogate: DCAA | | | 50 % Limits: 20-150 |

**Qualifiers:** DF Dilution Factor
MQL Method Quantitation Limit (adjusted)
MDL Method Dection Limit (unadjusted)

*26-Mar-09*

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# Analytical QC Summary Report

**AECOM EARTH TECH**
Order Number **0903061**

Project Description Cedar Chemicals

| **Organics** | **Laboratory Control Spike** | | | **23743-LCS** | | **Soil** |
|---|---|---|---|---|---|---|
| **Prep Method** | 8151A | **Batch** 23743 | **Date** | 03/09/09 15:03 | | |
| **Analytical Method** | 8151A | **Batch** 38386 | **Date** | 03/19/09 4:05 | **Dilution Factor** 1 | **By** DPC |

| Compound | LCS Conc. | Units | Spike Added | %Rec | QC Limits |
|---|---|---|---|---|---|
| Dinoseb | 10.5 | µg/Kg | 41.7 | 25 | 20-150 |
| Surrogate: DCAA | | | 69 % | Limits: 20-150 | |

**Qualifiers:** DF Dilution Factor
MQL Method Quantitation Limit (adjusted)
MDL Method Dection Limit (unadjusted)

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# Analytical QC Summary Report

**AECOM EARTH TECH**
Order Number **0903061**

Project Description: Cedar Chemicals

**Organics** **Sample Matrix Spike** **0903061-001AMS** **Soil**

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **Prep** | **Method** | 8151A | **Batch** | 23743 | **Date** | 03/09/09 15:03 | | |
| **Analytical** | **Method** | 8151A | **Batch** | 38386 | **Date** | 03/19/09 4:50 | **Dilution Factor** 1 | **By** DPC |

| Compound | MS Conc. | Units | Spike Added | Sample Conc. | % Rec | QC Limits |
|---|---|---|---|---|---|---|
| Surrogate: DCAA | | | 67 | % | Limits: 20-150 | |

**Qualifiers:** DF Dilution Factor
MQL Method Quantitation Limit (adjusted)
MDL Method Dection Limit (unadjusted)

*26-Mar-09*

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# Analytical QC Summary Report

**AECOM EARTH TECH**
Order Number **0903061**

Project Description: Cedar Chemicals

| **Organics** | **Sample Matrix Spike Duplicate** | | **0903061-001AMSD** | | **Soil** |
|---|---|---|---|---|---|
| **Prep Method** | 8151A | **Batch** 23743 | **Date** 03/09/09 15:03 | | |
| **Analytical Method** | 8151A | **Batch** 38386 | **Date** 03/19/09 5:13 | **Dilution Factor** 1 | **By** DPC |

| Compound | MSD Conc. | Units | Spike Added | Sample Conc. | %Rec | QC Limits | % RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|
| Surrogate: DCAA | | | 78 | % | Limits: | 20-150 | | |

**Qualifiers:** DF Dilution Factor
MQL Method Quantitation Limit (adjusted)
MDL Method Dection Limit (unadjusted)

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# Analytical QC Summary Report

**AECOM EARTH TECH**
Order Number **0903061**

Project Description: Cedar Chemicals

| **Metals** | **Method Blank** | | | | **23748-LB** | | **Soil** |
|---|---|---|---|---|---|---|---|
| **Prep** | **Method** 7470A | **Batch** 23748 | **Date** 03/10/09 9:27 | | | | |
| **Analytical** | **Method** 7470A | **Batch** 38286 | **Date** 03/10/09 11:16 | **Dilution Factor** 1 | | **By** TJ | |

| Compound | Result | Units | MQL |
|---|---|---|---|
| Mercury | < 0.0010 | mg/L | 0.0010 |

**Qualifiers:** DF Dilution Factor
MQL Method Quantitation Limit (adjusted)
MDL Method Dection Limit (unadjusted)

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# Analytical QC Summary Report

**AECOM EARTH TECH**
Order Number **0903061**

Project Description: Cedar Chemicals

| **Metals** | **TCLP Blank Fluid 1** | | | **23741-TCLPBLFL1** | | **Soil** |
|---|---|---|---|---|---|---|
| **Prep Method** | 7470A | **Batch** | 23748 | **Date** | 03/10/09 9:27 | |
| **Analytical Method** | 7470A | **Batch** | 38286 | **Date** | 03/10/09 11:29 | **Dilution Factor** 1 **By** TJ |

| Compound | Result | Units | MQL |
|---|---|---|---|
| Mercury | < 0.0010 | mg/L | 0.0010 |

**Qualifiers:** DF Dilution Factor; MQL Method Quantitation Limit (adjusted); MDL Method Dection Limit (unadjusted)

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# Analytical QC Summary Report

**AECOM EARTH TECH**
Order Number **0903061**

Project Description Cedar Chemicals

| **Metals** | **TCLP Blank Fluid 2** | | | | **23741-TCLPBLFL2** | | **Soil** |
|---|---|---|---|---|---|---|---|
| **Prep** | **Method** 7470A | **Batch** 23748 | **Date** 03/10/09 9:27 | | | | |
| **Analytical** | **Method** 7470A | **Batch** 38286 | **Date** 03/10/09 11:30 | **Dilution Factor** 1 | | **By** TJ | |

| Compound | Result | Units | MQL |
|---|---|---|---|
| Mercury | < 0.0010 | mg/L | 0.0010 |

**Qualifiers:** DF Dilution Factor
MQL Method Quantitation Limit (adjusted)
MDL Method Dection Limit (unadjusted)

*26-Mar-09*

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# Analytical QC Summary Report

**AECOM EARTH TECH**
Order Number **0903061**

Project Description Cedar Chemicals

| **Metals** | **Laboratory Control Spike** | | **23748-LCS** | | **Soil** |
|---|---|---|---|---|---|
| **Prep Method** | 7470A | **Batch** 23748 | **Date** | 03/10/09 9:27 | |
| **Analytical Method** | 7470A | **Batch** 38286 | **Date** | 03/10/09 11:19 | **Dilution Factor** 1 **By** TJ |

| Compound | LCS Conc. | Units | Spike Added | %Rec | QC Limits |
|---|---|---|---|---|---|
| Mercury | 0.0058 | mg/L | 0.0050 | 116 | 80-120 |

**Qualifiers:** DF Dilution Factor
MQL Method Quantitation Limit (adjusted)
MDL Method Dection Limit (unadjusted)

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# Analytical QC Summary Report

**AECOM EARTH TECH**
Order Number **0903061**

Project Description Cedar Chemicals

| **Metals** | **Sample Matrix Spike** | | | **0903106-001AMS** | | **Soil** |
|---|---|---|---|---|---|---|
| **Prep** | **Method** 7470A | **Batch** 23748 | **Date** 03/10/09 9:27 | | | |
| **Analytical** | **Method** 7470A | **Batch** 38286 | **Date** 03/10/09 11:27 | **Dilution Factor** 1 | | **By** TJ |

| Compound | MS Conc. | Units | Spike Added | Sample Conc. | % Rec | QC Limits |
|---|---|---|---|---|---|---|
| Mercury | 0.0059 | mg/L | 0.0050 | < 0.0010 | 118 | 80-120 |

**Qualifiers:** DF Dilution Factor
MQL Method Quantitation Limit (adjusted)
MDL Method Dection Limit (unadjusted)

*26-Mar-09*

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# Analytical QC Summary Report

**AECOM EARTH TECH**
Order Number **0903061**

Project Description: Cedar Chemicals

| **Metals** | **Sample Matrix Spike Duplicate** | | **0903106-001AMSD** | | **Soil** |
|---|---|---|---|---|---|
| **Prep Method** | 7470A | **Batch** 23748 | **Date** 03/10/09 9:27 | | |
| **Analytical Method** | 7470A | **Batch** 38286 | **Date** 03/10/09 11:28 | **Dilution Factor** 1 | **By** TJ |

| Compound | MSD Conc. | Units | Spike Added | Sample Conc. | % Rec | QC Limits | % RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|
| Mercury | 0.0060 | mg/L | 0.0050 | < 0.0010 | 120 | 80-120 | 2 | 20 |

**Qualifiers:** DF Dilution Factor
MQL Method Quantitation Limit (adjusted)
MDL Method Dection Limit (unadjusted)

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# Analytical QC Summary Report
## Form 4
## Method Blank Summary

### Aqueous

### GCMS Semi-Volatiles

**AECOM EARTH TECH**
Order Number **0903061**

Project Description: Cedar Chemicals

**Batch ID** **23751**
**Instrument ID** **BNA2**

**23751-LB**

**This Method Blank applies to the following batch samples:**

| Lab Sample ID | Lab File ID | Analyzed Date | / Time | Dilution Factor |
|---|---|---|---|---|
| 23751-LB | 1101012.D | 03/16/09 | 20:12 | 1 |
| 23751-LCS | 1201013.D | 03/16/09 | 20:42 | 1 |
| 23751-LCSD | 1301014.D | 03/16/09 | 21:12 | 1 |
| 0903061-010A | 1401015.D | 03/16/09 | 21:42 | 1 |
| 0903106-001A | 1701018.D | 03/16/09 | 23:13 | 1 |
| 0903106-001AMS | 1801019.D | 03/16/09 | 23:43 | 1 |
| 0903106-001AMSD | 1901020.D | 03/17/09 | 0:14 | 1 |

**Qualifiers:**

| | | | |
|---|---|---|---|
| * | Surrogate Recovery outside accepted limits | * I | Recoveries affected by interferences or high background |
| B | Analyte detected in the associated Method Blank | DF | Dilution Factor |
| E | Value exceeds method calibration range | H | Prepped / Analyzed out of holding time. |
| J | Estimated Value Analyte below reported detection limit | M | Minimum value |
| MDL | Method Dection Limit (unadjusted) | MQL | Method Quantitation Limit (adjusted) |
| MRL | Method Reporting Limit | N | Refer to attached Non-Compliance Report |

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# Analytical QC Summary Report

**AECOM EARTH TECH**
Order Number **0903061**

Project Description: Cedar Chemicals

**SemiVolatiles Method Blank** **23751-LB** **Aqueous**

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Prep Method** | 3510C | **Batch** | 23751 | **Date** | 03/10/09 10:29 | | |
| **Analytical Method** | 8270C | **Batch** | 38235 | **Date** | 03/16/09 20:12 | **Dilution Factor** 1 | **By** MJ |

| Compound | Result | Units | MQL |
|---|---|---|---|
| 2,4-Dinitrotoluene | < 0.00500 | mg/L | 0.00500 |
| Hexachlorobenzene | < 0.00500 | mg/L | 0.00500 |
| Hexachlorobutadiene | < 0.00500 | mg/L | 0.00500 |
| Hexachloroethane | < 0.00500 | mg/L | 0.00500 |
| 2-Methylphenol | < 0.00500 | mg/L | 0.00500 |
| 3&4-Methylphenol | < 0.00500 | mg/L | 0.00500 |
| Nitrobenzene | < 0.00500 | mg/L | 0.00500 |
| Pentachlorophenol | < 0.0100 | mg/L | 0.0100 |
| Pyridine | < 0.0100 | mg/L | 0.0100 |
| 2,4,5-Trichlorophenol | < 0.00500 | mg/L | 0.00500 |
| 2,4,6-Trichlorophenol | < 0.00500 | mg/L | 0.00500 |

| | | | | | |
|---|---|---|---|---|---|
| Surrogate: | Nitrobenzene-d5 | 53 | % | Limits: | 29-110 |
| Surrogate: | 2-Fluorobiphenyl | 56 | % | Limits: | 38-107 |
| Surrogate: | 4-Terphenyl-d14 | 79 | % | Limits: | 33-122 |
| Surrogate: | Phenol-d6 | 27 | % | Limits: | 10-115 |
| Surrogate: | 2,4,6-Tribromophenol | 62 | % | Limits: | 40-125 |
| Surrogate: | 2-Fluorophenol | 33 | % | Limits: | 20-110 |

**Qualifiers:** DF Dilution Factor
MQL Method Quantitation Limit (adjusted)
MDL Method Dection Limit (unadjusted)

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# Analytical QC Summary Report

**AECOM EARTH TECH**
Order Number **0903061**

Project Description: Cedar Chemicals

**SemiVolatiles** **Laboratory Control Spike** **23751-LCS** **Aqueous**

**Prep Method** 3510C **Batch** 23751 **Date** 03/10/09 10:29

**Analytical Method** 8270C **Batch** 38235 **Date** 03/16/09 20:42 **Dilution Factor** 1 **By** MJ

| Compound | LCS Conc. | Units | Spike Added | % Rec | QC Limits |
|---|---|---|---|---|---|
| 2,4-Dinitrotoluene | 0.0383 | mg/L | 0.0500 | 77 | 24-147 |
| Hexachlorobenzene | 0.0316 | mg/L | 0.0500 | 63 | 18-136 |
| Hexachlorobutadiene | 0.0215 | mg/L | 0.0500 | 43 | 22-109 |
| Hexachloroethane | 0.0187 | mg/L | 0.0500 | 37 | 16-107 |
| 2-Methylphenol | 0.0247 | mg/L | 0.0500 | 49 | 22-97 |
| 3&4-Methylphenol | 0.0251 | mg/L | 0.0500 | 50 | 21-96 |
| Nitrobenzene | 0.0264 | mg/L | 0.0500 | 53 | 27-117 |
| Pentachlorophenol | 0.0362 | mg/L | 0.0500 | 72 | 17-142 |
| Pyridine | 0.0261 | mg/L | 0.0500 | 52 | 10-71 |
| 2,4,5-Trichlorophenol | 0.0302 | mg/L | 0.0500 | 60 | 26-118 |
| 2,4,6-Trichlorophenol | 0.0299 | mg/L | 0.0500 | 60 | 26-115 |

| | | | | | |
|---|---|---|---|---|---|
| Surrogate: | Nitrobenzene-d5 | 49 | % | Limits: | 29-110 |
| Surrogate: | 2-Fluorobiphenyl | 51 | % | Limits: | 38-107 |
| Surrogate: | 4-Terphenyl-d14 | 81 | % | Limits: | 33-122 |
| Surrogate: | Phenol-d6 | 21 | % | Limits: | 10-115 |
| Surrogate: | 2,4,6-Tribromophenol | 58 | % | Limits: | 40-125 |
| Surrogate: | 2-Fluorophenol | 27 | % | Limits: | 20-110 |

**Qualifiers:** DF Dilution Factor; MDL Method Dection Limit (unadjusted); MQL Method Quantitation Limit (adjusted)

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# Analytical QC Summary Report

**AECOM EARTH TECH**
Order Number **0903061**

Project Description: Cedar Chemicals

**SemiVolatiles Laboratory Control Spike Duplicate 23751-LCSD Aqueous**

**Prep Method** 3510C **Batch** 23751 **Date** 03/10/09 10:29

**Analytical Method** 8270C **Batch** 38235 **Date** 03/16/09 21:12 **Dilution Factor** 1 **By** MJ

| Compound | LCSD Conc. | Units | Spike Added | % Rec | QC Limits | % RPD | RPD Limit |
|---|---|---|---|---|---|---|---|
| 2,4-Dinitrotoluene | 0.0349 | mg/L | 0.0500 | 70 | 24-147 | 9 | 20 |
| Hexachlorobenzene | 0.0292 | mg/L | 0.0500 | 58 | 18-136 | 8 | 20 |
| Hexachlorobutadiene | 0.0226 | mg/L | 0.0500 | 45 | 22-109 | 5 | 20 |
| Hexachloroethane | 0.0205 | mg/L | 0.0500 | 41 | 16-107 | 9 | 20 |
| 2-Methylphenol | 0.0248 | mg/L | 0.0500 | 50 | 22-97 | 0 | 20 |
| 3&4-Methylphenol | 0.0253 | mg/L | 0.0500 | 51 | 21-96 | 0 | 20 |
| Nitrobenzene | 0.0272 | mg/L | 0.0500 | 54 | 27-117 | 3 | 20 |
| Pentachlorophenol | 0.0349 | mg/L | 0.0500 | 70 | 17-142 | 4 | 20 |
| Pyridine | 0.0237 | mg/L | 0.0500 | 48 | 10-71 | 10 | 20 |
| 2,4,5-Trichlorophenol | 0.0298 | mg/L | 0.0500 | 60 | 26-118 | 1 | 20 |
| 2,4,6-Trichlorophenol | 0.0279 | mg/L | 0.0500 | 56 | 26-115 | 7 | 20 |

| | | | | | |
|---|---|---|---|---|---|
| Surrogate: | Nitrobenzene-d5 | 48 | % | Limits: | 29-110 |
| Surrogate: | 2-Fluorobiphenyl | 47 | % | Limits: | 38-107 |
| Surrogate: | 4-Terphenyl-d14 | 74 | % | Limits: | 33-122 |
| Surrogate: | Phenol-d6 | 22 | % | Limits: | 10-115 |
| Surrogate: | 2,4,6-Tribromophenol | 56 | % | Limits: | 40-125 |
| Surrogate: | 2-Fluorophenol | 28 | % | Limits: | 20-110 |

**Qualifiers:** DF Dilution Factor
MQL Method Quantitation Limit (adjusted)
MDL Method Dection Limit (unadjusted)

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# Analytical QC Summary Report

**AECOM EARTH TECH**
Order Number **0903061**

Project Description: Cedar Chemicals

**SemiVolatiles** **Sample Matrix Spike** **0903106-001AMS** **Aqueous**

**Prep Method** 3510C **Batch** 23751 **Date** 03/10/09 10:29

**Analytical Method** 8270C **Batch** 38235 **Date** 03/16/09 23:43 **Dilution Factor** 1 **By** MJ

| Compound | MS Conc. | Units | Spike Added | Sample Conc. | %Rec | QC Limits |
|---|---|---|---|---|---|---|
| 2,4-Dinitrotoluene | 0.146 | mg/L | 0.200 | < 0.0200 | 73 | 24-147 |
| Hexachlorobenzene | 0.125 | mg/L | 0.200 | < 0.0200 | 62 | 18-136 |
| Hexachlorobutadiene | 0.0995 | mg/L | 0.200 | < 0.0200 | 50 | 22-109 |
| Hexachloroethane | 0.0984 | mg/L | 0.200 | < 0.0200 | 49 | 16-107 |
| 2-Methylphenol | 0.143 | mg/L | 0.200 | < 0.0200 | 72 | 22-97 |
| 3&4-Methylphenol | 0.248 | mg/L | 0.400 | < 0.0200 | 62 | 21-96 |
| Nitrobenzene | 0.124 | mg/L | 0.200 | < 0.0200 | 62 | 27-117 |
| Pentachlorophenol | 0.164 | mg/L | 0.200 | < 0.0400 | 82 | 17-142 |
| Pyridine | 0.0837 | mg/L | 0.200 | < 0.0400 | 42 | 10-71 |
| 2,4,5-Trichlorophenol | 0.151 | mg/L | 0.200 | < 0.0200 | 76 | 26-118 |
| 2,4,6-Trichlorophenol | 0.142 | mg/L | 0.200 | < 0.0200 | 71 | 26-115 |

| | | | | | |
|---|---|---|---|---|---|
| Surrogate: | Nitrobenzene-d5 | 60 | % | Limits: | 29-110 |
| Surrogate: | 2-Fluorobiphenyl | 63 | % | Limits: | 38-107 |
| Surrogate: | 4-Terphenyl-d14 | 81 | % | Limits: | 33-122 |
| Surrogate: | Phenol-d6 | 36 | % | Limits: | 10-115 |
| Surrogate: | 2,4,6-Tribromophenol | 62 | % | Limits: | 40-125 |
| Surrogate: | 2-Fluorophenol | 45 | % | Limits: | 20-115 |

**Qualifiers:** DF Dilution Factor
MQL Method Quantitation Limit (adjusted)
MDL Method Dection Limit (unadjusted)

*26-Mar-09*

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# Analytical QC Summary Report

**AECOM EARTH TECH**
Order Number **0903061**

Project Description: Cedar Chemicals

**SemiVolatiles** **Sample Matrix Spike Duplicate** **0903106-001AMSD** **Aqueous**

**Prep Method** 3510C **Batch** 23751 **Date** 03/10/09 10:29

**Analytical Method** 8270C **Batch** 38235 **Date** 03/17/09 0:14 **Dilution Factor** 1 **By** MJ

| Compound | MSD Conc. | Units | Spike Added | Sample Conc. | %Rec | QC Limits | % RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|
| 2,4-Dinitrotoluene | 0.142 | mg/L | 0.200 | < 0.0200 | 71 | 24-147 | 3 | 20 |
| Hexachlorobenzene | 0.124 | mg/L | 0.200 | < 0.0200 | 62 | 18-136 | 0 | 20 |
| Hexachlorobutadiene | 0.0956 | mg/L | 0.200 | < 0.0200 | 48 | 22-109 | 4 | 20 |
| Hexachloroethane | 0.0955 | mg/L | 0.200 | < 0.0200 | 48 | 16-107 | 3 | 20 |
| 2-Methylphenol | 0.142 | mg/L | 0.200 | < 0.0200 | 71 | 22-97 | 0 | 20 |
| 3&4-Methylphenol | 0.249 | mg/L | 0.400 | < 0.0200 | 62 | 21-96 | 0 | 20 |
| Nitrobenzene | 0.122 | mg/L | 0.200 | < 0.0200 | 61 | 27-117 | 2 | 20 |
| Pentachlorophenol | 0.162 | mg/L | 0.200 | < 0.0400 | 81 | 17-142 | 0 | 20 |
| Pyridine | 0.0885 | mg/L | 0.200 | < 0.0400 | 44 | 10-71 | 6 | 20 |
| 2,4,5-Trichlorophenol | 0.158 | mg/L | 0.200 | < 0.0200 | 79 | 26-118 | 4 | 20 |
| 2,4,6-Trichlorophenol | 0.142 | mg/L | 0.200 | < 0.0200 | 71 | 26-115 | 0 | 20 |

| | | | | | |
|---|---|---|---|---|---|
| Surrogate: | Nitrobenzene-d5 | 59 | % | Limits: | 29-110 |
| Surrogate: | 2-Fluorobiphenyl | 62 | % | Limits: | 38-107 |
| Surrogate: | 4-Terphenyl-d14 | 81 | % | Limits: | 33-122 |
| Surrogate: | Phenol-d6 | 36 | % | Limits: | 10-115 |
| Surrogate: | 2,4,6-Tribromophenol | 61 | % | Limits: | 40-125 |
| Surrogate: | 2-Fluorophenol | 43 | % | Limits: | 20-110 |

**Qualifiers:** DF Dilution Factor
MQL Method Quantitation Limit (adjusted)
MDL Method Dection Limit (unadjusted)

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# Analytical QC Summary Report

**AECOM EARTH TECH**
Order Number **0903061**

Project Description: Cedar Chemicals

| **Metals** | **Method Blank** | | | | **23753-LB** | | **Soil** |
|---|---|---|---|---|---|---|---|
| **Prep Method** | 3005A | **Batch** | 23753 | **Date** | 03/10/09 11:53 | | |
| **Analytical Method** | 6010B | **Batch** | 38221 | **Date** | 03/11/09 20:58 | **Dilution Factor** 1 | **By** JTR |

| Compound | Result | Units | MQL |
|---|---|---|---|
| Silver | < 0.005 | mg/L | 0.005 |
| Arsenic | < 0.025 | mg/L | 0.025 |
| Barium | < 0.025 | mg/L | 0.025 |
| Cadmium | < 0.005 | mg/L | 0.005 |
| Chromium | < 0.010 | mg/L | 0.010 |
| Lead | < 0.010 | mg/L | 0.010 |
| Selenium | < 0.050 | mg/L | 0.050 |

**Qualifiers:** DF Dilution Factor
MQL Method Quantitation Limit (adjusted)
MDL Method Dection Limit (unadjusted)

*26-Mar-09*

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# Analytical QC Summary Report

**AECOM EARTH TECH**
Order Number **0903061**

Project Description: Cedar Chemicals

| **Metals** | **TCLP Blank Fluid 1** | | | | **23741-TCLPBLFL1** | | **Soil** |
|---|---|---|---|---|---|---|---|
| **Prep Method** | 3005A | **Batch** | 23753 | **Date** | 03/10/09 11:53 | | |
| **Analytical Method** | 6010B | **Batch** | 38221 | **Date** | 03/11/09 22:15 | **Dilution Factor** 1 | **By** JTR |

| Compound | Result | Units | MQL |
|---|---|---|---|
| Silver | < 0.005 | mg/L | 0.005 |
| Arsenic | < 0.025 | mg/L | 0.025 |
| Barium | < 0.025 | mg/L | 0.025 |
| Cadmium | < 0.005 | mg/L | 0.005 |
| Chromium | < 0.010 | mg/L | 0.010 |
| Lead | < 0.010 | mg/L | 0.010 |
| Selenium | < 0.050 | mg/L | 0.050 |

**Qualifiers:** DF Dilution Factor
MQL Method Quantitation Limit (adjusted)
MDL Method Dection Limit (unadjusted)

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# Analytical QC Summary Report

**AECOM EARTH TECH**
Order Number **0903061**

Project Description: Cedar Chemicals

| **Metals** | **TCLP Blank Fluid 2** | | | | **23741-TCLPBLFL2** | | **Soil** |
|---|---|---|---|---|---|---|---|
| **Prep Method** | 3005A | **Batch** | 23753 | **Date** | 03/10/09 11:53 | | |
| **Analytical Method** | 6010B | **Batch** | 38221 | **Date** | 03/11/09 22:22 | **Dilution Factor** 1 | **By** JTR |

| Compound | Result | Units | MQL |
|---|---|---|---|
| Silver | < 0.005 | mg/L | 0.005 |
| Arsenic | < 0.025 | mg/L | 0.025 |
| Barium | < 0.025 | mg/L | 0.025 |
| Cadmium | < 0.005 | mg/L | 0.005 |
| Chromium | < 0.010 | mg/L | 0.010 |
| Lead | < 0.010 | mg/L | 0.010 |
| Selenium | < 0.050 | mg/L | 0.050 |

**Qualifiers:** DF Dilution Factor
MQL Method Quantitation Limit (adjusted)
MDL Method Dection Limit (unadjusted)

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# Analytical QC Summary Report

**AECOM EARTH TECH**
Order Number **0903061**

Project Description: Cedar Chemicals

| **Metals** | **Laboratory Control Spike** | | **23753-LCS** | | **Soil** |
|---|---|---|---|---|---|
| **Prep Method** | 3005A | **Batch** 23753 | **Date** | 03/10/09 11:53 | |
| **Analytical Method** | 6010B | **Batch** 38221 | **Date** | 03/11/09 21:04 | **Dilution Factor** 1 **By** JTR |

| Compound | LCS Conc. | Units | Spike Added | %Rec | QC Limits |
|---|---|---|---|---|---|
| Silver | 0.100 | mg/L | 0.100 | 100 | 80-120 |
| Arsenic | 0.103 | mg/L | 0.100 | 103 | 80-120 |
| Barium | 1.02 | mg/L | 1.00 | 102 | 80-120 |
| Cadmium | 0.102 | mg/L | 0.100 | 102 | 80-120 |
| Chromium | 1.02 | mg/L | 1.00 | 102 | 80-120 |
| Lead | 0.102 | mg/L | 0.100 | 102 | 80-120 |
| Selenium | 0.098 | mg/L | 0.100 | 98 | 80-120 |

**Qualifiers:** DF Dilution Factor
MQL Method Quantitation Limit (adjusted)
MDL Method Dection Limit (unadjusted)

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# Analytical QC Summary Report

**AECOM EARTH TECH**
Order Number **0903061**

Project Description: Cedar Chemicals

**Metals** **Sample Matrix Spike** **0903064-001AMS** **Soil**

**Prep Method** 3005A **Batch** 23753 **Date** 03/10/09 11:53

**Analytical Method** 6010B **Batch** 38221 **Date** 03/11/09 22:02 **Dilution Factor** 1 **By** JTR

| Compound | MS Conc. | Units | Spike Added | Sample Conc. | %Rec | QC Limits |
|---|---|---|---|---|---|---|
| Silver | 0.529 | mg/L | 0.500 | < 0.005 | 106 | 70-125 |
| Arsenic | 0.622 | mg/L | 0.500 | 0.093 | 106 | 70-125 |
| Barium | 5.07 | mg/L | 5.00 | < 0.025 | 101 | 70-125 |
| Cadmium | 0.486 | mg/L | 0.500 | < 0.005 | 97 | 70-125 |
| Chromium | 4.98 | mg/L | 5.00 | 0.043 | 99 | 70-125 |
| Lead | 0.498 | mg/L | 0.500 | < 0.010 | 100 | 70-125 |
| Selenium | 0.522 | mg/L | 0.500 | < 0.050 | 104 | 70-125 |

**Qualifiers:** DF Dilution Factor
MQL Method Quantitation Limit (adjusted)
MDL Method Dection Limit (unadjusted)

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# Analytical QC Summary Report

**AECOM EARTH TECH**
Order Number **0903061**

Project Description: Cedar Chemicals

| **Metals** | **Sample Matrix Spike Duplicate** | | **0903064-001AMSD** | | **Soil** |
|---|---|---|---|---|---|
| **Prep Method** | 3005A | **Batch** 23753 | **Date** 03/10/09 11:53 | | |
| **Analytical Method** | 6010B | **Batch** 38221 | **Date** 03/11/09 22:09 | **Dilution Factor** 1 | **By** JTR |

| Compound | MSD Conc. | Units | Spike Added | Sample Conc. | %Rec | QC Limits | %RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|
| Silver | 0.534 | mg/L | 0.500 | < 0.005 | 107 | 70-125 | 0 | 20 |
| Arsenic | 0.627 | mg/L | 0.500 | 0.093 | 107 | 70-125 | 0 | 20 |
| Barium | 5.12 | mg/L | 5.00 | < 0.025 | 102 | 70-125 | 0 | 20 |
| Cadmium | 0.491 | mg/L | 0.500 | < 0.005 | 98 | 70-125 | 1 | 20 |
| Chromium | 5.04 | mg/L | 5.00 | 0.043 | 100 | 70-125 | 1 | 20 |
| Lead | 0.505 | mg/L | 0.500 | < 0.010 | 101 | 70-125 | 1 | 20 |
| Selenium | 0.527 | mg/L | 0.500 | < 0.050 | 105 | 70-125 | 0 | 20 |

**Qualifiers:** DF Dilution Factor; MQL Method Quantitation Limit (adjusted); MDL Method Dection Limit (unadjusted)

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# Analytical QC Summary Report
## Form 4
## Method Blank Summary

**Aqueous**

**Pesticides**

**AECOM EARTH TECH**
Order Number **0903061**

Project Description: Cedar Chemicals

**Batch ID** **23770**
**Instrument ID** **PEST2**

**23770-LB**

**This Method Blank applies to the following batch samples:**

| Lab Sample ID | Lab File ID | Analyzed Date | / Time | Dilution Factor |
|---|---|---|---|---|
| 0903061-010A | P2031909APST | 03/19/09 | 15:46 | 10 |
| 23770-LB | P2032309APST | 03/23/09 | 14:32 | 10 |
| 23770-LCS | P2032309APST | 03/23/09 | 14:59 | 10 |
| 23770-LCSD | P2032309APST | 03/23/09 | 15:26 | 10 |
| 23741-TCLPBLFL1 | P2032309APST | 03/23/09 | 17:24 | 10 |

**Qualifiers:**

| | | | |
|---|---|---|---|
| * | Surrogate Recovery outside accepted limits | * I | Recoveries affected by interferences or high background |
| B | Analyte detected in the associated Method Blank | DF | Dilution Factor |
| E | Value exceeds method calibration range | H | Prepped / Analyzed out of holding time. |
| J | Estimated Value Analyte below reported detection limit | M | Minimum value |
| MDL | Method Dection Limit (unadjusted) | MQL | Method Quantitation Limit (adjusted) |
| MRL | Method Reporting Limit | N | Refer to attached Non-Compliance Report |

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# Analytical QC Summary Report

**AECOM EARTH TECH**
Order Number **0903061**

Project Description: Cedar Chemicals

| **Organics** | **Method Blank** | | | | **23770-LB** | | **Aqueous** |
|---|---|---|---|---|---|---|---|
| **Prep Method** | 3510C | **Batch** | 23770 | **Date** | 03/11/09 11:57 | | |
| **Analytical Method** | 8081A | **Batch** | 38388 | **Date** | 03/23/09 14:32 | **Dilution Factor** 10 | **By** DPC |

| Compound | Result | Units | MQL |
|---|---|---|---|
| gamma-BHC | < 0.0000400 | mg/L | 0.0000400 |
| Chlordane | < 0.000250 | mg/L | 0.000250 |
| Endrin | < 0.0000400 | mg/L | 0.0000400 |
| Heptachlor | < 0.0000400 | mg/L | 0.0000400 |
| Heptachlor epoxide | < 0.0000400 | mg/L | 0.0000400 |
| Hexachlorobenzene | < 0.000400 | mg/L | 0.000400 |
| Methoxychlor | < 0.0000400 | mg/L | 0.0000400 |
| Toxaphene | < 0.000300 | mg/L | 0.000300 |

| | | | | | |
|---|---|---|---|---|---|
| Surrogate: | Decachlorobiphenyl | 98 | % | Limits: | 36-116 |
| Surrogate: | Tetrachloro-m-xylene | 63 | % | Limits: | 25-123 |

**Qualifiers:** DF Dilution Factor; MQL Method Quantitation Limit (adjusted); MDL Method Dection Limit (unadjusted)

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# Analytical QC Summary Report

**AECOM EARTH TECH**
Order Number **0903061**

Project Description: Cedar Chemicals

| **Organics** | **TCLP Blank Fluid 1** | | | | **23741-TCLPBLFL1** | | **Aqueous** |
|---|---|---|---|---|---|---|---|
| **Prep Method** | 3510C | **Batch** | 23770 | **Date** | 03/11/09 11:57 | | |
| **Analytical Method** | 8081A | **Batch** | 38388 | **Date** | 03/23/09 17:24 | **Dilution Factor** 10 | **By** DPC |

| Compound | Result | Units | MQL |
|---|---|---|---|
| gamma-BHC | < 0.000160 | mg/L | 0.000160 |
| Chlordane | < 0.00100 | mg/L | 0.00100 |
| Endrin | < 0.000160 | mg/L | 0.000160 |
| Heptachlor | < 0.000160 | mg/L | 0.000160 |
| Heptachlor epoxide | < 0.000160 | mg/L | 0.000160 |
| Hexachlorobenzene | < 0.00160 | mg/L | 0.00160 |
| Methoxychlor | < 0.000160 | mg/L | 0.000160 |
| Toxaphene | < 0.00120 | mg/L | 0.00120 |

| | | | | | |
|---|---|---|---|---|---|
| Surrogate: | Decachlorobiphenyl | 115 | % | Limits: | 36-116 |
| Surrogate: | Tetrachloro-m-xylene | 76 | % | Limits: | 25-123 |

**Qualifiers:** DF Dilution Factor
MQL Method Quantitation Limit (adjusted)
MDL Method Dection Limit (unadjusted)

*26-Mar-09*

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# Analytical QC Summary Report

**AECOM EARTH TECH**
Order Number **0903061**

Project Description: Cedar Chemicals

## Organics — Laboratory Control Spike — 23770-LCS — Aqueous

**Prep Method** 3510C **Batch** 23770 **Date** 03/11/09 11:57

**Analytical Method** 8081A **Batch** 38388 **Date** 03/23/09 14:59 **Dilution Factor** 10 **By** DPC

| Compound | LCS Conc. | Units | Spike Added | %Rec | QC Limits |
|---|---|---|---|---|---|
| gamma-BHC | 0.000716 | mg/L | 0.00100 | 72 | 41-102 |
| Endrin | 0.000829 | mg/L | 0.00100 | 83 | 45-117 |
| Heptachlor | 0.000725 | mg/L | 0.00100 | 72 | 40-110 |
| Heptachlor epoxide | 0.000793 | mg/L | 0.00100 | 79 | 42-115 |
| Methoxychlor | 0.000983 | mg/L | 0.00100 | 98 | 39-140 |

| | | | | | |
|---|---|---|---|---|---|
| Surrogate: | Decachlorobiphenyl | 102 | % | Limits: | 36-116 |
| Surrogate: | Tetrachloro-m-xylene | 52 | % | Limits: | 25-123 |

**Qualifiers:** DF Dilution Factor; MDL Method Dection Limit (unadjusted); MQL Method Quantitation Limit (adjusted)

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# Analytical QC Summary Report

**AECOM EARTH TECH**
Order Number **0903061**

Project Description: Cedar Chemicals

**Organics** **Laboratory Control Spike Duplicate** **23770-LCSD** **Aqueous**

**Prep Method** 3510C **Batch** 23770 **Date** 03/11/09 11:57

**Analytical Method** 8081A **Batch** 38388 **Date** 03/23/09 15:26 **Dilution Factor** 10 **By** DPC

| Compound | LCSD Conc. | Units | Spike Added | % Rec | QC Limits | % RPD | RPD Limit |
|---|---|---|---|---|---|---|---|
| gamma-BHC | 0.000726 | mg/L | 0.00100 | 73 | 41-102 | 1 | 20 |
| Endrin | 0.000797 | mg/L | 0.00100 | 80 | 45-117 | 4 | 20 |
| Heptachlor | 0.000740 | mg/L | 0.00100 | 74 | 40-110 | 2 | 20 |
| Heptachlor epoxide | 0.000758 | mg/L | 0.00100 | 76 | 42-115 | 5 | 20 |
| Methoxychlor | 0.00106 | mg/L | 0.00100 | 106 | 39-140 | 8 | 20 |

| | | | | | | |
|---|---|---|---|---|---|---|
| Surrogate: | Decachlorobiphenyl | 105 | % | Limits: | 36-116 |
| Surrogate: | Tetrachloro-m-xylene | 57 | % | Limits: | 25-123 |

**Qualifiers:** DF Dilution Factor
MQL Method Quantitation Limit (adjusted)
MDL Method Dection Limit (unadjusted)

*26-Mar-09*

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# Analytical QC Summary Report
## Form 4
## Method Blank Summary

### Aqueous

### GCMS Volatiles

**AECOM EARTH TECH**
Order Number **0903061**

Project Description: Cedar Chemicals

**Batch ID** **23771**
**Instrument ID** **VOC4**

**23771-LB**

**This Method Blank applies to the following batch samples:**

| Lab Sample ID | Lab File ID | Analyzed Date | / Time | Dilution Factor |
|---|---|---|---|---|
| 23771-LCS | 1002lcs.d | 03/11/09 | 13:30 | 1 |
| 23771-LB | 1005.d | 03/11/09 | 15:27 | 1 |
| 23740-TCLPBLFL1 | 1010.d | 03/11/09 | 18:20 | 10 |
| 0903061-010B | 1011.d | 03/11/09 | 18:54 | 10 |
| 0903106-001B | 1015.d | 03/11/09 | 21:12 | 10 |
| 0903106-001BMS | 1018.d | 03/11/09 | 22:56 | 10 |
| 0903106-001BMSD | 1019.d | 03/11/09 | 23:30 | 10 |

**Qualifiers:**

| | | | |
|---|---|---|---|
| * | Surrogate Recovery outside accepted limits | * I | Recoveries affected by interferences or high background |
| B | Analyte detected in the associated Method Blank | DF | Dilution Factor |
| E | Value exceeds method calibration range | H | Prepped / Analyzed out of holding time. |
| J | Estimated Value Analyte below reported detection limit | M | Minimum value |
| MDL | Method Dection Limit (unadjusted) | MQL | Method Quantitation Limit (adjusted) |
| MRL | Method Reporting Limit | N | Refer to attached Non-Compliance Report |

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# Analytical QC Summary Report

**AECOM EARTH TECH**
Order Number **0903061**

Project Description: Cedar Chemicals

| **Volatiles** | **Method Blank** | | | **23771-LB** | **Aqueous** |
|---|---|---|---|---|---|
| **Prep Method** | 5030B | **Batch** 23771 | **Date** | 03/11/09 12:02 | |
| **Analytical Method** | 8260B | **Batch** 38225 | **Date** | 03/11/09 15:27 | **Dilution Factor** 1 **By** LS |

| Compound | Result | Units | MQL |
|---|---|---|---|
| Benzene | < 0.00100 | mg/L | 0.00100 |
| 2-Butanone (MEK) | < 0.0200 | mg/L | 0.0200 |
| Carbon tetrachloride | < 0.00100 | mg/L | 0.00100 |
| Chlorobenzene | < 0.00100 | mg/L | 0.00100 |
| Chloroform | < 0.00100 | mg/L | 0.00100 |
| 1,4-Dichlorobenzene | < 0.00100 | mg/L | 0.00100 |
| 1,2-Dichloroethane | < 0.00100 | mg/L | 0.00100 |
| 1,1-Dichloroethene | < 0.00100 | mg/L | 0.00100 |
| Tetrachloroethene | < 0.00100 | mg/L | 0.00100 |
| Trichloroethene | < 0.00100 | mg/L | 0.00100 |
| Vinyl chloride | < 0.00100 | mg/L | 0.00100 |

| | | | | | |
|---|---|---|---|---|---|
| Surrogate: | Dibromofluoromethane | 109 | % | Limits: | 75-125 |
| Surrogate: | Toluene-d8 | 101 | % | Limits: | 85-120 |
| Surrogate: | 4-Bromofluorobenzene | 101 | % | Limits: | 85-118 |
| Surrogate: | 1,2-Dichloroethane-d4 | 112 | % | Limits: | 72-132 |

**Qualifiers:** DF Dilution Factor; MQL Method Quantitation Limit (adjusted); MDL Method Dection Limit (unadjusted)

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# Analytical QC Summary Report

**AECOM EARTH TECH**
Order Number **0903061**

Project Description: Cedar Chemicals

| **Volatiles** | **TCLP Blank Fluid 1** | | | | **23740-TCLPBLFL1** | | **Aqueous** |
|---|---|---|---|---|---|---|---|
| **Prep Method** | 5030B | **Batch** | 23771 | **Date** | 03/11/09 12:02 | | |
| **Analytical Method** | 8260B | **Batch** | 38225 | **Date** | 03/11/09 18:20 | **Dilution Factor** 10 | **By** LS |

| Compound | Result | Units | MQL |
|---|---|---|---|
| Benzene | < 0.0100 | mg/L | 0.0100 |
| 2-Butanone (MEK) | < 0.200 | mg/L | 0.200 |
| Carbon tetrachloride | < 0.0100 | mg/L | 0.0100 |
| Chlorobenzene | < 0.0100 | mg/L | 0.0100 |
| Chloroform | < 0.0100 | mg/L | 0.0100 |
| 1,4-Dichlorobenzene | < 0.0100 | mg/L | 0.0100 |
| 1,2-Dichloroethane | < 0.0100 | mg/L | 0.0100 |
| 1,1-Dichloroethene | < 0.0100 | mg/L | 0.0100 |
| Tetrachloroethene | < 0.0100 | mg/L | 0.0100 |
| Trichloroethene | < 0.0100 | mg/L | 0.0100 |
| Vinyl chloride | < 0.0100 | mg/L | 0.0100 |

| | | | | | |
|---|---|---|---|---|---|
| Surrogate: | Dibromofluoromethane | 103 | % | Limits: | 75-125 |
| Surrogate: | Toluene-d8 | 105 | % | Limits: | 85-120 |
| Surrogate: | 4-Bromofluorobenzene | 102 | % | Limits: | 85-118 |
| Surrogate: | 1,2-Dichloroethane-d4 | 104 | % | Limits: | 72-132 |

**Qualifiers:** DF Dilution Factor; MQL Method Quantitation Limit (adjusted); MDL Method Dection Limit (unadjusted)

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# Analytical QC Summary Report

**AECOM EARTH TECH**
Order Number **0903061**

Project Description: Cedar Chemicals

**Volatiles** **Laboratory Control Spike** **23771-LCS** **Aqueous**

**Prep Method** 5030B **Batch** 23771 **Date** 03/11/09 12:02

**Analytical Method** 8260B **Batch** 38225 **Date** 03/11/09 13:30 **Dilution Factor** 1 **By** LS

| Compound | LCS Conc. | Units | Spike Added | %Rec | QC Limits |
|---|---|---|---|---|---|
| Benzene | 0.0976 | mg/L | 0.100 | 98 | 80-120 |
| 2-Butanone (MEK) | 0.0776 | mg/L | 0.100 | 78 | 40-140 |
| Carbon tetrachloride | 0.100 | mg/L | 0.100 | 100 | 65-140 |
| Chlorobenzene | 0.0965 | mg/L | 0.100 | 96 | 80-120 |
| Chloroform | 0.0982 | mg/L | 0.100 | 98 | 80-120 |
| 1,4-Dichlorobenzene | 0.0896 | mg/L | 0.100 | 90 | 75-125 |
| 1,2-Dichloroethane | 0.0897 | mg/L | 0.100 | 90 | 70-130 |
| 1,1-Dichloroethene | 0.100 | mg/L | 0.100 | 100 | 80-120 |
| Tetrachloroethene | 0.0934 | mg/L | 0.100 | 93 | 45-150 |
| Trichloroethene | 0.0914 | mg/L | 0.100 | 91 | 70-125 |
| Vinyl chloride | 0.0843 | mg/L | 0.100 | 84 | 80-120 |

| | | | | | |
|---|---|---|---|---|---|
| Surrogate: | Dibromofluoromethane | 100 | % | Limits: | 75-125 |
| Surrogate: | Toluene-d8 | 97 | % | Limits: | 85-120 |
| Surrogate: | 4-Bromofluorobenzene | 101 | % | Limits: | 85-118 |
| Surrogate: | 1,2-Dichloroethane-d4 | 91 | % | Limits: | 72-132 |

**Qualifiers:** DF Dilution Factor
MQL Method Quantitation Limit (adjusted)
MDL Method Dection Limit (unadjusted)

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# Analytical QC Summary Report

**AECOM EARTH TECH**
Order Number **0903061**

Project Description: Cedar Chemicals

**Volatiles** **Sample Matrix Spike** **0903106-001BMS** **Aqueous**

**Prep Method** 5030B **Batch** 23771 **Date** 03/11/09 12:02

**Analytical Method** 8260B **Batch** 38225 **Date** 03/11/09 22:56 **Dilution Factor** 10 **By** LS

| Compound | MS Conc. | Units | Spike Added | Sample Conc. | %Rec | QC Limits |
|---|---|---|---|---|---|---|
| Benzene | 0.995 | mg/L | 1.00 | < 0.0100 | 100 | 80-120 |
| 2-Butanone (MEK) | 0.673 | mg/L | 1.00 | < 0.200 | 67 | 40-140 |
| Carbon tetrachloride | 1.03 | mg/L | 1.00 | < 0.0100 | 103 | 65-140 |
| Chlorobenzene | 0.953 | mg/L | 1.00 | < 0.0100 | 95 | 80-120 |
| Chloroform | 1.01 | mg/L | 1.00 | 0.0466 | 96 | 80-120 |
| 1,4-Dichlorobenzene | 0.907 | mg/L | 1.00 | < 0.0100 | 91 | 75-125 |
| 1,2-Dichloroethane | 0.908 | mg/L | 1.00 | < 0.0100 | 91 | 70-130 |
| 1,1-Dichloroethene | 0.997 | mg/L | 1.00 | < 0.0100 | 100 | 80-120 |
| Tetrachloroethene | 0.980 | mg/L | 1.00 | < 0.0100 | 98 | 45-150 |
| Trichloroethene | 0.952 | mg/L | 1.00 | < 0.0100 | 95 | 70-125 |
| Vinyl chloride | 0.952 | mg/L | 1.00 | < 0.0100 | 95 | 80-120 |

| | | | | | |
|---|---|---|---|---|---|
| Surrogate: | Dibromofluoromethane | 95 | % | Limits: | 75-125 |
| Surrogate: | Toluene-d8 | 107 | % | Limits: | 85-120 |
| Surrogate: | 4-Bromofluorobenzene | 95 | % | Limits: | 85-118 |
| Surrogate: | 1,2-Dichloroethane-d4 | 93 | % | Limits: | 72-132 |

**Qualifiers:** DF Dilution Factor; MDL Method Dection Limit (unadjusted); MQL Method Quantitation Limit (adjusted)

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# Analytical QC Summary Report

**AECOM EARTH TECH**
Order Number **0903061**

Project Description: Cedar Chemicals

**Volatiles** **Sample Matrix Spike Duplicate** **0903106-001BMSD** **Aqueous**

**Prep Method** 5030B **Batch** 23771 **Date** 03/11/09 12:02

**Analytical Method** 8260B **Batch** 38225 **Date** 03/11/09 23:30 **Dilution Factor** 10 **By** LS

| Compound | MSD Conc. | Units | Spike Added | Sample Conc. | % Rec | QC Limits | % RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|
| Benzene | 1.02 | mg/L | 1.00 | < 0.0100 | 102 | 80-120 | 2 | 30 |
| 2-Butanone (MEK) | 0.736 | mg/L | 1.00 | < 0.200 | 74 | 40-140 | 9 | 30 |
| Carbon tetrachloride | 1.06 | mg/L | 1.00 | < 0.0100 | 106 | 65-140 | 4 | 30 |
| Chlorobenzene | 0.984 | mg/L | 1.00 | < 0.0100 | 98 | 80-120 | 3 | 30 |
| Chloroform | 1.11 | mg/L | 1.00 | 0.0466 | 106 | 80-120 | 10 | 30 |
| 1,4-Dichlorobenzene | 1.02 | mg/L | 1.00 | < 0.0100 | 102 | 75-125 | 12 | 30 |
| 1,2-Dichloroethane | 0.960 | mg/L | 1.00 | < 0.0100 | 96 | 70-130 | 6 | 30 |
| 1,1-Dichloroethene | 1.02 | mg/L | 1.00 | < 0.0100 | 102 | 80-120 | 2 | 30 |
| Tetrachloroethene | 0.982 | mg/L | 1.00 | < 0.0100 | 98 | 45-150 | 0 | 30 |
| Trichloroethene | 0.947 | mg/L | 1.00 | < 0.0100 | 95 | 70-125 | 0 | 30 |
| Vinyl chloride | 0.987 | mg/L | 1.00 | < 0.0100 | 99 | 80-120 | 4 | 30 |

| | | | | | |
|---|---|---|---|---|---|
| Surrogate: | Dibromofluoromethane | 95 | % | Limits: | 75-125 |
| Surrogate: | Toluene-d8 | 98 | % | Limits: | 85-120 |
| Surrogate: | 4-Bromofluorobenzene | 92 | % | Limits: | 85-118 |
| Surrogate: | 1,2-Dichloroethane-d4 | 95 | % | Limits: | 72-132 |

**Qualifiers:** DF Dilution Factor
MQL Method Quantitation Limit (adjusted)
MDL Method Dection Limit (unadjusted)

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# Analytical QC Summary Report
## Form 4
## Method Blank Summary

### Aqueous

### Herbicides

**AECOM EARTH TECH**
Order Number **0903061**

Project Description: Cedar Chemicals

**Batch ID** 23796
**Instrument ID** PEST3

**23796-LB**

**This Method Blank applies to the following batch samples:**

| Lab Sample ID | Lab File ID | Analyzed Date | / Time | Dilution Factor |
|---|---|---|---|---|
| 23796-LB | P3031609BHRB | 03/16/09 | 23:25 | 1 |
| 23796-LCS | P3031609BHRB | 03/16/09 | 23:48 | 1 |
| 23796-LCSD | P3031609BHRB | 03/17/09 | 0:10 | 1 |
| 0903128-001B | P3031609BHRB | 03/17/09 | 0:33 | 1 |
| 0903128-001BMS | P3031609BHRB | 03/17/09 | 0:55 | 1 |
| 0903128-001BMSD | P3031609BHRB | 03/17/09 | 1:18 | 1 |
| 0903061-009A | P3031609BHRB | 03/17/09 | 2:03 | 1 |
| 0903061-010A | P3031609BHRB | 03/17/09 | 2:25 | 1 |
| 23741-TCLPBLFL1 | P3031609BHRB | 03/17/09 | 3:11 | 1 |

**Qualifiers:**

| | | | |
|---|---|---|---|
| * | Surrogate Recovery outside accepted limits | * I | Recoveries affected by interferences or high background |
| B | Analyte detected in the associated Method Blank | DF | Dilution Factor |
| E | Value exceeds method calibration range | H | Prepped / Analyzed out of holding time. |
| J | Estimated Value Analyte below reported detection limit | M | Minimum value |
| MDL | Method Dection Limit (unadjusted) | MQL | Method Quantitation Limit (adjusted) |
| MRL | Method Reporting Limit | N | Refer to attached Non-Compliance Report |

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# Analytical QC Summary Report

**AECOM EARTH TECH**
Order Number **0903061**

Project Description: Cedar Chemicals

| **Organics** | **Method Blank** | | | | **23796-LB** | | **Aqueous** |
|---|---|---|---|---|---|---|---|
| **Prep Method** | 8151A | **Batch** | 23796 | **Date** | 03/12/09 17:05 | | |
| **Analytical Method** | 8151A | **Batch** | 38333 | **Date** | 03/16/09 23:25 | **Dilution Factor** 1 | **By** KS |

| Compound | Result | Units | MQL |
|---|---|---|---|
| 2,4-D | < 0.000100 | mg/L | 0.000100 |
| 2,4,5-TP (Silvex) | < 0.0000300 | mg/L | 0.0000300 |
| Dinoseb | < 0.00270 | mg/L | 0.00270 |
| Surrogate: DCAA | | 79 | % Limits: 20-150 |

**Qualifiers:** DF Dilution Factor
MQL Method Quantitation Limit (adjusted)
MDL Method Dection Limit (unadjusted)

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# Analytical QC Summary Report

**AECOM EARTH TECH**
Order Number **0903061**

Project Description: Cedar Chemicals

| **Organics** | **TCLP Blank Fluid 1** | | | | **23741-TCLPBLFL1** | | **Aqueous** |
|---|---|---|---|---|---|---|---|
| **Prep Method** | 8151A | **Batch** | 23796 | **Date** | 03/12/09 17:05 | | |
| **Analytical Method** | 8151A | **Batch** | 38333 | **Date** | 03/17/09 3:11 | **Dilution Factor** 1 | **By** KS |

| Compound | Result | Units | MQL |
|---|---|---|---|
| 2,4-D | < 0.00200 | mg/L | 0.00200 |
| 2,4,5-TP (Silvex) | < 0.000600 | mg/L | 0.000600 |
| Dinoseb | < 0.0540 | mg/L | 0.0540 |
| Surrogate: DCAA | 64 | % | Limits: 20-150 |

**Qualifiers:** DF Dilution Factor; MDL Method Dection Limit (unadjusted); MQL Method Quantitation Limit (adjusted)

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# Analytical QC Summary Report

**AECOM EARTH TECH**
Order Number **0903061**

Project Description: Cedar Chemicals

| **Organics** | **Laboratory Control Spike** | | | **23796-LCS** | | **Aqueous** |
|---|---|---|---|---|---|---|
| **Prep Method** | 8151A | **Batch** 23796 | **Date** | 03/12/09 17:05 | | |
| **Analytical Method** | 8151A | **Batch** 38333 | **Date** | 03/16/09 23:48 | **Dilution Factor** 1 | **By** KS |

| Compound | LCS Conc. | Units | Spike Added | % Rec | QC Limits |
|---|---|---|---|---|---|
| 2,4-D | 0.00183 | mg/L | 0.00250 | 73 | 20-150 |
| 2,4,5-TP (Silvex) | 0.000200 | mg/L | 0.000250 | 80 | 20-150 |
| Dinoseb | 0.00159 | mg/L | 0.00125 | 127 | 20-150 |
| Surrogate: DCAA | | | 122 | % | Limits: 20-150 |

**Qualifiers:** DF Dilution Factor
MQL Method Quantitation Limit (adjusted)
MDL Method Dection Limit (unadjusted)

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# Analytical QC Summary Report

**AECOM EARTH TECH**
Order Number **0903061**

Project Description: Cedar Chemicals

| **Organics** | **Sample Matrix Spike** | | **0903128-001BMS** | | **Aqueous** |
|---|---|---|---|---|---|
| **Prep Method** | 8151A | **Batch** 23796 | **Date** | 03/12/09 17:05 | |
| **Analytical Method** | 8151A | **Batch** 38333 | **Date** | 03/17/09 0:55 | **Dilution Factor** 1 **By** KS |

| Compound | MS Conc. | Units | Spike Added | Sample Conc. | %Rec | QC Limits |
|---|---|---|---|---|---|---|
| 2,4-D | 0.0347 | mg/L | 0.0500 | 0.00739 | 55 | 20-150 |
| 2,4,5-TP (Silvex) | 0.00394 | mg/L | 0.00500 | < 0.000600 | 79 | 20-150 |
| Dinoseb | 0.0265 | mg/L | 0.0250 | 0.00142 | 100 | 20-150 |
| Surrogate: DCAA | | | 114 | % | Limits: | 20-150 |

**Qualifiers:** DF Dilution Factor
MQL Method Quantitation Limit (adjusted)
MDL Method Dection Limit (unadjusted)

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# Analytical QC Summary Report

**AECOM EARTH TECH**
Order Number **0903061**

Project Description: Cedar Chemicals

## Organics — Sample Matrix Spike Duplicate — 0903128-001BMSD — Aqueous

**Prep Method** 8151A **Batch** 23796 **Date** 03/12/09 17:05

**Analytical Method** 8151A **Batch** 38333 **Date** 03/17/09 1:18 **Dilution Factor** 1 **By** KS

| Compound | MSD Conc. | Units | Spike Added | Sample Conc. | % Rec | QC Limits | % RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|
| 2,4-D | 0.0329 | mg/L | 0.0500 | 0.00739 | 51 | 20-150 | 5 | 30 |
| 2,4,5-TP (Silvex) | 0.00346 | mg/L | 0.00500 | < 0.000600 | 69 | 20-150 | 13 | 30 |
| Dinoseb | 0.0243 | mg/L | 0.0250 | 0.00142 | 92 | 20-150 | 8 | 30 |

Surrogate: DCAA 89 % Limits: 20-150

**Qualifiers:** DF Dilution Factor; MDL Method Dection Limit (unadjusted); MQL Method Quantitation Limit (adjusted)