# LONGHORN ARMY AMMUNITION PLANT KARNACK, TEXAS

# ADMINISTRATIVE RECORD

**Volume 9 of 13**

**2009**

**Bate Stamp Numbers**

**00078395 – 00079299**

**Prepared for**

**Department of the Army**
**Longhorn Army Ammunition Plant**

**1976 – 2009**

***LONGHORN ARMY AMMUNITION PLANT***
***KARNACK, TEXAS***
***ADMINISTRATIVE RECORD – CHRONOLOGICAL INDEX***

VOLUME 9 of 13

2009

A. Title: Report – Final Feasibility Study, LHAAP-50, Former Sump Water Tank, Group 4, Longhorn Army Ammunition Plant, Karnack, Texas
Author(s): Shaw Environmental, Inc., Houston, Texas
Recipient: All Stakeholders
Date: December 17, 2009
Bate Stamp: 00078395 - 00079299

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# *FINAL*
# FEASIBILITY STUDY
# LHAAP-50, FORMER SUMP WATER TANK, GROUP 4
# LONGHORN ARMY AMMUNITION PLANT
# KARNACK, TEXAS


Shaw®

ON THE LINE

**DECEMBER 2009**

00078396

Shaw® Shaw Environmental, Inc.

***Date:*** ***December 17, 2009***

***Project No.:*** ***117591***

## ***TRANSMITTAL LETTER:***

***To:*** Mr. Aaron Williams

***Address:*** US Army Corps of Engineers - Tulsa

CESWT-PP-M

1645 South 101st East Ave

Tulsa, Oklahoma 74128

***Re:*** **Final Feasibility Study, LHAAP-50, Former Sump Water Tank, Group 4**
Longhorn Army Ammunition Plant, Karnack, Texas

Contract No. W912QR-04-D-0027/DS02

For: Review X As Requested ____ Approval ____ Corrections ____ Submittal ____ Other ____

| ***Item No:*** | ***No. of Copies*** | ***Date:*** | ***Document Title*** |
|---|---|---|---|
| 1 | 2 | December 2009 | **Final Feasibility Study, LHAAP-50, Former Sump Water Tank, Group 4** Longhorn Army Ammunition Plant, Karnack, Texas |
| | | | |
| | | | |

Aaron – Enclosed please find the final version of the above-named report for your records.

The document has been distributed according to the list below. Please call if any questions or comments.

***Sincerely:***

Praveen Srivastav
Project Manager

**Distribution List:**
Ms. Rose Zeiler – BRAC-LHAAP
Mr. Matthew Mechenes – AEC
Ms. Fay Duke – TCEQ (2)
Mr. Steve Tzhone – EPA (2)
Mr. Dale Vodak - TCEQ
Mr. Paul Bruckwicki –USFWS
Mr. John Lambert/Scottie Fiehler (distributed by A. Williams) - USACE

00078397

**DEPARTMENT OF THE ARMY**
**LONGHORN ARMY AMMUNITION PLANT**
**POST OFFICE BOX 220**
**RATCLIFF, AR 72951**

December 17, 2009

DAIM-ODB-LO

Mr. Stephen Tzhone
US Environmental Protection Agency
Superfund Division (6SF-AT)
1445 Ross Avenue
Dallas, TX 75202-2733

Re: Final Feasibility Study, LHAAP-50, Former Sump Water Tank, Group 4, Longhorn Army Ammunition Plant, Karnack, Texas, December 2009

Dear Mr. Tzhone,

The above-referenced document is being transmitted to you for your files. The document has been prepared by Shaw Environmental, Inc. (Shaw) on behalf of the Army as part of Shaw's performance based contract for the facility.

The point of contact for this action is the undersigned. I ask that Praveen Srivastav, Shaw's Project Manager, be copied on any communications related to the project. I may be contacted at 479-635-0110, or by email at rose.zeiler@us.army.mil.

Sincerely,

Rose M. Zeiler

Rose M. Zeiler, Ph.D.
Longhorn AAP Site Manager

Copies furnished:
F. Duke, TCEQ, Austin, TX
D. Vodak, TCEQ, Tyler, TX
P. Bruckwicki, Caddo Lake NWR, TX
J. Lambert/S. Fiehler, USACE, Tulsa District, OK
A. Williams, USACE, Tulsa District, OK
M. Mechenes, USAEC, MD
P. Srivastav, Shaw – Houston, TX (for project files)

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**DEPARTMENT OF THE ARMY**
**LONGHORN ARMY AMMUNITION PLANT**
**POST OFFICE BOX 220**
**RATCLIFF, AR 72951**

December 17, 2009

DAIM-ODB-LO

Ms. Fay Duke
Texas Commission on Environmental Quality
TCEQ Environmental Cleanup Section I, Team 2, MC-136
12100 Park 35 Circle, Bldg D
Austin, TX 78753

Re: Final Feasibility Study, LHAAP-50, Former Sump Water Tank, Group 4, Longhorn Army Ammunition Plant, Karnack, Texas, December 2009
SUP 126

Dear Ms. Duke,

The above-referenced document is being transmitted to you for your files. The document has been prepared by Shaw Environmental, Inc. (Shaw) on behalf of the Army as part of Shaw's performance based contract for the facility.

The point of contact for this action is the undersigned. I ask that Praveen Srivastav, Shaw's Project Manager be copied on any communications related to the project. I may be contacted at 479-635-0110, or by email at rose.zeiler@us.army.mil.

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Response to Regulatory Comments Chronology for *Draft Final Feasibility Study, LHAAP-50, former Sump Water Tank, Group 4, Longhorn Army Ammunition Plant, Karnack, Texas, dated November 2008*

**April 6, 2009** – Shaw (Army contractor) submitted RTCs to EPA and TCEQ comments on the Draft Final Feasibility Study.

**April 16, 2009** – EPA submitted responses to the RTCs. They agreed with all except two. (email from Steve Tzhone dated April 16, 2009, 12:16 p.m.)

**April 17, 2009** – TCEQ submitted general responses to the RTCs. (e-mail from Fay duke dated April 17, 2009, 5:19 p.m.)

**October 13, 2009** – Shaw responded to April responses. Additional information and RTC figure were included (e-mails from Praveen Srivastav dated 10/13/2009, 4:08 p.m. and RTC figure from Susan Watson dated 10/20/2009, 3:59 p.m.)

**November 20, 2009** – TCEQ has no additional comments. (email from Fay Duke dated 11/20/2009, 9:33 a.m.)

**December 8, 2009** – EPA agrees with all responses to comments. (email from Steve Tzhone dated 12/8/2009, 1:29 p.m.)

Additional editorial comments were made in the Final version for consistency with the Final Feasibility Study, LHAAP-46, issued in November 2009.

**Comments on Draft Final Feasibility Study (published November 2008)**
**LHAAP-50**
**Longhorn Army Ammunition Plant, Karnack, Texas**

**Reviewer:** Terry Burton, USEPA
**Respondents:** Shaw Environmental, Inc.

1. Respondent Concurs (C), Does Not Concur (D), Takes Exception (E), or Delete (X).
2. Commentor Agrees (A) with response, or Does not Agree (D) with response.

| Comment No. | Page | Section/ Paragraph | Comment | C, D[1], E or X | Response | A or D[2] |
|---|---|---|---|---|---|---|
| 1 | | | Subsurface heterogeneity alone guarantees multiple substrate injections for bioremediation. Sandy clay layers are preferred pathways for perchlorate travel. On the other hand, chlorinated solvents can also sorb to, or be retarded by, clays. It is highly probable that more than one substrate will be needed. | C | In the first bullet of Section 5.2.3.2 an investigation/ pilot study is discussed. Data would be gathered in this investigation for the design of the biotreatment that take into account the contaminants and the geology. | |
| 2 | | | Bioremediation of chlorinated solvents can get “stalled” at vinyl chloride in heterogeneous soils; this may require another round of injections at a later date. If wells need to be reused, that may affect the initial substrate choice. | C | Shaw’s dechlorinating culture, SDC-9, was developed to ensure complete degradation of vinyl chloride to harmless ethenes. If needed, this would be determined from data gathered in the investigation (first bullet of Section 5.2.3.2). | |
| 3 | ES-1 & 3-7 | | Page ES-1 lists the site as occupying a 1-acre industrial area. Page 3-7 describes the site as occupying 11 acres. Which is correct? | C | 1-acre is correct. Section 3.2.3.4 will be corrected. | |
| 4 | | | I disagree with removal of permeable reactive barriers from consideration purely based upon discontinuous sand layers. It may not be the best option, but the reason for removal from consideration is inadequate. Permeable barriers have been constructed in sandy soils. Hence, section 4.5.1.9 is incomplete. Perhaps it could be said that permeable reactive barriers are very difficult to implement given the soil heterogeneity of the site? Or perhaps the extent of contamination makes a barrier impracticable? Either solution is preferable to what was given. Did the contractor make a "block-and-copy" omission? | C | In Section 4.5.1.9, the last sentence will be replaced with the following: “Permeable reactive barriers are not retained as a process option due to the heterogeneity of the site soils and the discontinuous soil lenses which would limit the effective installation of the barrier and the treatment effectiveness.” | |
| 5 | | | I feel that the monitoring intervals are overly optimistic, and risk missing important data before issues arise. | E | Also see response to TCEQ’s comments 15, 16, and 19. Based on the length of time for treatment, the monitoring intervals of quarterly, then annual, and then for five year reviews is appropriate to be used for the FS. The monitoring program will be developed as part of the remedial design. Changes in sampling frequency would be discussed in the designed monitoring program. For cost estimating purposes for comparison of the alternatives, minor adjustments in sampling frequency will not affect the comparison outcome. | |

**Comments on Draft Final Feasibility Study (published November 2008)**
**LHAAP-50**
**Longhorn Army Ammunition Plant, Karnack, Texas**

**Reviewer:** Terry Burton, USEPA
**Respondents:** Shaw Environmental, Inc.

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| 6 | | | One can not define the number of wells before the substrate to be injected is chosen. At best inappropriate, at worst a sure source of error and potential failure. Some substrates need tight well spacing due to their lack of persistence in the subsurface. | C | As stated in Section 5.2.3.2, an investigation/pilot study will be performed. The data gathered would be used in the design of the biotreatment system. The number of wells is defined based on engineering judgment for cost estimating purposes to compare the alternatives. | |
| 7 | | | I did not see any studies on potential competitors for the electrons that are currently at the site. For example, soils with high carbonate or sulfate concentrations can buffer electron donors, necessitating additional injections of substrates. | C | A treatability study has not been conducted. This study would be part of the remedial design phase and would evaluate potential competitors for the electrons by evaluating the presence or absence of inhibitory substances. Based on experience, a second injection is assumed and is included in Section 5.2.3.3 and in the cost estimate. | |
| 8 | | | A scheme to do injections over a 50 sq. ft area, in order to treat a roughly 0.5 acre of heterogeneous surface area, is far too optimistic. I am unclear on how that was calculated. | C | As stated in Section 5.2.3.2, it is for cost estimating purposes and is based on the current knowledge of the site, technical judgment of the Contractor, and their knowledge of injection substrates and their patented bioaugmentation cultures. Since this is for cost comparison purposes, additional points would increase the cost of Alternative 3 making the cost difference greater between the alternatives. | |
| 9 | | | I disagree with the choice of the MNA alternative, as written. The evidence is not convincing that the COCs will indeed be reduced over time. It is questionable whether other federal agencies will be able to fully implement LUCs. Finally, the level of monitoring needed to support MNA has been greatly underestimated. I must question whether planning annual monitoring of an MNA site within the first 3 years can be considered a serious proposal. | D | In Appendix A, Figures 3-1 through 3-8 indicate the reduction of concentrations. The extent of the plume has been defined. Since data has already been gathered over the past 10 years, additional quarterly data collection of 1 year to confirm MNA should be adequate. However, the sampling frequency will be presented in more detail in the remedial design and may be modified based on regulatory comments. The monitoring plan included in the design will outline how to determine if more frequent monitoring is needed based on the evaluation of the collected MNA data once the remedy is in place. The monitoring for this site was estimated to continue for the five year reviews for 30 years (the time frame per Army policy to evaluate alternatives). | |

**Comments on Draft Final Feasibility Study (published November 2008)**
**LHAAP-50**
**Longhorn Army Ammunition Plant, Karnack, Texas**

**Reviewer:** Terry Burton, USEPA
**Respondents:** Shaw Environmental, Inc.

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|---|---|---|---|---|---|---|
| | | | | | Also see response to TCEQ's comments 22, 23, 24, and 25.<br><br>Reviewer's comment about implementation of LUCs is noted. Issues regarding transfer to other federal agencies are being addressed by BRAC. | |
| **General Comments** | | | | | | |
| 1 | | | TMV must be added to the abbreviations table | E | TMV (toxicity, mobility, or volume) will be spelled out in the text, but will be abbreviated and defined in individual tables. | |
| 2 | | | 3 remedial alternatives were presented. Given that DoD has provided innovative alternatives on other sites, and the technical reputation of the contractor, is there a reason other options were not even presented as strawmen? | C | In December 2004, in order to streamline the FS process, the Army, TCEQ, UEPA, and Shaw agreed to minimize the number of alternatives presented in the FS to those most likely to be implemented. TCEQ had suggested, in the context of LHAAP-12 FS, that the FS should be focused rather than expending efforts on evaluating alternatives that are improbable or technically infeasible to implement. | |

**Comments on Draft Final Feasibility Study (published November 2008)**
**LHAAP-50**
**Longhorn Army Ammunition Plant, Karnack, Texas**

**Reviewer:** Fay Duke, TCEQ
**Respondents:** Shaw Environmental, Inc.

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| 1 | | 1.2.1 Site Description & Figure 1-5 | If available, the hydraulic conductivity value for wells within the plume path should be provided. We believe this information will be important in estimating the fate and transport of the perchlorate plume. | C | From the RI, the hydraulic conductivities for 50WW01 ($1.7 \times 10^{-4}$ cm/sec) and 50WW02 ($8.8 \times 10^{-5}$ cm/sec) are within the range of $5.5 \times 10^{-5}$ cm/sec and $1.9 \times 10^{-4}$ cm/sec provided in Section 1.2.1. | |
| 2 | | 1.2.1 Site Description & Figure 1-5 | The text states, at 50WW02, a fine grain sand was observed in the silty clay where the well was screened. However, this is not reflected in Figure 1-5. Please clarify. | C | Notation on the drilling log for 50WW02 indicates that the soil is classified as silty clay for all intervals, but there are notes that fine sand was observed throughout. Thus, the cross section indicates the clay (silty clay) classification while the text further describes the notation on the log. | |
| 3 | | 1.3 Summary of Sampling Investigation | There is a lack of discussions regarding surface water and sediment investigation and findings for perchlorate contamination. We note that although perchlorate sampling of the surface waters and sediments were not part of the earlier phases of the Remedial Investigation (RI), subsequent samplings conducted at the Goose Prairie Creek (GPC) included perchlorate analysis. We recommend incorporating those results to fill in the question concerning whether historical practices from this site may have affected the creek.<br><br>Similarly, borings and DPT water sampling performed by STEP as part of the installation wide perchlorate investigation along the Goose Prairie Creek should be used to delineate the perchlorate plume. | E<br><br>C | The additional surface water samples collected as part of the dispute resolution monitoring program are discussed in Section 1.3.3.3 and sediment sampling is discussed in Section 1.3.2.1. No sediment samples were collected after the risk assessment.<br><br>As indicated in Figure 2-3, these results have already been used in the plume delineation. | |
| 4 | | 1.3.3.2 | We noted that the discussion of the perchlorate contamination in groundwater is limited to the results of existing wells. Although well 50WW02 currently contained the highest concentrations of perchlorate, it may not be located in the center of mass of the perchlorate plume. Based on our review, it would appear that there are currently no wells located within the center of mass of the perchlorate plume. Please revise to clarify. Additionally, please see our comments regarding the MNA evaluation. | C | 50WW02 contains the highest perchlorate concentrations from a well at LHAAP-50. Data from a DPT/Geoprobe sample to the east had concentrations that were higher; this is indicated on Figure 2-3. However, the available data show that the plume has been defined, and its migration is very slow. The front edge of the plume has moved less than 900 feet (distance between 50WW02 and 50WW07) in 20 years since operations at the site ceased in 1988. We believe that the available data from the wells are adequate to evaluate remedies for the site. | |
| 5 | | 1.3.3.3 | It is stated that results from 2008 surface water samples detected perchlorate at 27 µg/L from GPW-1 from GPC but the concentrations are less than the TCEQ surface water contact | C | **Section 1.3.3.3** will be replaced with the following: "As part of the dispute resolution monitoring program, quarterly sampling is conducted for perchlorate at | |

**Comments on Draft Final Feasibility Study (published November 2008)**
**LHAAP-50**
**Longhorn Army Ammunition Plant, Karnack, Texas**

**Reviewer:** Fay Duke, TCEQ
**Respondents:** Shaw Environmental, Inc.

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| | | | recreational levels. Please note that this levels exceeds the TCEQ drinking water levels. However, as we recall, the sampling results for GPW-3 is below the TCEQ drinking water standard for perchlorate. Please revise. | | selected locations along Goose Prairie Creek and Harrison Bayou. One location, GPW-1, is located in Goose Prairie Creek between LHAAP-50 and LHAAP-47. Historically, the perchlorate levels in the creek have fluctuated but remain below the TCEQ surface water contact recreational level (395 µg/L), and the groundwater MSC for residential use (GW-Res) (26 µg/L). Perchlorate was not detected in the last three quarters of sampling (since June 2008) at GPW-1. GPW-3 is located approximately 3,500 feet downstream of GPW-1. Historically, perchlorate concentrations have been below the GW-Res at GPW-3. Thus, the water flowing through the creek at GPW-1 is below the GW-Res and is not contaminating Caddo Lake." | |
| 6 | | 2.1 | Please include the risk assessment summary for the surface water and sediments samples associated with this site. Additionally, this section solely focus all human health risk. Please include summary of the ecological risk assessment. | C | Statement will be added that there is no impact to ecological receptors (Shaw, 2007c):<br><br>Sediment samples were included with the human health soil evaluation and the ecological risk. Surface water samples were evaluated for ecological risk only. | |
| 7 | | 2.4 | It is stated that both LHAAP-50 and LHAAP-47 may be contributing to the detections of perchlorate in the Goose Prairie Creek (GPC) but the level of detection is below the TCEQ contract recreation value. Please note that because GPC discharges into the nearby Caddo Lake (a public drinking water source), MCL or residential MSC for groundwater should be used for comparison.<br><br>Additionally, it is stated that the only pathways considered for remediation are soil to groundwater and future industrial groundwater use. We believe that soil to surface water as well as groundwater to surface water remained as potential exposure pathways to be address. | C<br><br>C | Per the modeling report, the concentrations of perchlorate in the surface water would be below 4 µg/L (previous Texas IAL) if the perchlorate-contaminated groundwater were to reach the surface water. Thus, groundwater to surface water pathway is not complete and will not be retained.<br><br>The soil to surface water pathway was not evaluated in the modeling report. Since it is unclear whether LHAAP-50 or LHAAP-47 or both are contributing to the detections of perchlorate in Goose Prairie Creek, it has been assumed that both sites may be contributors. Thus, the potential pathway from soil to surface water will be addressed and added as an RAO. Various sections and figures throughout the FS will be revised to reflect this addition.<br><br>The last sentence of the third paragraph of **Section 2.4** | |

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**Longhorn Army Ammunition Plant, Karnack, Texas**

**Reviewer:** Fay Duke, TCEQ
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| | | | | | will be replaced with the following: "Since the creek discharges into nearby Caddo Lake, a drinking water source, the concentrations in Goose Prairie Creek may also be compared to the GW-Res. The concentrations of perchlorate in the surface water were also below the GW-Res. Even though the concentrations in the creek are acceptable, detection of perchlorate in the creek water indicates that there could be a potential pathway from the contaminated surface soil at LHAAP-50 to the surface water. Thus, the soil pathways considered for remediation are the potential migration to surface water and leaching into the groundwater."<br><br>The last sentence of the 4th paragraph of **Section 2.4** will be replaced with the following: "Thus, the pathways considered for remediation are soil to groundwater, soil to surface water, and future industrial groundwater use."<br><br>Additionally the dashed line on **Figure 2-4** from drainage ditch to Goose Prairie Creek will be changed to a solid line. | |
| 8 | | 3.1<br>Remedial Action Objectives | As we commented earlier, the migration of contaminants in soil and groundwater to surface water are potential exposure pathways. Therefore, we believe remedial action objectives addressing these pathways should be established. | C | See response to Comment No. 7 regarding groundwater to surface water pathway. To add the soil to surface water pathway the 2nd RAO will be revised as follows: "…degradation of groundwater and surface water from soil…." | |
| 9 | | 3.3<br>Preliminary Remediation Levels & Table 3.2 | Remediation levels must be established to achieve the additional RAO as recommended above. Because of the close proximity of the site to Goose Prairie Creek and the potential discharges into the nearby Caddo Lake (a public drinking water source), residential MSC for perchlorate should be used as the remediation level groundwater. | C | Since the area of surface soil contamination is collocated with the subsurface soil, the GWP-Ind will be used for cleanup of the soil. Since the site has been used for industrial activities and will continue to be an industrial use site, the GW-Ind is the promulgated value for industrial use and is applicable to be protective of the hypothetical future maintenance worker. Removal of the soil above GWP-Ind is expected to address the soil to surface water pathway. | |
| 10 | | 4.4<br>Screening Process Options | Table 4-2 presents a limited number of technology processes with few retained for further evaluation. Technology not retained based on technical implentability issue must be explained. | C | Reasons will be added under the comments column for technologies not considered for further evaluation. | |

**Comments on Draft Final Feasibility Study (published November 2008)**
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| | | & Table 4-2 | It states that containment process is screened out because no high concentration source area has been identified. What does this mean? What is considered high concentration? Please note that insufficient investigation should not be a basis for eliminating a process from evaluation. Additionally, we do not believe that containment process is only to be used for source control. | | A high concentration source area would be an area within the groundwater with concentrations sufficiently high to migrate and reach Caddo Lake at levels that would be harmful to human health, or an area of high concentrations in soil that could continue to act as a source of cross-contamination to the groundwater. Since the plume is defined and has not migrated beyond 50WW07 and the contaminated soil that could leach contamination into the groundwater is being excavated, containment for source control was eliminated from further evaluation. Containment can be used for either source control or plume containment, but was not needed for either at this site. | |
| 11 | | 4.5.1.2 Monitored Natural Attenuation | Based on our review of the natural attenuation evaluation presented in Appendix A, we do not believe that natural attenuation can achieve cleanup. Please refer to our comments below regarding this remedial process. | D | Please see response to comments 22 through 25. | |
| 12 | | 4.5.1.5 Extraction Wells | It states that extraction wells and interceptor trenches were not retained for the remedial alternatives development since the discontinuous sand lenses may limit the effectiveness. There are currently interim remedies in place at other portion of the facility that utilize extraction technology, please explain why extraction would not work at this site. | E | The discontinuous sand lenses at LHAAP-50 coupled with the lower hydraulic conductivity, as compared to Site LHAAP-18/24 where extraction system is currently working, will limit the effectiveness of an extraction system. | |
| 13 | | 4.5.1.9 Permeable Reactive Barriers | We note that the evaluation of the PRB is limited to ZVM and GAC. Why isn't the barrier using biological material included? Additionally, PRB is not retained as a process option because of discontinuous sand lenses that would limit the treatment effectiveness. Please clarify why the geology limits the effectiveness. Base on the cross section map (figure 1-5), there appear to be mostly sand downgradient of 50WW02. | C | The biotreatment can be applied through a network of injection points or as a passive barrier wall. This clarification will be made in the text. If bioremediation is implemented, the decision on the best method of application will be evaluated and made during the remedial design.<br>Geology constrains the effectiveness of a PRB because contaminants can escape around the PRB wall if the wall is not keyed to a continuous clay layer at the bottom.<br>Also, see response to USEPA's comment 4. | |

**Comments on Draft Final Feasibility Study (published November 2008)**
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| 14 | | 4.5.1.11 Phytoremediation | Phytoremediation is eliminated from further consideration due to the significant time required for treatment. Is time factor the only factor for eliminating this technology for further consideration? How is the timeframe of this technology compared to the monitoring of natural attenuation process? | E | It is also due to the depth of contamination as stated in the text. The reference to the time being a limiting factor will be deleted. | |
| 15 | | 5.2.2 | Aside from TCEQ's concern with the effectiveness of the MNA discussed below, the proposed groundwater monitoring program is deficient. The monitoring program should be sufficient to evaluate the progress and the effectiveness of the MNA. A baseline must be established against which remedy performance can be measured. The monitoring net work should contain wells within the center of mass of the plume as well as multiple attenuation monitoring points (AMP) along the center axis of the contaminated groundwater plume. The TRRP guidance specifies a minimum of four with three located within the contaminated plume and one located up gradient of the source area to evaluate the change in COC over time and distance. The guidance requires that attenuation action levels be developed to provide near-term evidence that the process is responding as expected (time) and to be used to determine if remedy is not effective. Refer to the TRRP guidance for additional information on calculating the attenuation action levels. | C | The monitoring frequency is presented for cost-estimating purposes only and is the same in each alternative for comparative estimates. The monitoring program to be implemented will be developed in the remedial design. A minimum of one year of quarterly monitoring in the wells will be required. Any changes to this frequency will be based on evaluation of data. It is assumed that two additional wells will be installed for MNA monitoring (See response to Comment 22).<br>Additionally, this FS will be revised to use EPA language and the first sentence of the second paragraph will be replaced with the following: "For this alternative, it is assumed that a monitoring program will be designed and implemented in accordance with EPA protocol for evaluation natural attenuation of chlorinated solvents in ground water (USEPA, 1998) and performance monitoring of MNA remedies for VOCs in ground water (USEPA, 2004)." The following references will be added:"USEPA, 1998, *Technical Protocol for Evaluation Natural Attenuation of Chlorinated Solvents in Ground Water*, EPA/600/R-98/128, Washington, DC, September; USEPA, 2004, *Performance Monitoring of MNA Remedies for VOCs in Ground Water*, EPA/600/R-04/027, April, Cincinnati, OH". | |

**Comments on Draft Final Feasibility Study (published November 2008)**
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| Comment No. | Page | Section/ Paragraph | Comment | C, D[1], E or X | Response | A or D[2] |
|---|---|---|---|---|---|---|
| 16 | | 5.2.2 | It is stated that MNA sampling would occur quarterly for the first year. Monitoring will occur annually until the initial Five Year Reviews. Monitoring will be reduced to every 5 years thereafter. We believe that monitoring should be based on the frequency necessary to evaluate the effectiveness and progress of the natural attenuation. At a minimum, quarterly sampling should be conducted to evaluate and ensure that the trend of natural attenuation is occurring as expected. There should not be a reduction in monitoring until such time that data suggests that less frequent sampling is appropriate. We believe that 4 quarterly sampling may not be sufficient to evaluate the trend of natural attenuation and that less frequent sampling is appropriate.<br><br>Additionally, surface water monitoring at GPC should be part of the monitoring network. | C<br><br>E | See response to USEPA's Comment 5 and TCEQ Comment 15.<br><br>Quarterly surface water monitoring at Goose Prairie Creek is conducted as part of the facility wide dispute resolution monitoring program. No additional sampling is considered necessary. | |
| 17 | | 5.2.2 | It is stated, "if sampling results shows unusual trends of perturbation, additional investigation sampling may be performed." What are the criteria in which it will be evaluated and what action would result from the evaluation? With the uncertainty of whether natural attenuation can achieve the RAO, we believe that contingent remedy should be included if MNA is to be selected as a remedy. Furthermore, evaluation criteria must be established such that contingencies can be employed without modification to the remedy. | C | Specific criteria will be developed in the remedial design phase. Generally concentrations of PCE, TCE and daughter products will be evaluated along with TOC and microorganisms concentrations. Data evaluation techniques will follow USEPA guidance.<br><br>Section 5.2.2.3, 1st paragraph, last sentence, will be replaced with the following: "Sampling results will be evaluated in accordance with the monitoring program, and if the results indicate unusual deviations, outside of sampling variability or seasonal fluctuations, additional sampling or action will be taken as described in the monitoring program. If MNA is determined to not be effective, then the remedy under Alternative 3 will be implemented as a contingent action. The implementation of the contingent action will be described in the decision documents."<br><br>In Section 6.5, the following bullet will be added: "If this alternative is not found to be effective, Alternative 3 will be implemented as a contingent action." | |

**Comments on Draft Final Feasibility Study (published November 2008)**
**LHAAP-50**
**Longhorn Army Ammunition Plant, Karnack, Texas**

**Reviewer:** Fay Duke, TCEQ
**Respondents:** Shaw Environmental, Inc.

1. Respondent Concurs (C), Does Not Concur (D), Takes Exception (E), or Delete (X).
2. Commentor Agrees (A) with response, or Does not Agree (D) with response.

| Comment No. | Page | Section/ Paragraph | Comment | C, D[1], E or X | Response | A or D[2] |
|---|---|---|---|---|---|---|
| 18 | | 5.2.3.1 In Situ Bioremediation for Groundwater Plume | Defining Target Area - As commented earlier, the highest perchlorate concentration may not be located at 50WW02. Additional investigation should be conducted around the area of GPSASS50. | C | See response to Comment 4. | |
| | | | Sampling wells to monitor effectiveness - It is stated that this alternative can achieve cleanup levels in the treated area in approximately two years. It further states that COC is expected to remain downgradient of the treated area and “additional monitoring is recommended for up to 10 years after reduction of the COCs at the target area to the remediation levels.” Please clarify if the remediation levels will also be used for the additional monitoring? If no additional augmentations are used after the 2nd year, we interpret that plume outside of the treat area would employ MNA as the remedy. If so, this remedial alternative should include MNA. Furthermore, as we stated in our previous comment, please include an estimated timeframe in which RAO would be achieved to support the assumption that monitoring would be conducted for up to 10 years. | C | Preliminary remediation goals will be used for the additional monitoring. MNA will be used for the plume area outside of the treated area, and the text for Alternative 3 will be revised as follows:<br>“The estimated time for the RAO to be achieved is approximately 50 years. The continued MNA monitoring is included in the 5-year reviews beyond Year 10.”<br>Also see response to Comment 19. | |
| | | | Additionally, surface water monitoring at GPC should be part of the monitoring network. | E | Quarterly surface water monitoring is conducted as part of the dispute resolution. No additional sampling is considered necessary. | |
| 19 | | 5.2.3.3 Long-Term Operation | It is stated that groundwater sampling would occur quarterly for the first year. Annual monitoring will occur for year two through ten. The TCEQ cannot concur with the proposed monitoring schedule. We believe that monitoring should be based on the frequency necessary to evaluate the effectiveness and progress of the natural attenuation after the two years of in-situ bioremediation. At a minimum, quarterly sampling should be conducted until such time that data suggests that less frequent sampling is appropriate. | C | The monitoring frequency in the FS is a minimum that is used for cost estimating purposes. The monitoring program submitted for approval will be developed as part of the remedial design and will follow the USEPA *Performance Monitoring of MNA Remedies for VOCs in Ground Water*. The monitoring frequency in the program will be related to the historic data and to evaluate the effectiveness of the MNA remedy. Sampling frequency may decrease or increase over the course of the treatment based on the MNA monitoring data evaluation.<br>For further clarification, the MNA monitoring of the plume outside the treated area will begin during the performance monitoring of the treatment. Alternative 3 text will be revised to reflect that MNA will be used for treatment of the plume outside the treated area and the | |

**Comments on Draft Final Feasibility Study (published November 2008)**
**LHAAP-50**
**Longhorn Army Ammunition Plant, Karnack, Texas**

**Reviewer:** Fay Duke, TCEQ
**Respondents:** Shaw Environmental, Inc.

1. Respondent Concurs (C), Does Not Concur (D), Takes Exception (E), or Delete (X).
2. Commentor Agrees (A) with response, or Does not Agree (D) with response.

| Comment No. | Page | Section/ Paragraph | Comment | C, D[1], E or X | Response | A or D[2] |
|---|---|---|---|---|---|---|
| | | | | | MNA monitoring of the untreated area will be initiated in the first year.. | |
| 20 | | 6.3.2 Alternative 2 – Monitored Natural Attenuation | It is stated, "MNA activities associated with the land use controls would ensure that the COC concentrations in groundwater remain stable or continue to degrade naturally." Please clarify this statement. Land use control serves to prevent exposure to the contaminated groundwater while natural attenuation would stabilize the plume and reduce the COC concentrations in groundwater to acceptable level (MCLs). Additionally, statement implies that this alternative would achieve either to control the plume (plume stability) or reduction of concentration. In order to prevent further migration and comply with the ARAR, MNA must achieve both. | C | The portion of the sentence "associated with LUCs" will be deleted and "or" will be changed to "and". | |
| 21 | | 6.5 Recommendation | At this time, the TCEQ cannot concur with the recommended alternatives until our concerns are addressed. | C | After concurrence with these "response to comments", the changes will be incorporated into the final document. Also see response to USEPA's comment 9. | |
| **Appendix A** | | | | | | |
| 22 | | General – Perchlorate | Based on the data presented, the in-well decrease of perchlorate concentration is the only indicator which support natural attenuation. As perchlorate does not appreciably bind to soil particles, we are concern that the decrease in concentration in well 50WW02 may not be the result of degradation but rather the movement of the center of mass of the plume. It is our understanding that the center of mass of the perchlorate plume tends to move at an average velocity or faster than the velocity of the water. As we also indicated in earlier comments, there are no wells currently located in the center of mass nor wells located immediately downgradient of STEPDW02/GPSAS50-2 (temporary wells with the highest concentrations of perchlorate). With the current density of well, it is difficult to evaluate the fate and transport of the perchlorate plume. We recommend adding additional wells along the path of the plume to adequately | C | See Appendix A. Current concentrations of perchlorate are decreasing in monitoring wells which suggest monitored natural attenuation processes are decreasing levels. The current data suggest that processes other than microbial are contributing to the decrease in perchlorate concentrations. The site groundwater parameters also suggest that microbial degradation is not the primary mode of degradation at this site. However, the microbial analysis have shown that *D. ethenogenes* (although it is an anaerobe) is present which is able to degrade perchlorate. The current monitoring well network may not be sufficient to monitor plume stability/behavior; and the additional of new wells will be addressed in the remedial design phase. For this FS, it will be assumed that two new wells will be added for monitoring purposes. | |

**Comments on Draft Final Feasibility Study (published November 2008)**
**LHAAP-50**
**Longhorn Army Ammunition Plant, Karnack, Texas**

**Reviewer:** Fay Duke, TCEQ
**Respondents:** Shaw Environmental, Inc.

1. Respondent Concurs (C), Does Not Concur (D), Takes Exception (E), or Delete (X).
2. Commentor Agrees (A) with response, or Does not Agree (D) with response.

| Comment No. | Page | Section/ Paragraph | Comment | C, D[1], E or X | Response | A or D[2] |
|---|---|---|---|---|---|---|
| | | | evaluate the behavior of the perchlorate plume. Additional data such as analyzes of chloride ions and microbial analysis should also be collected to support that biodegradation is occurring. | | This assumption will be added to the text and estimates of both alternatives. This change will not affect the cost comparison outcome of the alternatives. | |
| 23 | | Chlorinated Ethenes | Similar to the perchlorate MNA analysis, the primary evidence of natural attenuation seem to depend heavily on the decreasing trend of the contaminant concentrations. We recommend additional analysis to support reductive dechlorination such as evaluating the concentrations of the parent compounds with those of the daughter compounds. (i.e., as the parent compounds decreases are there corresponding increases in the daughter compounds.) We recommend that graphs be prepared to analyze and present the trend analysis. | C | See Appendix A. Current concentrations of chlorinated ethenes are decreasing in monitoring wells which suggest monitored natural attenuation processes are decreasing levels. The current data (elevated DO and ORP) suggest that processes other than microbial are contributing to the decrease in chlorinated ethene concentrations. The presence of daughter (cis-1,2-DCE and VC) suggest that reductive dechlorination has occurred in the past, but the decrease in all of the daughter products and the elevated DO suggest that reductive dechlorination is not presently occurring. However the microbial analysis have shown that *D. ethenogenes* (although it is an anaerobe) is present which is able to degrade the chlorinated ethenes. Graphs for PCE and the daughter products are presented on Figure 3-1. | |
| 24 | | 3.1.3.1 | Please clarify whether cleanup time calculated for the daughter compounds anticipated an increase in concentrations as the parent compound undergoes reductive dechlorination? Additionally, what is the basis of the overall time frame for cleanup? Shouldn't the overall time frame for achieving cleanup based on when all COCs (including the daughter compounds) have achieve the cleanup standards? | C | At this time the groundwater conditions (elevated DO and ORP) and the lack of reductive dechlorination trends suggest that other natural attenuation processes may be at work, and therefore, the time will not increase due to the increase of daughter products. The basis for the 47 years is the degradation of TCE. | |
| 25 | | 4.0 | Overall, we feel that the data present do not seem to support natural attenuation would achieve the RAO in a reasonable time. | E | The future hypothetical industrial user will not be exposed to the groundwater at the site because of LUCs to be implemented as a part of the remedy. As expressed by the Army in the past, the time it might take for restoration is of less significance at LHAAP, as compared to some other use where receptors are present. | |

## Srivastav, Praveen

**From:** Tzhone.Stephen@epamail.epa.gov
**Sent:** Thursday, April 16, 2009 12:16 PM
**To:** Zeiler, Rose Ms CIV USA OSA
**Cc:** Srivastav, Praveen; Jones, Greg N; Everett, Kay; Wililams, Aaron; Scottie.Fiehler; DVODAK@tceq.state.tx.us; Fay Duke; jeffrey.armstrong@us.army.mil; Lambert, John R SWT; Williams, Mark; Forsythe.Barry@epamail.epa.gov; Paul Bruckwicki; Josiam.Raji@epamail.epa.gov
**Subject:** Longhorn: EPA comments on Army RTCs for DF FS LHAAP-50
**Attachments:** LHAAP-50 - DF FS RTC_EPA.doc; LHAAP-50 DF FS RTC_TCEQ.doc

Hi Rose,

The EPA has completed its review of the RTCs to *Draft Final Feasibility Study, LHAAP-50, Former Sump Water Tank, Group 4, Longhorn Army Ammunition Plant, Karnack, Texas.* The following are our comments.

---
EPA Comments on Army RTCs (LHAAP-50 DF FS RTC_EPA.doc):

1) Agree.
2) Agree.
3) Agree.
4) Agree.
5) Agree and Disagree: Reductions in a sampling regime occur after clear and convincing progress in the remediation. EPA recognizes that certain FS language is utilized for cost estimating purposes and that the monitoring program will be developed as part of the remedial design. Perhaps the Army may wish to go to FS language which integrates monitoring intervals of quarterly for the first 2 years then biannually until the five year review, to reflect a certain reality associated with evaluating MNA associated remedies.
6) Agree.
7) Agree.
8) Agree.
9) Agree and Disagree: There is no information to show that ethene production is occurring and/or increasing. For example, it could equally be presented that soil-sorption of the contaminants is occurring, and may have reached a saturation point. While EPA is not advocating such an example, it shows that the evidence presented is not clearly indicative of dechlorination. EPA would consider a chloride mass-balance or an isotope-selectivity study to be positive information to support the Army's position. In addition, EPA emphasizes that LUCs are a critical portion of this remedy. There is a concern about the 30-year time frame for the Army, given that the remedy is expected to require more than that time frame. Also, see related comment #5 (above).

Response to General Comments:
1) Agree.
2) Agree.

---

Stephen L. Tzhone
Superfund Remedial Project Manager
USEPA Region 6 (6SF-RA)
214.665.8409
tzhone.stephen@epa.gov

**RTCs, LHAAP-50 DF Feasibility Study**

**Srivastav, Praveen** to: Stephen Tzhone, Fay Duke 04/06/2009 09:55 AM

Cc: "Aaron K SWT Williams", "John R SWT Lambert", "Jones, Greg N", "Watson, Susan", "Everett, Kay", "Rose Zeiler"

---

Steve/Fay:

Please see attached responses to your comments on the DF Feasibility Study for LHAAP-50. Please call with any questions.

Thanks

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## Srivastav, Praveen

**From:** Fay Duke [FDUKE@tceq.state.tx.us]
**Sent:** Friday, April 17, 2009 5:20 PM
**To:** Stephen Tzhone; Srivastav, Praveen
**Cc:** Jones, Greg N; Everett, Kay; Watson, Susan; John R SWT Lambert; Rose Zeiler; Aaron K SWT Williams
**Subject:** Re: RTCs, LHAAP-50 DF Feasibility Study

Rose/Praveen,

The TCEQ has completed its review of the RTCs to Draft Final Feasibility Study, LHAAP-50. Rather than responding to each of the specific RTCs, we would like to first address two main issues that concerns us. We feel that the RTC did not adequately respond to our comments and concerns in these issues.

We continue to have concerns with the adequacy of the data in evaluating the center of mass of the contaminated groundwater plume. Based on the perchlorate investigations performed in 2001, the center of mass of the perchloarte plume is likely be located 100 feet down gradient of 50WW02 as documented the temporary well points installed at that time frame. Although the existing data and current well configuration is generally adequate to delineate the plume, the well configuration is not sufficient for remedy evaluation nor sufficient to conduct a conceptual design for cost estimation. For example, the MNA and ISB evaluation centers around 50WW02 instead of potentially higher concentration down gradient.
With respect to the MNA evaluation, we are not confident that natural attenuation without enhancement would remediate the site COC to acceptable levels. The concentration trend of 50WW02 indicates that some attenuation has occurred in the past. However, it is not clear how much of the perchlorate reduction is due to plume movement and how much is due to natural reduction. Additionally, the data collected in 2007 suggests that the reduction of the chlorinated ethene may be stalled. The geochemical data collected in 2007 suggests that the conditions of the shallow groundwater currently are not optimal for anaerobic reductive dechlorination. This is especially a concern for the TCE contamination since the complete degradation of the DCE and VC would require a much more reduced condition than what is currently at the site. Finally, it concerns us that in spite of the data, it is suggested that the contamination is being naturally attenuated perhaps not by reductive dechlorination but by other means. However data supporting those evaluations are not provided.
Finally, we recommend that MNA with enhancement such as adding substrates be considered.
Please contact me if you wish to discuss this.

Thanks, fd

Fay Duke (MC-136)
Remediation Division, TCEQ
PO Box 13087
Austin, Texas 78711-3087
512-239-2443
512-239-1212 (Fax)

>>> "Srivastav, Praveen" <Praveen.Srivastav@shawgrp.com> 4/6/2009 9:55 AM >>>
Steve/Fay:

Please see attached responses to your comments on the DF Feasibility Study for LHAAP-50. Please call with any questions.

Thanks

**Praveen Srivastav, PhD, PG, PMP**
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**From:** Tzhone.Stephen@epamail.epa.gov
**Sent:** Tuesday, December 08, 2009 1:29 PM
**To:** Zeiler, Rose Ms CIV USA OSA
**Cc:** Srivastav, Praveen; Williams, Aaron K SWT; Jones, Greg N; Lambert, John R SWT; Everett, Kay; Watson, Susan; Fay Duke; Burton.Terry@epamail.epa.gov
**Subject:** Longhorn: EPA Review of LHAAP-50 DF FS Latest Regulatory RTCs
**Attachments:** LHAAP-50 DF FS Addl EPA TCEQ Comments revised 10-13-09.pdf; LHAAP-50 DF FS TCEQ comments 041709.pdf; LHAAP-50 - DF FS RTC_EPA 040609.pdf; LHAAP-50 DF FS EPA comments 041609.pdf; LHAAP-50 DF FS RTC_TCEQ 040609.pdf

Hi Rose,

The EPA has completed its review of the *Army LHAAP-50 DF FS Latest Regulatory RTCs (email October 13, 2009)* and agree with all responses to comments. Please incorporate these responses to comments and finalize the LHAAP-50 Feasibility Study.

Stephen L. Tzhone
Superfund Remedial Project Manager
USEPA Region 6 (6SF-RA)
214.665.8409
tzhone.stephen@epa.gov

---

**From:** Srivastav, Praveen
**Sent:** Tuesday, October 13, 2009 4:08 PM
**To:** Stephen Tzhone; Fay Duke
**Cc:** Williams, Aaron K SWT; Zeiler, Rose Ms CIV USA OSA; Lambert, John R SWT; Jones, Greg N; Watson, Susan; Everett, Kay
**Subject:** FW: LHAAP-50 DF FS Latest Regulatory RTCs

Steve/Fay:

Please see attached responses to regulatory comments on the DF Feasibility Study for LHAAP-50. Please see e-mail below from Susan Watson for explanation regarding the attached files.

Please provide your concurrence or any questions at your earliest convenience so we can move forward with finalizing the FS.

Thanks

**Praveen Srivastav, PhD, PG**
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---

**From:** Watson, Susan
**Sent:** Tuesday, October 13, 2009 4:05 PM
**To:** Srivastav, Praveen
**Subject:** LHAAP-50 DF FS Latest Regulatory RTCs

Praveen,

The attached file (Item 5 below – LHAAP-50 DF FS RT Addl EPA TCEQ Comments revised 10-13-09.pdf) is ready for regulatory review. This file contains the latest responses to regulatory comments for LHAAP-50 DF FS. Also attached for information purposes are the various RTC files for LHAAP-50 (Items 1 through 4)in chronological order from oldest to most recent, as follows:

1. LHAAP-50 DF FS RTC EPA 040609.pdf – this file contains the original responses to EPA comments submitted on 04/06/09. – No change
2. LHAAP-50 DF FS RTC TCEQ 040609.pdf – this file contains the original responses to TCEQ comments submitted on 04/06/09. – No change
3. LHAAP-50 DF FS EPA comments 041609.pdf – this file contains EPA comments received on 4/16/09 in response to the RTCs (Item 1 above)
4. LHAAP-50 DF FS TCEQ comments 041709.pdf – this file contains TCEQ comments received on 4/17/09 in response to the RTCs (Item 2 above)
5. LHAAP-50 DF FS RT Addl EPA TCEQ Comments revised 10-13-09.pdf – this file contains the responses to the EPA and TCEQ comments received on 4/16/09 (Item 3 above) and 4/17/09 (Item 4 above), respectively.

Please call with any questions.

Thanks,

**Susan Watson, PE**
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**From:** Fay Duke [FDUKE@tceq.state.tx.us]
**Sent:** Friday, November 20, 2009 9:33 AM
**To:** Srivastav, Praveen; Zeiler, Rose MsCIV USA OSA
**Cc:** Everett, Kay; Jones, Greg N; Lambert, John R SWT; Tzhone, Stephen; Watson, Susan; Williams, Aaron K SWT
**Subject:** RE: FW: LHAAP-50 DF FS Latest Regulatory RTCs

Rose/Praveen,

The TCEQ completed its review of the RTCs to the LHAAP-50 DF FS and has no additional comments.

Regarding the RTC to LHAAP-16, we have a request. Many of the responses cannot be concur due to lack of information (assumed to be provided in the final FS). In order not to have another round of review, would you consider providing the results of the additional sampling (i.e. new wells.) and other major changes to the FS report?

Thanks, fd

Fay Duke (MC-136)
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512-239-2443
512-239-1212 (Fax)

>>> "Watson, Susan" <Susan.Watson@shawgrp.com> 10/20/2009 3:58 PM >>>
Fay,

Yes, the figure was missing. The attached file contains the RTC figure referenced in the 101309 comment resolution document. Additionally, we noted an error in the text, GPCLS-2 is noted as 186.7 feet MSL in the text, and it should be 186.69 feet MSL as indicated on the figure.

Please let me know if you have any additional questions.

**Susan Watson, PE**
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**From:** Fay Duke [mailto:FDUKE@tceq.state.tx.us]
**Sent:** Friday, October 16, 2009 5:20 PM
**To:** Srivastav, Praveen; Tzhone, Stephen
**Cc:** Everett, Kay; Jones, Greg N; Lambert, John R SWT; Watson, Susan; Williams, Aaron K SWT; Zeiler, Rose Ms CIV

USA OSA
**Subject:** Re: FW: LHAAP-50 DF FS Latest Regulatory RTCs

Praveen,

Are we missing a figure? The comment resolution document dated Oct.13, 2009 references a RTC figure. Can you please re-send it. Thanks, fd

>>> "Srivastav, Praveen" <Praveen.Srivastav@shawgrp.com> 10/13/2009 4:07 PM >>>
Steve/Fay:

Please see attached responses to regulatory comments on the DF Feasibility Study for LHAAP-50. Please see e-mail below from Susan Watson for explanation regarding the attached files.

Please provide your concurrence or any questions at your earliest convenience so we can move forward with finalizing the FS.

Thanks

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---

**From:** Watson, Susan
**Sent:** Tuesday, October 13, 2009 4:05 PM
**To:** Srivastav, Praveen
**Subject:** LHAAP-50 DF FS Latest Regulatory RTCs

Praveen,

The attached file (Item 5 below - LHAAP-50 DF FS RT Addl EPA TCEQ Comments revised 10-13-09.pdf) is ready for regulatory review. This file contains the latest responses to regulatory comments for LHAAP-50 DF FS. Also attached for information purposes are the various RTC files for LHAAP-50 (Items 1 through 4)in chronological order from oldest to most recent, as follows:

1. LHAAP-50 DF FS RTC EPA 040609.pdf - this file contains the original responses to EPA comments submitted on 04/06/09. - No change
2. LHAAP-50 DF FS RTC TCEQ 040609.pdf - this file contains the original responses to TCEQ comments submitted on 04/06/09. - No change
3. LHAAP-50 DF FS EPA comments 041609.pdf - this file contains EPA comments received on 4/16/09 in response to the RTCs (Item 1 above)
4. LHAAP-50 DF FS TCEQ comments 041709.pdf - this file contains TCEQ comments received on 4/17/09 in response to the RTCs (Item 2 above)

5. LHAAP-50 DF FS RT Addl EPA TCEQ Comments revised 10-13-09.pdf - this file contains the responses to the EPA and TCEQ comments received on 4/16/09 (Item 3 above) and 4/17/09 (Item 4 above), respectively.

Please call with any questions.

Thanks,

**Susan Watson, PE**
Project Engineer
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**LHAAP-50 Draft Final Feasibility Study Comment Resolution**
**October 13, 2009**

Shaw submitted responses to the USEPA and TCEQ comments on the LHAAP-50 Draft Final Feasibility Study on April 6, 2009. The USEPA and TCEQ reviewed these responses and agreed with some of the responses but had some additional comments as described in their emails dated April 16, 2009 (USEPA) and April 17, 2009 (TCEQ). The responses to comments dated April 6, 2009 and follow-up comments from EPA and TCEQ are attached.

Shaw and the Army concur with USEPA's additional comments on Nos. 5 and 9 as discussed in the April 27-28, 2009 meeting held in Austin at the TCEQ office. It was agreed that the sampling frequency for MNA will be quarterly for the first two years and then semiannual until the first 5-year review. Additionally, for the recommended MNA alternative, the data will be evaluated after 2 years of MNA sampling to determine if MNA is effective and should be continued. If MNA is found to not be effective after 2 years, in situ biotreatment will be performed as a contingent remedy to enhance the MNA.

Shaw and the Army note the concerns raised by TCEQ in the email dated April 17, 2009. The TCEQ's concern regarding the effectiveness of MNA will be addressed by implementation of a contingent remedy, as noted in response to comment 17. The TCEQ's concern regarding the perchlorate plume will be addressed as follows:

**One or more monitoring well(s) will be installed for MNA evaluation and the proposed location will be included in the remedial design. The purpose of the well(s) will be to determine if high perchlorate concentrations exist on the east side of the road where previous DPT sampling was conducted. Additional data from the well (s) will help to better define the plume concentrations and to evaluate MNA. Text will be added in Section 5.2.2.2 that two wells are assumed for cost estimating purposes (see TCEQ RTC No. 22).**

<u>Additional Information</u>

At the April 27-28, 2009 meeting, TCEQ requested the groundwater velocity and additional information to assess the impact to the creek from the contaminated groundwater at LHAAP-50.

- Groundwater velocity (Vx) is calculated by multiplying hydraulic conductivity (K) by groundwater gradient (I), then dividing by the porosity (n). The estimated porosity value for LHAAP-50 in the Final Modeling Report (Shaw, 2007) was 0.25.

  $$Vx = K * I / n$$

  Values for an average hydraulic conductivity (1.26E-4 cm/s) and groundwater gradient (0.0038 ft/ft) are also available from that report for LHAAP-50. Using these values, the groundwater velocity of 0.005 ft/day, or 2.0 ft/yr is calculated for LHAAP-50. Please note that the 2 ft/year velocity is based on the hydraulic conductivity and gradient across the site and does not take into account any changes in the hydraulic conductivity or porosity to the east. Since LHAAP-50 has been active for 54 years, using the 2 ft/year groundwater velocity would imply a plume length of approximately 108 feet, which is shorter than the estimated plume length indicated on Figure 2-2 of the FS.

- The bottom of the creek bed near LHAAP-50 is estimated to be approximately 185 to 186 feet MSL. This is based on the surveyed USGS rods at GPCLS-2 (186.7 ft MSL) and GPCLS-4 (183.29 ft MSL) as shown on the attached **RTC Figure**. By reviewing the **RTC Figure**, the groundwater may have been slightly above the bottom of the creek at times in the past. In March 2002 the groundwater elevations in 50WW01, 50WW02, and 50WW03 (STEP, 2005) are slightly above the approximate bottom of the creek. The creek sampling in January 2002 and June 2002 did not detect perchlorate in the creek water. In September 2002, the groundwater levels had fallen and were below the approximate bottom of the creek. In September 2002, perchlorate was not detected in the creek water. As shown below, the perchlorate concentrations in the creek do not seem to follow the rise and fall of groundwater elevations, i.e. the concentrations in the creek water rose after the groundwater elevation dropped to below the creek bottom.

The creek sampling data from GPW-1, near LHAAP-50, through 2007 is shown below.

| | | PARAMETER | Perchlorate | | |
|---|---|---|---|---|---|
| | | UNITS | ug/L | | |
| LOCATION | SAMPLE NO. | DATE | Result | Qual | ValQual |
| GPW-1 | GPW-1-000204 | 4-Feb-00 | 4 | | J |
| GPW-1 | GPW-1-000421 | 21-Apr-00 | 4 | < | U |
| GPW-1 | GPW-1-000808 | 8-Aug-00 | 4 | < | U |
| GPW-1 | GPW-1-001205 | 5-Dec-00 | 4 | < | UJ |
| GPW-1 | GPW-1-010717 | 17-Jul-01 | 4 | < | U |
| GPW-1 | GPW-1-011030 | 30-Oct-01 | 4 | < | UJ, L |
| GPW-1 | GPW-1-020115 | 15-Jan-02 | 4 | < | U |
| GPW-1 | GPW-1-020618 | 18-Jun-02 | 4 | < | U |
| GPW-1 | GPW-1-020926 | 26-Sep-02 | 4 | < | U |
| GPW-1 | GPW-1-021204 | 4-Dec-02 | 18.3 | | |
| GPW-1 | GPW-1-030213 | 13-Feb-03 | 18.6 | | |
| GPW-1 | GPW-1-030619 | 19-Jun-03 | 59.9 | | |
| GPW-1 | GPW-1-030619-FD | 19-Jun-03 | 57.1 | | |
| GPW-1 | GPW-1-040706 | 6-Jul-04 | 2.25 | | |
| GPW-1 | GPW-1-070515 | 15-May-07 | 1 | U | U |
| GPW-1 | GPW-1-070827 | 27-Aug-07 | 1 | U | U |
| GPW-1 | GPW-1-121707 | 17-Dec-07 | 10.7 | | |

Below is a table of the precipitation data from Marshall, Texas from 2002 and 2003.

| Precipitation | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2002 | 2.25 | 2.87 | 7.58 | 4.17 | 2.21 | 1.18 | 6.49 | 1.6 | 3.18 | 4.61 | 3.28 | 9.97 |
| 2003 | 0.43 | 8.73 | 1.37 | 1.25 | 0.89 | 10.26 | 1.31 | 1.89 | 2.39 | 2.17 | 2.68 | 2.77 |

A review of the precipitation data indicates that the months of heavy rainfall (December 2002, February 2003, and June 2003) correlate with the elevated perchlorate concentrations in the creek, which could be attributed to the runoff into the creek and a possible pathway of soil to surface water for perchlorate detections. This pathway will be mitigated by excavation and disposal of perchlorate-contaminated soil at LHAAP-50 and LHAAP-47 (Building 25C).

The original response to TCEQ's comment No. 5 concerning surface water will be revised as follows:

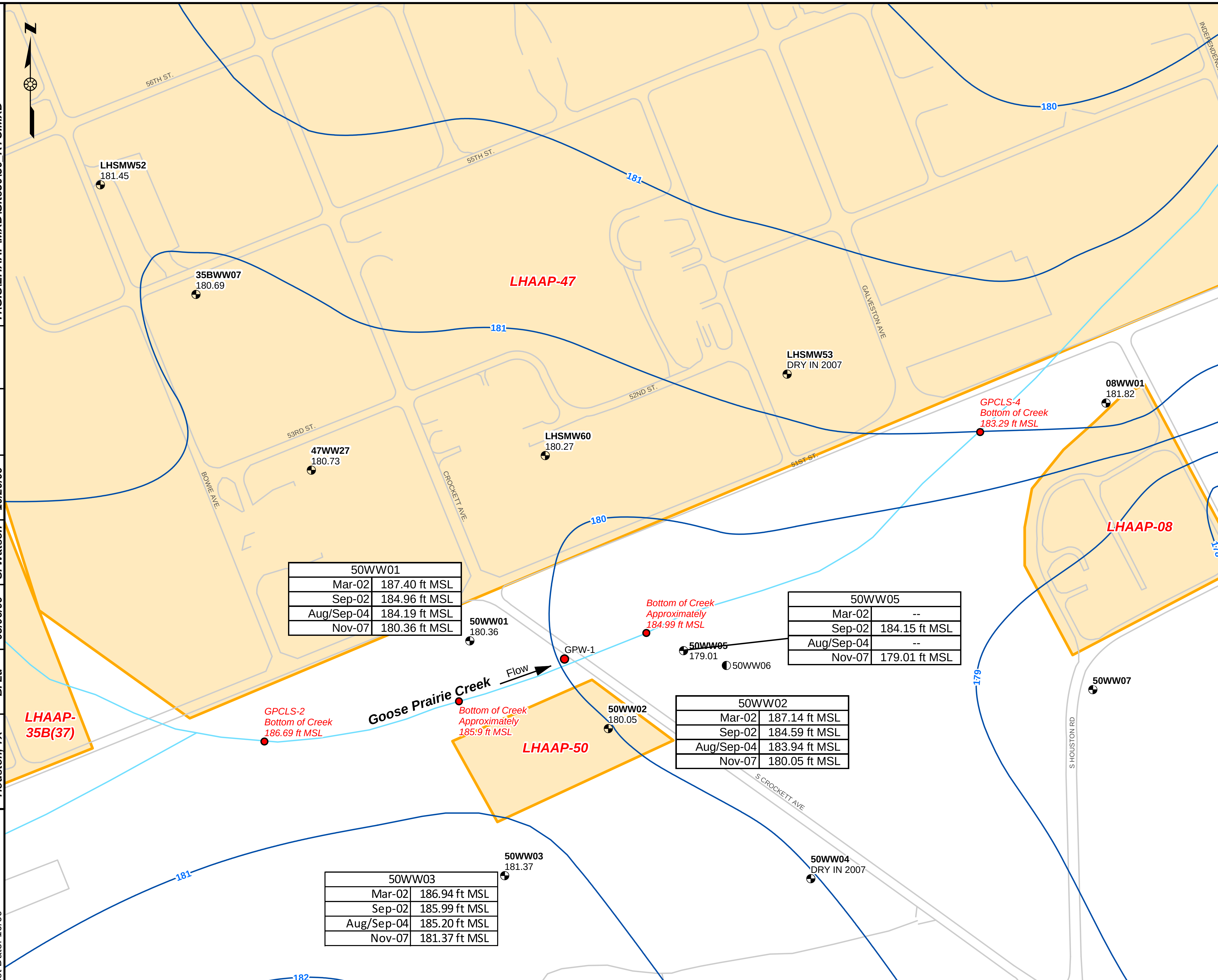
**Section 1.3.3.3** will be replaced with the following: "Sampling was conducted for perchlorate at selected locations along Goose Prairie Creek, including location GPW-1, located between LHAAP-50 and LHAAP-47. Historically, perchlorate levels in the creek have fluctuated from a max of 59.9 μg/L in June 2003 to a low of nondetect (or less than 1 μg/L), but have remained below the TCEQ surface water contact recreational level (395 μg/L). The perchlorate concentrations at GPW-1 have been below the groundwater MSC for residential use (GW-Res) (26 μg/L) in the last three quarters of sampling (since June 2008). GPW-3 is located approximately 3,500 feet downstream of GPW-1. Historically, perchlorate concentrations have been below the GW-Res at GPW-3. Thus, the water flowing through the creek at GPW-1 is not contaminating Caddo Lake above the GW-Res."

To address TCEQs concern about creek monitoring (Comment 16), the following will be added as monitoring under the excavation activities in the alternatives: "Semi-annual performance monitoring of Goose Prairie Creek adjacent to the LHAAP-50 will be conducted after excavation of the contaminated perchlorate pathway. The GPW-1 location will be sampled and a location upgradient of LHAAP-50 will be sampled. The upgradient location will be used to evaluate any contaminated runoff from the perchlorate contaminated site, LHAAP-47, located on the north side of the creek just west of LHAAP-50. Evaluation of this data will be included in the annual reports. The frequency and locations of sampling may be modified after evaluation of data. If perchlorate levels in the creek are consistently above the GW-Res after two years of monitoring, then additional evaluation will be conducted and any proposed actions will be included in the annual evaluation report to be submitted after year 2".

Also, as noted in the response to TCEQ comments 7 and 8, the modeling indicates that there would not be an impact to the creek assuming that the groundwater does reach the surface water. The uncertainties related to the modeling pointed out by TCEQ were addressed in the report by performing additional calculations in X and Y directions. Based on the creek elevation versus perchlorate concentration observations, the rainfall versus perchlorate concentrations, and the modeling; there is no evidence that the perchlorate contaminated groundwater is impacting or will impact the creek. Thus, it is proposed to not add the groundwater to surface water pathway as a remedial action objective.

Other Changes

As discussed during the monthly Managers' Meeting on August 18, 2009, Section 6.5, Recommendation, will be deleted.




| 50WW01 | |
|---|---|
| Mar-02 | 187.40 ft MSL |
| Sep-02 | 184.96 ft MSL |
| Aug/Sep-04 | 184.19 ft MSL |
| Nov-07 | 180.36 ft MSL |

| 50WW05 | |
|---|---|
| Mar-02 | -- |
| Sep-02 | 184.15 ft MSL |
| Aug/Sep-04 | -- |
| Nov-07 | 179.01 ft MSL |

| 50WW02 | |
|---|---|
| Mar-02 | 187.14 ft MSL |
| Sep-02 | 184.59 ft MSL |
| Aug/Sep-04 | 183.94 ft MSL |
| Nov-07 | 180.05 ft MSL |

| 50WW03 | |
|---|---|
| Mar-02 | 186.94 ft MSL |
| Sep-02 | 185.99 ft MSL |
| Aug/Sep-04 | 185.20 ft MSL |
| Nov-07 | 181.37 ft MSL |

**LEGEND**

- Shallow Monitoring Well
- Intermediate Monitoring Well
- Shallow Groundwater Elevation Contour
- Stream
- Road
- Site

**Note:**

Groundwater contour elevations collected in November - December 2007 were reported in feet. 50WW07 was installed in 2008; the groundwater contours were not developed using data from this well.

0 90 180 360 Feet

U.S. ARMY CORPS OF ENGINEERS
TULSA DISTRICT
TULSA, OKLAHOMA

RTC FIGURE
CREEKBED GROUNDWATER ELEVATION MAP
(SHALLOW ZONE)
LHAAP-50 FEASIBILITY STUDY
LONGHORN ARMY AMMUNITION PLANT
KARNACK, TEXAS

FILE PATH: T:\GIS\LHAAP\MXD\Site50\50_RTC.MXD
APPROVED BY
CHECKED BY: S. Watson 10/20/09
DRAWN BY: B. Lu 05/06/09
OFFICE: Houston, TX

Plot Date: 10/09

**From:** Fay Duke [FDUKE@tceq.state.tx.us]
**Sent:** Friday, November 20, 2009 9:33 AM
**To:** Srivastav, Praveen; Zeiler, Rose MsCIV USA OSA
**Cc:** Everett, Kay; Jones, Greg N; Lambert, John R SWT; Tzhone, Stephen; Watson, Susan; Williams, Aaron K SWT
**Subject:** RE: FW: LHAAP-50 DF FS Latest Regulatory RTCs

Rose/Praveen,

The TCEQ completed its review of the RTCs to the LHAAP-50 DF FS and has no additional comments.

Regarding the RTC to LHAAP-16, we have a request. Many of the responses cannot be concur due to lack of information (assumed to be provided in the final FS). In order not to have another round of review, would you consider providing the results of the additional sampling (i.e. new wells.) and other major changes to the FS report?

Thanks, fd

Fay Duke (MC-136)
Remediation Division, TCEQ
PO Box 13087
Austin, Texas 78711-3087
512-239-2443
512-239-1212 (Fax)

>>> "Watson, Susan" <Susan.Watson@shawgrp.com> 10/20/2009 3:58 PM >>>
Fay,

Yes, the figure was missing. The attached file contains the RTC figure referenced in the 101309 comment resolution document. Additionally, we noted an error in the text, GPCLS-2 is noted as 186.7 feet MSL in the text, and it should be 186.69 feet MSL as indicated on the figure.

Please let me know if you have any additional questions.

**Susan Watson, PE**
Project Engineer
Applied Science and Engineering
Shaw Environmental & Infrastructure Group
3010 Briarpark Drive, Suite 400
Houston, TX 77042
713.996.4407 direct
713.996.4436 fax
susan.watson@shawgrp.com

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**From:** Fay Duke [mailto:FDUKE@tceq.state.tx.us]
**Sent:** Friday, October 16, 2009 5:20 PM
**To:** Srivastav, Praveen; Tzhone, Stephen
**Cc:** Everett, Kay; Jones, Greg N; Lambert, John R SWT; Watson, Susan; Williams, Aaron K SWT; Zeiler, Rose Ms CIV

USA OSA
**Subject:** Re: FW: LHAAP-50 DF FS Latest Regulatory RTCs

Praveen,

Are we missing a figure? The comment resolution document dated Oct.13, 2009 references a RTC figure. Can you please re-send it. Thanks, fd

>>> "Srivastav, Praveen" <Praveen.Srivastav@shawgrp.com> 10/13/2009 4:07 PM >>>
Steve/Fay:

Please see attached responses to regulatory comments on the DF Feasibility Study for LHAAP-50. Please see e-mail below from Susan Watson for explanation regarding the attached files.

Please provide your concurrence or any questions at your earliest convenience so we can move forward with finalizing the FS.

Thanks

**Praveen Srivastav, PhD, PG**
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Federal Division/Project Management
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**From:** Watson, Susan
**Sent:** Tuesday, October 13, 2009 4:05 PM
**To:** Srivastav, Praveen
**Subject:** LHAAP-50 DF FS Latest Regulatory RTCs

Praveen,

The attached file (Item 5 below - LHAAP-50 DF FS RT Addl EPA TCEQ Comments revised 10-13-09.pdf) is ready for regulatory review. This file contains the latest responses to regulatory comments for LHAAP-50 DF FS. Also attached for information purposes are the various RTC files for LHAAP-50 (Items 1 through 4)in chronological order from oldest to most recent, as follows:

1. LHAAP-50 DF FS RTC EPA 040609.pdf - this file contains the original responses to EPA comments submitted on 04/06/09. - No change
2. LHAAP-50 DF FS RTC TCEQ 040609.pdf - this file contains the original responses to TCEQ comments submitted on 04/06/09. - No change
3. LHAAP-50 DF FS EPA comments 041609.pdf - this file contains EPA comments received on 4/16/09 in response to the RTCs (Item 1 above)
4. LHAAP-50 DF FS TCEQ comments 041709.pdf - this file contains TCEQ comments received on 4/17/09 in response to the RTCs (Item 2 above)

5. LHAAP-50 DF FS RT Addl EPA TCEQ Comments revised 10-13-09.pdf - this file contains the responses to the EPA and TCEQ comments received on 4/16/09 (Item 3 above) and 4/17/09 (Item 4 above), respectively.

Please call with any questions.

Thanks,

**Susan Watson, PE**
Project Engineer
Applied Science and Engineering
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______________________________________ The Shaw Group Inc. http://www.shawgrp.com

**From:** Tzhone.Stephen@epamail.epa.gov
**Sent:** Tuesday, December 08, 2009 1:29 PM
**To:** Zeiler, Rose Ms CIV USA OSA
**Cc:** Srivastav, Praveen; Williams, Aaron K SWT; Jones, Greg N; Lambert, John R SWT; Everett, Kay; Watson, Susan; Fay Duke; Burton.Terry@epamail.epa.gov
**Subject:** Longhorn: EPA Review of LHAAP-50 DF FS Latest Regulatory RTCs
**Attachments:** LHAAP-50 DF FS Addl EPA TCEQ Comments revised 10-13-09.pdf; LHAAP-50 DF FS TCEQ comments 041709.pdf; LHAAP-50 - DF FS RTC_EPA 040609.pdf; LHAAP-50 DF FS EPA comments 041609.pdf; LHAAP-50 DF FS RTC_TCEQ 040609.pdf

Hi Rose,

The EPA has completed its review of the *Army LHAAP-50 DF FS Latest Regulatory RTCs (email October 13, 2009)* and agree with all responses to comments. Please incorporate these responses to comments and finalize the LHAAP-50 Feasibility Study.

Stephen L. Tzhone
Superfund Remedial Project Manager
USEPA Region 6 (6SF-RA)
214.665.8409
tzhone.stephen@epa.gov

---

**From:** Srivastav, Praveen
**Sent:** Tuesday, October 13, 2009 4:08 PM
**To:** Stephen Tzhone; Fay Duke
**Cc:** Williams, Aaron K SWT; Zeiler, Rose Ms CIV USA OSA; Lambert, John R SWT; Jones, Greg N; Watson, Susan; Everett, Kay
**Subject:** FW: LHAAP-50 DF FS Latest Regulatory RTCs

Steve/Fay:

Please see attached responses to regulatory comments on the DF Feasibility Study for LHAAP-50. Please see e-mail below from Susan Watson for explanation regarding the attached files.

Please provide your concurrence or any questions at your earliest convenience so we can move forward with finalizing the FS.

Thanks

**Praveen Srivastav, PhD, PG**
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---

**From:** Watson, Susan
**Sent:** Tuesday, October 13, 2009 4:05 PM
**To:** Srivastav, Praveen
**Subject:** LHAAP-50 DF FS Latest Regulatory RTCs

Praveen,

The attached file (Item 5 below – LHAAP-50 DF FS RT Addl EPA TCEQ Comments revised 10-13-09.pdf) is ready for regulatory review. This file contains the latest responses to regulatory comments for LHAAP-50 DF FS. Also attached for information purposes are the various RTC files for LHAAP-50 (Items 1 through 4)in chronological order from oldest to most recent, as follows:

1. LHAAP-50 DF FS RTC EPA 040609.pdf – this file contains the original responses to EPA comments submitted on 04/06/09. – No change
2. LHAAP-50 DF FS RTC TCEQ 040609.pdf – this file contains the original responses to TCEQ comments submitted on 04/06/09. – No change
3. LHAAP-50 DF FS EPA comments 041609.pdf – this file contains EPA comments received on 4/16/09 in response to the RTCs (Item 1 above)
4. LHAAP-50 DF FS TCEQ comments 041709.pdf – this file contains TCEQ comments received on 4/17/09 in response to the RTCs (Item 2 above)
5. LHAAP-50 DF FS RT Addl EPA TCEQ Comments revised 10-13-09.pdf – this file contains the responses to the EPA and TCEQ comments received on 4/16/09 (Item 3 above) and 4/17/09 (Item 4 above), respectively.

Please call with any questions.

Thanks,

**Susan Watson, PE**
Project Engineer
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00078430

*FINAL*
# FEASIBILITY STUDY
# LHAAP-50, FORMER SUMP WATER TANK, GROUP 4
# LONGHORN ARMY AMMUNITION PLANT
# KARNACK, TEXAS

**Prepared for**

**U.S. Army Corps of Engineers**
**Tulsa District**
**1645 South 101st Avenue**
**Tulsa, Oklahoma**

**Prepared by**

**Shaw Environmental, Inc.**
**1401 Enclave Parkway, Suite 250**
**Houston, Texas 77077**

**Contract No. W912QR-04-D-0027, Task Order No. DS02**
**Shaw Project No. 117591**

**December 2009**

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## Acronyms and Abbreviations

| | |
|---|---|
| µg/kg | micrograms per kilogram |
| µg/L | micrograms per liter |
| 2,3,7,8-TCDD | 2,3,7,8-tetrachlorodibenzo-p-dioxin |
| AOC | area of contamination |
| ARARs | applicable or relevant and appropriate requirements |
| Army | U.S. Department of the Army |
| AST | aboveground storage tank |
| BERA | Baseline Ecological Risk Assessment |
| bgs | below ground surface |
| CERCLA | Comprehensive Environmental Response, Compensation, and Liability Act of 1980 |
| CFR | Code of Federal Regulations |
| CLI | Caddo Lake Institute |
| cm/sec | centimeters per second |
| COCs | chemicals of concern |
| CWA | Clean Water Act of 1972 |
| DCA | dichloroethane |
| DCE | dichloroethene |
| ECOP | environmental condition of property |
| FFA | Federal Facility Agreement |
| FR | Federal Register |
| FS | Feasibility Study |
| GAC | granulated activated carbon |
| GRAs | general response actions |
| GW-Ind | groundwater MSC for industrial use |
| GWP-Ind | soil MSC for industrial use based on groundwater protection |
| GW-Res | groundwater MSC for residential use |
| HI | hazard index |
| HQ | hazard quotient |
| Jacobs | Jacobs Engineering Group, Inc. |
| LHAAP | Longhorn Army Ammunition Plant |
| LHAAP-50 | former Sump Water Tank Area |
| LTM | long-term monitoring |
| LUC | land use control |
| MARC | Multiple Award Remediation Contract |
| MCL | maximum contaminant level |
| mg/kg | milligrams per kilogram |
| MNA | monitored natural attenuation |

## Acronyms and Abbreviations (continued)

| | |
|---|---|
| MSC | medium-specific concentration |
| NCP | National Oil and Hazardous Substances Pollution Contingency Plan |
| NPDES | National Pollutant Discharge Elimination System |
| NPL | National Priorities List |
| O&M | operation and maintenance |
| OSHA | Occupational Safety and Health Administration |
| PCB | polychlorinated biphenyl |
| PCE | tetrachloroethene |
| pH | potential hydrogen ion concentration |
| PP | Proposed Plan |
| PPE | personal protective equipment |
| RAOs | remedial action objectives |
| RCRA | Resource Conservation and Recovery Act |
| RI | Remedial Investigation |
| ROD | Record of Decision |
| RRS | Risk Reduction Standard |
| SAI-Ind | soil MSC for industrial use based on inhalation, ingestion, and dermal contact |
| SDWA | Safe Drinking Water Act |
| Shaw | Shaw Environmental, Inc. |
| SI | site investigation |
| STEP | Solutions to Environmental Problems |
| Sverdrup | Sverdrup Environmental, Inc. |
| SVOC | semivolatile organic compound |
| TAC | Texas Administrative Code |
| TBC | to-be-considered |
| TCA | trichloroethane |
| TCE | trichloroethene |
| TCEQ | Texas Commission on Environmental Quality |
| TNT | trinitrotoluene |
| TOC | total organic carbon |
| TWQS | Texas Water Quality Standards |
| USACE | U.S. Army Corps of Engineers |
| USC | United States Code |
| USEPA | U.S. Environmental Protection Agency |
| USFWS | U.S. Fish and Wildlife Service |
| VC | vinyl chloride |
| VOC | volatile organic compound |
| ZVM | zero-valence metals |

# *Executive Summary*

This Feasibility Study (FS) was prepared by Shaw Environmental, Inc. (Shaw), for the U.S. Army Corps of Engineers (USACE), Tulsa District, under the Louisville District's Multiple Award Remediation Contract (MARC), Contract No. W912QR-04-D-0027, for remediation activities at the Longhorn Army Ammunition Plant (LHAAP) in Karnack, Texas. This FS presents the analysis of remediation alternatives for the former Sump Water Tank Area designated as LHAAP-50 in accordance with the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA), and provides for the remedy selection consistent with the intended use of LHAAP as a wildlife refuge.

LHAAP is an inactive, government-owned, formerly contractor-operated and maintained Department of Defense facility located in central-east Texas. LHAAP-50, the Former Sump Water Tank, is a 1-acre industrial area located in the north-central portion of LHAAP. Historically, LHAAP-50 contained an aboveground storage tank (AST) to which industrial wastewater was transported from 1955 to 1988 (Plexus, 2005). The wastewater was collected from industrial waste production sumps located at various operating buildings throughout the LHAAP. If the nature of the operations at a building was such that contamination in the sump was considered negligible, the sump was allowed to overflow. All other sumps were emptied, and their wastewater was transported to the AST at LHAAP-50. After the solids were filtered, discharges from this tank were made upstream of the bridge on Crockett Avenue into Goose Prairie Creek. The flow in the creek was sufficient to dilute the water to safe levels (Jacobs Engineering Group, Inc. [Jacobs], 2002). The AST has since been removed (Jacobs, 2002).

LHAAP was placed on the National Priorities List (NPL) on August 9, 1990. A Federal Facility Agreement (FFA) became effective December 30, 1991 among U.S. Environmental Protection Agency (USEPA), the U.S. Department of the Army (Army), and the Texas Natural Resources Conservation Commission (TNRCC), now the Texas Commission on Environmental Quality (TCEQ). LHAAP-50 was not one of the originally listed NPL sites; however, it is being managed in the same manner because of the presence of contaminated groundwater under the site. The site has been added to the list of NPL sites at LHAAP with concurrence from the Army and USEPA Headquarters.

The entire installation was under the control of the U.S. Department of the Army (Army) until May 5, 2004, when approximately two-thirds of the property was transferred to the U.S. Department of Interior's Fish and Wildlife Service (USFWS). The property transfer process is continuing as response is completed at smaller parcels of land. The U.S. Army Environmental Command provides funding for the environmental remedial activities at LHAAP. The Base

Realignment and Closure Office are responsible for all aspects of LHAAP including the environmental program operations and land transfer.

Goose Prairie Creek is the nearest significant surface water body to LHAAP-50. Runoff from LHAAP-50 drains into Goose Prairie Creek, which eventually flows into Caddo Lake (a drinking water source for multiple communities).

Sampling specific to the LHAAP-50 media was conducted during site investigation, Phase III Remedial Investigations (RIs) by Jacobs, and during additional investigations through 2008. The baseline human health risk assessment for the Group 4 Sites (Jacobs, 2003), which was based on data from the RIs and additional investigations through 2001, determined that the groundwater at LHAAP-50 poses an unacceptable cancer risk and non-cancer hazard for a hypothetical future maintenance worker under an industrial scenario. Though the soil at LHAAP-50 does not pose a risk to human health or ecological receptors, it is contaminated with perchlorate at levels that could potentially migrate into the groundwater. The Installation-Wide Baseline Ecological Risk Assessment did not identify any potential risk to ecological receptors (Shaw, 2007a).

The contaminants, identified to pose risk, were detected in groundwater at concentrations exceeding their respective maximum contaminant levels (MCLs) or the groundwater medium-specific concentration for industrial use (perchlorate only) and are considered to be a chemical of concern (COC) as follows:

- Trichloroethene
- Vinyl chloride
- 1,1-dichloroethene
- 1,2-dichloroethane
- Tetrachloroethene
- Perchlorate

Approximately 99.9 percent of the total cancer risk in groundwater was contributed by tetrachloroethene (PCE) and trichloroethene (TCE) and their daughter products, 1,1-dichloroethene (DCE), 1,2-dichloroethane, and vinyl chloride (VC). The primary contributor to the carcinogenic risk is TCE (77 percent of the total groundwater risk and 27 percent of the non-carcinogenic risk). Perchlorate accounts for 64 percent of the non-carcinogenic risk.

The remedial action objectives (RAOs) established within this FS address potential human health risks associated with LHAAP-50 groundwater as well as addressing soil that contains levels of perchlorate at concentrations that have the potential to cause further deterioration of the groundwater quality. The Army recognizes U.S. Environmental Protection Agency's policy to return usable water to its potential beneficial use, based upon the non-binding programmatic expectation in the National Oil and Hazardous Substances Pollution Contingency Plan (NCP).

The RAOs for LHAAP-50, which take into account the future use of the site as a wildlife refuge, are:

- Protect human health for the hypothetical future maintenance worker by preventing exposure to groundwater contaminated with VOCs and perchlorate
- Protect human health by preventing further potential degradation of groundwater and surface water from soil contaminated with perchlorate
- Return groundwater to its potential beneficial use, wherever practicable, within a reasonable time period given the particular site circumstances.

The FS identifies and screens remedial technologies and associated process options that may be appropriate for satisfying the RAO for LHAAP-50 with respect to effectiveness, implementability, and cost. Select remedial technologies and process options were carried forward after the initial screening and were combined to develop the following remedial alternatives for LHAAP-50:

- **Alternative 1 – No Action.** Leaves the contaminated groundwater and soil in place with no remedial action or additional measures to prevent exposure to the COCs, and serves as a baseline for comparison with the other alternatives. A No Action alternative is required under CERCLA.
- **Alternative 2 – Excavation, Monitored Natural Attenuation, Land Use Controls.** Excavates soil with perchlorate levels at concentrations that may impact groundwater. Implements a monitored natural attenuation program (MNA) for natural degradation of COCs in the groundwater to cleanup levels. Implements land use controls (LUCs) until proposed cleanup levels are met.
- **Alternative 3 – Excavation, In Situ Bioremediation, Land Use Controls (Short Term).** In situ bioremediation is used in a target area of highest concentrations (i.e., the area around monitoring well 50WW02) to reduce the timeframe until contaminant levels in groundwater meet cleanup levels. In addition, soils with perchlorate levels present at concentrations that may migrate to groundwater would be removed. Implements LUCs until proposed cleanup levels are met.

Each alternative was evaluated against CERCLA criteria to provide a basis for selecting a preferred alternative in the follow-on Proposed Plan (PP) and Record of Decision (ROD) documents.

**Table ES-1** summarizes the comparative analysis of the alternatives presented in this study. Two additional criteria, State acceptance and community acceptance, will be evaluated during the PP stage.

**Table ES-1**
**Comparative Analysis of Alternatives**

| Comparative Analysis of Alternatives Criteria | Alternative 1<br>No Action | Alternative 2<br>Excavation, Monitored Natural Attenuation with Land Use Controls | Alternative 3<br>Excavation, In Situ Bioremediation, Land Use Controls |
|---|---|---|---|
| Overall protection of human health and the environment | No protection. Does not achieve RAO. | Achieves RAO. Protection of human health and environment provided by maintenance of land use controls. MNA activities would demonstrate that degradation of plume is occurring. Land use controls in place until cleanup levels are met. Removal of soil with concentrations of perchlorate above cleanup levels would prevent future migration from soil to groundwater and surface water. | Achieves RAO. Protection of human health and environment provided by remediation of groundwater COCs in a target area. Land use controls in place indefinitely. Removal of soil with concentrations of perchlorate above cleanup levels would prevent future migration from soil to groundwater and surface water. |
| Compliance with ARARs | Does not comply with chemical-specific ARARs or TBC guidance for perchlorate. | Complies with ARARs. | Complies with ARARs. |
| Long-term effectiveness and permanence | Not effective. | Decrease in COC concentration and presence of degradation products suggests that contaminants are degrading naturally. To be confirmed by MNA sampling following remedy selection.<br>Land use controls would be effective and reliable so long as they are maintained.<br>Excavation of soil is effective long-term and permanent as contamination would be removed from the site and placed in a permitted landfill. | Should be effective and permanent; however, uncertainty exists concerning the degree to which the alternative will be effectiveness in enhancing the natural biological processing occurring at the site. Pilot testing may be required prior to implementation. May require multiple treatments. MNA will be implemented in untreated areas of the plume.<br>Land use controls would be effective and reliable so long as they are maintained.<br>Excavation of soils is long-term effective and permanent as contamination would be removed from the site and placed in a permitted landfill. |
| Reduction of TMV through treatment | No reduction. | No active remediation would be performed for groundwater. However, a reduction in TMV would be provided through natural biodegradation processes that are occurring in the aquifer. In addition, removal of contaminated soils would provide a reduction in the mobility of contaminants in soil. | Provides permanent reduction in TMV in the target area provided conditions are favorable. In addition, removal of contaminated soils would provide a reduction in the mobility of contaminants in soil. |

**Table ES-1 (*Continued*)**
**Comparative Analysis of Alternatives**

| Comparative Analysis of Alternatives Criteria | Alternative 1 No Action | Alternative 2 Excavation, Monitored Natural Attenuation with Land Use Controls | Alternative 3 Excavation, In Situ Bioremediation, Land Use Controls |
|---|---|---|---|
| Short-term effectiveness | No short-term impacts. | Minimal impacts to the community, workers, or the environment from short-term activities. Provides almost immediate protection. | Minimal impacts to the community, workers, or the environment from short-term activities. Provides almost immediate protection. |
| Implementability | Inherently implementable. | Readily implemented. | Readily implemented. Specialized knowledge required for implementation. |
| • Capital | $0 | $215,000 | $402,000 |
| • O&M | $0 | $424,000 | $512,000 |
| • Present worth | $0 | $639,000 | $914,000 |

Notes and Acronyms:

Costs rounded to nearest thousand dollars

ARARs applicable or relevant and appropriate requirements
COCs chemicals of concern
MNA monitored natural attenuation
O&M operations and maintenance
RAO remedial action objectives
TBC to be considered
TMV toxicity, mobility, or volume

# 1.0 Introduction

This Feasibility Study (FS) was prepared by Shaw Environmental, Inc. (Shaw), for the U.S. Army Corps of Engineers (USACE), Tulsa District, under the Louisville District's Multiple Award Remediation Contract (MARC) Contract No. W912QR-04-D-0027, for remediation activities on the Longhorn Army Ammunition Plant (LHAAP) in Karnack, Texas. This FS presents the analysis of remediation alternatives for the former Sump Water Tank Area designated as LHAAP-50 in accordance with the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA), and provides the basis for remedy selection consistent with the intended future use of LHAAP as a wildlife refuge.

The U.S. Army Environmental Command provides funding for the environmental remedial activities. The Base Realignment and Closure Division are responsible for all aspects of LHAAP including the environmental program, operations, and land transfer.

## 1.1 Purpose and Organization of Report

Environmental cleanup decision-making under CERCLA follows a prescribed sequence: Remedial Investigation (RI), FS, Proposed Plan (PP), and Record of Decision (ROD). The RI serves as the mechanism for collecting data to characterize site conditions, determine the nature and extent of the contamination, and assess risks to human health and the environment from this contamination. LHAAP-50 was designated as a Group 4 site in previous investigations. This investigatory element of decision making for the Group 4 sites has been completed and documented in the RI report (Jacobs Engineering Group, Inc. [Jacobs], 2002), the baseline human health risk assessment (Jacobs, 2003), the environmental site assessment (Plexus, 2005), the data gaps investigation (Shaw 2007a), modeling report (Shaw, 2007b), and the monitored natural attenuation evaluation (Appendix A). A new well was installed in 2008, and the data is included in Appendix B. No human health risk or hazard to a hypothetical future maintenance worker was identified from the soil at LHAAP-50, but a non-carcinogenic hazard and carcinogenic risk was identified from the groundwater. The human health risk was evaluated in the final Baseline Human Health and Screening Ecological Risk Assessment for the Group 4 sites (Jacobs, 2003). The ecological risk was evaluated in the Installation-Wide Baseline Ecological Risk Assessment (BERA) (Shaw, 2007c). No potential risk to ecological receptors from the LHAAP-50 media was identified.

This FS takes the next step of identifying and evaluating remedial solutions. The environmental problems identified for LHAAP-50 are primarily volatile organic compounds (VOC) and perchlorate contamination in the shallow groundwater. Even though perchlorate is not a

Resource Conservation and Recovery Act (RCRA) or CERCLA waste, it is an emerging contaminant and is addressed in this FS. The formulation of viable alternatives involves defining remedial action objectives (RAOs), general response actions, volumes or area of media to be addressed, and potentially applicable technologies and process options. After a reasonable number of appropriate alternatives have been formulated, the alternatives undergo a detailed analysis using nine established evaluation criteria. The detailed analysis profiles individual alternatives against the criteria and compares them with each other to gauge their relative performance. Each alternative that makes it to this stage of the analysis, with the exception of the required "No Action" alternative, is expected to be protective of human health and compliant with applicable or relevant and appropriate requirements (ARARs) (unless a waiver is justified), both threshold requirements under CERCLA. The alternatives developed in this FS address the media and chemicals of concern (COCs) at LHAAP-50 through combinations of source control and groundwater actions.

The preferred alternative for LHAAP-50 will be presented in the PP. The PP will briefly summarize the alternatives studied in this FS, highlighting the key factors that led to identifying the preferred alternative. The U.S. Department of the Army (Army) will submit the PP to the regulatory agencies, Texas Commission on Environmental Quality (TCEQ) and the U.S. Environmental Protection Agency (USEPA), and then the public for review. After this review, the Army will release a ROD that documents the selected remedy, certifies that the remedy selection process was carried out in accordance with CERCLA, and addresses public comments on the PP. Relevant documentation, including the RI, FS, and subsequent documents, are or will be available to the public in the Administrative Record for this project. The Administrative Record is housed at LHAAP and at the Marshall Public Library in Marshall, Texas.

## *1.2 Longhorn Army Ammunition Plant Background*

### *1.2.1 Site Description*

The LHAAP is an inactive, government-owned, formerly contractor-operated and -maintained industrial facility located in central-east Texas in the northeastern corner of Harrison County. The former installation occupied nearly 8,416 acres between State Highway 43 at Karnack, Texas, and the western shore of Caddo Lake as shown in **Figure 1-1**. The nearest cities are Marshall, Texas, approximately 14 miles to the southwest, and Shreveport, Louisiana, approximately 40 miles to the east. Caddo Lake, a large freshwater lake situated on the Texas-Louisiana border, bounds LHAAP to the north and east. The industries in the surrounding area consist of agriculture, timber, oil and natural gas production, and recreation.

LHAAP-50 is located in the north-central portion of LHAAP and covers an area of approximately 1 acre (**Figure 1-2**). The site is bound by Goose Prairie Creek to the north and by Crockett Avenue to the northeast. LHAAP-47 is located north of LHAAP-50 and LHAAP-08 is to the east. **Figure 1-3** shows the current site boundary. The northeastern half of LHAAP-50 is an open area of grass and brush that is bounded by South Crockett Avenue to the northeast. The southwestern half of the site is an area of heavy timber bounded by a drainage ditch to the west, a railroad spur to the south, and Goose Prairie Creek to the north. Two gravel access lanes connect LHAAP-50 to South Crockett Avenue. Runoff from the northeastern half of the site is generally toward the northeast. Runoff is collected by a drainage ditch to the northeast that runs parallel to South Crockett Avenue and eventually joins Goose Prairie Creek. Runoff from the remainder of the site is toward the north directly into Goose Prairie Creek. Runoff is collected to the west by a drainage ditch that carries the runoff north into Goose Prairie Creek.

Six monitoring wells have been installed at LHAAP-50 in the shallow zone, at a depth of approximately 20 feet below grade. One well has been installed in the intermediate zone at approximately 55 feet below ground surface (bgs). The monitoring well locations at LHAAP-50 and the adjacent wells from surrounding sites are shown on **Figure 1-3**. There are no wells completed in the deep saturated zone. Based on the 2007 potentiometric surface map for LHAAP production area, the groundwater flow direction in the shallow saturated zone below LHAAP-50 is to the east-northeast as shown on Figure 1-4. Rising head slug tests were performed on all wells at LHAAP-50 to calculate hydraulic conductivity values using the Bouwer-Rice method. The hydraulic conductivity values for the shallow saturated zone at LHAAP-50 ranged from $5.5 \times 10^{-5}$ centimeters per second (cm/sec) at well 50WW04 to $1.9 \times 10^{-4}$ cm/sec at well 50WW03 (Jacobs, 2002).

General soil and geologic maps indicate that the site is situated on the outcrop of the Wilcox Group. The Wilcox Group materials at the site generally consist of a few feet of residually derived soils overlying silts and clays. Surficial soils range from 0 to 2 feet thick and are composed of brown, silty sand grading into gray silt. This material is underlain by yellowish-brown to gray silt and clay with alternating layers of sandy clays and silty clays. The alternating layers are present from 8 to 11 feet bgs in borings to the south and up to 18 feet bgs at boring 50WW01 to the north. At 50WW02, a fine grain sand was observed in the silty clay where the well was screened. A cross-section of the site is shown in **Figure 1-5**.

### *1.2.2 History*

LHAAP was established in December 1941, near the beginning of World War II, when the Army issued a contract to build a six-line production facility for manufacturing trinitrotoluene (TNT). Various media have been contaminated by past industrial operations and waste management practices at LHAAP. Industrial operations involved the use of secondary explosives, rocket motor propellants, and various pyrotechnics, such as illuminating and signal flares and ammunition. Explosives included TNT and black powder. Typical composite propellants were composed of a rubber binder, an oxidizer such as ammonium perchlorate, and a powdered metal fuel such as aluminum. Pyrotechnics were generally composed of an inorganic oxidizer, such as sodium nitrate, a metal powder such as magnesium, and a binder. Other materials used in the industrial operations included acids, lubricants, and solvents, particularly trichloroethene (TCE) and methylene chloride. Waste management included sanitary wastewater treatment, industrial wastewater treatment, holding/evaporation ponds, storm water drainage, sanitary and contaminated waste landfills, and demolition/burning grounds. Discharges and releases to surface water, groundwater, and other secondary media have occurred from the historical operations and practices.

LHAAP was placed on the National Priorities List (NPL) August 9, 1990. A Federal Facility Agreement (FFA) among the USEPA, the Army, and the Texas Natural Resources Conservation Commission, now the TCEQ, became effective December 30, 1991. LHAAP became inactive in July 1997, and a year later the Army issued a contract to remove salvageable property. On May 5, 2004, the Army transferred approximately 5,032 acres to the U.S. Fish and Wildlife Service (USFWS) for management as the Caddo Lake National Wildlife Refuge. Almost 2,000 acres have been transferred to the USFWS since the initial transfer and the process will continue as response is completed at individual sites. The remaining land is under the Army's control and includes the Group 2 and 4 sites currently undergoing RI/FS studies. The Army intends to transfer this land to the USFWS after the environmental response is completed.

LHAAP-50 contained an aboveground storage tank (AST) which received industrial wastewater from various waste production sumps throughout LHAAP from 1955 to 1988 (Plexus, 2005). LHAAP-50 was not originally listed as an NPL site in FFA; however, the Army and regulatory agencies have concurred that the site groundwater impact is of NPL caliber. As described in the Longhorn Missile publication dated 15 September 1966, all operating buildings at the LHAAP installation were provided with individual concrete sumps to collect industrial wastewater (Jacobs, 2002). If the nature of the operations was such that contamination was considered negligible, the sump was permitted to overflow and drain into the drainage ditches. All other sumps were emptied and their wastewater transported by truck to a 47,000-gallon AST located at LHAAP-50. Discharges from this storage tank were made upstream of the bridge on Crockett Avenue, which crosses Goose Prairie Creek just south of 51st Street. Contents from this storage tank were emptied into Goose Prairie Creek after all solids were filtered out and the natural flow in the creek was sufficient to "dilute the waste to a level that is safe for fish and other aquatic life." (Jacobs, 2002) If natural flow in the creek was considered insufficient, clean water was apparently pumped into the creek to dilute the contents. Because the storage tank was described as holding industrial wastewater, it is possible hazardous wastes may have been released by these activities.

## *1.3 Summary of Sampling Investigations*

Site investigations at the Group 4 sites were performed in a phased approach. The investigations conducted at LHAAP-50 are summarized in **Table 1-1**. Phase I was initiated to evaluate potentially contaminated sites for possible uncontrolled releases to the environment and to identify site-related contaminants. Phase II investigation work was conducted to further investigate those areas identified in Phase I that required additional investigation to characterize the contaminants present. Following the Phase II investigation, a Pre-Phase III investigation was conducted by USACE in May 1996. This investigation used direct push groundwater sampling devices to assist in delineating the extent of VOC contamination in the shallow groundwater beneath the Group 4 project area and to help determine additional monitoring well locations. Based upon the results of this Pre-Phase III investigation, the scope of the Phase III investigation was defined. The goal of the Phase III RI was to complete the investigation of the Group 4 sites and establish the extent of groundwater contamination. Activities conducted after Phase III were completed to respond to specific data needs such as the extent of VOC contamination in groundwater and evaluation of natural attenuation. Throughout these efforts, the USACE and Shaw collected quarterly surface water samples in the Goose Prairie Creek. The surface water sampling locations are presented in **Figure 1-3**.

### *1.3.1 Initial Site Investigation*

During 1995, a Site Investigation (SI) was performed at LHAAP-50. During this investigation, sediments and soils were sampled in order to assess whether industrial wastewater that was stored in the tank had impacted LHAAP-50. Two sediment samples (50SD01 and 50SD02) were collected from Goose Prairie Creek, five surface soil samples (50SS01 through 50SS05) were collected, four soil borings were completed (50SB01 through 50SB04), and 12 soil samples were collected from the soil borings.

#### *1.3.1.1 Sediment Sampling*

Two sediment samples (50SD01 and 50SD02) were collected from Goose Prairie Creek and submitted for laboratory analysis of VOCs, semivolatile organic compounds (SVOCs), explosive compounds, and metals. The results from the sediment samples showed no detected concentrations of SVOCs or explosive compounds. One VOC, TCE, was detected at a concentration of 33 micrograms per kilogram (µg/kg) in sample 50SD02.

Sixteen metals were detected in the sediment samples; however, the detections were all at low concentrations, often below background levels.

#### *1.3.1.2 Soil Sampling*

Five surface soil samples (50SS01 through 50SS05) were collected at LHAAP-50 during the SI. The samples were submitted for laboratory analysis of VOCs, SVOCs, explosive compounds, and metals. The results from the surface soil samples showed no detected concentrations of explosive compounds.

TCE was detected in two surface soil samples (50SS02 and 50SS04) at concentrations of 3J µg/kg and 5 µg/kg respectively. Three SVOCs [benzoic acid, benzyl butyl phthalate, and bis(2-ethylhexyl) phthalate] were detected in the soil samples at low concentrations. Sixteen metals were detected in the soil samples; however, only lead was detected at an elevated concentration. Lead was detected in all five surface soil samples at concentrations ranging from 3.1J to 30.0J milligrams per kilogram (mg/kg) (Jacobs, 2002).

Subsurface soil samples were collected at LHAAP-50 from soil borings 50SB01 through 50SB04. A total of 12 samples were collected and submitted for laboratory analysis of VOCs, SVOCs, explosive compounds, and metals. The soil samples showed no detected results of explosive compounds. TCE was detected in sample 50SB02 at a concentration of 519 µg/kg. Two SVOCs [benzyl butyl phthalate and bis(2-ethylhexyl) phthalate] were detected in the soil samples at low concentrations. Barium was detected in three samples at concentrations ranging from 283 to 871 mg/kg. Beryllium was detected in six samples at concentrations ranging from 0.94 to 2.7 mg/kg. Lead was detected in all 12 subsurface soil samples at concentrations ranging from 4.86 to 33.0J mg/kg (Jacobs, 2002).

### *1.3.2 Phase III RI*

Sverdrup Environmental, Inc. (Sverdrup) conducted the field activities for the Phase III RI in 1998. Activities at LHAAP-50 included the collection of sediment, surface water, soil, and groundwater samples.

#### *1.3.2.1 Sediment Sampling*

Six sediment (50SD03 through 50SD08) and six surface water samples (50SW03 through 50SW08) were collected at LHAAP-50, with Goose Prairie Creek as the targeted area. The sediment and surface water samples were analyzed for VOCs, SVOCs, explosive compounds, cyanides, and metals. Two sediment samples (50SD06 and 50SD08) and two surface water samples (50SW06 and 50SW08) were also analyzed for pesticides, polychlorinated biphenyls (PCBs), and dioxins/furans. Sediment samples were analyzed for total organic carbon (TOC) and surface water samples were analyzed for hardness (Jacobs, 2002).

The results from the sediment samples showed no detections of SVOCs or explosive compounds. Five VOCs were detected in the sediment samples at low concentrations. Cyanide was detected in one sample (50SD05) at a concentration of 947.9 µg/kg.

Arsenic was detected in one sample (50SD08) at a concentration of 14.2 mg/kg. Beryllium was detected in four samples at concentrations ranging from 0.938 to 2.6 mg/kg. Lead was detected in all six sediment samples at concentrations ranging from 10.4 to 71.7 mg/kg. Selenium was detected in four samples at concentrations ranging from 1.5 to 3.4 mg/kg. Samples 50SD06 and 50SD08 showed no detected concentrations of PCBs. Two pesticides were detected in 50SD08 at low concentrations. Ten dioxin/furan compounds were detected between the two sediment samples (Jacobs, 2002).

#### *1.3.2.2 Surface Water Sampling*

The results from the surface water samples detected three VOCs (acetone, TCE, and cis-1,2-dichloroethene [DCE]) at concentrations below their Texas Water Quality Standard (TWQS) value and maximum contaminant level (MCL) (Jacobs, 2002). The other four surface water samples showed no detected concentrations for VOCs. One SVOC [bis(2-ethylhexyl)phthalate] was detected in 50SW03 at a low concentration of 7.3 micrograms per liter (µg/L). The TWQS for bis(2-ethylhexyl) phthalate is 59 µg/L. One explosive compound (2,6-dinitrotoluene) was detected in 50SW05 at a concentration of 11 µg/L. Cyanide was detected in one of the six surface water samples at a concentration of 11 µg/L (Jacobs, 2002).

Fifteen metals were detected among the six surface water samples. Aluminum, arsenic, copper, lead, thallium, and zinc were detected at concentrations exceeding the TWQS values. Aluminum was detected in all six samples at concentrations from 1,100 to 11,000 µg/L, exceeding the TWQS of 991 µg/L. Copper was detected in two samples (50SW03 and 50SW07) at concentrations of 44 µg/L and 29 µg/L, respectively, exceeding the TWQS of 12.3 µg/L. Lead was detected in all six samples at concentrations ranging from 3 to 69 µg/L, above the TWQS of 2.52 µg/L. Zinc was detected in two samples (50SW03 and 50SW04) at concentrations of 140 µg/L and 470 µg/L, respectively, compared to the TWQS of 104 µg/L. Samples 50SW06 and 50SW08 were analyzed for pesticides, PCBs, and dioxin/furan compounds. No pesticides or PCBs were detected in samples. Three dioxin/furan compounds were detected between the two samples (Jacobs, 2002).

#### *1.3.2.3 Soil Sampling*

Soil samples were collected during the Phase III investigation at two sample locations, 50SB06 and 50SB07. Soil samples were collected at intervals of 0 to 0.5 feet, 1 to 3 feet, 3 to 5 feet for location 50SB06 and one sample was collected at 0 to 0.5 feet at 50SB07. A total of four samples were collected and analyzed for VOCs, SVOCs, pesticides, PCBs, explosive compounds, dioxins/furans, and metals.

The results for the soil samples showed no detected concentrations of SVOCs or explosive compounds.

TCE and three pesticides were detected in the soil samples at low concentrations. One PCB (Aroclor 1254) was detected in three soil samples at low concentrations. Fifteen dioxin/furan compounds were detected among the soil samples at low concentrations. Lead was detected in all four samples at concentrations ranging from 15.4 to 29.6 mg/kg. Selenium was also detected in all four soil samples at concentrations ranging from 1.45 to 2.92 mg/kg.

#### *1.3.2.4 Groundwater Sampling*

Four monitoring wells (50WW01 through 50WW04) were installed at LHAAP-50 during the Phase III RI. One groundwater sample was collected from each well at the time of installation and the samples were submitted for laboratory analysis of VOCs, SVOCs, explosive compounds, perchlorate, and metals. The sample from 50WW01 was also analyzed for pesticides, PCBs, and dioxin/furan compounds.

The results from the groundwater sampling showed no detected concentrations of SVOCs, explosive compounds, pesticides, and PCBs. 1,1-DCE was detected at a concentration of 50 μg/L and 1,2-dichloroethane (DCA) was detected at a concentration of 98 μg/L. Tetrachloroethene (PCE) was detected at a concentration of 35 μg/L, and TCE was detected at a concentration of 2,900 μg/L. Vinyl chloride (VC) was detected at a concentration of 100 μg/L and cis-1,2-DCE was detected at a concentration of 2,100 μg/L. The VOC levels were above associated MCLs (Jacobs, 2002).

Perchlorate was analyzed in wells 50WW01, 50WW02, and 50WW04. No detections of perchlorate were identified in wells 50WW01 and 50WW04; however, very high levels (18,000 μg/L) were detected in 50WW02. Well 50WW01 was analyzed for dioxin/furan compounds. The results showed detections of three dioxins/furans at low concentrations (Jacobs, 2002).

### *1.3.3 Additional Investigations*

Additional investigations at LHAAP-50 included the collection of four soil samples and four groundwater samples in May 2000 (Jacobs, 2002). A second round of groundwater samples were collected in February 2001 (STEP, 2005). A round of groundwater samples and soil samples from eight soil borings were collected in August and September 2004 (Shaw, 2007a). One new well, 50WW06, was installed and was screened in the intermediate groundwater-bearing zone. All samples collected during the additional investigations were analyzed for perchlorate. Samples collected in 2004 were also analyzed for VOCs. VOC and perchlorate groundwater samples were collected by Shaw in 2007 for natural attenuation evaluation (**Appendix A**), and a new shallow well was installed to the east of LHAAP-50 and sampled in 2008 to delineate the VOC plume (**Appendix B**). **Appendix A** also contains a summary table of historic VOC data.

#### *1.3.3.1 Soil*

Four soil samples were collected in May 2000 from two soil borings (50SB08 and 50SB09) at intervals of 0 to 0.5 feet bgs and 1 to 2 feet bgs. Perchlorate was detected in three of the samples at concentrations ranging from 30 to 36.1 µg/kg (Jacobs, 2002). In May 2000, during the wet season, soil samples were collected at five locations from 0 to 1 feet bgs and 1 to 2 feet bgs along surface drainage pathways from the old tank location (STEP, 2005). In this FS, the samples are designated as STEP-50SSxx to avoid confusion with the 50SSxx samples collected in 1995 (Sverdrup, 1997). The samples were analyzed for perchlorate. Perchlorate was only detected in the 0 to 0.5 foot bgs interval at concentrations of 40.6J µg/kg to 45,600 µg/kg (STEP, 2005). In 2004, samples were collected from eight soil borings (50SB10 through 50SB17) at the surface (0 to 1 feet bgs), immediately above the water, and from the intervening zone (Shaw, 2007a). Perchlorate was detected at a concentration of 25J µg/kg in the surface soil sample from 50SB10. Additionally, concentrations of 740 µg/kg and 2,600 µg/kg at depths of 6 to 9 feet bgs and 9 to 11 feet bgs (just above the water table), respectively, were detected in soil collected from 50SB17. Two VOCs, acetone and methylene chloride, were detected at or estimated near the detection limit. The data reports were reviewed and the methylene chloride detections are attributable to laboratory contamination. Acetone was detected at a maximum concentration of 0.054 mg/kg. The soil medium-specific concentration (MSC) for industrial use based on inhalation, ingestion, and dermal contact (SAI-Ind) is 2,500 mg/kg (TCEQ, 2006). Since the concentration is below the SAI-Ind, which would be the cleanup level, cleanup of acetone in soil is not carried forward.

#### *1.3.3.2 Groundwater*

In May 2000, groundwater samples were collected from monitoring wells 50WW01 through 50WW04 and analyzed for perchlorate (STEP, 2005). Perchlorate was detected in three wells (50WW01 through 50WW03) at concentrations ranging from 2.6 to 3,210J µg/L. In February 2001, groundwater samples were collected from 50WW01 through 50WW03 and analyzed for perchlorate. The February 2001 groundwater samples showed detected concentrations of perchlorate in 50WW02 at 10,000 µg/L (STEP, 2005).

A new monitoring well, 50WW06 was installed in the intermediate zone in August 2004 (Shaw, 2007a). In August and September 2004, groundwater samples were collected from monitoring wells 50WW01 through 50WW04 and 50WW06 and analyzed for perchlorate and VOCs. During the 2004 sampling, perchlorate was detected at a concentration of 2,500 µg/L in the shallow monitoring well 50WW02, located in the eastern portion of LHAAP-50. Except for monitoring well 50WW02 and 50WW06, perchlorate was not detected in any other groundwater samples collected from LHAAP-50 during the 2004 round (Shaw, 2007a). Perchlorate and TCE were detected in the well in the intermediate water bearing zone, 50WW06, at concentrations of 6.7 µg/L and 15 µg/L, respectively (Shaw, 2007a). Twelve VOCs were also detected in the groundwater at LHAAP-50 during the 2004 sampling. TCE was detected at a concentration of 9,200 µg/L at monitoring well 50WW02. Additionally, cis-1,2-DCE was detected at a concentration of 1,800 µg/L at monitoring well 50WW02.

In May 2005, groundwater samples were collected from wells 50WW01 through 50WW06 and were analyzed for perchlorate and VOCs. Perchlorate was detected in three wells (50WW02, 50WW05, and 50WW06) with a maximum detection of 1, 590 µg/L at 50WW02. Several VOCs were detected at 50WW02 and 50WW05. The maximum concentrations were at 50WW02 and several VOCs (PCE at 6.5 µg/L, TCE at 4,810 µg/L, cis-1,2-DCE at 954 µg/L, 1,1-DCE at 4.74 µg/L, and vinyl chloride at 7.95 µg/L) had concentrations above their MCLs. At 50WW06, the intermediate well, only TCE (4.7 µg/L) and acetone (11.4 µg/L) were detected. TCE was below the MCL at 50WW06.

In February 2007, additional samples were collected from 50WW02, 50WW03, 50WW05, and 50WW06 and were analyzed for perchlorate, VOCs, and natural attenuation parameters to evaluate monitored natural attenuation (MNA) as a remedy for LHAAP-50. 50WW02 continued to be the well where maximum VOC and perchlorate concentrations were detected. TCE continued to be below the MCL and perchlorate was not detected at the intermediate well 50WW06. These results were used in the natural attenuation evaluation (**Appendix A**) and the lab reports are included in **Appendix B**.

In February 2008, an additional well (50WW07) was installed downgradient of LHAAP-50 in the shallow zone to delineate the extent of the plume. No VOCs or perchlorate were detected. The data and well information are included in **Appendix B**.

#### *1.3.3.3 Surface Water*

Sampling was conducted for perchlorate at selected locations along Goose Prairie Creek, including location GPW-1, located between LHAAP-50 and LHAAP-47. Historically, perchlorate levels in the creek have fluctuated from a max of 59.9 µg/L in June 2003 to a low of nondetect (or less than 1 µg/L), but have remained below the TCEQ surface water contact recreational level (395 µg/L). The perchlorate concentrations at GPW-1 have been below the groundwater MSC for residential use (GW-Res) (26 µg/L) in the last three quarters of sampling (since June 2008). GPW-3 is located approximately 3,500 feet downstream of GPW-1. Historically, perchlorate concentrations have been below the GW-Res at GPW-3. Thus, the water flowing through the creek at GPW-1 is not contaminating Caddo Lake above the GW-Res.

## Table 1-1
## Summary of Investigations at LHAAP-50 Former Sump Water Tank Area

| |
|---|
| Initial Site Investigation (Jacobs, 2002) |
| • Collected 2 sediment samples (50SD01 and 50SD02) from Goose Prairie Creek<br>• Collected 5 surface soil samples (50SS01–50SS05) and a resampling of each of the 5 locations 4 months later (explosive analysis only)<br>• Collected 12 soil samples from 4 soil boring locations (50SB01–50SB04) |
| Phase III (Jacobs, 2002) |
| • 6 sediment and 6 surface water samples were collected (50SD03 through 50SD08 and 50SW03)<br>• Collected 4 soil samples [50SB06 (0-0.5 feet), (1-3 feet), (3-5 feet) and 50SS07 (0-0.5 feet)] from 2 sample locations<br>• Installed 4 monitoring wells (50WW01–50WW04) and collected groundwater samples from each well |
| Additional Investigations |
| • May 2000—Collected 4 soil samples from 2 soil borings (50SB08 and 50SB09) and collected STEP-50SS01 through 50SS05 along surface drainage paths for analysis and groundwater samples from wells 50WW01–50WW04 for perchlorate analysis (STEP, 2005)<br>• February 2001 – Collected groundwater samples from wells 50WW01–50WW03 for perchlorate analysis (STEP, 2005)<br>• September 2002 – Installed shallow zone well, 50WW05 (STEP, 2005)<br>• August/September 2004 – Installed intermediate zone well 50WW06, collected groundwater samples from wells (50WW01 through 50WW06) and 8 soil borings for TCL VOCs and perchlorate analysis (Shaw, 2007a)<br>• May 2005 – Collected groundwater samples from 50WW01 through 50WW06 (tabulated data – Appendix A)<br>• February 2007 – Collected samples from 50WW02, 50WW05 and 50WW06 for MNA evaluation (Appendix A)<br>• February 2008 – Installed 50WW07 in the shallow zone and sampled for VOCs (Appendix B) |

*Abbreviations:*

*MNA* *monitored natural attenuation*
*STEP* *Solutions to Environmental Problems*
*TCL* *target compound list*
*VOCs* *volatile organic compounds*

00078454

PLOT DATE: 5/20/08
FORMAT REVISION 5/13/02

| IMAGE | X-REF | OFFICE | DRAWN BY | | CHECKED BY | | APPROVED BY | | DRAWING NUMBER |
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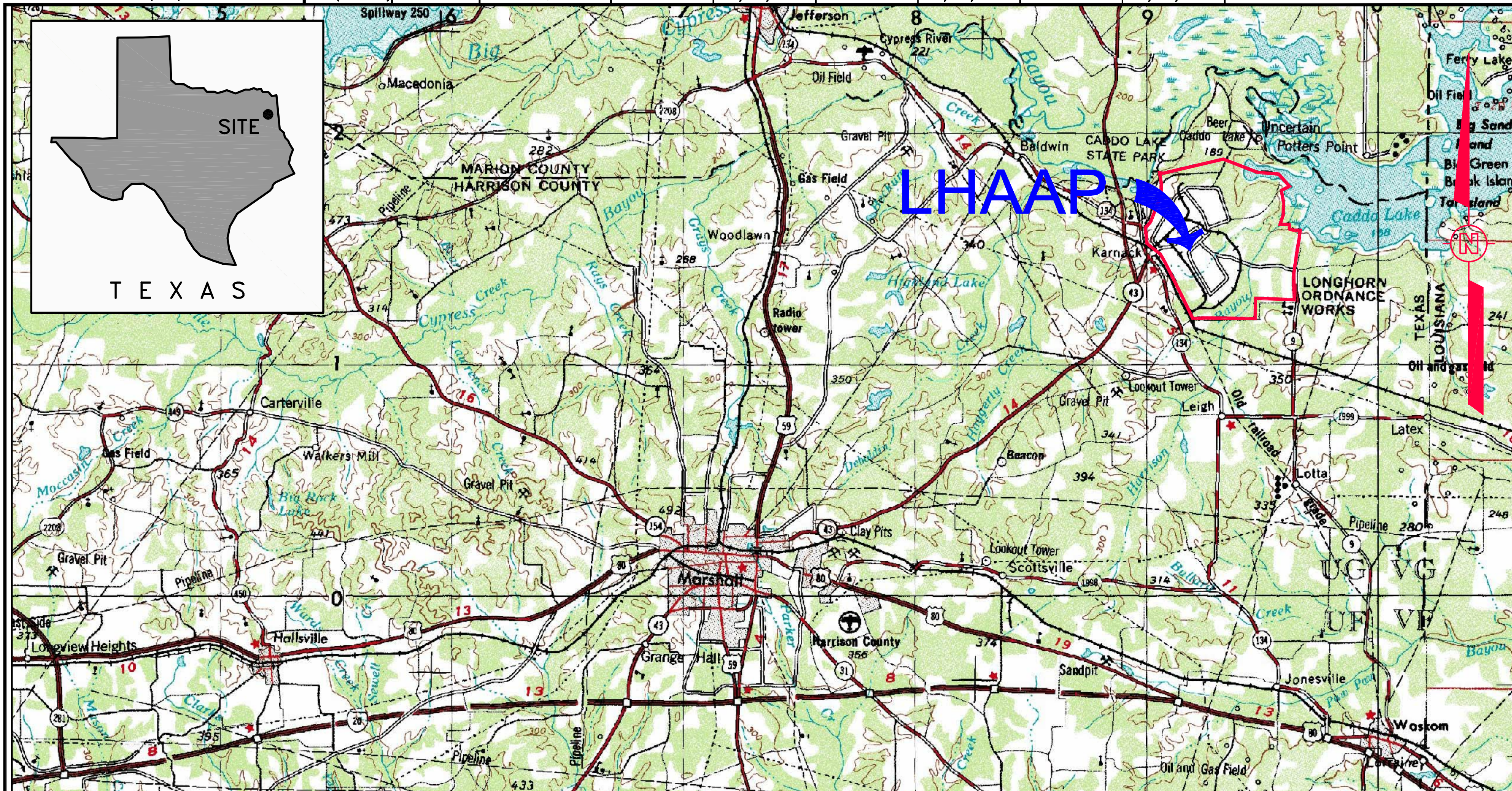
| TYLER(250_000) | --- | Houston, Texas | J. RDZ | 1/10/08 | D. CRISPO | 1/10/08 | P. SRIVASTAV | 1/10/08 | 117591-A2 |




LEGEND:

LHAAP SITE BOUNDARY

MILES

0 5 10

REFERENCE:
U.S.G.S. QUADRANGLE OF
TYLER, TEXAS; LOUISIANA 1956, REVISED 1977
SCALE 1:250,000

Shaw

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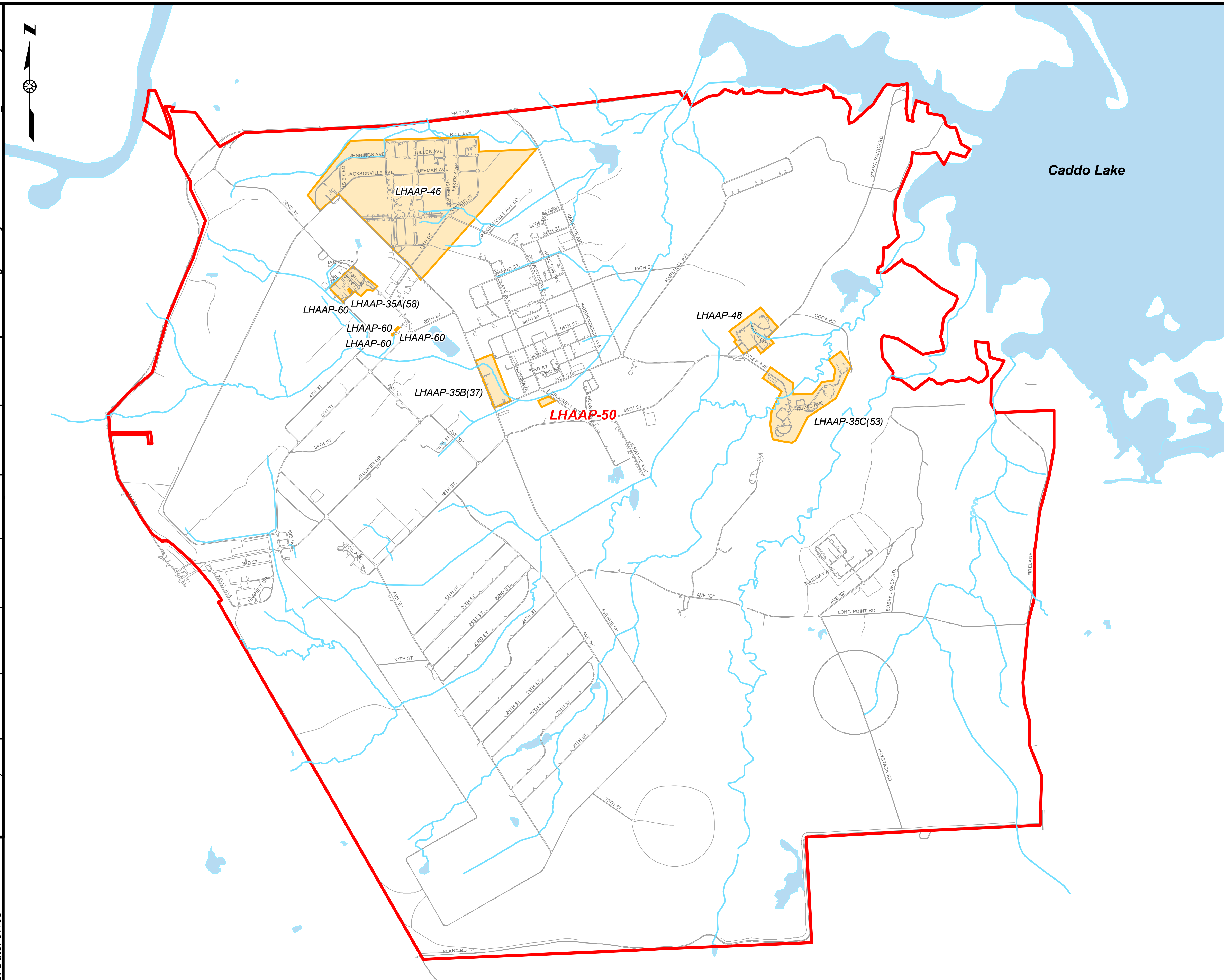
TULSA DISTRICT
TULSA, OKLAHOMA

FIGURE 1-1

**LHAAP LOCATION MAP**
**LHAAP-50 FEASIBILITY STUDY**
LONGHORN ARMY AMMUNITION PLANT
KARNACK, TEXAS




**LEGEND**

- Stream
- Road
- Site
- Lake
- LHAAP Boundary

0 1,200 2,400 4,800 Feet

| FILE PATH | T:\GIS\Longhorn\MyWKSP\MXD\Site50\50_SiteVicinity.mxd |
|---|---|
| APPROVED BY | P. Srivastav 07/10/08 |
| CHECKED BY | S. Watson 05/19/08 |
| DRAWN BY | B. Lu 05/19/08 |
| OFFICE | Houston, TX |

Plot Date: 07/08

Shaw

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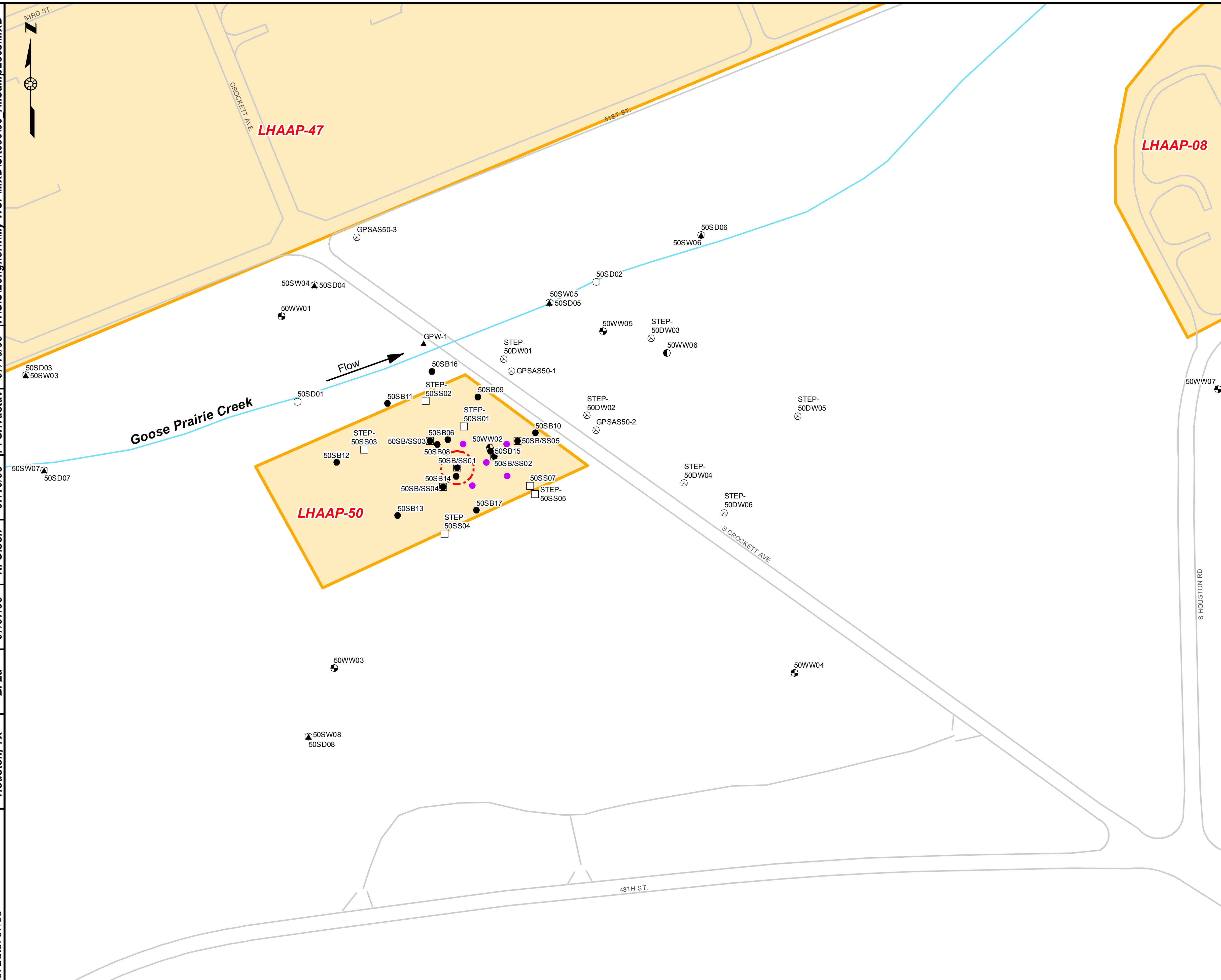
FIGURE 1-2

LHAAP-50 SITE VICINITY MAP
FEASIBILITY STUDY

LONGHORN ARMY AMMUNITION PLANT
KARNACK, TEXAS

00078456




## LEGEND

- Shallow Monitoring Well
- Intermediate Monitoring Well
- Hydropunch
- Surface Water Sample
- Sediment Sample
- Surface Soil Sample
- Soil Boring
- Proposed Injection Location
- Former Tank Location
- Stream
- Road
- Site

0 60 120 240
Feet

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FIGURE 1-3

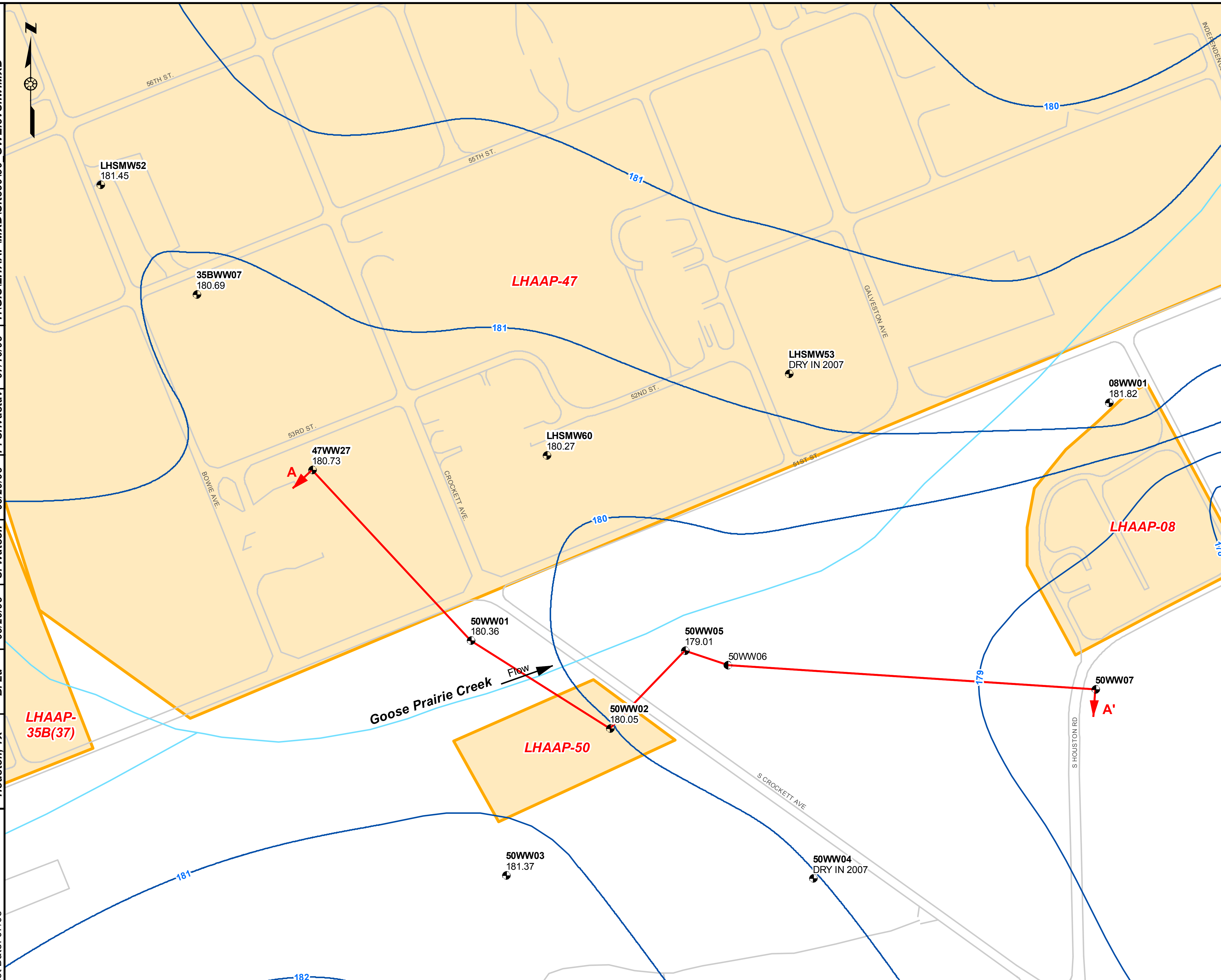
SAMPLE LOCATION MAP
LHAAP-50

LONGHORN ARMY AMMUNITION PLANT
KARNACK, TEXAS

| | |
|---|---|
| FILE PATH | T:\GIS\Longhorn\My WSP\MXD\Site50\50_AllSampLocs.MXD |
| APPROVED BY | P. Srivastav 07/10/08 |
| CHECKED BY | N. Olson 07/10/08 |
| DRAWN BY | B. Lu 07/07/08 |
| OFFICE | Houston, TX |

Plot Date: 07/08

00078457

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APPROVED BY P. Srivastav 07/10/08

CHECKED BY S. Watson 05/20/08

DRAWN BY B. Lu 05/20/08

OFFICE Houston, TX

Plot Date: 07/08

**LEGEND**

- Shallow Monitoring Well
- Intermediate Monitoring Well
- Shallow Groundwater Elevation Contour
- Cross-Section Line
- Stream
- Road
- Site

**Note:**

Groundwater contour elevations collected in November - December 2007 were reported in feet. 50WW07 was installed in 2008; the groundwater contours were not developed using data from this well.

0 90 180 360 Feet

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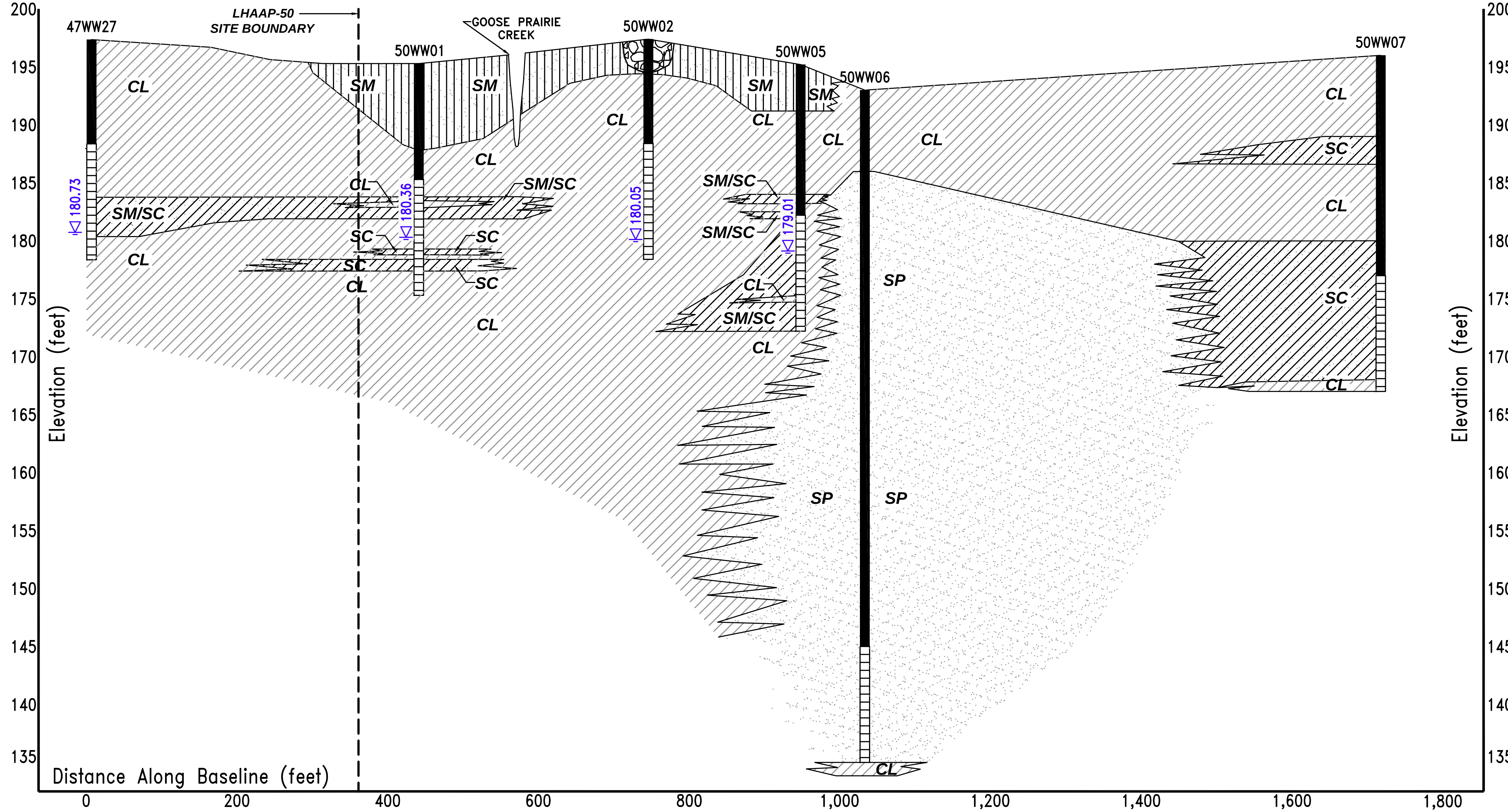
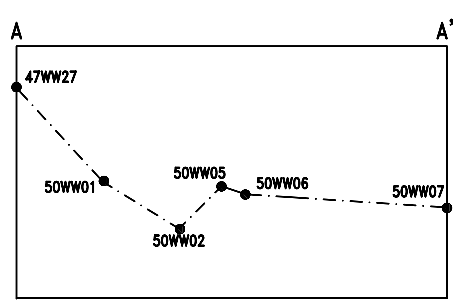
FIGURE 1-4
GROUNDWATER ELEVATION MAP
(SHALLOW ZONE)
LHAAP-50 FEASIBILITY STUDY
LONGHORN ARMY AMMUNITION PLANT
KARNACK, TEXAS

00078458




# SECTION A–A'

*SCALE: AS SHOWN*




LEGEND:

- CLAY (CL)
- CLAYEY SAND (SM/SC)
- SILTY SAND (SM)
- WELL SORTED SAND (SP)
- SCREEN
- WATER LEVEL (MSL)

NOTE:

1.) THE FEBRUARY 2008 WATER LEVEL FOR 50WW07 IS 179.55 FEET MEAN SEA LEVEL.

2.) NOV/DEC 2007 WATER LEVEL IN FEET MEAN SEA LEVEL.

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FIGURE 1–5
GEOLOGICAL CROSS SECTION A–A'
LHAAP–50 FEASIBILITY STUDY
LONGHORN ARMY AMMUNITION PLANT
KARNACK, TEXAS

| IMAGE | X-REF | OFFICE | DRAWN BY | CHECKED BY | APPROVED BY | DRAWING NUMBER |
|---|---|---|---|---|---|---|
| --- | --- | Houston, Texas | L. JONES 05/08/08 | A. WILLMORE 07/09/08 | P. SRIVASTAV 07/09/08/08/08 | 117591-B10 |

PLOT DATE: 07/10/08
FORMAT REVISION 3/25/99

# 2.0 Risk and Site Assessment

This section summarizes the risk assessment approach, risk conclusions, and the conceptual site model for LHAAP-50. Information in this section is based on data obtained from the following references:

- Group 4 Sites RI (Jacobs, 2002)
- Group 4 Sites Baseline Human Health Risk Assessment Report (Jacobs, 2003)
- Groups 2 and 4 Groundwater Data Gaps Investigation (Shaw, 2007a)
- Installation-Wide Baseline Ecological Risk Assessment (Shaw, 2007c)
- Plant-Wide Perchlorate Investigation (STEP, 2005)
- Environmental Site Assessment (Plexus, 2005)
- Natural Attenuation Evaluation (**Appendix A**)

## 2.1 Risk Assessment Summary

This summary is based on the conclusions presented in the *Final Baseline Human Health and Screening Ecological Risk Assessment for the Group 4 Sites* (Jacobs, 2003). The Jacobs risk assessment (Jacobs, 2003) presented the human health risks and hazards to a hypothetical future maintenance worker under an industrial scenario for soil and groundwater and a screening level ecological risk assessment. A Baseline Ecological Risk Assessment (Shaw, 2007c) was also conducted and concluded there is no impact to ecological receptors. For the human health risk assessment, soil and groundwater data were used to calculate the aggregate risk values, which were then compared to the USEPA target risk range of $1 \times 10^{-4}$ to $1 \times 10^{-6}$ for the excess lifetime cancer risk and a hazard index (HI) of 1.

### 2.1.1 Soil

For the hypothetical future maintenance worker exposure to soil at LHAAP-50, the carcinogenic risk and non-carcinogenic hazard are acceptable. The results for risk assessment included surface and subsurface soil samples and sediment samples. For all soil scenarios, individual and cumulative cancer risks are below $1 \times 10^{-6}$ and HIs are less than 1.

### 2.1.2 Groundwater

For the hypothetical future maintenance worker exposure to the groundwater at LHAAP-50, the carcinogenic risk and non-carcinogenic hazard exceed the acceptable limits. Groundwater data with unacceptable risk were also compared to MCLs. The total carcinogenic risk to groundwater for a hypothetical future maintenance worker is $5.5 \times 10^{-3}$. The total HI is 305. All chemicals with carcinogenic risk greater than $1 \times 10^{-6}$ and a hazard quotient (HQ) greater than 0.1 are listed in Tables 2-1 and 2-2, respectively.

## *2.2 Evaluation of Data Collected Since the Risk Assessment*

The risk assessment was completed using data from the samples through February 2001 for groundwater and the 1998 soil samples. Since that time, additional groundwater and soil samples have been collected and analyzed.

### *2.2.1 Soil*

Additional samples were collected during the perchlorate investigation in 2002 (STEP, 2005) and during the data gaps investigation in 2004 (Shaw, 2007a). The maximum perchlorate detected was in a surface soil sample at a concentration of 45,600 µg/kg collected during the perchlorate investigation (STEP, 2005). The exposure point concentration for perchlorate used in the risk assessment was 36.1 µg/kg, with an associated HQ of $4.2 \times 10^{-5}$ (Jacobs, 2003). Using ratios of the HQ to the perchlorate concentrations, the HQ for the maximum concentration of perchlorate detected since the risk assessment would yield a HQ less than $5 \times 10^{-2}$. Thus, the HQ will still be below 0.1 and does not change the outcome of the risk assessment for soil. Thus, the cancer risks and non-cancer hazards posed by soil fall within the acceptable range.

### *2.2.2 Groundwater*

Additional groundwater samples have been collected since the risk assessment and analyzed for perchlorate, VOCs, and attenuation parameters. No new VOCs were detected that would change the listed chemicals in **Tables 2-1** or **2-2**. Chloroform, 1,1,2-trichloroethane (TCA), and 1,2,4-trimethylbenzene all had a carcinogenic risk greater than $1 \times 10^{-6}$ or an HQ greater than 0.1. More recent data from 50WW02 indicated that chloroform concentrations decreased while TCA and 1,2,4-trimethylbenze were not detected. Thus, the results obtained from these post risk assessment groundwater samples do not alter the conclusions of the risk assessment that groundwater poses risk.

## *2.3 Media Contamination Assessment*

Chemicals in the groundwater at LHAAP-50 pose an unacceptable risk to human health. Evaluation of data generated after the risk assessment did not identify any additional COCs with risks exceeding the USEPA target risk level of $1 \times 10^{-4}$ or a HQ greater than 0.1 as shown in Tables 2-1 and 2-2. Chemicals in the soil do not pose an unacceptable risk or hazard to human health.

### *2.3.1 Soil*

Perchlorate was detected in soil at LHAAP-50 near the location of the former AST. VOCs were detected at or just above the detection limit in soil at various borings and soil sample locations at the site. The AST is the most likely source of contaminants released into the environment at LHAAP-50. Perchlorate and VOCs were released via overflows, spills, and discharges to the soil and adjacent surface water.

Even though data in the human health risk assessment indicates that chemicals in the soil at LHAAP-50 pose no unacceptable risk to human health, an evaluation was conducted to determine if perchlorate present in the soil poses a threat to the environment. Perchlorate is an emerging contaminant that is extremely soluble, and the potential for residual perchlorate in soil to migrate into the groundwater was evaluated. Perchlorate was detected at a maximum concentration of 45,600 µg/kg in the surface soil between 0 to 0.5 feet bgs (STEP, 2005). The TCEQ soil MSC for industrial use based on groundwater protection (GWP-Ind) for perchlorate is 7,200 µg/kg. Based on the concentrations in the groundwater, the maximum concentrations detected in soil, and the GWP-Ind, perchlorate could be acting as residual source. Therefore, assessment of alternatives will include removal of soil in the areas where perchlorate concentrations exceed the GWP-Ind since it may act as a residual source to the groundwater contamination. The area of perchlorate contamination in soil to be addressed is shown in **Figure 2-1**.

### *2.3.2 Groundwater*

Based on the human health risk assessment, groundwater at LHAAP-50 poses an unacceptable carcinogenic risk and non-carcinogenic hazard to a hypothetical future maintenance worker at LHAAP under an industrial scenario.

Groundwater contaminants identified to have a risk greater than $1 \times 10^{-6}$ are listed in **Table 2-1**. The COCs listed in **Table 2-1** for the LHAAP-50 groundwater are TCE, VC, 1,1-DCE, 1,2-DCA, and PCE due to their contribution to risk and exceedance of their respective MCL. Even though chloroform, 2,3,7,8-tetrachlorodibenzo-p-dioxin (2,3,7,8-TCDD), and 1,1,2-TCA indicated risk above $1 \times 10^{-6}$, the maximum concentrations are not above the MCL, and they are not identified as COCs. The most recent detected VOC concentrations in groundwater are shown in **Figure 2-2**.

Based on the human health risk assessment, groundwater at LHAAP-50 poses an unacceptable non-carcinogenic hazard to a hypothetical future maintenance worker at LHAAP-50 under an industrial scenario. Groundwater contaminants with a HQ greater than 0.1 are listed in **Table 2-2**. Many of the contaminants have a MCL. Since perchlorate does not have an MCL, the TCEQ groundwater MSC for industrial use (GW-Ind) was used for evaluation. The COCs listed in **Table 2-2** for the LHAAP-50 groundwater are perchlorate, TCE, cis-1,2-DCE, 1,2-DCE, VC, PCE, and 1,1-DCE due to the contribution to HI and exceedance of their respective MCLs. Chloroform was eliminated as a COC since the concentrations are below the MCL. 1,2,4-Trimethylbenze was eliminated as a COC since it was not detected the most recent sample results from 50WW02 or any other well. Three metals (antimony, nickel, and manganese) have an HQ above 0.1. These metals were eliminated as COCs since the HQs are less than 1 and for the additional reasons as indicated in **Table 2-2**.

Perchlorate contributed the majority of the non-carcinogenic hazard with an HQ of 200. The most recent perchlorate concentrations in groundwater are shown in **Figure 2-3**.

All of the COCs have MCLs, except perchlorate. To address perchlorate, the TCEQ GW-Ind will be used. The areas where the VOC COCs exceed the MCLs in the shallow zone are shown in **Figure 2-2**. The area where perchlorate in the shallow zone exceeds the TCEQ GW-Ind is shown in **Figure 2-3**.

## *2.4 Conceptual Site Model*

**Figure 2-4** illustrates the overall conceptual site model for LHAAP-50. The model presents those pathways that are being considered for remediation. Those pathways that are likely to be incomplete or have negligible impact are not being considered for remediation as discussed below.

The AST was the most likely source of contaminants being released into the environment (**Figure 2-1**). Since the AST has been removed, there is no longer a potential release mechanism for leaks or spills. Perchlorate and VOCs were probably released via overflows, spills, and discharges to the soil and adjacent surface water. Sufficient perchlorate levels remain in the soil to act as an ongoing source of groundwater contamination or to be potentially released into surface waters during storm events. The area of perchlorate contamination in the soil is very small, and the concentrations of perchlorate do not pose an unacceptable risk to human health (hypothetical future maintenance worker) or ecological receptor.

Goose Prairie Creek runs on the north side of LHAAP-50 and the south side of LHAAP-47, and both may be contributing to detections of perchlorate in the surface water. However, perchlorate results for the surface water are below the contact recreation value of 395 µg/L (TCEQ, 2007). Since the creek discharges into nearby Caddo Lake, a drinking water source, the concentrations in Goose Prairie Creek may also be compared to the GW-Res. The concentrations of perchlorate in the surface water were also below the GW-Res. Even though the concentrations in the creek are acceptable, detection of perchlorate in the creek water indicates that there could be a potential pathway from the contaminated surface soil at LHAAP-50 to the surface water. Thus, the soil pathways considered for remediation are the potential migration to surface water and leaching into the groundwater.

The groundwater at LHAAP-50 may pose a risk for the hypothetical future maintenance workers. Groundwater modeling concluded that there was no impact to surface water from groundwater (Shaw, 2007b), and recent surface water samples collected were below TWQS levels. Thus, the pathways considered for remediation are soil-to-groundwater, soil-to-surface water, and future industrial groundwater use.

## Table 2-1
## Chemicals Contributing to Carcinogenic Risk in Groundwater

| Chemical | Cancer Risk Groundwater [a] | Exposure Point Concentration [b] (µg/L) | Well | MCL (µg/L) | Retained as Chemical of Concern ? |
|---|---|---|---|---|---|
| Trichloroethene | $4.3 \times 10^{-3}$ | 22,000 | 50WW02 | 5 | Yes, 1 |
| Vinyl Chloride | $5.8 \times 10^{-4}$ | 100 | 50WW02 | 2 | Yes, 1 |
| 1,1-Dichloroethene | $4.0 \times 10^{-4}$ | 50 | 50WW02 | 7 | Yes, 1 |
| 1,2-Dichloroethane | $2.0 \times 10^{-4}$ | 98 | 50WW02 | 5 | Yes, 1 |
| Chloroform | $3.8 \times 10^{-5}$ | 25 | 50WW02 | 80[c] | No, 2 |
| 2,3,7,8-TCDD | $3.6 \times 10^{-5}$ | $7.3 \times 10^{-6}$ | 50WW01 | $3 \times 10^{-5}$ | No, 2 |
| Tetrachloroethene | $3.2 \times 10^{-5}$ | 35 | 50WW02 | 5 | Yes, 1 |
| 1,1,2-Trichloroethane | $1.4 \times 10^{-6}$ | 3.6 | 50WW02 | 5 | No, 2 |

*Notes and Abbreviations:*

1. *Identified as chemical of concern (COC) since Exposure Point Concentration is above the Safe Drinking Water Act MCL.*
2. *Excluded since Exposure Point Concentration is below the Safe Drinking Water Act MCL.*

[a] *All chemicals with cancer risks exceeding $1.0 \times 10^{-6}$ are listed from Baseline Risk Assessment Table 3-73 (Jacobs, 2003).*
[b] *From Baseline Risk Assessment Table 3-50 (Jacobs, 2003).*
[c] *MCL for total trihalomethanes which include chloroform, bromodichloromethane, dibromochloromethane, and bromoform.*

*MCL maximum contaminant level*
*µg/L micrograms per liter*

## Table 2-2
## Chemicals Contributing to Hazard Index in Groundwater

| Chemical | Hazard Quotient [a] | Exposure Point Concentration [b] (µg/L) | Well | MCL (µg/L) | Retained as Chemical of Concern ? |
|---|---|---|---|---|---|
| Perchlorate | 200 | 18,000 | 50WW02 | 72[c] | Yes, 1 |
| Trichloroethene | 84 | 22,000 | 50WW02 | 5 | Yes, 1 |
| Chloroform | 14 | 25 | 50WW02 | 80[d] | No, 2 |
| cis-1,2-Dichloroethene | 5.3 | 4,400 | 50WW02 | 70 | Yes, 1 |
| 1,2-Dichloroethane | 3.4 | 98 | 50WW02 | 5 | Yes, 1 |
| Vinyl chloride | 0.5 | 100 | 50WW02 | 2 | Yes, 1 |
| Antimony | 0.34 | 14 | 50WW02 | 6 | No, 3 |
| Nickel | 0.34 | 690 | 50WW03 | - | No, 4 |
| Manganese | 0.23 | 1,110 | 50WW03 | - | No, 5 |
| Tetrachloroethene | 0.18 | 35 | 50WW02 | 5 | Yes, 1 |
| 1,1-Dichloroethene | 0.13 | 50 | 50WW02 | 7 | Yes, 1 |
| 1,2,4-Trimethylbenzene | 0.11 | 3.9 | 50WW02 | - | No, 6 |

*Notes and Abbreviations:*

*All chemicals with hazard indexes exceeding 0.1 are listed.*

1. *Identified as chemical of concern (COC) since Exposure Point Concentration is above value indicated in MCL column.*
2. *Excluded as COC since Exposure Point Concentration is less than value indicated in MCL column.*
3. *Excluded as COC since hazard quotient is less than 1 and the exposure point concentration is marginally above the LHAAP perimeter well background of 11.5 µg/L, and it was only detected above background once. Additionally, based on LHAAP operations, antimony compounds did not have significant or widespread use.*
4. *Excluded as COC since Exposure Point Concentration is less than Texas Commission on Environmental Quality industrial use groundwater medium-specific concentration of 2,000 µg/L, which would be proposed as a clean up level, and hazard quotient is less than 1.*
5. *Excluded as COC since Exposure Point Concentration is less than LHAAP perimeter well background of 7,820 µg/L.*
6. *Excluded as COC since more recent sample results were below detection limit, and hazard quotient is less than 1.*

[a] *From Baseline Risk Assessment Table 3-74 and Table C-152 (Jacobs, 2003).*
[b] *From Baseline Risk Assessment Table 3-50 (Jacobs, 2003).*
[c] *No MCL for perchlorate. Value shown is the Texas Commission on Environmental Quality Industrial Use Groundwater Medium-Specific Concentration.*
[d] *MCL for total trihalomethanes which include chloroform, bromodichloromethane, dibromochloromethane, and bromoform.*

*MCL Safe Drinking Water Act Maximum Contaminant Level*
*µg/L micrograms per liter*

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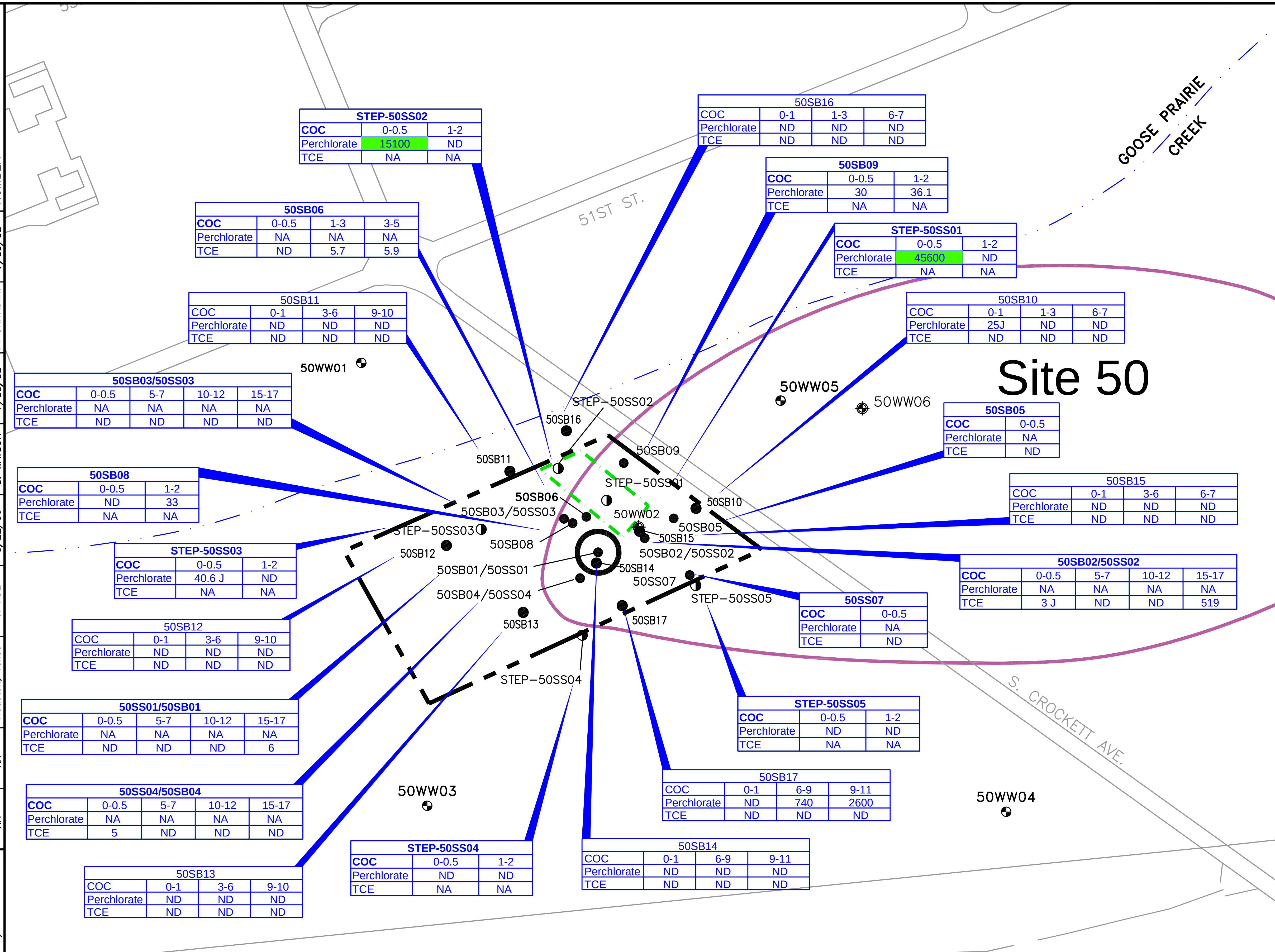


**STEP-50SS02**

| COC | 0-0.5 | 1-2 |
|---|---|---|
| Perchlorate | 15100 | ND |
| TCE | NA | NA |

**50SB16**

| COC | 0-1 | 1-3 | 6-7 |
|---|---|---|---|
| Perchlorate | ND | ND | ND |
| TCE | ND | ND | ND |

**50SB09**

| COC | 0-0.5 | 1-2 |
|---|---|---|
| Perchlorate | 30 | 36.1 |
| TCE | NA | NA |

**50SB06**

| COC | 0-0.5 | 1-3 | 3-5 |
|---|---|---|---|
| Perchlorate | NA | NA | NA |
| TCE | ND | 5.7 | 5.9 |

**STEP-50SS01**

| COC | 0-0.5 | 1-2 |
|---|---|---|
| Perchlorate | 45600 | ND |
| TCE | NA | NA |

**50SB11**

| COC | 0-1 | 3-6 | 9-10 |
|---|---|---|---|
| Perchlorate | ND | ND | ND |
| TCE | ND | ND | ND |

**50SB10**

| COC | 0-1 | 1-3 | 6-7 |
|---|---|---|---|
| Perchlorate | 25J | ND | ND |
| TCE | ND | ND | ND |

**50SB03/50SS03**

| COC | 0-0.5 | 5-7 | 10-12 | 15-17 |
|---|---|---|---|---|
| Perchlorate | NA | NA | NA | NA |
| TCE | ND | ND | ND | ND |

**50SB05**

| COC | 0-0.5 |
|---|---|
| Perchlorate | NA |
| TCE | ND |

**50SB08**

| COC | 0-0.5 | 1-2 |
|---|---|---|
| Perchlorate | ND | 33 |
| TCE | NA | NA |

**50SB15**

| COC | 0-1 | 3-6 | 6-7 |
|---|---|---|---|
| Perchlorate | ND | ND | ND |
| TCE | ND | ND | ND |

**STEP-50SS03**

| COC | 0-0.5 | 1-2 |
|---|---|---|
| Perchlorate | 40.6 J | ND |
| TCE | NA | NA |

**50SB02/50SS02**

| COC | 0-0.5 | 5-7 | 10-12 | 15-17 |
|---|---|---|---|---|
| Perchlorate | NA | NA | NA | NA |
| TCE | 3 J | ND | ND | 519 |

**50SS07**

| COC | 0-0.5 |
|---|---|
| Perchlorate | NA |
| TCE | ND |

**50SB12**

| COC | 0-1 | 3-6 | 9-10 |
|---|---|---|---|
| Perchlorate | ND | ND | ND |
| TCE | ND | ND | ND |

**50SS01/50SB01**

| COC | 0-0.5 | 5-7 | 10-12 | 15-17 |
|---|---|---|---|---|
| Perchlorate | NA | NA | NA | NA |
| TCE | ND | ND | ND | 6 |

**STEP-50SS05**

| COC | 0-0.5 | 1-2 |
|---|---|---|
| Perchlorate | ND | ND |
| TCE | NA | NA |

**50SB17**

| COC | 0-1 | 6-9 | 9-11 |
|---|---|---|---|
| Perchlorate | ND | 740 | 2600 |
| TCE | ND | ND | ND |

**50SS04/50SB04**

| COC | 0-0.5 | 5-7 | 10-12 | 15-17 |
|---|---|---|---|---|
| Perchlorate | NA | NA | NA | NA |
| TCE | 5 | ND | ND | ND |

**STEP-50SS04**

| COC | 0-0.5 | 1-2 |
|---|---|---|
| Perchlorate | ND | ND |
| TCE | NA | NA |

**50SB14**

| COC | 0-1 | 6-9 | 9-11 |
|---|---|---|---|
| Perchlorate | ND | ND | ND |
| TCE | ND | ND | ND |

**50SB13**

| COC | 0-1 | 3-6 | 9-10 |
|---|---|---|---|
| Perchlorate | ND | ND | ND |
| TCE | ND | ND | ND |

LEGEND:

- ATTENUATION MONITORING WELL
- SHALLOW MONITORING WELL
- SURFACE SOIL SAMPLE
- SOIL BORING SAMPLING LOCATION
- SITE BOUNDARY
- FORMER STORAGE TANK LOCATION
- COC — CONSTITUENT OF CONCERN
- ND — NOT DETECTED
- NA — NOT ANALYZED
- AREA OF PERCHLORATE CONTAMINATION FOR SOIL REMOVAL
- PERCHLORATE CONCENTRATIONS GREATER THAN 7,200 ug/kg
- EXTENT OF TCE GROUNDWATER PLUME >5 MICROGRAMS PER LITER

NOTE:
1. CONCENTRATIONS ARE REPORTED IN MICROGRAMS PER KILOGRAM (µg/kg)

SCALE
0 100 200 FEET

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FIGURE 2-1
TCE AND PERCHLORATE CONCENTRATION IN SOIL
LHAAP-50 FEASIBILTY STUDY
LONGHORN ARMY AMMUNITION PLANT
KARNACK, TEXAS


REFERENCES:
SOLUTIONS TO ENVIRONMENTAL PROBLEMS, INC., MARCH 2003, *DRAFT FINAL PROJECT REPORT PLANT-WIDE PERCHLORATE INVESTIGATION LONGHORN ARMY AMMUNITION PLANT, KARNACK, TEXAS,* FINAL, OAK RIDGE, TN.

JACOBS ENGINEERING GROUP, INC., JANUARY 2002, *FINAL REMEDIAL INVESTIGATIONS REPORT FOR THE GROUP 4 SITES,* OAK RIDGE, TN.

DATA GAP REFERENCE:
SHAW ENVIRONMENTAL, INC. 2007 DATA GAP INVESTIGATION REPORT, LONGHORN ARMY AMMUNITION PLANT, KARNACK, TEXAS, DRAFT FINAL, APRIL.


DRAWING NUMBER 117591-B9
APPROVED BY P. SRIVASTAV 7/09/08
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IMAGE NA-
PLOT DATE: 06/05/06
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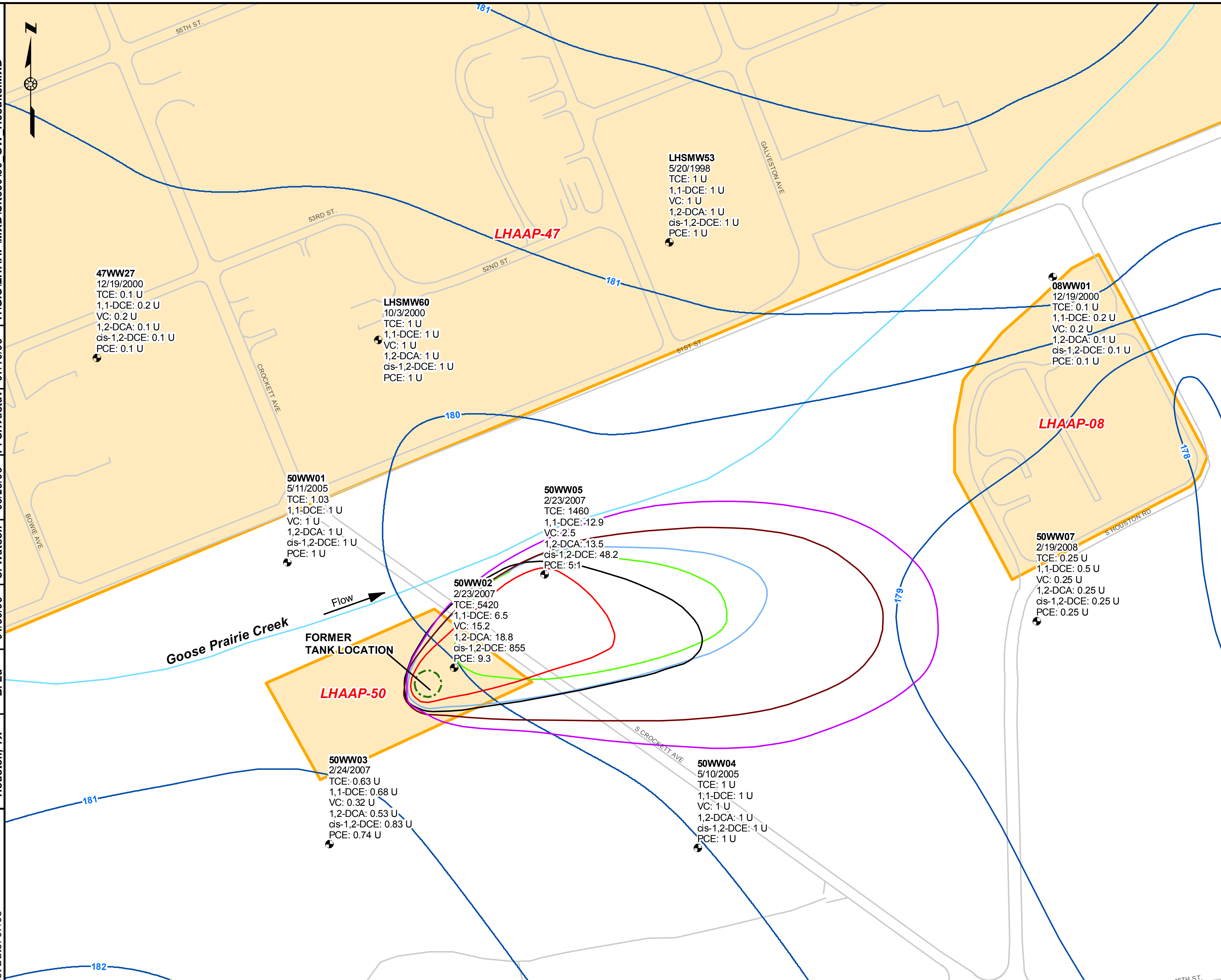


**LEGEND**

- Shallow Monitoring Well
- TCE Plume (5 µg/L Extent)
- 1,1-DCE Plume (7 µg/L Extent)
- VC Plume (2 µg/L Extent)
- PCE Plume (5 µg/L Extent)
- 1,2-DCA Plume (5 µg/L Extent)
- cis-1,2-DCE Plume (7 µg/L Extent)
- Groundwater Elevation Contour
- Stream
- Road
- Site

**Notes:**

1. All contours were generated using ArcGIS 9.2.
2. Groundwater contour elevations collected in November - December 2007 were reported in feet.
3. COC concentrations were reported in micrograms per liter (µg/L).
4. Concentrations based on the latest data collected at each well.
5. TCE - Trichloroethene
   DCE - Dichloroethene
   VC - Vinyl chloride
   PCE - Tetrachloroethene
   DCA - Dichloroethane
6. Extents of contaminants are based on MCLs.

0 75 150 300 Feet

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FIGURE 2-2
VOC CONCENTRATIONS IN GROUNDWATER
FOR SHALLOW ZONE
LHAAP-50 FEASIBILITY STUDY
LONGHORN ARMY AMMUNITION PLANT
KARNACK, TEXAS

| | |
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| APPROVED BY | P. Srivastav 07/10/08 |
| CHECKED BY | S. Watson 05/23/08 |
| DRAWN BY | B. Lu 04/30/08 |
| OFFICE | Houston, TX |

Plot Date: 07/08

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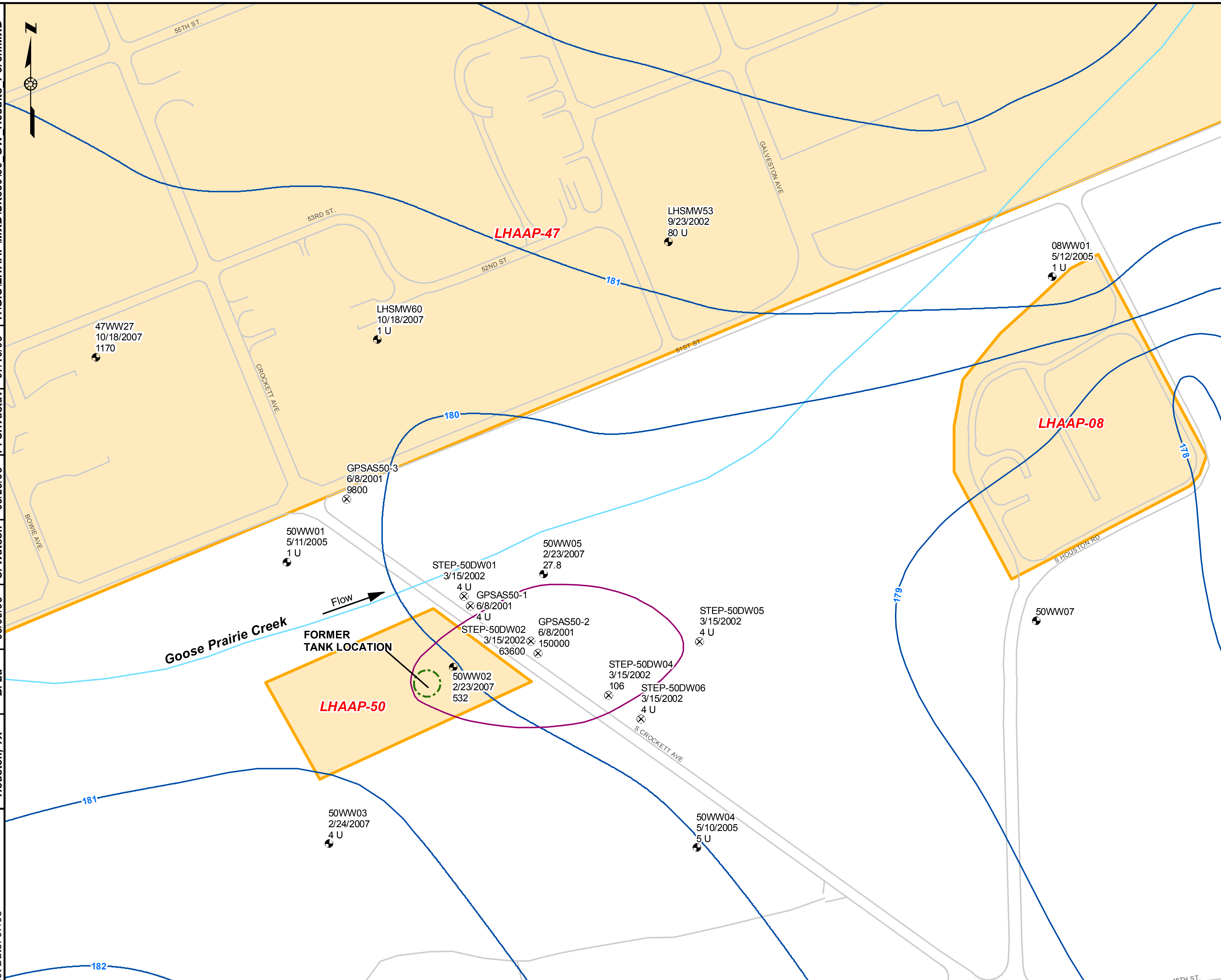


**LEGEND**

- Shallow Monitoring Well
- DPT and Geoprobe Sample Location
- Perchlorate Plume (72 µg/L Extent)
- Groundwater Elevation Contour
- Stream
- Road
- Site

**Notes:**

1. Groundwater contour elevations collected in November - December 2007 were reported in feet.
2. COC concentrations were reported in micrograms per liter (µg/L).
3. Concentrations based on the latest data collected at each well.

0 75 150 300 Feet

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FIGURE 2-3
PERCHLORATE CONCENTRATIONS IN GROUNDWATER FOR SHALLOW ZONE
LHAAP-50 FEASIBILITY STUDY
LONGHORN ARMY AMMUNITION PLANT
KARNACK, TEXAS

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CHECKED BY S. Watson 05/23/08
DRAWN BY B. Lu 05/09/08
OFFICE Houston, TX

Plot Date: 07/08

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PLOT DATE: 05/20/08
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| site model | --- | Houston, Texas | L. JONES | 05/06/08 | S. WATSON | 05/09/08 | P. SRIVASTAV | 07/09/08 | 117591-A31 |

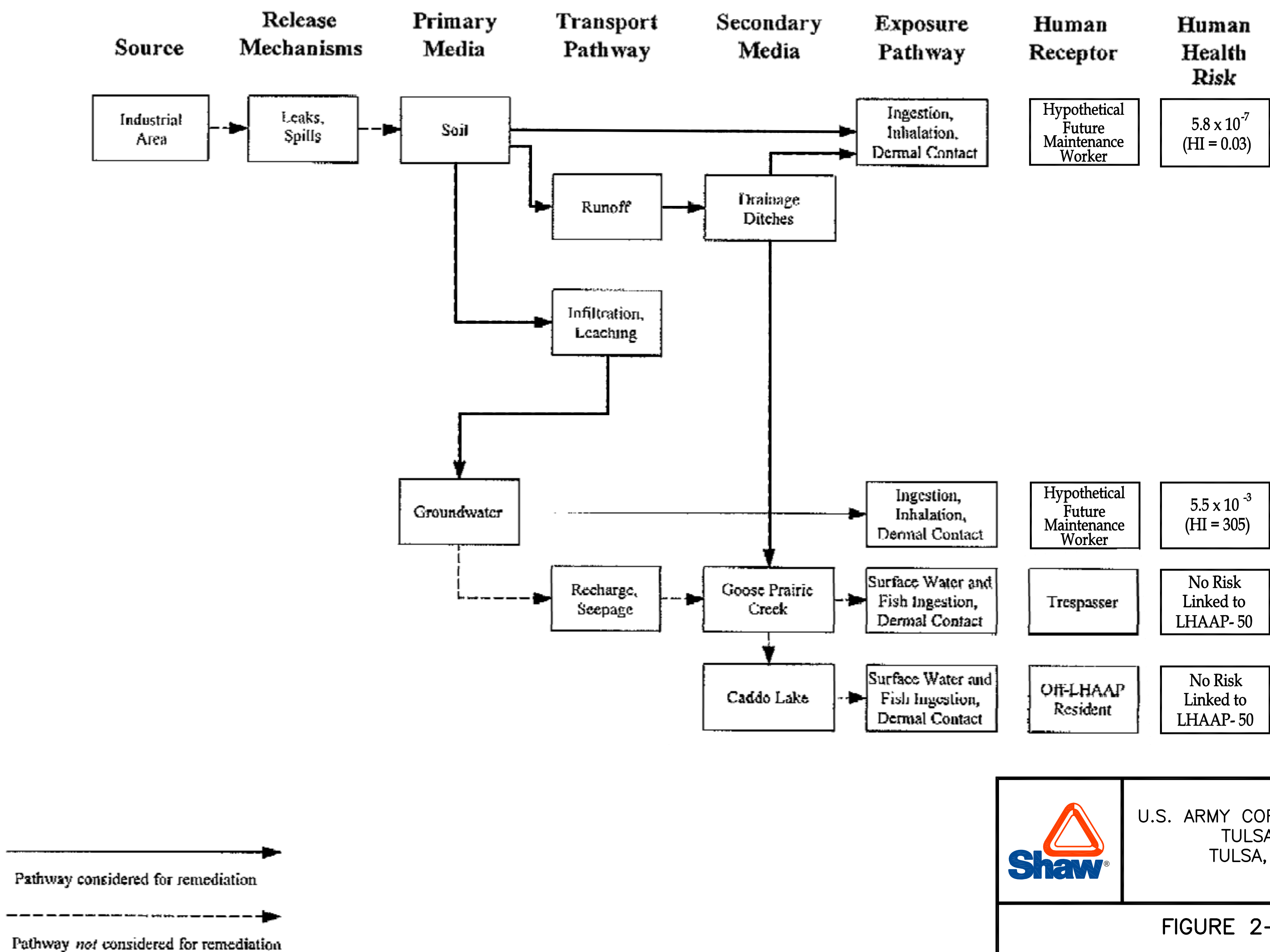


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FIGURE 2-4

CONCEPTUAL SITE MODEL
LHAAP-50 FEASIBILITY STUDY

LONGHORN ARMY AMMUNITION PLANT
KARNACK, TEXAS

# 3.0 Remedial Action Objective and Remediation Levels

This section identifies the RAOs **(Section 3.1)**, potential chemical-, location- and action-specific ARARs **(Section 3.2)**, and preliminary remediation levels **(Section 3.3)** for LHAAP-50. The RAO identifies the general goals or end points that the remediation will accomplish, while the preliminary remediation levels identify specific cleanup standards for each medium of concern based on risk or ARARs. The remediation levels may be applied to individual contaminants.

## 3.1 Remedial Action Objectives

RAOs are established to protect human health and the environment while also meeting ARARs. The identification of RAOs must consider the environmental issues at the site and the receptors that are affected. As identified in the conceptual site model (**Section 2.3**), the primary environmental issues at LHAAP-50 are:

- Groundwater that exceeds MCLs for VOCs (PCE, TCE, 1,1-DCA, 1,2-DCE, cis-1,2-DCE, and VC) and has the potential to adversely impact human health
- Groundwater that exceeds the MSC for industrial use for perchlorate and has the potential to adversely impact human health
- Soil that has concentrations of perchlorate in excess of the TCEQ GWP-Ind concentration and has the potential to continue to be a source of groundwater contamination

The Army recognizes U.S. Environmental Protection Agency's policy to return usable water to its potential beneficial use based upon the non-binding programmatic expectation in the National Oil and Hazardous Substances Pollution Contingency Plan (NCP). The future use of the entire LHAAP facility is as a wildlife refuge. A hypothetical future maintenance worker has been proposed as a conservative human receptor scenario for this land use. As documented in the Baseline Ecological Risk Assessment (Shaw, 2007c), ecological risk is not a concern at LHAAP-50. Based on these considerations, the RAOs for LHAAP-50 are as follows:

- Protect human health for the hypothetical future maintenance worker by preventing exposure to groundwater contaminated with VOCs and perchlorate
- Protect human health by preventing further potential degradation of groundwater and surface water from soil contaminated with perchlorate
- Return groundwater to its potential beneficial use, wherever practicable, within a reasonable time period given the particular site circumstances.

## *3.2 Applicable or Relevant and Appropriate Requirements*

The NCP, 40 Code of Federal Regulations (CFR) 300.430(f)(1)(ii)(B) states that on-site remedial actions conducted under CERCLA must attain, or have waived, legally applicable ARARs under federal or more stringent state environmental or facility citing laws identified at the time of the ROD signature. This section provides a preliminary identification and evaluation of potential federal and State of Texas chemical-, location-, and action-specific ARARs for the remediation of LHAAP-50 under CERCLA.

### *3.2.1 Definitions and Methods*

Applicable requirements are those cleanup standards, standards of control, and other substantive environmental protection requirements, criteria, or limitations promulgated under federal or state law that specifically address a hazardous substance, pollutant, contaminant, remedial action, location, or other circumstance at a CERCLA site (40 CFR 300.5). A requirement is applicable if all the jurisdictional and site-specific prerequisites of the requirement are met; that is, a requirement is applicable if it directly and fully addresses the situation at the site.

Relevant and appropriate requirements are those substantive environmental protection requirements, criteria, or limitations promulgated under federal or state law that, while not applicable, address problems or situations sufficiently similar to those encountered at the CERCLA site so that their use is well suited to the particular site (40 CFR 300.5). The criteria for determining relevance and appropriateness are listed at 40 CFR 300.400(g)(2). A relevant and appropriate requirement must be complied with to the same extent as an applicable requirement.

To qualify as a state ARAR mandating cleanup standards under 40 CFR 300.400(g)(4) of the NCP, a state requirement must be (1) promulgated (of general applicability and legally enforceable), (2) an environmental or facility citing law or regulation, (3) substantive (not procedural or administrative), (4) more stringent than a comparable federal requirement, (5) identified by the state in a timely manner, and (6) consistently applied throughout the state. Pursuant to USEPA guidance (USEPA, 1989), where USEPA has delegated to a state the authority to implement a federal program, the state regulations replace the equivalent federal requirements as the potential ARARs.

ARARs are generally divided into chemical-, location-, and action-specific requirements. Chemical-specific ARARs are usually promulgated health- or risk-based numerical values or methods used to determine acceptable concentrations of chemicals that may be found in, or discharged to, the environment. Location-specific ARARs restrict actions or contaminant concentrations in certain environmentally sensitive areas. Action-specific ARARs are usually technology- or activity-based requirements, or limitations on actions taken with respect to hazardous wastes.

An on-site action need not comply with administrative parts of requirements identified as ARARs. According to USEPA guidance (USEPA, 1988a), administrative requirements are mechanisms that facilitate the implementation of the related substantive requirements of a statute or regulation (e.g., approval of or consultation with administrative bodies, documentation, permit issuance, reporting, record keeping, and enforcement).

The NCP at 40 CFR 300.400(e)(1) exempts on-site actions from having to obtain federal, state, or local permits and defines "on-site" as meaning "the aerial extent of contamination and all suitable areas in very close proximity to the contamination necessary for the implementation of the response action." However, on-site actions must still be in compliance with any substantive permit requirements. Off-site actions must not only comply with requirements that are legally applicable, but they must comply with both the substantive and the administrative parts of those requirements. Permits, if required, must be obtained for all remedial activities conducted off site (40 CFR 300.400[e][2]). Statutory waivers of ARARs (40 CFR 300.430[f][1][ii][C]) may not be used for off-site actions.

The USEPA has noted in its CERCLA guidance that if attainment of a numerical value that is a potential chemical-specific ARAR is impossible because the background level of the chemical subject to CERCLA authority is higher than that of the potential ARAR, the numeric criterion would not be considered an ARAR (USEPA, 1991).

ARARs include only federal or more stringent state environmental laws and regulations and do not include occupational safety regulations. The USEPA requires compliance with the Occupational Safety and Health Administration (OSHA) standards and other worker protection requirements under Section 300.150 of the NCP, not through the ARARs process. Therefore, none of the promulgated OSHA regulations (e.g., 29 CFR 1926, 29 CFR 1910) are addressed here as ARARs.

In addition to ARARs, 40 CFR 300.400(g)(3) states that federal or state nonpromulgated advisories or guidance may be identified as to-be-considered (TBC) guidance for contaminants, conditions, and/or actions at the site. TBCs include non-promulgated criteria, advisories, guidance, and proposed standards. TBCs are not ARARs because they are neither promulgated nor enforceable. TBCs may be used to interpret ARARs and to determine preliminary remediation goals when ARARs do not exist for particular contaminants or are not sufficiently protective to develop cleanup levels. TBCs, such as guidance or policy documents, developed to implement regulations may be considered and used where necessary to ensure protectiveness.

Potential TBCs evaluated as part of this investigation are listed in **Tables 3-1, 3-2,** and **3-3** and are discussed herein.

Chemical-specific requirements are discussed in **Section 3.2.2**; **Table 3-1** includes a narrative listing of chemical-specific ARARs/TBCs for LHAAP-50. **Table 3-2** includes a numerical listing of chemical-specific ARARs/TBCs for groundwater. Location-specific ARARs/TBCs for the sensitive resources potentially identified at LHAAP are discussed in **Section 3.2.3** and listed in **Table 3-3**. Action-specific ARARs/TBCs are listed in **Table 3-4** and are grouped by component action.

### *3.2.2 Potential Chemical-Specific ARARs*

This section identifies the potential chemical-specific ARARs that apply to soil and groundwater at LHAAP-50. These ARARs are summarized in **Table 3-1**.

#### *3.2.2.1 Chemical-Specific ARARs for Soil*

There are no federal promulgated chemical-specific ARARs for soil. The TCEQ Texas Risk Reduction Rules are promulgated state standards for this site. It is anticipated that removal of perchlorate-contaminated soils above the TCEQ GWP-Ind of 7,200 μg/kg will prevent contamination of the groundwater at the site.

#### *3.2.2.2 Chemical-Specific ARARs for Air*

Contaminants emitted into the air during remediation must meet certain chemical-specific requirements for fugitive particulate matter and opacity. Since emissions would be a result of a proposed action, they are addressed as action-specific ARARs in **Section 3.2.4**. However, it is unlikely the proposed actions in this FS would cause emissions that would impact the air.

#### *3.2.2.3 Chemical-Specific ARARs for Surface Water*

Section 121(d)(2) of CERCLA states that every remedial action shall require a level of control which at least attains surface water quality criteria established under Sections 304 or 303 of the Clean Water Act of 1972 (CWA). Therefore, surface water quality criteria are ARARs if there is a remedial action that affects surface water, and measures will be implemented during construction to prevent off-site migration of contaminants to surface waters.

#### *3.2.2.4 Chemical-Specific ARARs for Groundwater*

Where the beneficial use of groundwater is as a current or potential source of drinking water, USEPA states a preference for Safe Drinking Water Act of 1974 non-zero MCL goals and MCLs where they are relevant and appropriate [CERCLA 121(d)(2)(A), as amended, and 40 CFR 300.403(e)(2)(i)(B) and (C)]. Data from the Phase III RI field activities indicate that contaminants at LHAAP-50 have impacted groundwater and that remediation of the groundwater to achieve chemical-specific ARARs may be necessary as a component of this response action (Jacobs, 2002).

LHAAP is being addressed using the Risk Reduction Standards (RRS) (30 Texas Administrative Code [TAC} 335.551 through 335.569). The RRS were provided to ensure adequate protection of human health and the environment from potential exposure to contaminants associated with releases from solid waste management facilities or other areas. There are three sets of RRS that provide cleanup levels ranging from closure/remediation to site background (RRS 1) to closure/remediation with controls (RRS 3). For the purposes of this FS, under the hypothetical future maintenance worker scenario, a Baseline Risk Assessment under RRS 3 was completed for LHAAP-50 which identified COCs in groundwater that potentially pose carcinogenic risk and hazard to the hypothetical future maintenance worker. These identified COCs, with the exception of perchlorate, have MCLs. Thus, the cleanup goal for groundwater will be the MCLs which meet health-based standards and criteria. Medium-specific concentrations provided under Texas Risk Reduction Rules (30 TAC 335.551 through 335.569) are applicable where MCLs are not available, i.e., perchlorate.

### *3.2.3 Potential Location-Specific ARARs*

This section identifies the potential location-specific ARARs that may apply to LHAAP-50. These ARARs are summarized in **Table 3-3**.

#### *3.2.3.1 Sensitive Habitats*

A sensitive habitat is defined within the CERCLA hazard ranking system (40 CFR 300, Appendix A) as one that contains an important biological resource or a particularly fragile resource. Wetlands are specifically included as a type of sensitive habitat. Other sensitive habitats include plant communities of unusual or limited distribution and important seasonal-use areas for wildlife (e.g., migration routes, breeding areas, or crucial winter habitat).

Although there are low-lying wetland areas associated with the drainage ditch and Goose Prairie Creek at LHAAP-50, no formal wetlands survey has been conducted at the LHAAP specifically (USACE, 1992; Jacobs, 2001). Nearby Caddo Lake, however, into which LHAAP surface waters flow is part of the Big Cypress Bayou, which is considered a wetland of international significance. Adverse impacts to any identified wetlands located at LHAAP or to the Caddo Lake/Big Cypress Bayou wetland system from remedial actions at LHAAP-50 must be avoided to the extent practicable. If identified wetlands will be impacted and wetland mitigation is required, Title 12, Chapter 221 (*Wetlands Mitigation*) of the Texas Code, as well as the federal standards for wetland mitigation, may provide location-specific ARARs. These requirements will be evaluated during the final ROD stage as further site-specific data are collected and the preferred alternative is proposed and evaluated.

The Fish and Wildlife Coordination Act (16 USC 661 et seq.) requires that the effects of water-related projects that modify, divert, or control waters, including drainage activities, be considered with a view to preventing loss of and damage to such resources. This act may provide ARARs if groundwater diversion or treatment activities will impact groundwater-to-surface-water drainage patterns such that fish or wildlife may be adversely affected.

### *3.2.4 Potential Action-Specific ARARs*

Action-specific ARARs include operation, performance and design requirements or limitations based on the waste types, media, and remedial activities. This section provides a preliminary identification and evaluation of potential federal and state of Texas action-specific ARARs for the proposed remediation of LHAAP-50.

Pursuant to USEPA guidance, there are no action-specific ARARs for the required no action alternative (USEPA, 1991). The action-specific ARARs for the activities common to the remedial action to be conducted at LHAAP-50 are discussed in **Section 3.2.4.1** below. All action-specific ARARs are listed in **Table 3-4** and are grouped by component action.

#### *3.2.4.1 ARARS for Activities Associated with Action Alternatives*

Some of the proposed remedial action alternatives at LHAAP-50 will involve one or more of the following activities: waste generation, characterization, management, storage, and disposal activities; land use controls (LUCs), and long-term monitoring (LTM). Action-specific ARARs are discussed here for the activities common to the remedial activities to be proposed for LHAAP-50.

##### *3.2.4.1.1 Waste and Disposal Activities*

The processes of monitoring, intercepting, or treating contaminated groundwater may generate a variety of primary and secondary waste streams (e.g., soil, personal protective equipment, and dewatering and decontamination fluids). These waste streams are expected to be non-hazardous waste. All solid waste (defined as any solid, liquid, semisolid, or contained gaseous material intended for discard [40 CFR 261.2]) generated during remedial activities must be appropriately characterized to determine whether it contains RCRA hazardous waste (40 CFR 262.11; 30 TAC 335.62; 30 TAC 335.503[a][4]; 30 TAC 335.504). All wastes must be managed, stored, treated (if necessary), and disposed in accordance with the ARARs for waste management listed in **Table 3-4** for the particular type of waste stream or contaminants in the waste.

Excavated environmental media including soil excavated during the installation of wells would be sent off site for disposal or, in the case of non-hazardous trenching or well construction soil, redeposited within the area of contamination (AOC). The USEPA defines “onsite” as the lateral extent of contamination and all suitable areas in close proximity to the contamination necessary for the implementation of the CERCLA response action and notes that such contamination may contain varying types and concentrations of hazardous substances (53 Federal Register [FR] 51444; 55 FR 8758). The soil generated from remedial activities at LHAAP-50 is expected to be non hazardous. ARARs for the management of such media at the site of generation are listed in **Table 3-4**.

The USEPA has stated that excavation and redeposition of contaminated soil within an AOC does not constitute "generation"; therefore, the requirements of 40 CFR 262.11 and 268.7 to characterize generated wastes are not applicable (Office of Solid Waste and Emergency Response Directive 9441.1992[16], June 11, 1992). Consolidation of waste between AOCs for treatment or disposal, however, or excavation and treatment with subsequent disposal in the same AOC or off-site disposal constitute "placement." In these situations, RCRA Subtitle C requirements for the generation, handling, treatment, and disposal of such wastes are applicable if the waste/media is determined to contain RCRA hazardous waste (55 FR 8758).

##### *3.2.4.1.2 Land Use Controls and Long-Term Monitoring*

Some combination of restrictive covenants, administrative controls, physical barriers, physical surveillance or other controls, in combination with LTM of groundwater, would be necessary under all remedial alternatives to restrict access to contamination and protect human health and the environment because none of the actions will completely remove all of the groundwater contamination to levels that would allow unrestricted access and use of the groundwater.

When engineering or LUC measures are required to protect human health and the environment, 30 TAC 335.565 requires compliance with the identified post-closure care requirements and deed recordation of the facility in accordance with Sections 335.566(b) through (e). The deed recordation must include a description of post-closure measures required and any LUCs placed on the future use of the property, as well as a metes and bounds description of the tract of land. Since there is no deed for federal land, when the Army transfers the land to the USFWS, a recordation of the LUC , as required by the State of Texas, will accompany the transfer. If the land is transferred from a federal entity to a non-federal entity, it is transferred by deed. Some or all of these requirements may be ARARs for this remedial action; the specific combination of controls negotiated for this action would be listed in a signed ROD.

##### *3.2.4.1.4 Well Construction*

All of the proposed alternatives, other than the no action alternative, may involve the placement, use, or eventual plugging and abandonment of some type of groundwater monitoring, injection, and/or extraction wells, either for in-situ treatment or extraction of the contaminated groundwater or for LTM of the groundwater. Available standards for well construction and plugging/abandonment would provide ARARs for such actions.

Texas has promulgated technical requirements in Chapter 76 of Title 16 of the TAC applicable to construction, operation, and plugging/abandonment of water wells. In particular, 16 TAC 76.1000 (*Locations and Standards of Completion for Wells*), 16 TAC 76.1002 (*Standards for Wells Producing Undesirable Water or Constituents*) (LHAAP-50 contaminated groundwater could be considered "undesirable water" defined pursuant to Section 76.10[36] as "water that is injurious to human health and the environment or water that can cause pollution to land or other waters"), 16 TAC 76.1004 (*Standards for Capping and Plugging of Wells and Plugging Wells that Penetrate Undesirable Water or Constituent Zones*), and 16 TAC 76.1008 (*Pump Installation*) may provide ARARs for the placement, construction, and eventual plugging/abandonment of groundwater injection or extraction wells or the placement and long-term operation of groundwater monitoring wells for proposed groundwater remedial strategies.

#### *3.2.4.1.5 Water Treatment*

Contaminated groundwater and wastewaters collected during well drilling or decontamination activities could be transported to the on-site water treatment facility constructed as a component of the previous interim remedial action at other LHAAP sites (LHAAP-18/24) and would subsequently be discharged in compliance with the CWA outfall limits for the facility as listed in the ROD. Such waters would be characterized, as required, before transport and managed accordingly in compliance with requirements for the type of waste contaminating the water. To assure compliance with the water treatment plant's discharge limits, the incoming water must meet the waste acceptance criteria for the facility. On-site wastewater treatment units (as defined in 40 CFR 260.10) that are part of a wastewater treatment facility that is subject to regulation under Section 402 or Section 307(b) of the CWA are not subject to RCRA Subtitle C hazardous waste management standards (40 CFR 270.1[c][2][v]; 40 CFR 264.1[g][6]; 30 TAC 335.42[d][1]). The USEPA has clarified that this exemption applies to all tanks, conveyance systems, and ancillary equipment, including piping and transfer trucks, associated with the wastewater treatment unit (53 FR 34079, September 2, 1988).

## *3.3 Preliminary Remediation Goals*

The RAOs for LHAAP-50 listed in **Section 3.1** allow for a range of response action. For a response action that leaves contamination in place, LUCs would be needed in combination with the response action in order to prevent exposure. For a response action that removes the contamination, preliminary remediation goals would be needed to determine when sufficient contamination has been removed. Preliminary remediation goals are the concentrations for individual chemicals in soil and groundwater above which remediation or control measures would be required. The preliminary remediation goals for soil and groundwater at LHAAP-50 are determined with consideration of the risk to human health and the ARARs identified for the site as discussed in **Section 3.2.2**.

The chemical-specific ARARs and preliminary remediation goals for groundwater at LHAAP-50 are the MCLs and TCEQ GW-Ind (perchlorate). Groundwater with an unacceptable risk or hazard is present at LHAAP-50 primarily due to TCE and perchlorate. The chemicals VC, cis-1,2-DCA, 1,1-DCE, 1,2-DCA, and PCE were also detected in groundwater at concentrations exceeding their respective MCLs and are also considered COCs. Perchlorate was detected in groundwater exceeding its TCEQ GW-Ind. **Table 3-2** summarizes the COCs and the proposed cleanup level for groundwater using the MCLs and TCEQ's GW-Ind (perchlorate).

The proposed cleanup level for the perchlorate contaminated soil is shown in **Table 3-2**. It should be noted that perchlorate does not have federal promulgated standards and is an emerging contaminant. A cleanup value protective of groundwater can be calculated under Risk Reduction Standard No. 3, but it would be approximately the same value as the value published by TCEQ for Risk Reduction Standard No. 2. Thus, the TCEQ GWP-Ind for perchlorate of 7,200 μg/kg has been selected for the cleanup level (TCEQ, 2006).

**Table 3-1**
**Potential Chemical-Specific ARARs/TBCs**

| Citation | Activity or Prerequisite/Status | Requirement |
|---|---|---|
| | Groundwater | |
| Federal Safe Drinking Water Act | Applicable to drinking water at the tap—relevant and appropriate for water that could potentially be used for human consumption | Water designated as a current or potential source of drinking water must not exceed drinking water standard. See Table 3-2 for specific numeric criteria. |
| State of Texas Risk Reduction Standards<br>30 TAC 335.558 and 335.559(d)(2) as updated in the Texas Commission on Environmental Quality memorandum July 23, 1998 | Applicable to industrial groundwater—relevant and appropriate for potential hypothetical future maintenance worker exposure to groundwater | If no maximum contaminant level has been promulgated, groundwater must not exceed the industrial medium-specific concentration. |
| | Soil | |
| State of Texas Risk Reduction Standards<br>30 TAC 335.558 and 335.559(d)(2) as updated in the Texas Commission on Environmental Quality | Relevant and appropriate for potential protection of soil to groundwater pathway for hypothetical potential future industrial use of groundwater. | No federal promulgated concentration for perchlorate. |

*Abbreviations:*

*ARAR applicable or relevant and appropriate requirement*
*TAC Texas Administrative Code*
*TBC to-be-considered [guidance]*

**Table 3-2**
**Chemical-Specific ARARs (Proposed Cleanup Levels)**

| COC | ARAR |
|---|---|
| Groundwater | MCL (µg/L) |
| 1,1-Dichloroethene | 7 |
| 1,2-Dichloroethane | 5 |
| cis-1,2-Dicloroethene | 70 |
| Perchlorate | 72 [a] |
| Tetrachloroethene | 5 |
| Trichloroethylene | 5 |
| Vinyl Chloride | 2 |
| Soil | GWP-Ind (µg/kg) |
| Perchlorate | 7,200 |

*Notes and Abbreviations:*

[a] *Groundwater medium-specific concentration for industrial use for perchlorate since no MCL exists*

*µg/kg* *micrograms per kilogram*
*µg/L* *micrograms per liter*
*ARAR* *applicable or relevant and appropriate requirement*
*COCs* *chemicals of concern*
*GWP-Ind* *soil medium-specific concentration for industrial use based on groundwater protection*
*MCL* *maximum contaminant level as established in the Safe Drinking Water Act*

**Table 3-3**
**Potential Location-Specific ARARs/TBCs**

| Resource/Citation | Activity or Prerequisite Status | Requirement |
|---|---|---|
| Protection of Wetlands<br><br>Section 404 of the Clean Water Act (33 USC 1344); 40 CFR 230.10(a) and (d); Swampbuster Provision of the Food Security Act; Executive Order 11990, "Protection of Wetlands" | Actions that involve the discharge of dredged or fill material into jurisdictional wetlands or actions that have a potential adverse impact to, or take place within, wetlands—**applicable** if delineated wetlands are present at the site and will be adversely impacted by the action | No discharge of dredged or fill material into an aquatic ecosystem is permitted if there is a practicable alternative that would have less adverse impact.<br><br>No discharge of dredged or fill material shall be permitted unless appropriate and practicable steps per 40 CFR 230.70 et seq have been taken, which will minimize potential impacts of the discharge on the aquatic ecosystem. |

Abbreviations:

ARAR applicable or relevant and appropriate requirement
CFR Code of Federal Regulations
FS feasibility study
LHAAP Longhorn Army Ammunition Plant
TAC Texas Administrative Code
TBC to-be-considered (guidance)
USC United States Code

# Table 3-4
## Potential Action-Specific ARARs/TBCs

| Citation | Activity or Prerequisite/Status | Requirement |
|---|---|---|
| *Waste Generation, Management, and Storage* | | |
| Characterization of Solid Waste<br><br>40 CFR 262.11<br>30 TAC 335.62<br>30 TAC 335.504<br>30 TAC 335.503(a)(4) | Generation of solid waste, as defined in 30 TAC 335.1—**applicable**.<br><br>It should be noted that perchlorate contaminated soil in non hazardous. | Must determine whether the generated solid waste is RCRA hazardous waste by using prescribed testing methods or applying generator knowledge based on information regarding material or process used. If the waste is determined to be hazardous, it must be managed in accordance with 40 CFR 262–268.<br><br>After making the hazardous waste determination as required, if the waste is determined to be nonhazardous, the generator shall then classify the waste as Class 1, Class 2, or Class 3 (as defined in Section 335.505 through Section 335.507) using one or more of the methods listed in Section 335.503(a)(4) and Section 335.508 and manage the waste in accordance with the requirements of Chapter 335 of the TAC for industrial solid waste. |
| Characterization of Hazardous Waste<br><br>40 CFR 264.13(a)(1); 40 CFR 268.7<br>30 TAC 335.504(3)<br>30 TAC 335.509<br>30 TAC 335.511 | Generation of a RCRA hazardous waste for treatment, storage, or disposal—**applicable** if hazardous waste is generated (e.g., PPE). | Must obtain a detailed chemical and physical analysis of a representative sample of the waste(s) that at a minimum contains all the information that must be known to treat, store, or dispose of the waste in accordance with 40 CFR 264 and 268.<br><br>Must also determine whether the waste is restricted from land disposal under 40 CFR 268 et seq. by testing in accordance with prescribed methods or use of generator knowledge of waste. |
| Management of RCRA Hazardous Waters—Wastewater Treatment Unit Exclusion<br><br>40 CFR 264.1(g)(6)<br>40 CFR 270.1(c)(2)<br>30 TAC 335.41(d)(1) | Treatment/disposal of wastewater containing RCRA hazardous waste—**applicable** to management of contaminated groundwater if it is determined to contain RCRA characteristically hazardous waste. | On-site wastewater treatment units, as defined in 40 CFR 260.10, that are part of a wastewater treatment facility subject to regulation under Section 402 or Section 307(b) of the CWA are excluded from the requirements of RCRA Subtitle C (Note: USEPA has clarified that this exemption applies to all tank systems, conveyance systems, and ancillary equipment, including transfer trucks, associated with the wastewater treatment unit [53 FR 34079, September 2, 1988]). |
| Requirements for Temporary Storage of Hazardous Waste in Accumulation Areas<br><br>40 CFR 262.34(a) and (c)(1)<br>30 TAC 335.69(a) and (d) | On-site accumulation of 55 gallons or less of RCRA hazardous waste for 90 days or less at or near the point of generation—**applicable** if hazardous waste is generated (e.g., PPE) and stored in an accumulation area. | A generator may accumulate hazardous waste at the facility provided that<br>• Waste is placed in containers that comply with 40 CFR 264.171 to 264.173 (Subpart I); and<br>• Container is marked with the words “hazardous waste”; or<br>• Container may be marked with other words that identify the contents. |
| Requirements for the Use and Management of Containers<br><br>40 CFR 264.171–264.173<br>30 TAC 335.69(e)<br>30 TAC 335.152(a)(7) | On-site storage/treatment of RCRA hazardous waste in containers for greater than 90 days—**applicable** if hazardous waste is generated (e.g., PPE) and is stored in containers. | Design and operating standards of 40 CFR 264.175(c) and 40 CFR 264.171, 264.172, and 264.173(a) and (b) must be met for the use and management of hazardous waste in containers. |
| Well Construction Standards—Monitoring or Injection Wells<br><br>16 TAC 76.1000 | Construction of water wells—**applicable** to construction of new monitoring or injection wells, if needed. | Wells shall be completed in accordance with the technical requirements of Section 76.1000, as appropriate. |

**Table 3-4 *(continued)***
**Potential Action-Specific ARARs/TBCs**

| Citation | Activity or Prerequisite/Status | Requirement |
|---|---|---|
| Well Construction Standards—Extraction Wells<br><br>16 TAC 76.1000(a) and (c) through (h)<br>16 TAC 76.1002(a) through (c)<br>16 TAC 76.1008(a) through (c) | Construction of water wells—**applicable** to construction of extraction (recovery) wells. | Wells shall be completed in accordance with the technical requirements of Section 76.1000, as appropriate.<br><br>Water wells completed to produce undesirable water shall be cased to prevent the mixing of water or constituent zones.<br><br>The annular space between the casing and the wall of the borehole shall be pressure grouted with cement or bentonite grout to the land surface. Bentonite grout may not be used if a water zone contains chloride water above 1500 ppm or if hydrocarbons are present.<br><br>Wells producing undesirable water or constituents shall be completed in such a manner that will not allow undesirable fluids to flow onto the land surface.<br><br>During installation of a water well pump, installer shall make a reasonable effort to maintain integrity of groundwater and to prevent contamination by elevating the pump column and fittings, or by other means suitable under the circumstances. Pump shall be constructed so that no unprotected openings into the interior of the pump or well casing exist. |
| *Treatment/Disposal* | | |
| Disposal of Wastewater (e.g., contaminated groundwater, dewatering fluids, decontamination liquids)<br><br>40 CFR 268.1(c)(4)(i)<br>30 TAC 335.431(c) | RCRA-restricted characteristically hazardous waste intended for disposal—**applicable** if extracted groundwater is determined to be RCRA characteristically hazardous . | Disposal is not prohibited if such wastes are managed in a treatment system subject to regulation under Section 402 of the CWA that subsequently discharges to waters of the United States. |
| *Closure* | | |
| Requirements for Closure of a RCRA Container Storage Area<br><br>40 CFR 264.111<br>40 CFR 264.178<br>30 TAC 335.152(a)(5)<br>30 TAC 335.152(a)(7) | Closure of a RCRA-permitted container storage area—**applicable** if hazardous waste is generated (e.g., PPE) and is stored in containers. | Must close unit in a manner that<br>• Minimizes the need for further maintenance;<br>• Controls, minimizes, or eliminates, to the extent necessary to protect human health and the environment, post-closure escape of hazardous waste, hazardous constituents, leachate, contaminated runoff, or hazardous waste decomposition products to ground or surface waters or to the atmosphere; and<br>• Complies with closure requirements of 40 CFR 178.<br><br>All hazardous waste and residues must be removed from containment system. Remaining containers, liners, bases, and soil containing or contaminated with hazardous waste or residues must be decontaminated or removed. |
| Standards for Plugging Wells that Penetrate Undesirable Water or Constituent Zones<br><br>16 TAC 76.1004(a) through (c) | Plugging and abandonment of wells—**applicable** to plugging and closure of monitoring and/or extraction wells. | If a well is abandoned, all removable casing shall be removed and the entire well pressure filled via a tremie pipe with cement from bottom up to the land surface. In lieu of this procedure, the well shall be pressure-filled via a tremie tube with bentonite grout of a minimum 9.1 lb/gal weight followed by a cement plug extending from land surface to a depth of not less than 2 feet. Undesirable water or constituents or the freshwater zone(s) shall be isolated with cement plugs. |

## Table 3-4 *(continued)*
## Potential Action-Specific ARARs/TBCs

| Citation | Activity or Prerequisite/Status | Requirement |
|---|---|---|
| *Post-Closure Care and Land Use Controls* | | |
| Land Use Controls when Hazardous Substances are Left in Place<br><br>30 TAC 335.565<br>30 TAC 335.566 | Hazardous substances left in place on contaminated property—relevant and appropriate. | Where engineering or land use control measures are required to protect human health and the environment, they must comply with the identified post-closure care requirements and deed recordation of the facility in accordance with Section 335.566.<br><br>Must record in the deed records of the county or counties in which the activities take place the information specified in Sections 335.566(b) through (e):<br><br>• Description of post-closure measures required,<br>• Description of any land use or legal controls placed on the future use of the property,<br>• Metes and bounds description of the tract of land, and<br>• Statement that pertinent information and documents are available for inspection. |

*Abbreviations:*

| | | | |
|---|---|---|---|
| *ARAR* | *applicable or relevant and appropriate requirement* | *LHAAP* | *Longhorn Army Ammunition Plant* |
| *CFR* | *Code of Federal Regulations* | *%* | *percent* |
| *CWA* | *Clean Water Act of 1972* | *PPE* | *personal protective equipment* |
| *USEPA* | *U.S. Environmental Protection Agency* | *ppm* | *part per million* |
| *FR* | *Federal Register* | *RCRA* | *Resource Conservation and Recovery Act of 1976* |
| *FS* | *feasibility study* | *TAC* | *Texas Administrative Code* |
| *lb/gal* | *pound per gallon* | | |

# *4.0 Identification and Screening of Technologies and Process Options*

The primary objective of identifying, screening, and evaluating potentially applicable technology types and process options for the LHAAP-50 FS is to identify an appropriate range of remedial technologies and process options to be developed into remediation alternatives. This screening process consists of a series of analytical steps that include the following:

- Identify volumes or areas of media of concern, and COCs **(Section 4.1)**
- Identify general response actions (GRAs) **(Section 4.2)**
- Identify and screen remedial technologies and process options **(Section 4.3)**
- Evaluate and select representative process options **(Section 4.4)**

These steps are outlined in the USEPA RI/FS guidance (USEPA, 1988b) and the NCP.

## *4.1 Contaminants and Media of Concern*

### *4.1.1 Groundwater*

**Section 1.0** presents the site conditions at LHAAP-50. Based on available sampling data, groundwater at LHAAP-50 has been identified as the medium of concern because it poses an unacceptable carcinogenic risk and non-carcinogenic hazard to a hypothetical future maintenance worker, primarily due to the presence of PCE, TCE, 1,1-DCE, 1,2-DCA, cis-1,2-DCE, vinyl chloride, and perchlorate. These contaminants are identified as COCs due to their unacceptable carcinogenic risk and non-cancer hazard to a hypothetical future maintenance worker and exceedance of their respective MCLs or GWP-Ind (perchlorate) in groundwater. The most recent concentrations are shown on **Figures 2-1** and **2-2**. Two wells, both screened within the shallow groundwater zone, had detections of some COCs above their respective MCL.

TCE and perchlorate, for which the MCL and GWP-Ind are 5 μg/L and 72 μg/L, respectively, are the COCs detected most consistently during all the sampling events and were also associated with the greatest risks or hazards to human health. Therefore, the area where these COCs were detected was selected as a conservative basis for determining the vertical and horizontal extent of groundwater requiring remedial action at LHAAP-50. At 50WW02, a fine grain sand was observed in the silty clay over the 10-foot screened interval; and the approximate vertical extent of the TCE is assumed to be 10 feet. Both perchlorate and TCE have historically been detected at high concentrations in well 50WW02. Low levels of these contaminants have been detected in wells 50WW02 and 50WW05. The TCE plume (**Figure 2-1**) is larger and encompasses the perchlorate plume (**Figure 2-2**). Therefore, the extent of contamination, as shown on **Figure 2-1**, is approximately 244,000 square feet.

**Equation 4-1** estimates the total volume of contaminated groundwater in gallons by using the vertical and horizontal extents.

| | |
|---|---|
| Lateral extent of groundwater contamination (244,000 square feet) × vertical extent of groundwater contamination (10 feet) × total porosity (0.3) × 7.48 gallons per cubic foot = 5,475,360 gallons | **Equation 4-1** |

Therefore, a conservative estimate of the volume of groundwater requiring remedial action equals approximately 5.5 million gallons.

### *4.1.2 Soil*

Available soil data indicate the perchlorate surface soil (where the concentrations exceed the GWP-Ind of 7,200 μg/kg) is within the area of the perchlorate groundwater plume. Thus, the potential for further migration of perchlorate from the soil into the groundwater is within the area of groundwater contamination. **Figure 2-1** shows this area (approximately 4,000 square feet) of contamination to depth of one foot bgs. Thus, the total volume of contaminated soil with a potential to allow further migration of perchlorate into the groundwater is 4,000 cubic feet, or approximately 150 cubic yards.

## *4.2 General Response Actions*

GRAs are general actions that can be taken to achieve the RAO for the medias of concern, which are groundwater and soil at LHAAP-50. The potential applicability of GRAs and associated technologies was evaluated based on key factors that include the type and form of wastes, geologic characteristics, and location-specific constraints. **Table 4-1** summarizes the applicable GRAs for groundwater at LHAAP-50. A no action GRA must also be considered for a baseline of comparison.

## *4.3 Identification and Screening of Potentially Applicable Technologies*

Presented below are general descriptions of potentially applicable technologies and process options for the GRAs. The term "process option" refers to specific processes within each technology type. For example, the in-situ treatment technology category could include process options such as permeable reactive barriers, enhanced bioremediation, or chemical oxidation. Several broad technology types may be identified for each general response action, and numerous process options may exist for each technology. Even within process options there are additional levels of choice, such as different agents for enhanced bioremediation.

The identification and screening process is performed in accordance with the CERCLA FS guidance document (USEPA, 1988b), as specified by the NCP (40 CFR Part 300, Subpart F).

Initial identification as potentially applicable is based primarily on technical feasibility, using the following criteria:

- Compatibility with constituent characteristics
- Compatibility with site characteristics
- Ability to achieve RAO – either alone or as a component of a treatment train
- Development status – a technology must be developed to the point of field-scale demonstration so that information is available on performance, reliability, and cost.

Based on these criteria, some remedial action technologies and the associated process options were eliminated from further consideration from the universe of technologies. Those technology types considered most likely to meet the groundwater RAO are presented in **Table 4-2**.

## *4.4 Screening of Process Options*

Each process option for a given technology provides a basis for developing remedial alternatives and evaluating their costs and attributes. However, the specific process used to implement the remedial action may not be selected until the remedial design phase of the project (USEPA, 1988b). Furthermore, pilot or treatability studies conducted prior to or during the final design may indicate that the representative technology is not feasible. If this occurs, the next best demonstrated available technology is selected.

For GRAs with more than one process option, each option is evaluated according to the following criteria:

- **Effectiveness –** which includes evaluation of the following:
  - Potential effectiveness in handling the estimated areas or volumes of media
  - Potential in meeting the RAO.
  - Potential impacts to human health and the environment during the construction and implementation phase.
  - Demonstrated reliability of the process with respect to contaminants and conditions at the site (USEPA, 1988).

- **Implementability –** which includes both the technical and institutional feasibility of implementing a process option:
  - Technologies passing the initial screen of applicability are screened on the basis of technical feasibility. This criterion means feasibility under site-specific conditions. This evaluation may indicate that although a technology may be

generally applicable for the COCs, the specific technology may be unworkable or limited due to site-specific conditions.

- Institutional feasibility emphasizes the institutional aspects of implementability, such as the ability to obtain permits for off-site actions; the availability of treatment, storage, and disposal services (including capacity); and the availability of equipment and skilled workers to implement the technology (USEPA, 1988).

- **Cost** – which plays a limited role in the screening of process options. Cost is considered a deciding factor only when two alternatives are found to be equally protective. Ranges or approximations of relative capital and operation and maintenance (O&M) costs are used rather than detailed estimates. The cost analysis is made on the basis of prior experience with technologies, readily available information, and engineering judgment. Each process is evaluated relative to other process options of the same technology type, based on a cost range.

Following selection of the most appropriate process options for each technology type, the process options are combined to form remedial alternatives. The remedial alternatives are discussed in **Section 6.0**.

## *4.5 Evaluation and Selection of Representative Process Options*

In this section, the process options within each technology type are evaluated using three criteria: effectiveness, implementability, and cost. The most applicable process options are included in the development of remedial alternatives in the FS.

### *4.5.1 Groundwater*

#### *4.5.1.1 No Action*

The no action option does not provide for any groundwater remedial activities. No monitoring of the groundwater conditions occurs under this option. This option is retained as a baseline with which other remediation alternatives are prepared.

- **Effectiveness –** A lack of access controls or remediation of the groundwater from LHAAP-50 could result in a future unacceptable risk to humans if the groundwater is ingested.
- **Implementability –** No implementation is required.
- **Cost –** None.

#### *4.5.1.2 Monitored Natural Attenuation*

MNA is a passive remedial process option that will achieve the cleanup levels over time. Natural processes such as dilution, volatilization, biodegradation, adsorption, and chemical reactions with subsurface materials are monitored to confirm their progress in reducing contaminant concentrations to acceptable levels over time. Natural attenuation may already be occurring at LHAAP-50 as discussed in **Appendix A**. The types of contaminants found at LHAAP-50 are amenable to this technology.

- **Effectiveness –** MNA is considered under CERCLA on a case-by-case basis. USEPA guidance has been developed to aid in the selection of this process option for VOCs. MNA has been selected for a number of CERCLA sites. It is effective when short-term releases have been mitigated and a determination is made that natural attenuation is occurring and that further off-site releases are not occurring at unacceptable levels. Regular monitoring must be conducted throughout the process to confirm that attenuation is occurring in accordance with cleanup objectives. The evaluation of MNA parameters indicate natural attenuation is occurring at LHAAP-50 (see **Appendix A**).
- **Implementability –** Significant groundwater sampling and analyses must be performed to confirm that conditions are suitable for natural attenuation and to establish a monitoring network. It must also be confirmed that additional source releases and unacceptable off-site releases are not occurring.
- **Cost –** Low to moderate.

*Summary of Monitored Natural Attenuation Process Option*

Monitored Natural Attenuation is carried forward as a representative process option. This process option could be combined with other process options to meet the RAO.

#### *4.5.1.3 Land Use Controls*

LUCs would be implemented to regulate access to groundwater and include covenants/deed restrictions, administrative controls, and physical mechanisms. This process option controls exposure by restricting access and use of the contaminated groundwater and also provides information needed to assess future conditions at the site. The LUC process option is applicable to the groundwater at LHAAP-50. Notification of industrial/recreational use will accompany all transfer documents and will be recorded in the County Courthouse. Five-Year Reviews will be performed to document that the land use remains consistent with the industrial/recreational exposure scenario evaluated in the risk assessment.

**Covenants/Deed Restrictions.** Restrictions to the groundwater can be accomplished through modifications to the property deed or agreements about land use. Legal restrictions can be placed on the installation of groundwater extraction wells not only to prevent access to the contamination but also to minimize the possibility of moving the contamination toward a future user. A recordation of the LUCs (including restriction of groundwater use) will accompany the transfer documentation from the Army to the USFWS. Deed restrictions would be needed only if the Army releases the property to a non-federal entity. These restrictions are only effective as long as the property owners and local authorities enforce them. The Army is ultimately responsible for the enforcement of the LUCs.

- **Effectiveness –** Covenants/deed restrictions are effective, if enforced, in controlling human activities such as potable well construction. These actions can limit or prevent exposure to contaminants remaining on the site after remediation and can be implemented on a temporary basis. The 5-year review will ensure that the covenants/deed restrictions are enforced and remain effective.
- **Implementability –** These options can be readily implemented.
- **Cost –** Low.

**Administrative Controls.** Administrative controls consist of the use of training or procedures to limit access to the site and reduce the risk to human health posed by site contamination at LHAAP-50. These measures may include internal notices and site inspections to serve as a reminder of the existence of LUCs, a site approval process to review land-use changes at LHAAP-50 to ensure the LUCs are followed, training of site personnel regarding the existence and care of the LUCs, and regular inspection and maintenance of the LUCs. These are controls the Army can use while they maintain control of the site.

- **Effectiveness –** Administrative controls are effective in controlling human intrusion into contaminated areas during and after remediation. The training required for access to the site limits potential exposure to the contaminated groundwater. Administrative controls can be used in conjunction with physical mechanisms and deed restrictions. This option is effective only while LUCs are maintained.
- **Implementability –** Training and procedures are readily available and implemented. They may need to be modified for LHAAP.
- **Cost –** Low.

**Physical Mechanisms.** Physical mechanisms include physical barriers intended to limit access to property, such as fences or signs. However, the future use of the site is to be a part of a refuge under the USFWS. It is anticipated that covenants/deed restrictions and administrative controls will be adequate to control access to the contaminated groundwater and physical mechanisms will not be required.

*Summary of Land Use Controls Process Options*

Covenants/deed restrictions and administrative controls are carried forward as representative process options for the LUC process options. The covenants/deed restrictions would only be used if the Army releases the land to a non-federal entity. The LUC process options could be combined with other process options to meet the RAOs.

#### *4.5.1.4 Long-Term Media Monitoring*

Environmental media (e.g., groundwater) can be monitored after the implementation of the remedial action to determine the effect the remedy has had on the level of contamination. Long-term media monitoring can detect a potential failure of the action to meet the RAO. Monitoring can also be used to detect changes in expected site conditions or changes in the expected effectiveness of the remedy, and indicate whether additional actions should be implemented.

- **Effectiveness** – Long-term media monitoring would be successful in evaluating the effectiveness of a remedial alternative. The effectiveness of the monitoring system depends on the design of the monitoring plan.
- **Implementability –** Equipment and personnel are readily available. The site is readily accessible, and most monitoring techniques have already been implemented at LHAAP. Multiple groundwater-monitoring wells are already in place, and there is a reasonable baseline of groundwater conditions.
- **Cost –** Moderate due to labor and analytical costs.

*Summary of Long-Term Media Monitoring*

Long-term media monitoring is carried forward as a process option to be combined with other process options to meet the RAOs.

#### *4.5.1.5 Extraction Wells*

Vertically installed wells are designed to collect and extract clean or contaminated groundwater to contain a plume or to reduce contaminant mass in the plume. Extraction wells have been used with mixed results at LHAAP.

- **Effectiveness** – Extraction wells are considered the most effective groundwater removal technology applicable over a wide range of site conditions. However, proper locations need to be selected to provide for effective extraction and long-term operation is required. LHAAP-50 contains discontinuous sand lenses that can limit the effectiveness of extraction.
- **Implementability –** This process is the single most commonly used method to remove groundwater in a very wide range of conditions. Some site predesign characterization may be needed to site new wells. Extraction wells are easy to install at depths required to intercept all depths of groundwater.
- **Cost –** Low to moderate.

*Summary of Extraction Well Process*

Extraction wells are not retained as a representative groundwater removal process option since the discontinuous sand lenses may limit the effectiveness.

#### *4.5.1.6 Interceptor Trenches*

An interceptor trench is a high permeability subsurface trench that collects contaminated groundwater. It is constructed and operates very much like a vertical French drain with the exception that the collected groundwater is actively pumped from the trench for ex situ treatment. The trench can be installed across the entire width of a shallow plume to more effectively capture contaminated groundwater.

- **Effectiveness –** Interceptor trenches are generally very effective at collecting groundwater. The trench functions like a continuous line of extraction wells. However, the discontinuous nature of the permeable lenses which control shallow groundwater will limit the effective use of trenches.
- **Implementability** – Interceptor trenches are relatively easy to install with conventional construction equipment in the shallow groundwater zone. The process requires long-term maintenance to ensure that the permeable media and collection piping do not become clogged.
- **Cost –** Moderate to high.

*Summary of Interceptor Trench Process Option*

Interceptor trenches are not retained as a representative groundwater removal process option since the discontinuous sans lenses may limit the effectiveness.

#### *4.5.1.7 Air Sparging/Soil Vapor Extraction*

This process option is designed to remove VOCs from the groundwater by volatilizing these contaminants through the introduction of air. Air is introduced into the groundwater, assisting in the volatilization of those organics in solution in the groundwater. Extraction wells are installed into the vadose zone and a vacuum is drawn on these wells. The extraction system draws off the organic-laden air that was bubbled through the groundwater in addition to any vapors that exist in the soil pore spaces. The volatilized contaminants can then be drawn from these extraction wells and treated. This process can be used in those areas where VOCs exist in the groundwater and the vadose zone above this groundwater is relatively permeable.

- **Effectiveness –** This process is very effective on highly volatile contaminants (e.g., 1, 1-DCE, TCE, and PCE) and highly permeable formations. It is incompatible with certain soil types, and high humid content inhibits volatilization of contaminants. High clay content soil, however, may limit the effectiveness of air sparging by retarding the movement of air and vapors through the soil column. Implementation at LHAAP-50 is complicated by the nonhomogeneous geology found at the site. The presence of discontinuous high-permeability zones can result in preferential air flow paths, limiting the effectiveness.

- **Implementability** – Vapor extraction and air sparge equipment is readily available, and commercial vendors are available to design and operate these systems. This process has been used at many hazardous waste sites in relatively homogeneous media. Organics that are removed from the vapor extraction wells require ex situ treatment. Site characterization and modeling are required to determine the proper location of the injection and extraction wells and extraction rates.

- **Cost –** Low to moderate.

*Summary of Air Sparging/Soil Vapor Extraction Process Option*

Air sparging/soil vapor extraction is not retained as a process option since the discontinuous sand lenses may limit the effectiveness of the option.

#### *4.5.1.8 In Situ Oxidation*

Contaminated media are treated through the addition of oxidants, such as potassium permanganate, hydrogen peroxide, or ozone, which convert the contaminants to a less mobile or toxic form. This process option is applicable to VOCs such as 1,1-DCE, TCE, and PCE.

- **Effectiveness** – In situ oxidation is effective for treatment of VOCs (particularly TCE) in a relatively homogeneous and porous medium rather than the nonhomogeneous geology found at LHAAP-50. Moreover, this technology is typically used as a source-area treatment and is less effective for treatment of large areas of low contaminant concentrations (e.g., dissolved plumes) similar to the groundwater plume identified at LHAAP-50. The effectiveness of the treatment usually depends on the success of the delivery method. The long-term effectiveness is uncertain as a change in chemistry could mobilize or change the chemical behavior of the previously oxidized or reduced constituents.

- **Implementability –** This process option may be difficult to implement due to concerns regarding delivery and sufficient exposure of the contaminants to the chemical oxidants. Special handling considerations are often required due to the reactive and corrosive characteristics of the oxidants. Furthermore, in situ chemical oxidation can produce particulates and cause a loss of permeability in the subsurface. Other potential side effects from this treatment technique include gas evolution, generation of fugitive VOC emissions, potentially toxic byproducts, and release of heat generated during the oxidation process. Because oxidants are often highly reactive in the subsurface, they may not migrate long distances from the delivery point. Consequently, several, closely-spaced injection points would be required to adequately disperse the oxidant. A pilot test would also be required to determine the site-specific chemical transport properties of the aquifer.

- **Cost –** Moderate.

*Summary of In Situ Oxidation Process Option*

In situ oxidation is not retained as a process option because of the discontinuous sand lenses that would limit the effectiveness of treating the large plume area.

#### *4.5.1.9 Permeable Reactive Barriers*

Permeable reactive barriers can be a physical/chemical or biological treatment option. A reactive barrier or gate is a permeable wall containing reactive media that is constructed across the path of a contaminant plume. As contaminated water passes through the wall, the contaminants are removed or degraded, allowing uncontaminated water to emerge on the downgradient side. Reactive barriers are usually installed through adaptation of conventional construction methods for impermeable barriers such as open trenches, polymer slurry trenches, and overlapping caissons. Reactive barriers may be constructed from a variety of materials including zero-valence metals (ZVM), granulated activated carbon (GAC), biological material, and other sorbents. These materials treat contaminants through a combination of mechanisms, including adsorption, chemical reduction, and biodegradation. Application of biological material (biotreatment) can be implemented as either a passive barrier wall or a network of injection points; biotreatment is evaluated in **Section 4.5.1.10**.

ZVM works by chemically reducing contaminants, thus either causing their degradation or limiting their mobility. A variety of metals can be used as reducing agents such as silver, gold, palladium, copper, zinc, aluminum, manganese, and iron. In situ reactive gates require high volumes of ZVM, making the application of precious metals such as silver, gold, and palladium impractical. The most practical metal for this technology is iron, because of its relative abundance, low cost, and low toxicity. However, more expensive yet more effective forms of iron (palletized iron) may be necessary, depending on the contaminant.

GAC is the most widely used adsorbent and filter medium because of its effectiveness on a variety of contaminants. GAC is chemically stable and will not produce secondary contaminants. The surface area of the carbon and the pH of the solution flowing through the medium determine the rate and effectiveness of GAC in adsorbing contaminants. In addition, different contaminants are adsorbed according to different ionic natures and kinetics.

- **Effectiveness –** The effectiveness of this process depends greatly on the contaminants, the reactive media, site hydrology, and site geochemistry. Reactive media clogging and exhaustion causes the need for periodic replacement. The gates are generally limited to shallower applications because of the difficulties in installing and monitoring the media at depth. There are concerns over the longevity of the reactive media given uncertain and changing chemical and physical conditions.

- **Implementability** – Permeable reactive barriers require adequate site and contaminant characterization and monitoring to determine effectiveness. This process requires treatability testing before full-scale implementation to determine potential physical and chemical interactions with surrounding materials, location within the aquifer, and criteria for replacement. Long-term maintenance requirements may be significant.

- **Cost –** Low to moderate.

*Summary of Permeable Reactor Barrier Process Option*

Permeable reactive barriers are not retained as a process option due to the heterogeneity of the site soils and the discontinuous soil lenses which would limit the effective installation of the barrier and the treatment effectiveness.

##### *4.5.1.10 Enhanced Bioremediation*

This general process option covers a wide range of individual biological process options that rely on microbial transformation of organic contaminants under aerobic or anaerobic conditions into benign forms to obtain energy or carbon. Enhanced biodegradation is applicable to the groundwater at LHAAP-50. Excessively high concentrations of contaminants could be toxic to microbes. Many organic contaminants, including the COCs at LHAAP-50, can be biodegraded under anaerobic (without oxygen) conditions. The activity of microorganisms is greatly affected by pH, redox potential, temperature, oxygen content, and most importantly, nutrient availability. These conditions can be manipulated to achieve optimal conditions for microbial activity, accelerating the biodegradation of the target contaminants. The conditions are manipulated through the addition of nutrients or electron acceptors or donors.

- **Effectiveness –** In situ biodegradation is effective in either low oxygen conditions or high oxygen and methane conditions in a permeable media that enhances the continuing delivery of nutrients to the bacteria. The primary challenge for in situ biological treatment is to effectively introduce the bacteria and nutrients to the affected areas and ensure adequate mixing and contact. The rate of destruction is typically slower than other competing processes, but fewer and less toxic byproducts result. Pilot-scale testing at other sites has demonstrated that some enhancements will allow indigenous bacteria to degrade chlorinated solvents such as those detected at LHAAP-50.

- **Implementability –** Enhancing the biological activity may be difficult in some of the low permeability soil at LHAAP-50 because of complications associated with the delivery of nutrients and oxygen. Equipment and expertise are readily available, but significant treatability testing would be required.

- **Cost –** Moderate.

*Summary of Enhanced Bioremediation Process Option*

Enhanced biotreatment bioremediation has been retained as a process option that could be implemented in a target area to treat areas of highest concentrations.

#### *4.5.1.11 Phytoremediation*

Phytoremediation is an emerging technology that uses plants to control contaminant releases from soil or water. It is only applicable to contamination present in the shallow zone, and it may be effective for treatment of VOCs. Phytoremediation processes can be classified based on the contaminant fate: degradation, extraction, containment, or a combination of these. Phytoremediation mechanisms include extraction of contaminants from groundwater; concentration of contaminants in plant tissue; degradation of contaminants by biotic or abiotic processes; volatilization or transpiration of volatile contaminants from plants to the air; immobilization of contaminants in the root zone; hydraulic control of contaminated groundwater (plume control); and control of runoff, erosion, and infiltration by vegetative covers. Poplar and cottonwood trees have been successfully used to remove and degrade TCE from groundwater.

- **Effectiveness –** It has been demonstrated that TCE is effectively removed by phytodegradation or the uptake and breakdown of contaminants by metabolic processes. Hybrid poplar trees were exposed to water containing 50 parts per million TCE and metabolized the TCE within the tree. Plant uptake is controlled by hydrophobicity, solubility, and polarity. Toxic intermediates or degradation products may be formed.
- **Implementability** – Time is required for the deeper-rooted trees to grow sufficiently to provide an effective remedy. The contamination depth, even in the shallow zone, would require deeper-rooted plants. This is a fairly easy process option to implement.
- **Cost –** Moderate.

*Summary of Phytoremediation Process Options*

Phytoremediation is eliminated from further consideration due to the depth of contamination.

#### *4.5.1.12 On-Site Mobile Treatment Plant*

A small, skid-mounted or mobile treatment plant could be built near the point of groundwater extraction. The treatment system would be designed for removal of the COCs from the extracted groundwater. GAC or air stripping could remove the COCs. The new treatment plant may require a pretreatment system (e.g., precipitation) if iron and other interfering metals are present in the groundwater.

- **Effectiveness –** The new system could be very effective. All of the considered technologies are proven effective and are even used at an existing treatment plant at LHAAP. Smaller units have less operational flexibility and may expect deviations more often. However, this option would be effective.

- **Implementability –** The implementation of this option is more difficult than that of the existing treatment plant. A few studies would be needed to design the plant to meet the site conditions. This option is still reasonably easy to implement.
- **Cost –** Moderate. The capital costs of this option are considerably greater than that of the existing plant. However, there is a potential that the operational costs could be minimized.

*Summary of Ex Situ Treatment Process Options (Treatment Plant)*

Ex situ treatment is not retained since this technology would be evaluated in combination with groundwater extraction which has been eliminated as a process option.

#### *4.5.1.13 Burning Ground No. 3 Groundwater Treatment Plant*

Process wastewater and decontamination water are sent to the LHAAP groundwater treatment plant. This facility, which is currently processing contaminated groundwater from other LHAAP sites, includes unit operations such as neutralization, precipitation, biological digestion, and air stripping. The effluent from the plant is discharged to Harrison Bayou.

- **Effectiveness –** The existing facility is currently treating groundwater. The hydraulic capacity of the plant has not been met yet, so additional flow could be effectively handled. The discharge requirements are routinely met, indicating an effective operation.
- **Implementability –** The treatment plant is already operational. It is operating below current design capacity. Depending on the composition of the site water sent to the plant, it is possible that no revisions to the treatment components of the plant would be necessary.
- **Cost –** Low.

*Summary of Ex Situ Treatment Process Options (Treatment Plant)*

Ex situ treatment is not retained since this technology would be evaluated in combination with groundwater extraction which has been eliminated as a process option.

#### *4.5.1.14 Surface Water Discharge*

This process option discharges treated wastewater into a surface water body, stream, or river. This would require piping and pumps or a gravity drain system to transport the treated water to the surface water discharge point. The treated wastewater would likely be discharged into a local surface water body. Currently, the existing treatment plant discharges into Harrison Bayou.

- **Effectiveness** – This process option is an effective method for disposal of water if the requisite National Pollutant Discharge Elimination System (NPDES) discharge limits can be met. The current treatment system discharges to Harrison Bayou through an NPDES-monitored point.

- **Implementability** – Discharge limits have already been selected for the current discharge point. The existing water treatment plant is currently discharging through this point; therefore, this process option would be easily implemented.

- **Cost** – Low.

*Summary of Surface Water Discharge Process Options*

Surface water discharge is not retained since it would be evaluated in combination with groundwater extraction which has been eliminated as a process option.

### 4.5.2 Summary of Representative Process Options for Groundwater

The following technologies/process options remain after screening:

- No Action
- Land Use Controls
- Long-Term Monitoring
- Monitored Natural Attenuation
- In Situ Bioremediation

### 4.5.3 Soil

#### 4.5.3.1 No Action

The no action option does not provide any soil remedial activities. This option is retained as a baseline with which other remediation alternatives are prepared.

- **Effectiveness** –A lack of any remedial action to address the potential for perchlorate in the soil could result in additional groundwater contamination.

- **Implementability** – No implementation is required.

- **Cost** – None.

#### 4.5.3.2 Excavation

The excavation process option is designed to physically remove the contaminated soil from the subsurface. It is implemented in conjunction with other process options such as ex situ treatment or disposal.

- **Effectiveness** – This process is very effective in removing material from the subsurface that may continue to act as source of contamination to the groundwater. Excavation, however, is a typically a precursor to ex-situ treatment or disposal.

- **Implementability** – Equipment operators and excavation equipment is readily available. Due to the shallow nature of the contamination, the excavation is easily implementable since there are no concerns with the stability of the excavation and its effect on the surrounding area.
- **Cost** – Low.

*Summary of Excavation Process Option*

Excavation will be retained as a representative process option to be combined with other options to fully meet the RAOs.

#### *4.5.3.3 Treatment*

The treatment option can be implemented either in situ or ex situ. Since the material is non hazardous, ex situ treatment is not considered for this FS. In situ treatment would involve mixing carbon source (chicken, cow, or horse manure) into the soil. The biotreated soil will be sampled periodically and the groundwater around the treatment area may be sampled.

- **Effectiveness** – This process option is effective in reducing perchlorate concentrations in soil. Pilot studies for in situ treatment of perchlorate in soils have been conducted at LHAAP and were effective in reducing concentrations. However, long term sampling and monitoring of the area would be needed until levels reach cleanup levels.
- **Implementability –** To ensure the treatment is effective, a pilot study would be needed to determine the type and quantity of the carbon source that would be most effective. Materials that could be used for treatment are readily available. As in the pilot study, the area would be watered to enhance the distribution of the carbon source throughout the soil and provide optimum conditions for treatment. There is a slight risk of contaminants from the manure migrating into the adjacent Goose Prairie Creek from surface runoff if the treatment area is not covered.
- **Cost –** Moderate.

*Summary of Treatment Process Option*

For treatment a pilot study may need to be conducted to determine the most effective treatment method and the treatment would be conducted over a period of time with periodic testing. Excavation and disposal can be completed without studies or ongoing sampling events. Thus, treatment is not retained since excavation and disposal are more implementable.

#### *4.5.3.4 Disposal*

Disposal would be implemented using an off-site RCRA Subtitle D permitted landfill for the perchlorate contaminated soil.

- **Effectiveness** – Disposal combined with excavation is an effective method to reduce potential migration of the contaminant from the soil into the groundwater as long as the disposal facility used is permitted to accept this type of waste.
- **Implementability –** RCRA Subtitle D permitted landfills are available and can accept the small quantity of nonhazardous waste soil to be generated.
- **Cost –** Low.

*Summary of Disposal Process Option*

Disposal is readily implementable and effective and will be retained as a representative process option to be combined with other process option.

### *4.5.4 Summary of Representative Process Options for Soil*

The process options retained for soil are:

- No Action
- Excavation
- Disposal

**Table 4-1**
**General Response Actions at LHAAP-50**

| GRA | Description |
|---|---|
| No Action | No remedial measures. Does not satisfy RAO, but must be evaluated as the baseline for comparison of other response actions and alternatives. |
| Land Use Controls | Application of administrative actions such as land use restrictions and deed recordations or monitoring to protect public health and the environment through management of potential risk. |
| Groundwater Removal | Extraction of contaminated groundwater for on-site treatment or off-site treatment/disposal |
| Groundwater Treatment | Treatment of contaminated groundwater in-situ or ex situ. |
| Groundwater Containment | Isolation of contaminated groundwater using subsurface barriers or an engineered cap. Typically requires combination of other GRA such as removal/treatment. |
| Groundwater Disposal | Treatment/disposal of contaminated groundwater. Typically coupled with removal/treatment general response action. |
| Soil Removal | Removal of contaminated soil for on-site treatment as well as off-site treatment/disposal. |
| Soil Treatment | Treatment of contaminated soil in situ or ex situ. |
| Soil Disposal | Disposal of contaminated soil, coupled with a removal/treatment general response action. |

*Abbreviations:*

*RAO remedial action objective*

**Table 4-2**
**Identification and Screening of Groundwater Remedial Action Technologies**
**LHAAP-50**

| General Response Action Technology Type | Description and Process Options | Comments | Retain for Further Evaluation? |
|---|---|---|---|
| A. No Action | No remedial measures to be taken. | The "No Action" alternative must be fully evaluated according to 40 CFR 300.68. | Yes |
| B. Land Use Controls | Restrict future use of and access to the contaminated media to prevent unauthorized exposure to contaminated media. Monitor degradation and groundwater plume stability. Includes:<br>• Land Use Controls<br>• Long-Term Media Monitoring | A feasible approach for preventing exposure to on-site contamination and to verify MNA is occurring. | Yes |
| C. Groundwater Removal<br>• Groundwater extraction | Remove groundwater from the subsurface to relocate it or prepare it for treatment. Includes:<br>• Extraction wells<br>• Interceptor trenches | A routine procedure using traditional methods such as vertical wells and trenches. Some methods are more complex such as horizontal wells. Combined with on- or off-site treatment technologies. Not retained since discontinuous sand lenses may limit the effectiveness. | No |
| D. Groundwater Treatment<br>• In situ treatment | Treat groundwater in place to reduce the contaminant mobility or toxicity.<br>Includes:<br>• Monitored Natural Attenuation<br>• Air sparging/soil vapor extraction<br>• Oxidation<br>• Permeable reactive barriers<br>• Bioremediation<br>• Phytoremediation | Generally proven technologies. More difficult to design since the subsurface soil and groundwater characteristics will impact performance. | Yes |
| • Ex situ treatment | Treat extracted groundwater or vapor after removal from the subsurface<br>• On-site with mobile treatment or<br>• Burning Ground No. 3 Groundwater Treatment Plant. | Burning Ground No. 3 Groundwater Treatment Plant is operational and may have the capacity for groundwater treatment. Not retained since ex situ treatment would be evaluated with groundwater removal technologies which were eliminated. | No |

**Table 4-2 (*Continued*)**
**Identification and Screening of Groundwater Remedial Action Technologies**
**LHAAP-50**

| General Response Action Technology Type | Description and Process Options | Comments | Retain for Further Evaluation? |
|---|---|---|---|
| E. Groundwater Containment | Isolate groundwater plume in place. Includes:<br>• Slurry walls<br>• Engineered caps | No source area is identified. Effective uses of containment include isolation of high concentration source areas and minimizing plume irrigation. No high concentration source area has been identified. Also, the plume has been delineated and is stable. Thus, containment is not an effective remedy for this plume. | No |
| F. Groundwater Disposal | Discharge of treated groundwater to surface water. | Straightforward technology assuming treatment techniques have met permit requirements. Not retained since disposal would be used in conjunction with groundwater removal technologies which were eliminated. | No |
| G. Soil Removal | Remove soil from the subsurface for ex situ treatment or disposal. | A routine practice that will confirm contamination has been removed through sampling. | Yes |
| H. Soil Treatment | Treat soil in place or after removal to reduce contaminant concentrations. | Proven technology at Longhorn for surface soils. | Yes |
| I. Soil Disposal | Dispose of contaminated soil in RCRA Subtitle D landfill as non hazardous waste. | Straightforward technology that is easily implemented.. | Yes |

*Abbreviations:*

*CFR Code of Federal Regulations*

# *5.0 Development and Description of Alternatives*

**Section 5.1** presents the development of a range of alternatives based on the key assumptions regarding site and contaminant conditions **(Section 2.0)**, the RAOs **(Section 3.0)**, and the representative process options **(Section 4.0)**. **Section 5.2** presents the detailed description of the alternatives.

## *5.1 Development of Alternatives*

### *5.1.1 Requirements and Preferences*

The CERCLA process, as defined in the NCP, develops a remedy that protects human health and the environment, complies with ARARs (unless a statutory waiver is justified and granted), is cost-effective, and uses permanent solutions and alternative treatment or resource recovery technologies to the maximum extent practicable. A statutory preference for remedies that would result in permanent and significant decreases in toxicity, mobility, or volume through treatment and provide long-term protection is stated in Section 121 of CERCLA, as amended.

The NCP defines the following preferences in developing remedial action alternatives:

- Use of treatment to address the "principal threats" posed by a site, wherever practical.
- Use of engineering controls, such as containment, for waste that poses a relatively low, long-term threat and for which treatment is not practical.
- Implementation of a combination of actions, as appropriate, to achieve protection of human health and the environment. For example, in appropriate site situations, treatment of principal threats would be combined with engineering controls, such as containment, and land use controls for treatment residuals and untreated waste.
- Use of LUCs, such as drinking water supply controls and covenants, to supplement engineering controls for short- and long-term management to prevent or limit exposures to hazardous substances.
- Selection of an innovative technology when the technology offers the following: the potential for comparable or better treatment performance or implementability, fewer or lesser magnitude adverse impacts than other technologies, or lower costs than demonstrated technologies for similar levels of performance.

These statutory requirements and preferences were given due consideration in the development of alternatives for LHAAP-50.

### *5.1.2 Development using Remediation Strategies and Process Options*

The media at LHAAP-50 presenting an unacceptable risk or hazard is groundwater. However, the soil is considered to be a potential source to the groundwater contamination. The purpose of the remedial alternatives discussion is to present the decision maker with technical and economic options to select the most appropriate option for remediation of groundwater and soil at LHAAP-50. Although all of the action alternatives have been designed to achieve the RAO and the statutory requirements under CERCLA, each alternative must also be sufficiently unique in its strategy and approach that the range of alternatives represents a reasonable spectrum of final site conditions in the view of the decision makers.

The process options that remain after screening are grouped and combined into alternatives to address the RAO.

## *5.2 Description of Remedial Alternatives*

The following sections describe the remedial alternatives. The level of detail presented here supports the detailed evaluation and cost estimate in **Section 6.0** and **Appendix B**, respectively. Designs and process options other than those considered here may be substituted once the decision on remedial approach is made.

### *5.2.1 Alternative 1 – No Action Alternative*

As required by the NCP, the no action alternative provides a comparative baseline against which the action alternatives can be evaluated. Under this alternative groundwater and soil would be left "as is," without implementing any additional containment, removal, treatment, or other mitigating actions. No other actions would be implemented to reduce existing or potential future exposure to human and ecological receptors.

### *5.2.2 Alternative 2 – Excavation, Monitored Natural Attenuation, LUCs*

Alternative No. 2 has been developed to provide actions that may be taken to limit public exposure to the contaminated media by 1) demonstrating reduction of contamination to groundwater by natural processes and 2) removing the soil to eliminate the soil to groundwater pathway.

For this alternative, it is assumed that a monitoring program will be designed and implemented in accordance with USEPA protocol for evaluation natural attenuation of chlorinated solvents in ground water (USEPA, 1998) and performance monitoring of MNA remedies for VOCs in ground water (USEPA, 2004). Groundwater remediates naturally through intrinsic bioremediation and other physical loss mechanisms which are monitored to ensure that groundwater contamination remains localized and that contaminant migration, if any, is minimal. The toxicity, mobility or volume of groundwater contaminants is not reduced by any engineering process. Instead, concentrations of COCs in groundwater are reduced through natural processes including biodegradation, dispersion, adsorption, volatilization, and dilution over time and with distance from the source. To document that natural attenuation is occurring, a groundwater monitoring program will be implemented at the site. The USEPA provides guidance for monitored natural attenuation as a remedial action in use of *Monitored Natural Attenuation at Superfund, RCRA, and Underground Storage Tank Sites (USEPA, 1999).* USEPA guidance specifies recommended lines of evidence to document natural attenuation at a site. This section presents a description of the alternative that may be used to implement MNA at LHAAP-50.

#### *5.2.2.1 Soil Program*

The recommended remedial action consists of excavation and off-site disposal of the perchlorate-contaminated soil at a RCRA Subtitle D-permitted landfill. Excavation of the contaminated soil and disposal in a RCRA-permitted landfill will remove soil that is considered to be a contaminant source to groundwater, thereby, protecting groundwater. The estimated volume of soil to be removed is 150 cubic yards and is based on the conservative TCEQ GWP-Ind of 7,200 μg/kg for perchlorate in soil. The approximate limits of excavation are shown on **Figure 5-1**. The removal of soil contamination will be verified by collecting confirmation samples from the walls and floors of the excavation area and submitting them for laboratory analysis for perchlorate.

Semi-annual performance monitoring of Goose Prairie Creek adjacent to the LHAAP-50 will be conducted after excavation of the contaminated perchlorate pathway. The GPW-1 location will be sampled and a location upgradient of LHAAP-50 will be sampled. The upgradient location will be used to evaluate any contaminated runoff from the perchlorate contaminated site, LHAAP-47, located on the north side of the creek just west of LHAAP-50. Evaluation of this data will be included in the annual reports. The frequency and locations of sampling may be modified after evaluation of data. If perchlorate levels in the creek are consistently above the GW-Res after two years of monitoring, then additional evaluation will be conducted and any proposed actions will be included in the annual evaluation report to be submitted after year 2.

The anticipated future use of the site as part of Caddo Lake National Wildlife Refuge is based on a Memorandum of Agreement between the USFWS and the Army (Army, 2004). A notification will be recorded with Harrison County that the site is suitable for non-residential use because the site was not evaluated for unrestricted use. The notification will also be included in the Environmental Protection Provisions in the environmental condition of property (ECOP) document to be prepared for transferring the property to the USFWS. Limited monitoring will take place in the form of Letters of Certification from the Army or the Transferee to TCEQ every five years to document that the use of LHAAP-50 is consistent with the non-residential use scenarios evaluated in the risk assessment. The certification can be included with the CERCLA Five-Year Reviews for as long as they are conducted.

##### *5.2.2.2 Groundwater Program*

A natural attenuation evaluation was completed for LHAAP-50 and is included in **Appendix A**. It concludes that natural attenuation is occurring and estimates approximately 50 years for TCE to attenuate to MCLs and less than 10 years for the perchlorate to attenuate to the TCEQ GW-Ind.

For this alternative, it is assumed that a monitoring program will be implemented to evaluate the effectiveness of the natural attenuation at the site. Monitoring wells 50WW02 and 50WW05 currently provide groundwater data to represent the groundwater contamination. Monitoring well 50WW07 will be included in the monitoring program as a well downgradient of the plume. Additionally, for cost estimating purposes it is assumed two new monitoring wells will be installed.

LUCs will be maintained until the cleanup levels are achieved. The LUCs will consist of a restriction on groundwater use at LHAAP-50. If at some time in the future, property ownership is transferred from a federal agency to the private sector, a deed restriction for the use of groundwater is required and will be developed. Notification of industrial/recreational use will accompany all transfer documents and will be recorded with the Harrison County. Five-Year Reviews will be performed to document that the land use remains consistent with the industrial/recreational exposure scenario evaluated in the risk assessment.

***Monitored Natural Attenuation***

MNA performance monitoring will be performed quarterly for the first two years. After eight quarterly sampling events, MNA will be evaluated. The analytical program will consist of VOCs, including chlorinated compounds and degradation products, methane, ethene, and ethane. Initially, the following geochemical parameters will also be included in the analytical program, dissolved oxygen (field), redox potential (field), sulfate, nitrate, nitrites, alkalinity, TOC, and ferrous iron (field). The number of wells to be monitored will be determined in the remedial design. However, the cost estimate includes installation of 2 new monitoring wells.

Annual reports will be prepared as needed to document the program. Sampling frequency or analytical suite may be modified based on the results of the sampling program.

***Long-Term Operation***

Long-term operations will begin after the 8 quarters of MNA performance monitoring. The sampling frequency will then be changed to semiannually until the first 5-Year Review.

Sampling and analysis of groundwater would be performed at LHAAP-50 for multiple contaminants and general chemistry parameters. Monitoring would be required to demonstrate that natural attenuation is occurring, as well as compliance with ARARs and the RAO. Data obtained during the monitoring program will be used in support of the 5-year reviews required by CERCLA Section 121(c). The sampling frequency may be changed to once every five years if the data suggest that less frequent sampling is appropriate.

For cost estimating purposes, the long-term monitoring schedule is assumed to be semiannual for years 3 through 5, annually for years 6 through 10, and every 5 years thereafter. Future sampling frequency after the first 5-year review will be evaluated and determined at that time. The location and number of monitoring wells included in the LTM program will be reviewed on an annual basis. Any well that is proposed for the LTM program that becomes damaged, or is required to be removed due to construction or other activities, may be replaced or repaired, as needed. The need for continuing LTM at the location will be evaluated based on existing and expected future groundwater conditions. All water quality results, and the results of the review, will be provided in annual monitoring reports or as needed. The estimated cleanup time of 50 years is based on limited data, and actual cleanup time could be higher or lower than this estimate.

### *5.2.3 Alternative 3 – Excavation, In Situ Bioremediation, LUCs*

The goals of this alternative are to achieve ARARs for the COCs at the target area where contaminant concentrations in groundwater are highest at LHAAP-50 and to prevent human exposure to groundwater contamination until the ARARs are achieved (i.e., the immediate area around 50WW02). In situ bioremediation followed by MNA will be implemented to reduce groundwater contaminant concentrations to the acceptable cleanup levels, and maintains LUCs. Once the soils containing contamination above cleanup levels have been removed from LHAAP-50, achievement of cleanup levels in groundwater will be expedited by remediating groundwater in the area of highest concentrations. LUCs would be maintained indefinitely for use of the site as an industrial/wildlife refuge.

#### *5.2.3.1 Soil Program*

The recommended remedial action includes excavation and off-site disposal of the perchlorate-contaminated soil at a RCRA Subtitle D-permitted landfill. Excavation of the contaminated soil and disposal in a RCRA-permitted landfill will remove soil that is considered to be a contaminant source to groundwater, thereby, protecting groundwater. The estimated volume of soil to be removed is 150 cubic yards and is based on the conservative TCEQ GWP-Ind of 7,200 µg/kg for perchlorate in soil. The approximate limits of excavation are shown on **Figure 5-2**. The removal of soil contamination will be verified by collecting confirmation samples from the walls and floors of the excavation area and submitting them for laboratory analysis for perchlorate.

Semi-annual performance monitoring of Goose Prairie Creek adjacent to the LHAAP-50 will be conducted after excavation of the contaminated perchlorate pathway. The GPW-1 location will be sampled and a location upgradient of LHAAP-50 will be sampled. The upgradient location will be used to evaluate any contaminated runoff from the perchlorate contaminated site, LHAAP-47, located on the north side of the creek just west of LHAAP-50. Evaluation of this data will be included in the annual reports. The frequency and locations of sampling may be modified after evaluation of data. If perchlorate levels in the creek are consistently above the GW-Res after two years of monitoring, then additional evaluation will be conducted and any proposed actions will be included in the annual evaluation report to be submitted after year 2.

The anticipated future use of the site as part of Caddo Lake National Wildlife Refuge is based on a Memorandum of Agreement between the USFWS and the Army (Army, 2004). A notification will be recorded with Harrison County that the site is suitable for non-residential use because the site was not evaluated for unrestricted use. The notification will also be included in the Environmental Protection Provisions in the ECOP document to be prepared for transferring the property to the USFWS. Limited monitoring will take place in the form of Letters of Certification from the Army or the Transferee to TCEQ every five years to document that the use of LHAAP-50 is consistent with the non-residential use scenarios evaluated in the risk assessment. The certification can be included with the CERCLA Five-Year Reviews for as long as they are conducted.

#### *5.2.3.2 In Situ Bioremediation for Groundwater Plume*

In situ groundwater bioremediation is a technology that encourages growth and reproduction of indigenous microorganisms to enhance biodegradation of organic constituents in the saturated zone. The microbiological processes are used to degrade or transform contaminants to ultimately less toxic or nontoxic forms. Groundwater at LHAAP-50 is impacted by VOCs (PCE, TCE, 1,1-DCE, 1,2-DCA, and VC) and perchlorate that exceed their respective cleanup levels in groundwater. Treatment under anaerobic conditions is often applied to these types of contaminants.

In general, the components of the in situ bioremediation action include:

- **Defining the target area.** Currently shallow monitoring wells 50WW02 and 50WW05 are impacted. Shallow groundwater is present in thin (3 to 5 foot) discontinuous sand lenses which occur in a formation consisting primarily of clay to silty clay. At 50WW02, fine-grained sand was observed in the silty clay over the 10-foot interval that was screened. In situ bioremediation is proposed around 50WW02. To define the target area for treatment, a direct push investigation will be performed. The purpose of this investigation is: 1) to better delineate the target area (sand lenses or fine-grained sands [seams] impacted), 2) determine the concentration of VOCs and obtain geochemistry information prior to treatment, and 3) identify the treatment zone (laterally and vertically). This study is necessary to identify the types and amounts of substances required to stimulate optimum contaminant degradation and specify geologic and geochemistry information for project design. Some of the parameters that are important to consider include the mix of contaminants in the plume; soil type and properties; pH; salinity; competing electron acceptors (e.g., sulfates, nitrates) and the presence or absence of inhibitory substances.

- **Installing temporary wells for injection.** Chlorinated solvents often require nutrients and other growth-stimulating additives/materials specific to the contaminants' metabolic degradation process. The wells would be used to inject these materials to accelerate microbial degradation of the plumes.

- **Injecting microbial cultures and nutrients into the subsurface at a predetermined location.** Bacteria present in the groundwater can use chlorinated solvents as electron acceptors. Electron donors may include a wide variety of nutrients: sugars (molasses), alcohols (methanol, ethanol), volatile acids (acetate, lactate), and/or wastes (food processing, manure). The COCs at LHAAP-50 can degrade under anaerobic conditions, but microorganisms, mechanisms, and redox requirements differ. Based on results of a initial study, appropriate nutrients and other materials would be injected into the subsurface. For this FS, it is assumed that a bioaugmentation will be used at the site. This form of bioremediation combines the injection of microbial cultures capable of degrading the contaminants with a carbon source to provide adequate conditions for the proliferation of the dechlorinating organisms. For costing purposes in this FS, it is assumed that application would be over a 50-foot square area at the area of highest concentrations, with five injection points at the four corners and at the center of the square. Injection points would be installed using direct-push technology. It is anticipated that the material would be injected twice, and that the injection would occur in the shallow zone, at approximately 20 feet bgs.

- **Monitoring wells.** Current well locations are shown on **Figure 1-3**. The effectiveness of the treatment will be monitored using the monitoring well 50WW02, which is assumed to be located just downgradient of the treated area.

- **Sampling wells to monitor effectiveness.** Monitoring for contaminants would be performed to assess the effectiveness of the treatment. Anticipated remediation times may be short in the target area with appropriate contact. MNA will be implemented in the untreated areas and will be initiated in the first year. Assuming first order anaerobic degradation rates and reasonable half-lives for the COCs, the COCs could be reduced to their respective cleanup levels in approximately two years directly in the target area.

However, due to the discontinuous nature of the shallow groundwater, it is anticipated that residuals will be present downgradient, and possibly in the clay material directly overlying the saturated zone. For cost estimating purposes, it is assumed sampling will be performed quarterly for the first year, then annually for the following years. The estimated time for the RAO to be achieved is approximately 50 years. The continued MNA monitoring is included in the 5-year reviews beyond Year 10. The analytical program will consist of perchlorate, and VOCs, including chlorinated compounds and their degradation products, methane, ethene, and ethane. The following geochemical parameters will also be included in the analytical program, dissolved oxygen (field), redox potential (field), sulfate, nitrate, nitrites, alkalinity, TOC, and ferrous iron (field).

- **Reporting.** Annual reports will be prepared to document the effectiveness of the treatment. The first year annual report will include a review of the four quarters of data and provide an evaluation of the effectiveness of the bioremediation alternative.

If at some time in the future, property ownership is transferred from a federal agency to the private sector, a deed restriction for the use of groundwater and use of the land as an industrial/wildlife refuge will be developed, if transfer occurs during the time frame that COCs are present above groundwater cleanup levels. The Army will record a notice of LUCs with Harrison County and will include the notice with any transfer letter to the USFWS for the intended future use as a national refuge.

#### *5.2.3.3 MNA for Groundwater*

MNA will be initiated in year 1 in the untreated portions of plume. MNA performance monitoring will be performed quarterly for the first two years. After eight quarterly sampling events, MNA will be evaluated. The analytical program will consist of VOCs, including chlorinated compounds and degradation products, methane, ethene, and ethane. Initially, the following geochemical parameters will also be included in the analytical program, dissolved oxygen (field), redox potential (field), sulfate, nitrate, nitrites, alkalinity, TOC, and ferrous iron (field). The number of wells to be monitored will be determined in the remedial design. However, the cost estimate includes installation of two new monitoring wells.

Annual reports will be prepared as needed to document the program. Sampling frequency or analytical suite may be modified based on the results of the sampling program.

#### *5.2.3.4 Long-Term Operation*

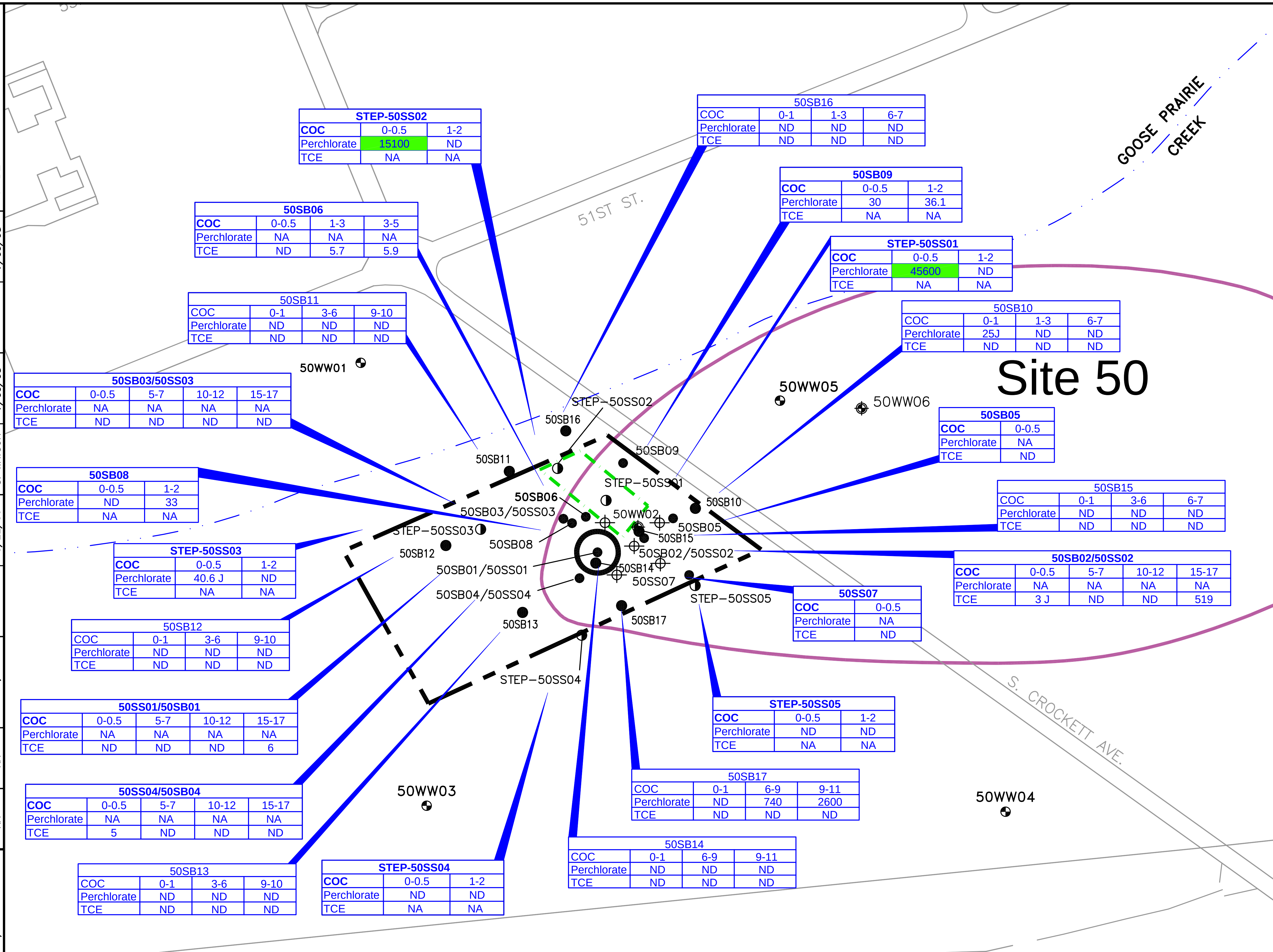
Long term operation would include monitoring of groundwater at LHAAP-50 for a fixed period of time (assumed to be 10 years in the estimate). Sampling and analysis of groundwater would be performed at LHAAP-50 for VOCs and general chemistry parameters. Groundwater sampling would occur quarterly for the first year, annually for years two through ten. It is also assumed that a second bioaugmentation treatment will be required during year 2 of the remediation program to further treat COCs in the target area. Monitoring would be required to demonstrate reduction in concentrations is occurring, as well as compliance with ARARs and the RAO. Data obtained during the monitoring program will be used in support of the 5-year reviews required by CERCLA Section 121(c).

The location and number of monitoring wells will be reviewed on an annual basis. Any well that is proposed for long-term monitoring that becomes damaged, or is required to be removed due to construction or other activities, may be replaced or repaired, as needed. The need for continuing the long-term monitoring at the location will be evaluated based on existing and expected future groundwater conditions. All water quality results, and the results of the review, will be provided in an annual monitoring report.

#### *5.2.3.5 Land Use Controls*

The LUCs will consist of a restriction on LHAAP-50 to maintain the use as an industrial/wildlife refuge. If at some time in the future, property ownership is transferred from a federal agency to the private sector, a deed restriction for the use of groundwater and use of the land as an industrial/wildlife refuge will be developed. The Army will record a notice of LUCs with Harrison County and will include the notice with any transfer letter to the USFWS for the intended future use as a national refuge.

00078512




**STEP-50SS02**

| COC | 0-0.5 | 1-2 |
|---|---|---|
| Perchlorate | 15100 | ND |
| TCE | NA | NA |

**50SB16**

| COC | 0-1 | 1-3 | 6-7 |
|---|---|---|---|
| Perchlorate | ND | ND | ND |
| TCE | ND | ND | ND |

**50SB09**

| COC | 0-0.5 | 1-2 |
|---|---|---|
| Perchlorate | 30 | 36.1 |
| TCE | NA | NA |

**50SB06**

| COC | 0-0.5 | 1-3 | 3-5 |
|---|---|---|---|
| Perchlorate | NA | NA | NA |
| TCE | ND | 5.7 | 5.9 |

**STEP-50SS01**

| COC | 0-0.5 | 1-2 |
|---|---|---|
| Perchlorate | 45600 | ND |
| TCE | NA | NA |

**50SB11**

| COC | 0-1 | 3-6 | 9-10 |
|---|---|---|---|
| Perchlorate | ND | ND | ND |
| TCE | ND | ND | ND |

**50SB10**

| COC | 0-1 | 1-3 | 6-7 |
|---|---|---|---|
| Perchlorate | 25J | ND | ND |
| TCE | ND | ND | ND |

**50SB03/50SS03**

| COC | 0-0.5 | 5-7 | 10-12 | 15-17 |
|---|---|---|---|---|
| Perchlorate | NA | NA | NA | NA |
| TCE | ND | ND | ND | ND |

**50SB05**

| COC | 0-0.5 |
|---|---|
| Perchlorate | NA |
| TCE | ND |

**50SB08**

| COC | 0-0.5 | 1-2 |
|---|---|---|
| Perchlorate | ND | 33 |
| TCE | NA | NA |

**50SB15**

| COC | 0-1 | 3-6 | 6-7 |
|---|---|---|---|
| Perchlorate | ND | ND | ND |
| TCE | ND | ND | ND |

**STEP-50SS03**

| COC | 0-0.5 | 1-2 |
|---|---|---|
| Perchlorate | 40.6 J | ND |
| TCE | NA | NA |

**50SB02/50SS02**

| COC | 0-0.5 | 5-7 | 10-12 | 15-17 |
|---|---|---|---|---|
| Perchlorate | NA | NA | NA | NA |
| TCE | 3 J | ND | ND | 519 |

**50SS07**

| COC | 0-0.5 |
|---|---|
| Perchlorate | NA |
| TCE | ND |

**50SB12**

| COC | 0-1 | 3-6 | 9-10 |
|---|---|---|---|
| Perchlorate | ND | ND | ND |
| TCE | ND | ND | ND |

**50SS01/50SB01**

| COC | 0-0.5 | 5-7 | 10-12 | 15-17 |
|---|---|---|---|---|
| Perchlorate | NA | NA | NA | NA |
| TCE | ND | ND | ND | 6 |

**STEP-50SS05**

| COC | 0-0.5 | 1-2 |
|---|---|---|
| Perchlorate | ND | ND |
| TCE | NA | NA |

**50SB17**

| COC | 0-1 | 6-9 | 9-11 |
|---|---|---|---|
| Perchlorate | ND | 740 | 2600 |
| TCE | ND | ND | ND |

**50SS04/50SB04**

| COC | 0-0.5 | 5-7 | 10-12 | 15-17 |
|---|---|---|---|---|
| Perchlorate | NA | NA | NA | NA |
| TCE | 5 | ND | ND | ND |

**50SB14**

| COC | 0-1 | 6-9 | 9-11 |
|---|---|---|---|
| Perchlorate | ND | ND | ND |
| TCE | ND | ND | ND |

**50SB13**

| COC | 0-1 | 3-6 | 9-10 |
|---|---|---|---|
| Perchlorate | ND | ND | ND |
| TCE | ND | ND | ND |

**STEP-50SS04**

| COC | 0-0.5 | 1-2 |
|---|---|---|
| Perchlorate | ND | ND |
| TCE | NA | NA |

LEGEND:
- PROPOSED INJECTION WELLS
- ATTENUATION MONITORING WELL
- SHALLOW MONITORING WELL
- SURFACE SOIL SAMPLE
- SOIL BORING SAMPLING LOCATION
- SITE BOUNDARY
- FORMER STORAGE TANK LOCATION
- COC CONSTITUENT OF CONCERN
- ND NOT DETECTED
- NA NOT ANALYZED
- EXCAVATE SOIL TO 1 FOOT BELOW GRADE
- PERCHLORATE CONCENTRATIONS GREATER THAN 7,200 ug/kg
- EXTENT OF TCE GROUNDWATER PLUME >5 MICROGRAMS PER LITER

NOTE:
1. CONCENTRATIONS ARE REPORTED IN MICROGRAMS PER KILOGRAM (µg/kg)

Shaw

U.S. ARMY CORPS OF ENGINEERS
TULSA DISTRICT
TULSA, OKLAHOMA

FIGURE 5-1

**DETAILS OF ALTERNATIVE 2 EXCAVATION MONITORED NATURAL ATTENUATION LAND USE CONTROLS LHAAP-50 FEASIBILITY STUDY**

LONGHORN ARMY AMMUNITION PLANT
KARNACK, TEXAS

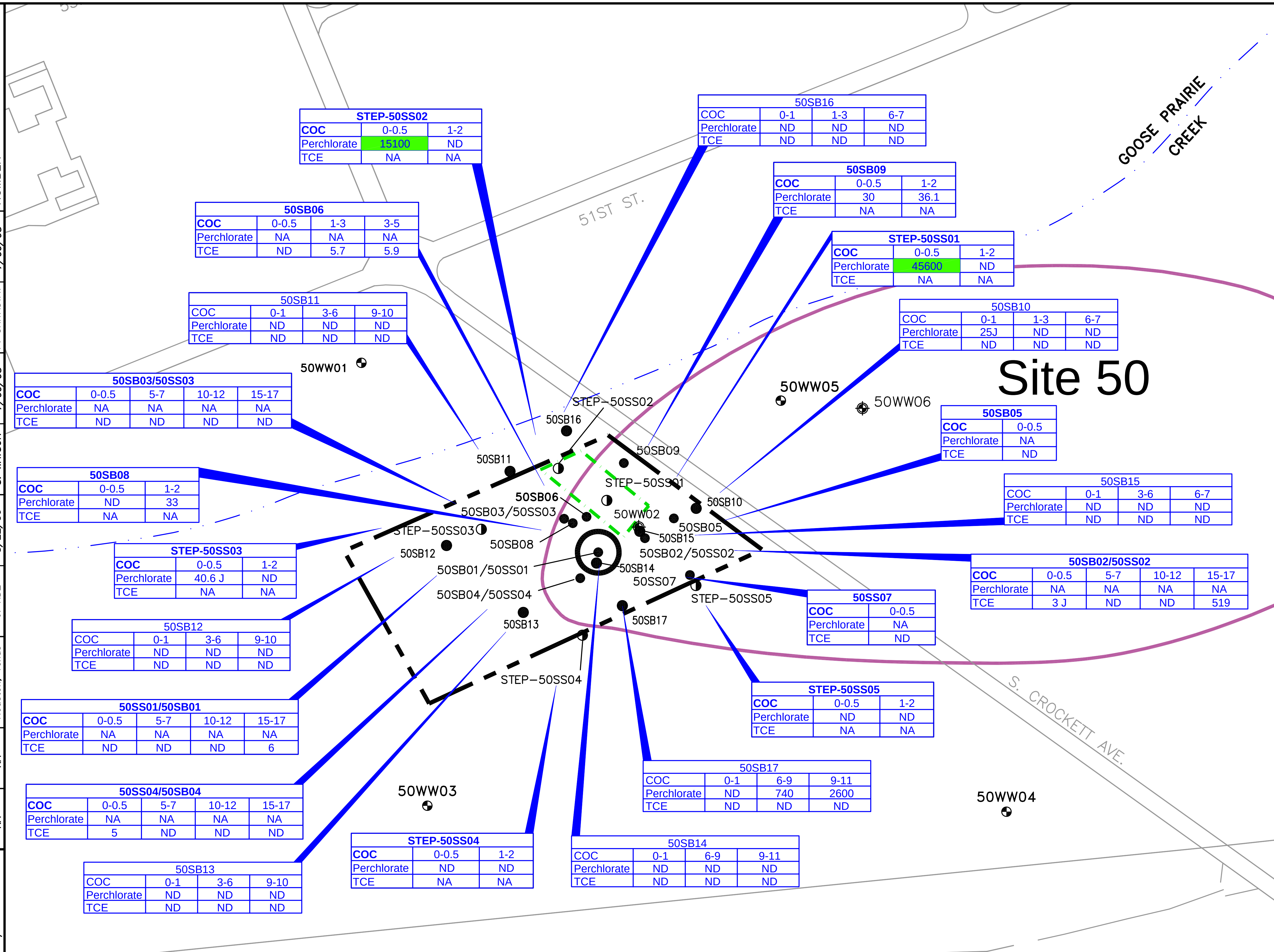

REFERENCES:
SOLUTIONS TO ENVIRONMENTAL PROBLEMS, INC., MARCH 2003, *DRAFT FINAL PROJECT REPORT PLANT-WIDE PERCHLORATE INVESTIGATION LONGHORN ARMY AMMUNITION PLANT, KARNACK, TEXAS,* FINAL, OAK RIDGE, TN.

JACOBS ENGINEERING GROUP, INC., JANUARY 2002, *FINAL REMEDIAL INVESTIGATIONS REPORT FOR THE GROUP 4 SITES,* OAK RIDGE, TN.

DATA GAP REFERENCE:
SHAW ENVIRONMENTAL, INC. 2007 DATA GAP INVESTIGATION REPORT, LONGHORN ARMY AMMUNITION PLANT, KARNACK, TEXAS, DRAFT FINAL, APRIL.


| | |
|---|---|
| DRAWING NUMBER | 117591-B9 |
| APPROVED BY | P. SRIVASTAV 7/09/08 |
| CHECKED BY | S. WATSON 7/09/08 |
| DRAWN BY | J. RDZ 5/22/06 |
| OFFICE | Houston, Texas |
| X-REF | NA- |
| IMAGE | NA- |

PLOT DATE: 06/05/06
FORMAT REVISION 3/25/99




| STEP-50SS02 | | |
|---|---|---|
| COC | 0-0.5 | 1-2 |
| Perchlorate | 15100 | ND |
| TCE | NA | NA |

| 50SB16 | | | |
|---|---|---|---|
| COC | 0-1 | 1-3 | 6-7 |
| Perchlorate | ND | ND | ND |
| TCE | ND | ND | ND |

| 50SB09 | | |
|---|---|---|
| COC | 0-0.5 | 1-2 |
| Perchlorate | 30 | 36.1 |
| TCE | NA | NA |

| 50SB06 | | | |
|---|---|---|---|
| COC | 0-0.5 | 1-3 | 3-5 |
| Perchlorate | NA | NA | NA |
| TCE | ND | 5.7 | 5.9 |

| STEP-50SS01 | | |
|---|---|---|
| COC | 0-0.5 | 1-2 |
| Perchlorate | 45600 | ND |
| TCE | NA | NA |

| 50SB11 | | | |
|---|---|---|---|
| COC | 0-1 | 3-6 | 9-10 |
| Perchlorate | ND | ND | ND |
| TCE | ND | ND | ND |

| 50SB10 | | | |
|---|---|---|---|
| COC | 0-1 | 1-3 | 6-7 |
| Perchlorate | 25J | ND | ND |
| TCE | ND | ND | ND |

| 50SB03/50SS03 | | | | |
|---|---|---|---|---|
| COC | 0-0.5 | 5-7 | 10-12 | 15-17 |
| Perchlorate | NA | NA | NA | NA |
| TCE | ND | ND | ND | ND |

| 50SB05 | |
|---|---|
| COC | 0-0.5 |
| Perchlorate | NA |
| TCE | ND |

| 50SB08 | | |
|---|---|---|
| COC | 0-0.5 | 1-2 |
| Perchlorate | ND | 33 |
| TCE | NA | NA |

| 50SB15 | | | |
|---|---|---|---|
| COC | 0-1 | 3-6 | 6-7 |
| Perchlorate | ND | ND | ND |
| TCE | ND | ND | ND |

| STEP-50SS03 | | |
|---|---|---|
| COC | 0-0.5 | 1-2 |
| Perchlorate | 40.6 J | ND |
| TCE | NA | NA |

| 50SB02/50SS02 | | | | |
|---|---|---|---|---|
| COC | 0-0.5 | 5-7 | 10-12 | 15-17 |
| Perchlorate | NA | NA | NA | NA |
| TCE | 3 J | ND | ND | 519 |

| 50SS07 | |
|---|---|
| COC | 0-0.5 |
| Perchlorate | NA |
| TCE | ND |

| 50SB12 | | | |
|---|---|---|---|
| COC | 0-1 | 3-6 | 9-10 |
| Perchlorate | ND | ND | ND |
| TCE | ND | ND | ND |

| 50SS01/50SB01 | | | | |
|---|---|---|---|---|
| COC | 0-0.5 | 5-7 | 10-12 | 15-17 |
| Perchlorate | NA | NA | NA | NA |
| TCE | ND | ND | ND | 6 |

| STEP-50SS05 | | |
|---|---|---|
| COC | 0-0.5 | 1-2 |
| Perchlorate | ND | ND |
| TCE | NA | NA |

| 50SB17 | | | |
|---|---|---|---|
| COC | 0-1 | 6-9 | 9-11 |
| Perchlorate | ND | 740 | 2600 |
| TCE | ND | ND | ND |

| 50SS04/50SB04 | | | | |
|---|---|---|---|---|
| COC | 0-0.5 | 5-7 | 10-12 | 15-17 |
| Perchlorate | NA | NA | NA | NA |
| TCE | 5 | ND | ND | ND |

| STEP-50SS04 | | |
|---|---|---|
| COC | 0-0.5 | 1-2 |
| Perchlorate | ND | ND |
| TCE | NA | NA |

| 50SB14 | | | |
|---|---|---|---|
| COC | 0-1 | 6-9 | 9-11 |
| Perchlorate | ND | ND | ND |
| TCE | ND | ND | ND |

| 50SB13 | | | |
|---|---|---|---|
| COC | 0-1 | 3-6 | 9-10 |
| Perchlorate | ND | ND | ND |
| TCE | ND | ND | ND |

LEGEND:
- ATTENUATION MONITORING WELL
- SHALLOW MONITORING WELL
- SURFACE SOIL SAMPLE
- SOIL BORING SAMPLING LOCATION
- SITE BOUNDARY
- FORMER STORAGE TANK LOCATION
- COC CONSTITUENT OF CONCERN
- ND NOT DETECTED
- NA NOT ANALYZED
- EXCAVATE SOIL TO 1 FOOT BELOW GRADE
- PERCHLORATE CONCENTRATIONS GREATER THAN 7,200 ug/kg
- EXTENT OF TCE GROUNDWATER PLUME >5 MICROGRAMS PER LITER

NOTE:
1. CONCENTRATIONS ARE REPORTED IN MICROGRAMS PER KILOGRAM (µg/kg)

SCALE
0 100 200 FEET

U.S. ARMY CORPS OF ENGINEERS
TULSA DISTRICT
TULSA, OKLAHOMA

FIGURE 5-2
DETAILS OF ALTERNATIVE 3 EXCAVATION, IN SITU BIOREMEDIATION, LAND USE CONTROLS
LHAAP-50 FEASIBILITY STUDY
LONGHORN ARMY AMMUNITION PLANT
KARNACK, TEXAS


REFERENCES:
SOLUTIONS TO ENVIRONMENTAL PROBLEMS, INC., MARCH 2003, *DRAFT FINAL PROJECT REPORT PLANT-WIDE PERCHLORATE INVESTIGATION LONGHORN ARMY AMMUNITION PLANT, KARNACK, TEXAS,* FINAL, OAK RIDGE, TN.

JACOBS ENGINEERING GROUP, INC., JANUARY 2002, *FINAL REMEDIAL INVESTIGATIONS REPORT FOR THE GROUP 4 SITES,* OAK RIDGE, TN.

DATA GAP REFERENCE:
SHAW ENVIRONMENTAL, INC. 2007 DATA GAP INVESTIGATION REPORT, LONGHORN ARMY AMMUNITION PLANT, KARNACK, TEXAS, DRAFT FINAL, APRIL.


DRAWING NUMBER 117591-B9
APPROVED BY P. SRIVASTAV 7/09/08
CHECKED BY S. WATSON 7/09/08
DRAWN BY J. RDZ 5/22/06
OFFICE Houston, Texas
X-REF NA-
IMAGE NA-
PLOT DATE: 06/05/06 FORMAT REVISION 3/25/99

# 6.0 Detailed Analysis of Alternatives

## 6.1 Introduction

The detailed analysis of alternatives presents and assesses relevant information that provides the basis for selecting an alternative and preparing a ROD. **Section 6.2** provides an overview of the evaluation criteria. The detailed analysis begins with an individual analysis in **Section 6.3** in which each alternative is individually evaluated according to the evaluation criteria identified in the NCP (40 CFR 300.430). Following the individual analysis, the alternatives are compared in relation to the two threshold criteria and then the alternatives are assessed regarding the five balancing criteria, highlighting the key advantages, disadvantages, and trade-offs that are considered as part of the evaluation process.

## 6.2 Overview of the Evaluation Criteria

CERCLA, Section 121, as amended, specifies statutory requirements for remedial actions. These requirements include protection of human health and the environment, compliance with ARARs, a preference for permanent solutions that incorporate treatment as a principal element to the maximum extent practicable, and cost-effectiveness. To assess whether alternatives meet the requirements, the USEPA has identified nine criteria in the NCP (40 CFR 300.430) that must be evaluated for each alternative considered for selection (Section 300.430[e][9][iii]). Provided here are summaries of the factors that comprise the nine criteria and an overview of the approach taken by this FS to address these criteria.

### 6.2.1 Criterion 1: Overall Protection of Human Health and the Environment

This evaluation criterion assesses whether the alternative achieves and maintains adequate protection of human health and the environment in accordance with the RAO established in **Section 3.0**. Because the scope of this criterion is broad, it also reflects the discussions of the subsequent criteria, including long-term effectiveness and permanence, and short-term effectiveness. Evaluation of this criterion describes how site risks associated with each pathway are eliminated, reduced, or mitigated through treatment, engineering, or land use controls. This criterion also considers whether an alternative poses an unacceptable short-term or cross-media affect.

### 6.2.2 Criterion 2: Compliance with ARARS

This criterion addresses compliance with promulgated federal and state environmental requirements. The detailed analysis summarizes which requirements are applicable or relevant and appropriate to an alternative and how the alternative meets these requirements. If an alternative cannot meet a requirement, a determination can be made that a waiver under CERCLA may be appropriate, and a basis for justifying the waiver is presented. ARARs consist of two sets of requirements – those that apply and those that are relevant and appropriate. In certain cases, standards may not exist that address the proposed action or the COC(s). In such cases, non-promulgated advisories, criteria, or guidance developed by the USEPA or other federal agencies or states can be TBCs. There are three types of ARARs; chemical-specific, location-specific, and action-specific. The chemical-, location-, and action-specific ARARs are presented in **Section 3.2**.

### *6.2.3 Criterion 3: Long-Term Effectiveness and Permanence*

This criterion evaluates the extent to which an alternative achieves an overall reduction in risk to human health and the environment after the RAO is met. The criterion considers the degree to which the alternative provides sufficient long-term controls and reliability to prevent exposures that exceed protective levels for human and environmental receptors. The principal factors addressed by this criterion include magnitude of residual risk and the adequacy and reliability of controls to address such risk. This criterion also addresses the uncertainties associated with these factors.

The evaluation of adequacy and reliability of controls assesses the effectiveness of any treatment, containment, or institutional measures that are part of the alternative. Factors considered include performance characteristics, maintenance requirements, and expected durability. Information and data from past performance and similar technology applications are incorporated appropriately into the evaluation. Land use controls are considered where they have the potential to improve the effectiveness of engineered measures.

### *6.2.4 Criterion 4: Reduction of Toxicity, Mobility, or Volume through Treatment*

This criterion reflects the statutory preference that remedial alternatives contain a principal component that substantially reduces toxicity, mobility, or volume of hazardous substances through treatment. The evaluation regarding this criterion considers the extent to which alternative technologies can effectively and permanently fix, transform, immobilize, or reduce the volume of waste materials and contaminated media.

### *6.2.5 Criterion 5: Short-Term Effectiveness*

This criterion addresses the effects of the construction and implementation phases of the alternative until the RAO is achieved. The evaluation regarding this criterion considers the effect on human health and the environment posed by operations conducted during the remedial action phases. Both the potential effect and associated mitigative measures are examined for maintaining protectiveness for the community, remediation workers, and environmental receptors throughout the duration of activities.

Potential short-term risks to the pubic include inhalation of constituents that may be released during waste removal and treatment operations, and contaminant exposure and physical injury during waste transport off site. Potential short-term risks to workers include direct contact and exposure during construction, waste handling, and transportation; physical injury or death during construction and transportation activities; and non-remediation worker exposures to airborne contaminants during waste and soil removal operations. Alternative analyses also include a description of mitigating measures such as engineering and land use controls that are expected to minimize potential risks to the public and workers. This evaluation also addresses the anticipated duration of remedial activities.

### *6.2.6 Criterion 6: Implementability*

This criterion examines the technical and administrative factors affecting implementation of an alternative and considers the availability of services and materials required during implementation. Technical factors to be assessed include the ease and reliability of construction and operations, the prospects for implementing a future action, and the adequacy of monitoring systems to detect failures. Administrative factors include permitting and coordination requirements between the lead agency and regulatory agencies. Service and material considerations include treatment, storage, and disposal capacities, equipment and operator availability, and prospective technology applicability or development requirements.

The assessment of technical feasibility examines the performance history of the technologies in direct applications or considers the expected performance for similar applications. Uncertainties associated with construction, operation, and performance monitoring are also addressed.

The evaluation of administrative feasibility includes a discussion of those actions required to coordinate with regulatory agencies to establish the framework for complying with key substantive technical requirements that must be met by an alternative. Additionally, those alternatives that include off-site transportation of waste are reviewed to assess the feasibility of off-site disposal.

The availability of services and materials is addressed by analyzing the material components of the proposed technologies to determine the locations and quantities of those materials, and by reviewing process operations to identify special services, operator skills, or training required to readily implement the process.

The NCP requires that the evaluation of the relative administrative feasibility of each alternative include "…activities needed to coordinate with other offices and agencies, and the ability and time required to obtain any necessary approvals and permits from other agencies (for off-site actions). CERCLA, Section 121(e), stipulates that no deferral, state, or local permit shall be required for the portion of any removal or remedial action conducted entirely on site." An action must satisfy the substantive requirements of the permits that will otherwise be required.

### 6.2.7 Criterion 7: Cost

Cost estimates are included for each remedial alternative. The estimates are based on feasibility level scoping and are intended to aid in making project evaluations and comparisons among alternatives. The estimates have an expected accuracy of +50 to –30 percent for the scope of the action described in **Section 5.0** for each alternative.

The estimates are divided into capital cost and O&M cost, and are developed according to an assumed schedule for the various activities based on similar project experience.

Capital costs are defined as those expenditures required to initiate and install an alternative. These are short-term costs and are exclusive of costs required to maintain the action throughout the project lifetime. Capital costs consist of direct and indirect costs. Direct costs include construction costs (material, labor, and equipment to install an action), service equipment, process and new process buildings, utilities, and waste disposal costs. Indirect costs include design engineering, inspection, project integration, project administration and management, and project contingencies.

O&M costs are long-term costs associated with ongoing remediation at a site. These costs occur after construction and installation are completed. The costs include labor, materials, utilities, and services required to monitor, operate, and maintain the facilities for a period of up to 30 years.

The estimated present worth of each remedial alternative is determined on a discount rate of 7 percent and a base maintenance/monitoring period of up to 30 years, unless the alternative evaluated is expected to be complete in less than 30 years.

**Appendix C** presents detailed cost estimates and the major assumptions used to develop the cost estimates for each remedial alternative.

### 6.2.8 Criterion 8: State Acceptance

State acceptance of an alternative will be evaluated in the Proposed Plan issued for public comment. Therefore, this criterion is not considered in this FS.

### 6.2.9 Criterion 9: Community Acceptance

Community acceptance of each alternative will be evaluated after a Proposed Plan is issued for public comment. Therefore, this criterion is not considered in this FS.

## 6.3 Individual Analysis of Alternatives

### 6.3.1 Alternative 1 – No Action

Under the no action alternative, no further action would be taken to control human exposure to contaminated groundwater. The contaminated groundwater would remain in place without the implementation of any contaminant removal, treatment, or containment. Land use controls to prevent access to contaminated site groundwater would not be implemented. Further, the No Action alternative involves no action to prevent perchlorate present at elevated concentrations in soil from migrating to groundwater or surface water bodies on LHAAP. This alternative provides a baseline for comparison purposes.

#### *6.3.1.1 Overall Protection of Human Health and the Environment*

The no action alternative does not achieve the RAO for LHAAP-50. This alternative provides no control of exposure to the contaminated groundwater or actions to prevent further deterioration of the groundwater as the area of high concentrations remains, and no reduction in the risks to human receptors for current and future land use scenarios. Risks to receptors from ingestion of groundwater contaminants would exceed the USEPA-established threshold for acceptable incremental lifetime cancer risk of $1 \times 10^{-4}$ for carcinogens or an HI of 1 for non-carcinogens. Unacceptable risks to the environment were not determined to be associated with LHAAP-50 in the BERA (Shaw, 2007c).

#### *6.3.1.2 Compliance with ARARs*

CERCLA, Section 121, cleanup standards, including compliance with ARARs, apply only to actions the USEPA determines should be taken under CERCLA, Sections 104 and 106 authority. A no action decision will be made when no action is deemed necessary to reduce, control, or mitigate exposure because the site does not present a threat to human health and the environment, or because any action taken will worsen the negative effects on human health and the environment. Because no remedial activities are associated with this alternative, compliance with chemical-specific ARARs would not be met. Since no remedial activities would be conducted, action-specific and location-specific ARARs would not apply.

#### *6.3.1.3 Long-Term Effectiveness and Permanence*

*Magnitude of Residual Risk*

The no action alternative would not provide an effective or permanent long-term solution. The residual risk and toxicity from groundwater exposure under a no action alternative would be unacceptable at LHAAP-50. The carcinogenic risk is $5.5 \times 10^{-3}$ and the non carcinogenic hazard is above acceptable levels from the groundwater. The major contributor to the risk is TCE. In addition, concentrations of perchlorate remain in soil that could act as a continuing source to the groundwater contamination. However, it should be noted that the risk was calculated for a hypothetical future maintenance worker ingesting the groundwater, although this scenario is unlikely. Currently, the groundwater at LHAAP-50 is not used for drinking water, and would not be used for drinking water under a wildlife refuge future use scenario. The shallow groundwater impacted at the site is unlikely to be used as a water source since it is present in thin discontinuous lenses, likely to be low in yield. Based on the groundwater flow and transport model (Shaw, 2007b), groundwater will not adversely impact Goose Prairie Creek.

*Adequacy and Reliability of Controls*

The no action alternative would not provide the maintenance of land use controls at LHAAP-50 and, therefore, would not reduce the existing exposure risks posed by contaminated site groundwater if it were to be used at the site; however use is unlikely.

#### 6.3.1.4 Reduction of Toxicity, Mobility, or Volume through Treatment

Implementation of the no action alternative would not reduce toxicity, mobility, or volume of contaminants because this alternative does not employ treatment.

#### 6.3.1.5 Short-Term Effectiveness

Under the no action alternative, no remedial action would be taken; therefore, the short-term effectiveness criterion is not applicable to this alternative. No short-term risks to workers, the community or the environment would exist.

#### 6.3.1.6 Implementability

This alternative is inherently implementable because no remedial action would be taken.

#### 6.3.1.7 Cost

There are no costs associated with the no action alternative.

### 6.3.2 Alternative 2 – Excavation, Monitored Natural Attenuation, LUCs

Alternative 2 relies on removal of soil to prevent potential soil to groundwater migration of perchlorate and monitoring the natural reduction of contaminant levels in groundwater in an MNA program, combined with the maintenance of land use controls to prevent human exposure to contaminated groundwater at LHAAP-50. LUCs are a major portion of the alternative to ensure that the future use of the site is consistent with industrial use, and because contaminated groundwater would remain in the ground until MNA reduces the COC concentrations to below cleanup levels. MNA activities would ensure that the COC concentrations in groundwater remain stable and continue to degrade naturally. In addition, soils containing contaminants at levels that could migrate to groundwater and cause further degradation of the groundwater quality would be removed.

#### 6.3.2.1 Overall Protection of Human Health and the Environment

*Protection of Human Health*

Existing soil concentrations are protective of a hypothetical future maintenance worker, but existing groundwater concentrations pose a risk to the hypothetical future maintenance worker.

This alternative would achieve the RAOs for LHAAP-50. Continued maintenance of the LUCs would prevent human access and exposure to groundwater that poses an unacceptable risk to human health. The controls would include a combination of Army procedures and training, which will in turn be provided to the USFWS for incorporation into the agency's land management program. If transferred out of U. S. government control, deed restrictions would be placed on the property to prohibit or restrict property uses (e.g., drinking water well installation) that may result in exposure to groundwater. It is unlikely that impacted groundwater at the site would be used as a water supply since it is present in narrow discontinuous sand lenses which probably are low yield.

The MNA program would monitor the groundwater plume and ensure that the COCs in groundwater are not migrating beyond the downgradient well and that the COCs continue to degrade or remain stable. The soil removal component of this alternative would prevent further degradation of the groundwater by removal of contaminants from the soil that, if not removed, may migrate to the groundwater.

*Protection of the Environment*

The facility-wide ecological baseline risk assessment concluded that risks to ecological receptors at the Group 4 sites were within the acceptable risk range.

#### 6.3.2.2 Compliance with ARARs

*Chemical-Specific ARARs*

This alternative will achieve the cleanup levels for groundwater contaminants that exceed their respective ARARs in groundwater since COCs are naturally degrading. The time frame is estimated to be less than 50 years. Since use of groundwater as a water supply is unlikely based on future land use and the probable low yield of the discontinuous water bearing zones at LHAAP-50, the time frame for achievement of groundwater ARARs is considered acceptable. Based on modeling (Shaw, 2007b), the groundwater does not adversely impact surface water. This alternative would meet the TCEQ GWP-Ind of 7,200 μg/kg for perchlorate in soil once the removal is complete.

*Location-Specific ARARs*

Activities that would be conducted under this alternative would comply with all location-specific ARARs. No activities would take place in sensitive environments such as wetlands.

*Action-Specific ARARs*

The activities that would be conducted under this alternative would comply with all action-specific ARARs.

#### *6.3.2.3 Long-Term Effectiveness and Permanence*

*Magnitude of Residual Risks*

The implementation of LUCs under this alternative would prevent direct contact by human receptors with the groundwater at LHAAP-50, thus minimizing the potential risk posed by groundwater contamination. The risk from ingestion of the groundwater is primarily from TCE and perchlorate; however, cis-1,2-DCE, 1,1-DCE, 1,2-dichloroethane, PCE, and vinyl chloride, also contribute to the risk and are present above MCLs.

The TCEQ guidance for MNA (TCEQ, 2001) provides primary, secondary, and other lines of evidence to support that natural attenuation is occurring. These same lines of evidence may be used to evaluate the long term effectiveness of this technology as a remedial action. The lines of evidence for natural attenuation at LHAAP-50 are discussed in **Appendix A**.

Based on the lines of evidence, natural attenuation of the COCs is occurring at LHAAP-50. Further, groundwater is currently not used and is unlikely to be used in the future due to 1) the low yield expected from thin discontinuous sand lenses and 2) the proposed future land use. Groundwater use restrictions will control the use of groundwater.

*Adequacy and Reliability of Controls*

The implementation of LUCs would protect potential human receptors from exposure to contaminated groundwater at LHAAP-50 until proposed cleanup levels are met. The reliability of LUCs would depend on the long-term maintenance of the controls. The effectiveness of the LUCs would depend on the annual and five-year CERCLA reviews. The 5-year reviews may indicate the need for components of this alternative to be maintained, modified, or replaced.

The soil removal portion of this alternative would be reliable as contaminated soil would be removed from the property and placed in a RCRA-permitted landfill.

#### *6.3.2.4 Reduction of Toxicity, Mobility, or Volume through Treatment*

Although the alternative provides no active remedial measure to reduce the toxicity, mobility, or volume of COCs in groundwater through treatment, reduction of toxicity, mobility, and volume is achieved though natural bioattenuation of contaminants in the aquifer. This reduction would be verified through the monitoring program over several years.

The soil excavation portion of this alternative provides reduction of mobility because perchlorate is removed from the site and placed in a permitted disposal facility. Toxicity and volume of the soil contaminants are not reduced as the form and quantity of the perchlorate is not altered.

#### *6.3.2.5 Short-Term Effectiveness*

*Protection of the Community during Remedial Action*

This alternative is protective of the surrounding community during remedy implementation primarily because all activities would occur on site with very little disturbance of contaminated material.

*Protection of Workers during Remedial Action*

No significant short-term risks to human health or the environment would exist during implementation of this alternative. However, worker exposure to soils and contaminated groundwater is possible during excavation, drilling, well installation, and sampling activities associated with the monitoring events. The short-term risks associated with these activities may be minimized through implementation of an effective health and safety program.

*Short-Term Environmental Effects*

Since minimal disturbance of contaminated material would occur under this alternative, short-term impacts to the environment are unlikely. The implementation of proper engineering controls would minimize the risk of environmental impacts.

*Duration of Remedial Activities*

Implementation of LUCs would prevent exposure to contaminated groundwater by prohibiting the installation of potable water wells at LHAAP-50 and ensure that the site use is consistent with industrial use. This alternative could provide almost immediate protection because LUCs can be implemented relatively quickly (e.g., within six months). Maintenance of controls for industrial/wildlife refuge use of the land would remain in place indefinitely because the site has not been demonstrated to be suitable for unrestricted use.

The anticipated duration of the proposed soil excavation, including mobilization/demobilization, site preparation, excavation, field screening, excavation confirmation sampling, site restoration and off-site disposal of the contaminated soil is five days. In order to expedite activities, field screening results will be used to determine the extent of excavation so that backfill and site restoration activities can begin prior to receiving final laboratory confirmation sample results.

The estimated duration of MNA is approximately 50 years.

#### *6.3.2.6 Implementability*

*Technical Feasibility*

All components of this alternative are readily implementable. Minimal technical concerns exist that would hinder the implementation of this alternative because no remedial activities other than installation of additional wells and sampling under the monitored natural attenuation program would be performed under this alternative. The LUC and soil excavation portion of this alternative are readily available and can be implemented with conventional technologies. All equipment, services and materials are readily available to conduct the activities for this alternative.

*Administrative Feasibility*

All actions under this alternative are implemented on site and thus do not require permits, though substantive provisions of permits that would otherwise be required are considered to be ARARs. By legal agreement (i.e., the FFA), the Army shall submit to the USEPA and TCEQ a Responsiveness Summary and a draft ROD. Following consideration of any comments by TCEQ, the ROD will be finalized jointly by the Army and USEPA, or if they are unable to reach agreement about the selection of the remedial action, by the USEPA Administrator. By addressing the identified ARARs in the ROD, it is anticipated that the alternative would adequately address administrative barriers.

Land use controls, although administratively implementable, would require the following: development of an implementation plan as part of the remedial design and internal notices to relevant regulatory offices of the existence of the LUCs. Approval by the USEPA and the State of Texas is required prior to the modification or termination of LUCs, implementation actions, or modification of land-use by the Army. The Army shall also seek concurrence from the USEPA and the State of Texas prior to any action that may disrupt the effectiveness of the LUCs or any action that may alter or negate the need for LUCs.

#### 6.3.2.7 Cost

The total project present worth cost of this alternative is approximately $639,000. The details of the cost estimates for all of the alternatives are presented in **Appendix C**.

*Direct Capital Cost*

The total direct capital cost is estimated at $215,000.

*O&M Cost*

The total O&M cost is estimated at approximately $424,000. The O&M cost includes maintenance of land use controls, installation of two additional monitoring wells, and MNA through year 30. The long-term monitoring would support the required CERCLA 5-year reviews.

### 6.3.3 Alternative 3 – Excavation, In Situ Bioremediation, LUCs

This alternative reduces contamination in the area of highest concentrations in the groundwater plume via in situ bioremediation using bioaugmentation, to levels that would result in residual COCs remaining in the plume for a decreased duration. It is estimated that cleanup levels in the groundwater would be achieved in 10 years after treatment. However, this is just an estimate since the hydrogeologic conditions and current extent of contamination has not fully been defined. These actions would reduce COC concentrations in the groundwater to the MCLs or TCEQ GW-Ind throughout the site, provided bioremediation results are favorable. In addition, soils containing contaminants at levels that could migrate to groundwater and cause further degradation of the groundwater quality would be removed. Long-term LUCs would be maintained indefinitely for the industrial/wildlife refuge use of the land and for groundwater until COC concentration meet ARARs.

#### *6.3.3.1 Overall Protection of Human Health and the Environment*

*Protection of Human Health*

Existing soil concentrations are protective of a hypothetical future maintenance worker, but existing groundwater concentrations pose a risk to the hypothetical future maintenance worker.

The remedial action proposed for this alternative would eventually achieve the destruction of the COCs present in groundwater above cleanup levels established for LHAAP-50. Therefore, the residual site risk upon completion of these actions would be within the target risk range for a hypothetical future maintenance worker.

*Protection of the Environment*

The facility-wide ecological baseline risk assessment concluded that risks to ecological receptors at the Group 4 sites were within the acceptable risk range.

#### *6.3.3.2 Compliance with ARARs*

*Chemical-Specific ARARs*

This alternative would comply with chemical-specific ARARs for groundwater throughout the site because the contaminant MCLs or TCEQ GW-Ind (perchlorate) would be achieved in an assumed 10 year time frame after treatment. In addition, this alternative would meet the TCEQ GWP-Ind of 7,200 μg/kg for perchlorate in soil.

*Location-Specific ARARs*

The activities that would be conducted under this alternative would comply with location-specific ARARs. No activities would take place in sensitive environments such as wetlands.

*Action-Specific ARARs*

The activities that would be conducted under this alternative would comply with action-specific ARARs.

#### *6.3.3.3 Long-Term Effectiveness and Permanence*

*Magnitude of Residual Risks*

Upon completion of groundwater remediation, the residual site risk would be within the target risk range for a hypothetical future maintenance worker.

*Adequacy and Reliability of Controls*

In situ groundwater bioremediation should be effective for reducing COC concentrations in LHAAP-50 groundwater. However, optimum groundwater conditions would be required to increase the effectiveness of biological activity on these contaminants. More extensive aquifer characterization is needed before designing the system and to determine the area for optimum bioaugmentation. Due to the limited data on the nature of the current plume, the effectiveness of this technology at LHAAP-50 cannot be fully assessed.

Land use controls would also prevent exposure to the groundwater COCs exceeding the MCLs or TCEQ GW-Ind (perchlorate) during the time required for groundwater bioremediation. The reliability of LUCs would depend on the maintenance of the controls. Compliance with the risk-reduction goals would be monitored and performance of the controls would be assessed throughout the duration of this alternative. The assessment may indicate the need for components of this alternative to be maintained, modified, or replaced.

The soil removal portion of this alternative would be reliable as contaminated soil would be removed from the property and placed in a RCRA-permitted landfill.

#### *6.3.3.4 Reduction of Toxicity, Mobility, or Volume through Treatment*

In situ bioremediation would irreversibly reduce the toxicity, mobility and volume of the contaminants in LHAAP-50 shallow groundwater. This alternative would satisfy the USEPA statutory preference for remedial actions that permanently reduce contaminant toxicity, mobility and volume and utilize treatment as a principle element.

The soil excavation portion of this alternative provides reduction of mobility because perchlorate is removed from the site and placed in a permitted disposal facility. Toxicity and volume of the soil contaminants are not reduced as the form and quantity of the perchlorate is not altered.

#### *6.3.3.5 Short-Term Effectiveness*

*Protection of the Community during Remedial Action*

This alternative is protective of the surrounding community during remedy implementation primarily because activities would occur on site with very little disturbance of contaminated material.

*Protection of Workers during Remedial Action*

This alternative would involve potential short-term risks to workers associated with the operation of drilling equipment and potential exposure to contaminated soil and groundwater during excavation and sampling activities. The implementation of an effective health and safety program would minimize potential short-term risks to remediation personnel. Remediation workers would conform to the site health and safety program and would be equipped with the necessary personal protective equipment (PPE). A site-specific health and safety plan would be prepared prior to implementing this alternative.

*Short-Term Environmental Effects*

Since minimal disturbance of contaminated material would occur under this alternative, short-term impacts to the environment are unlikely. The implementation of proper engineering controls would minimize the risk of environmental impacts.

*Duration of Remedial Activities*

The duration of this groundwater treatment portion of the alternative is estimated to be approximately 12 years. It is assumed that; in year 1, the field investigation to define the aquifer conditions will be performed, the plans prepared and one bioaugmentation treatment performed. In year two, four quarters of monitoring is performed as well as a second bioaugmentation treatment. The second treatment is followed by 10 years of additional groundwater monitoring. The time frames for this alternative are difficult to estimate due the undefined extent of COCs in shallow groundwater and the thin discontinuous nature of the more permeable lenses which facilitate treatment. In addition residual COCs may be present in the clay matrix surrounding the permeable lenses which could continue to impact water quality into the future and MNA is assumed to continue for 30 years. Aquifer studies are needed to determine the most effective location for injection. Monitoring would be needed until cleanup levels are met to determine trends in groundwater contamination levels and effectiveness of the remedial action. The monitoring time may increase or decrease depending on the effectiveness of the treatment method.

The anticipated duration of the proposed soil excavation, including mobilization/demobilization, site preparation, excavation, field screening, excavation confirmation sampling, site restoration and off-site disposal of the contaminated soil is five days. In order to expedite activities, field screening results will be used to determine the extent of excavation so that backfill and site restoration activities can begin prior to receiving final laboratory confirmation sample results.

LUCs for the groundwater will continue until contaminant concentrations are below MCLs or the GW-Ind (perchlorate).

#### *6.3.3.6 Implementability*

*Technical Feasibility*

All components of this alternative are implementable. The equipment and materials required for microbe and carbon source delivery are commercially available, but specialized knowledge of in situ biological treatment would be required for implementation. With sufficient study, it is likely that an implementable design could be developed, however subsurface conditions could impact the effectiveness and cost. The LUC and soil excavation portion of this alternative are readily available and can be implemented with conventional technologies.

*Administrative Feasibility*

All actions under this alternative would be implemented on the site and thus do not require permits, though substantive provisions of permits that would otherwise be required are considered to be ARARs. By legal agreement (i.e., the FFA), the Army shall submit to the USEPA and TCEQ a Responsiveness Summary and a draft ROD. Following consideration of any comments by TCEQ, the ROD will be finalized jointly by the Army and USEPA, or if they are unable to reach agreement about the selection of the remedial action, by the USEPA Administrator. By addressing the identified ARARs in the ROD and subsequent documents, it is anticipated that the alternative would adequately address all administrative barriers.

Land use controls, although administratively implementable, would require the following: development of an implementation plan as part of the remedial design and internal notices to relevant regulatory offices of the existence of the land use controls. Approval by the USEPA and the State of Texas is required prior to the modification or termination of land use controls, implementation actions, or modification of land-use by the Army. The Army shall also seek concurrence from the USEPA and the State of Texas prior to any action that may disrupt the effectiveness of the land use controls or any action that may alter or negate the need for land use controls.

#### *6.3.3.7 Cost*

The total project present worth cost of Alternative 3 is approximately $914,000. The details of the cost estimates for all of the alternatives are presented in **Appendix C**.

*Capital Cost*

The total direct capital cost is estimated at approximately $402,000. The direct capital cost includes the activities associated with land use controls (access controls), in situ bioremediation, and monitoring well installation.

*O&M Cost*

The total O&M cost is estimated at approximately $512,000. The O&M cost includes a second bioremediation treatment and long-term monitoring through year 10 associated with the land use controls and the assessment of in situ bioremediation performance.

## 6.4 Comparative Analysis of Alternatives

### 6.4.1 Introduction

This section presents a comparative analysis of the remedial alternatives for LHAAP-50 according to the CERCLA evaluation criteria described in **Section 6.2**. This analysis is the second stage of the detailed evaluation process and provides information that forms the basis for selecting a preferred remedy.

This comparative analysis considers two of the three criteria categories, the threshold criteria and primary balancing criteria. The threshold category contains two criteria that must be satisfied by the selected alternative:

- Overall protection of human health and the environment and
- Compliance with ARARs.

These criteria are important because they reflect the key statutory mandates of CERCLA. If an alternative does not satisfy both of these criteria, it is not eligible to be selected.

The primary balancing category contains five criteria under which the relative advantages and disadvantages of the alternatives are compared to determine the most appropriate remedy. The five criteria are the following:

- Long-term effectiveness and permanence
- Reduction of toxicity, mobility, or volume through treatment
- Short-term effectiveness
- Implementability
- Cost

The comparison of these five criteria for the alternatives forms the basis of the comparative analysis. The first and second balancing criteria address the statutory preference for treatment as a principal element of the remedy. Together with the third and fourth criteria, they form the basis for determining the general feasibility of each alternative and for determining whether costs are proportional to the overall effectiveness.

The two modifying criteria, state and community acceptance, must be satisfied if the alternative is to be accepted. The modifying criteria of state and community acceptance are typically not evaluated until the public has had an opportunity to comment on the Proposed Plan. Because specific alternatives have not been presented to the state and community, these two criteria are not formally compared in the FS.

A comparative analysis under the threshold and primary balancing criteria is presented in **Sections 6.4.2** and **6.4.3**, respectively, and is consistent with the format of the individual analysis of alternatives in **Section 6.3**.

### *6.4.2 Threshold Criteria*

#### *6.4.2.1 Overall Protection of Human Health and the Environment*

The three alternatives provide varying levels of human health protection. Alternative 1, no action, does not achieve the RAOs and provides the least protection of all the alternatives; it provides no reduction in risks to human health or the environment because no measures would be implemented to eliminate the pathway for human exposure to the groundwater contamination.

Alternatives 2 and 3, both satisfy the RAOs for LHAAP-50. Both alternatives remove the soils that may act as a continuing source of groundwater contamination. Alternative 2, which relies the most heavily on land use controls combined with MNA and does not provide contaminant removal or treatment in groundwater other than by natural processes, would be protective of human health because the controls would prevent human access to the contaminated groundwater. Alternative 3 provides a higher level of overall protection than Alternative 2 because the ARARs for the groundwater COCs would be achieved at the site in a shorter time frame, thereby eliminating unacceptable exposure risks sooner.

#### *6.4.2.2 Compliance with ARARs*

Alternative 1 does not comply with chemical-specific ARARs for groundwater or TBC guidance for soil because no remedial action or measures would be implemented. Alternatives 2 and 3 comply with chemical-specific ARARs for groundwater and TBC guidance for soil.

Location-specific and action-specific ARARs would not apply to Alternative 1 since no remedial activities would be conducted. Alternatives 2 and 3 comply with location-specific and action-specific ARARs.

### *6.4.3 Primary Balancing Criteria*

#### *6.4.3.1 Long-Term Effectiveness and Permanence*

Alternative 1 would be the least effective and permanent in the long term because no contaminant removal or treatment would take place and no measures would be implemented to control exposure risks posed by contaminated site groundwater or the potential for soil to groundwater migration of perchlorate. Alternative 2 offers a moderate degree of long-term effectiveness through the implementation of MNA with land use controls, which would minimize the potential risk posed by the contaminated groundwater. In addition, soils with elevated levels of contaminants would be removed from the site.

Although Alternative 3 is designed to reduce groundwater contaminant concentrations and achieve the cleanup levels in a shorter period of time, the actual effectiveness will be evaluated following remedy selection. However, at present, Alternative 3 is expected to offer the highest degree of long-term effectiveness and permanence compared to the other alternatives.

#### *6.4.3.2 Reduction of Toxicity, Mobility, or Volume through Treatment*

Alternatives 1 and 2 do not employ active treatment to result in a reduction of toxicity, mobility, or volume of contaminants. However, bioattenuation achieves a reduction in toxicity, mobility and volume in the aquifer as the contaminants are permanently degraded into non-toxic end products. The monitoring program employed for Alternative 2 would verify the degree with which these processes are occurring.

Alternative 3 provides a reduction in toxicity, mobility and volume via bioattenuation of contaminants, as well. As amendments are added to the aquifer to enhance the natural biological activity, this alternative provides the greatest degree of reduction in toxicity, mobility and volume of the groundwater contaminants. However, this reduction would only occur if the results of pre-design investigation and further evaluations of in situ bioremediation are favorable.

The soil excavation component of Alternatives 2 and 3 provides a reduction of mobility because perchlorate is removed from the site and placed in a permitted disposal facility. Toxicity and volume are not reduced by the excavation portion of the alternative as the form and quantity of the perchlorate is not altered.

#### *6.4.3.3 Short-Term Effectiveness*

Because Alternative 1 does not involve any remedial measures, no short-term risk to workers, the community or the environment would exist.

Alternatives 2 and 3 involve potential short-term risks to workers associated with exposure to contaminated soil and groundwater and operation of drilling/construction equipment. The time period to achieve the groundwater cleanup levels is the most significant difference between Alternatives 2 and 3. Alternative 3 is expected to take less time to achieve the cleanup levels than Alternative 2, provided subsurface conditions for in situ bioremediation is favorable. The implementation of Alternative 3 would require more time than for Alternative 2 due to the requirement for a remedial design and pre-design testing. Alternative 2 would provide almost immediate protection because the land use controls could be implemented relatively quickly, but maintenance of these controls would be required longer than Alternative 3.

For the soil excavation component of Alternatives 2 and 3, the use of proper dust suppressant measures would control windblown emissions of contaminated dust to protect the community and on-site workers. Proper personal protective equipment would be required for site workers.

#### *6.4.3.4 Implementability*

Under the no action alternative, no remedial action would be taken. Therefore, no difficulties or uncertainties would be associated with its implementation. Alternatives 2 and 3 are easily implemented from a technical standpoint as all equipment, materials, and services required are readily available. Alternative 3 would be slightly more difficult to implement than Alternative 2 from a technical standpoint due to the specialized expertise required to design and construct the in situ bioremediation treatment elements.

Administratively, all of the alternatives are implementable.

#### *6.4.3.5 Cost*

Cost estimates are used in the CERCLA FS process to eliminate those remedial alternatives that are significantly more expensive than competing alternatives without offering commensurate increases in performance or overall protection of human health or the environment. The cost estimates developed are preliminary estimates with an intended accuracy range of +50 to –30 percent. Final costs will depend on actual labor and material costs, actual site conditions, productivity, competitive market conditions, final scope, final schedule, final engineering design, and other variables.

Costs developed are capital costs (including fixed-price remedial construction) and long-term O&M costs (post-remediation). Overall 30-year present worth costs are developed for each alternative assuming a discount rate of 2.8 percent. Total project present worth costs for each alternative is presented in **Appendix C**.

The progression of present worth costs from the least expensive alternative to the most expensive alternative is as follows: Alternative 1, Alternative 2, and Alternative 3. No costs are associated with Alternative 1 because no remedial activities would be conducted. Alternative 2 has the lowest present worth and capital costs of the active remedial alternatives. The present worth costs for Alternative 2 is lower than that of Alternative 3, primarily due to the activities associated with the injection phase of in situ bioremediation under Alternative 3. The highest O&M cost is associated with Alternative 3 primarily due to the O&M for the groundwater bioremediation program.

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# *Appendix A*

# *Natural Attenuation Evaluation for LHAAP-50*

00078535

**APPENDIX A**
**NATURAL ATTENUATION EVALUATION**

***FINAL***
**FEASIBILITY STUDY**
**LHAAP-50, FORMER SUMP WATER TANK, GROUP 4**
**LONGHORN ARMY AMMUNITION PLANT**
**KARNACK, TEXAS**

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**Contract No. W912QR-04-D-0027, Task Order No. DS02**
**Shaw Project No. 117591**

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# Acronyms and Abbreviations

| | |
|---|---|
| cells/mL | cells per milliliter |
| $Cl^-$ | chloride |
| $ClO_2^-$ | chlorite |
| $ClO_3^-$ | chlorate |
| $ClO_4^-$ | perchlorate |
| $CO_2$ | carbon dioxide |
| COC | chemicals of concern |
| DCA | dichloroethane |
| DCE | dichloroethene |
| DHC | *Dehalococcoides ethenogenes* |
| DO | dissolved oxygen |
| $Fe^{+3}$ | ferric iron |
| GW-Ind | groundwater medium-specific concentration for industrial use |
| GWRTAC | Ground-Water Remediation Technologies Analysis Center |
| LHAAP | Longhorn Army Ammunition Plant |
| MARC | Multiple Award Remediation Contract |
| MCL | maximum contaminant level |
| µg/L | micrograms per liter |
| mg/L | milligrams per liter |
| MNA | monitored natural attenuation |
| mV | millivolts |
| $NO_3^-$ | nitrate |
| $O_2$ | oxygen |
| ORP | oxidation-reduction potential |
| PCE | tetrachloroethene |
| Shaw | Shaw Environmental, Inc. |
| $SO_4^{-2}$ | sulfate |
| TCA | trichloroethane |
| TCE | trichloroethene |
| TCEQ | Texas Commission on Environmental Quality |
| TOC | total organic carbon |
| TRRP | Texas Risk Reduction Program |
| USAFCEE | U.S. Air Force Center for Environmental Excellence |
| USEPA | U.S. Environmental Protection Agency |
| VC | vinyl chloride |

# 1.0 Introduction

The U.S. Army Corps of Engineers, Tulsa District, contracted Shaw Environmental, Inc. (Shaw), under Louisville District's Multiple Award Remediation Contract (MARC) No. W912QR-04-D-0027, Task Order No. DS02, to conduct environmental restoration at Longhorn Army Ammunition Plant (LHAAP). This report presents the evaluation for the occurrence of natural attenuation of groundwater contaminants at the Former Sump Water Tank, designated as LHAAP-50. The general location of this site is shown on **Figure 1-1**.

LHAAP-50, Former Sump Water Tank, historically contained an aboveground storage tank for industrial wastewater, and covers approximately 1 acre (**Figure 1-2**). LHAAP-50 is located just south of LHAAP-47 and Goose Prairie Creek.

The subsurface is composed of silty clay to clayey silt, and poorly sorted silty sand. The clay layers tend to separate this groundwater zone into shallow and intermediate groundwater zones. The groundwater flow direction in the shallow zone is east-northeast across the site (**Figure 1-2**), based on the November/December 2007 groundwater elevation measurements.

The groundwater at LHAAP-50 is contaminated with volatile organic compounds (including tetrachloroethene [PCE] and trichloroethene [TCE]), and perchlorate as the primary chemicals of concern (COC). The sample results through March 2007 are used in the evaluation of monitored natural attenuation (MNA).

# 2.0 Description of Natural Attenuation

Natural attenuation is defined as the reduction of contaminants from the combined effect of intrinsic biodegradation, advection, dispersion, dilution, volatilization, and absorption mechanisms. Generally, intrinsic biodegradation is the most important natural attenuation mechanism that results in contaminant destruction. Intrinsic biodegradation can occur in any environment that supports microbial activity. The biodegradation may be limited by the lack of a suitable respiratory substrate (e.g., oxygen) or inorganic nutrients, extreme pH, or limited contaminant bioavailability. Accurate contamination delineation, subsurface condition characterization, and contaminant migration determination are critical for defining the contribution of intrinsic biodegradation to concentration reduction, for evaluating the effectiveness of natural attenuation, and for establishing regulatory support for use of natural attenuation at a site. MNA entails the use of natural attenuation within the context of a monitoring plan to demonstrate reductions in contaminant concentrations and achievement of remedial action objectives.

## 2.1 Natural Attenuation Lines of Evidence

The U.S. Environmental Protection Agency (USEPA) guidance, *Technical Protocol for Evaluating Natural Attenuation of Chlorinated Solvents in Groundwater* (USEPA, 1998), will be used as guidance for the natural attenuation evaluation. The USEPA guidance specifies a tiered approach of recommended lines of evidence required for demonstrating that MNA is an effective remedy.

There are three lines of evidence according to the USEPA guidance document based on the OSWER Directive 9200.4-17 (USEPA, 1999), which are described as follows:

1. ***First line of evidence.*** Observed Reduction in Contaminant Mass and Concentration. Relies on use of historical groundwater data that demonstrate a clear trend of stable or decreasing COC concentrations over time at appropriate monitoring or sampling points.
2. ***Second line of evidence.*** Identified and Quantified Natural Attenuation Processes. Uses geochemical indicators to document certain geochemical signatures or “footprints” in the groundwater that demonstrate (indirectly) the type of natural attenuation process(es) occurring at the site and the rate at which such processes will reduce COCs to the maximum contaminant levels (MCLs) or groundwater medium-specific concentration for industrial use (GW-Ind) levels established by the Texas Commission on Environmental Quality (TCEQ).

- ***Third line of evidence.*** Microcosm Studies. Most often consists of predictive modeling studies and other laboratory/field studies that demonstrate the occurrence of natural attenuation process(es) at the site and its ability to degrade the COCs.

All three lines of evidence were evaluated for LHAAP-50 to demonstrate the occurrence of natural attenuation of groundwater COCs.

## *2.2 Biodegradation*

Biodegradation occurs when bacteria use contaminants as carbon sources or electron acceptors. The COCs at LHAAP-50 include perchlorate and chlorinated solvents exceeding their MCLs or GW-Ind. All contaminants can be degraded through microbial activity in the subsurface. Under the right conditions, all site COCs are amenable to biodegradation. A brief description of the various biodegradation pathways and mechanisms is described in the subsequent sections.

The technical protocol for evaluating natural attenuation of chlorinated solvents in groundwater (USEPA, 1998) has a preliminary screening worksheet for evaluating whether anaerobic biodegradation is occurring. The worksheet assigns points for geochemistry and the presence of daughter products. A point total of 5 or less, devotes inadequate evidence of anaerobic degradation. A point total of 15 or more is adequate evidence for anaerobic biodegradation. In between 5 and 15, the score represents limited evidence for anaerobic degradation. The preliminary screening worksheet only addresses anaerobic degradation, not any of the other pathways for natural attenuation (aerobic biodegradation, diffusion, adsorbtion, etc.).

### *2.2.1 Perchlorate*

Perchlorate is the soluble anion associated with ammonium, potassium, and sodium perchlorate. Perchlorate is used as an energetic booster or oxidant in solid propellant for rockets and missiles, and likely leached into the groundwater during the disposal of explosive materials and solid rocket fuel. The perchlorate anion is very mobile in aqueous systems, and can persist in the environment for many decades under aerobic condition because of its resistance to react with other available constituents. However, perchlorate can be reduced to chlorite and chloride in the presence of indigenous perchlorate-reducing microbes under anaerobic conditions (GWRTAC, 2001). The reduction in perchlorate concentrations can be direct evidence for the occurrence of biodegradation supporting the first line of evidence.

Perchlorate-reducing organisms couple the oxidization of an organic or inorganic electron donor to the reduction of perchlorate in a form of anaerobic respiration. Perchlorate ($ClO_4^-$) reduction produces chlorate ($ClO_3^-$), which can be further reduced to chlorite ($ClO_2^-$), then to the innocuous final product as chloride ($Cl^-$) and oxygen ($O_2$) (Rikken et al., 1996), as indicated in the following pathway:

$$ClO_4^- \rightarrow ClO_3^- \rightarrow ClO_2^- \rightarrow Cl^- + O_2$$

### 2.2.2 Chlorinated Solvents

The chlorinated solvents at this site are classified as chlorinated ethenes, ethanes, and methane. The most abundant chlorinated solvent at the site is TCE. Chlorinated ethenes and ethanes include parent compounds (TCE, PCE, 1,1,1-trichloroethane [TCA], 1,1,2-TCA) that biodegrade via multiple pathways and generate a variety of daughter products (cis-1,2-dichloroethene [DCE], 1,1-DCE, 1,2-dichloroethane [DCA], and vinyl chloride [VC]) that are generated from biotic or abiotic degradation of those parent compounds. Observing a decreasing trend of parent compounds and generation of daughter products are direct evidence for the occurrence of biodegradation supporting the first line of evidence.

One of the most prevalent pathways for biodegradation of chlorinated solvents is via reductive dechlorination. During this process, a chlorinated hydrocarbon is used as an electron acceptor resulting in the replacement of a chlorine atom with a hydrogen atom. The biodegradation of TCE primarily produces cis-1,2-DCE, with a trace amount of trans-1,2-DCE. 1,2-DCE isomers undergo reductive dechlorination resulting in the formation of VC, and subsequently the innocuous product ethene. When the 1,2-DCE isomers are generated, the cis-isomer is produced 10 to 100 times more often than the trans-isomer (Bouwer, 1994 and USEPA, 1998). The TCA compounds can also undergo reductive dechlorination, resulting in the formation of DCA isomers, followed by chloroethane, and then the harmless product ethane. The isomer 1,1-DCE is predominantly produced via abiotic hydrolysis of 1,1,1-TCA, and then further reduced to VC via reductive dechlorination.

Alternately, the DCE isomers, DCA and VC can be utilized as carbon sources and undergo biodegradation to carbon dioxide and chloride ions via aerobic or anaerobic oxidation. Although the chlorinated solvents can degrade via multiple biodegradation pathways, reductive dechlorination is typically the most common pathway observed. Chlorinated solvent can also undergo biogeochemical reductive dechlorination under high sulfate and iron levels (U.S. Air Force Center for Environmental Excellence [USAFCEE], 2003). During this degradation pathway, sulfate reducing bacteria produce sulfite and mineral iron without VC generation.

## 2.3 Geomicrobiology

Biological monitoring parameters are indicators of microbiological activity in the subsurface and are evaluated in support of the second lines of evidence. Microbial respiration is the biochemical process that leads to the oxidation of reduced organic carbon. Frequently encountered respiratory substrates (or electron acceptors) include $O_2$, nitrate ($NO_3^-$), ferric iron ($Fe^{+3}$), sulfate ($SO_4^{-2}$), and carbon dioxide ($CO_2$). Respiratory substrates are used preferentially based on the amount of energy that can be derived from each of them. Respiratory substrates are used in the following order:

$$O_2 > NO_3^- > Fe^{+3} > SO_4^{-2} > CO_2$$

Biodegradation of $ClO_4^-$ can occur under anaerobic nitrate-reducing conditions (GWRTAC, 2001). Reductive dechlorination of chlorinated solvents occurs under anaerobic (reducing) conditions such as sulfate-reducing and methanogenic conditions (USEPA, 1998). Nitrate-reducing conditions provide more energy to microorganisms than iron-reducing, sulfate-reducing condition, and methanogenic conditions. Sulfate reduction and methanogenesis are inhibited until oxygen, nitrate, and ferric iron have been depleted (USAFCEE, 2004). When perchlorate contaminants are co-mingled with chlorinated solvents in groundwater, microbes derive more energy from perchlorate degradation, thus chlorinated solvents will typically persist in groundwater until perchlorate is depleted.

The reduction of highly chlorinated compounds like PCE, TCE, and TCA may occur under sulfate-reducing conditions; however, DCE isomers, 1,2-DCA, and VC require the more reducing methanogenic conditions to undergo reductive dechlorination, which typically commence once the sulfate concentrations near depletion.

As discussed above, the concentrations of microbial respiratory substrates and products can be used to demonstrate intrinsic biodegradation. Expected changes include depressed concentrations of dissolved oxygen (DO) and negative oxidation-reduction potential (ORP) values within and downgradient of actively degrading contaminant plumes. The concentrations of anaerobic respiratory substrates such as nitrate and sulfate should decrease in groundwater located within and downgradient of a contaminant plume that is actively undergoing intrinsic anaerobic biodegradation. Similarly, the concentrations of the products of anaerobic microbial respiration, specifically ferrous iron and methane, should increase under similar circumstances.

The biodegradation of perchlorate and chlorinated solvents, whether via reductive dechlorination, dichloroelimination, or anaerobic oxidation, releases chloride ions into groundwater. In areas where the groundwater has a very low background chloride concentration, an elevation in chloride concentrations may be observed as a result of biodegradation of chlorinated solvents. However, high background chloride concentrations were observed at LHAAP, thus, the slight contribution of chloride into the groundwater through biodegradation is not quantifiable.

## *2.4 Microbial Analysis*

Microbial analysis can provide evidence to support the third line of evidence. A number of bacteria that contain nitrate reductases are capable of reducing perchlorate, such as *Staphylococcus epidermidis* and *Bacillus cereus* et al (GWRTAC, 2001). Perchlorate-reducing bacteria appear to be nearly ubiquitous in natural environments such as soils, sediments, surface water, and groundwater aquifers. There are multiple strains that can dechlorinate TCE and TCA under anaerobic reductive conditions, but only one strain, *Dehalococcoides ethenogenes* (DHC), can completely reduce the DCE isomers and VC to ethene. The presence of DHC in the groundwater can be the evidence to support the third line of evidence.

# 3.0 Natural Attenuation Evaluation Results

The following sections present the results of the natural attenuation evaluation as they pertain to demonstrating MNA in accordance with the three lines of evidence.

Four wells representing the two groundwater zones were sampled for natural attenuation parameters in February 2007. The COCs at this site were identified as PCE, TCE, cis-1,2-DCE, 1,1-DCE, VC, 1,2-DCA, and perchlorate. The groundwater sample forms and laboratory reports associated with the February 2007 groundwater round for this natural attenuation evaluation are presented in Appendix B to the Feasibility Study.

For the purposes of this evaluation, the USEPA MCLs for drinking water or the GW-Ind under TCEQ guidelines (Risk Reduction Rule Standard No. 2) are used as the cleanup levels for LHAAP-50. The GW-Ind is used for the evaluation of the COCs without MCLs. COCs that exceed their MCLs at LHAAP-50 include PCE, TCE, cis-1,2-DCE, 1,1 DCE, VC, and 1,2 DCA. The COC at this site exceeding the GW-Ind was identified as perchlorate.

The preliminary screening worksheet (USEPA, 1998) was used to evaluate if anaerobic biodegradation was occurring in wells within the PCE plume at LHAAP-50 that had most of the requisite analytical test results (**Table 3-1**). Well 50WW03 scored 4 points, indicating anaerobic biodegradation is probably not occurring there. The other three wells (50WW02, 50WW05, and 50WW06) showed totals of 10, 12, and 6 points; showing limited evidence of anaerobic degradation. Because the preliminary screening shows limited evidence for anaerobic biodegradation, the data was evaluated using the lines of evidence.

The evaluation of MNA lines of evidence for the shallow groundwater zone at LHAAP-50 is presented below.

## 3.1 Shallow Groundwater Zone

The shallow groundwater zone extends from 9 to 20 feet below surface. The COCs at this site are primarily distributed in the shallow aquifer. Three of the five shallow monitoring wells, 50WW02, 50WW03, and 50WW05 were sampled for natural attenuation parameters in February 2007. Monitoring wells 50WW03, 50WW02, and 50WW05 are along a downgradient flow direction (to the east), with 50WW02 located closest to the assumed source area (**Figure 1-2**).

### 3.1.1 Change in COC Concentrations over Time and with Distance

The change in groundwater COC concentrations over time and with distance was evaluated in the shallow groundwater at LHAAP-50.

#### *3.1.1.1 Perchlorate*

Perchlorate has historically been detected above GW-Ind in 50WW02 and 50WW05. During the February 2007 sampling event, perchlorate was observed exceeding the GW-Ind level of 72 micrograms per liter (µg/L) in only one well, 50WW02, at a concentration of 532 µg/L (**Table 3-2**). A decreasing trend of perchlorate over time was observed in 50WW02 (**Figure 3-1**) and 50WW05 (**Figure 3-2**) where higher concentrations were historically observed. Perchlorate concentrations decreased between the upgradient well, 50WW02 (532 µg/L) and the downgradient well, 50WW05, (27.8 µg/L) during February 2007 sampling event, suggesting that perchlorate is attenuating along the groundwater flow direction. The analytical results suggest that natural attenuation is effectively controlling perchlorate levels, as shown by in-well decreasing concentration trends and reductions over distance.

#### *3.1.1.2 Chlorinated Ethenes*

According to historical and the most current data, PCE, TCE, cis-1,2-DCE, VC, and 1,1-DCE are the only chlorinated ethenes detected above their respective MCLs. The chlorinated ethenes are discussed in this section.

*PCE:* PCE concentrations were observed exceeding the MCL (5 µg/L) in wells 50WW02 and 50WW05 during the February 2007 sampling event. In both wells, PCE concentrations decreased over the course of monitoring (**Figure 3-1** and **Figure 3-2**). In February 2007, PCE concentrations decrease from the upgradient well 50WW02 (9.3 µg/L) to downgradient well 50WW05 (5.1 µg/L) (**Table 3-2**), indicating that PCE is being attenuated along the groundwater flow direction. The analytical data suggests that PCE has been attenuated effectively over time and distance at LHAAP-50.

*TCE:* During the most recent sampling events, only 50WW02 and 50WW05 exhibited TCE concentrations above the MCL (5 µg/L) in February 2007 (**Table 3-2**). In monitoring well 50WW02, TCE peaked at 16,100 µg/L in October 2000, followed by a decrease to 5,420 µg/L in February 2007 (**Figure 3-1**). In 50WW05, TCE decreased from 3,130 to 1,460 µg/L between May 2005 and February 2007 (**Figure 3-2**). In February 2007, TCE concentration decreased from the upgradient well 50WW02 (5,420 µg/L) to downgradient well 50WW05 (1,460 µg/L) (**Table 3-2**), indicating that TCE has attenuated along the groundwater flow direction. Based on the analytical results, TCE has been attenuated over time and distance. The existence of large quantities of perchlorate may inhibit the reductive dechlorination of TCE. In 50WW02, TCE concentrations fluctuated prior to October 2000 while perchlorate was observed at relatively high concentrations. The continuous reduction of perchlorate at 50WW02 has also allowed a steady decrease in TCE concentration since October 2000.

*cis-1,2-DCE:* As TCE is degraded via reductive dechlorination, the next lower chlorinated daughter product is primarily cis-1,2-DCE. During the February 2007 sampling event, cis-1,2-DCE exceeded its MCL (70 μg/L) in 50WW02 at a level of 855 μg/L. At 50WW02 an initial increase followed by a decreasing trend of cis-1,2-DCE has been observed as TCE is reduced over time (**Figure 3-1**). Also, a decrease in cis-1,2-DCE concentrations was seen between the upgradient well 50WW05 (855 μg/L) and the downgradient well at 50WW02 (48.2 μg/L) (**Table 3-2**). This data suggest that cis-1,2-DCE has been attenuated along the groundwater flow direction. Furthermore, the ratio of cis- and trans-1,2-DCE isomers was above 10 in 50WW05 and 50WW02 (**Table 3-2**), indicating DCE isomers were historically produced via biological reductive dechlorination.

*1,1-DCE:* The abiotic hydrolysis of 1,1,1-TCA produces 1,1-DCE which can undergo reductive dechlorination to VC and ethene. During the sampling event in February 2007, 50WW05 is the only well that exhibited 1,1-DCE concentrations above its MCL (7 μg/L). A decrease in 1,1-DCE levels from 21.6 to 12.6 μg/L was observed between May 2005 and February 2007 in 50WW05 (**Table 3-2**). Historical 1,1-DCE concentrations were above MCL at 50WW02, however levels decreased from 50 μg/L in September 1998 to 6.5 μg/L in February 2007.

*VC:* As the parent compounds TCE or TCA are reduced, VC is the final chlorinated daughter product during reductive dechlorination. In February 2007, VC exceeded its MCL (2 μg/L) in 50WW02 at 15.2 μg/L and in 50WW05 at 2.5 μg/L. Decreasing concentrations of VC over time have been observed in both monitoring wells (**Table 3-2**).

The detection of cis-1,2-DCE and VC are direct evidence that reductive dechlorination has occurred historically. As the result of reductive dechlorination, a decrease in the parent compound TCE should accompany an increase in daughter compounds cis-1,2-DCE and VC. However, in the wells impacted with chlorinated ethenes, the decrease of TCE, cis-1,2-DCE and VC has occurred simultaneously between 2000 and 2007. Therefore, the decrease of chlorinated ethenes may be due to attenuation processes including adsorption, dispersion, dilution, diffusion, volatilization, sorption, and cometabolic degradation.

#### *3.1.1.3 Chlorinated Ethane*

TCA can also undergo reductive dechlorination, resulting in the formation of DCA isomers, followed by chloroethane, and then the harmless product ethane. 1,2-DCA is the only chlorinated ethane exceeding its MCL (5 μg/L) at monitoring wells 50WW02 (18.8 μg/L) and 50WW05 (13.5 μg/L) during the February 2007 sampling event (**Table 3-2**). 1,2-DCA exhibited decreasing concentrations in 50WW02 (**Figure 3-1**) and 50WW05 (**Figure 3-2**). Lower levels of 1,2-DCA were observed in the downgradient well 50WW05 than in the upgradient well 50WW02, suggesting that attenuation has occurred along the groundwater flow direction.

The historical and current concentrations of the COCs indicate a clear decreasing trend (**Table 3-2**). The concentration decreases along the groundwater flow direction also suggests attenuation with distance away from the contamination source. These results show that all COCs are being attenuated over time and over distance.

### *3.1.2 Geochemical Indicators*

Groundwater field parameters, including DO, ORP, pH, temperature, and conductivity, were analyzed in the field during the 2007 sampling event. In addition, laboratory analyses for the following natural attenuation parameters were performed during the same sampling event: gases (methane, ethane, and ethene), anions (sulfate, nitrate, nitrite, and chloride), and total organic carbon (TOC). The results of the 2007 sampling event are presented in **Table 3-2**.

*Dissolved Oxygen and Oxidative-Reduction Potential:* Oxygen is the preferred terminal electron acceptor during aerobic microbial respiration. DO concentrations below 0.5 milligrams per liter (mg/L) are the most favorable condition for anaerobic reductive dechlorination, and anaerobic microbial activity would not tolerate DO levels above 5 mg/L (USEPA, 1998). DO concentrations ranged from 1.53 mg/L in 50WW05 to 6.25 mg/L in 50WW02 during the February 2007 sampling event (**Table 3-2**). ORP often correlates with the dominant type of microbial activity. The more negative the measurement, the more likely that sulfate-reducing or methanogenic conditions can exist in the subsurface and typically require ORP values below 50 millivolts (mV) (USEPA, 1998) . The ORP measurements in the shallow groundwater zone at LHAAP-50 ranged from 200 mV in 50WW03 to 306.4 mV in 50WW05 during the February 2007 sampling event (**Table 3-2**). The results of DO and ORP measurements suggest oxidative conditions exist, which is unfavorable for reductive dechlorination of perchlorate and chlorinated solvents.

*Nitrate:* Following oxygen, microorganisms preferentially use nitrate as a terminal electron acceptor. Concentrations of nitrate less than 1 mg/L are not expected to interfere with anaerobic reductive dechlorination (USEPA, 1998). Active nitrate-reducing conditions are often indicated by a depletion of nitrate in groundwater and a possible increase in nitrite, which is favorable for perchlorate reduction. Nitrate and nitrite concentrations were both below detection limits in February 2007 (**Table 3-2**), which suggest that nitrate levels would not interfere with reductive dechlorination at LHAAP-50.

*Ferrous Iron:* Once nitrate has been depleted, microorganisms use ferric iron as the next terminal electron acceptor. As a measurement of reduced ferric iron, an accumulation of ferrous iron may be observed. Ferrous iron levels above 1 mg/L suggest that groundwater conditions are favorable for reductive dechlorination (USEPA, 1998). During the February 2007 sampling event, ferrous iron ranged from non-detect in 50WW05 to 0.4 mg/L in 50WW05 (**Table 3-2**). These data suggest that iron reduction is not currently occurring at this site.

*Sulfate:* Reductive dechlorination of highly chlorinated compounds such as TCE occurs under sulfate-reducing conditions, but the reductive dechlorination of cis-1,2-DCE and VC is unlikely to occur under the same conditions. Sulfate-reducing conditions are favored when other electron acceptors such as oxygen, nitrate, and bioavailable ferric iron are depleted, leaving sulfate as the primary acceptor. Active sulfate reduction is often indicated by a depletion of sulfate in groundwater and a possible increase in sulfide. Concentrations of sulfate greater than 20 mg/L may cause competitive exclusion of reductive dechlorination (USEPA, 1998). Sulfate concentrations at LHAAP-50 ranged from 198 mg/L in 50WW02 to 403 mg/L in 50WW03; meanwhile sulfite was below the detection limit (0.2 mg/L) in all monitoring wells. This suggests that most of the site groundwater is not under sulfate-reducing conditions at this time.

*Methane:* Methanogenesis occurs in highly reducing conditions and an accumulation of methane above 0.5 mg/L are considered to represent methanogenic conditions (USEPA, 1998). During the February 2007 sampling event, elevated methane concentrations above 0.5 mg/L were not observed in the shallow groundwater zone (**Table 3-2**). However methane was detected in all monitoring wells sampled in February 2007, which suggests methanogenic microbes may be present in the groundwater.

*Ethane and Ethene:* Ethane and ethene are the end products of reductive dechlorination. The lack of detection of ethane and ethene suggests that complete dechlorination is not occurring in the shallow groundwater zone at this time (**Table 3-2**).

*Total Organic Carbon:* Regardless of the electron acceptor being used, organic carbon is a required source of energy to sustain microbial activity. TOC concentrations greater than 20 mg/L are considered adequate to support microbial activity (USEPA, 1998). In wells sampled in February 2007, TOC ranged from 2.0 mg/L at 50WW05 to 3.0 mg/L at 50WW02 in the shallow groundwater zone (**Table 3-2**). Even though TOC levels are not in the optimal range, the levels observed are adequate to stimulate microbial activity in the shallow groundwater zone. Reductive dechlorination has historically occurred to produce chlorinated ethene daughter products before TOC was consumed to the current levels.

*pH:* The optimal pH range for microbial activity is between 6 and 8 standard units but pH values between 5 and 9 are tolerated. The pH within the shallow groundwater zones ranged from 6.3 to 7.1 standard units during the February 2007 sampling event (**Table 3-2**). The pH values at LHAAP-50 are within the optimal range to support biodegradation.

The qualitative assessment of the geochemical indicators in the shallow groundwater zone at LHAAP-50 presents evidence that geochemical conditions are not optimal at this time for anaerobic reductive dechlorination of perchlorate and chlorinated ethenes.

### 3.1.3 Natural Attenuation Rate Estimation and Microbial Analysis

Natural attenuation rate estimations and microbial analysis provide evidence supporting lines of evidence for the shallow groundwater zone. These attenuation rate estimations incorporate all of the attenuation pathways, but cannot determine which pathway accounts for what portion of the attenuation.

#### 3.1.3.1 Natural Attenuation Rate and Cleanup Time Estimation

Decreasing concentrations of COCs were observed in the impacted monitoring wells 50WW02 and 50WW05. The time-dependent attenuation rates of COCs in 50WW02 were estimated, based on COC concentrations over time in the monitoring well, with the assumption of first-order degradation kinetics. The time-dependent attenuation rates in 50WW05 were not estimated, due to the lack of the minimum number of results (3) required to determine a trend. The in–well attenuation rates for perchlorate, PCE, TCE, cis-1,2-DCE, 1,2-DCA, and VC were calculated for the shallow groundwater zone and the results are summarized in **Table 3-3**. Although the attenuation rates at 50WW05 cannot be calculated due to limited data, the decreasing concentrations of contaminants suggest natural attenuation is occurring.

Attenuation rates and cleanup times for the COCs are as follows:

***Perchlorate:*** **Figure 3-3** is a graphical presentation of natural attenuation rate calculation for perchlorate in well 50WW02. The attenuation rate constant for perchlorate is 0.00100 day$^{-1}$, and the estimated time to reach the GW-Ind is 5.5 years (**Table 3-3**).

***PCE:*** **Figure 3-4** is graphical presentation of natural attenuation rate constant calculation for PCE in 50WW02. The estimated attenuation rate was 0.00046 day$^{-1}$, and the estimated clean-up time is 3.7 years (**Table 3-3**).

***TCE:*** **Figure 3-5** is graphical presentation of natural attenuation rate calculation for TCE in well 50WW02. The attenuation rate for TCE is 0.0004 day$^{-1}$, corresponding to a cleanup time of 47.7 years (**Table 3-3**).

***Cis-1,2-DCE:*** **Figure 3-6** is a graphical presentation of natural attenuation rate calculation for cis-1,2-DCE in well 50WW02, which exhibited an attenuation rate constant at 0.00053 day$^{-1}$ and a cleanup time of 12.9 years (**Table 3-3**).

***VC:*** **Figure 3-7** is a graphical presentation of natural attenuation rate calculation for VC. Based on the attenuation rate of 0.00070 day$^{-1}$, the estimated cleanup time for VC is 7.9 years.

***1,2-DCA:*** **Figure 3-8** is a graphical presentation of the time-dependent natural attenuation rate constant calculation for 1,2-DCA in 50WW02. The estimated attenuation rate was 0.00055 day$^{-1}$, and the estimated clean-up time is 6.6 years (**Table 3-3**).

Based on the estimated natural attenuation rates for TCE, the cleanup via natural attenuation in the shallow groundwater zone will be less than 50 years. However, the estimation is based on current data, and future monitoring results should verify and update the attenuation rates and corresponding cleanup times in both monitoring wells impacted with COCs.

#### *3.1.3.2 Microbial Analysis*

An important indicator of reductive dechlorination is the presence of DHC, the only known species capable of complete dechlorination of TCE and its daughter products to innocuous ethene via reductive dechlorination. During the most recent sampling event in February 2007, DHC cells were observed in the two wells impacted with chlorinated solvents at levels of 12 cells per milliliter (cells/mL) in 50WW02 and 36 cells/mL in 50WW05 (**Table 3-2**). The presence of the dechlorinating microorganisms suggests that microbes able to process complete reductive dechlorination are present at LHAAP-50.

## *3.2 Intermediate Groundwater Zone*

The intermediate groundwater zone extends from 45 to 60 feet, and is separated from the shallow and deep groundwater zones by clay layers. During the February 2007 sampling event, natural attenuation parameters were sampled from 50WW06 which is located within the intermediate groundwater zone. TCE was detected at 15 µg/L in August 2004, followed by a decrease to 2 µg/L, below the MCL (5 µg/L), in February 2007 (**Table 3-4**). Perchlorate was detected at levels below the GW-Ind (72 µg/L) during sampling events at LHAAP-50 (**Table 3-4**). Thus, natural attenuation was not evaluated for the intermediate groundwater zone.

# 4.0 Summary of Results and Conclusions

Historical perchlorate and VOC data and geochemical indicators for the groundwater at LHAAP-50 were evaluated to determine if MNA can be used as a feasible remedy for chlorinated solvents and perchlorate present in the shallow groundwater. Preliminary screening of multiple wells at LHAAP-50 indicated limited evidence for anaerobic biodegradation, and a more detailed evaluation was made. A tiered approach using three lines of evidence was used to examine the occurrence of natural attenuation in site groundwater. The first line of evidence evaluated reductions in COC concentrations over time and with distance, the second line of evidence evaluated geochemical indicators, while the third line of evidence entailed estimation of natural attenuation rate and microbial analysis. The results of the tiered evaluation and the conclusions are summarized below.

The COCs exceeding MCLs or GW-Inds in the shallow groundwater zone at LHAAP-50 are PCE, TCE, cis-1,2-DCE, 1,1-DCE, 1,2-DCA, VC, and perchlorate. Wells designated as intermediate or deep are not affected.

***First Line of Evidence:*** Historical analytical data indicate the occurrence of perchlorate and chlorinated solvent biodegradation at this site. The decreasing in-well concentration trends of all COCs over time were observed in monitoring wells at LHAAP-50. Comparing the analytical result from two upgradient and downgradient wells also suggests decreasing trends of most COCs with distance away from the central location of contamination. These results show that COCs have been attenuated over time and over distance.

***Second Line of Evidence:*** The qualitative assessment of the geochemical indicators in the shallow groundwater zones at LHAAP-50 present evidence that geochemical conditions are not optimal for the degradation of perchlorate and chlorinated solvents via reductive dechlorination. In the shallow groundwater zone, the elevated DO and ORP levels suggest aerobic and oxidative conditions exist. The TOC concentrations observed at LHAAP-50 shallow groundwater zone are not at optimal levels to support microbial activity, but are adequate for reductive chlorination to occur.

***Third Line of Evidence:*** The time-dependent in-well natural attenuation rates were calculated for perchlorate, PCE, TCE, cis-1,2-DCE, 1,2-DCA, and VC. TCE attenuation is the limiting step to reach site wide cleanup. Based on in-well time dependent attenuation rates, the estimated cleanup time is 47.7 years for TCE to achieve the MCL in monitoring well 50WW02. The presence of the dechlorinating microorganisms at the impacted areas is further evidence that site conditions are capable of complete dechlorination.

***Conclusion:*** The natural attenuation evaluation demonstrates that natural attenuation is occurring in at LHAAP-50. COCs are attenuated via mechanisms including cometabolic degradation, dispersion, dilution, volatilization, and sorption. Although the geochemical conditions are not optimal for reductive dechlorination, the COC concentrations are decreasing and moderate cleanup times were estimated.

The natural attenuation evaluation demonstrates that MNA is a feasible alternative as the sole remedy for the COCs in the shallow groundwater at LHAAP-50.

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# *Tables*

# Table 3-1
# Preliminary Screening Worksheet for Reductive Dechlorination
# LHAAP-50

**Analytical Parameters and Weighting for Preliminary Screening for Anaerobic Biodegradation Processes (EPA/600/R-98/128)**

| Analysis | Concentration in Most Contaminated Zone | Interpretation | Value | 50WW02 Points Assigned | 50WW03 Points Assigned | 50WW05 Points Assigned | 50WW06 Points Assigned |
|---|---|---|---|---|---|---|---|
| Oxygen* | <0.5 mg/L | Tolerated, suppresses the reductive pathway at higher concentrations | 3 | 0 | 0 | 0 | 0 |
| Oxygen* | >5 mg/L | Not tolerated; however, VC may be oxidized aerobically | -3 | -3 | 0 | 0 | 0 |
| Nitrate* | <1 mg/L | At higher concentrations may compete with reductive pathway | 2 | 2 | 2 | 2 | 2 |
| Iron II* | >1 mg/L | Reductive pathway possible; VC may be oxidized under Fe(III)-reducing conditions | 3 | 0 | 0 | 0 | 0 |
| Sulfate* | <20 mg/L | At higher concentrations may compete with reductive pathway | 2 | 0 | 0 | 0 | 0 |
| Sulfide* | >1 mg/L | Reductive pathway possible | 3 | 0 | 0 | 0 | 0 |
| Methane* | <0.5 mg/L<br>>0.5 mg/L | VC oxidizes<br>Ultimate reductive daughter product, VC Accumulates | 0<br>3 | 0 | 0 | 0 | 0 |
| Oxidation Reduction Potential* (ORP) against Ag/AgCl electrode | <50 millivolts (mV)<br><-100mV | Reductive pathway possible<br>Reductive pathway likely | 1<br>2 | 0 | 0 | 0 | 1 |
| pH* | 5 < pH < 9<br>5 > pH >9 | Optimal range for reductive pathway<br>Outside optimal range for reductive pathway | 0<br>-2 | 0 | 0 | 0 | 0 |
| TOC | > 20 mg/L | Carbon and energy source; drives dechlorination; can be natural or anthropogenic | 2 | 0 | 0 | 0 | 0 |
| Temperature* | > 20°C | At T >20°C biochemical process is accelerated | 1 | 1 | 1 | 1 | 1 |
| Carbon Dioxide | >2x background | Ultimate oxidative daughter product | 1 | 0 | 1 | 0 | 0 |
| Alkalinity | >2x background | Results from interaction between CO2 and aquifer minerals | 1 | 0 | 0 | 1 | 0 |
| Chloride* | >2x background | Daughter product of organic chlorine | 2 | 0 | 0 | 0 | 0 |
| Hydrogen | >1 nM | Reductive pathway possible, VC may accumulate | 3 | NT | NT | NT | NT |
| Hydrogen | <1 nM | VC oxidized | 0 | NT | NT | NT | NT |
| Volatile Fatty Acids | > 0.1 mg/L | Intermediates resulting from biodegradation of more complex compounds; carbon and energy source | 2 | NT | NT | NT | NT |
| BTEX* | > 0.1 mg/L | Carbon and energy source; drives dechlorination | 2 | 0 | 0 | 0 | 0 |
| Tetrachloroethene | | Material released | 0 | 0 | 0 | 0 | 0 |
| Trichloroethene* | | Material released<br>Daughter product of PCE | 0<br>2a | 0 | 0 | 0 | 0 |
| DCE* | | Material released<br>Daughter product of TCE<br>If cis is > 80% of total DCE it is likely a daughter product<br>1,1-DCE can be chemical reaction product of TCA | 0<br>2a | 2 | 0 | 2 | 2 |
| VC* | | Material released<br>Daughter product of DCE | 0<br>2a | 2 | 0 | 2 | 0 |
| 1,1,1-Trichloroethane* | | Material released | 0 | 0 | 0 | 0 | 0 |
| DCA | | Daughter product of TCA under reducing conditions | 2 | 2 | 0 | 2 | 0 |
| Carbon Tetrachloride | | Material released | 0 | 0 | 0 | 0 | 0 |
| Chloroethane* | | Daughter product of DCA or VC under reducing conditions | 2 | 0 | 0 | 0 | 0 |
| Ethene/Ethane | >0.01mg/L<br>>0.1 mg/L | Daughter product of VC/ethene | 2<br>3 | 0 | 0 | 0 | 0 |
| Chloroform | | Material released<br>Daughter product of Carbon Tetrachloride | 0<br>2 | 2 | 0 | 2 | 0 |
| Dichloromethane (Methylene Chloride) | | Material released<br>Daughter product of Chloroform | 0<br>2 | 2 | 0 | 0 | 0 |
| | | | Totals | 10 | 4 | 12 | 6 |

* - Required Analysis
a - points awarded only if it can be shown that the compound is a daughter product (not a source constituent)
NT - not tested

## Table 3-2
## Summary of Shallow Groundwater Zone Analytical Results
## LHAAP-50

| LOCATION_CODE | | 50WW01 | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| SAMPLE_DATE | | 30-Sep-98 | | | 31-Aug-04 | | | 11-May-05 | | |
| SAMPLE_PURPOSE | | REG | | | REG | | | REG | | |
| Parameter | Units | Result | Qual | ValQual | Result | Qual | ValQual | Result | Qual | ValQual |
| **VOLATILES** | | | | | | | | | | |
| Tetrachloroethene | ug/L | 1 | < | U | 5 | U | U | 0.25 | U | U |
| Trichloroethene | ug/L | 1 | < | U | 5 | U | UJ | 1.03 | | |
| cis-1,2-Dichloroethene | ug/L | 1 | < | U | 5 | U | U | 0.25 | U | U |
| trans-1,2-Dichloroethene | ug/L | 1 | < | U | 5 | U | U | 0.25 | U | U |
| Vinyl chloride | ug/L | 1 | < | U | 5 | U | U | 0.25 | U | U |
| 1,1-Dichloroethene | ug/L | 1 | < | U | 5 | U | U | 0.5 | U | U |
| 1,2-Dichloroethane | ug/L | 1 | < | U | 5 | U | U | 0.125 | U | U |
| Chloroform | ug/L | 1 | < | U | 5 | U | U | 0.125 | U | U |
| **GASES** | | | | | | | | | | |
| Ethane | ug/L | | | | | | | | | |
| Ethylene | ug/L | | | | | | | | | |
| Methane | ug/L | | | | | | | | | |
| **FIELD TESTS** | | | | | | | | | | |
| Dissolved Oxygen | mg/L | | | | | | | | | |
| Ferrous iron | mg/L | | | | | | | | | |
| ORP | mV | | | | | | | | | |
| pH | STD UNIT | | | | | | | | | |
| Specific Conductivity | uS/cm | | | | | | | | | |
| Temperature | Deg C | | | | | | | | | |
| Turbidity | NTU | | | | | | | | | |
| **GEN CHEMISTRY** | | | | | | | | | | |
| Carbon Dioxide | mg/L | | | | | | | | | |
| Chloride | mg/L | | | | | | | | | |
| Nitrate | mg/L | | | | | | | | | |
| Nitrate / Nitrite | mg/L | | | | | | | | | |
| Nitrite | mg/L | | | | | | | | | |
| Perchlorate | ug/L | | | | 1 | U | U | 0.5 | U | U |
| pH | STD UNIT | | | | | | | | | |
| Specific Conductivity | uS/cm | | | | | | | | | |
| Sulfate | mg/L | | | | | | | | | |
| Sulfide | mg/L | | | | | | | | | |
| Total Alkalinity | mg/L | | | | | | | | | |
| Total Organic Carbon | mg/L | | | | | | | | | |
| **DHC** | | | | | | | | | | |
| Dehalococcoides | cells/ml | | | | | | | | | |
| **DIOXINS_FURANS** | | | | | | | | | | |
| Octachlorodibenzo-p-dioxin | pg/L | 275.671 | | | | | | | | |

## Table 3-2
## Summary of Shallow Groundwater Zone Analytical Results
## LHAAP-50

| | LOCATION_CODE | 50WW02 | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | SAMPLE_DATE | 30-Sep-98 | | | 22-Oct-98 | | | 24-May-00 | | | 3-Oct-00 | | | 30-Aug-04 | | | 11-May-05 | | | 23-Feb-07 | | |
| | SAMPLE_PURPOSE | REG | | | REG | | | REG | | | REG | | | REG | | | REG | | | REG | | |
| Parameter | Units | Result | Qual | ValQual | Result | Qual | ValQual | Result | Qual | ValQual | Result | Qual | ValQual | Result | Qual | ValQual | Result | Qual | ValQual | Result | Qual | ValQual |
| **VOLATILES** | | | | | | | | | | | | | | | | | | | | | | |
| Tetrachloroethene | ug/L | 35 | | | | | | 100 | < | U | 18 | < | U | 28 | | | 6.59 | | | 9.3 | | |
| Trichloroethene | ug/L | 2900 | | | | | | 11000 | | | 16100 | | | 9200 | D | | 4810 | | | 5420 | | |
| cis-1,2-Dichloroethene | ug/L | 2100 | | | | | | 2300 | | J | 4060 | | | 1800 | D | | 954 | | | 855 | | |
| trans-1,2-Dichloroethene | ug/L | 15 | | | | | | 100 | < | U | 7.2 | < | U | 8 | | | 2.75 | | | 2.6 | | |
| Vinyl chloride | ug/L | 100 | | | | | | 100 | < | U | 14 | < | U | 36 | | | 7.95 | | | 15.2 | | |
| 1,1-Dichloroethene | ug/L | 50 | | | | | | 100 | < | U | 7.6 | < | U | 20 | | | 4.74 | | | 6.5 | | |
| 1,2-Dichloroethane | ug/L | 98 | | | | | | 100 | < | U | 79 | | | 58 | | | 20.2 | | | 18.8 | | |
| Chloroform | ug/L | 25 | | | | | | 100 | < | U | 8.8 | < | U | 13 | | | 4.35 | | | 4.2 | | |
| **GASES** | | | | | | | | | | | | | | | | | | | | | | |
| Ethane | ug/L | | | | | | | | | | | | | | | | | | | 0.6 | U | U |
| Ethylene | ug/L | | | | | | | | | | | | | | | | | | | 0.8 | U | U |
| Methane | ug/L | | | | | | | | | | | | | | | | | | | 1.87 | | |
| **FIELD TESTS** | | | | | | | | | | | | | | | | | | | | | | |
| Dissolved Oxygen | mg/L | | | | | | | | | | | | | 2.46 | | | 8.64 | | | 6.25 | | |
| Ferrous iron | mg/L | | | | | | | | | | | | | | | | | | | 0 | | |
| ORP | mV | | | | | | | | | | | | | 310.1 | | | 1764 | | | 306.4 | | |
| pH | STD UNIT | | | | | | | | | | | | | 6.25 | | | 6.54 | | | 6.3 | | |
| Specific Conductivity | uS/cm | | | | | | | | | | | | | 1953 | | | 1720 | | | 1622 | | |
| Temperature | Deg C | | | | | | | | | | | | | 25.91 | | | 21.19 | | | 19.63 | | |
| Turbidity | NTU | | | | | | | | | | | | | 4.9 | | | | | | 0 | | |
| **GEN CHEMISTRY** | | | | | | | | | | | | | | | | | | | | | | |
| Carbon Dioxide | mg/L | | | | | | | | | | | | | | | | | | | 140 | | |
| Chloride | mg/L | | | | | | | | | | | | | | | | | | | 219 | | |
| Nitrate | mg/L | | | | | | | | | | | | | | | | | | | 0.005 | U | U |
| Nitrate / Nitrite | mg/L | | | | | | | | | | | | | | | | | | | 0.02 | B | J |
| Nitrite | mg/L | | | | | | | | | | | | | | | | | | | 0.003 | U | U |
| Perchlorate | ug/L | | | | 18000 | | | 3210 | | J | 9950 | | | 2500 | | | 1590 | | | 532 | | |
| pH | STD UNIT | | | | | | | | | | | | | | | | | | | 6.3 | | |
| Specific Conductivity | uS/cm | | | | | | | | | | | | | | | | | | | 1400 | | |
| Sulfate | mg/L | | | | | | | | | | | | | | | | | | | 198 | | |
| Sulfide | mg/L | | | | | | | | | | | | | | | | | | | 0.2 | UB | U |
| Total Alkalinity | mg/L | | | | | | | | | | | | | | | | | | | 138 | | |
| Total Organic Carbon | mg/L | | | | | | | | | | | | | | | | | | | 3 | | |
| **DHC** | | | | | | | | | | | | | | | | | | | | | | |
| Dehalococcoides | cells/ml | | | | | | | | | | | | | | | | | | | 12 | | |
| **DIOXINS_FURANS** | | | | | | | | | | | | | | | | | | | | | | |
| Octachlorodibenzo-p-dioxin | pg/L | | | | | | | | | | | | | | | | | | | | | |

# Table 3-2
## Summary of Shallow Groundwater Zone Analytical Results
## LHAAP-50

| LOCATION_CODE | | 50WW03 | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SAMPLE_DATE | | 30-Sep-98 | | | 30-Aug-04 | | | 11-May-05 | | | 24-Feb-07 | | |
| SAMPLE_PURPOSE | | REG | | | REG | | | REG | | | REG | | |
| Parameter | Units | Result | Qual | ValQual | Result | Qual | ValQual | Result | Qual | ValQual | Result | Qual | ValQual |
| **VOLATILES** | | | | | | | | | | | | | |
| Tetrachloroethene | ug/L | 1 | < | U | 5 | U | U | 0.25 | U | U | 0.74 | U | U |
| Trichloroethene | ug/L | 0.57 | | | 8 | | | 0.25 | U | U | 0.63 | U | U |
| cis-1,2-Dichloroethene | ug/L | 1 | < | U | 5 | U | U | 0.25 | U | U | 0.83 | U | U |
| trans-1,2-Dichloroethene | ug/L | 1 | < | U | 5 | U | U | 0.25 | U | U | 0.75 | U | U |
| Vinyl chloride | ug/L | 1 | < | U | 5 | U | U | 0.25 | U | U | 0.32 | U | U |
| 1,1-Dichloroethene | ug/L | 1 | < | U | 5 | U | U | 0.5 | U | U | 0.68 | U | U |
| 1,2-Dichloroethane | ug/L | 1 | < | U | 5 | U | UJ | 0.125 | U | U | 0.53 | U | U |
| Chloroform | ug/L | 1 | < | U | 5 | U | U | 0.125 | U | U | 0.66 | U | U |
| **GASES** | | | | | | | | | | | | | |
| Ethane | ug/L | | | | | | | | | | 0.6 | U | U |
| Ethylene | ug/L | | | | | | | | | | 0.8 | U | U |
| Methane | ug/L | | | | | | | | | | 0.56 | | |
| **FIELD TESTS** | | | | | | | | | | | | | |
| Dissolved Oxygen | mg/L | | | | | | | | | | 3.08 | | |
| Ferrous iron | mg/L | | | | | | | | | | 0.06 | | |
| ORP | mV | | | | | | | | | | 200 | | |
| pH | STD UNIT | | | | | | | | | | 7.05 | | |
| Specific Conductivity | uS/cm | | | | | | | | | | 6867 | | |
| Temperature | Deg C | | | | | | | | | | 18.75 | | |
| Turbidity | NTU | | | | | | | | | | 4.5 | | |
| **GEN CHEMISTRY** | | | | | | | | | | | | | |
| Carbon Dioxide | mg/L | | | | | | | | | | 416 | | |
| Chloride | mg/L | | | | | | | | | | 944 | | |
| Nitrate | mg/L | | | | | | | | | | 0.005 | U | U |
| Nitrate / Nitrite | mg/L | | | | | | | | | | 0.01 | B | J |
| Nitrite | mg/L | | | | | | | | | | 0.003 | U | UJL |
| Perchlorate | ug/L | | | | 1 | U | U | 2 | U | U | 4 | U | U |
| pH | STD UNIT | | | | | | | | | | 7.1 | | |
| Specific Conductivity | uS/cm | | | | | | | | | | 3340 | | |
| Sulfate | mg/L | | | | | | | | | | 403 | | |
| Sulfide | mg/L | | | | | | | | | | 0.2 | UB | U |
| Total Alkalinity | mg/L | | | | | | | | | | 417 | | |
| Total Organic Carbon | mg/L | | | | | | | | | | 2 | | |
| **DHC** | | | | | | | | | | | | | |
| Dehalococcoides | cells/ml | | | | | | | | | | 10 | U | U |
| **DIOXINS_FURANS** | | | | | | | | | | | | | |
| Octachlorodibenzo-p-dioxin | pg/L | | | | | | | | | | | | |

| LOCATION_CODE | | 50WW04 | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| SAMPLE_DATE | | 30-Sep-98 | | | 31-Aug-04 | | | 10-May-05 | | |
| SAMPLE_PURPOSE | | REG | | | REG | | | REG | | |
| Parameter | Units | Result | Qual | ValQual | Result | Qual | ValQual | Result | Qual | ValQual |
| **VOLATILES** | | | | | | | | | | |
| Tetrachloroethene | ug/L | 1 | < | U | 5 | U | U | 0.25 | U | U |
| Trichloroethene | ug/L | 9.4 | | | 2 | J | J | 0.25 | U | U |
| cis-1,2-Dichloroethene | ug/L | 0.64 | | J | 5 | U | U | 0.25 | U | U |
| trans-1,2-Dichloroethene | ug/L | 1 | < | U | 5 | U | U | 0.25 | U | U |
| Vinyl chloride | ug/L | 1 | < | U | 5 | U | U | 0.25 | U | U |
| 1,1-Dichloroethene | ug/L | 1 | < | U | 5 | U | U | 0.5 | U | U |
| 1,2-Dichloroethane | ug/L | 1 | < | U | 5 | U | UJ | 0.25 | U | U |
| Chloroform | ug/L | 0.63 | | J | 5 | U | U | 0.125 | U | U |
| **GASES** | | | | | | | | | | |
| Ethane | ug/L | | | | | | | | | |
| Ethylene | ug/L | | | | | | | | | |
| Methane | ug/L | | | | | | | | | |
| **FIELD TESTS** | | | | | | | | | | |
| Dissolved Oxygen | mg/L | | | | | | | 6.67 | | |
| Ferrous iron | mg/L | | | | | | | | | |
| ORP | mV | | | | | | | 118.2 | | |
| pH | STD UNIT | | | | | | | 6.6 | | |
| Specific Conductivity | uS/cm | | | | | | | 5179 | | |
| Temperature | Deg C | | | | | | | 22.87 | | |
| Turbidity | NTU | | | | | | | 15.3 | | |
| **GEN CHEMISTRY** | | | | | | | | | | |
| Carbon Dioxide | mg/L | | | | | | | | | |
| Chloride | mg/L | | | | | | | | | |
| Nitrate | mg/L | | | | | | | | | |
| Nitrate / Nitrite | mg/L | | | | | | | | | |
| Nitrite | mg/L | | | | | | | | | |
| Perchlorate | ug/L | | | | 1 | U | U | 2.5 | U | U |
| pH | STD UNIT | | | | | | | | | |
| Specific Conductivity | uS/cm | | | | | | | | | |
| Sulfate | mg/L | | | | | | | | | |
| Sulfide | mg/L | | | | | | | | | |
| Total Alkalinity | mg/L | | | | | | | | | |
| Total Organic Carbon | mg/L | | | | | | | | | |
| **DHC** | | | | | | | | | | |
| Dehalococcoides | cells/ml | | | | | | | | | |
| **DIOXINS_FURANS** | | | | | | | | | | |
| Octachlorodibenzo-p-dioxin | pg/L | | | | | | | | | |

**Table 3-2**
**Summary of Shallow Groundwater Zone Analytical Results**
**LHAAP-50**

| LOCATION_CODE | | **50WW05** | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| SAMPLE_DATE | | 21-Sep-02 | | | 11-May-05 | | | 23-Feb-07 | | |
| SAMPLE_PURPOSE | | REG | | | REG | | | REG | | |
| Parameter | Units | Result | Qual | ValQual | Result | Qual | ValQual | Result | Qual | ValQual |
| **VOLATILES** | | | | | | | | | | |
| Tetrachloroethene | ug/L | | | | 6.76 | | | 5.1 | | |
| Trichloroethene | ug/L | | | | 3130 | | | 1460 | | |
| cis-1,2-Dichloroethene | ug/L | | | | 66.3 | | | 48.2 | | |
| trans-1,2-Dichloroethene | ug/L | | | | 1.76 | | | 0.75 | U | U |
| Vinyl chloride | ug/L | | | | 3.69 | | | 2.5 | | |
| 1,1-Dichloroethene | ug/L | | | | 21.6 | | | 12.9 | | |
| 1,2-Dichloroethane | ug/L | | | | 24.1 | | | 13.5 | | |
| Chloroform | ug/L | | | | 0.279 | J | J | 0.66 | U | U |
| **GASES** | | | | | | | | | | |
| Ethane | ug/L | | | | | | | 0.6 | U | U |
| Ethylene | ug/L | | | | | | | 0.8 | U | U |
| Methane | ug/L | | | | | | | 2.93 | | |
| **FIELD TESTS** | | | | | | | | | | |
| Dissolved Oxygen | mg/L | | | | 4.04 | | | 1.53 | | |
| Ferrous iron | mg/L | | | | | | | 0.4 | | |
| ORP | mV | | | | 161.3 | | | 62.1 | | |
| pH | STD UNIT | | | | 6.78 | | | 7.1 | | |
| Specific Conductivity | uS/cm | | | | 3378 | | | 2.411 | | |
| Temperature | Deg C | | | | 19.01 | | | 20.55 | | |
| Turbidity | NTU | | | | | | | 0 | | |
| **GEN CHEMISTRY** | | | | | | | | | | |
| Carbon Dioxide | mg/L | | | | | | | 73 | | |
| Chloride | mg/L | | | | | | | 253 | | |
| Nitrate | mg/L | | | | | | | 0.005 | U | U |
| Nitrate / Nitrite | mg/L | | | | | | | 0.005 | U | U |
| Nitrite | mg/L | | | | | | | 0.003 | U | U |
| Perchlorate | ug/L | 5850 | | | 719 | | | 27.8 | | |
| pH | STD UNIT | | | | | | | 7.1 | | |
| Specific Conductivity | uS/cm | | | | | | | 1800 | | |
| Sulfate | mg/L | | | | | | | 286 | | |
| Sulfide | mg/L | | | | | | | 0.2 | UB | U |
| Total Alkalinity | mg/L | | | | | | | 457 | | |
| Total Organic Carbon | mg/L | | | | | | | 2 | | |
| **DHC** | | | | | | | | | | |
| Dehalococcoides | cells/ml | | | | | | | 36 | | |
| **DIOXINS_FURANS** | | | | | | | | | | |
| Octachlorodibenzo-p-dioxin | pg/L | | | | | | | | | |

## Table 3-2
## Summary of Shallow Groundwater Zone Analytical Results
## LHAAP-50

| LOCATION_CODE | | 50WW05 | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| SAMPLE_DATE | | 21-Sep-02 | | | 11-May-05 | | | 23-Feb-07 | | |
| SAMPLE_PURPOSE | | REG | | | REG | | | REG | | |
| Parameter | Units | Result | Qual | ValQual | Result | Qual | ValQual | Result | Qual | ValQual |
| **VOLATILES** | | | | | | | | | | |
| Tetrachloroethene | ug/L | | | | 6.76 | | | 5.1 | | |
| Trichloroethene | ug/L | | | | 3130 | | | 1460 | | |
| cis-1,2-Dichloroethene | ug/L | | | | 66.3 | | | 48.2 | | |
| trans-1,2-Dichloroethene | ug/L | | | | 1.76 | | | 0.75 | U | U |
| Vinyl chloride | ug/L | | | | 3.69 | | | 2.5 | | |
| 1,1-Dichloroethene | ug/L | | | | 21.6 | | | 12.9 | | |
| 1,2-Dichloroethane | ug/L | | | | 24.1 | | | 13.5 | | |
| Chloroform | ug/L | | | | 0.279 | J | J | 0.66 | U | U |
| **GASES** | | | | | | | | | | |
| Ethane | ug/L | | | | | | | 0.6 | U | U |
| Ethylene | ug/L | | | | | | | 0.8 | U | U |
| Methane | ug/L | | | | | | | 2.93 | | |
| **FIELD TESTS** | | | | | | | | | | |
| Dissolved Oxygen | mg/L | | | | 4.04 | | | 1.53 | | |
| Ferrous iron | mg/L | | | | | | | 0.4 | | |
| ORP | mV | | | | 161.3 | | | 62.1 | | |
| pH | STD UNIT | | | | 6.78 | | | 7.1 | | |
| Specific Conductivity | uS/cm | | | | 3378 | | | 2.411 | | |
| Temperature | Deg C | | | | 19.01 | | | 20.55 | | |
| Turbidity | NTU | | | | | | | 0 | | |
| **GEN CHEMISTRY** | | | | | | | | | | |
| Carbon Dioxide | mg/L | | | | | | | 73 | | |
| Chloride | mg/L | | | | | | | 253 | | |
| Nitrate | mg/L | | | | | | | 0.005 | U | U |
| Nitrate / Nitrite | mg/L | | | | | | | 0.005 | U | U |
| Nitrite | mg/L | | | | | | | 0.003 | U | U |
| Perchlorate | ug/L | 5850 | | | 719 | | | 27.8 | | |
| pH | STD UNIT | | | | | | | 7.1 | | |
| Specific Conductivity | uS/cm | | | | | | | 1800 | | |
| Sulfate | mg/L | | | | | | | 286 | | |
| Sulfide | mg/L | | | | | | | 0.2 | UB | U |
| Total Alkalinity | mg/L | | | | | | | 457 | | |
| Total Organic Carbon | mg/L | | | | | | | 2 | | |
| **DHC** | | | | | | | | | | |
| Dehalococcoides | cells/ml | | | | | | | 36 | | |
| **DIOXINS_FURANS** | | | | | | | | | | |
| Octachlorodibenzo-p-dioxin | pg/L | | | | | | | | | |

Qualifiers:

< - same as U

B - The concentration reported was detected in the associated method blank, trip blank, or equipmen blank within 5X/10X the blank concentration.

D - sample was diluted for analysis

J - The analyte was positively identified; the reported value is the estimated concentration of the constituent detected in the sample analyzed.

L - Result may be biased low. Details are provided in the validation report.

U - Not detected. The analyte was analyzed for, but not detected above the associated reporting limit.

Abbreviations:

cells/ml - cells per milliliter

Deg C - degress centigrade

ug/L - micrograms per liter

uS/cm - microsiemens per centimeter

mg/L - milligrams per liter

NTU - nephelometric turbidity unit

pg/L - picograms per liter

STD UNIT - standard unit

## Table 3-3
## Estimation of Cleanup Times Using Time-Dependent Attenuation Rates

| Well ID | Attenuation Rate ($day^{-1}$) | Attenuation Half-life (days) | Attenuation Half-life (years) | Current Conc. (µg/L) | MCL or GW-Ind (µg/L) | Estimated Cleanup (years) |
|---|---|---|---|---|---|---|
| **Perchlorate** | | | | | | |
| 50WW02 | 0.00100 | 693.1 | 1.9 | 532 | 72 | 5.5 |
| **Tetrachloroethene** | | | | | | |
| 50WW02 | 0.00046 | 1513.4 | 4.1 | 9.3 | 5 | 3.7 |
| **Trichloroethene** | | | | | | |
| 50WW02 | 0.00040 | 1728.5 | 4.7 | 5420 | 5 | 47.7 |
| **cis-1,2-Dichloroethene** | | | | | | |
| 50WW02 | 0.00053 | 1300.5 | 3.6 | 855 | 70 | 12.9 |
| **Vinyl Chloride** | | | | | | |
| 50WW02 | 0.00070 | 991.6 | 2.7 | 15.2 | 2 | 7.9 |
| **1,2-Dichloroethane** | | | | | | |
| 50WW02 | 0.00055 | 1264.9 | 3.5 | 18.8 | 5 | 6.6 |

Notes and Abbreviations:

1) The estimated cleanup time was calculated as the time it would take the most recent detected chemicals of concern concentrations to reach the MCL using the site-specific attenuation rate, and assuming first order degradation kinetics.

GW-Ind - groundwater medium-specific concentration for industrial use.

MCL - maximum contaminant level

µg/L - micrograms per liter

# Table 3-4
# Summary of Intermediate Zone Groundwater Analytical Results
# LHAAP-50

| | LOCATION_CODE | 50WW06 | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | SAMPLE_DATE | 30-Aug-04 | | | 11-May-05 | | | 22-Feb-07 | | |
| | SAMPLE_PURPOSE | REG | | | REG | | | REG | | |
| Parameter | Units | Result | Qual | ValQual | Result | Qual | ValQual | Result | Qual | ValQual |
| **VOLATILES** | | | | | | | | | | |
| Tetrachloroethene | ug/L | 5 | U | U | 0.25 | U | U | 0.74 | U | U |
| Trichloroethene | ug/L | 15 | | | 4.7 | | | 2 | | |
| cis-1,2-Dichloroethene | ug/L | 5 | U | U | 0.332 | J | J | 0.83 | U | U |
| trans-1,2-Dichloroethene | ug/L | 5 | U | U | 0.25 | U | U | 0.75 | U | U |
| Vinyl chloride | ug/L | 5 | U | U | 0.25 | U | U | 0.32 | U | U |
| 1,1-Dichloroethene | ug/L | 5 | U | U | 0.5 | U | U | 0.68 | U | U |
| 1,2-Dichloroethane | ug/L | 5 | U | UJ | 0.5 | U | U | 0.53 | U | U |
| Chloroform | ug/L | 5 | U | U | 0.125 | U | U | 0.66 | U | U |
| **GASES** | | | | | | | | | | |
| Ethane | ug/L | | | | | | | 0.6 | U | U |
| Ethylene | ug/L | | | | | | | 0.8 | U | U |
| Methane | ug/L | | | | | | | 2.5 | | |
| **FIELD TESTS** | | | | | | | | | | |
| Dissolved Oxygen | mg/L | | | | 8.82 | | | 2.09 | | |
| Ferrous iron | mg/L | | | | | | | 0.44 | | |
| ORP | mV | | | | -98.6 | | | 59.6 | | |
| pH | STD UNIT | | | | 11.96 | | | 6.91 | | |
| Specific Conductivity | uS/cm | | | | 23.7 | | | 1.583 | | |
| Temperature | Deg C | | | | 20.97 | | | 19.25 | | |
| Turbidity | NTU | | | | 4.4 | | | 0 | | |
| **GEN CHEMISTRY** | | | | | | | | | | |
| Carbon Dioxide | mg/L | | | | | | | 44 | | |
| Chloride | mg/L | | | | | | | 209 | | |
| Nitrate | mg/L | | | | | | | 0.005 | U | U |
| Nitrate / Nitrite | mg/L | | | | | | | 0.04 | B | J |
| Nitrite | mg/L | | | | | | | 0.003 | U | U |
| Perchlorate | ug/L | 6.7 | | | 24.8 | | | 4 | U | U |
| pH | STD UNIT | | | | | | | 7.1 | | |
| Specific Conductivity | uS/cm | | | | | | | 1260 | | |
| Sulfate | mg/L | | | | | | | 203 | | |
| Sulfide | mg/L | | | | | | | 0.2 | UB | U |
| Total Alkalinity | mg/L | | | | | | | 278 | | |
| Total Organic Carbon | mg/L | | | | | | | 3 | | |
| **DHC** | | | | | | | | | | |
| Dehalococcoides | cells/ml | | | | | | | 10 | U | U |
| **DIOXINS_FURANS** | | | | | | | | | | |
| Octachlorodibenzo-p-dioxin | pg/L | | | | | | | | | |

Abbreviations:

cells/ml - cells per milliliter

Deg C - degrees celsius

μg/L - micrograms per liter

μS/cm - microseconds per centimeter

mg/L - milligrams per liter

NTU - nepheletic turbidity units

STD UNIT - standard units

Qualifiers:

B - The concentration reported was detected in the associated method blank, trip blank, or equipment blank within 5X/10X the blank concentration.

J - The analyte was positively identified; the reported value is the estimated concentration of the constituent detected in the sample analyzed.

U - Not detected. The analyte was analyzed for, but not detected above the associated reporting limit.

# *Figures*

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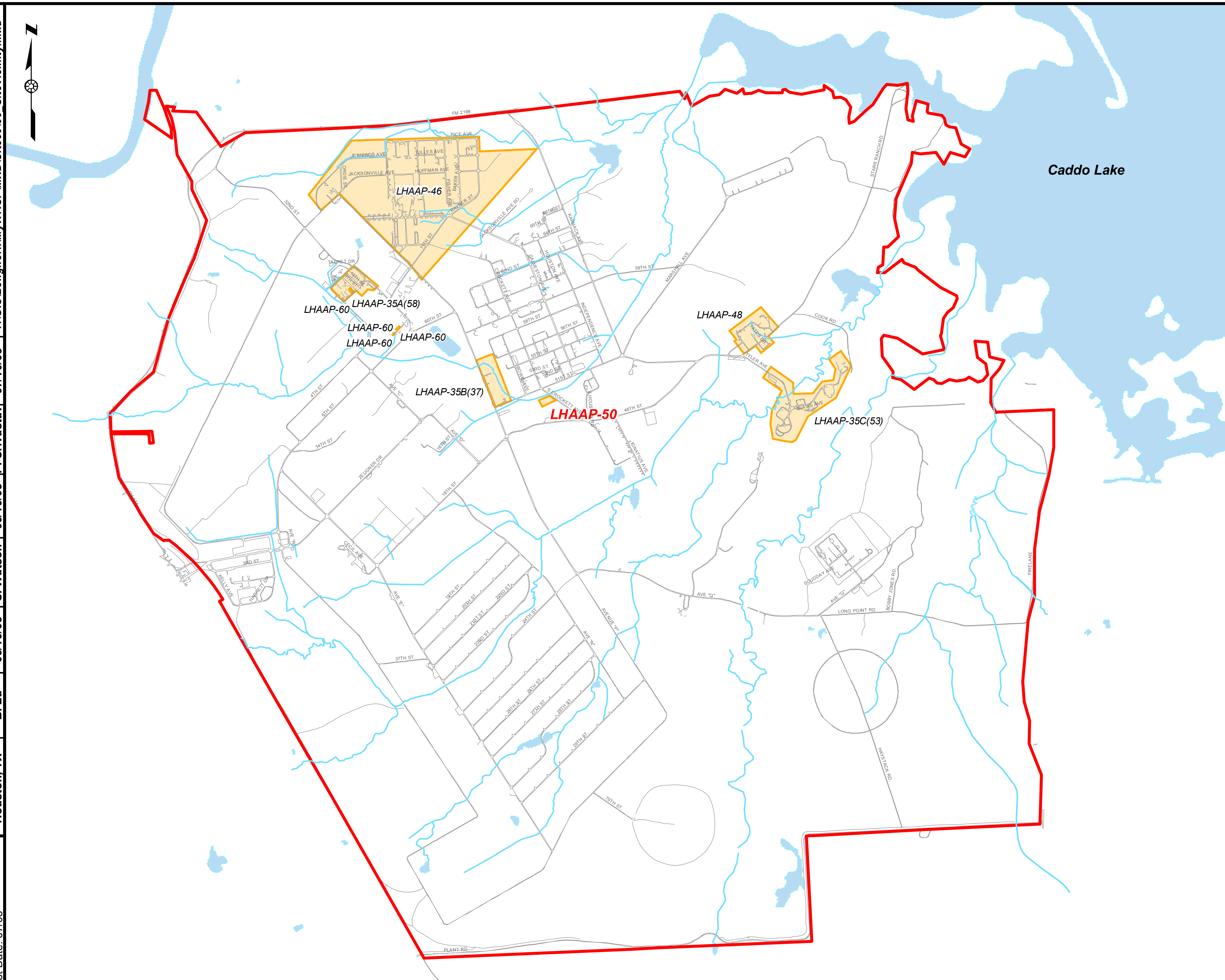
| OFFICE | DRAWN BY | CHECKED BY | APPROVED BY | FILE PATH |
|---|---|---|---|---|
| Houston, TX | B. Lu 05/19/08 | S. Watson 05/19/08 | P. Srivastav 07/10/08 | T:\GIS\Longhorn\MyWKSP\MXD\Site50\50_SiteVicinity.mxd |

Plot Date: 07/08




**LEGEND**

- Stream
- Road
- Site
- Lake
- LHAAP Boundary

0 1,200 2,400 4,800 Feet

Shaw®

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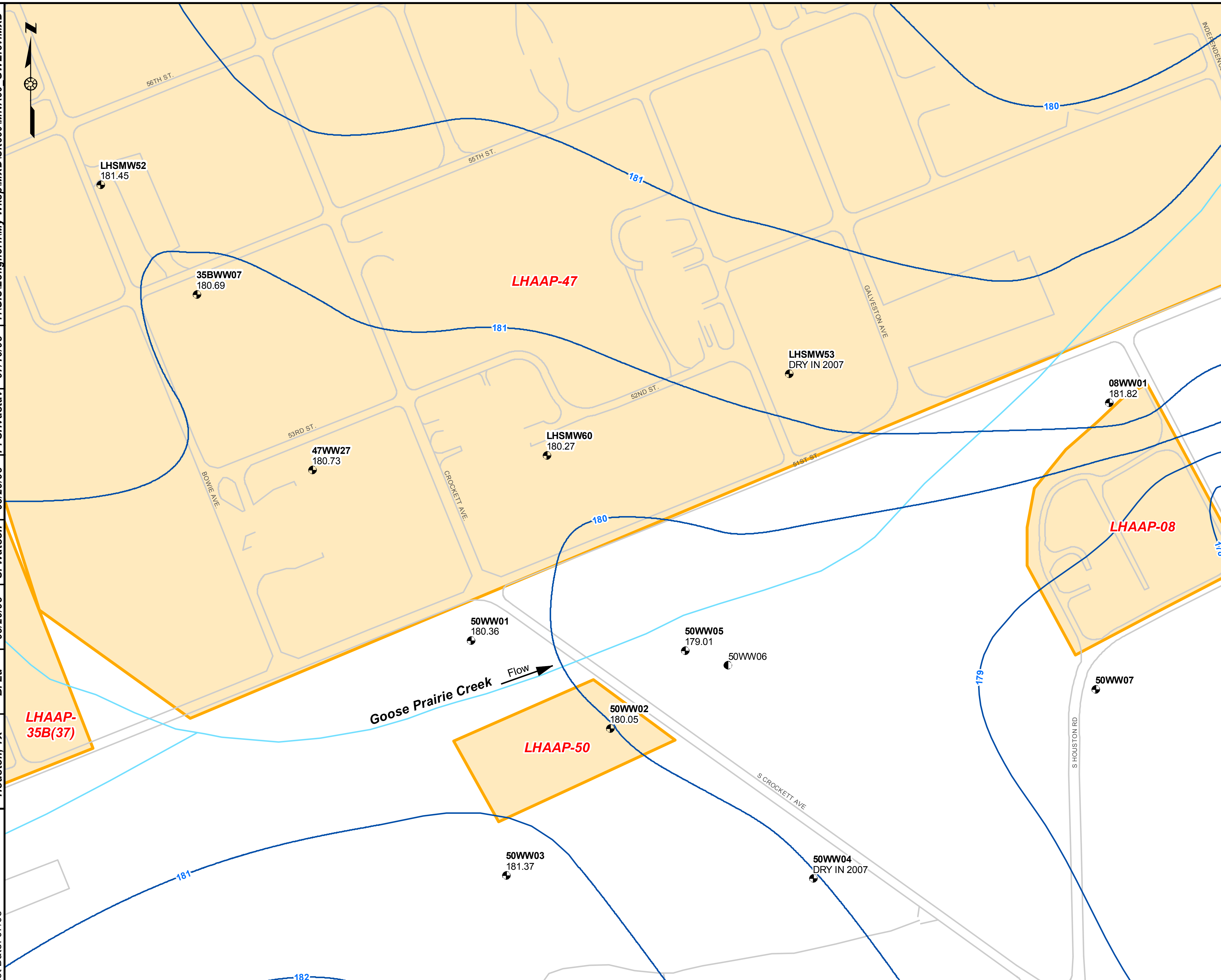
TULSA DISTRICT
TULSA, OKLAHOMA

FIGURE 1-1

SITE LOCATION MAP, LHAAP-50
MNA EVALUATION

LONGHORN ARMY AMMUNITION PLANT
KARNACK, TEXAS

00078566




## LEGEND

- Shallow Monitoring Well
- Intermediate Monitoring Well
- Shallow Groundwater Elevation Contour
- Stream
- Road
- Site

**Note:**

Groundwater elevations collected in November - December 2007 were reported in feet.

0 90 180 360 Feet

FILE PATH T:\GIS\Longhorn\My Wksp\MXD\Site50\MNA50_GWElev.MXD
APPROVED BY P. Srivastav 07/10/08
CHECKED BY S. Watson 05/20/08
DRAWN BY B. Lu 05/20/08
OFFICE Houston, TX

Plot Date: 07/08

Shaw

U.S. ARMY CORPS OF ENGINEERS
TULSA DISTRICT
TULSA, OKLAHOMA

FIGURE 1-2
MONITORING WELL LOCATION MAP AND GROUNDWATER ELEVATION, LHAAP-50
MNA EVALUATION
LONGHORN ARMY AMMUNITION PLANT
KARNACK, TEXAS

**Figure 3-1**
**Concentration Trends Over Time In Monitoring Well 50WW02**
**LHAAP-50**

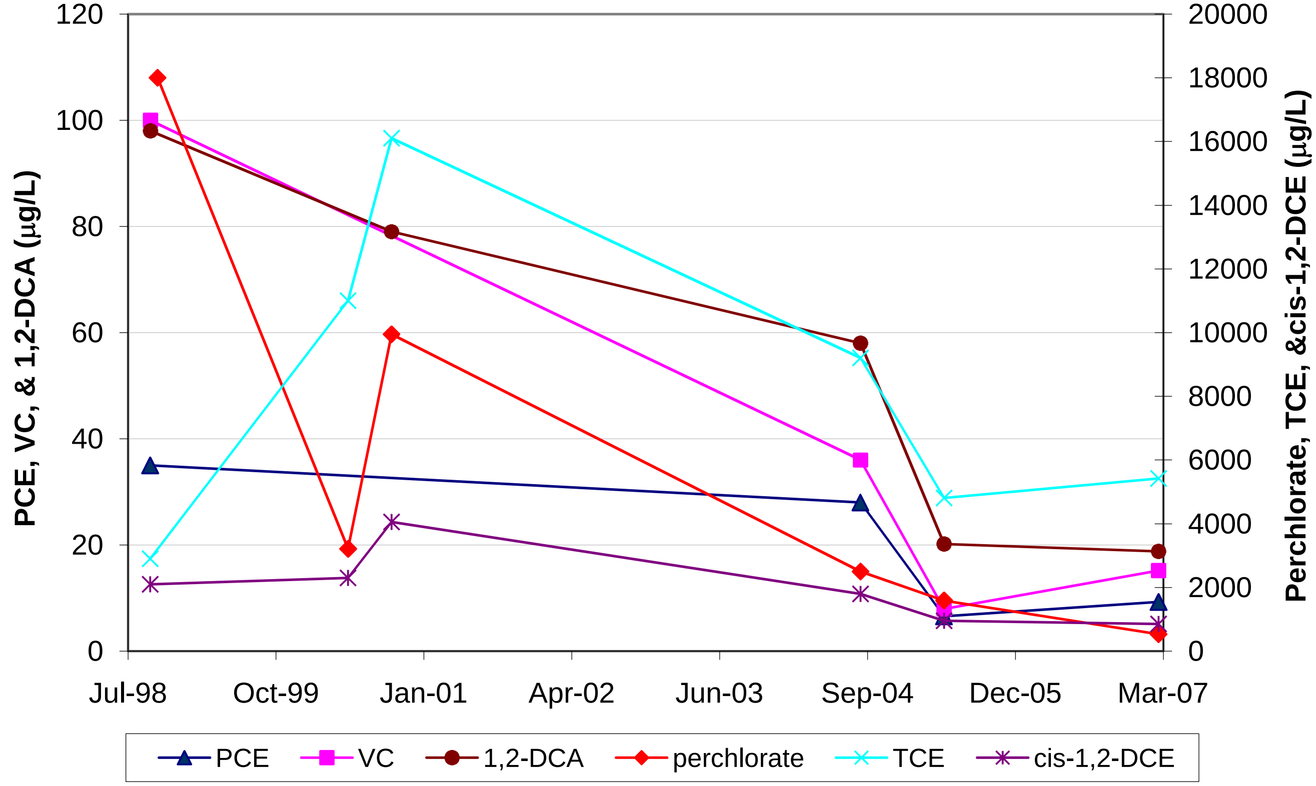


**Figure 3-2**
**Concentration Trends Over Time In Monitoring Well 50WW05**
**LHAAP-50**

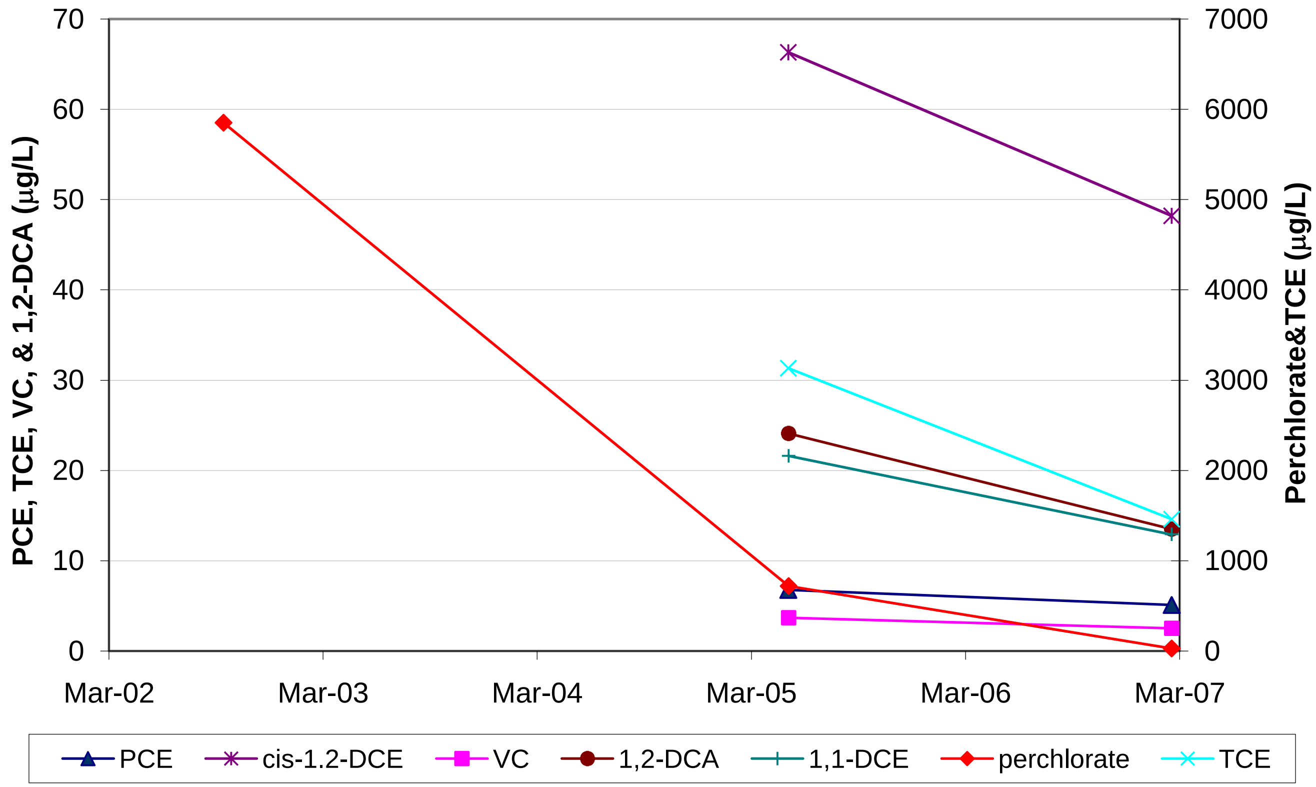


**Figure 3-3**
**Estimation of Time-Dependent Perchlorate Attenuation Rate**
**LHAAP-50**

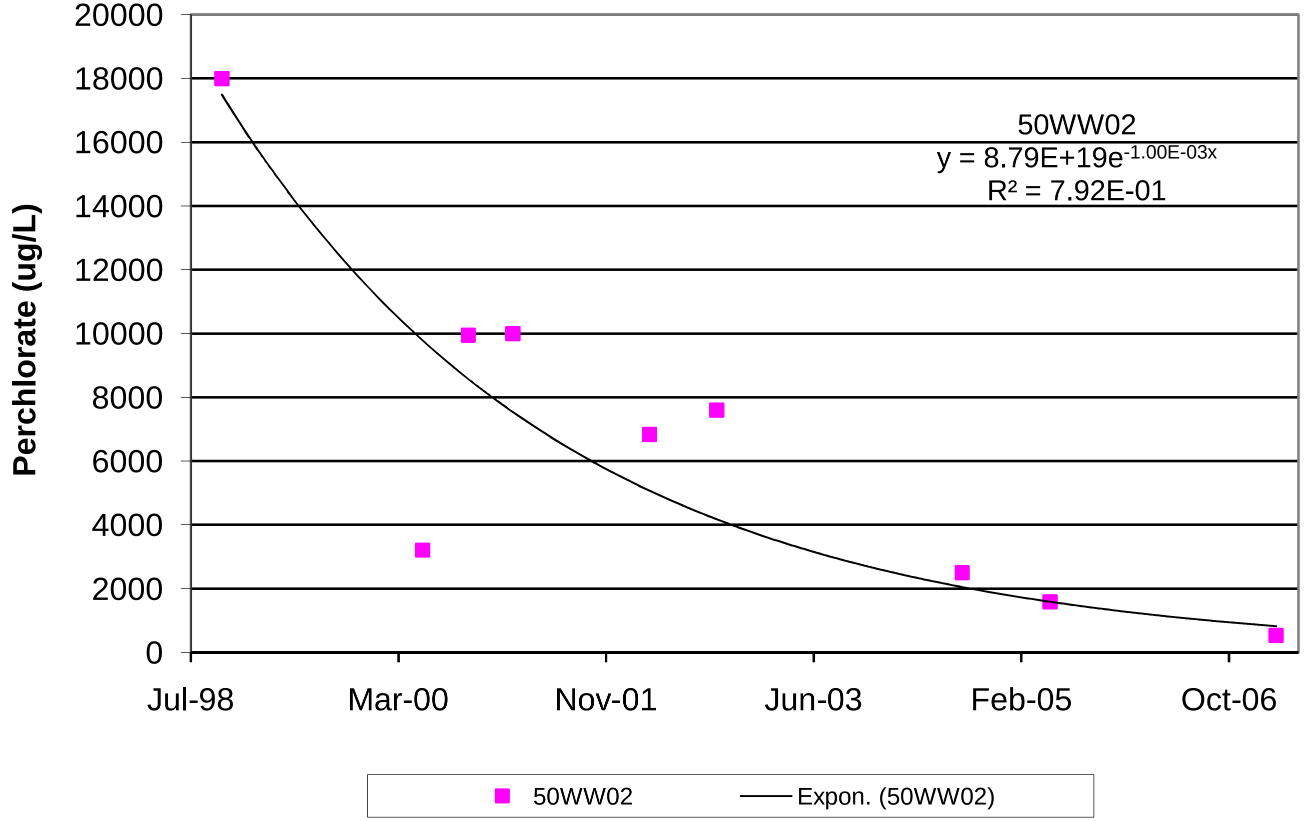


**Figure 3-4**
**Estimation of Time-Dependent Tetrachloroethene Attenuation Rate**
**LHAAP-50**

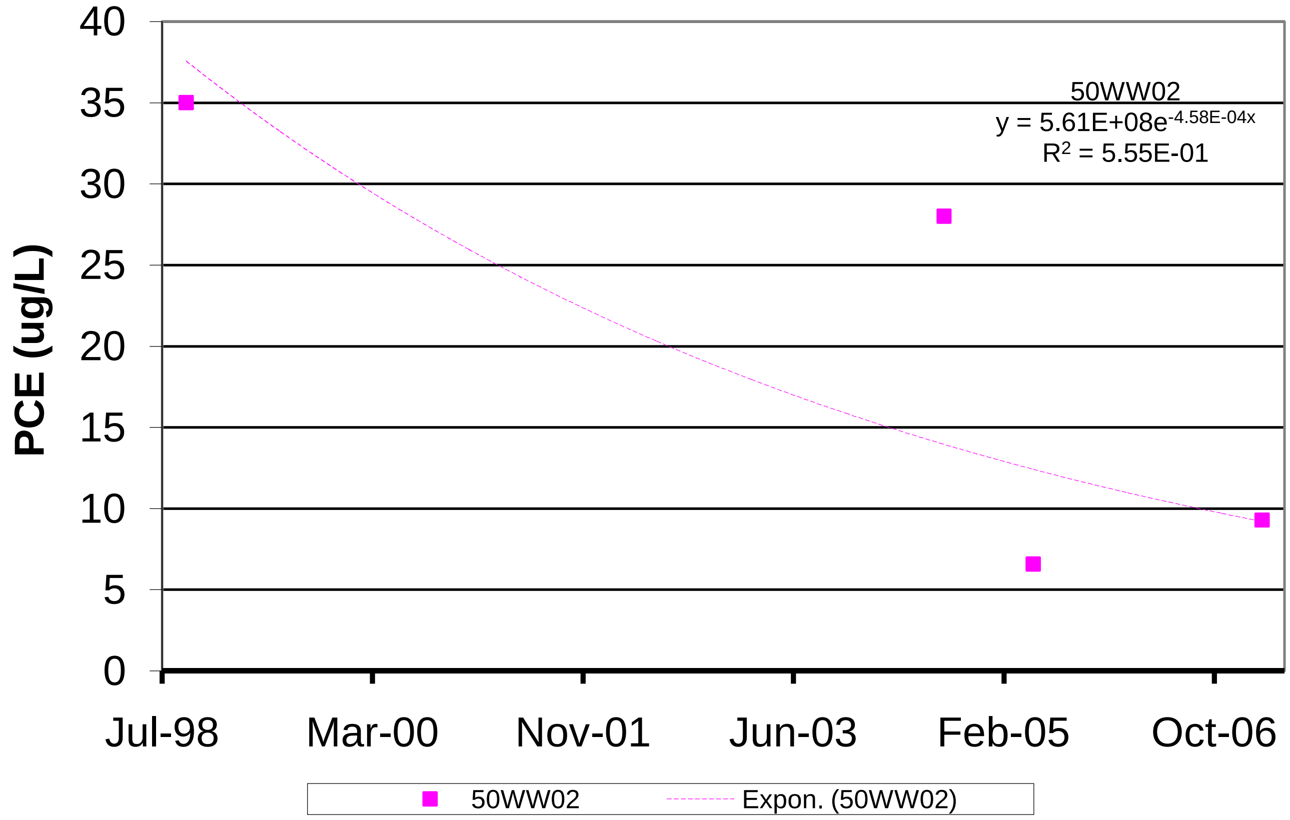


**Figure 3-5**
**Estimation of Time-Dependent Trichloroethene Attenuation Rate**
**LHAAP-50**

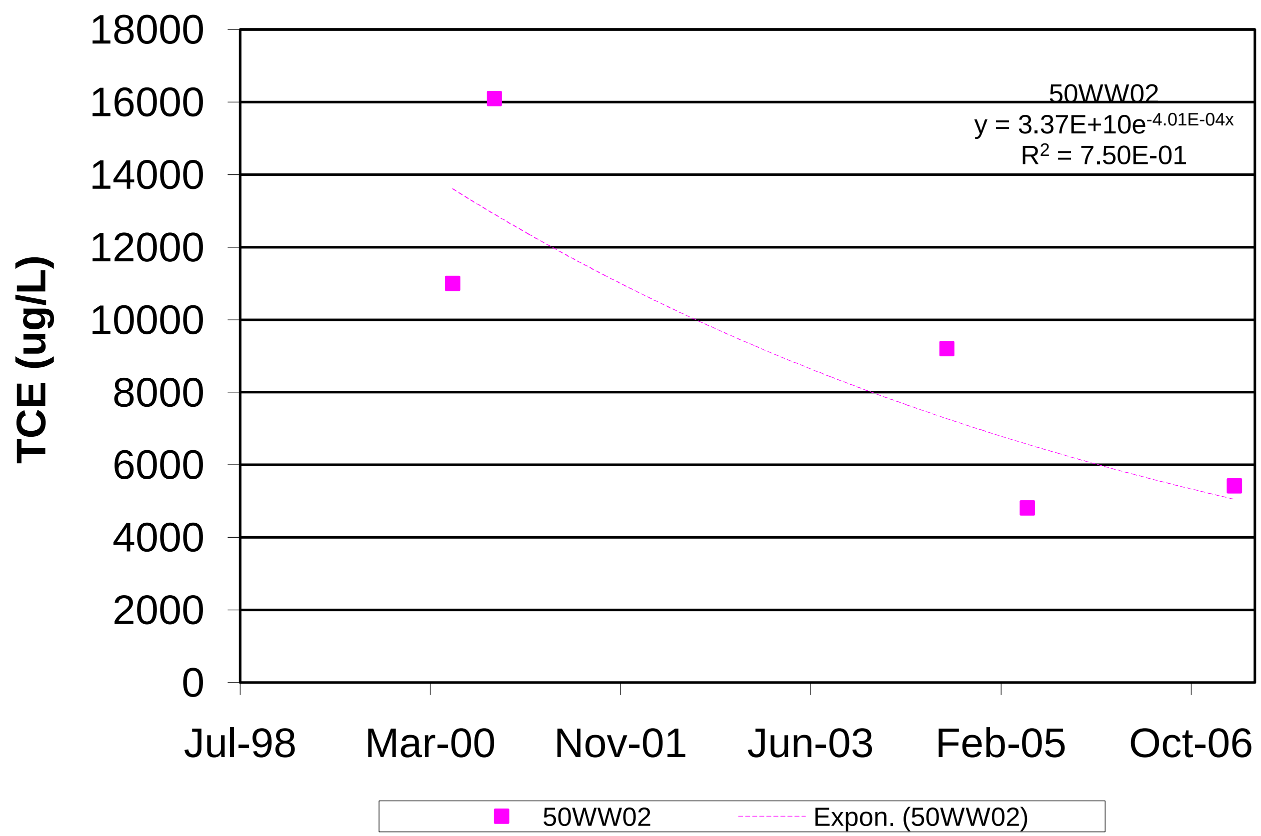


**Figure 3-6**
**Estimation of Time-Dependent cis-1,2-Dichloroethene Attenuation Rate**
**LHAAP-50**

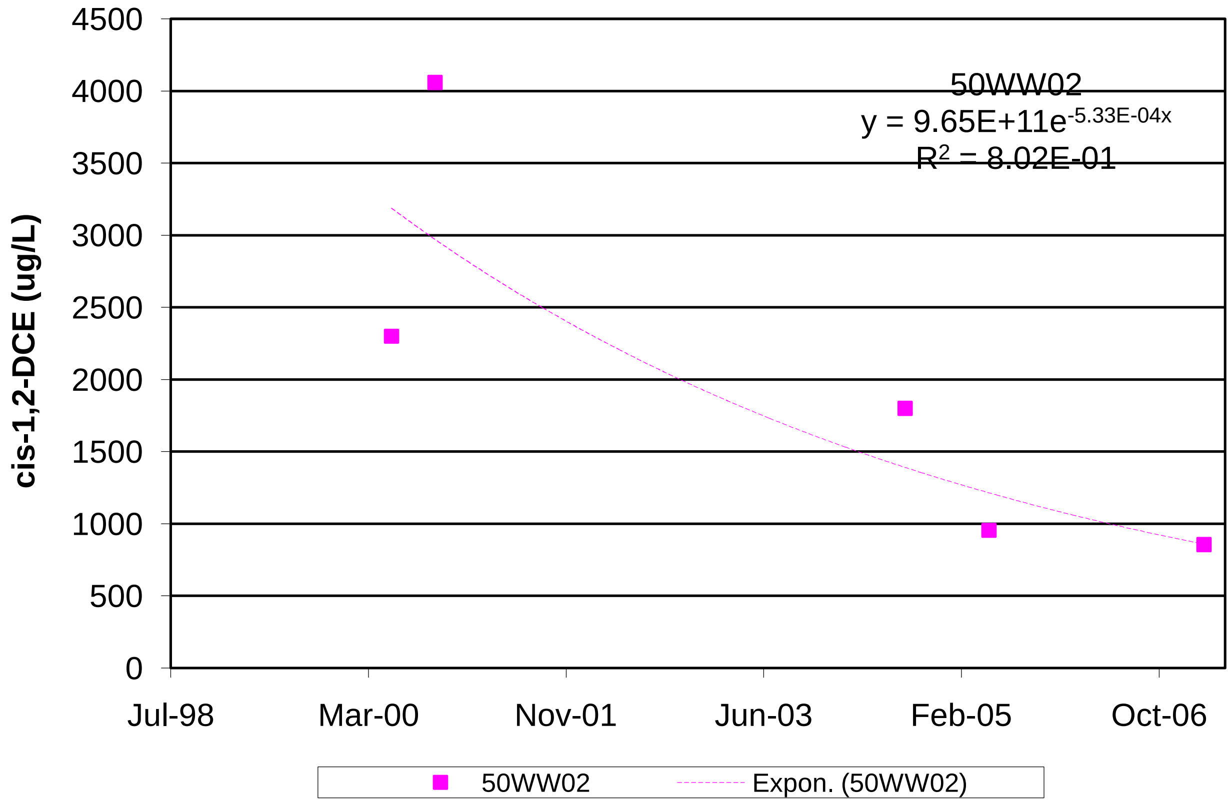


**Figure 3-7**
**Estimation of Time-Dependent Vinyl Chloride Attenuation Rate**
**LHAAP-50**

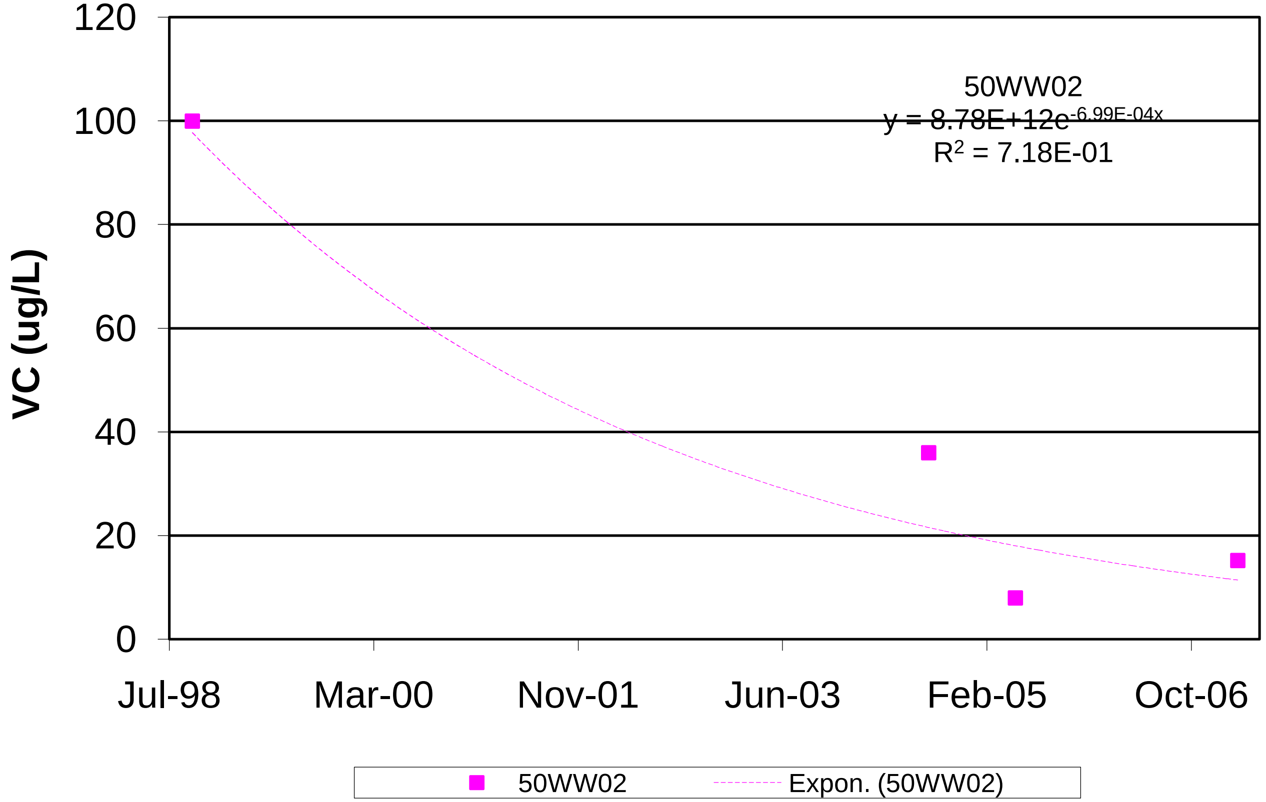
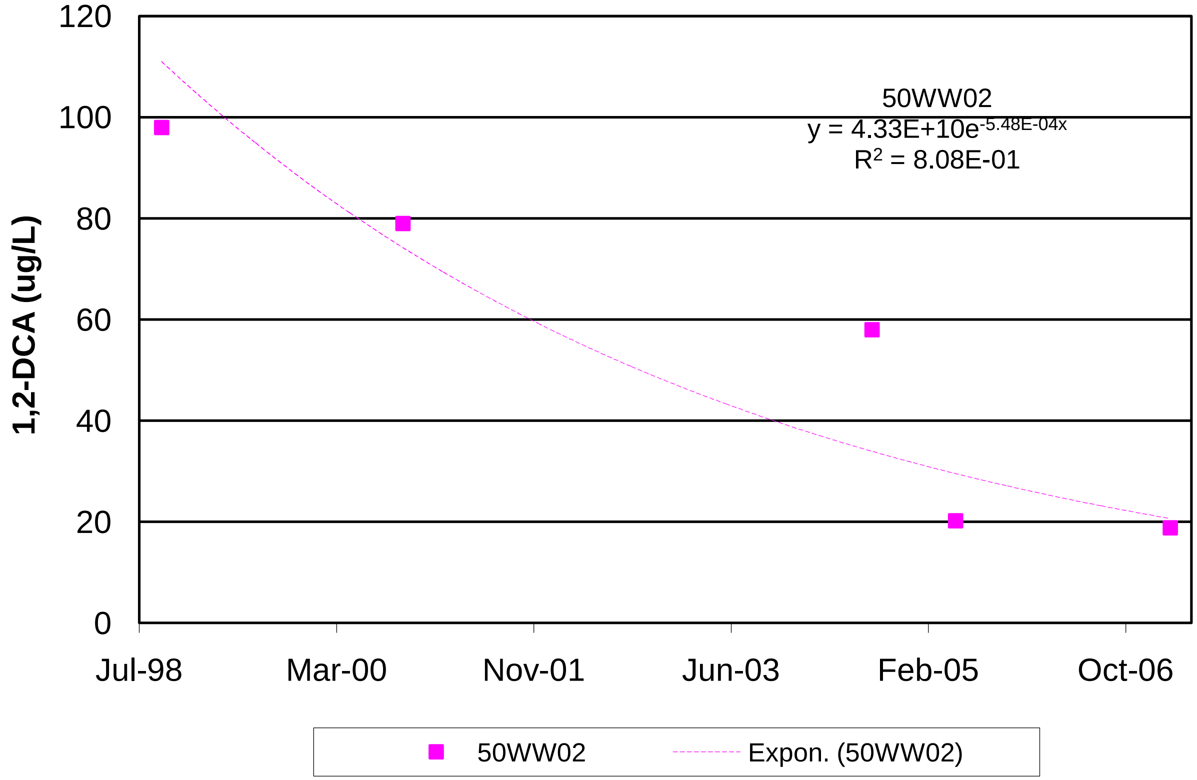


**Figure 3-8**
**Estimation of Time-Dependent 1,2-Dichloroethane Attenuation Rate**
**LHAAP-50**



# *Appendix B*

## *2007 and 2008 Analytical Reports, Field Data, and 50WW07 Logs*

## 2007 and 2008 Groundwater Data for LHAAP-50

| | | LOCATION_CODE | 47WW27 | | | | | 50WW02 | | | | | 50WW03 | | | | | 50WW05 | | | | | 50WW06 | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | SAMPLE_NO | 47WW27-101807 | | | | | 50WW02-FEB2007 | | | | | 50WW03-FEB2007 | | | | | 50WW05-FEB2007 | | | | | 50WW06-FEB2007 | | | | |
| | | SAMPLE_DATE | 18-Oct-07 | | | | | 23-Feb-07 | | | | | 24-Feb-07 | | | | | 23-Feb-07 | | | | | 22-Feb-07 | | | | |
| | | SAMPLE_PURPOSE | REG | | | | | REG | | | | | REG | | | | | REG | | | | | REG | | | | |
| Test Group | Parameter | Units | Result | Qual | ValQual | RC | DF | Result | Qual | ValQual | RC | DF | Result | Qual | ValQual | RC | DF | Result | Qual | ValQual | RC | DF | Result | Qual | ValQual | RC | DF |
| DHE | Dehalococcoides | cells/mL | | | | | | 12 | | | | 1 | 10 | U | U | | 1 | 36 | | | | 1 | 10 | U | U | | 1 |
| FIELD TESTS | Dissolved Oxygen | mg/L | 2.36 | | | | 1 | 6.25 | | | | 1 | 3.08 | | | | 1 | 1.53 | | | | 1 | 2.09 | | | | 1 |
| FIELD TESTS | Ferrous iron | mg/L | | | | | | 0 | | | | 1 | 0.06 | | | | 1 | 0.4 | | | | 1 | 0.44 | | | | 1 |
| FIELD TESTS | Oxygen Reduction Potential | mV | 399.5 | | | | 1 | 306.4 | | | | 1 | 200 | | | | 1 | 62.1 | | | | 1 | 59.6 | | | | 1 |
| FIELD TESTS | pH | pH Units | 5.51 | | | | 1 | 6.3 | | | | 1 | 7.05 | | | | 1 | 7.1 | | | | 1 | 6.91 | | | | 1 |
| FIELD TESTS | Salinity | mg/L | | | | | | 0.82 | | | | 1 | 3.78 | | | | 1 | 1.26 | | | | 1 | 3.01 | | | | 1 |
| FIELD TESTS | Specific Conductivity | uS/cm | 412 | | | | 1 | 1622 | | | | 1 | 6867 | | | | 1 | 2411 | | | | 1 | 1583 | | | | 1 |
| FIELD TESTS | Temperature | Deg C | 19.68 | | | | 1 | 19.63 | | | | 1 | 18.75 | | | | 1 | 20.55 | | | | 1 | 19.25 | | | | 1 |
| FIELD TESTS | Turbidity | NTU | 167.8 | | | | 1 | 0 | | | | 1 | 4.5 | | | | 1 | 0 | | | | 1 | 0 | | | | 1 |
| GASES | Ethane | ug/L | | | | | | 0.6 | U | U | | 1 | 0.6 | U | U | | 1 | 0.6 | U | U | | 1 | 0.6 | U | U | | 1 |
| GASES | Ethylene | ug/L | | | | | | 0.8 | U | U | | 1 | 0.8 | U | U | | 1 | 0.8 | U | U | | 1 | 0.8 | U | U | | 1 |
| GASES | Methane | ug/L | | | | | | 1.87 | | | | 1 | 0.56 | | | | 1 | 2.93 | | | | 1 | 2.5 | | | | 1 |
| GEN CHEMISTRY | Carbon Dioxide | mg/L | | | | | | 140 | | | | 1 | 416 | | | | 1 | 73 | | | | 1 | 44 | | | | 1 |
| GEN CHEMISTRY | Chloride | mg/L | | | | | | 219 | | | | 10 | 944 | | | | 50 | 253 | | | | 20 | 209 | | | | 20 |
| GEN CHEMISTRY | Nitrate | mg/L | | | | | | 0.005 | U | U | | 1 | 0.005 | U | U | | 1 | 0.005 | U | U | | 1 | 0.005 | U | U | | 1 |
| GEN CHEMISTRY | Nitrate / Nitrite | mg/L | | | | | | 0.02 | B | J | 15 | 1 | 0.01 | B | J | 15 | 1 | 0.005 | U | U | | 1 | 0.04 | B | J | 15 | 1 |
| GEN CHEMISTRY | Nitrite | mg/L | | | | | | 0.003 | U | U | | 1 | 0.003 | U | UJL | 02B | 1 | 0.003 | U | U | | 1 | 0.003 | U | U | | 1 |
| GEN CHEMISTRY | Perchlorate | ug/L | 1170 | | | | 15 | 532 | | | | 1 | 4 | U | U | | 1 | 27.8 | | | | 1 | 4 | U | U | | 1 |
| GEN CHEMISTRY | pH | pH Units | | | | | | 6.3 | | | | 1 | 7.1 | | | | 1 | 7.1 | | | | 1 | 7.1 | | | | 1 |
| GEN CHEMISTRY | Specific Conductivity | uS/cm | | | | | | 1400 | | | | 1 | 3340 | | | | 1 | 1800 | | | | 1 | 1260 | | | | 1 |
| GEN CHEMISTRY | Sulfate | mg/L | | | | | | 198 | | | | 2 | 403 | | | | 10 | 286 | | | | 4 | 203 | | | | 2 |
| GEN CHEMISTRY | Sulfide | mg/L | | | | | | 0.2 | UB | U | | 1 | 0.2 | UB | U | | 1 | 0.2 | UB | U | | 1 | 0.2 | UB | U | | 1 |
| GEN CHEMISTRY | Total Alkalinity | mg/L | | | | | | 138 | | | | 1 | 417 | | | | 5 | 457 | | | | 5 | 278 | | | | 5 |
| GEN CHEMISTRY | Total Organic Carbon | mg/L | | | | | | 3 | | | | 1 | 2 | | | | 1 | 2 | | | | 1 | 3 | | | | 1 |
| VOLATILES | 1,1,1,2-Tetrachloroethane | ug/L | | | | | | | | | | | | | | | | | | | | | | | | | |
| VOLATILES | 1,1,1-Trichloroethane | ug/L | | | | | | 0.37 | U | U | | 1 | 0.37 | U | U | | 1 | 0.37 | U | U | | 1 | 0.37 | U | U | | 1 |
| VOLATILES | 1,1,2,2-Tetrachloroethane | ug/L | | | | | | 0.46 | U | U | | 1 | 0.46 | U | U | | 1 | 0.46 | U | U | | 1 | 0.46 | U | U | | 1 |
| VOLATILES | 1,1,2-Trichloroethane | ug/L | | | | | | 0.92 | J | J | 15 | 1 | 0.66 | U | U | | 1 | 0.66 | U | U | | 1 | 0.66 | U | U | | 1 |
| VOLATILES | 1,1-Dichloroethane | ug/L | | | | | | 5.4 | | | | 1 | 0.52 | U | U | | 1 | 1.3 | J | J | 15 | 1 | 0.52 | U | U | | 1 |
| VOLATILES | 1,1-Dichloroethene | ug/L | | | | | | 6.5 | | | | 1 | 0.68 | U | U | | 1 | 12.9 | | | | 1 | 0.68 | U | U | | 1 |
| VOLATILES | 1,1-Dichloropropene | ug/L | | | | | | | | | | | | | | | | | | | | | | | | | |
| VOLATILES | 1,2,3-Trichlorobenzene | ug/L | | | | | | | | | | | | | | | | | | | | | | | | | |
| VOLATILES | 1,2,3-Trichloropropane | ug/L | | | | | | | | | | | | | | | | | | | | | | | | | |
| VOLATILES | 1,2,4-Trichlorobenzene | ug/L | | | | | | | | | | | | | | | | | | | | | | | | | |
| VOLATILES | 1,2,4-Trimethylbenzene | ug/L | | | | | | | | | | | | | | | | | | | | | | | | | |
| VOLATILES | 1,2-Dibromo-3-chloropropane | ug/L | | | | | | | | | | | | | | | | | | | | | | | | | |
| VOLATILES | 1,2-Dibromoethane | ug/L | | | | | | | | | | | | | | | | | | | | | | | | | |
| VOLATILES | 1,2-Dichlorobenzene | ug/L | | | | | | | | | | | | | | | | | | | | | | | | | |
| VOLATILES | 1,2-Dichloroethane | ug/L | | | | | | 18.8 | | | | 1 | 0.53 | U | U | | 1 | 13.5 | | | | 1 | 0.53 | U | U | | 1 |
| VOLATILES | 1,2-Dichloropropane | ug/L | | | | | | 0.59 | U | U | | 1 | 0.59 | U | U | | 1 | 0.59 | U | U | | 1 | 0.59 | U | U | | 1 |
| VOLATILES | 1,2-Dimethylbenzene (o-Xylene) | ug/L | | | | | | | | | | | | | | | | | | | | | | | | | |
| VOLATILES | 1,3,5-Trimethylbenzene | ug/L | | | | | | | | | | | | | | | | | | | | | | | | | |
| VOLATILES | 1,3-Dichlorobenzene | ug/L | | | | | | | | | | | | | | | | | | | | | | | | | |
| VOLATILES | 1,3-Dichloropropane | ug/L | | | | | | | | | | | | | | | | | | | | | | | | | |
| VOLATILES | 1,4-Dichlorobenzene | ug/L | | | | | | | | | | | | | | | | | | | | | | | | | |
| VOLATILES | 2,2-Dichloropropane | ug/L | | | | | | | | | | | | | | | | | | | | | | | | | |
| VOLATILES | 2-Butanone | ug/L | | | | | | 3 | U | U | | 1 | 3 | U | U | | 1 | 3 | U | U | | 1 | 3 | U | U | | 1 |
| VOLATILES | 2-Chloroethyl vinyl ether | ug/L | | | | | | | | | | | | | | | | | | | | | | | | | |
| VOLATILES | 2-Chlorotoluene | ug/L | | | | | | | | | | | | | | | | | | | | | | | | | |
| VOLATILES | 2-Hexanone | ug/L | | | | | | 1.9 | U | U | | 1 | 1.9 | U | U | | 1 | 1.9 | U | U | | 1 | 1.9 | U | U | | 1 |

## 2007 and 2008 Groundwater Data for LHAAP-50

| | | LOCATION_CODE | 47WW27 | | | | | 50WW02 | | | | | 50WW03 | | | | | 50WW05 | | | | | 50WW06 | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | SAMPLE_NO | 47WW27-101807 | | | | | 50WW02-FEB2007 | | | | | 50WW03-FEB2007 | | | | | 50WW05-FEB2007 | | | | | 50WW06-FEB2007 | | | | |
| | | SAMPLE_DATE | 18-Oct-07 | | | | | 23-Feb-07 | | | | | 24-Feb-07 | | | | | 23-Feb-07 | | | | | 22-Feb-07 | | | | |
| | | SAMPLE_PURPOSE | REG | | | | | REG | | | | | REG | | | | | REG | | | | | REG | | | | |
| Test Group | Parameter | Units | Result | Qual | ValQual | RC | DF | Result | Qual | ValQual | RC | DF | Result | Qual | ValQual | RC | DF | Result | Qual | ValQual | RC | DF | Result | Qual | ValQual | RC | DF |
| VOLATILES | 4-Chlorotoluene | ug/L | | | | | | | | | | | | | | | | | | | | | | | | | |
| VOLATILES | Acetone | ug/L | | | | | | 2.8 | U | U | | 1 | 2.8 | U | U | | 1 | 2.8 | U | U | | 1 | 2.8 | U | U | | 1 |
| VOLATILES | Benzene | ug/L | | | | | | 0.46 | J | J | 15 | 1 | 0.23 | U | U | | 1 | 0.23 | U | U | | 1 | 0.23 | U | U | | 1 |
| VOLATILES | Bromobenzene | ug/L | | | | | | | | | | | | | | | | | | | | | | | | | |
| VOLATILES | Bromochloromethane | ug/L | | | | | | | | | | | | | | | | | | | | | | | | | |
| VOLATILES | Bromodichloromethane | ug/L | | | | | | 0.33 | U | U | | 1 | 0.33 | U | U | | 1 | 0.33 | U | U | | 1 | 0.33 | U | U | | 1 |
| VOLATILES | Bromoform | ug/L | | | | | | 0.65 | U | U | | 1 | 0.65 | U | U | | 1 | 0.65 | U | U | | 1 | 0.65 | U | U | | 1 |
| VOLATILES | Bromomethane | ug/L | | | | | | 0.47 | U | U | | 1 | 0.47 | U | U | | 1 | 0.47 | U | U | | 1 | 0.47 | U | U | | 1 |
| VOLATILES | Carbon disulfide | ug/L | | | | | | 0.62 | U | U | | 1 | 0.62 | U | U | | 1 | 0.62 | U | U | | 1 | 0.62 | U | U | | 1 |
| VOLATILES | Carbon tetrachloride | ug/L | | | | | | 0.52 | U | U | | 1 | 0.52 | U | U | | 1 | 0.52 | U | U | | 1 | 0.52 | U | U | | 1 |
| VOLATILES | Chlorobenzene | ug/L | | | | | | 0.54 | U | U | | 1 | 0.54 | U | U | | 1 | 0.54 | U | U | | 1 | 0.54 | U | U | | 1 |
| VOLATILES | Chloroethane | ug/L | | | | | | 0.46 | U | U | | 1 | 0.46 | U | U | | 1 | 0.46 | U | U | | 1 | 0.46 | U | U | | 1 |
| VOLATILES | Chloroform | ug/L | | | | | | 4.2 | | | | 1 | 0.66 | U | U | | 1 | 0.66 | U | U | | 1 | 0.66 | U | U | | 1 |
| VOLATILES | Chloromethane | ug/L | | | | | | 0.6 | U | U | | 1 | 0.6 | U | U | | 1 | 0.6 | U | U | | 1 | 0.6 | U | U | | 1 |
| VOLATILES | cis-1,2-Dichloroethene | ug/L | | | | | | 855 | | | | 100 | 0.83 | U | U | | 1 | 48.2 | | | | 1 | 0.83 | U | U | | 1 |
| VOLATILES | cis-1,3-Dichloropropene | ug/L | | | | | | 0.59 | U | U | | 1 | 0.59 | U | U | | 1 | 0.59 | U | U | | 1 | 0.59 | U | U | | 1 |
| VOLATILES | Dibromochloromethane | ug/L | | | | | | 0.68 | U | U | | 1 | 0.68 | U | U | | 1 | 0.68 | U | U | | 1 | 0.68 | U | U | | 1 |
| VOLATILES | Dibromomethane | ug/L | | | | | | | | | | | | | | | | | | | | | | | | | |
| VOLATILES | Dichlorodifluoromethane | ug/L | | | | | | | | | | | | | | | | | | | | | | | | | |
| VOLATILES | Ethylbenzene | ug/L | | | | | | 0.48 | U | U | | 1 | 0.48 | U | U | | 1 | 0.48 | U | U | | 1 | 0.48 | U | U | | 1 |
| VOLATILES | Hexachlorobutadiene | ug/L | | | | | | | | | | | | | | | | | | | | | | | | | |
| VOLATILES | Isopropylbenzene | ug/L | | | | | | | | | | | | | | | | | | | | | | | | | |
| VOLATILES | m,p-Xylenes | ug/L | | | | | | | | | | | | | | | | | | | | | | | | | |
| VOLATILES | Methyl isobutyl ketone | ug/L | | | | | | 7.3 | U | U | | 1 | 7.3 | U | U | | 1 | 7.3 | U | U | | 1 | 7.3 | U | U | | 1 |
| VOLATILES | Methylene chloride | ug/L | | | | | | 0.67 | U | U | | 1 | 0.67 | U | U | | 1 | 0.67 | U | U | | 1 | 0.67 | U | U | | 1 |
| VOLATILES | Naphthalene | ug/L | | | | | | | | | | | | | | | | | | | | | | | | | |
| VOLATILES | n-Butylbenzene | ug/L | | | | | | | | | | | | | | | | | | | | | | | | | |
| VOLATILES | n-Propylbenzene | ug/L | | | | | | | | | | | | | | | | | | | | | | | | | |
| VOLATILES | p-Isopropyltoluene | ug/L | | | | | | | | | | | | | | | | | | | | | | | | | |
| VOLATILES | sec-Butylbenzene | ug/L | | | | | | | | | | | | | | | | | | | | | | | | | |
| VOLATILES | Styrene | ug/L | | | | | | 0.5 | U | U | | 1 | 0.5 | U | U | | 1 | 0.5 | U | U | | 1 | 0.5 | U | U | | 1 |
| VOLATILES | tert-Butylbenzene | ug/L | | | | | | | | | | | | | | | | | | | | | | | | | |
| VOLATILES | Tetrachloroethene | ug/L | | | | | | 9.3 | | | | 1 | 0.74 | U | U | | 1 | 5.1 | | | | 1 | 0.74 | U | U | | 1 |
| VOLATILES | Toluene | ug/L | | | | | | 0.54 | U | U | | 1 | 0.54 | U | U | | 1 | 0.54 | U | U | | 1 | 0.54 | U | U | | 1 |
| VOLATILES | trans-1,2-Dichloroethene | ug/L | | | | | | 2.6 | | | | 1 | 0.75 | U | U | | 1 | 0.75 | U | U | | 1 | 0.75 | U | U | | 1 |
| VOLATILES | trans-1,3-Dichloropropene | ug/L | | | | | | 0.61 | U | U | | 1 | 0.61 | U | U | | 1 | 0.61 | U | U | | 1 | 0.61 | U | U | | 1 |
| VOLATILES | Trichloroethene | ug/L | | | | | | 5420 | | | | 100 | 0.63 | U | U | | 1 | 1460 | | | | 20 | 2 | | | | 1 |
| VOLATILES | Trichlorofluoromethane | ug/L | | | | | | | | | | | | | | | | | | | | | | | | | |
| VOLATILES | Vinyl acetate | ug/L | | | | | | | | | | | | | | | | | | | | | | | | | |
| VOLATILES | Vinyl chloride | ug/L | | | | | | 15.2 | | | | 1 | 0.32 | U | U | | 1 | 2.5 | | | | 1 | 0.32 | U | U | | 1 |
| VOLATILES | Xylenes, Total | ug/L | | | | | | 1.1 | U | U | | 1 | 1.1 | U | U | | 1 | 1.1 | U | U | | 1 | 1.1 | U | U | | 1 |

## 2007 and 2008 Groundwater Data for LHAAP-50

| | | LOCATION_CODE | 50WW07 | | | | | LHSMW60 | | | | | LHSMW60 | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | SAMPLE_NO | 50WW07-021908 | | | | | LHSMW60-101807 | | | | | LHSMW60-101807-QC | | | | |
| | | SAMPLE_DATE | 19-Feb-08 | | | | | 18-Oct-07 | | | | | 18-Oct-07 | | | | |
| | | SAMPLE_PURPOSE | REG | | | | | REG | | | | | FD | | | | |
| Test Group | Parameter | Units | Result | Qual | ValQual | RC | DF | Result | Qual | ValQual | RC | DF | Result | Qual | ValQual | RC | DF |
| DHE | Dehalococcoides | cells/mL | | | | | | | | | | | | | | | |
| FIELD TESTS | Dissolved Oxygen | mg/L | | | | | | | | | | | | | | | |
| FIELD TESTS | Ferrous iron | mg/L | | | | | | | | | | | | | | | |
| FIELD TESTS | Oxygen Reduction Potential | mV | | | | | | | | | | | | | | | |
| FIELD TESTS | pH | pH Units | | | | | | | | | | | | | | | |
| FIELD TESTS | Salinity | mg/L | | | | | | | | | | | | | | | |
| FIELD TESTS | Specific Conductivity | uS/cm | | | | | | | | | | | | | | | |
| FIELD TESTS | Temperature | Deg C | | | | | | | | | | | | | | | |
| FIELD TESTS | Turbidity | NTU | | | | | | | | | | | | | | | |
| GASES | Ethane | ug/L | | | | | | | | | | | | | | | |
| GASES | Ethylene | ug/L | | | | | | | | | | | | | | | |
| GASES | Methane | ug/L | | | | | | | | | | | | | | | |
| GEN CHEMISTRY | Carbon Dioxide | mg/L | | | | | | | | | | | | | | | |
| GEN CHEMISTRY | Chloride | mg/L | | | | | | | | | | | | | | | |
| GEN CHEMISTRY | Nitrate | mg/L | | | | | | | | | | | | | | | |
| GEN CHEMISTRY | Nitrate / Nitrite | mg/L | | | | | | | | | | | | | | | |
| GEN CHEMISTRY | Nitrite | mg/L | | | | | | | | | | | | | | | |
| GEN CHEMISTRY | Perchlorate | ug/L | | | | | | 0.5 | U | U | | 1 | 0.5 | U | U | | 1 |
| GEN CHEMISTRY | pH | pH Units | | | | | | | | | | | | | | | |
| GEN CHEMISTRY | Specific Conductivity | uS/cm | | | | | | | | | | | | | | | |
| GEN CHEMISTRY | Sulfate | mg/L | | | | | | | | | | | | | | | |
| GEN CHEMISTRY | Sulfide | mg/L | | | | | | | | | | | | | | | |
| GEN CHEMISTRY | Total Alkalinity | mg/L | | | | | | | | | | | | | | | |
| GEN CHEMISTRY | Total Organic Carbon | mg/L | | | | | | | | | | | | | | | |
| VOLATILES | 1,1,1,2-Tetrachloroethane | ug/L | 0.25 | U | U | | 1 | | | | | | | | | | |
| VOLATILES | 1,1,1-Trichloroethane | ug/L | 0.25 | U | U | | 1 | | | | | | | | | | |
| VOLATILES | 1,1,2,2-Tetrachloroethane | ug/L | 0.125 | U | U | | 1 | | | | | | | | | | |
| VOLATILES | 1,1,2-Trichloroethane | ug/L | 0.25 | U | U | | 1 | | | | | | | | | | |
| VOLATILES | 1,1-Dichloroethane | ug/L | 0.125 | U | U | | 1 | | | | | | | | | | |
| VOLATILES | 1,1-Dichloroethene | ug/L | 0.5 | U | U | | 1 | | | | | | | | | | |
| VOLATILES | 1,1-Dichloropropene | ug/L | 0.25 | U | U | | 1 | | | | | | | | | | |
| VOLATILES | 1,2,3-Trichlorobenzene | ug/L | 0.125 | U | U | | 1 | | | | | | | | | | |
| VOLATILES | 1,2,3-Trichloropropane | ug/L | 0.5 | U | U | | 1 | | | | | | | | | | |
| VOLATILES | 1,2,4-Trichlorobenzene | ug/L | 0.2 | U | U | | 1 | | | | | | | | | | |
| VOLATILES | 1,2,4-Trimethylbenzene | ug/L | 0.25 | U | U | | 1 | | | | | | | | | | |
| VOLATILES | 1,2-Dibromo-3-chloropropane | ug/L | 1 | U | U | | 1 | | | | | | | | | | |
| VOLATILES | 1,2-Dibromoethane | ug/L | 0.25 | U | U | | 1 | | | | | | | | | | |
| VOLATILES | 1,2-Dichlorobenzene | ug/L | 0.125 | U | U | | 1 | | | | | | | | | | |
| VOLATILES | 1,2-Dichloroethane | ug/L | 0.25 | U | U | | 1 | | | | | | | | | | |
| VOLATILES | 1,2-Dichloropropane | ug/L | 0.2 | U | U | | 1 | | | | | | | | | | |
| VOLATILES | 1,2-Dimethylbenzene (o-Xylene) | ug/L | 0.25 | U | U | | 1 | | | | | | | | | | |
| VOLATILES | 1,3,5-Trimethylbenzene | ug/L | 0.25 | U | U | | 1 | | | | | | | | | | |
| VOLATILES | 1,3-Dichlorobenzene | ug/L | 0.25 | U | U | | 1 | | | | | | | | | | |
| VOLATILES | 1,3-Dichloropropane | ug/L | 0.2 | U | U | | 1 | | | | | | | | | | |
| VOLATILES | 1,4-Dichlorobenzene | ug/L | 0.125 | U | U | | 1 | | | | | | | | | | |
| VOLATILES | 2,2-Dichloropropane | ug/L | 0.25 | U | U | | 1 | | | | | | | | | | |
| VOLATILES | 2-Butanone | ug/L | 2.5 | U | U | | 1 | | | | | | | | | | |
| VOLATILES | 2-Chloroethyl vinyl ether | ug/L | 2 | U | U | | 1 | | | | | | | | | | |
| VOLATILES | 2-Chlorotoluene | ug/L | 0.125 | U | U | | 1 | | | | | | | | | | |
| VOLATILES | 2-Hexanone | ug/L | 2.5 | U | U | | 1 | | | | | | | | | | |

## 2007 and 2008 Groundwater Data for LHAAP-50

| | | LOCATION_CODE | 50WW07 | | | | | LHSMW60 | | | | | LHSMW60 | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | SAMPLE_NO | 50WW07-021908 | | | | | LHSMW60-101807 | | | | | LHSMW60-101807-QC | | | | |
| | | SAMPLE_DATE | 19-Feb-08 | | | | | 18-Oct-07 | | | | | 18-Oct-07 | | | | |
| | | SAMPLE_PURPOSE | REG | | | | | REG | | | | | FD | | | | |
| Test Group | Parameter | Units | Result | Qual | ValQual | RC | DF | Result | Qual | ValQual | RC | DF | Result | Qual | ValQual | RC | DF |
| VOLATILES | 4-Chlorotoluene | ug/L | 0.25 | U | U | | 1 | | | | | | | | | | |
| VOLATILES | Acetone | ug/L | 3.54 | J | J | 15 | 1 | | | | | | | | | | |
| VOLATILES | Benzene | ug/L | 0.125 | U | U | | 1 | | | | | | | | | | |
| VOLATILES | Bromobenzene | ug/L | 0.125 | U | U | | 1 | | | | | | | | | | |
| VOLATILES | Bromochloromethane | ug/L | 0.2 | U | U | | 1 | | | | | | | | | | |
| VOLATILES | Bromodichloromethane | ug/L | 0.25 | U | U | | 1 | | | | | | | | | | |
| VOLATILES | Bromoform | ug/L | 0.5 | U | U | | 1 | | | | | | | | | | |
| VOLATILES | Bromomethane | ug/L | 0.5 | U | U | | 1 | | | | | | | | | | |
| VOLATILES | Carbon disulfide | ug/L | 0.5 | U | U | | 1 | | | | | | | | | | |
| VOLATILES | Carbon tetrachloride | ug/L | 0.25 | U | U | | 1 | | | | | | | | | | |
| VOLATILES | Chlorobenzene | ug/L | 0.125 | U | U | | 1 | | | | | | | | | | |
| VOLATILES | Chloroethane | ug/L | 0.5 | U | U | | 1 | | | | | | | | | | |
| VOLATILES | Chloroform | ug/L | 0.125 | U | U | | 1 | | | | | | | | | | |
| VOLATILES | Chloromethane | ug/L | 0.25 | U | U | | 1 | | | | | | | | | | |
| VOLATILES | cis-1,2-Dichloroethene | ug/L | 0.25 | U | U | | 1 | | | | | | | | | | |
| VOLATILES | cis-1,3-Dichloropropene | ug/L | 0.25 | U | U | | 1 | | | | | | | | | | |
| VOLATILES | Dibromochloromethane | ug/L | 0.25 | U | U | | 1 | | | | | | | | | | |
| VOLATILES | Dibromomethane | ug/L | 0.25 | U | U | | 1 | | | | | | | | | | |
| VOLATILES | Dichlorodifluoromethane | ug/L | 0.25 | U | U | | 1 | | | | | | | | | | |
| VOLATILES | Ethylbenzene | ug/L | 0.25 | U | U | | 1 | | | | | | | | | | |
| VOLATILES | Hexachlorobutadiene | ug/L | 0.25 | U | U | | 1 | | | | | | | | | | |
| VOLATILES | Isopropylbenzene | ug/L | 0.25 | U | U | | 1 | | | | | | | | | | |
| VOLATILES | m,p-Xylenes | ug/L | 0.5 | U | U | | 1 | | | | | | | | | | |
| VOLATILES | Methyl isobutyl ketone | ug/L | 2.5 | U | U | | 1 | | | | | | | | | | |
| VOLATILES | Methylene chloride | ug/L | 0.25 | U | U | | 1 | | | | | | | | | | |
| VOLATILES | Naphthalene | ug/L | 0.2 | U | U | | 1 | | | | | | | | | | |
| VOLATILES | n-Butylbenzene | ug/L | 0.25 | U | U | | 1 | | | | | | | | | | |
| VOLATILES | n-Propylbenzene | ug/L | 0.125 | U | U | | 1 | | | | | | | | | | |
| VOLATILES | p-Isopropyltoluene | ug/L | 0.25 | U | U | | 1 | | | | | | | | | | |
| VOLATILES | sec-Butylbenzene | ug/L | 0.25 | U | U | | 1 | | | | | | | | | | |
| VOLATILES | Styrene | ug/L | 0.125 | U | U | | 1 | | | | | | | | | | |
| VOLATILES | tert-Butylbenzene | ug/L | 0.25 | U | U | | 1 | | | | | | | | | | |
| VOLATILES | Tetrachloroethene | ug/L | 0.25 | U | U | | 1 | | | | | | | | | | |
| VOLATILES | Toluene | ug/L | 0.25 | U | U | | 1 | | | | | | | | | | |
| VOLATILES | trans-1,2-Dichloroethene | ug/L | 0.25 | U | U | | 1 | | | | | | | | | | |
| VOLATILES | trans-1,3-Dichloropropene | ug/L | 0.5 | U | U | | 1 | | | | | | | | | | |
| VOLATILES | Trichloroethene | ug/L | 0.25 | U | U | | 1 | | | | | | | | | | |
| VOLATILES | Trichlorofluoromethane | ug/L | 0.25 | U | U | | 1 | | | | | | | | | | |
| VOLATILES | Vinyl acetate | ug/L | 2.5 | U | U | | 1 | | | | | | | | | | |
| VOLATILES | Vinyl chloride | ug/L | 0.25 | U | U | | 1 | | | | | | | | | | |
| VOLATILES | Xylenes, Total | ug/L | | | | | | | | | | | | | | | |

Notes and Abbreviations:

02B - Analysis
15 - Quantitation
ug/L - micrograms per liter
cells/mL - cells per milliliter
Deg C - degrees celsius
DF - dilution factor
J - The analyte was positively identified; the reported value is the estimated concentration of the constituent detected in the sample analyzed.
L - Result may be biased low. Details are provided in the validation report.
mg/L - milligrams per liter
mV - millivolt
NTU - nephelometric turbidity unit
RC - reason code
U - Not detected. The analyte was analyzed for, but not detected above the associated reporting limit.
uS/cm - microsiemens per centimeter

KEMRON
ENVIRONMENTAL SERVICES

156 Starlite Drive, Marietta, OH 45750 • TEL 740-373-4071 • FAX 740-373-4835 • http://www.kemron.com

**Laboratory Report Number: L0710596**

Please find enclosed the analytical results for the samples you submitted to KEMRON Environmental Services.

Review and compilation of your report was completed by KEMRON's Sales and Service Team. If you have questions, comments or require further assistance regarding this report, please contact your team member noted in the reviewed box bleow at 800-373-4071. Team member e-mail addresses also appear here for your convenience.

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This report was reviewed on November 02, 2007.

Stephanie Mossburg

STEPHANIE MOSSBURG - Team Chemist/Data Specialist

I certify that all test results meet all of the requirements of the NELAP standards and other applicable contract terms and conditions. All results for soil samples are reported on a 'dry-weight' basis unless specified otherwise. Analytical results for water and wastes are reported on a 'as received' basis unless specified otherwise. A statement of uncertainty for each analysis is available upon request. This laboratory report shall not be reproduced, except in full, without the written approval of KEMRON Environmental Services.

This report was certified on November 02, 2007.

David E. Vandenberg

David Vandenberg - Vice President

FL DOH NELAP ID: E8755
This report contains a total of 321 pages.

**Protecting Our Environmental Future**

# KEMRON REPORT L0710596
# PREPARED FOR Shaw E I, Inc.
# WORK ID: LONGHORN AAP KARNACK TX

# 1.0 Introduction

KEMRON ENVIRONMENTAL SERVICES
REPORT NARRATIVE

**KEMRON Login No.:** L0710596

**CHAIN OF CUSTODY:** The chain of custody number was 10305.

**SHIPMENT CONDITIONS:** The chain of custody forms were received sealed in a cooler. The cooler temperature was 4 degrees C.

**SAMPLE MANAGEMENT:** All samples received were intact.

I certify that this data package is in compliance with the terms and conditions agreed to by the client and KEMRON Environmental Services, both technically and for completeness, except for the conditions noted above. Release of the data contained in this hardcopy data package has been authorized by the Laboratory Manager or designated person, as verified by the following signature.

| Approved: 25-OCT-07 |
| --- |
| Stephanie Mossburg |

# Laboratory Data Package Cover Page

This data Package consists of:

This signature page, the laboratory review checklists, and the following reportable data:

R1 Field chain-of-custody documentation;

R2 sample identification cross-reference;

R3 Test reports (analytical data sheets) for each enviornmental sample that includes:

- a) Items consistant with NELAC 5.13 or ISO/IEC 17025 Section 5.10
- b) dilution factors,
- c) preparation methods,
- d) Cleanup methods, and
- e) If required for the project, tentatively identified compounds (TICs)

R4 Surrogate recovery data including:

- a) Calculated recovery (%R) for each analyte, and
- b) The laboratory's surrogate QC limits.

R5 Test reports/summary forms for blank samples;

R6 Test reports/summary forms FOR laboratory control samples (LCSs) including:

- a) LCS spiking amount,
- b) Calculated %R for each analyte, and
- c) The laboratory"s LCS QC limits.

R7 Test reports for project matrix spike/matrix spike duplicates (MS/MSDs) including:

- a) Samples associated with the MS/MSD clearly identified,
- b) MS/MSD spiking amounts,
- c) Concentration of each MS/MSD analyte measured in the parent and spiked samples,
- d) Calculated %R and relative percent differences (RPDs), and
- e) The laboratory's MS/MSD QC limits

R8 Laboratory analytical duplicate (if applicable) revocery and precision:

- a) the amount of analyte measured in the duplicate,
- b) the calculated RPD, and
- c) the laboratory's QC limits for anlytical duplicates.

R9 List of method quantitation limits (MQLs) for each analyte for each method and matrix;

R10 Other problems or anomalies.

The exception Report for every "No" or "Not Reviewed (NR)" item in laboratory review checklist.

**Release statement:** I am responsible for the release of this laboratory data package. This data package has been reviewed by the laboratory and is complete and technically compliant with the requirements of the methods used, except where noted by the laboratory in the attached exceptions reports. By my signature below, I affirm to the best of my knowledge, all problems/anomalies, observed by the laboratory as having the potential to affect the quality of the data, have been identified by the laboratoy in the Laboratory Review Checklist, and no information or data have been knowingly withheld that would affect the quality of the data.

**Check, If applicable: []** This laboratory is an in-house laboratory controlled by the person repsonding to rule. The official signing the cover page of the rule-required report (for example, the APAR) in which these data are used is responsible for releasing this data package and is by signature affirming the above release statement is trus.

| SHERI L. PFALZGRAF | Sheri L. Pfalzgraf | Chemist II | November 2, 2007 |
|---|---|---|---|
| Name (Printed) | Signature | Official Title (printed) | DATE |

**KEMRON Environmental Services**
Laboratory Review Checklist

| | |
|---|---|
| Laboratory Name: | KEMRON |
| Laboratory Log Number: | L0710596 |
| Project Name: | 798-LONGHORN |
| Method: | 6020 |
| Prep Batch Number(s): | WG253712 |
| Reviewer Name: | SHERI L. PFALZGRAF |
| LRC Date: | November 02, 2007 |

| Description | Yes | No | NA(1) | NR(2) | ER(3) |
|---|---|---|---|---|---|
| **Chain-Of-Custody (C-O-C)** | | | | | |
| Did samples meet the laboratory's standard conditions of sample acceptability upon receipt? | ✓ | | | | |
| Were all departures from standard conditions described in an exception report? | ✓ | | | | |
| **Sample and quality control (QC) identification** | | | | | |
| Are all field sample ID numbers cross-referenced to the laboratory ID numbers? | ✓ | | | | |
| Are all laboratory ID numbers cross-referenced to the corresponding QC data? | ✓ | | | | |
| **Test reports** | | | | | |
| Were all samples prepared and analyzed within holding times? | ✓ | | | | |
| Other than those results <MQL, were all other raw values bracketed by calibration standards? | ✓ | | | | |
| Were calculations checked by a peer or supervisor? | ✓ | | | | |
| Were all analyte identifications checked by a peer or supervisor? | ✓ | | | | |
| Were sample quantitation limits reported for all analytes not detected? | ✓ | | | | |
| Were all results for soil and sediment samples reported on a dry weight basis? | ✓ | | | | |
| Were % moisture (or solids) reported for all soil and sediment samples? | ✓ | | | | |
| If required for the project, TICs reported? | | | ✓ | | |
| **Surrogate recovery data** | | | | | |
| Were surrogates added prior to extraction? | | | ✓ | | |
| Were surrogate percent recoveries in all samples within the laboratory QC limits? | | | ✓ | | |
| **Test reports/summary forms for blank samples** | | | | | |
| Were appropriate type(s) of blanks analyzed? | ✓ | | | | |
| Were blanks analyzed at the appropriate frequency? | ✓ | | | | |
| Were method blanks taken through the entire analytical process, including preparation and, if applicable, cleanup procedures? | ✓ | | | | |
| Were blank concentrations <RL? | ✓ | | | | |
| **Laboratory control samples (LCS):** | | | | | |
| Were all COCs included in the LCS? | ✓ | | | | |
| Was each LCS taken through the entire analytical procedure, including prep and cleanup steps? | ✓ | | | | |
| Were LCSs analyzed at the required frequency? | ✓ | | | | |
| Were LCS (and LCSD, if applicable) %Rs within the laboratory QC limits? | ✓ | | | | |
| Does the detectability data document the laboratory's capability to detect the COCs at the MDL used to calculate the SQLs? | ✓ | | | | |
| Was the LCSD RPD within QC limits? | | | ✓ | | |
| **Matrix spike (MS) and matrix spike duplicate (MSD) data** | | | | | |
| Were the project/method specified analytes included in the MS and MSD? | | | ✓ | | |
| Were MS/MSD analyzed at the appropriate frequency? | | | ✓ | | |
| Were MS (and MSD, if applicable) %Rs within the laboratory QC limits? | | | ✓ | | |

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| Description | Yes | No | NA(1) | NR(2) | ER(3) |
|---|---|---|---|---|---|
| Were MS/MSD RPDs within laboratory QC limits? | | | ✓ | | |
| **Analytical duplicate data** | | | | | |
| Were appropriate analytical duplicates analyzed for each matrix? | | | ✓ | | |
| Were analytical duplicates analyzed at the appropriate frequency? | | | ✓ | | |
| Were RPDs or relative standard deviations within the laboratory QC limits? | | | ✓ | | |
| **Method quantitation limits (MQLs):** | | | | | |
| Are the MQLs for each method analyte included in the laboratory data package? | ✓ | | | | |
| Do the MQLs correspond to the concentration of the lowest non-zero calibration standard? | ✓ | | | | |
| Are unadjusted MQLs included in the laboratory data package? | | ✓ | | | 1 |
| **Other problems/anomalies** | | | | | |
| Are all known problems/anomalies/special conditions noted in this LRC and ER? | ✓ | | | | |
| Were all necessary corrective actions performed for the reported data? | ✓ | | | | |
| Was applicable and available technology used to lower the SQL minimize the matrix interference affects on the sample results? | ✓ | | | | |
| **ICAL** | | | | | |
| Were response factors and/or relative response factors for each analyte within QC limits? | | | ✓ | | |
| Were percent RSDs or correlation coefficient criteria met? | ✓ | | | | |
| Was the number of standards recommended in the method used for all analytes? | ✓ | | | | |
| Were all points generated between the lowest and highest standard used to calculate the curve? | ✓ | | | | |
| Are ICAL data available for all instruments used? | ✓ | | | | |
| Has the initial calibration curve been verified using an appropriate second source standard? | ✓ | | | | |
| **Initial and continuing calibration verification (ICV and CCV) and continuing calibration blank (CCB):** | | | | | |
| Was the CCV analyzed at the method-required frequency? | ✓ | | | | |
| Were percent differences for each analyte within the method-required QC limits? | ✓ | | | | |
| Was the ICAL curve verified for each analyte? | ✓ | | | | |
| Was the absolute value of the analyte concentration in the inorganic CCB $<$RL? | ✓ | | | | |
| **Mass spectral tuning:** | | | | | |
| Was the appropriate compound for the method used for tuning? | | | ✓ | | |
| Were ion abundance data within the method-required QC limits? | | | ✓ | | |
| **Internal standards (IS):** | | | | | |
| Were IS area counts and retention times within the method-required QC limits? | | | ✓ | | |
| **Raw data (NELAC section 1 appendix A glossary, and section 5.12 or ISO/IEC 17025 section 4.12.2)** | | | | | |
| Were the raw data (for example, chromatograms, spectral data) reviewed by an analyst? | ✓ | | | | |
| Were data associated with manual integrations flagged on the raw data? | | | ✓ | | |
| **Dual column confirmation** | | | | | |
| Did dual column confirmation results meet the method-required QC? | | | ✓ | | |
| **Tentatively identified compounds (TICs):** | | | | | |
| If TICs were requested, were the mass spectra and TIC data subject to appropriate checks? | | | ✓ | | |
| **Interference Check Sample (ICS) results:** | | | | | |
| Were percent recoveries within method QC limits? | ✓ | | | | |
| **Serial dilutions, post digestion spikes, and method of standard additions** | | | | | |
| Were percent differences, recoveries, and the linearity within the QC limits specified in the method? | ✓ | | | | |
| **Method detection limit (MDL) studies** | | | | | |
| Was a MDL study performed for each reported analyte? | ✓ | | | | |
| Is the MDL either adjusted or supported by the analysis of DCSs? | ✓ | | | | |
| **Proficiency test reports:** | | | | | |
| Was the laboratory's performance acceptable on the applicable proficiency tests or evaluation studies? | ✓ | | | | |

| Description | Yes | No | NA(1) | NR(2) | ER(3) |
|---|---|---|---|---|---|
| **Standards documentation** | | | | | |
| Are all standards used in the analyses NIST-traceable or obtained from other appropriate sources? | ✓ | | | | |
| **Compound/analyte identification procedures** | | | | | |
| Are the procedures for compound/analyte identification documented? | ✓ | | | | |
| **Demonstration of analyst competency (DOC)** | | | | | |
| Was DOC conducted consistent with NELAC Chapter 5C or ISO/IEC 4? | ✓ | | | | |
| Is documentation of the analyst's competency up-to-date and on file? | ✓ | | | | |
| **Verification/validation documentation for methods (NELAC Chap 5 or ISO/IEC 17025 Section 5)** | | | | | |
| Are all the methods used to generate the data documented, verified, and validated, where applicable? | ✓ | | | | |
| **Laboratory standard operating procedures (SOPs):** | | | | | |
| Are laboratory SOPs current and on file for each method performed? | ✓ | | | | |

**KEMRON Environmental Services**
Laboratory Review Checklist

| | |
|---|---|
| Laboratory Name: | KEMRON |
| Laboratory Log Number: | L0710596 |
| Project Name: | 798-LONGHORN |
| Method: | 6020 |
| Prep Batch Number(s): | WG253712 |
| Reviewer Name: | SHERI L. PFALZGRAF |
| LRC Date: | November 02, 2007 |

**EXCEPTIONS REPORT**
**ER1 - Due to a result that exceeded the linear range on initial analysis, client sample 12 was reported from a dilution analysis for sodium. Due to a result that was noncompliant on the negative side on initial analysis, sample 12 was reported from a dilution analysis for vanadium. Due to a result that exceeded the linear range of the instrument in the reference sample to the MS/MSD, the reference, MS, and MSD were reported from dilution analyses for sodium. Due to results that were noncompliant on the negative side in the reference sample to the MS/MSD, the reference, MS, and MSD were reported from dilution analyses for aluminum and vanadium.**
**Footnotes:**
**(1) NA = Not applicable to method or project**
**(2) NR = Not reviewed**
**(3) ER# = Exception report number**

# Laboratory Data Package Cover Page

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This data Package consists of:

This signature page, the laboratory review checklists, and the following reportable data:

R1 Field chain-of-custody documentation;

R2 sample identification cross-reference;

R3 Test reports (analytical data sheets) for each enviornmental sample that includes:

- a) Items consistant with NELAC 5.13 or ISO/IEC 17025 Section 5.10
- b) dilution factors,
- c) preparation methods,
- d) Cleanup methods, and
- e) If required for the project, tentatively identified compounds (TICs)

R4 Surrogate recovery data including:

- a) Calculated recovery (%R) for each analyte, and
- b) The laboratory's surrogate QC limits.

R5 Test reports/summary forms for blank samples;

R6 Test reports/summary forms FOR laboratory control samples (LCSs) including:

- a) LCS spiking amount,
- b) Calculated %R for each analyte, and
- c) The laboratory"s LCS QC limits.

R7 Test reports for project matrix spike/matrix spike duplicates (MS/MSDs) including:

- a) Samples associated with the MS/MSD clearly identified,
- b) MS/MSD spiking amounts,
- c) Concentration of each MS/MSD analyte measured in the parent and spiked samples,
- d) Calculated %R and relative percent differences (RPDs), and
- e) The laboratory's MS/MSD QC limits

R8 Laboratory analytical duplicate (if applicable) revocery and precision:

- a) the amount of analyte measured in the duplicate,
- b) the calculated RPD, and
- c) the laboratory's QC limits for anlytical duplicates.

R9 List of method quantitation limits (MQLs) for each analyte for each method and matrix;

R10 Other problems or anomalies.

The exception Report for every "No" or "Not Reviewed (NR)" item in laboratory review checklist.

**Release statement:** I am responsible for the release of this laboratory data package. This data package has been reviewed by the laboratory and is complete and technically compliant with the requirements of the methods used, except where noted by the laboratory in the attached exceptions reports. By my signature below, I affirm to the best of my knowledge, all problems/anomalies, observed by the laboratory as having the potential to affect the quality of the data, have been identified by the laboratoy in the Laboratory Review Checklist, and no information or data have been knowingly withheld that would affect the quality of the data.

**Check, If applicable: []** This laboratory is an in-house laboratory controlled by the person repsonding to rule. The official signing the cover page of the rule-required report (for example, the APAR) in which these data are used is responsible for releasing this data package and is by signature affirming the above release statement is trus.

| MAREN M. BEERY | Maren Beery | Metals Supervisor | November 1, 2007 |
|---|---|---|---|
| Name (Printed) | Signature | Official Title (printed) | DATE |

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**KEMRON Environmental Services**
Laboratory Review Checklist

| | |
|---|---|
| Laboratory Name: | KEMRON |
| Laboratory Log Number: | L0710596 |
| Project Name: | 798-LONGHORN |
| Method: | 6010 |
| Prep Batch Number(s): | WG253902 |
| Reviewer Name: | MAREN M. BEERY |
| LRC Date: | November 01, 2007 |

| Description | Yes | No | NA(1) | NR(2) | ER(3) |
|---|---|---|---|---|---|
| **Chain-Of-Custody (C-O-C)** | | | | | |
| Did samples meet the laboratory's standard conditions of sample acceptability upon receipt? | ✓ | | | | |
| Were all departures from standard conditions described in an exception report? | ✓ | | | | |
| **Sample and quality control (QC) identification** | | | | | |
| Are all field sample ID numbers cross-referenced to the laboratory ID numbers? | ✓ | | | | |
| Are all laboratory ID numbers cross-referenced to the corresponding QC data? | ✓ | | | | |
| **Test reports** | | | | | |
| Were all samples prepared and analyzed within holding times? | ✓ | | | | |
| Other than those results <MQL, were all other raw values bracketed by calibration standards? | | | ✓ | | ER1 |
| Were calculations checked by a peer or supervisor? | ✓ | | | | |
| Were all analyte identifications checked by a peer or supervisor? | ✓ | | | | |
| Were sample quantitation limits reported for all analytes not detected? | ✓ | | | | |
| Were all results for soil and sediment samples reported on a dry weight basis? | ✓ | | | | |
| Were % moisture (or solids) reported for all soil and sediment samples? | ✓ | | | | |
| If required for the project, TICs reported? | | | ✓ | | |
| **Surrogate recovery data** | | | | | |
| Were surrogates added prior to extraction? | | | ✓ | | |
| Were surrogate percent recoveries in all samples within the laboratory QC limits? | | | ✓ | | |
| **Test reports/summary forms for blank samples** | | | | | |
| Were appropriate type(s) of blanks analyzed? | ✓ | | | | |
| Were blanks analyzed at the appropriate frequency? | ✓ | | | | |
| Were method blanks taken through the entire analytical process, including preparation and, if applicable, cleanup procedures? | ✓ | | | | |
| Were blank concentrations <RL? | ✓ | | | | |
| **Laboratory control samples (LCS):** | | | | | |
| Were all COCs included in the LCS? | ✓ | | | | |
| Was each LCS taken through the entire analytical procedure, including prep and cleanup steps? | ✓ | | | | |
| Were LCSs analyzed at the required frequency? | ✓ | | | | |
| Were LCS (and LCSD, if applicable) %Rs within the laboratory QC limits? | ✓ | | | | |
| Does the detectability data document the laboratory's capability to detect the COCs at the MDL used to calculate the SQLs? | ✓ | | | | |
| Was the LCSD RPD within QC limits? | | | ✓ | | |
| **Matrix spike (MS) and matrix spike duplicate (MSD) data** | | | | | |
| Were the project/method specified analytes included in the MS and MSD? | | | ✓ | | |
| Were MS/MSD analyzed at the appropriate frequency? | | | ✓ | | |
| Were MS (and MSD, if applicable) %Rs within the laboratory QC limits? | | | ✓ | | |

| Description | Yes | No | NA(1) | NR(2) | ER(3) |
|---|---|---|---|---|---|
| Were MS/MSD RPDs within laboratory QC limits? | | | ✓ | | |
| **Analytical duplicate data** | | | | | |
| Were appropriate analytical duplicates analyzed for each matrix? | | | ✓ | | |
| Were analytical duplicates analyzed at the appropriate frequency? | | | ✓ | | |
| Were RPDs or relative standard deviations within the laboratory QC limits? | | | ✓ | | |
| **Method quantitation limits (MQLs):** | | | | | |
| Are the MQLs for each method analyte included in the laboratory data package? | ✓ | | | | |
| Do the MQLs correspond to the concentration of the lowest non-zero calibration standard? | ✓ | | | | |
| Are unadjusted MQLs included in the laboratory data package? | ✓ | | | | |
| **Other problems/anomalies** | | | | | |
| Are all known problems/anomalies/special conditions noted in this LRC and ER? | ✓ | | | | |
| Were all necessary corrective actions performed for the reported data? | ✓ | | | | |
| Was applicable and available technology used to lower the SQL minimize the matrix interference affects on the sample results? | ✓ | | | | ER2 |
| **ICAL** | | | | | |
| Were response factors and/or relative response factors for each analyte within QC limits? | | | ✓ | | |
| Were percent RSDs or correlation coefficient criteria met? | ✓ | | | | |
| Was the number of standards recommended in the method used for all analytes? | ✓ | | | | |
| Were all points generated between the lowest and highest standard used to calculate the curve? | ✓ | | | | |
| Are ICAL data available for all instruments used? | ✓ | | | | |
| Has the initial calibration curve been verified using an appropriate second source standard? | ✓ | | | | |
| **Initial and continuing calibration verification (ICV and CCV) and continuing calibration blank (CCB):** | | | | | |
| Was the CCV analyzed at the method-required frequency? | ✓ | | | | |
| Were percent differences for each analyte within the method-required QC limits? | ✓ | | | | |
| Was the ICAL curve verified for each analyte? | ✓ | | | | |
| Was the absolute value of the analyte concentration in the inorganic CCB $<$RL? | ✓ | | | | |
| **Mass spectral tuning:** | | | | | |
| Was the appropriate compound for the method used for tuning? | | | ✓ | | |
| Were ion abundance data within the method-required QC limits? | | | ✓ | | |
| **Internal standards (IS):** | | | | | |
| Were IS area counts and retention times within the method-required QC limits? | | | ✓ | | |
| **Raw data (NELAC section 1 appendix A glossary, and section 5.12 or ISO/IEC 17025 section 4.12.2)** | | | | | |
| Were the raw data (for example, chromatograms, spectral data) reviewed by an analyst? | ✓ | | | | |
| Were data associated with manual integrations flagged on the raw data? | | | ✓ | | |
| **Dual column confirmation** | | | | | |
| Did dual column confirmation results meet the method-required QC? | | | ✓ | | |
| **Tentatively identified compounds (TICs):** | | | | | |
| If TICs were requested, were the mass spectra and TIC data subject to appropriate checks? | | | ✓ | | |
| **Interference Check Sample (ICS) results:** | | | | | |
| Were percent recoveries within method QC limits? | ✓ | | | | |
| **Serial dilutions, post digestion spikes, and method of standard additions** | | | | | |
| Were percent differences, recoveries, and the linearity within the QC limits specified in the method? | ✓ | | | | |
| **Method detection limit (MDL) studies** | | | | | |
| Was a MDL study performed for each reported analyte? | ✓ | | | | |
| Is the MDL either adjusted or supported by the analysis of DCSs? | ✓ | | | | |
| **Proficiency test reports:** | | | | | |
| Was the laboratory's performance acceptable on the applicable proficiency tests or evaluation studies? | ✓ | | | | |

| Description | Yes | No | NA(1) | NR(2) | ER(3) |
|---|---|---|---|---|---|
| **Standards documentation** | | | | | |
| Are all standards used in the analyses NIST-traceable or obtained from other appropriate sources? | ✓ | | | | |
| **Compound/analyte identification procedures** | | | | | |
| Are the procedures for compound/analyte identification documented? | ✓ | | | | |
| **Demonstration of analyst competency (DOC)** | | | | | |
| Was DOC conducted consistent with NELAC Chapter 5C or ISO/IEC 4? | ✓ | | | | |
| Is documentation of the analyst's competency up-to-date and on file? | ✓ | | | | |
| **Verification/validation documentation for methods (NELAC Chap 5 or ISO/IEC 17025 Section 5)** | | | | | |
| Are all the methods used to generate the data documented, verified, and validated, where applicable? | ✓ | | | | |
| **Laboratory standard operating procedures (SOPs):** | | | | | |
| Are laboratory SOPs current and on file for each method performed? | ✓ | | | | |

**KEMRON Environmental Services**
Laboratory Review Checklist

| | |
|---|---|
| Laboratory Name: | KEMRON |
| Laboratory Log Number: | L0710596 |
| Project Name: | 798-LONGHORN |
| Method: | 6010 |
| Prep Batch Number(s): | WG253902 |
| Reviewer Name: | MAREN M. BEERY |
| LRC Date: | November 01, 2007 |

**EXCEPTIONS REPORT**

**ER#1 - Due to a result that exceeded the linear range on initial analysis, client sample 12 was reported from a dilution analysis for sodium.**

**ER2 - Due to a result that was noncompliant on the negative side on initial analysis, sample 12 was reported from a dilution analysis for vanadium.**

**Footnotes:**

**(1) NA = Not applicable to method or project**

**(2) NR = Not reviewed**

**(3) ER# = Exception report number**

# Laboratory Data Package Cover Page

This data Package consists of:

This signature page, the laboratory review checklists, and the following reportable data:

R1 Field chain-of-custody documentation;

R2 sample identification cross-reference;

R3 Test reports (analytical data sheets) for each enviornmental sample that includes:

a) Items consistant with NELAC 5.13 or ISO/IEC 17025 Section 5.10

b) dilution factors,

c) preparation methods,

d) Cleanup methods, and

e) If required for the project, tentatively identified compounds (TICs)

R4 Surrogate recovery data including:

a) Calculated recovery (%R) for each analyte, and

b) The laboratory's surrogate QC limits.

R5 Test reports/summary forms for blank samples;

R6 Test reports/summary forms FOR laboratory control samples (LCSs) including:

a) LCS spiking amount,

b) Calculated %R for each analyte, and

c) The laboratory"s LCS QC limits.

R7 Test reports for project matrix spike/matrix spike duplicates (MS/MSDs) including:

a) Samples associated with the MS/MSD clearly identified,

b) MS/MSD spiking amounts,

c) Concentration of each MS/MSD analyte measured in the parent and spiked samples,

d) Calculated %R and relative percent differences (RPDs), and

e) The laboratory's MS/MSD QC limits

R8 Laboratory analytical duplicate (if applicable) revocery and precision:

a) the amount of analyte measured in the duplicate,

b) the calculated RPD, and

c) the laboratory's QC limits for anlytical duplicates.

R9 List of method quantitation limits (MQLs) for each analyte for each method and matrix;

R10 Other problems or anomalies.

The exception Report for every "No" or "Not Reviewed (NR)" item in laboratory review checklist.

**Release statement:** I am responsible for the release of this laboratory data package. This data package has been reviewed by the laboratory and is complete and technically compliant with the requirements of the methods used, except where noted by the laboratory in the attached exceptions reports. By my signature below, I affirm to the best of my knowledge, all problems/anomalies, observed by the laboratory as having the potential to affect the quality of the data, have been identified by the laboratoy in the Laboratory Review Checklist, and no information or data have been knowingly withheld that would affect the quality of the data.

**Check, If applicable: []** This laboratory is an in-house laboratory controlled by the person repsonding to rule. The official signing the cover page of the rule-required report (for example, the APAR) in which these data are used is responsible for releasing this data package and is by signature affirming the above release statement is trus.

| MAREN M. BEERY | Maren Beery | Metals Supervisor | October 25, 2007 |
|---|---|---|---|
| Name (Printed) | Signature | Official Title (printed) | DATE |

**KEMRON Environmental Services**

Laboratory Review Checklist

| | |
|---|---|
| Laboratory Name: | KEMRON |
| Laboratory Log Number: | L0710596 |
| Project Name: | 798-LONGHORN |
| Method: | 7471 |
| Prep Batch Number(s): | WG253689 |
| Reviewer Name: | MAREN M. BEERY |
| LRC Date: | October 25, 2007 |

| Description | Yes | No | NA(1) | NR(2) | ER(3) |
|---|---|---|---|---|---|
| **Chain-Of-Custody (C-O-C)** | | | | | |
| Did samples meet the laboratory’s standard conditions of sample acceptability upon receipt? | ✓ | | | | |
| Were all departures from standard conditions described in an exception report? | ✓ | | | | |
| **Sample and quality control (QC) identification** | | | | | |
| Are all field sample ID numbers cross-referenced to the laboratory ID numbers? | ✓ | | | | |
| Are all laboratory ID numbers cross-referenced to the corresponding QC data? | ✓ | | | | |
| **Test reports** | | | | | |
| Were all samples prepared and analyzed within holding times? | ✓ | | | | |
| Other than those results <MQL, were all other raw values bracketed by calibration standards? | ✓ | | | | |
| Were calculations checked by a peer or supervisor? | ✓ | | | | |
| Were all analyte identifications checked by a peer or supervisor? | ✓ | | | | |
| Were sample quantitation limits reported for all analytes not detected? | ✓ | | | | |
| Were all results for soil and sediment samples reported on a dry weight basis? | ✓ | | | | |
| Were % moisture (or solids) reported for all soil and sediment samples? | ✓ | | | | |
| If required for the project, TICs reported? | | | ✓ | | |
| **Surrogate recovery data** | | | | | |
| Were surrogates added prior to extraction? | | | ✓ | | |
| Were surrogate percent recoveries in all samples within the laboratory QC limits? | | | ✓ | | |
| **Test reports/summary forms for blank samples** | | | | | |
| Were appropriate type(s) of blanks analyzed? | ✓ | | | | |
| Were blanks analyzed at the appropriate frequency? | ✓ | | | | |
| Were method blanks taken through the entire analytical process, including preparation and, if applicable, cleanup procedures? | ✓ | | | | |
| Were blank concentrations <RL? | ✓ | | | | |
| **Laboratory control samples (LCS):** | | | | | |
| Were all COCs included in the LCS? | ✓ | | | | |
| Was each LCS taken through the entire analytical procedure, including prep and cleanup steps? | ✓ | | | | |
| Were LCSs analyzed at the required frequency? | ✓ | | | | |
| Were LCS (and LCSD, if applicable) %Rs within the laboratory QC limits? | ✓ | | | | |
| Does the detectability data document the laboratory’s capability to detect the COCs at the MDL used to calculate the SQLs? | ✓ | | | | |
| Was the LCSD RPD within QC limits? | | | ✓ | | |
| **Matrix spike (MS) and matrix spike duplicate (MSD) data** | | | | | |
| Were the project/method specified analytes included in the MS and MSD? | | | ✓ | | |
| Were MS/MSD analyzed at the appropriate frequency? | | | ✓ | | |
| Were MS (and MSD, if applicable) %Rs within the laboratory QC limits? | | | ✓ | | |

| Description | Yes | No | NA(1) | NR(2) | ER(3) |
|---|---|---|---|---|---|
| Were MS/MSD RPDs within laboratory QC limits? | | | ✓ | | |
| **Analytical duplicate data** | | | | | |
| Were appropriate analytical duplicates analyzed for each matrix? | | | ✓ | | |
| Were analytical duplicates analyzed at the appropriate frequency? | | | ✓ | | |
| Were RPDs or relative standard deviations within the laboratory QC limits? | | | ✓ | | |
| **Method quantitation limits (MQLs):** | | | | | |
| Are the MQLs for each method analyte included in the laboratory data package? | ✓ | | | | |
| Do the MQLs correspond to the concentration of the lowest non-zero calibration standard? | ✓ | | | | |
| Are unadjusted MQLs included in the laboratory data package? | ✓ | | | | |
| **Other problems/anomalies** | | | | | |
| Are all known problems/anomalies/special conditions noted in this LRC and ER? | ✓ | | | | |
| Were all necessary corrective actions performed for the reported data? | ✓ | | | | |
| Was applicable and available technology used to lower the SQL minimize the matrix interference affects on the sample results? | ✓ | | | | |
| **ICAL** | | | | | |
| Were response factors and/or relative response factors for each analyte within QC limits? | | | ✓ | | |
| Were percent RSDs or correlation coefficient criteria met? | ✓ | | | | |
| Was the number of standards recommended in the method used for all analytes? | ✓ | | | | |
| Were all points generated between the lowest and highest standard used to calculate the curve? | ✓ | | | | |
| Are ICAL data available for all instruments used? | ✓ | | | | |
| Has the initial calibration curve been verified using an appropriate second source standard? | ✓ | | | | |
| **Initial and continuing calibration verification (ICV and CCV) and continuing calibration blank (CCB):** | | | | | |
| Was the CCV analyzed at the method-required frequency? | ✓ | | | | |
| Were percent differences for each analyte within the method-required QC limits? | ✓ | | | | |
| Was the ICAL curve verified for each analyte? | ✓ | | | | |
| Was the absolute value of the analyte concentration in the inorganic CCB <RL? | ✓ | | | | |
| **Mass spectral tuning:** | | | | | |
| Was the appropriate compound for the method used for tuning? | | | ✓ | | |
| Were ion abundance data within the method-required QC limits? | | | ✓ | | |
| **Internal standards (IS):** | | | | | |
| Were IS area counts and retention times within the method-required QC limits? | | | ✓ | | |
| **Raw data (NELAC section 1 appendix A glossary, and section 5.12 or ISO/IEC 17025 section 4.12.2)** | | | | | |
| Were the raw data (for example, chromatograms, spectral data) reviewed by an analyst? | ✓ | | | | |
| Were data associated with manual integrations flagged on the raw data? | | | ✓ | | |
| **Dual column confirmation** | | | | | |
| Did dual column confirmation results meet the method-required QC? | | | ✓ | | |
| **Tentatively identified compounds (TICs):** | | | | | |
| If TICs were requested, were the mass spectra and TIC data subject to appropriate checks? | | | ✓ | | |
| **Interference Check Sample (ICS) results:** | | | | | |
| Were percent recoveries within method QC limits? | | | ✓ | | |
| **Serial dilutions, post digestion spikes, and method of standard additions** | | | | | |
| Were percent differences, recoveries, and the linearity within the QC limits specified in the method? | ✓ | | | | |
| **Method detection limit (MDL) studies** | | | | | |
| Was a MDL study performed for each reported analyte? | ✓ | | | | |
| Is the MDL either adjusted or supported by the analysis of DCSs? | ✓ | | | | |
| **Proficiency test reports:** | | | | | |
| Was the laboratory's performance acceptable on the applicable proficiency tests or evaluation studies? | ✓ | | | | |

00078597

| Description | Yes | No | NA(1) | NR(2) | ER(3) |
|---|---|---|---|---|---|
| **Standards documentation** | | | | | |
| Are all standards used in the analyses NIST-traceable or obtained from other appropriate sources? | ✓ | | | | |
| **Compound/analyte identification procedures** | | | | | |
| Are the procedures for compound/analyte identification documented? | ✓ | | | | |
| **Demonstration of analyst competency (DOC)** | | | | | |
| Was DOC conducted consistent with NELAC Chapter 5C or ISO/IEC 4? | ✓ | | | | |
| Is documentation of the analyst's competency up-to-date and on file? | ✓ | | | | |
| **Verification/validation documentation for methods (NELAC Chap 5 or ISO/IEC 17025 Section 5)** | | | | | |
| Are all the methods used to generate the data documented, verified, and validated, where applicable? | ✓ | | | | |
| **Laboratory standard operating procedures (SOPs):** | | | | | |
| Are laboratory SOPs current and on file for each method performed? | ✓ | | | | |

**KEMRON Environmental Services**
Laboratory Review Checklist

| | |
|---|---|
| Laboratory Name: | KEMRON |
| Laboratory Log Number: | L0710596 |
| Project Name: | 798-LONGHORN |
| Method: | 7471 |
| Prep Batch Number(s): | WG253689 |
| Reviewer Name: | MAREN M. BEERY |
| LRC Date: | October 25, 2007 |

**EXCEPTIONS REPORT**
**ER# - Description**
Footnotes:
(1) NA = Not applicable to method or project
(2) NR = Not reviewed
(3) ER# = Exception report number

# Laboratory Data Package Cover Page

This data Package consists of:

This signature page, the laboratory review checklists, and the following reportable data:

R1 Field chain-of-custody documentation;

R2 sample identification cross-reference;

R3 Test reports (analytical data sheets) for each enviornmental sample that includes:

a) Items consistant with NELAC 5.13 or ISO/IEC 17025 Section 5.10

b) dilution factors,

c) preparation methods,

d) Cleanup methods, and

e) If required for the project, tentatively identified compounds (TICs)

R4 Surrogate recovery data including:

a) Calculated recovery (%R) for each analyte, and

b) The laboratory's surrogate QC limits.

✓R5 Test reports/summary forms for blank samples;

✓R6 Test reports/summary forms for laboratory control samples (LCSs) including:

a) LCS spiking amount,

b) Calculated %R for each analyte, and

c) The laboratory"s LCS QC limits.

R7 Test reports for project matrix spike/matrix spike duplicates (MS/MSDs) including:

a) Samples associated with the MS/MSD clearly identified,

b) MS/MSD spiking amounts,

c) Concentration of each MS/MSD analyte measured in the parent and spiked samples,

d) Calculated %R and relative percent differences (RPDs), and

e) The laboratory's MS/MSD QC limits

R8 Laboratory analytical duplicate (if applicable) revocery and precision:

a) the amount of analyte measured in the duplicate,

b) the calculated RPD, and

c) the laboratory's QC limits for anlytical duplicates.

R9 List of method quantitation limits (MQLs) for each analyte for each method and matrix;

R10 Other problems or anomalies.

The exception Report for every "No" or "Not Reviewed (NR)" item in laboratory review checklist.

**Release statement:** I am responsible for the release of this laboratory data package. This data package has been reviewed by the laboratory and is complete and technically compliant with the requirements of the methods used, except where noted by the laboratory in the attached exceptions reports. By my signature below, I affirm to the best of my knowledge, all problems/anomalies, observed by the laboratory as having the potential to affect the quality of the data, have been identified by the laboratoy in the Laboratory Review Checklist, and no information or data have been knowingly withheld that would affect the quality of the data.

**Check, If applicable: []** This laboratory is an in-house laboratory controlled by the person repsonding to rule. The official signing the cover page of the rule-required report (for example, the APAR) in which these data are used is responsible for releasing this data package and is by signature affirming the above release statement is trus.

| DEANNA I. HESSON | Deanna I Hesson | Conventional Lab Supervisor | October 29, 2007 |
|---|---|---|---|
| Name (Printed) | Signature | Official Title (printed) | DATE |

**KEMRON Environmental Services**
Laboratory Review Checklist

| | |
|---|---|
| Laboratory Name: | KEMRON |
| Laboratory Log Number: | L0710596 |
| Project Name: | 798-LONGHORN |
| Method: | TDS |
| Prep Batch Number(s): | WG253612 |
| Reviewer Name: | DEANNA I. HESSON |
| LRC Date: | October 29, 2007 |

| Description | Yes | No | NA(1) | NR(2) | ER(3) |
|---|---|---|---|---|---|
| **Chain-Of-Custody (C-O-C)** | | | | | |
| Did samples meet the laboratory's standard conditions of sample acceptability upon receipt? | ✓ | | | | |
| Were all departures from standard conditions described in an exception report? | ✓ | | | | |
| **Sample and quality control (QC) identification** | | | | | |
| Are all field sample ID numbers cross-referenced to the laboratory ID numbers? | ✓ | | | | |
| Are all laboratory ID numbers cross-referenced to the corresponding QC data? | ✓ | | | | |
| **Test reports** | | | | | |
| Were all samples prepared and analyzed within holding times? | ✓ | | | | |
| Other than those results <MQL, were all other raw values bracketed by calibration standards? | | | ✓ | | |
| Were calculations checked by a peer or supervisor? | ✓ | | | | |
| Were all analyte identifications checked by a peer or supervisor? | ✓ | | | | |
| Were sample quantitation limits reported for all analytes not detected? | ✓ | | | | |
| Were all results for soil and sediment samples reported on a dry weight basis? | | | ✓ | | |
| Were % moisture (or solids) reported for all soil and sediment samples? | | | ✓ | | |
| If required for the project, TICs reported? | | | ✓ | | |
| **Surrogate recovery data** | | | | | |
| Were surrogates added prior to extraction? | | | ✓ | | |
| Were surrogate percent recoveries in all samples within the laboratory QC limits? | | | ✓ | | |
| **Test reports/summary forms for blank samples** | | | | | |
| Were appropriate type(s) of blanks analyzed? | ✓ | | | | |
| Were blanks analyzed at the appropriate frequency? | ✓ | | | | |
| Were method blanks taken through the entire analytical process, including preparation and, if applicable, cleanup procedures? | ✓ | | | | |
| Were blank concentrations <MQL? | ✓ | | | | |
| **Laboratory control samples (LCS):** | | | | | |
| Were all COCs included in the LCS? | ✓ | | | | |
| Was each LCS taken through the entire analytical procedure, including prep and cleanup steps? | ✓ | | | | |
| Were LCSs analyzed at the required frequency? | ✓ | | | | |
| Were LCS (and LCSD, if applicable) %Rs within the laboratory QC limits? | ✓ | | | | |
| Does the detectability data document the laboratorys capability to detect the COCs at the MDL used to calculate the SQLs? | ✓ | | | | |
| Was the LCSD RPD within QC limits? | ✓ | | | | |
| **Matrix spike (MS) and matrix spike duplicate (MSD) data** | | | | | |
| Were the project/method specified analytes included in the MS and MSD? | | | ✓ | | |
| Were MS/MSD analyzed at the appropriate frequency? | | | ✓ | | |
| Were MS (and MSD, if applicable) %Rs within the laboratory QC limits? | | | ✓ | | |

| Description | Yes | No | NA(1) | NR(2) | ER(3) |
|---|---|---|---|---|---|
| Were MS/MSD RPDs within laboratory QC limits? | | | ✓ | | |
| **Analytical duplicate data** | | | | | |
| Were appropriate analytical duplicates analyzed for each matrix? | | | ✓ | | |
| Were analytical duplicates analyzed at the appropriate frequency? | | | ✓ | | |
| Were RPDs or relative standard deviations within the laboratory QC limits? | | | ✓ | | |
| **Method quantitation limits (MQLs):** | | | | | |
| Are the MQLs for each method analyte included in the laboratory data package? | ✓ | | | | |
| Do the MQLs correspond to the concentration of the lowest non-zero calibration standard? | ✓ | | | | |
| Are unadjusted MQLs included in the laboratory data package? | ✓ | | | | |
| **Other problems/anomalies** | | | | | |
| Are all known problems/anomalies/special conditions noted in this LRC and ER? | ✓ | | | | |
| Were all necessary corrective actions performed for the reported data? | ✓ | | | | |
| Was applicable and available technology used to lower the SQL minimize the matrix interference affects on the sample results? | ✓ | | | | |
| Were response factors and/or relative response factors for each analyte within QC limits? | | | ✓ | | |
| Were percent RSDs or correlation coefficient criteria met? | | | ✓ | | |
| Was the number of standards recommended in the method used for all analytes? | | | ✓ | | |
| Were all points generated between the lowest and highest standard used to calculate the curve? | | | ✓ | | |
| Are ICAL data available for all instruments used? | | | ✓ | | |
| Has the initial calibration curve been verified using an appropriate second source standard? | | | ✓ | | |
| **Initial and continuing calibration verification (ICV and CCV) and continuing calibration blank (CCB):** | | | | | |
| Was the CCV analyzed at the method-required frequency? | | | ✓ | | |
| Were percent differences for each analyte within the method-required QC limits? | | | ✓ | | |
| Was the ICAL curve verified for each analyte? | | | ✓ | | |
| Was the absolute value of the analyte concentration in the inorganic CCB $<$MDL? | | | ✓ | | |
| **Mass spectral tuning:** | | | | | |
| Was the appropriate compound for the method used for tuning? | | | ✓ | | |
| Were ion abundance data within the method-required QC limits? | | | ✓ | | |
| **Internal standards (IS):** | | | | | |
| Were IS area counts and retention times within the method-required QC limits? | | | ✓ | | |
| **Raw data (NELAC section 1 appendix A glossary, and section 5.12 or ISO/IEC 17025 section 4.12.2)** | | | | | |
| Were the raw data (for example, chromatograms, spectral data) reviewed by an analyst? | ✓ | | | | |
| Were data associated with manual integrations flagged on the raw data? | | | ✓ | | |
| **Dual column confirmation** | | | | | |
| Did dual column confirmation results meet the method-required QC? | | | ✓ | | |
| **Tentatively identified compounds (TICs):** | | | | | |
| If TICs were requested, were the mass spectra and TIC data subject to appropriate checks? | | | ✓ | | |
| **Interference Check Sample (ICS) results:** | | | | | |
| Were percent recoveries within method QC limits? | | | ✓ | | |
| **Serial dilutions, post digestion spikes, and method of standard additions** | | | | | |
| Were percent differences, recoveries, and the linearity within the QC limits specified in the method? | | | ✓ | | |
| **Method detection limit (MDL) studies** | | | | | |
| Was a MDL study performed for each reported analyte? | ✓ | | | | |
| Is the MDL either adjusted or supported by the analysis of DCSs? | ✓ | | | | |
| **Proficiency test reports:** | | | | | |
| Was the laboratory's performance acceptable on the applicable proficiency tests or evaluation studies? | ✓ | | | | |

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| Description | Yes | No | NA(1) | NR(2) | ER(3) |
|---|---|---|---|---|---|
| **Standards documentation** | | | | | |
| Are all standards used in the analyses NIST-traceable or obtained from other appropriate sources? | ✓ | | | | |
| **Compound/analyte identification procedures** | | | | | |
| Are the procedures for compound/analyte identification documented? | ✓ | | | | |
| **Demonstration of analyst competency (DOC)** | | | | | |
| Was DOC conducted consistent with NELAC Chapter 5C or ISO/IEC 4? | ✓ | | | | |
| Is documentation of the analyst's competency up-to-date and on file? | ✓ | | | | |
| **Verification/validation documentation for methods (NELAC Chap 5 or ISO/IEC 17025 Section 5)** | | | | | |
| Are all the methods used to generate the data documented, verified, and validated, where applicable? | ✓ | | | | |
| **Laboratory standard operating procedures (SOPs):** | | | | | |
| Are laboratory SOPs current and on file for each method performed? | ✓ | | | | |

**KEMRON Environmental Services**
Laboratory Review Checklist

| | |
|---|---|
| Laboratory Name: | KEMRON |
| Laboratory Log Number: | L0710596 |
| Project Name: | 798-LONGHORN |
| Method: | TDS |
| Prep Batch Number(s): | WG253612 |
| Reviewer Name: | DEANNA I. HESSON |
| LRC Date: | October 29, 2007 |

**EXCEPTIONS REPORT**
**ER# - Description**
Footnotes:
(1) NA = Not applicable to method or project
(2) NR = Not reviewed
(3) ER# = Exception report number

# Laboratory Data Package Cover Page



This data Package consists of:

This signature page, the laboratory review checklists, and the following reportable data:

R1 Field chain-of-custody documentation;

R2 sample identification cross-reference;

R3 Test reports (analytical data sheets) for each enviornmental sample that includes:

a) Items consistant with NELAC 5.13 or ISO/IEC 17025 Section 5.10

b) dilution factors,

c) preparation methods,

d) Cleanup methods, and

e) If required for the project, tentatively identified compounds (TICs)

R4 Surrogate recovery data including:

a) Calculated recovery (%R) for each analyte, and

b) The laboratory's surrogate QC limits.

✓R5 Test reports/summary forms for blank samples;

✓R6 Test reports/summary forms for laboratory control samples (LCSs) including:

a) LCS spiking amount,

b) Calculated %R for each analyte, and

c) The laboratory"s LCS QC limits.

R7 Test reports for project matrix spike/matrix spike duplicates (MS/MSDs) including:

a) Samples associated with the MS/MSD clearly identified,

b) MS/MSD spiking amounts,

c) Concentration of each MS/MSD analyte measured in the parent and spiked samples,

d) Calculated %R and relative percent differences (RPDs), and

e) The laboratory's MS/MSD QC limits

R8 Laboratory analytical duplicate (if applicable) revocery and precision:

a) the amount of analyte measured in the duplicate,

b) the calculated RPD, and

c) the laboratory's QC limits for anlytical duplicates.

R9 List of method quantitation limits (MQLs) for each analyte for each method and matrix;

R10 Other problems or anomalies.

The exception Report for every "No" or "Not Reviewed (NR)" item in laboratory review checklist.

**Release statement:** I am responsible for the release of this laboratory data package. This data package has been reviewed by the laboratory and is complete and technically compliant with the requirements of the methods used, except where noted by the laboratory in the attached exceptions reports. By my signature below, I affirm to the best of my knowledge, all problems/anomalies, observed by the laboratory as having the potential to affect the quality of the data, have been identified by the laboratoy in the Laboratory Review Checklist, and no information or data have been knowingly withheld that would affect the quality of the data.

**Check, If applicable: []** This laboratory is an in-house laboratory controlled by the person repsonding to rule. The official signing the cover page of the rule-required report (for example, the APAR) in which these data are used is responsible for releasing this data package and is by signature affirming the above release statement is trus.

| DEANNA I. HESSON | Deanna Hesson | Conventional Lab Supervisor | October 29, 2007 |
|---|---|---|---|
| Name (Printed) | Signature | Official Title (printed) | DATE |

RG-366/TRRP-13 December 2002 A1

**KEMRON Environmental Services**
Laboratory Review Checklist

| | |
|---|---|
| Laboratory Name: | KEMRON |
| Laboratory Log Number: | L0710596 |
| Project Name: | 798-LONGHORN |
| Method: | TSS |
| Prep Batch Number(s): | WG253700 |
| Reviewer Name: | DEANNA I. HESSON |
| LRC Date: | October 29, 2007 |

| Description | Yes | No | NA(1) | NR(2) | ER(3) |
|---|---|---|---|---|---|
| **Chain-Of-Custody (C-O-C)** | | | | | |
| Did samples meet the laboratory's standard conditions of sample acceptability upon receipt? | ✓ | | | | |
| Were all departures from standard conditions described in an exception report? | ✓ | | | | |
| **Sample and quality control (QC) identification** | | | | | |
| Are all field sample ID numbers cross-referenced to the laboratory ID numbers? | ✓ | | | | |
| Are all laboratory ID numbers cross-referenced to the corresponding QC data? | ✓ | | | | |
| **Test reports** | | | | | |
| Were all samples prepared and analyzed within holding times? | ✓ | | | | |
| Other than those results <MQL, were all other raw values bracketed by calibration standards? | | | ✓ | | |
| Were calculations checked by a peer or supervisor? | ✓ | | | | |
| Were all analyte identifications checked by a peer or supervisor? | ✓ | | | | |
| Were sample quantitation limits reported for all analytes not detected? | ✓ | | | | |
| Were all results for soil and sediment samples reported on a dry weight basis? | | | ✓ | | |
| Were % moisture (or solids) reported for all soil and sediment samples? | | | ✓ | | |
| If required for the project, TICs reported? | | | ✓ | | |
| **Surrogate recovery data** | | | | | |
| Were surrogates added prior to extraction? | | | ✓ | | |
| Were surrogate percent recoveries in all samples within the laboratory QC limits? | | | ✓ | | |
| **Test reports/summary forms for blank samples** | | | | | |
| Were appropriate type(s) of blanks analyzed? | ✓ | | | | |
| Were blanks analyzed at the appropriate frequency? | ✓ | | | | |
| Were method blanks taken through the entire analytical process, including preparation and, if applicable, cleanup procedures? | ✓ | | | | |
| Were blank concentrations <MQL? | ✓ | | | | |
| **Laboratory control samples (LCS):** | | | | | |
| Were all COCs included in the LCS? | ✓ | | | | |
| Was each LCS taken through the entire analytical procedure, including prep and cleanup steps? | ✓ | | | | |
| Were LCSs analyzed at the required frequency? | ✓ | | | | |
| Were LCS (and LCSD, if applicable) %Rs within the laboratory QC limits? | ✓ | | | | |
| Does the detectability data document the laboratorys capability to detect the COCs at the MDL used to calculate the SQLs? | ✓ | | | | |
| Was the LCSD RPD within QC limits? | ✓ | | | | |
| **Matrix spike (MS) and matrix spike duplicate (MSD) data** | | | | | |
| Were the project/method specified analytes included in the MS and MSD? | | | ✓ | | |
| Were MS/MSD analyzed at the appropriate frequency? | | | ✓ | | |
| Were MS (and MSD, if applicable) %Rs within the laboratory QC limits? | | | ✓ | | |

| Description | Yes | No | NA(1) | NR(2) | ER(3) |
|---|---|---|---|---|---|
| Were MS/MSD RPDs within laboratory QC limits? | | | ✓ | | |
| **Analytical duplicate data** | | | | | |
| Were appropriate analytical duplicates analyzed for each matrix? | | | ✓ | | |
| Were analytical duplicates analyzed at the appropriate frequency? | | | ✓ | | |
| Were RPDs or relative standard deviations within the laboratory QC limits? | | | ✓ | | |
| **Method quantitation limits (MQLs):** | | | | | |
| Are the MQLs for each method analyte included in the laboratory data package? | ✓ | | | | |
| Do the MQLs correspond to the concentration of the lowest non-zero calibration standard? | ✓ | | | | |
| Are unadjusted MQLs included in the laboratory data package? | ✓ | | | | |
| **Other problems/anomalies** | | | | | |
| Are all known problems/anomalies/special conditions noted in this LRC and ER? | ✓ | | | | |
| Were all necessary corrective actions performed for the reported data? | ✓ | | | | |
| Was applicable and available technology used to lower the SQL minimize the matrix interference affects on the sample results? | ✓ | | | | |
| Were response factors and/or relative response factors for each analyte within QC limits? | | | ✓ | | |
| Were percent RSDs or correlation coefficient criteria met? | | | ✓ | | |
| Was the number of standards recommended in the method used for all analytes? | | | ✓ | | |
| Were all points generated between the lowest and highest standard used to calculate the curve? | | | ✓ | | |
| Are ICAL data available for all instruments used? | | | ✓ | | |
| Has the initial calibration curve been verified using an appropriate second source standard? | | | ✓ | | |
| **Initial and continuing calibration verification (ICV and CCV) and continuing calibration blank (CCB):** | | | | | |
| Was the CCV analyzed at the method-required frequency? | | | ✓ | | |
| Were percent differences for each analyte within the method-required QC limits? | | | ✓ | | |
| Was the ICAL curve verified for each analyte? | | | ✓ | | |
| Was the absolute value of the analyte concentration in the inorganic CCB $<$MDL? | | | ✓ | | |
| **Mass spectral tuning:** | | | | | |
| Was the appropriate compound for the method used for tuning? | | | ✓ | | |
| Were ion abundance data within the method-required QC limits? | | | ✓ | | |
| **Internal standards (IS):** | | | | | |
| Were IS area counts and retention times within the method-required QC limits? | | | ✓ | | |
| **Raw data (NELAC section 1 appendix A glossary, and section 5.12 or ISO/IEC 17025 section 4.12.2)** | | | | | |
| Were the raw data (for example, chromatograms, spectral data) reviewed by an analyst? | ✓ | | | | |
| Were data associated with manual integrations flagged on the raw data? | | | ✓ | | |
| **Dual column confirmation** | | | | | |
| Did dual column confirmation results meet the method-required QC? | | | ✓ | | |
| **Tentatively identified compounds (TICs):** | | | | | |
| If TICs were requested, were the mass spectra and TIC data subject to appropriate checks? | | | ✓ | | |
| **Interference Check Sample (ICS) results:** | | | | | |
| Were percent recoveries within method QC limits? | | | ✓ | | |
| **Serial dilutions, post digestion spikes, and method of standard additions** | | | | | |
| Were percent differences, recoveries, and the linearity within the QC limits specified in the method? | | | ✓ | | |
| **Method detection limit (MDL) studies** | | | | | |
| Was a MDL study performed for each reported analyte? | ✓ | | | | |
| Is the MDL either adjusted or supported by the analysis of DCSs? | ✓ | | | | |
| **Proficiency test reports:** | | | | | |
| Was the laboratory's performance acceptable on the applicable proficiency tests or evaluation studies? | ✓ | | | | |

| Description | Yes | No | NA(1) | NR(2) | ER(3) |
|---|---|---|---|---|---|
| **Standards documentation** | | | | | |
| Are all standards used in the analyses NIST-traceable or obtained from other appropriate sources? | ✓ | | | | |
| **Compound/analyte identification procedures** | | | | | |
| Are the procedures for compound/analyte identification documented? | ✓ | | | | |
| **Demonstration of analyst competency (DOC)** | | | | | |
| Was DOC conducted consistent with NELAC Chapter 5C or ISO/IEC 4? | ✓ | | | | |
| Is documentation of the analyst's competency up-to-date and on file? | ✓ | | | | |
| **Verification/validation documentation for methods (NELAC Chap 5 or ISO/IEC 17025 Section 5)** | | | | | |
| Are all the methods used to generate the data documented, verified, and validated, where applicable? | ✓ | | | | |
| **Laboratory standard operating procedures (SOPs):** | | | | | |
| Are laboratory SOPs current and on file for each method performed? | ✓ | | | | |

**KEMRON Environmental Services**
Laboratory Review Checklist

| | |
|---|---|
| Laboratory Name: | KEMRON |
| Laboratory Log Number: | L0710596 |
| Project Name: | 798-LONGHORN |
| Method: | TSS |
| Prep Batch Number(s): | WG253700 |
| Reviewer Name: | DEANNA I. HESSON |
| LRC Date: | October 29, 2007 |

**EXCEPTIONS REPORT**
**ER# - Description**
Footnotes:
(1) NA = Not applicable to method or project
(2) NR = Not reviewed
(3) ER# = Exception report number

# Laboratory Data Package Cover Page

00078609

This data Package consists of:

This signature page, the laboratory review checklists, and the following reportable data:

R1 Field chain-of-custody documentation;

R2 sample identification cross-reference;

R3 Test reports (analytical data sheets) for each enviornmental sample that includes:

- a) Items consistant with NELAC 5.13 or ISO/IEC 17025 Section 5.10
- b) dilution factors,
- c) preparation methods,
- d) Cleanup methods, and
- e) If required for the project, tentatively identified compounds (TICs)

R4 Surrogate recovery data including:

- a) Calculated recovery (%R) for each analyte, and
- b) The laboratory's surrogate QC limits.

✓R5 Test reports/summary forms for blank samples;

✓R6 Test reports/summary forms for laboratory control samples (LCSs) including:

- a) LCS spiking amount,
- b) Calculated %R for each analyte, and
- c) The laboratory"s LCS QC limits.

R7 Test reports for project matrix spike/matrix spike duplicates (MS/MSDs) including:

- a) Samples associated with the MS/MSD clearly identified,
- b) MS/MSD spiking amounts,
- c) Concentration of each MS/MSD analyte measured in the parent and spiked samples,
- d) Calculated %R and relative percent differences (RPDs), and
- e) The laboratory's MS/MSD QC limits

✓R8 Laboratory analytical duplicate (if applicable) revocery and precision:

- a) the amount of analyte measured in the duplicate,
- b) the calculated RPD, and
- c) the laboratory's QC limits for anlytical duplicates.

R9 List of method quantitation limits (MQLs) for each analyte for each method and matrix;

R10 Other problems or anomalies.

✓The exception Report for every "No" or "Not Reviewed (NR)" item IN laboratory review checklist.

**Release statement:** I am responsible for the release of this laboratory data package. This data package has been reviewed by the laboratory and is complete and technically compliant with the requirements of the methods used, except where noted by the laboratory in the attached exceptions reports. By my signature below, I affirm to the best of my knowledge, all problems/anomalies, observed by the laboratory as having the potential to affect the quality of the data, have been identified by the laboratoy in the Laboratory Review Checklist, and no information or data have been knowingly withheld that would affect the quality of the data.

**Check, If applicable: []** This laboratory is an in-house laboratory controlled by the person repsonding to rule. The official signing the cover page of the rule-required report (for example, the APAR) in which these data are used is responsible for releasing this data package and is by signature affirming the above release statement is trus.

| MICHAEL D. COCHRAN | Michael Cochran | Semivolatiles Lab Supervisor | October 30, 2007 |
|---|---|---|---|
| Name (Printed) | Signature | Official Title (printed) | DATE |

**KEMRON Environmental Services**
Laboratory Review Checklist

| | |
|---|---|
| Laboratory Name: | KEMRON |
| Laboratory Log Number: | L0710596 |
| Project Name: | 798-LONGHORN |
| Method: | 314 |
| Prep Batch Number(s): | WG254202 |
| Reviewer Name: | MICHAEL D. COCHRAN |
| LRC Date: | October 30, 2007 |

| Description | Yes | No | NA(1) | NR(2) | ER(3) |
|---|---|---|---|---|---|
| **Chain-Of-Custody (C-O-C)** | | | | | |
| Did samples meet the laboratory's standard conditions of sample acceptability upon receipt? | ✓ | | | | |
| Were all departures from standard conditions described in an exception report? | ✓ | | | | |
| **Sample and quality control (QC) identification** | | | | | |
| Are all field sample ID numbers cross-referenced to the laboratory ID numbers? | ✓ | | | | |
| Are all laboratory ID numbers cross-referenced to the corresponding QC data? | ✓ | | | | |
| **Test reports** | | | | | |
| Were all samples prepared and analyzed within holding times? | ✓ | | | | |
| Other than those results <MQL, were all other raw values bracketed by calibration standards? | ✓ | | | | |
| Were calculations checked by a peer or supervisor? | ✓ | | | | |
| Were all analyte identifications checked by a peer or supervisor? | ✓ | | | | |
| Were sample quantitation limits reported for all analytes not detected? | ✓ | | | | |
| Were all results for soil and sediment samples reported on a dry weight basis? | | | ✓ | | |
| Were % moisture (or solids) reported for all soil and sediment samples? | | | ✓ | | |
| If required for the project, TICs reported? | ✓ | | | | |
| **Surrogate recovery data** | | | | | |
| Were surrogates added prior to extraction? | | | ✓ | | |
| Were surrogate percent recoveries in all samples within the laboratory QC limits? | | | ✓ | | |
| **Test reports/summary forms for blank samples** | | | | | |
| Were appropriate type(s) of blanks analyzed? | ✓ | | | | |
| Were blanks analyzed at the appropriate frequency? | ✓ | | | | |
| Were method blanks taken through the entire analytical process, including preparation and, if applicable, cleanup procedures? | | | ✓ | | |
| Were blank concentrations <MQL? | ✓ | | | | |
| **Laboratory control samples (LCS):** | | | | | |
| Were all COCs included in the LCS? | ✓ | | | | |
| Was each LCS taken through the entire analytical procedure, including prep and cleanup steps? | ✓ | | | | |
| Were LCSs analyzed at the required frequency? | ✓ | | | | |
| Were LCS (and LCSD, if applicable) %Rs within the laboratory QC limits? | ✓ | | | | |
| Does the detectability data document the laboratorys capability to detect the COCs at the MDL used to calculate the SQLs? | ✓ | | | | |
| Was the LCSD RPD within QC limits? | | | ✓ | | |
| **Matrix spike (MS) and matrix spike duplicate (MSD) data** | | | | | |
| Were the project/method specified analytes included in the MS and MSD? | ✓ | | | | |
| Were MS/MSD analyzed at the appropriate frequency? | ✓ | | | | |
| Were MS (and MSD, if applicable) %Rs within the laboratory QC limits? | ✓ | | | | 1 |

| Description | Yes | No | NA(1) | NR(2) | ER(3) |
|---|---|---|---|---|---|
| Were MS/MSD RPDs within laboratory QC limits? | ✓ | | | | |
| **Analytical duplicate data** | | | | | |
| Were appropriate analytical duplicates analyzed for each matrix? | ✓ | | | | |
| Were analytical duplicates analyzed at the appropriate frequency? | ✓ | | | | |
| Were RPDs or relative standard deviations within the laboratory QC limits? | ✓ | | | | |
| **Method quantitation limits (MQLs):** | | | | | |
| Are the MQLs for each method analyte included in the laboratory data package? | ✓ | | | | |
| Do the MQLs correspond to the concentration of the lowest non-zero calibration standard? | ✓ | | | | |
| Are unadjusted MQLs included in the laboratory data package? | ✓ | | | | |
| **Other problems/anomalies** | | | | | |
| Are all known problems/anomalies/special conditions noted in this LRC and ER? | ✓ | | | | |
| Were all necessary corrective actions performed for the reported data? | ✓ | | | | |
| Was applicable and available technology used to lower the SQL minimize the matrix interference affects on the sample results? | ✓ | | | | 2 |
| Were response factors and/or relative response factors for each analyte within QC limits? | ✓ | | | | |
| Were percent RSDs or correlation coefficient criteria met? | ✓ | | | | |
| Was the number of standards recommended in the method used for all analytes? | ✓ | | | | |
| Were all points generated between the lowest and highest standard used to calculate the curve? | ✓ | | | | |
| Are ICAL data available for all instruments used? | ✓ | | | | |
| Has the initial calibration curve been verified using an appropriate second source standard? | ✓ | | | | |
| **Initial and continuing calibration verification (ICV and CCV) and continuing calibration blank (CCB):** | | | | | |
| Was the CCV analyzed at the method-required frequency? | ✓ | | | | |
| Were percent differences for each analyte within the method-required QC limits? | ✓ | | | | |
| Was the ICAL curve verified for each analyte? | ✓ | | | | |
| Was the absolute value of the analyte concentration in the inorganic CCB $<$MDL? | ✓ | | | | |
| **Mass spectral tuning:** | | | | | |
| Was the appropriate compound for the method used for tuning? | | | ✓ | | |
| Were ion abundance data within the method-required QC limits? | | | ✓ | | |
| **Internal standards (IS):** | | | | | |
| Were IS area counts and retention times within the method-required QC limits? | | | ✓ | | |
| **Raw data (NELAC section 1 appendix A glossary, and section 5.12 or ISO/IEC 17025 section 4.12.2)** | | | | | |
| Were the raw data (for example, chromatograms, spectral data) reviewed by an analyst? | ✓ | | | | |
| Were data associated with manual integrations flagged on the raw data? | ✓ | | | | |
| **Dual column confirmation** | | | | | |
| Did dual column confirmation results meet the method-required QC? | | | ✓ | | |
| **Tentatively identified compounds (TICs):** | | | | | |
| If TICs were requested, were the mass spectra and TIC data subject to appropriate checks? | | | ✓ | | |
| **Interference Check Sample (ICS) results:** | | | | | |
| Were percent recoveries within method QC limits? | | | ✓ | | |
| **Serial dilutions, post digestion spikes, and method of standard additions** | | | | | |
| Were percent differences, recoveries, and the linearity within the QC limits specified in the method? | | | ✓ | | |
| **Method detection limit (MDL) studies** | | | | | |
| Was a MDL study performed for each reported analyte? | ✓ | | | | |
| Is the MDL either adjusted or supported by the analysis of DCSs? | ✓ | | | | |
| **Proficiency test reports:** | | | | | |
| Was the laboratory's performance acceptable on the applicable proficiency tests or evaluation studies? | ✓ | | | | |

| Description | Yes | No | NA(1) | NR(2) | ER(3) |
|---|---|---|---|---|---|
| **Standards documentation** | | | | | |
| Are all standards used in the analyses NIST-traceable or obtained from other appropriate sources? | ✓ | | | | |
| **Compound/analyte identification procedures** | | | | | |
| Are the procedures for compound/analyte identification documented? | ✓ | | | | |
| **Demonstration of analyst competency (DOC)** | | | | | |
| Was DOC conducted consistent with NELAC Chapter 5C or ISO/IEC 4? | ✓ | | | | |
| Is documentation of the analyst's competency up-to-date and on file? | ✓ | | | | |
| **Verification/validation documentation for methods (NELAC Chap 5 or ISO/IEC 17025 Section 5)** | | | | | |
| Are all the methods used to generate the data documented, verified, and validated, where applicable? | ✓ | | | | |
| **Laboratory standard operating procedures (SOPs):** | | | | | |
| Are laboratory SOPs current and on file for each method performed? | ✓ | | | | |

**KEMRON Environmental Services**
Laboratory Review Checklist

| | |
|---|---|
| Laboratory Name: | KEMRON |
| Laboratory Log Number: | L0710596 |
| Project Name: | 798-LONGHORN |
| Method: | 314 |
| Prep Batch Number(s): | WG254202 |
| Reviewer Name: | MICHAEL D. COCHRAN |
| LRC Date: | October 30, 2007 |

**EXCEPTIONS REPORT**
**ER# - Description**
1. The MS/MSD results were not associated with this sample delivery group.
2. Samples -01, -03 and -04 were analyzed at a dilution only due to high conductivity readings.

(1) NA = Not applicable to method or project
(2) NR = Not reviewed
(3) ER# = Exception report number

# Laboratory Data Package Cover Page



This data Package consists of:

This signature page, the laboratory review checklists, and the following reportable data:

✓R1 Field chain-of-custody documentation;
✓R2 sample identification cross-reference;
R3 Test reports (analytical data sheets) for each enviornmental sample that includes:
- a) Items consistant with NELAC 5.13 or ISO/IEC 17025 Section 5.10
- b) dilution factors,
- c) preparation methods,
- d) Cleanup methods, and
- e) If required for the project, tentatively identified compounds (TICs)

✓R4 Surrogate recovery data including:
- a) Calculated recovery (%R) for each analyte, and
- b) The laboratory's surrogate QC limits.

✓R5 Test reports/summary forms for blank samples;
✓R6 Test reports/summary forms for laboratory control samples (LCSs) including:
- a) LCS spiking amount,
- b) Calculated %R for each analyte, and
- c) The laboratory"s LCS QC limits.

✓R7 Test reports for project matrix spike/matrix spike duplicates (MS/MSDs) including:
- a) Samples associated with the MS/MSD clearly identified,
- b) MS/MSD spiking amounts,
- c) Concentration of each MS/MSD analyte measured in the parent and spiked samples,
- d) Calculated %R and relative percent differences (RPDs), and
- e) The laboratory's MS/MSD QC limits

✓R8 Laboratory analytical duplicate (if applicable) revocery and precision:
- a) the amount of analyte measured in the duplicate,
- b) the calculated RPD, and
- c) the laboratory's QC limits for anlytical duplicates.

✓R9 List of method quantitation limits (MQLs) for each analyte for each method and matrix;
✓R10 Other problems or anomalies.
✓The exception Report for every "No" or "Not Reviewed (NR)" item IN laboratory review checklist.

**Release statement:** I am responsible for the release of this laboratory data package. This data package has been reviewed by the laboratory and is complete and technically compliant with the requirements of the methods used, except where noted by the laboratory in the attached exceptions reports. By my signature below, I affirm to the best of my knowledge, all problems/anomalies, observed by the laboratory as having the potential to affect the quality of the data, have been identified by the laboratoy in the Laboratory Review Checklist, and no information or data have been knowingly withheld that would affect the quality of the data.

**Check, if applicable: [✓]** This laboratory is an in-house laboratory controlled by the person repsonding to rule. The official signing the cover page of the rule-required report (for example, the APAR) in which these data are used is responsible for releasing this data package and is by signature affirming the above release statement is true.

| MIKE D. ALBERTSON | | Volatiles Lab Supervisor | October 30, 2007 |
|---|---|---|---|
| Name (Printed) | Signature | Official Title (printed) | DATE |

**KEMRON Environmental Services**
Laboratory Review Checklist

| | |
|---|---|
| Laboratory Name: | KEMRON |
| Laboratory Log Number: | L0710596 |
| Project Name: | 798-LONGHORN |
| Method: | 8260B |
| Prep Batch Number(s): | 253794, 254006, 253678 |
| Reviewer Name: | MIKE D. ALBERTSON |
| LRC Date: | October 30, 2007 |

| Description | Yes | No | NA(1) | NR(2) | ER(3) |
|---|---|---|---|---|---|
| **Chain-Of-Custody (C-O-C)** | | | | | |
| Did samples meet the laboratory's standard conditions of sample acceptability upon receipt? | ✓ | | | | |
| Were all departures from standard conditions described in an exception report? | ✓ | | | | |
| **Sample and quality control (QC) identification** | | | | | |
| Are all field sample ID numbers cross-referenced to the laboratory ID numbers? | ✓ | | | | |
| Are all laboratory ID numbers cross-referenced to the corresponding QC data? | ✓ | | | | |
| **Test reports** | | | | | |
| Were all samples prepared and analyzed within holding times? | ✓ | | | | |
| Other than those results <MQL, were all other raw values bracketed by calibration standards? | ✓ | | | | |
| Were calculations checked by a peer or supervisor? | ✓ | | | | |
| Were all analyte identifications checked by a peer or supervisor? | ✓ | | | | |
| Were sample quantitation limits reported for all analytes not detected? | ✓ | | | | |
| Were all results for soil and sediment samples reported on a dry weight basis? | ✓ | | | | |
| Were % moisture (or solids) reported for all soil and sediment samples? | ✓ | | | | |
| If required for the project, TICs reported? | | | ✓ | | |
| **Surrogate recovery data** | | | | | |
| Were surrogates added prior to extraction? | ✓ | | | | |
| Were surrogate percent recoveries in all samples within the laboratory QC limits? | | ✓ | | | 1, 2 |
| **Test reports/summary forms for blank samples** | | | | | |
| Were appropriate type(s) of blanks analyzed? | ✓ | | | | |
| Were blanks analyzed at the appropriate frequency? | ✓ | | | | |
| Were method blanks taken through the entire analytical process, including preparation and, if applicable, cleanup procedures? | ✓ | | | | |
| Were blank concentrations <MQL? | ✓ | | | | |
| **Laboratory control samples (LCS):** | | | | | |
| Were all COCs included in the LCS? | ✓ | | | | |
| Was each LCS taken through the entire analytical procedure, including prep and cleanup steps? | ✓ | | | | |
| Were LCSs analyzed at the required frequency? | ✓ | | | | |
| Were LCS (and LCSD, if applicable) %Rs within the laboratory QC limits? | | ✓ | | | 3 |
| Does the detectability data document the laboratorys capability to detect the COCs at the MDL used to calculate the SQLs? | ✓ | | | | |
| Was the LCSD RPD within QC limits? | ✓ | | | | |
| **Matrix spike (MS) and matrix spike duplicate (MSD) data** | | | | | |
| Were the project/method specified analytes included in the MS and MSD? | | | ✓ | | |
| Were MS/MSD analyzed at the appropriate frequency? | | | ✓ | | |
| Were MS (and MSD, if applicable) %Rs within the laboratory QC limits? | | | ✓ | | |

| Description | Yes | No | NA(1) | NR(2) | ER(3) |
|---|---|---|---|---|---|
| Were MS/MSD RPDs within laboratory QC limits? | | | ✓ | | |
| **Analytical duplicate data** | | | | | |
| Were appropriate analytical duplicates analyzed for each matrix? | | | ✓ | | |
| Were analytical duplicates analyzed at the appropriate frequency? | | | ✓ | | |
| Were RPDs or relative standard deviations within the laboratory QC limits? | | | ✓ | | |
| **Method quantitation limits (MQLs):** | | | | | |
| Are the MQLs for each method analyte included in the laboratory data package? | ✓ | | | | |
| Do the MQLs correspond to the concentration of the lowest non-zero calibration standard? | ✓ | | | | |
| Are unadjusted MQLs included in the laboratory data package? | ✓ | | | | |
| **Other problems/anomalies** | | | | | |
| Are all known problems/anomalies/special conditions noted in this LRC and ER? | ✓ | | | | |
| Were all necessary corrective actions performed for the reported data? | ✓ | | | | |
| Was applicable and available technology used to lower the SQL minimize the matrix interference affects on the sample results? | ✓ | | | | |
| **ICAL** | | | | | |
| Were response factors and/or relative response factors for each analyte within QC limits? | ✓ | | | | |
| Were percent RSDs or correlation coefficient criteria met? | ✓ | | | | |
| Was the number of standards recommended in the method used for all analytes? | ✓ | | | | |
| Were all points generated between the lowest and highest standard used to calculate the curve? | ✓ | | | | |
| Are ICAL data available for all instruments used? | ✓ | | | | |
| Has the initial calibration curve been verified using an appropriate second source standard? | ✓ | | | | |
| **Initial and continuing calibration verification (ICV and CCV) and continuing calibration blank (CCB):** | | | | | |
| Was the CCV analyzed at the method-required frequency? | ✓ | | | | |
| Were percent differences for each analyte within the method-required QC limits? | ✓ | | | | |
| Was the ICAL curve verified for each analyte? | | ✓ | | | 4 |
| Was the absolute value of the analyte concentration in the inorganic CCB <MDL? | | | ✓ | | |
| **Mass spectral tuning:** | | | | | |
| Was the appropriate compound for the method used for tuning? | ✓ | | | | |
| Were ion abundance data within the method-required QC limits? | ✓ | | | | |
| **Internal standards (IS):** | | | | | |
| Were IS area counts and retention times within the method-required QC limits? | ✓ | | | | |
| **Raw data (NELAC section 1 appendix A glossary, and section 5.12 or ISO/IEC 17025 section 4.12.2)** | | | | | |
| Were the raw data (for example, chromatograms, spectral data) reviewed by an analyst? | ✓ | | | | |
| Were data associated with manual integrations flagged on the raw data? | ✓ | | | | |
| **Dual column confirmation** | | | | | |
| Did dual column confirmation results meet the method-required QC? | | | ✓ | | |
| **Tentatively identified compounds (TICs):** | | | | | |
| If TICs were requested, were the mass spectra and TIC data subject to appropriate checks? | | | ✓ | | |
| **Interference Check Sample (ICS) results:** | | | | | |
| Were percent recoveries within method QC limits? | | | ✓ | | |
| **Serial dilutions, post digestion spikes, and method of standard additions** | | | | | |
| Were percent differences, recoveries, and the linearity within the QC limits specified in the method? | | | ✓ | | |
| **Method detection limit (MDL) studies** | | | | | |
| Was a MDL study performed for each reported analyte? | ✓ | | | | |
| Is the MDL either adjusted or supported by the analysis of DCSs? | ✓ | | | | |
| **Proficiency test reports:** | | | | | |
| Was the laboratory's performance acceptable on the applicable proficiency tests or evaluation studies? | ✓ | | | | |

| Description | Yes | No | NA(1) | NR(2) | ER(3) |
|---|---|---|---|---|---|
| **Standards documentation** | | | | | |
| Are all standards used in the analyses NIST-traceable or obtained from other appropriate sources? | ✓ | | | | |
| **Compound/analyte identification procedures** | | | | | |
| Are the procedures for compound/analyte identification documented? | ✓ | | | | |
| **Demonstration of analyst competency (DOC)** | | | | | |
| Was DOC conducted consistent with NELAC Chapter 5C or ISO/IEC 4? | ✓ | | | | |
| Is documentation of the analyst's competency up-to-date and on file? | ✓ | | | | |
| **Verification/validation documentation for methods (NELAC Chap 5 or ISO/IEC 17025 Section 5)** | | | | | |
| Are all the methods used to generate the data documented, verified, and validated, where applicable? | ✓ | | | | |
| **Laboratory standard operating procedures (SOPs):** | | | | | |
| Are laboratory SOPs current and on file for each method performed? | ✓ | | | | |

**EXCEPTIONS REPORT**

**ER# - Description**

#1: Toluene-d8 was below the lower control limit in the analyses of samples 01 and 09.
#2: Surrogate toluene-d8 was below the lower control limit in the method blank analyzed 10/24/07 on HPMS-11.
#3: MTBE exceeded the upper advisory limit in the LCS/LCSD analyzed 10/25/07 on HPMS-10.
Methyl acetate and MTBE exceeded the upper advisory limits in the LCS/LCSD analyzed 10/24/07 on HPMS-11.
#4: Methyl acetate exceeded the upper control limit in the alternate source analyzed 10/01/07 on HPMS-11.

Footnotes:
(1) NA = Not applicable to method or project
(2) NR = Not reviewed
(3) ER# = Exception report number

# 2.1 Volatiles Data

# 2.1.1 Volatiles GCMS Data (8260)

# 2.1.1.1 Summary Data

# LABORATORY REPORT

00078621

**L0710596**

**11/02/07 10:41**

**Submitted By**

**KEMRON Environmental Services**
**156 Starlite Drive**
**Marietta , OH 45750**
**( 740 ) 373 - 4071**

**For**

Account Name: Shaw E & I, Inc.
ABB Lummus Biulding
3010 Briarpark Drive Suite 4N
Houston, TX 77042
Attention: Larry Duty

Account Number: 2773
Work ID: LHAAD

P.O. Number: 322255 OP

## Sample Analysis Summary

| Client ID | Lab ID | Method | Dilution | Date Received |
|---|---|---|---|---|
| LHSMW56-102007 | L0710596-01 | 8260B | 1 | 23-OCT-07 |
| LHSMW56-102007 | L0710596-01 | 8260B | 100 | 23-OCT-07 |
| 47WW05-102007 | L0710596-02 | 8260B | 1 | 23-OCT-07 |
| 47WW05-102007 | L0710596-02 | 8260B | 10 | 23-OCT-07 |
| 47WW23-101907 | L0710596-05 | 8260B | 1 | 23-OCT-07 |
| 47WW21-101807 | L0710596-07 | 8260B | 1 | 23-OCT-07 |
| 47WW21-101807-QC | L0710596-08 | 8260B | 1 | 23-OCT-07 |
| 47WW01-101807 | L0710596-09 | 8260B | 1 | 23-OCT-07 |
| 47WW01-101807 | L0710596-09 | 8260B | 20 | 23-OCT-07 |
| 47WW04-101807 | L0710596-10 | 8260B | 1 | 23-OCT-07 |
| 47WWZZ-101807 | L0710596-11 | 8260B | 1 | 23-OCT-07 |
| TRIP BLANK | L0710596-15 | 8260B | 1 | 23-OCT-07 |

| | | | |
|---|---|---|---|
| Sample Number: L0710596-01 | PrePrep Method: NONE | Instrument: HPMS11 |
| Client ID: LHSMW56-102007 | Prep Method: 5030B | Prep Date: 10/24/2007 16:23 |
| Matrix: Water | Analytical Method: 8260B | Cal Date: 10/01/2007 15:48 |
| Workgroup Number: WG253678 | Analyst: MES | Run Date: 10/24/2007 16:23 |
| Collect Date: 10/20/2007 08:10 | Dilution: 1 | File ID: 11M46864 |
| Sample Tag: 01 | Units: ug/L | |

| Analyte | CAS. Number | Result | Qual | PQL | SDL |
|---|---|---|---|---|---|
| 1,1,1-Trichloroethane | 71-55-6 | | U | 1.00 | 0.250 |
| 1,1,2,2-Tetrachloroethane | 79-34-5 | | U | 1.00 | 0.125 |
| 1,1,2-Trichloro-1,2,2-Trifluoroethane | 76-13-1 | | U | 5.00 | 0.250 |
| 1,1,2-Trichloroethane | 79-00-5 | 0.835 | J | 1.00 | 0.250 |
| 1,1-Dichloroethane | 75-34-3 | 46.2 | | 1.00 | 0.125 |
| 1,1-Dichloroethene | 75-35-4 | 184 | | 1.00 | 0.500 |
| 1,2,4-Trichlorobenzene | 120-82-1 | | U | 1.00 | 0.200 |
| 1,2-Dibromo-3-chloropropane | 96-12-8 | | U | 5.00 | 1.00 |
| 1,2-Dibromoethane | 106-93-4 | | U | 1.00 | 0.250 |
| 1,2-Dichlorobenzene | 95-50-1 | | U | 1.00 | 0.125 |
| 1,2-Dichloroethane | 107-06-2 | | U | 1.00 | 0.250 |
| cis-1,2-Dichloroethene | 156-59-2 | 219 | I | 1.00 | 0.250 |
| trans-1,2-Dichloroethene | 156-60-5 | 2.47 | | 1.00 | 0.250 |
| 1,2-Dichloropropane | 78-87-5 | | U | 1.00 | 0.200 |
| 1,3-Dichlorobenzene | 541-73-1 | | U | 1.00 | 0.250 |
| 1,4-Dichlorobenzene | 106-46-7 | | U | 1.00 | 0.125 |
| 2-Butanone | 78-93-3 | | U | 10.0 | 2.50 |
| 2-Hexanone | 591-78-6 | | U | 10.0 | 2.50 |
| 4-Methyl-2-pentanone | 108-10-1 | | U | 10.0 | 2.50 |
| Acetone | 67-64-1 | | U | 10.0 | 2.50 |
| Benzene | 71-43-2 | 0.543 | J | 1.00 | 0.125 |
| Bromodichloromethane | 75-27-4 | | U | 1.00 | 0.250 |
| Bromoform | 75-25-2 | | U | 1.00 | 0.500 |
| Bromomethane | 74-83-9 | | U | 1.00 | 0.500 |
| Carbon disulfide | 75-15-0 | | U | 1.00 | 0.500 |
| Carbon tetrachloride | 56-23-5 | | U | 1.00 | 0.250 |
| Chlorobenzene | 108-90-7 | | U | 1.00 | 0.125 |
| Chloroethane | 75-00-3 | | U | 1.00 | 0.500 |
| Chloroform | 67-66-3 | | U | 1.00 | 0.125 |
| Chloromethane | 74-87-3 | | U | 1.00 | 0.250 |
| cis-1,3-Dichloropropene | 10061-01-5 | | U | 1.00 | 0.250 |
| Cyclohexane | 110-82-7 | | U | 5.00 | 0.250 |
| Dibromochloromethane | 124-48-1 | | U | 1.00 | 0.250 |
| Dichlorodifluoromethane | 75-71-8 | | U | 1.00 | 0.250 |
| Ethyl benzene | 100-41-4 | | U | 1.00 | 0.250 |
| Isopropylbenzene | 98-82-8 | | U | 1.00 | 0.250 |
| Methyl acetate | 79-20-9 | | U | 10.0 | 0.250 |
| Methyl tert-butyl ether | 1634-04-4 | | U | 5.00 | 0.500 |
| Methylcyclohexane | 108-87-2 | | U | 10.0 | 0.250 |
| Methylene chloride | 75-09-2 | | U | 2.00 | 0.250 |
| Styrene | 100-42-5 | | U | 1.00 | 0.125 |
| Tetrachloroethene | 127-18-4 | 0.746 | J | 1.00 | 0.250 |
| Toluene | 108-88-3 | | U | 1.00 | 0.250 |
| trans-1,3-Dichloropropene | 10061-02-6 | | U | 1.00 | 0.500 |
| Trichloroethene | 79-01-6 | 3560 | I | 1.00 | 0.250 |
| Trichlorofluoromethane | 75-69-4 | | U | 1.00 | 0.250 |
| Vinyl chloride | 75-01-4 | 33.6 | | 1.00 | 0.250 |
| Xylenes, Total | 1330-20-7 | | U | 1.00 | 0.500 |

| | | | | | |
|---|---|---|---|---|---|
| Sample Number: | L0710596-01 | PrePrep Method: | NONE | Instrument: | HPMS11 |
| Client ID: | LHSMW56-102007 | Prep Method: | 5030B | Prep Date: | 10/24/2007 16:23 |
| Matrix: | Water | Analytical Method: | 8260B | Cal Date: | 10/01/2007 15:48 |
| Workgroup Number: | WG253678 | Analyst: | MES | Run Date: | 10/24/2007 16:23 |
| Collect Date: | 10/20/2007 08:10 | Dilution: | 1 | File ID: | 11M46864 |
| Sample Tag: | 01 | Units: | ug/L | | |

| Surrogate | % Recovery | Lower | Upper | Qual |
|---|---|---|---|---|
| 1,2-Dichloroethane-d4 | 91.6 | 80 | 120 | |
| Dibromofluoromethane | 92.5 | 86 | 118 | |
| p-Bromofluorobenzene | 89.2 | 86 | 115 | |
| Toluene-d8 | 86.2 | 88 | 110 | * |

U Not detected at or above adjusted sample detection limit
J The analyte was positively identified, but the quantitation was below the RL
* Surrogate or spike compound out of range
I Semiquantitative result (out of instrument calibration range)

Sample Number: L0710596-01
Client ID: LHSMW56-102007
Matrix: Water
Workgroup Number: WG254006
Collect Date: 10/20/2007 08:10
Sample Tag: DL01

PrePrep Method: NONE
Prep Method: 5030B
Analytical Method: 8260B
Analyst: MES
Dilution: 100
Units: ug/L

Instrument: HPMS10
Prep Date: 10/27/2007 12:28
Cal Date: 10/18/2007 16:51
Run Date: 10/27/2007 12:28
File ID: 10M59916

| Analyte | CAS. Number | Result | Qual | PQL | SDL |
|---|---|---|---|---|---|
| 1,1,1-Trichloroethane | 71-55-6 | | U | 100 | 25.0 |
| 1,1,2,2-Tetrachloroethane | 79-34-5 | | U | 100 | 12.5 |
| 1,1,2-Trichloro-1,2,2-Trifluoroethane | 76-13-1 | | U | 500 | 25.0 |
| 1,1,2-Trichloroethane | 79-00-5 | | U | 100 | 25.0 |
| 1,1-Dichloroethane | 75-34-3 | 44.2 | J | 100 | 12.5 |
| 1,1-Dichloroethene | 75-35-4 | 188 | | 100 | 50.0 |
| 1,2,4-Trichlorobenzene | 120-82-1 | | U | 100 | 20.0 |
| 1,2-Dibromo-3-chloropropane | 96-12-8 | | U | 500 | 100 |
| 1,2-Dibromoethane | 106-93-4 | | U | 100 | 25.0 |
| 1,2-Dichlorobenzene | 95-50-1 | | U | 100 | 12.5 |
| 1,2-Dichloroethane | 107-06-2 | | U | 100 | 25.0 |
| cis-1,2-Dichloroethene | 156-59-2 | 171 | | 100 | 25.0 |
| trans-1,2-Dichloroethene | 156-60-5 | | U | 100 | 25.0 |
| 1,2-Dichloropropane | 78-87-5 | | U | 100 | 20.0 |
| 1,3-Dichlorobenzene | 541-73-1 | | U | 100 | 25.0 |
| 1,4-Dichlorobenzene | 106-46-7 | | U | 100 | 12.5 |
| 2-Butanone | 78-93-3 | | U | 1000 | 250 |
| 2-Hexanone | 591-78-6 | | U | 1000 | 250 |
| 4-Methyl-2-pentanone | 108-10-1 | | U | 1000 | 250 |
| Acetone | 67-64-1 | | U | 1000 | 250 |
| Benzene | 71-43-2 | | U | 100 | 12.5 |
| Bromodichloromethane | 75-27-4 | | U | 100 | 25.0 |
| Bromoform | 75-25-2 | | U | 100 | 50.0 |
| Bromomethane | 74-83-9 | | U | 100 | 50.0 |
| Carbon disulfide | 75-15-0 | | U | 100 | 50.0 |
| Carbon tetrachloride | 56-23-5 | | U | 100 | 25.0 |
| Chlorobenzene | 108-90-7 | | U | 100 | 12.5 |
| Chloroethane | 75-00-3 | | U | 100 | 50.0 |
| Chloroform | 67-66-3 | | U | 100 | 12.5 |
| Chloromethane | 74-87-3 | | U | 100 | 25.0 |
| cis-1,3-Dichloropropene | 10061-01-5 | | U | 100 | 25.0 |
| Cyclohexane | 110-82-7 | | U | 500 | 25.0 |
| Dibromochloromethane | 124-48-1 | | U | 100 | 25.0 |
| Dichlorodifluoromethane | 75-71-8 | | U | 100 | 25.0 |
| Ethyl benzene | 100-41-4 | | U | 100 | 25.0 |
| Isopropylbenzene | 98-82-8 | | U | 100 | 25.0 |
| Methyl acetate | 79-20-9 | | U | 1000 | 25.0 |
| Methyl tert-butyl ether | 1634-04-4 | | U | 500 | 50.0 |
| Methylcyclohexane | 108-87-2 | | U | 1000 | 25.0 |
| Methylene chloride | 75-09-2 | | U | 200 | 25.0 |
| Styrene | 100-42-5 | | U | 100 | 12.5 |
| Tetrachloroethene | 127-18-4 | | U | 100 | 25.0 |
| Toluene | 108-88-3 | | U | 100 | 25.0 |
| trans-1,3-Dichloropropene | 10061-02-6 | | U | 100 | 50.0 |
| Trichloroethene | 79-01-6 | 8740 | | 100 | 25.0 |
| Trichlorofluoromethane | 75-69-4 | | U | 100 | 25.0 |
| Vinyl chloride | 75-01-4 | 35.6 | J | 100 | 25.0 |
| Xylenes, Total | 1330-20-7 | | U | 100 | 50.0 |

Sample Number: L0710596-01
Client ID: LHSMW56-102007
Matrix: Water
Workgroup Number: WG254006
Collect Date: 10/20/2007 08:10
Sample Tag: DL01

PrePrep Method: NONE
Prep Method: 5030B
Analytical Method: 8260B
Analyst: MES
Dilution: 100
Units: ug/L

Instrument: HPMS10
Prep Date: 10/27/2007 12:28
Cal Date: 10/18/2007 16:51
Run Date: 10/27/2007 12:28
File ID: 10M59916

| Surrogate | % Recovery | Lower | Upper | Qual |
|---|---|---|---|---|
| 1,2-Dichloroethane-d4 | 96.8 | 80 | 120 | |
| Dibromofluoromethane | 99.5 | 86 | 118 | |
| p-Bromofluorobenzene | 102 | 86 | 115 | |
| Toluene-d8 | 98.2 | 88 | 110 | |

U Not detected at or above adjusted sample detection limit
J The analyte was positively identified, but the quantitation was below the RL

Sample Number: L0710596-02
Client ID: 47WW05-102007
Matrix: Water
Workgroup Number: WG253678
Collect Date: 10/20/2007 08:50
Sample Tag: 01

PrePrep Method: NONE
Prep Method: 5030B
Analytical Method: 8260B
Analyst: MES
Dilution: 1
Units: ug/L

Instrument: HPMS11
Prep Date: 10/24/2007 16:53
Cal Date: 10/01/2007 15:48
Run Date: 10/24/2007 16:53
File ID: 11M46865

| Analyte | CAS. Number | Result | Qual | PQL | SDL |
|---|---|---|---|---|---|
| 1,1,1-Trichloroethane | 71-55-6 | | U | 1.00 | 0.250 |
| 1,1,2,2-Tetrachloroethane | 79-34-5 | | U | 1.00 | 0.125 |
| 1,1,2-Trichloro-1,2,2-Trifluoroethane | 76-13-1 | 3.16 | J | 5.00 | 0.250 |
| 1,1,2-Trichloroethane | 79-00-5 | | U | 1.00 | 0.250 |
| 1,1-Dichloroethane | 75-34-3 | | U | 1.00 | 0.125 |
| 1,1-Dichloroethene | 75-35-4 | 0.702 | J | 1.00 | 0.500 |
| 1,2,4-Trichlorobenzene | 120-82-1 | | U | 1.00 | 0.200 |
| 1,2-Dibromo-3-chloropropane | 96-12-8 | | U | 5.00 | 1.00 |
| 1,2-Dibromoethane | 106-93-4 | | U | 1.00 | 0.250 |
| 1,2-Dichlorobenzene | 95-50-1 | | U | 1.00 | 0.125 |
| 1,2-Dichloroethane | 107-06-2 | | U | 1.00 | 0.250 |
| cis-1,2-Dichloroethene | 156-59-2 | 6.44 | | 1.00 | 0.250 |
| trans-1,2-Dichloroethene | 156-60-5 | | U | 1.00 | 0.250 |
| 1,2-Dichloropropane | 78-87-5 | | U | 1.00 | 0.200 |
| 1,3-Dichlorobenzene | 541-73-1 | | U | 1.00 | 0.250 |
| 1,4-Dichlorobenzene | 106-46-7 | | U | 1.00 | 0.125 |
| 2-Butanone | 78-93-3 | | U | 10.0 | 2.50 |
| 2-Hexanone | 591-78-6 | | U | 10.0 | 2.50 |
| 4-Methyl-2-pentanone | 108-10-1 | | U | 10.0 | 2.50 |
| Acetone | 67-64-1 | | U | 10.0 | 2.50 |
| Benzene | 71-43-2 | | U | 1.00 | 0.125 |
| Bromodichloromethane | 75-27-4 | | U | 1.00 | 0.250 |
| Bromoform | 75-25-2 | | U | 1.00 | 0.500 |
| Bromomethane | 74-83-9 | | U | 1.00 | 0.500 |
| Carbon disulfide | 75-15-0 | | U | 1.00 | 0.500 |
| Carbon tetrachloride | 56-23-5 | | U | 1.00 | 0.250 |
| Chlorobenzene | 108-90-7 | | U | 1.00 | 0.125 |
| Chloroethane | 75-00-3 | | U | 1.00 | 0.500 |
| Chloroform | 67-66-3 | 0.277 | J | 1.00 | 0.125 |
| Chloromethane | 74-87-3 | | U | 1.00 | 0.250 |
| cis-1,3-Dichloropropene | 10061-01-5 | | U | 1.00 | 0.250 |
| Cyclohexane | 110-82-7 | | U | 5.00 | 0.250 |
| Dibromochloromethane | 124-48-1 | | U | 1.00 | 0.250 |
| Dichlorodifluoromethane | 75-71-8 | | U | 1.00 | 0.250 |
| Ethyl benzene | 100-41-4 | | U | 1.00 | 0.250 |
| Isopropylbenzene | 98-82-8 | | U | 1.00 | 0.250 |
| Methyl acetate | 79-20-9 | | U | 10.0 | 0.250 |
| Methyl tert-butyl ether | 1634-04-4 | | U | 5.00 | 0.500 |
| Methylcyclohexane | 108-87-2 | | U | 10.0 | 0.250 |
| Methylene chloride | 75-09-2 | | U | 2.00 | 0.250 |
| Styrene | 100-42-5 | | U | 1.00 | 0.125 |
| Tetrachloroethene | 127-18-4 | | U | 1.00 | 0.250 |
| Toluene | 108-88-3 | | U | 1.00 | 0.250 |
| trans-1,3-Dichloropropene | 10061-02-6 | | U | 1.00 | 0.500 |
| Trichloroethene | 79-01-6 | 677 | I | 1.00 | 0.250 |
| Trichlorofluoromethane | 75-69-4 | | U | 1.00 | 0.250 |
| Vinyl chloride | 75-01-4 | | U | 1.00 | 0.250 |
| Xylenes, Total | 1330-20-7 | | U | 1.00 | 0.500 |

| | | | | | |
|---|---|---|---|---|---|
| Sample Number: | L0710596-02 | PrePrep Method: | NONE | Instrument: | HPMS11 |
| Client ID: | 47WW05-102007 | Prep Method: | 5030B | Prep Date: | 10/24/2007 16:53 |
| Matrix: | Water | Analytical Method: | 8260B | Cal Date: | 10/01/2007 15:48 |
| Workgroup Number: | WG253678 | Analyst: | MES | Run Date: | 10/24/2007 16:53 |
| Collect Date: | 10/20/2007 08:50 | Dilution: | 1 | File ID: | 11M46865 |
| Sample Tag: | 01 | Units: | ug/L | | |

| Surrogate | % Recovery | Lower | Upper | Qual |
|---|---|---|---|---|
| 1,2-Dichloroethane-d4 | 94.8 | 80 | 120 | |
| Dibromofluoromethane | 93.3 | 86 | 118 | |
| p-Bromofluorobenzene | 90.0 | 86 | 115 | |
| Toluene-d8 | 88.6 | 88 | 110 | |

U Not detected at or above adjusted sample detection limit
J The analyte was positively identified, but the quantitation was below the RL
I Semiquantitative result (out of instrument calibration range)

Sample Number: L0710596-02
Client ID: 47WW05-102007
Matrix: Water
Workgroup Number: WG254006
Collect Date: 10/20/2007 08:50
Sample Tag: DL01

PrePrep Method: NONE
Prep Method: 5030B
Analytical Method: 8260B
Analyst: MES
Dilution: 10
Units: ug/L

Instrument: HPMS10
Prep Date: 10/27/2007 13:00
Cal Date: 10/18/2007 16:51
Run Date: 10/27/2007 13:00
File ID: 10M59917

| Analyte | CAS. Number | Result | Qual | PQL | SDL |
|---|---|---|---|---|---|
| 1,1,1-Trichloroethane | 71-55-6 | | U | 10.0 | 2.50 |
| 1,1,2,2-Tetrachloroethane | 79-34-5 | | U | 10.0 | 1.25 |
| 1,1,2-Trichloro-1,2,2-Trifluoroethane | 76-13-1 | 2.53 | J | 50.0 | 2.50 |
| 1,1,2-Trichloroethane | 79-00-5 | | U | 10.0 | 2.50 |
| 1,1-Dichloroethane | 75-34-3 | | U | 10.0 | 1.25 |
| 1,1-Dichloroethene | 75-35-4 | | U | 10.0 | 5.00 |
| 1,2,4-Trichlorobenzene | 120-82-1 | | U | 10.0 | 2.00 |
| 1,2-Dibromo-3-chloropropane | 96-12-8 | | U | 50.0 | 10.0 |
| 1,2-Dibromoethane | 106-93-4 | | U | 10.0 | 2.50 |
| 1,2-Dichlorobenzene | 95-50-1 | | U | 10.0 | 1.25 |
| 1,2-Dichloroethane | 107-06-2 | | U | 10.0 | 2.50 |
| cis-1,2-Dichloroethene | 156-59-2 | 6.02 | J | 10.0 | 2.50 |
| trans-1,2-Dichloroethene | 156-60-5 | | U | 10.0 | 2.50 |
| 1,2-Dichloropropane | 78-87-5 | | U | 10.0 | 2.00 |
| 1,3-Dichlorobenzene | 541-73-1 | | U | 10.0 | 2.50 |
| 1,4-Dichlorobenzene | 106-46-7 | | U | 10.0 | 1.25 |
| 2-Butanone | 78-93-3 | | U | 100 | 25.0 |
| 2-Hexanone | 591-78-6 | | U | 100 | 25.0 |
| 4-Methyl-2-pentanone | 108-10-1 | | U | 100 | 25.0 |
| Acetone | 67-64-1 | | U | 100 | 25.0 |
| Benzene | 71-43-2 | | U | 10.0 | 1.25 |
| Bromodichloromethane | 75-27-4 | | U | 10.0 | 2.50 |
| Bromoform | 75-25-2 | | U | 10.0 | 5.00 |
| Bromomethane | 74-83-9 | | U | 10.0 | 5.00 |
| Carbon disulfide | 75-15-0 | | U | 10.0 | 5.00 |
| Carbon tetrachloride | 56-23-5 | | U | 10.0 | 2.50 |
| Chlorobenzene | 108-90-7 | | U | 10.0 | 1.25 |
| Chloroethane | 75-00-3 | | U | 10.0 | 5.00 |
| Chloroform | 67-66-3 | | U | 10.0 | 1.25 |
| Chloromethane | 74-87-3 | | U | 10.0 | 2.50 |
| cis-1,3-Dichloropropene | 10061-01-5 | | U | 10.0 | 2.50 |
| Cyclohexane | 110-82-7 | | U | 50.0 | 2.50 |
| Dibromochloromethane | 124-48-1 | | U | 10.0 | 2.50 |
| Dichlorodifluoromethane | 75-71-8 | | U | 10.0 | 2.50 |
| Ethyl benzene | 100-41-4 | | U | 10.0 | 2.50 |
| Isopropylbenzene | 98-82-8 | | U | 10.0 | 2.50 |
| Methyl acetate | 79-20-9 | | U | 100 | 2.50 |
| Methyl tert-butyl ether | 1634-04-4 | | U | 50.0 | 5.00 |
| Methylcyclohexane | 108-87-2 | | U | 100 | 2.50 |
| Methylene chloride | 75-09-2 | | U | 20.0 | 2.50 |
| Styrene | 100-42-5 | | U | 10.0 | 1.25 |
| Tetrachloroethene | 127-18-4 | | U | 10.0 | 2.50 |
| Toluene | 108-88-3 | | U | 10.0 | 2.50 |
| trans-1,3-Dichloropropene | 10061-02-6 | | U | 10.0 | 5.00 |
| Trichloroethene | 79-01-6 | 759 | | 10.0 | 2.50 |
| Trichlorofluoromethane | 75-69-4 | | U | 10.0 | 2.50 |
| Vinyl chloride | 75-01-4 | | U | 10.0 | 2.50 |
| Xylenes, Total | 1330-20-7 | | U | 10.0 | 5.00 |

Sample Number: L0710596-02
Client ID: 47WW05-102007
Matrix: Water
Workgroup Number: WG254006
Collect Date: 10/20/2007 08:50
Sample Tag: DL01

PrePrep Method: NONE
Prep Method: 5030B
Analytical Method: 8260B
Analyst: MES
Dilution: 10
Units: ug/L

Instrument: HPMS10
Prep Date: 10/27/2007 13:00
Cal Date: 10/18/2007 16:51
Run Date: 10/27/2007 13:00
File ID: 10M59917

| Surrogate | % Recovery | Lower | Upper | Qual |
|---|---|---|---|---|
| 1,2-Dichloroethane-d4 | 99.1 | 80 | 120 | |
| Dibromofluoromethane | 101 | 86 | 118 | |
| p-Bromofluorobenzene | 98.9 | 86 | 115 | |
| Toluene-d8 | 96.5 | 88 | 110 | |

U Not detected at or above adjusted sample detection limit
J The analyte was positively identified, but the quantitation was below the RL

Sample Number:L0710596-05
Client ID:47WW23-101907
Matrix:Water
Workgroup Number:WG253794
Collect Date:10/19/2007 09:45
Sample Tag:01

PrePrep Method:NONE
Prep Method:5030B
Analytical Method:8260B
Analyst:MES
Dilution:1
Units:ug/L

Instrument:HPMS10
Prep Date:10/25/2007 12:40
Cal Date:10/18/2007 16:51
Run Date:10/25/2007 12:40
File ID:10M59859

| Analyte | CAS. Number | Result | Qual | PQL | SDL |
|---|---|---|---|---|---|
| 1,1,1-Trichloroethane | 71-55-6 | | U | 1.00 | 0.250 |
| 1,1,2,2-Tetrachloroethane | 79-34-5 | | U | 1.00 | 0.125 |
| 1,1,2-Trichloro-1,2,2-Trifluoroethane | 76-13-1 | | U | 5.00 | 0.250 |
| 1,1,2-Trichloroethane | 79-00-5 | | U | 1.00 | 0.250 |
| 1,1-Dichloroethane | 75-34-3 | | U | 1.00 | 0.125 |
| 1,1-Dichloroethene | 75-35-4 | | U | 1.00 | 0.500 |
| 1,2,4-Trichlorobenzene | 120-82-1 | | U | 1.00 | 0.200 |
| 1,2-Dibromo-3-chloropropane | 96-12-8 | | U | 5.00 | 1.00 |
| 1,2-Dibromoethane | 106-93-4 | | U | 1.00 | 0.250 |
| 1,2-Dichlorobenzene | 95-50-1 | | U | 1.00 | 0.125 |
| 1,2-Dichloroethane | 107-06-2 | | U | 1.00 | 0.250 |
| cis-1,2-Dichloroethene | 156-59-2 | | U | 1.00 | 0.250 |
| trans-1,2-Dichloroethene | 156-60-5 | | U | 1.00 | 0.250 |
| 1,2-Dichloropropane | 78-87-5 | | U | 1.00 | 0.200 |
| 1,3-Dichlorobenzene | 541-73-1 | | U | 1.00 | 0.250 |
| 1,4-Dichlorobenzene | 106-46-7 | | U | 1.00 | 0.125 |
| 2-Butanone | 78-93-3 | | U | 10.0 | 2.50 |
| 2-Hexanone | 591-78-6 | | U | 10.0 | 2.50 |
| 4-Methyl-2-pentanone | 108-10-1 | | U | 10.0 | 2.50 |
| Acetone | 67-64-1 | | U | 10.0 | 2.50 |
| Benzene | 71-43-2 | | U | 1.00 | 0.125 |
| Bromodichloromethane | 75-27-4 | | U | 1.00 | 0.250 |
| Bromoform | 75-25-2 | | U | 1.00 | 0.500 |
| Bromomethane | 74-83-9 | | U | 1.00 | 0.500 |
| Carbon disulfide | 75-15-0 | | U | 1.00 | 0.500 |
| Carbon tetrachloride | 56-23-5 | | U | 1.00 | 0.250 |
| Chlorobenzene | 108-90-7 | | U | 1.00 | 0.125 |
| Chloroethane | 75-00-3 | | U | 1.00 | 0.500 |
| Chloroform | 67-66-3 | | U | 1.00 | 0.125 |
| Chloromethane | 74-87-3 | | U | 1.00 | 0.250 |
| cis-1,3-Dichloropropene | 10061-01-5 | | U | 1.00 | 0.250 |
| Cyclohexane | 110-82-7 | | U | 5.00 | 0.250 |
| Dibromochloromethane | 124-48-1 | | U | 1.00 | 0.250 |
| Dichlorodifluoromethane | 75-71-8 | | U | 1.00 | 0.250 |
| Ethyl benzene | 100-41-4 | | U | 1.00 | 0.250 |
| Isopropylbenzene | 98-82-8 | | U | 1.00 | 0.250 |
| Methyl acetate | 79-20-9 | | U | 10.0 | 0.250 |
| Methyl tert-butyl ether | 1634-04-4 | | U | 5.00 | 0.500 |
| Methylcyclohexane | 108-87-2 | | U | 10.0 | 0.250 |
| Methylene chloride | 75-09-2 | | U | 2.00 | 0.250 |
| Styrene | 100-42-5 | | U | 1.00 | 0.125 |
| Tetrachloroethene | 127-18-4 | | U | 1.00 | 0.250 |
| Toluene | 108-88-3 | | U | 1.00 | 0.250 |
| trans-1,3-Dichloropropene | 10061-02-6 | | U | 1.00 | 0.500 |
| Trichloroethene | 79-01-6 | | U | 1.00 | 0.250 |
| Trichlorofluoromethane | 75-69-4 | | U | 1.00 | 0.250 |
| Vinyl chloride | 75-01-4 | | U | 1.00 | 0.250 |
| Xylenes, Total | 1330-20-7 | | U | 1.00 | 0.500 |

Report Number: **L0710596**

Report Date : **November 2, 2007**

00078631

| | | | | | |
|---|---|---|---|---|---|
| Sample Number: | **L0710596-05** | PrePrep Method: | **NONE** | Instrument: | **HPMS10** |
| Client ID: | **47WW23-101907** | Prep Method: | **5030B** | Prep Date: | **10/25/2007 12:40** |
| Matrix: | **Water** | Analytical Method: | **8260B** | Cal Date: | **10/18/2007 16:51** |
| Workgroup Number: | **WG253794** | Analyst: | **MES** | Run Date: | **10/25/2007 12:40** |
| Collect Date: | **10/19/2007 09:45** | Dilution: | **1** | File ID: | **10M59859** |
| Sample Tag: | **01** | Units: | **ug/L** | | |

| Surrogate | % Recovery | Lower | Upper | Qual |
|---|---|---|---|---|
| 1,2-Dichloroethane-d4 | 102 | 80 | 120 | |
| Dibromofluoromethane | 103 | 86 | 118 | |
| p-Bromofluorobenzene | 99.2 | 86 | 115 | |
| Toluene-d8 | 97.6 | 88 | 110 | |

**U Not detected at or above adjusted sample detection limit**

Sample Number: L0710596-07
Client ID: 47WW21-101807
Matrix: Water
Workgroup Number: WG253794
Collect Date: 10/18/2007 14:20
Sample Tag: 01

PrePrep Method: NONE
Prep Method: 5030B
Analytical Method: 8260B
Analyst: MES
Dilution: 1
Units: ug/L

Instrument: HPMS10
Prep Date: 10/25/2007 13:11
Cal Date: 10/18/2007 16:51
Run Date: 10/25/2007 13:11
File ID: 10M59860

| Analyte | CAS. Number | Result | Qual | PQL | SDL |
|---|---|---|---|---|---|
| 1,1,1-Trichloroethane | 71-55-6 | | U | 1.00 | 0.250 |
| 1,1,2,2-Tetrachloroethane | 79-34-5 | | U | 1.00 | 0.125 |
| 1,1,2-Trichloro-1,2,2-Trifluoroethane | 76-13-1 | | U | 5.00 | 0.250 |
| 1,1,2-Trichloroethane | 79-00-5 | | U | 1.00 | 0.250 |
| 1,1-Dichloroethane | 75-34-3 | 0.161 | J | 1.00 | 0.125 |
| 1,1-Dichloroethene | 75-35-4 | 0.566 | J | 1.00 | 0.500 |
| 1,2,4-Trichlorobenzene | 120-82-1 | | U | 1.00 | 0.200 |
| 1,2-Dibromo-3-chloropropane | 96-12-8 | | U | 5.00 | 1.00 |
| 1,2-Dibromoethane | 106-93-4 | | U | 1.00 | 0.250 |
| 1,2-Dichlorobenzene | 95-50-1 | | U | 1.00 | 0.125 |
| 1,2-Dichloroethane | 107-06-2 | | U | 1.00 | 0.250 |
| cis-1,2-Dichloroethene | 156-59-2 | 1.99 | | 1.00 | 0.250 |
| trans-1,2-Dichloroethene | 156-60-5 | | U | 1.00 | 0.250 |
| 1,2-Dichloropropane | 78-87-5 | | U | 1.00 | 0.200 |
| 1,3-Dichlorobenzene | 541-73-1 | | U | 1.00 | 0.250 |
| 1,4-Dichlorobenzene | 106-46-7 | | U | 1.00 | 0.125 |
| 2-Butanone | 78-93-3 | | U | 10.0 | 2.50 |
| 2-Hexanone | 591-78-6 | | U | 10.0 | 2.50 |
| 4-Methyl-2-pentanone | 108-10-1 | | U | 10.0 | 2.50 |
| Acetone | 67-64-1 | | U | 10.0 | 2.50 |
| Benzene | 71-43-2 | | U | 1.00 | 0.125 |
| Bromodichloromethane | 75-27-4 | | U | 1.00 | 0.250 |
| Bromoform | 75-25-2 | | U | 1.00 | 0.500 |
| Bromomethane | 74-83-9 | | U | 1.00 | 0.500 |
| Carbon disulfide | 75-15-0 | | U | 1.00 | 0.500 |
| Carbon tetrachloride | 56-23-5 | | U | 1.00 | 0.250 |
| Chlorobenzene | 108-90-7 | | U | 1.00 | 0.125 |
| Chloroethane | 75-00-3 | | U | 1.00 | 0.500 |
| Chloroform | 67-66-3 | | U | 1.00 | 0.125 |
| Chloromethane | 74-87-3 | | U | 1.00 | 0.250 |
| cis-1,3-Dichloropropene | 10061-01-5 | | U | 1.00 | 0.250 |
| Cyclohexane | 110-82-7 | | U | 5.00 | 0.250 |
| Dibromochloromethane | 124-48-1 | | U | 1.00 | 0.250 |
| Dichlorodifluoromethane | 75-71-8 | | U | 1.00 | 0.250 |
| Ethyl benzene | 100-41-4 | | U | 1.00 | 0.250 |
| Isopropylbenzene | 98-82-8 | | U | 1.00 | 0.250 |
| Methyl acetate | 79-20-9 | | U | 10.0 | 0.250 |
| Methyl tert-butyl ether | 1634-04-4 | | U | 5.00 | 0.500 |
| Methylcyclohexane | 108-87-2 | | U | 10.0 | 0.250 |
| Methylene chloride | 75-09-2 | | U | 2.00 | 0.250 |
| Styrene | 100-42-5 | | U | 1.00 | 0.125 |
| Tetrachloroethene | 127-18-4 | | U | 1.00 | 0.250 |
| Toluene | 108-88-3 | | U | 1.00 | 0.250 |
| trans-1,3-Dichloropropene | 10061-02-6 | | U | 1.00 | 0.500 |
| Trichloroethene | 79-01-6 | 2.61 | | 1.00 | 0.250 |
| Trichlorofluoromethane | 75-69-4 | | U | 1.00 | 0.250 |
| Vinyl chloride | 75-01-4 | | U | 1.00 | 0.250 |
| Xylenes, Total | 1330-20-7 | | U | 1.00 | 0.500 |

| | | | | | |
|---|---|---|---|---|---|
| Sample Number: | L0710596-07 | PrePrep Method: | NONE | Instrument: | HPMS10 |
| Client ID: | 47WW21-101807 | Prep Method: | 5030B | Prep Date: | 10/25/2007 13:11 |
| Matrix: | Water | Analytical Method: | 8260B | Cal Date: | 10/18/2007 16:51 |
| Workgroup Number: | WG253794 | Analyst: | MES | Run Date: | 10/25/2007 13:11 |
| Collect Date: | 10/18/2007 14:20 | Dilution: | 1 | File ID: | 10M59860 |
| Sample Tag: | 01 | Units: | ug/L | | |

| Surrogate | % Recovery | Lower | Upper | Qual |
|---|---|---|---|---|
| 1,2-Dichloroethane-d4 | 100 | 80 | 120 | |
| Dibromofluoromethane | 102 | 86 | 118 | |
| p-Bromofluorobenzene | 96.6 | 86 | 115 | |
| Toluene-d8 | 93.9 | 88 | 110 | |

U Not detected at or above adjusted sample detection limit
J The analyte was positively identified, but the quantitation was below the RL

Sample Number:**L0710596-08**
Client ID:**47WW21-101807-QC**
Matrix:**Water**
Workgroup Number:**WG253678**
Collect Date:**10/18/2007 14:20**
Sample Tag:**01**

PrePrep Method:**NONE**
Prep Method:**5030B**
Analytical Method:**8260B**
Analyst:**MES**
Dilution:**1**
Units:**ug/L**

Instrument:**HPMS11**
Prep Date:**10/24/2007 18:55**
Cal Date:**10/01/2007 15:48**
Run Date:**10/24/2007 18:55**
File ID:**11M46869**

| Analyte | CAS. Number | Result | Qual | PQL | SDL |
|---|---|---|---|---|---|
| 1,1,1-Trichloroethane | 71-55-6 | | U | 1.00 | 0.250 |
| 1,1,2,2-Tetrachloroethane | 79-34-5 | | U | 1.00 | 0.125 |
| 1,1,2-Trichloro-1,2,2-Trifluoroethane | 76-13-1 | | U | 5.00 | 0.250 |
| 1,1,2-Trichloroethane | 79-00-5 | | U | 1.00 | 0.250 |
| 1,1-Dichloroethane | 75-34-3 | 0.171 | J | 1.00 | 0.125 |
| 1,1-Dichloroethene | 75-35-4 | | U | 1.00 | 0.500 |
| 1,2,4-Trichlorobenzene | 120-82-1 | | U | 1.00 | 0.200 |
| 1,2-Dibromo-3-chloropropane | 96-12-8 | | U | 5.00 | 1.00 |
| 1,2-Dibromoethane | 106-93-4 | | U | 1.00 | 0.250 |
| 1,2-Dichlorobenzene | 95-50-1 | | U | 1.00 | 0.125 |
| 1,2-Dichloroethane | 107-06-2 | | U | 1.00 | 0.250 |
| cis-1,2-Dichloroethene | 156-59-2 | 2.10 | | 1.00 | 0.250 |
| trans-1,2-Dichloroethene | 156-60-5 | | U | 1.00 | 0.250 |
| 1,2-Dichloropropane | 78-87-5 | | U | 1.00 | 0.200 |
| 1,3-Dichlorobenzene | 541-73-1 | | U | 1.00 | 0.250 |
| 1,4-Dichlorobenzene | 106-46-7 | | U | 1.00 | 0.125 |
| 2-Butanone | 78-93-3 | | U | 10.0 | 2.50 |
| 2-Hexanone | 591-78-6 | | U | 10.0 | 2.50 |
| 4-Methyl-2-pentanone | 108-10-1 | | U | 10.0 | 2.50 |
| Acetone | 67-64-1 | | U | 10.0 | 2.50 |
| Benzene | 71-43-2 | | U | 1.00 | 0.125 |
| Bromodichloromethane | 75-27-4 | | U | 1.00 | 0.250 |
| Bromoform | 75-25-2 | | U | 1.00 | 0.500 |
| Bromomethane | 74-83-9 | | U | 1.00 | 0.500 |
| Carbon disulfide | 75-15-0 | | U | 1.00 | 0.500 |
| Carbon tetrachloride | 56-23-5 | | U | 1.00 | 0.250 |
| Chlorobenzene | 108-90-7 | | U | 1.00 | 0.125 |
| Chloroethane | 75-00-3 | | U | 1.00 | 0.500 |
| Chloroform | 67-66-3 | | U | 1.00 | 0.125 |
| Chloromethane | 74-87-3 | | U | 1.00 | 0.250 |
| cis-1,3-Dichloropropene | 10061-01-5 | | U | 1.00 | 0.250 |
| Cyclohexane | 110-82-7 | | U | 5.00 | 0.250 |
| Dibromochloromethane | 124-48-1 | | U | 1.00 | 0.250 |
| Dichlorodifluoromethane | 75-71-8 | | U | 1.00 | 0.250 |
| Ethyl benzene | 100-41-4 | | U | 1.00 | 0.250 |
| Isopropylbenzene | 98-82-8 | | U | 1.00 | 0.250 |
| Methyl acetate | 79-20-9 | | U | 10.0 | 0.250 |
| Methyl tert-butyl ether | 1634-04-4 | | U | 5.00 | 0.500 |
| Methylcyclohexane | 108-87-2 | | U | 10.0 | 0.250 |
| Methylene chloride | 75-09-2 | | U | 2.00 | 0.250 |
| Styrene | 100-42-5 | | U | 1.00 | 0.125 |
| Tetrachloroethene | 127-18-4 | | U | 1.00 | 0.250 |
| Toluene | 108-88-3 | | U | 1.00 | 0.250 |
| trans-1,3-Dichloropropene | 10061-02-6 | | U | 1.00 | 0.500 |
| Trichloroethene | 79-01-6 | 3.06 | | 1.00 | 0.250 |
| Trichlorofluoromethane | 75-69-4 | | U | 1.00 | 0.250 |
| Vinyl chloride | 75-01-4 | | U | 1.00 | 0.250 |
| Xylenes, Total | 1330-20-7 | | U | 1.00 | 0.500 |

| | | | | | |
|---|---|---|---|---|---|
| Sample Number: | L0710596-08 | PrePrep Method: | NONE | Instrument: | HPMS11 |
| Client ID: | 47WW21-101807-QC | Prep Method: | 5030B | Prep Date: | 10/24/2007 18:55 |
| Matrix: | Water | Analytical Method: | 8260B | Cal Date: | 10/01/2007 15:48 |
| Workgroup Number: | WG253678 | Analyst: | MES | Run Date: | 10/24/2007 18:55 |
| Collect Date: | 10/18/2007 14:20 | Dilution: | 1 | File ID: | 11M46869 |
| Sample Tag: | 01 | Units: | ug/L | | |

| Surrogate | % Recovery | Lower | Upper | Qual |
|---|---|---|---|---|
| 1,2-Dichloroethane-d4 | 94.2 | 80 | 120 | |
| Dibromofluoromethane | 97.7 | 86 | 118 | |
| p-Bromofluorobenzene | 92.1 | 86 | 115 | |
| Toluene-d8 | 89.1 | 88 | 110 | |

**U** Not detected at or above adjusted sample detection limit
**J** The analyte was positively identified, but the quantitation was below the RL

Sample Number:L0710596-09
Client ID:47WW01-101807
Matrix:Water
Workgroup Number:WG253678
Collect Date:10/18/2007 10:15
Sample Tag:01

PrePrep Method:NONE
Prep Method:5030B
Analytical Method:8260B
Analyst:MES
Dilution:1
Units:ug/L

Instrument:HPMS11
Prep Date:10/24/2007 19:25
Cal Date:10/01/2007 15:48
Run Date:10/24/2007 19:25
File ID:11M46870

| Analyte | CAS. Number | Result | Qual | PQL | SDL |
|---|---|---|---|---|---|
| 1,1,1-Trichloroethane | 71-55-6 | | U | 1.00 | 0.250 |
| 1,1,2,2-Tetrachloroethane | 79-34-5 | | U | 1.00 | 0.125 |
| 1,1,2-Trichloro-1,2,2-Trifluoroethane | 76-13-1 | 1610 | I | 5.00 | 0.250 |
| 1,1,2-Trichloroethane | 79-00-5 | | U | 1.00 | 0.250 |
| 1,1-Dichloroethane | 75-34-3 | 0.536 | J | 1.00 | 0.125 |
| 1,1-Dichloroethene | 75-35-4 | | U | 1.00 | 0.500 |
| 1,2,4-Trichlorobenzene | 120-82-1 | | U | 1.00 | 0.200 |
| 1,2-Dibromo-3-chloropropane | 96-12-8 | | U | 5.00 | 1.00 |
| 1,2-Dibromoethane | 106-93-4 | | U | 1.00 | 0.250 |
| 1,2-Dichlorobenzene | 95-50-1 | | U | 1.00 | 0.125 |
| 1,2-Dichloroethane | 107-06-2 | | U | 1.00 | 0.250 |
| cis-1,2-Dichloroethene | 156-59-2 | | U | 1.00 | 0.250 |
| trans-1,2-Dichloroethene | 156-60-5 | | U | 1.00 | 0.250 |
| 1,2-Dichloropropane | 78-87-5 | | U | 1.00 | 0.200 |
| 1,3-Dichlorobenzene | 541-73-1 | | U | 1.00 | 0.250 |
| 1,4-Dichlorobenzene | 106-46-7 | | U | 1.00 | 0.125 |
| 2-Butanone | 78-93-3 | | U | 10.0 | 2.50 |
| 2-Hexanone | 591-78-6 | | U | 10.0 | 2.50 |
| 4-Methyl-2-pentanone | 108-10-1 | | U | 10.0 | 2.50 |
| Acetone | 67-64-1 | | U | 10.0 | 2.50 |
| Benzene | 71-43-2 | | U | 1.00 | 0.125 |
| Bromodichloromethane | 75-27-4 | | U | 1.00 | 0.250 |
| Bromoform | 75-25-2 | | U | 1.00 | 0.500 |
| Bromomethane | 74-83-9 | | U | 1.00 | 0.500 |
| Carbon disulfide | 75-15-0 | | U | 1.00 | 0.500 |
| Carbon tetrachloride | 56-23-5 | | U | 1.00 | 0.250 |
| Chlorobenzene | 108-90-7 | | U | 1.00 | 0.125 |
| Chloroethane | 75-00-3 | | U | 1.00 | 0.500 |
| Chloroform | 67-66-3 | | U | 1.00 | 0.125 |
| Chloromethane | 74-87-3 | 0.310 | J | 1.00 | 0.250 |
| cis-1,3-Dichloropropene | 10061-01-5 | | U | 1.00 | 0.250 |
| Cyclohexane | 110-82-7 | | U | 5.00 | 0.250 |
| Dibromochloromethane | 124-48-1 | | U | 1.00 | 0.250 |
| Dichlorodifluoromethane | 75-71-8 | | U | 1.00 | 0.250 |
| Ethyl benzene | 100-41-4 | | U | 1.00 | 0.250 |
| Isopropylbenzene | 98-82-8 | | U | 1.00 | 0.250 |
| Methyl acetate | 79-20-9 | | U | 10.0 | 0.250 |
| Methyl tert-butyl ether | 1634-04-4 | | U | 5.00 | 0.500 |
| Methylcyclohexane | 108-87-2 | | U | 10.0 | 0.250 |
| Methylene chloride | 75-09-2 | | U | 2.00 | 0.250 |
| Styrene | 100-42-5 | | U | 1.00 | 0.125 |
| Tetrachloroethene | 127-18-4 | | U | 1.00 | 0.250 |
| Toluene | 108-88-3 | | U | 1.00 | 0.250 |
| trans-1,3-Dichloropropene | 10061-02-6 | | U | 1.00 | 0.500 |
| Trichloroethene | 79-01-6 | 0.337 | J | 1.00 | 0.250 |
| Trichlorofluoromethane | 75-69-4 | | U | 1.00 | 0.250 |
| Vinyl chloride | 75-01-4 | | U | 1.00 | 0.250 |
| Xylenes, Total | 1330-20-7 | | U | 1.00 | 0.500 |

| | | | | | |
|---|---|---|---|---|---|
| Sample Number: | L0710596-09 | PrePrep Method: | NONE | Instrument: | HPMS11 |
| Client ID: | 47WW01-101807 | Prep Method: | 5030B | Prep Date: | 10/24/2007 19:25 |
| Matrix: | Water | Analytical Method: | 8260B | Cal Date: | 10/01/2007 15:48 |
| Workgroup Number: | WG253678 | Analyst: | MES | Run Date: | 10/24/2007 19:25 |
| Collect Date: | 10/18/2007 10:15 | Dilution: | 1 | File ID: | 11M46870 |
| Sample Tag: | 01 | Units: | ug/L | | |

| Surrogate | % Recovery | Lower | Upper | Qual |
|---|---|---|---|---|
| 1,2-Dichloroethane-d4 | 93.5 | 80 | 120 | |
| Dibromofluoromethane | 94.2 | 86 | 118 | |
| p-Bromofluorobenzene | 89.4 | 86 | 115 | |
| Toluene-d8 | 87.0 | 88 | 110 | * |

U Not detected at or above adjusted sample detection limit
J The analyte was positively identified, but the quantitation was below the RL
* Surrogate or spike compound out of range
I Semiquantitative result (out of instrument calibration range)

Sample Number: L0710596-09
Client ID: 47WW01-101807
Matrix: Water
Workgroup Number: WG254006
Collect Date: 10/18/2007 10:15
Sample Tag: DL01

PrePrep Method: NONE
Prep Method: 5030B
Analytical Method: 8260B
Analyst: MES
Dilution: 20
Units: ug/L

Instrument: HPMS10
Prep Date: 10/27/2007 13:32
Cal Date: 10/18/2007 16:51
Run Date: 10/27/2007 13:32
File ID: 10M59918

| Analyte | CAS. Number | Result | Qual | PQL | SDL |
|---|---|---|---|---|---|
| 1,1,1-Trichloroethane | 71-55-6 | | U | 20.0 | 5.00 |
| 1,1,2,2-Tetrachloroethane | 79-34-5 | | U | 20.0 | 2.50 |
| 1,1,2-Trichloro-1,2,2-Trifluoroethane | 76-13-1 | 1420 | | 100 | 5.00 |
| 1,1,2-Trichloroethane | 79-00-5 | | U | 20.0 | 5.00 |
| 1,1-Dichloroethane | 75-34-3 | | U | 20.0 | 2.50 |
| 1,1-Dichloroethene | 75-35-4 | | U | 20.0 | 10.0 |
| 1,2,4-Trichlorobenzene | 120-82-1 | | U | 20.0 | 4.00 |
| 1,2-Dibromo-3-chloropropane | 96-12-8 | | U | 100 | 20.0 |
| 1,2-Dibromoethane | 106-93-4 | | U | 20.0 | 5.00 |
| 1,2-Dichlorobenzene | 95-50-1 | | U | 20.0 | 2.50 |
| 1,2-Dichloroethane | 107-06-2 | | U | 20.0 | 5.00 |
| cis-1,2-Dichloroethene | 156-59-2 | | U | 20.0 | 5.00 |
| trans-1,2-Dichloroethene | 156-60-5 | | U | 20.0 | 5.00 |
| 1,2-Dichloropropane | 78-87-5 | | U | 20.0 | 4.00 |
| 1,3-Dichlorobenzene | 541-73-1 | | U | 20.0 | 5.00 |
| 1,4-Dichlorobenzene | 106-46-7 | | U | 20.0 | 2.50 |
| 2-Butanone | 78-93-3 | | U | 200 | 50.0 |
| 2-Hexanone | 591-78-6 | | U | 200 | 50.0 |
| 4-Methyl-2-pentanone | 108-10-1 | | U | 200 | 50.0 |
| Acetone | 67-64-1 | | U | 200 | 50.0 |
| Benzene | 71-43-2 | | U | 20.0 | 2.50 |
| Bromodichloromethane | 75-27-4 | | U | 20.0 | 5.00 |
| Bromoform | 75-25-2 | | U | 20.0 | 10.0 |
| Bromomethane | 74-83-9 | | U | 20.0 | 10.0 |
| Carbon disulfide | 75-15-0 | | U | 20.0 | 10.0 |
| Carbon tetrachloride | 56-23-5 | | U | 20.0 | 5.00 |
| Chlorobenzene | 108-90-7 | | U | 20.0 | 2.50 |
| Chloroethane | 75-00-3 | | U | 20.0 | 10.0 |
| Chloroform | 67-66-3 | | U | 20.0 | 2.50 |
| Chloromethane | 74-87-3 | | U | 20.0 | 5.00 |
| cis-1,3-Dichloropropene | 10061-01-5 | | U | 20.0 | 5.00 |
| Cyclohexane | 110-82-7 | | U | 100 | 5.00 |
| Dibromochloromethane | 124-48-1 | | U | 20.0 | 5.00 |
| Dichlorodifluoromethane | 75-71-8 | | U | 20.0 | 5.00 |
| Ethyl benzene | 100-41-4 | | U | 20.0 | 5.00 |
| Isopropylbenzene | 98-82-8 | | U | 20.0 | 5.00 |
| Methyl acetate | 79-20-9 | | U | 200 | 5.00 |
| Methyl tert-butyl ether | 1634-04-4 | | U | 100 | 10.0 |
| Methylcyclohexane | 108-87-2 | | U | 200 | 5.00 |
| Methylene chloride | 75-09-2 | | U | 40.0 | 5.00 |
| Styrene | 100-42-5 | | U | 20.0 | 2.50 |
| Tetrachloroethene | 127-18-4 | | U | 20.0 | 5.00 |
| Toluene | 108-88-3 | | U | 20.0 | 5.00 |
| trans-1,3-Dichloropropene | 10061-02-6 | | U | 20.0 | 10.0 |
| Trichloroethene | 79-01-6 | | U | 20.0 | 5.00 |
| Trichlorofluoromethane | 75-69-4 | | U | 20.0 | 5.00 |
| Vinyl chloride | 75-01-4 | | U | 20.0 | 5.00 |
| Xylenes, Total | 1330-20-7 | | U | 20.0 | 10.0 |

| | | | | | |
|---|---|---|---|---|---|
| Sample Number: | L0710596-09 | PrePrep Method: | NONE | Instrument: | HPMS10 |
| Client ID: | 47WW01-101807 | Prep Method: | 5030B | Prep Date: | 10/27/2007 13:32 |
| Matrix: | Water | Analytical Method: | 8260B | Cal Date: | 10/18/2007 16:51 |
| Workgroup Number: | WG254006 | Analyst: | MES | Run Date: | 10/27/2007 13:32 |
| Collect Date: | 10/18/2007 10:15 | Dilution: | 20 | File ID: | 10M59918 |
| Sample Tag: | DL01 | Units: | ug/L | | |

| Surrogate | % Recovery | Lower | Upper | Qual |
|---|---|---|---|---|
| 1,2-Dichloroethane-d4 | 102 | 80 | 120 | |
| Dibromofluoromethane | 102 | 86 | 118 | |
| p-Bromofluorobenzene | 102 | 86 | 115 | |
| Toluene-d8 | 97.4 | 88 | 110 | |

U Not detected at or above adjusted sample detection limit

Sample Number:L0710596-10
Client ID:47WW04-101807
Matrix:Water
Workgroup Number:WG253794
Collect Date:10/18/2007 11:30
Sample Tag:01

PrePrep Method:NONE
Prep Method:5030B
Analytical Method:8260B
Analyst:MES
Dilution:1
Units:ug/L

Instrument:HPMS10
Prep Date:10/25/2007 13:42
Cal Date:10/18/2007 16:51
Run Date:10/25/2007 13:42
File ID:10M59861

| Analyte | CAS. Number | Result | Qual | PQL | SDL |
|---|---|---|---|---|---|
| 1,1,1-Trichloroethane | 71-55-6 | | U | 1.00 | 0.250 |
| 1,1,2,2-Tetrachloroethane | 79-34-5 | | U | 1.00 | 0.125 |
| 1,1,2-Trichloro-1,2,2-Trifluoroethane | 76-13-1 | | U | 5.00 | 0.250 |
| 1,1,2-Trichloroethane | 79-00-5 | | U | 1.00 | 0.250 |
| 1,1-Dichloroethane | 75-34-3 | | U | 1.00 | 0.125 |
| 1,1-Dichloroethene | 75-35-4 | | U | 1.00 | 0.500 |
| 1,2,4-Trichlorobenzene | 120-82-1 | | U | 1.00 | 0.200 |
| 1,2-Dibromo-3-chloropropane | 96-12-8 | | U | 5.00 | 1.00 |
| 1,2-Dibromoethane | 106-93-4 | | U | 1.00 | 0.250 |
| 1,2-Dichlorobenzene | 95-50-1 | | U | 1.00 | 0.125 |
| 1,2-Dichloroethane | 107-06-2 | | U | 1.00 | 0.250 |
| cis-1,2-Dichloroethene | 156-59-2 | | U | 1.00 | 0.250 |
| trans-1,2-Dichloroethene | 156-60-5 | | U | 1.00 | 0.250 |
| 1,2-Dichloropropane | 78-87-5 | | U | 1.00 | 0.200 |
| 1,3-Dichlorobenzene | 541-73-1 | | U | 1.00 | 0.250 |
| 1,4-Dichlorobenzene | 106-46-7 | | U | 1.00 | 0.125 |
| 2-Butanone | 78-93-3 | | U | 10.0 | 2.50 |
| 2-Hexanone | 591-78-6 | | U | 10.0 | 2.50 |
| 4-Methyl-2-pentanone | 108-10-1 | | U | 10.0 | 2.50 |
| Acetone | 67-64-1 | | U | 10.0 | 2.50 |
| Benzene | 71-43-2 | | U | 1.00 | 0.125 |
| Bromodichloromethane | 75-27-4 | | U | 1.00 | 0.250 |
| Bromoform | 75-25-2 | | U | 1.00 | 0.500 |
| Bromomethane | 74-83-9 | | U | 1.00 | 0.500 |
| Carbon disulfide | 75-15-0 | | U | 1.00 | 0.500 |
| Carbon tetrachloride | 56-23-5 | | U | 1.00 | 0.250 |
| Chlorobenzene | 108-90-7 | | U | 1.00 | 0.125 |
| Chloroethane | 75-00-3 | | U | 1.00 | 0.500 |
| Chloroform | 67-66-3 | | U | 1.00 | 0.125 |
| Chloromethane | 74-87-3 | | U | 1.00 | 0.250 |
| cis-1,3-Dichloropropene | 10061-01-5 | | U | 1.00 | 0.250 |
| Cyclohexane | 110-82-7 | | U | 5.00 | 0.250 |
| Dibromochloromethane | 124-48-1 | | U | 1.00 | 0.250 |
| Dichlorodifluoromethane | 75-71-8 | | U | 1.00 | 0.250 |
| Ethyl benzene | 100-41-4 | | U | 1.00 | 0.250 |
| Isopropylbenzene | 98-82-8 | | U | 1.00 | 0.250 |
| Methyl acetate | 79-20-9 | | U | 10.0 | 0.250 |
| Methyl tert-butyl ether | 1634-04-4 | | U | 5.00 | 0.500 |
| Methylcyclohexane | 108-87-2 | | U | 10.0 | 0.250 |
| Methylene chloride | 75-09-2 | | U | 2.00 | 0.250 |
| Styrene | 100-42-5 | | U | 1.00 | 0.125 |
| Tetrachloroethene | 127-18-4 | | U | 1.00 | 0.250 |
| Toluene | 108-88-3 | | U | 1.00 | 0.250 |
| trans-1,3-Dichloropropene | 10061-02-6 | | U | 1.00 | 0.500 |
| Trichloroethene | 79-01-6 | | U | 1.00 | 0.250 |
| Trichlorofluoromethane | 75-69-4 | | U | 1.00 | 0.250 |
| Vinyl chloride | 75-01-4 | | U | 1.00 | 0.250 |
| Xylenes, Total | 1330-20-7 | | U | 1.00 | 0.500 |

Sample Number:**L0710596-10**
Client ID:**47WW04-101807**
Matrix:**Water**
Workgroup Number:**WG253794**
Collect Date:**10/18/2007 11:30**
Sample Tag:**01**

PrePrep Method:**NONE**
Prep Method:**5030B**
Analytical Method:**8260B**
Analyst:**MES**
Dilution:**1**
Units:**ug/L**

Instrument:**HPMS10**
Prep Date:**10/25/2007 13:42**
Cal Date:**10/18/2007 16:51**
Run Date:**10/25/2007 13:42**
File ID:**10M59861**

| Surrogate | % Recovery | Lower | Upper | Qual |
|---|---|---|---|---|
| 1,2-Dichloroethane-d4 | 107 | 80 | 120 | |
| Dibromofluoromethane | 103 | 86 | 118 | |
| p-Bromofluorobenzene | 96.0 | 86 | 115 | |
| Toluene-d8 | 95.3 | 88 | 110 | |

**U Not detected at or above adjusted sample detection limit**

| | | |
|---|---|---|
| Sample Number: L0710596-11 | PrePrep Method: NONE | Instrument: HPMS10 |
| Client ID: 47WWZZ-101807 | Prep Method: 5030B | Prep Date: 10/27/2007 14:05 |
| Matrix: Water | Analytical Method: 8260B | Cal Date: 10/18/2007 16:51 |
| Workgroup Number: WG254006 | Analyst: MES | Run Date: 10/27/2007 14:05 |
| Collect Date: 10/18/2007 09:55 | Dilution: 1 | File ID: 10M59919 |
| Sample Tag: 02 | Units: ug/L | |

| Analyte | CAS. Number | Result | Qual | PQL | SDL |
|---|---|---|---|---|---|
| 1,1,1-Trichloroethane | 71-55-6 | | U | 1.00 | 0.250 |
| 1,1,2,2-Tetrachloroethane | 79-34-5 | | U | 1.00 | 0.125 |
| 1,1,2-Trichloro-1,2,2-Trifluoroethane | 76-13-1 | | U | 5.00 | 0.250 |
| 1,1,2-Trichloroethane | 79-00-5 | | U | 1.00 | 0.250 |
| 1,1-Dichloroethane | 75-34-3 | | U | 1.00 | 0.125 |
| 1,1-Dichloroethene | 75-35-4 | | U | 1.00 | 0.500 |
| 1,2,4-Trichlorobenzene | 120-82-1 | | U | 1.00 | 0.200 |
| 1,2-Dibromo-3-chloropropane | 96-12-8 | | U | 5.00 | 1.00 |
| 1,2-Dibromoethane | 106-93-4 | | U | 1.00 | 0.250 |
| 1,2-Dichlorobenzene | 95-50-1 | | U | 1.00 | 0.125 |
| 1,2-Dichloroethane | 107-06-2 | | U | 1.00 | 0.250 |
| cis-1,2-Dichloroethene | 156-59-2 | | U | 1.00 | 0.250 |
| trans-1,2-Dichloroethene | 156-60-5 | | U | 1.00 | 0.250 |
| 1,2-Dichloropropane | 78-87-5 | | U | 1.00 | 0.200 |
| 1,3-Dichlorobenzene | 541-73-1 | | U | 1.00 | 0.250 |
| 1,4-Dichlorobenzene | 106-46-7 | | U | 1.00 | 0.125 |
| 2-Butanone | 78-93-3 | | U | 10.0 | 2.50 |
| 2-Hexanone | 591-78-6 | | U | 10.0 | 2.50 |
| 4-Methyl-2-pentanone | 108-10-1 | | U | 10.0 | 2.50 |
| Acetone | 67-64-1 | | U | 10.0 | 2.50 |
| Benzene | 71-43-2 | | U | 1.00 | 0.125 |
| Bromodichloromethane | 75-27-4 | | U | 1.00 | 0.250 |
| Bromoform | 75-25-2 | | U | 1.00 | 0.500 |
| Bromomethane | 74-83-9 | | U | 1.00 | 0.500 |
| Carbon disulfide | 75-15-0 | 1.01 | | 1.00 | 0.500 |
| Carbon tetrachloride | 56-23-5 | | U | 1.00 | 0.250 |
| Chlorobenzene | 108-90-7 | | U | 1.00 | 0.125 |
| Chloroethane | 75-00-3 | | U | 1.00 | 0.500 |
| Chloroform | 67-66-3 | | U | 1.00 | 0.125 |
| Chloromethane | 74-87-3 | 0.809 | J | 1.00 | 0.250 |
| cis-1,3-Dichloropropene | 10061-01-5 | | U | 1.00 | 0.250 |
| Cyclohexane | 110-82-7 | | U | 5.00 | 0.250 |
| Dibromochloromethane | 124-48-1 | | U | 1.00 | 0.250 |
| Dichlorodifluoromethane | 75-71-8 | | U | 1.00 | 0.250 |
| Ethyl benzene | 100-41-4 | | U | 1.00 | 0.250 |
| Isopropylbenzene | 98-82-8 | | U | 1.00 | 0.250 |
| Methyl acetate | 79-20-9 | | U | 10.0 | 0.250 |
| Methyl tert-butyl ether | 1634-04-4 | | U | 5.00 | 0.500 |
| Methylcyclohexane | 108-87-2 | | U | 10.0 | 0.250 |
| Methylene chloride | 75-09-2 | | U | 2.00 | 0.250 |
| Styrene | 100-42-5 | | U | 1.00 | 0.125 |
| Tetrachloroethene | 127-18-4 | | U | 1.00 | 0.250 |
| Toluene | 108-88-3 | | U | 1.00 | 0.250 |
| trans-1,3-Dichloropropene | 10061-02-6 | | U | 1.00 | 0.500 |
| Trichloroethene | 79-01-6 | | U | 1.00 | 0.250 |
| Trichlorofluoromethane | 75-69-4 | | U | 1.00 | 0.250 |
| Vinyl chloride | 75-01-4 | | U | 1.00 | 0.250 |
| Xylenes, Total | 1330-20-7 | | U | 1.00 | 0.500 |

| | | | | | |
|---|---|---|---|---|---|
| Sample Number: | L0710596-11 | PrePrep Method: | NONE | Instrument: | HPMS10 |
| Client ID: | 47WWZZ-101807 | Prep Method: | 5030B | Prep Date: | 10/27/2007 14:05 |
| Matrix: | Water | Analytical Method: | 8260B | Cal Date: | 10/18/2007 16:51 |
| Workgroup Number: | WG254006 | Analyst: | MES | Run Date: | 10/27/2007 14:05 |
| Collect Date: | 10/18/2007 09:55 | Dilution: | 1 | File ID: | 10M59919 |
| Sample Tag: | 02 | Units: | ug/L | | |

| Surrogate | % Recovery | Lower | Upper | Qual |
|---|---|---|---|---|
| 1,2-Dichloroethane-d4 | 98.6 | 80 | 120 | |
| Dibromofluoromethane | 95.2 | 86 | 118 | |
| p-Bromofluorobenzene | 91.6 | 86 | 115 | |
| Toluene-d8 | 91.2 | 88 | 110 | |

U Not detected at or above adjusted sample detection limit
J The analyte was positively identified, but the quantitation was below the RL

Sample Number: L0710596-15
Client ID: TRIP BLANK
Matrix: Water
Workgroup Number: WG253678
Collect Date: 10/20/2007 00:01
Sample Tag: 01

PrePrep Method: NONE
Prep Method: 5030B
Analytical Method: 8260B
Analyst: MES
Dilution: 1
Units: ug/L

Instrument: HPMS11
Prep Date: 10/24/2007 13:22
Cal Date: 10/01/2007 15:48
Run Date: 10/24/2007 13:22
File ID: 11M46858

| Analyte | CAS. Number | Result | Qual | PQL | SDL |
|---|---|---|---|---|---|
| 1,1,1-Trichloroethane | 71-55-6 | | U | 1.00 | 0.250 |
| 1,1,2,2-Tetrachloroethane | 79-34-5 | | U | 1.00 | 0.125 |
| 1,1,2-Trichloro-1,2,2-Trifluoroethane | 76-13-1 | | U | 5.00 | 0.250 |
| 1,1,2-Trichloroethane | 79-00-5 | | U | 1.00 | 0.250 |
| 1,1-Dichloroethane | 75-34-3 | | U | 1.00 | 0.125 |
| 1,1-Dichloroethene | 75-35-4 | | U | 1.00 | 0.500 |
| 1,2,4-Trichlorobenzene | 120-82-1 | | U | 1.00 | 0.200 |
| 1,2-Dibromo-3-chloropropane | 96-12-8 | | U | 5.00 | 1.00 |
| 1,2-Dibromoethane | 106-93-4 | | U | 1.00 | 0.250 |
| 1,2-Dichlorobenzene | 95-50-1 | | U | 1.00 | 0.125 |
| 1,2-Dichloroethane | 107-06-2 | | U | 1.00 | 0.250 |
| cis-1,2-Dichloroethene | 156-59-2 | | U | 1.00 | 0.250 |
| trans-1,2-Dichloroethene | 156-60-5 | | U | 1.00 | 0.250 |
| 1,2-Dichloropropane | 78-87-5 | | U | 1.00 | 0.200 |
| 1,3-Dichlorobenzene | 541-73-1 | | U | 1.00 | 0.250 |
| 1,4-Dichlorobenzene | 106-46-7 | | U | 1.00 | 0.125 |
| 2-Butanone | 78-93-3 | | U | 10.0 | 2.50 |
| 2-Hexanone | 591-78-6 | | U | 10.0 | 2.50 |
| 4-Methyl-2-pentanone | 108-10-1 | | U | 10.0 | 2.50 |
| Acetone | 67-64-1 | | U | 10.0 | 2.50 |
| Benzene | 71-43-2 | | U | 1.00 | 0.125 |
| Bromodichloromethane | 75-27-4 | | U | 1.00 | 0.250 |
| Bromoform | 75-25-2 | | U | 1.00 | 0.500 |
| Bromomethane | 74-83-9 | | U | 1.00 | 0.500 |
| Carbon disulfide | 75-15-0 | | U | 1.00 | 0.500 |
| Carbon tetrachloride | 56-23-5 | | U | 1.00 | 0.250 |
| Chlorobenzene | 108-90-7 | | U | 1.00 | 0.125 |
| Chloroethane | 75-00-3 | | U | 1.00 | 0.500 |
| Chloroform | 67-66-3 | | U | 1.00 | 0.125 |
| Chloromethane | 74-87-3 | | U | 1.00 | 0.250 |
| cis-1,3-Dichloropropene | 10061-01-5 | | U | 1.00 | 0.250 |
| Cyclohexane | 110-82-7 | | U | 5.00 | 0.250 |
| Dibromochloromethane | 124-48-1 | | U | 1.00 | 0.250 |
| Dichlorodifluoromethane | 75-71-8 | | U | 1.00 | 0.250 |
| Ethyl benzene | 100-41-4 | | U | 1.00 | 0.250 |
| Isopropylbenzene | 98-82-8 | | U | 1.00 | 0.250 |
| Methyl acetate | 79-20-9 | | U | 10.0 | 0.250 |
| Methyl tert-butyl ether | 1634-04-4 | | U | 5.00 | 0.500 |
| Methylcyclohexane | 108-87-2 | | U | 10.0 | 0.250 |
| Methylene chloride | 75-09-2 | | U | 2.00 | 0.250 |
| Styrene | 100-42-5 | | U | 1.00 | 0.125 |
| Tetrachloroethene | 127-18-4 | | U | 1.00 | 0.250 |
| Toluene | 108-88-3 | | U | 1.00 | 0.250 |
| trans-1,3-Dichloropropene | 10061-02-6 | | U | 1.00 | 0.500 |
| Trichloroethene | 79-01-6 | | U | 1.00 | 0.250 |
| Trichlorofluoromethane | 75-69-4 | | U | 1.00 | 0.250 |
| Vinyl chloride | 75-01-4 | | U | 1.00 | 0.250 |
| Xylenes, Total | 1330-20-7 | | U | 1.00 | 0.500 |

Report Number: **L0710596**

Report Date : **November 2, 2007**

00078645

Sample Number: **L0710596-15**
Client ID: **TRIP BLANK**
Matrix: **Water**
Workgroup Number: **WG253678**
Collect Date: **10/20/2007 00:01**
Sample Tag: **01**

PrePrep Method: **NONE**
Prep Method: **5030B**
Analytical Method: **8260B**
Analyst: **MES**
Dilution: **1**
Units: **ug/L**

Instrument: **HPMS11**
Prep Date: **10/24/2007 13:22**
Cal Date: **10/01/2007 15:48**
Run Date: **10/24/2007 13:22**
File ID: **11M46858**

| Surrogate | % Recovery | Lower | Upper | Qual |
|---|---|---|---|---|
| 1,2-Dichloroethane-d4 | 88.0 | 80 | 120 | |
| Dibromofluoromethane | 91.6 | 86 | 118 | |
| p-Bromofluorobenzene | 90.9 | 86 | 115 | |
| Toluene-d8 | 89.3 | 88 | 110 | |

**U Not detected at or above adjusted sample detection limit**

# 2.1.1.2 QC Summary Data

# Example 8260 Calculations

**1.0 Calculating the Response Factor (RF) from the initial calibration (ICAL) data:**

RF = [ (Ax) (Cis) ] / [ (Ais) (Cx) ]

where:

| | Example |
|---|---|
| Ax = Area of the characteristic ion for the compound being measured: | 3399156 |
| Cis = Concentration of the specific internal standard (ug/mL) | 25 |
| Ais = Area of the characteristic ion of the specific internal standard | 846471 |
| Cx = Concentration of the compound in the standard being measured (ug/mL) | 100 |
| RF = Calculated Response Factor | **1.0039** |

**2.0 Calculating the concentration ( C ) of a compound in water using the average RF: ***

Cx = [ (Ax) (Cis) (Vn)(D)] / [ (Ais) (RF) (Vs) ]

where:

| | **Example** |
|---|---|
| Ax = Area of the characteristic ion for the compound being measured | **3122498** |
| Cis = Concentration of the specific internal standard (ug/L) | **25** |
| D = Dilution factor for sample as a multiplier ( 10x = 10) | **1** |
| Ais = Area of the characteristic ion of the specific internal standard | **611048** |
| RF = Average RF from the ICAL | **1.004** |
| Vs = Purge volume of sample (mL) | **10** |
| Vn = Nominal purge volume of sample (mL) ( 10.0 mL ) | **10** |
| Cx = Concentration of the compound in the sample being measured (ug/L) | **127.2428** |

**3.0 Calculating the concentration ( C ) of a compound in soil using the average RF: ***

Cx = [ (Ax) (Cis) (Wn)(D)] / [ (Ais) (RF) (Ws) ]

where:

| | **Example** |
|---|---|
| Ax = Area of the characteristic ion for the compound being measured | **3122498** |
| Cis = Concentration of the specific internal standard (ug/L) | **25** |
| D = Dilution factor for sample as a multiplier ( 10x = 10) | **1** |
| Ais = Area of the characteristic ion of the specific internal standard | **611048** |
| RF = Average RF from the ICAL | **1.004** |
| Ws = Weight of sample purged (g) | **5** |
| Wn = Nominal purge weight (g) ( 5.0 g) | **5** |
| Cx = Concentration of the compound in the sample being measured (ug/L) | **127.2428** |

Dry weight correction:

| | |
|---|---|
| Percent solids (PCT_S) | **50** |
| Cd = (Cx) (100)/PCT_S | **254.4856** |

* Concentrations appearing on the instrument quantitation reports are on-column results and do not take into account initial volume, final volume, and the dilution factor.

**4.0 Concentration from Linear Regression**

**Step 1: Retrieve Curve Data From Plot, y = mx + b**

y = response ratio = response of analyte / response of IS = Ax/Ais

x = amount ratio = concentration analyte/concentration internal standard = Cx / Cis

m = slope from curve = 0.213

b = intercept from curve = - 0.00642

**Step 2: Calculate y from Quantitation Report**

y = 86550/593147 = 0.1459

**Step 3: Solve for x**

x = (y - b)/m = [( 0.1459 -( - 0.00642)]/ 0.213 = 0.7152

**Step 4: Solve for analyte concentration Cx**

Cx = Cis ( x ) = (25.0)(0.7152) = 17.88

**Example Spreadsheet Calculation:**

| | |
|---|---|
| Slope from curve, m: | **0.213** |
| Intercept from curve, b: | **-0.00642** |
| Area of analyte, Ax: | **86550** |
| Area of Internal Standard , Ais: | **593147** |
| Concentration of IS, Cis | **25.00** |
| Response Ratio: | **0.145917** |
| Amount Ratio: | **0.715195** |
| Concentration: | **17.87988** |
| Units of Internal Standard: | **ug/L** |

**5.0 Concentration from Quadratic Regression**

**Step 1 - Retrieve Curve Data from Plot, y = Ax^2 + Bx + C**
Where:
Ax^2 + Bx + (C - y) = 0
A, B, C = constants from the ICAL quadratic regression
y = Response ratio = Area of analyte/Area of internal standard (IS)
x = Amount ratio = Concentration of analyte/concentration of IS

**Step 2: Calculate y from Quantitation Report**

y = Ax/Ais

**Step 3: Solve for x using the quadratic formula**
Ax^2 + Bx + C - y = 0

$$x = \frac{b \pm \sqrt{\left(b^2 - 4a\left(c - y\right)\right)}}{2a}$$ (Two possible solutions)

**Step 4: Solve for analyte concentration Cx**

Cx = ( Cis )( Amount ratio)

**Example Spreadsheet Calculation:**

| | | |
|---|---|---|
| Value of A from plot: | **-0.00629** | |
| Value of B from plot: | **0.511** | |
| Value of C from plot: | **-0.0276** | |
| Area of unknown from quantitation report: | **293821** | |
| Area of IS from quantiation report: | **784848** | |
| Response ratio, y: | **0.374367** | |
| C - y: | **-0.40197** | |
| Root 1 - Computed amount ratio , X1: | **80.44567** | |
| Root 2 - Computed amount ratio , X2: | **0.794396** | use this solution |
| Concentration of IS, Cis: | **25.00** | |
| Concentration of analyte, Cx: | **19.86** | ug/L |

**KEMRON Environmental Services**

Instrument Run Log

Instrument: HPMS11 Dataset: 100107
Analyst1: MES Analyst2: NA
Method: 8260B SOP: MSV01 Rev: 10
Method: 5030/5035 SOP: PAT01 Rev: 10

Maintenance Log ID: 21097

Internal Standard: STD21833 Surrogate Standard: STD22023
CCV: STD22186 LCS: STD22188 MS/MSD: NA

Column 1 ID: RTX502.2 Column 2 ID: NA
Workgroups: WG251532,WG251619

Comments:

| Seq. | File ID | Sample Information | pH | Mat | Dil | Reference | Date/Time |
|---|---|---|---|---|---|---|---|
| 1 | 11M46046 | SYSTEM BLANK | NA | 1 | 1 | | 10/01/07 08:53 |
| 2 | 11M46047 | SYSTEM BLANK | NA | 1 | 1 | | 10/01/07 09:23 |
| 3 | 11M46048 | SYSTEM BLANK | NA | 1 | 1 | | 10/01/07 10:00 |
| 4 | 11M46049 | SYSTEM BLANK | NA | 1 | 1 | | 10/01/07 10:40 |
| 5 | 11M46050 | WG251532-01 50NG BFB STD 8260 | NA | 1 | 1 | STD21685 | 10/01/07 11:15 |
| 6 | 11M46051 | WG251532-02 0.3ug/L WATER STD 8260 | NA | 1 | 1 | STD22186 | 10/01/07 11:40 |
| 7 | 11M46052 | WG251532-03 0.4 ug/L WATER STD 8260 | NA | 1 | 1 | STD22186 | 10/01/07 12:11 |
| 8 | 11M46053 | WG251532-04 1 ug/L WATER STD 8260 | NA | 1 | 1 | STD22186 | 10/01/07 12:42 |
| 9 | 11M46054 | WG251532-05 2 ug/L WATER STD 8260 | NA | 1 | 1 | STD22186 | 10/01/07 13:12 |
| 10 | 11M46055 | WG251532-06 5 ug/L WATER STD 8260 | NA | 1 | 1 | STD22186 | 10/01/07 13:42 |
| 11 | 11M46056 | WG251532-07 20 ug/L WATER STD 8260 | NA | 1 | 1 | STD22186 | 10/01/07 14:18 |
| 12 | 11M46057 | WG251532-08 50 ug/L WATER STD 8260 | NA | 1 | 1 | STD22186 | 10/01/07 14:48 |
| 13 | 11M46058 | WG251532-09 100 ug/L WATER STD 8260 | NA | 1 | 1 | STD22186 | 10/01/07 15:18 |
| 14 | 11M46059 | WG251532-10 200 ug/L WATER STD 8260 | NA | 1 | 1 | STD22186 | 10/01/07 15:48 |
| 15 | 11M46060 | SYSTEM BLANK | NA | 1 | 1 | | 10/01/07 16:19 |
| 16 | 11M46061 | SYSTEM BLANK | NA | 1 | 1 | | 10/01/07 16:49 |
| 17 | 11M46062 | SYSTEM BLANK | NA | 1 | 1 | | 10/01/07 17:23 |
| 18 | 11M46063 | WG251532-11 20ug/L ALT SOURCE 8260 | NA | 1 | 1 | STD22188 | 10/01/07 18:05 |
| 19 | 11M46064 | WG251618-01 50NG BFB STD 8260 | NA | 1 | 1 | STD21685 | 10/01/07 18:38 |
| 42 | 11M46065 | WG251618-02 50ug/L WATER STD 8260 | NA | 1 | 1 | STD22186 | 10/01/07 19:02 |
| 20 | 11M46066 | SYSTEM BLANK | NA | 1 | 1 | | 10/01/07 19:32 |
| 21 | 11M46067 | WG251532-11 20ug/L ALT SOURCE | NA | 1 | 1 | STD22188 | 10/01/07 20:02 |
| 22 | 11M46068 | WG251619-01 VBLK1001 BLANK 8260 | NA | 1 | 1 | | 10/01/07 20:32 |
| 23 | 11M46069 | WG251619-01 VBLK1001 BLANK 8260 | NA | 1 | 1 | | 10/01/07 21:02 |
| 24 | 11M46070 | WG251619-02 20ug/L LCS 8260 | NA | 1 | 1 | STD22188 | 10/01/07 21:32 |
| 25 | 11M46071 | WG251619-03 20ug/L LCSDUP 8260 | NA | 1 | 1 | STD22188 | 10/01/07 22:02 |
| 26 | 11M46072 | L0709662-09 B D1 5X 826-SPE | <2 | 1 | 5 | | 10/01/07 22:33 |
| 27 | 11M46073 | L0709662-10 B D1 10X 826-SPE | <2 | 1 | 10 | | 10/01/07 23:03 |
| 28 | 11M46074 | L0709662-11 B D1 10X 826-SPE | 5 | 1 | 10 | | 10/01/07 23:33 |
| 29 | 11M46075 | L0709499-11 B D1 10X 826-SPE | <2 | 1 | 10 | | 10/02/07 00:03 |
| 30 | 11M46076 | L0709540-08 A 826-SPE | <2 | 1 | 1 | | 10/02/07 00:33 |
| 31 | 11M46077 | L0709542-09 A 826-SPE | <2 | 1 | 1 | | 10/02/07 01:03 |
| 32 | 11M46078 | L0709540-01 A 826-SPE | <2 | 1 | 1 | | 10/02/07 01:34 |
| 33 | 11M46079 | L0709540-02 A 826-SPE | <2 | 1 | 1 | | 10/02/07 02:04 |

Approved: October 03, 2007

**KEMRON Environmental Services**

Instrument Run Log

| | | | | | |
|---|---|---|---|---|---|
| Instrument: | HPMS11 | Dataset: | 100107 | | |
| Analyst1: | MES | Analyst2: | NA | | |
| Method: | 8260B | SOP: | MSV01 | Rev: | 10 |
| Method: | 5030/5035 | SOP: | PAT01 | Rev: | 10 |

Maintenance Log ID: 21097

| | | | | | |
|---|---|---|---|---|---|
| Internal Standard: | STD21833 | Surrogate Standard: | STD22023 | | |
| CCV: | STD22186 | LCS: | STD22188 | MS/MSD: | NA |

Column 1 ID: RTX502.2 Column 2 ID: NA

Workgroups: WG251532,WG251619

| Seq. | File ID | Sample Information | pH | Mat | Dil | Reference | Date/Time |
|---|---|---|---|---|---|---|---|
| 34 | 11M46080 | L0709540-04 A 826-SPE | <2 | 1 | 1 | | 10/02/07 02:34 |
| 35 | 11M46081 | L0709540-05 A 826-SPE | <2 | 1 | 1 | | 10/02/07 03:04 |
| 36 | 11M46082 | L0709540-06 A 826-SPE | <2 | 1 | 1 | | 10/02/07 03:34 |
| 37 | 11M46083 | L0709540-07 A 826-SPE | <2 | 1 | 1 | | 10/02/07 04:05 |
| 38 | 11M46084 | L0709538-05 A 826-SPE | <2 | 1 | 1 | | 10/02/07 04:35 |
| 39 | 11M46085 | L0709538-07 A 826-SPE | <2 | 1 | 1 | | 10/02/07 05:05 |
| 40 | 11M46086 | L0709600-19 A 826-SPE | <2 | 1 | 1 | | 10/02/07 05:35 |
| 41 | 11M46087 | L0709600-21 A 826-SPE | <2 | 1 | 1 | | 10/02/07 06:05 |

**Comments**

| Seq. | Rerun | Dil. | Reason | Analytes |
|---|---|---|---|---|
| 18 | | | | |
| File ID: 11M46063 | | | | |
| | Do not report. | | | |

Approved: October 03, 2007

**KEMRON Environmental Services**

Instrument Run Log

Instrument: HPMS10    Dataset: 101807

Analyst1: MES    Analyst2: NA

Method: 8260B    SOP: MSV01    Rev: 10

Method: 5030/5035    SOP: PAT01    Rev: 10

Maintenance Log ID: 21384

Internal Standard: STD22019    Surrogate Standard: STD22132

CCV: STD22565    LCS: STD22574    MS/MSD: NA

Column 1 ID: RTX502.2    Column 2 ID: NA

Workgroups: WG253187

Comments:

| Seq. | File ID | Sample Information | pH | Mat | Dil | Reference | Date/Time |
|---|---|---|---|---|---|---|---|
| 1 | 10M59716 | WG253187-01 50NG BFB STD 8260 | NA | 1 | 1 | STD22252 | 10/18/07 08:52 |
| 2 | 10M59717 | SYSTEM BLANK | NA | 1 | 1 | | 10/18/07 09:18 |
| 3 | 10M59718 | WG253187-02 0.3 ug/L WATER STD 8260 | NA | 1 | 1 | STD22560 | 10/18/07 09:57 |
| 4 | 10M59719 | WG253187-03 0.4 ug/L WATER STD 8260 | NA | 1 | 1 | STD22565 | 10/18/07 10:29 |
| 5 | 10M59720 | WG253187-04 1 ug/L WATER STD 8260 | NA | 1 | 1 | STD22565 | 10/18/07 11:00 |
| 6 | 10M59721 | WG253187-05 2 ug/L WATER STD 8260 | NA | 1 | 1 | STD22565 | 10/18/07 11:31 |
| 7 | 10M59722 | WG253187-06 5 ug/L WATER STD 8260 | NA | 1 | 1 | STD22565 | 10/18/07 12:03 |
| 8 | 10M59723 | WG253187-07 20 ug/L WATER STD 8260 | NA | 1 | 1 | STD22565 | 10/18/07 12:35 |
| 9 | 10M59724 | WG253187-08 50 ug/L WATER STD 8260 | NA | 1 | 1 | STD22565 | 10/18/07 13:07 |
| 10 | 10M59725 | WG253187-09 100 ug/L WATER STD 8260 | NA | 1 | 1 | STD22565 | 10/18/07 13:45 |
| 11 | 10M59726 | WG253187-10 200 ug/L WATER STD 8260 | NA | 1 | 1 | STD22565 | 10/18/07 14:16 |
| 12 | 10M59727 | WG253187-11 300 ug/L WATER STD 8260 | NA | 1 | 1 | STD22565 | 10/18/07 14:47 |
| 13 | 10M59728 | SYSTEM BLANK | NA | 1 | 1 | | 10/18/07 15:18 |
| 14 | 10M59729 | SYSTEM BLANK | NA | 1 | 1 | | 10/18/07 15:49 |
| 15 | 10M59730 | SYSTEM BLANK | NA | 1 | 1 | | 10/18/07 16:20 |
| 16 | 10M59731 | WG253187-03 0.4 ug/L WATER STD 8260 | NA | 1 | 1 | STD22565 | 10/18/07 16:51 |
| 17 | 10M59732 | WG253187-12 20ug/L ALT SOURCE | NA | 1 | 1 | STD22409 | 10/18/07 18:23 |
| 18 | 10M59733 | WG253187-12 100ug/L MA OXY ALT SOUR | NA | 1 | 1 | STD22474 | 10/18/07 18:55 |
| 19 | 10M59734 | WG253187-13 100ug/L MA OXY ALT SOUR | NA | 1 | 1 | STD22474 | 10/18/07 19:37 |
| 20 | 10M59735 | SYSTEM BLANK | NA | 1 | 1 | | 10/18/07 20:08 |

## Comments

| Seq. | Rerun | Dil. | Reason | Analytes |
|---|---|---|---|---|
| 4 | | | | |
| File ID: 10M59719 | | | | |
| Do not report. | | | | |
| 18 | | | | |
| File ID: 10M59733 | | | | |
| Do not report. | | | | |

Approved: October 23, 2007

Page: 1

**KEMRON Environmental Services**

Instrument Run Log

| | | | | | |
|---|---|---|---|---|---|
| Instrument: | HPMS11 | Dataset: | 102407 | | |
| Analyst1: | MES | Analyst2: | TMB | | |
| Method: | 8260B | SOP: | MSV01 | Rev: | 10 |
| Method: | 624 | SOP: | MSV10 | Rev: | 9 |
| Method: | 5030/5035 | SOP: | PAT01 | Rev: | 10 |
| Maintenance Log ID: | 21449 | | | | |

| | | | | | |
|---|---|---|---|---|---|
| Internal Standard: | STD22304 | Surrogate Standard: | STD22615 | | |
| CCV: | STD22565 | LCS: | STD22574 | MS/MSD: | NA |

Column 1 ID: RTX502.2 Column 2 ID: NA

Workgroups: WG253678

Comments:

| Seq. | File ID | Sample Information | pH | Mat | Dil | Reference | Date/Time |
|---|---|---|---|---|---|---|---|
| 1 | 11M46848 | SYSTEM BLANK | NA | 1 | 1 | | 10/24/07 08:23 |
| 2 | 11M46849 | SYSTEM BLANK | NA | 1 | 1 | | 10/24/07 08:54 |
| 3 | 11M46850 | WG253676-01 50ng BFB STD 8260 | NA | 1 | 1 | STD22252 | 10/24/07 09:19 |
| 4 | 11M46851 | WG253676-02 50ug/L CCV STD 8260 | NA | 1 | 1 | STD22565 | 10/24/07 09:42 |
| 5 | 11M46852 | WG253678-01 VBLK1024 BLANK 8260 | NA | 1 | 1 | | 10/24/07 10:21 |
| 6 | 11M46853 | WG253678-01 VBLK1024 BLANK 8260 | NA | 1 | 1 | | 10/24/07 10:51 |
| 7 | 11M46854 | WG253678-02 20ug/L LCS STD 8260 | NA | 1 | 1 | STD22574 | 10/24/07 11:21 |
| 8 | 11M46855 | WG253678-03 20ug/L LCSDUP STD 8260 | NA | 1 | 1 | STD22574 | 10/24/07 11:52 |
| 9 | 11M46856 | L0710605-01 A 826-BETX | <2 | 1 | 1 | | 10/24/07 12:22 |
| 10 | 11M46857 | L0710610-05 A 826-SPE | <2 | 1 | 1 | | 10/24/07 12:52 |
| 11 | 11M46858 | L0710596-15 A 826-SPE | <2 | 1 | 1 | | 10/24/07 13:22 |
| 12 | 11M46859 | L0710597-14 A 826-SPE | <2 | 1 | 1 | | 10/24/07 13:52 |
| 13 | 11M46860 | L0710610-01 A 826-SPE | <2 | 1 | 1 | | 10/24/07 14:23 |
| 14 | 11M46861 | L0710610-02 A 826-SPE | <2 | 1 | 1 | | 10/24/07 14:53 |
| 15 | 11M46862 | L0710610-03 A 826-SPE | <2 | 1 | 1 | | 10/24/07 15:23 |
| 16 | 11M46863 | L0710610-04 A 10X 826-SPE | <2 | 1 | 10 | | 10/24/07 15:54 |
| 17 | 11M46864 | L0710596-01 A 826-SPE | <2 | 1 | 1 | | 10/24/07 16:23 |
| 18 | 11M46865 | L0710596-02 A 826-SPE | 5 | 1 | 1 | | 10/24/07 16:53 |
| 19 | 11M46866 | L0710596-05 A 826-SPE | <2 | 1 | 1 | | 10/24/07 17:23 |
| 20 | 11M46867 | L0710597-09 A 826-SPE | <2 | 1 | 1 | | 10/24/07 17:54 |
| 21 | 11M46868 | L0710596-07 A 826-SPE | <2 | 1 | 1 | | 10/24/07 18:24 |
| 22 | 11M46869 | L0710596-08 A 826-SPE | <2 | 1 | 1 | | 10/24/07 18:55 |
| 23 | 11M46870 | L0710596-09 A 826-SPE | <2 | 1 | 1 | | 10/24/07 19:25 |
| 24 | 11M46871 | L0710596-10 A 826-SPE | <2 | 1 | 1 | | 10/24/07 19:56 |
| 25 | 11M46872 | L0710596-11 A 826-SPE | <2 | 1 | 1 | | 10/24/07 20:26 |
| 26 | 11M46873 | L0710597-07 A 826-SPE | <2 | 1 | 1 | | 10/24/07 20:56 |
| 27 | 11M46874 | SYSTEM BLANK | NA | 1 | 1 | | 10/24/07 21:27 |
| 28 | 11M46875 | WG253678-04 624 BLANK | NA | 1 | 1 | | 10/24/07 21:57 |
| 29 | 11M46876 | L0710674-01 A 624-SPE | 3 | 2 | 1 | | 10/24/07 22:28 |
| 30 | 11M46877 | L0710680-01 A 624-SPE | 7 | 2 | 1 | | 10/24/07 22:59 |

**Comments**

| Seq. | Rerun | Dil. | Reason | Analytes |
|---|---|---|---|---|

Approved: October 26, 2007

**KEMRON Environmental Services**

Instrument Run Log

Instrument: HPMS11 Dataset: 102407

Analyst1: MES Analyst2: TMB

Method: 8260B SOP: MSV01 Rev: 10

Method: 624 SOP: MSV10 Rev: 9

Method: 5030/5035 SOP: PAT01 Rev: 10

Maintenance Log ID: 21449

Internal Standard: STD22304 Surrogate Standard: STD22615

CCV: STD22565 LCS: STD22574 MS/MSD: NA

Column 1 ID: RTX502.2 Column 2 ID: NA

Workgroups: WG253678

**Comments**

| Seq. | Rerun | Dil. | Reason | Analytes |
|---|---|---|---|---|
| 16 | X | 1 | Analyzed too dilute | |
| File ID: 11M46863 | | | | |
| | Do not report. | | | |
| 17 | X | 100 | Over Calibration Range | cis-1,2-DCE and TCE |
| File ID: 11M46864 | | | | |
| 18 | X | 10 | Over Calibration Range | TCE |
| File ID: 11M46865 | | | | |
| 19 | X | 1 | Carry-over contamination | |
| File ID: 11M46866 | | | | |
| | Do not report. | | | |
| 20 | X | 5 | Over Calibration Range | FREON-113 |
| File ID: 11M46867 | | | | |
| 21 | X | 1 | Carry-over contamination | |
| File ID: 11M46868 | | | | |
| | Do not report. | | | |
| 23 | X | 20 | Over Calibration Range | FREON-113 |
| File ID: 11M46870 | | | | |
| 24 | X | 1 | Carry-over contamination | |
| File ID: 11M46871 | | | | |
| | Do not report. | | | |

Approved: October 26, 2007

Page: 2

**KEMRON Environmental Services**

Instrument Run Log

Instrument: HPMS10 Dataset: 102507

Analyst1: MES Analyst2: NA

Method: 8260B SOP: MSV01 Rev: 10

Method: 5030/5035 SOP: PAT01 Rev: 10

Maintenance Log ID: 21463

Internal Standard: STD22019 Surrogate Standard: STD22132

CCV: STD22565 LCS: STD22574 MS/MSD: NA

Column 1 ID: RTX502.2 Column 2 ID: NA

Workgroups: WG253794

Comments:

| Seq. | File ID | Sample Information | pH | Mat | Dil | Reference | Date/Time |
|---|---|---|---|---|---|---|---|
| 1 | 10M59849 | WG253793-01 50NG BFB STD 8260 | NA | 1 | 1 | STD22252 | 10/25/07 07:51 |
| 2 | 10M59850 | WG253793-01 50NG BFB STD 8260 | NA | 1 | 1 | STD22252 | 10/25/07 08:04 |
| 3 | 10M59851 | WG253793-02 50ug/L WATER STD 8260 | NA | 1 | 1 | STD22565 | 10/25/07 08:27 |
| 4 | 10M59852 | WG253794-01 VBLK1025 BLANK 8260 | NA | 1 | 1 | | 10/25/07 09:00 |
| 5 | 10M59853 | WG253794-01 VBLK1025 BLANK 8260 | NA | 1 | 1 | | 10/25/07 09:31 |
| 6 | 10M59854 | WG253794-02 20ug/L LCS 8260 | NA | 1 | 1 | STD22574 | 10/25/07 10:03 |
| 7 | 10M59855 | WG253794-03 20ug/L LCSDUP 8260 | NA | 1 | 1 | STD22574 | 10/25/07 10:35 |
| 8 | 10M59856 | L0710582-10 B D1 10X 826-LOW | <2 | 1 | 10 | | 10/25/07 11:06 |
| 9 | 10M59857 | L0710616-01 A 826-SPE | <2 | 1 | 1 | | 10/25/07 11:37 |
| 10 | 10M59858 | L0710557-03 B 826-SPE | <2 | 1 | 1 | | 10/25/07 12:08 |
| 11 | 10M59859 | L0710596-05 B 826-SPE | <2 | 1 | 1 | | 10/25/07 12:40 |
| 12 | 10M59860 | L0710596-07 B 826-SPE | <2 | 1 | 1 | | 10/25/07 13:11 |
| 13 | 10M59861 | L0710596-10 B 826-SPE | <2 | 1 | 1 | | 10/25/07 13:42 |
| 14 | 10M59862 | L0710582-11 B D1 10X 826-LOW | <2 | 1 | 10 | | 10/25/07 14:13 |
| 15 | 10M59863 | L0710582-15 B D1 10X 826-LOW | <2 | 1 | 10 | | 10/25/07 14:44 |
| 16 | 10M59864 | L0710582-05 B D1 10X 826-LOW | <2 | 1 | 10 | | 10/25/07 15:15 |
| 17 | 10M59865 | L0710616-02 A 826-SPE | <2 | 1 | 1 | | 10/25/07 15:46 |
| 18 | 10M59866 | L0710616-03 A 826-SPE | <2 | 1 | 1 | | 10/25/07 16:17 |
| 19 | 10M59867 | L0710616-04 A 826-SPE | <2 | 1 | 1 | | 10/25/07 16:48 |
| 20 | 10M59868 | L0710616-05 A 826-SPE | <2 | 1 | 1 | | 10/25/07 17:19 |
| 21 | 10M59869 | L0710616-06 A 826-SPE | <2 | 1 | 1 | | 10/25/07 17:51 |
| 22 | 10M59870 | L0710597-05 A 826-SPE | <2 | 1 | 1 | | 10/25/07 18:23 |
| 23 | 10M59871 | L0710597-06 A 826-SPE | <2 | 1 | 1 | | 10/25/07 18:54 |
| 24 | 10M59872 | L0710597-08 A 826-SPE | <2 | 1 | 1 | | 10/25/07 19:26 |
| 25 | 10M59873 | L0710597-10 A 826-SPE | <2 | 1 | 1 | | 10/25/07 19:57 |
| 26 | 10M59874 | SYSTEM BLANK | NA | 1 | 1 | | 10/25/07 20:28 |
| 27 | 10M59875 | SYSTEM BLANK | NA | 1 | 1 | | 10/25/07 21:00 |
| 28 | 10M59877 | SYSTEM CHECK | NA | 1 | 1 | | 10/25/07 21:32 |

**Comments**

| Seq. | Rerun | Dil. | Reason | Analytes |
|---|---|---|---|---|
| 1 | | | | |
| File ID: 10M59849 | | | | |

Approved: October 29, 2007

**KEMRON Environmental Services**

Instrument Run Log

Instrument: HPMS10 Dataset: 102507

Analyst1: MES Analyst2: NA

Method: 8260B SOP: MSV01 Rev: 10

Method: 5030/5035 SOP: PAT01 Rev: 10

Maintenance Log ID: 21463

Internal Standard: STD22019 Surrogate Standard: STD22132

CCV: STD22565 LCS: STD22574 MS/MSD: NA

Column 1 ID: RTX502.2 Column 2 ID: NA

Workgroups: WG253794

**Comments**

| Seq. | Rerun | Dil. | Reason | Analytes |
|---|---|---|---|---|
| | RR, BFB failed. | | | |
| 24 | X | 25 | Over Calibration Range | TCE |
| File ID: | 10M59872 | | | |
| 25 | X | 1 | Carry-over contamination | |
| File ID: | 10M59873 | | | |
| | Do not report. | | | |

Approved: October 29, 2007

Page: 2

**KEMRON Environmental Services**

Instrument Run Log

Instrument: HPMS10 Dataset: 102707

Analyst1: MES Analyst2: NA

Method: 8260B SOP: MSV01 Rev: 10

Method: 5030/5035 SOP: PAT01 Rev: 10

Maintenance Log ID: 21484

Internal Standard: STD22714 Surrogate Standard: STD22715

CCV: STD22565 LCS: STD22574 MS/MSD: NA

Column 1 ID: RTX502.2 Column 2 ID: NA

Workgroups: WG254006

Comments:

| Seq. | File ID | Sample Information | pH | Mat | Dil | Reference | Date/Time |
|---|---|---|---|---|---|---|---|
| 1 | 10M59910 | WG254005-01 50NG BFB STD 8260 | NA | 1 | 1 | STD22252 | 10/27/07 09:21 |
| 2 | 10M59911 | WG254005-02 50ug/L WATER STD 8260 | NA | 1 | 1 | STD22565 | 10/27/07 09:47 |
| 3 | 10M59912 | WG254006-01 VBLK1027 BLANK 8260 | NA | 1 | 1 | | 10/27/07 10:19 |
| 4 | 10M59913 | WG254006-01 VBLK1027 BLANK 8260 | NA | 1 | 1 | | 10/27/07 10:52 |
| 5 | 10M59914 | WG254006-02 20ug/L LCS 8260 | NA | 1 | 1 | STD22574 | 10/27/07 11:24 |
| 6 | 10M59915 | WG254006-03 20ug/L LCSDUP 8260 | NA | 1 | 1 | STD22574 | 10/27/07 11:56 |
| 7 | 10M59916 | L0710596-01 B D1 100X 826-SPE | <2 | 1 | 100 | | 10/27/07 12:28 |
| 8 | 10M59917 | L0710596-02 B D1 10X 826-SPE | 5 | 1 | 10 | | 10/27/07 13:00 |
| 9 | 10M59918 | L0710596-09 B D1 20X 826-SPE | <2 | 1 | 20 | | 10/27/07 13:32 |
| 10 | 10M59919 | L0710596-11 B 826-SPE | <2 | 1 | 1 | | 10/27/07 14:05 |
| 11 | 10M59920 | L0710597-07 B 826-SPE | <2 | 1 | 1 | | 10/27/07 14:37 |
| 12 | 10M59921 | L0710582-07 B 826-LOW | <2 | 1 | 1 | | 10/27/07 15:10 |
| 13 | 10M59922 | L0710582-09 B 826-LOW | <2 | 1 | 1 | | 10/27/07 15:42 |
| 14 | 10M59923 | L0710582-16 B 826-LOW | <2 | 1 | 1 | | 10/27/07 16:15 |
| 15 | 10M59924 | L0710582-17 B 826-LOW | <2 | 1 | 1 | | 10/27/07 16:46 |
| 16 | 10M59925 | L0710597-09 B D1 5X 826-SPE | <2 | 1 | 5 | | 10/27/07 17:19 |
| 17 | 10M59926 | L0710447-03 B D1 10X 826-SPE | <2 | 1 | 10 | | 10/27/07 17:51 |
| 18 | 10M59927 | L0710447-04 B D1 5X 826-SPE | <2 | 1 | 5 | | 10/27/07 18:24 |
| 19 | 10M59928 | L0710447-07 B D1 5X 826-SPE | <2 | 1 | 5 | | 10/27/07 18:56 |
| 20 | 10M59929 | L0710494-03 B D1 20X 826-SPE | <2 | 1 | 20 | | 10/27/07 19:29 |
| 21 | 10M59930 | L0710494-04 B D1 20X 826-SPE | <2 | 1 | 20 | | 10/27/07 20:03 |
| 22 | 10M59931 | L0710494-05 B D1 50X 826-SPE | <2 | 1 | 50 | | 10/27/07 20:35 |
| 23 | 10M59932 | L0710494-07 B D1 5X 826-SPE | <2 | 1 | 5 | | 10/27/07 21:08 |
| 24 | 10M59933 | L0710582-04 A 826-LOW | <2 | 1 | 1 | | 10/27/07 21:41 |
| 25 | 10M59934 | SYSTEM BLANK | NA | 1 | 1 | | 10/27/07 22:13 |
| 26 | 10M59935 | SYSTEM CHECK | NA | 1 | 1 | | 10/27/07 22:44 |

**Comments**

| Seq. | Rerun | Dil. | Reason | Analytes |
|---|---|---|---|---|
| 24 | X | 2.5 | Missed Tune | |
| File ID: | 10M59933 | | | |

Approved: October 30, 2007

Page: 1

Checklist ID: 21827

# KEMRON Environmental Services
## Data Checklist

Date: 01-OCT-2007
Analyst: MES
Analyst: NA
Method: 8260
Instrument: HPMS11
Curve Workgroup: NA
Runlog ID: 18538
Analytical Workgroups: WG251532,WG251619

| | |
|---|---|
| BFB | X |
| Initial Calibration | X |
| Average RF | X |
| Linear Reg or Higher Order Curve | X |
| Second Source standard % Difference | X |
| Continuing Calibration /Check Standards | X |
| Project/Client Specific Requirements | X |
| Special Standards | NA |
| Blanks | X |
| TCL's | X |
| Surrogates | X |
| LCS (Laboratory Control Sample) | X |
| Recoveries | X |
| Surrogates | X |
| MS/MSD/Duplicates | NA |
| Samples | X |
| TCL Hits | X |
| Spectra of TCL Hits | X |
| Surrogates | X |
| Internal Standards Criteria | X |
| Library Searches | NA |
| Calculations & Correct Factors | X |
| Dilutions Run | X |
| Reruns | NA |
| Manual Integrations | NA |
| Case Narrative | X |
| Results Reporting/Data Qualifiers | X |
| KOBRA Workgroup Data | X |
| Check for Completeness | X |
| Primary Reviewer | MES |
| Secondary Reviewer | MDA |
| | |
| | |
| Check for compliance with method and project specific requirements | X |
| Check the completeness of reported information | X |
| Check the information for the report narrative | X |
| Check the reasonableness of the results | X |
| | |

Primary Reviewer: 02-OCT-2007
Mary Schilling

Secondary Reviewer: 03-OCT-2007
[illegible signature]

Generated: OCT-03-2007 10:10:17

KEMRON Environmental Services
Data Checklist

Date: 18-OCT-2007
Analyst: MES
Analyst: NA
Method: 8260
Instrument: HPMS10
Curve Workgroup: NA
Runlog ID: 18888
Analytical Workgroups: WG253187

| | |
|---|---|
| BFB | X |
| Initial Calibration | X |
| Average RF | X |
| Linear Reg or Higher Order Curve | X |
| Second Source standard % Difference | X |
| Continuing Calibration /Check Standards | NA |
| Project/Client Specific Requirements | NA |
| Special Standards | NA |
| Blanks | NA |
| TCL's | NA |
| Surrogates | NA |
| LCS (Laboratory Control Sample) | NA |
| Recoveries | NA |
| Surrogates | NA |
| MS/MSD/Duplicates | NA |
| Samples | NA |
| TCL Hits | NA |
| Spectra of TCL Hits | NA |
| Surrogates | NA |
| Internal Standards Criteria | NA |
| Library Searches | NA |
| Calculations & Correct Factors | NA |
| Dilutions Run | NA |
| Reruns | NA |
| Manual Integrations | NA |
| Case Narrative | NA |
| Results Reporting/Data Qualifiers | X |
| KOBRA Workgroup Data | X |
| Check for Completeness | X |
| Primary Reviewer | MES |
| Secondary Reviewer | MDA |
| | |
| | |
| Check for compliance with method and project specific requirements | X |
| Check the completeness of reported information | X |
| Check the information for the report narrative | X |
| Check the reasonableness of the results | X |
| | |

Primary Reviewer:
22-OCT-2007

Secondary Reviewer:
23-OCT-2007

Generated: OCT-23-2007 11:16:45

KEMRON Environmental Services
Data Checklist

Date: 24-OCT-2007
Analyst: MES
Analyst: TMB
Method: 8260/624
Instrument: HPMS11
Curve Workgroup: NA
Runlog ID: 18964
Analytical Workgroups: WG253678

| | |
|---|---|
| BFB | X |
| Initial Calibration | X |
| Average RF | X |
| Linear Reg or Higher Order Curve | X |
| Second Source standard % Difference | X |
| Continuing Calibration /Check Standards | X |
| Project/Client Specific Requirements | X |
| Special Standards | NA |
| Blanks | X |
| TCL's | X |
| Surrogates | X |
| LCS (Laboratory Control Sample) | X |
| Recoveries | X |
| Surrogates | X |
| MS/MSD/Duplicates | NA |
| Samples | X |
| TCL Hits | X |
| Spectra of TCL Hits | X |
| Surrogates | X |
| Internal Standards Criteria | X |
| Library Searches | NA |
| Calculations & Correct Factors | X |
| Dilutions Run | NA |
| Reruns | X |
| Manual Integrations | NA |
| Case Narrative | X |
| Results Reporting/Data Qualifiers | X |
| KOBRA Workgroup Data | X |
| Check for Completeness | X |
| Primary Reviewer | MES |
| Secondary Reviewer | MDA |
| | |
| | |
| Check for compliance with method and project specific requirements | X |
| Check the completeness of reported information | X |
| Check the information for the report narrative | X |
| Check the reasonableness of the results | X |
| | |

Primary Reviewer:
25-OCT-2007

Secondary Reviewer:
26-OCT-2007

Generated: OCT-26-2007 13:30:22

KEMRON Environmental Services

Data Checklist

Date: 25-OCT-2007

Analyst: MES

Analyst: NA

Method: 8260

Instrument: HPMS10

Curve Workgroup: NA

Runlog ID: 18983

Analytical Workgroups: WG253794

| | |
|---|---|
| BFB | X |
| Initial Calibration | X |
| Average RF | X |
| Linear Reg or Higher Order Curve | X |
| Second Source standard % Difference | X |
| Continuing Calibration /Check Standards | X |
| Project/Client Specific Requirements | X |
| Special Standards | NA |
| Blanks | X |
| TCL's | X |
| Surrogates | X |
| LCS (Laboratory Control Sample) | X |
| Recoveries | X |
| Surrogates | X |
| MS/MSD/Duplicates | NA |
| Samples | X |
| TCL Hits | X |
| Spectra of TCL Hits | X |
| Surrogates | X |
| Internal Standards Criteria | X |
| Library Searches | NA |
| Calculations & Correct Factors | X |
| Dilutions Run | X |
| Reruns | X |
| Manual Integrations | NA |
| Case Narrative | X |
| Results Reporting/Data Qualifiers | X |
| KOBRA Workgroup Data | X |
| Check for Completeness | X |
| Primary Reviewer | MES |
| Secondary Reviewer | MDA |
| | |
| | |
| Check for compliance with method and project specific requirements | X |
| Check the completeness of reported information | X |
| Check the information for the report narrative | X |
| Check the reasonableness of the results | X |
| | |

Primary Reviewer:
26-OCT-2007

Secondary Reviewer:
29-OCT-2007

Generated: OCT-29-2007 09:10:40

KEMRON Environmental Services
Data Checklist

Date: 27-OCT-2007
Analyst: MES
Analyst: NA
Method: 8260
Instrument: HPMS10
Curve Workgroup: NA
Runlog ID: 19007
Analytical Workgroups: WG254006

| | |
|---|---|
| BFB | X |
| Initial Calibration | X |
| Average RF | X |
| Linear Reg or Higher Order Curve | X |
| Second Source standard % Difference | X |
| Continuing Calibration /Check Standards | X |
| Project/Client Specific Requirements | X |
| Special Standards | NA |
| Blanks | X |
| TCL's | X |
| Surrogates | X |
| LCS (Laboratory Control Sample) | X |
| Recoveries | X |
| Surrogates | X |
| MS/MSD/Duplicates | NA |
| Samples | X |
| TCL Hits | X |
| Spectra of TCL Hits | X |
| Surrogates | X |
| Internal Standards Criteria | X |
| Library Searches | NA |
| Calculations & Correct Factors | X |
| Dilutions Run | X |
| Reruns | NA |
| Manual Integrations | NA |
| Case Narrative | X |
| Results Reporting/Data Qualifiers | X |
| KOBRA Workgroup Data | X |
| Check for Completeness | X |
| Primary Reviewer | MES |
| Secondary Reviewer | MDA |
| | |
| | |
| Check for compliance with method and project specific requirements | X |
| Check the completeness of reported information | X |
| Check the information for the report narrative | X |
| Check the reasonableness of the results | X |
| | |

Primary Reviewer: 29-OCT-2007

Secondary Reviewer: 30-OCT-2007

Generated: OCT-30-2007 08:43:08

# KEMRON Environmental Services
## HOLDING TIMES
## EQUIVALENT TO AFCEE FORM 9

Analytical Method: 8260B

AAB#: WG254006

Login Number: L0710596

| Client ID | Date Collected | Date Received | Date Extracted | Max Hold Time Ext. | Time Held Ext. | Date Analyzed | Max Hold Time Anal | Time Held Anal. | Q |
|---|---|---|---|---|---|---|---|---|---|
| 47WWZZ-101807 | 10/18/07 | 10/23/07 | 10/27/07 | 14 | 9.17 | 10/27/07 | 14 | 9.17 | |
| 47WW05-102007 | 10/20/07 | 10/23/07 | 10/27/07 | 14 | 7.17 | 10/27/07 | 14 | 7.17 | |
| LHSMW56-102007 | 10/20/07 | 10/23/07 | 10/27/07 | 14 | 7.18 | 10/27/07 | 14 | 7.18 | |
| 47WW01-101807 | 10/18/07 | 10/23/07 | 10/27/07 | 14 | 9.14 | 10/27/07 | 14 | 9.14 | |

* EXT = SEE PROJECT QAPP REQUIREMENTS

*ANAL = SEE PROJECT QAPP REQUIREMENTS

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Version 1.5 PDF File ID: 921089
Report generated 10/30/2007 15:49

# KEMRON Environmental Services
## HOLDING TIMES
## EQUIVALENT TO AFCEE FORM 9

Analytical Method: 8260B

AAB#: WG253794

Login Number: L0710596

| Client ID | Date Collected | Date Received | Date Extracted | Max Hold Time Ext. | Time Held Ext. | Date Analyzed | Max Hold Time Anal | Time Held Anal. | Q |
|---|---|---|---|---|---|---|---|---|---|
| 47WW21-101807 | 10/18/07 | 10/23/07 | 10/25/07 | 14 | 6.95 | 10/25/07 | 14 | 6.95 | |
| 47WW04-101807 | 10/18/07 | 10/23/07 | 10/25/07 | 14 | 7.09 | 10/25/07 | 14 | 7.09 | |
| 47WW23-101907 | 10/19/07 | 10/23/07 | 10/25/07 | 14 | 6.12 | 10/25/07 | 14 | 6.12 | |

* EXT = SEE PROJECT QAPP REQUIREMENTS

*ANAL = SEE PROJECT QAPP REQUIREMENTS

KEMRON FORMS - Modified 11/20/2006
Version 1.5 PDF File ID: 921089
Report generated 10/30/2007 15:49

# KEMRON Environmental Services
## HOLDING TIMES
## EQUIVALENT TO AFCEE FORM 9

00078664

Analytical Method: 8260B

AAB#: WG253678

Login Number: L0710596

| Client ID | Date Collected | Date Received | Date Extracted | Max Hold Time Ext. | Time Held Ext. | Date Analyzed | Max Hold Time Anal | Time Held Anal. | Q |
|---|---|---|---|---|---|---|---|---|---|
| 47WW05-102007 | 10/20/07 | 10/23/07 | 10/24/07 | 14 | 4.34 | 10/24/07 | 14 | 4.34 | |
| TRIP BLANK | 10/20/07 | 10/23/07 | 10/24/07 | 14 | 4.56 | 10/24/07 | 14 | 4.56 | |
| 47WW21-101807-QC | 10/18/07 | 10/23/07 | 10/24/07 | 14 | 6.19 | 10/24/07 | 14 | 6.19 | |
| LHSMW56-102007 | 10/20/07 | 10/23/07 | 10/24/07 | 14 | 4.34 | 10/24/07 | 14 | 4.34 | |
| 47WW01-101807 | 10/18/07 | 10/23/07 | 10/24/07 | 14 | 6.38 | 10/24/07 | 14 | 6.38 | |

* EXT = SEE PROJECT QAPP REQUIREMENTS
*ANAL = SEE PROJECT QAPP REQUIREMENTS

KEMRON FORMS - Modified 11/20/2006
Version 1.5 PDF File ID: 921089
Report generated 10/30/2007 15:49

# SURROGATE STANDARDS

Login Number: L0710596
Instrument Id: HPMS11
Workgroup (AAB#): WG253678

Method: 8260
CAL ID: HPMS11 - 01-OCT-07
Matrix: Water

| Sample Number | Dilution | Tag | 1 | 2 | 3 | 4 |
|---|---|---|---|---|---|---|
| L0710596-01 | 1.00 | 01 | 91.6 | 92.5 | 89.2 | 86.2 |
| L0710596-02 | 1.00 | 01 | 94.8 | 93.3 | 90.0 | 88.6 |
| L0710596-08 | 1.00 | 01 | 94.2 | 97.7 | 92.1 | 89.1 |
| L0710596-09 | 1.00 | 01 | 93.5 | 94.2 | 89.4 | 87.0 |
| L0710596-15 | 1.00 | 01 | 88.0 | 91.6 | 90.9 | 89.3 |
| WG253678-01 | 1.00 | 01 | 90.9 | 90.6 | 88.4 | 87.6 |
| WG253678-02 | 1.00 | 01 | 89.4 | 93.1 | 87.1 | 88.0 |
| WG253678-03 | 1.00 | 01 | 90.1 | 93.3 | 87.5 | 89.5 |
| WG253678-04 | 1.00 | 01 | 94.9 | 93.8 | 89.2 | 87.4 |

| Surrogates | Surrogate Limits | | |
|---|---|---|---|
| 1 - 1,2-Dichloroethane-d4 | 80 | - | 120 |
| 2 - Dibromofluoromethane | 86 | - | 118 |
| 3 - p-Bromofluorobenzene | 86 | - | 115 |
| 4 - Toluene-d8 | 88 | - | 110 |

Underline = Result out of surrogate limits

DL = surrogate diluted out
ND = surrogate not detected

KEMRON FORMS - Modified 09/27/2006
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## SURROGATE STANDARDS

Login Number: L0710596
Instrument Id: HPMS10
Workgroup (AAB#): WG254006

Method: 8260
CAL ID: HPMS10 - 18-OCT-07
Matrix: Water

| Sample Number | Dilution | Tag | 1 | 2 | 3 | 4 |
|---|---|---|---|---|---|---|
| L0710596-01 | 100 | DL01 | 96.8 | 99.5 | 102 | 98.2 |
| L0710596-02 | 10.0 | DL01 | 99.1 | 101 | 98.9 | 96.5 |
| L0710596-09 | 20.0 | DL01 | 102 | 102 | 102 | 97.4 |
| L0710596-11 | 1.00 | 02 | 98.6 | 95.2 | 91.6 | 91.2 |
| WG254006-01 | 1.00 | 01 | 98.2 | 96.5 | 97.5 | 94.7 |
| WG254006-02 | 1.00 | 01 | 102 | 102 | 97.1 | 97.3 |
| WG254006-03 | 1.00 | 01 | 98.3 | 101 | 101 | 99.4 |

| | Surrogates | Surrogate Limits |
|---|---|---|
| 1 | 1,2-Dichloroethane-d4 | 80 - 120 |
| 2 | Dibromofluoromethane | 86 - 118 |
| 3 | p-Bromofluorobenzene | 86 - 115 |
| 4 | Toluene-d8 | 88 - 110 |

Underline = Result out of surrogate limits

DL = surrogate diluted out
ND = surrogate not detected

KEMRON FORMS - Modified 09/27/2006
Version 1.5 PDF File ID: 921097
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## SURROGATE STANDARDS

Login Number: L0710596
Instrument Id: HPMS10
Workgroup (AAB#): WG253794

Method: 8260
CAL ID: HPMS10 - 18-OCT-07
Matrix: Water

| Sample Number | Dilution | Tag | 1 | 2 | 3 | 4 |
|---|---|---|---|---|---|---|
| L0710596-05 | 1.00 | 01 | 102 | 103 | 99.2 | 97.6 |
| L0710596-07 | 1.00 | 01 | 100 | 102 | 96.6 | 93.9 |
| L0710596-10 | 1.00 | 01 | 107 | 103 | 96.0 | 95.3 |
| WG253794-01 | 1.00 | 01 | 99.7 | 101 | 105 | 105 |
| WG253794-02 | 1.00 | 01 | 99.3 | 102 | 96.6 | 98.5 |
| WG253794-03 | 1.00 | 01 | 93.7 | 96.4 | 95.9 | 96.5 |

| Surrogates | Surrogate Limits | | |
|---|---|---|---|
| 1 - 1,2-Dichloroethane-d4 | 80 | - | 120 |
| 2 - Dibromofluoromethane | 86 | - | 118 |
| 3 - p-Bromofluorobenzene | 86 | - | 115 |
| 4 - Toluene-d8 | 88 | - | 110 |

Underline = Result out of surrogate limits

DL = surrogate diluted out
ND = surrogate not detected

KEMRON FORMS - Modified 09/27/2006
Version 1.5 PDF File ID: 921097
Report generated 10/30/2007 15:50

## METHOD BLANK SUMMARY

Login Number: L0710596
Blank File ID: 10M59853
Prep Date: 10/25/07 09:31
Analyzed Date: 10/25/07 09:31
Analyst: MES

Work Group: WG253794
Blank Sample ID: WG253794-01
Instrument ID: HPMS10
Method: 8260B

This Method Blank Applies To The Following Samples:

| Client ID | Lab Sample ID | Lab File ID | Time Analyzed | TAG |
|---|---|---|---|---|
| LCS | WG253794-02 | 10M59854 | 10/25/07 10:03 | 01 |
| LCS2 | WG253794-03 | 10M59855 | 10/25/07 10:35 | 01 |
| 47WW23-101907 | L0710596-05 | 10M59859 | 10/25/07 12:40 | 01 |
| 47WW21-101807 | L0710596-07 | 10M59860 | 10/25/07 13:11 | 01 |
| 47WW04-101807 | L0710596-10 | 10M59861 | 10/25/07 13:42 | 01 |

KEMRON FORMS - Modified 01/31/2007
Version 1.5 PDF File ID: 921090
Report generated 10/30/2007 15:49

# METHOD BLANK SUMMARY

Login Number: L0710596
Work Group: WG254006
Blank File ID: 10M59913
Blank Sample ID: WG254006-01
Prep Date: 10/27/07 10:52
Instrument ID: HPMS10
Analyzed Date: 10/27/07 10:52
Method: 8260B
Analyst: MES

This Method Blank Applies To The Following Samples:

| Client ID | Lab Sample ID | Lab File ID | Time Analyzed | TAG |
|---|---|---|---|---|
| LCS | WG254006-02 | 10M59914 | 10/27/07 11:24 | 01 |
| LCS2 | WG254006-03 | 10M59915 | 10/27/07 11:56 | 01 |
| LHSMW56-102007 | L0710596-01 | 10M59916 | 10/27/07 12:28 | DL01 |
| 47WW05-102007 | L0710596-02 | 10M59917 | 10/27/07 13:00 | DL01 |
| 47WW01-101807 | L0710596-09 | 10M59918 | 10/27/07 13:32 | DL01 |
| 47WWZZ-101807 | L0710596-11 | 10M59919 | 10/27/07 14:05 | 02 |

KEMRON FORMS - Modified 01/31/2007
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Report generated 10/30/2007 15:49

## METHOD BLANK SUMMARY

Login Number: L0710596
Blank File ID: 11M46853
Prep Date: 10/24/07 10:51
Analyzed Date: 10/24/07 10:51
Analyst: MES

Work Group: WG253678
Blank Sample ID: WG253678-01
Instrument ID: HPMS11
Method: 8260B

This Method Blank Applies To The Following Samples:

| Client ID | Lab Sample ID | Lab File ID | Time Analyzed | TAG |
|---|---|---|---|---|
| LCS | WG253678-02 | 11M46854 | 10/24/07 11:21 | 01 |
| LCS2 | WG253678-03 | 11M46855 | 10/24/07 11:52 | 01 |
| TRIP BLANK | L0710596-15 | 11M46858 | 10/24/07 13:22 | 01 |
| LHSMW56-102007 | L0710596-01 | 11M46864 | 10/24/07 16:23 | 01 |
| 47WW05-102007 | L0710596-02 | 11M46865 | 10/24/07 16:53 | 01 |
| 47WW21-101807-QC | L0710596-08 | 11M46869 | 10/24/07 18:55 | 01 |
| 47WW01-101807 | L0710596-09 | 11M46870 | 10/24/07 19:25 | 01 |

KEMRON FORMS - Modified 01/31/2007
Version 1.5 PDF File ID: 921090
Report generated 10/30/2007 15:49

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# METHOD BLANK REPORT

Login Number: L0710596 | Prep Date: 10/25/07 09:31 | Sample ID: WG253794-01
Instrument ID: HPMS10 | Run Date: 10/25/07 09:31 | Prep Method: 5030B
File ID: 10M59853 | Analyst: MES | Method: 8260B
Workgroup (AAB#): WG253794 | Matrix: Water | Units: ug/L
Contract #: DACA56-94-D-0020 | Cal ID: HPMS10 - 18-OCT-07

| Analytes | SDL | PQL | Concentration | Dilution | Qualifier |
|---|---|---|---|---|---|
| 1,1,1-Trichloroethane | 0.250 | 1.00 | 0.250 | 1 | U |
| 1,1,2,2-Tetrachloroethane | 0.125 | 1.00 | 0.125 | 1 | U |
| 1,1,2-Trichloro-1,2,2-Trifluoroethane | 0.250 | 5.00 | 0.250 | 1 | U |
| 1,1,2-Trichloroethane | 0.250 | 1.00 | 0.250 | 1 | U |
| 1,1-Dichloroethane | 0.125 | 1.00 | 0.125 | 1 | U |
| 1,1-Dichloroethene | 0.500 | 1.00 | 0.500 | 1 | U |
| 1,2,4-Trichlorobenzene | 0.200 | 1.00 | 0.200 | 1 | U |
| 1,2-Dibromo-3-chloropropane | 1.00 | 5.00 | 1.00 | 1 | U |
| 1,2-Dibromoethane | 0.250 | 1.00 | 0.250 | 1 | U |
| 1,2-Dichlorobenzene | 0.125 | 1.00 | 0.125 | 1 | U |
| 1,2-Dichloroethane | 0.250 | 1.00 | 0.250 | 1 | U |
| cis-1,2-Dichloroethene | 0.250 | 1.00 | 0.250 | 1 | U |
| trans-1,2-Dichloroethene | 0.250 | 1.00 | 0.250 | 1 | U |
| 1,2-Dichloropropane | 0.200 | 1.00 | 0.200 | 1 | U |
| 1,3-Dichlorobenzene | 0.250 | 1.00 | 0.250 | 1 | U |
| 1,4-Dichlorobenzene | 0.125 | 1.00 | 0.125 | 1 | U |
| 2-Butanone | 2.50 | 10.0 | 2.50 | 1 | U |
| 2-Hexanone | 2.50 | 10.0 | 2.50 | 1 | U |
| 4-Methyl-2-pentanone | 2.50 | 10.0 | 2.50 | 1 | U |
| Acetone | 2.50 | 10.0 | 2.50 | 1 | U |
| Benzene | 0.125 | 1.00 | 0.125 | 1 | U |
| Bromodichloromethane | 0.250 | 1.00 | 0.250 | 1 | U |
| Bromoform | 0.500 | 1.00 | 0.500 | 1 | U |
| Bromomethane | 0.500 | 1.00 | 0.500 | 1 | U |
| Carbon disulfide | 0.500 | 1.00 | 0.500 | 1 | U |
| Carbon tetrachloride | 0.250 | 1.00 | 0.250 | 1 | U |
| Chlorobenzene | 0.125 | 1.00 | 0.125 | 1 | U |
| Chloroethane | 0.500 | 1.00 | 0.500 | 1 | U |
| Chloroform | 0.125 | 1.00 | 0.125 | 1 | U |
| Chloromethane | 0.250 | 1.00 | 0.250 | 1 | U |
| cis-1,3-Dichloropropene | 0.250 | 1.00 | 0.250 | 1 | U |
| Cyclohexane | 0.250 | 5.00 | 0.250 | 1 | U |
| Dibromochloromethane | 0.250 | 1.00 | 0.250 | 1 | U |
| Dichlorodifluoromethane | 0.250 | 1.00 | 0.250 | 1 | U |
| Ethyl benzene | 0.250 | 1.00 | 0.250 | 1 | U |
| Isopropylbenzene | 0.250 | 1.00 | 0.250 | 1 | U |
| Methyl acetate | 0.250 | 10.0 | 0.250 | 1 | U |
| Methyl tert-butyl ether | 0.500 | 5.00 | 0.500 | 1 | U |
| Methylcyclohexane | 0.250 | 10.0 | 0.250 | 1 | U |
| Methylene chloride | 0.250 | 2.00 | 0.250 | 1 | U |
| Styrene | 0.125 | 1.00 | 0.125 | 1 | U |
| Tetrachloroethene | 0.250 | 1.00 | 0.250 | 1 | U |

KEMRON FORMS - Modified 12/07/2006
Version 1.5 PDF File ID: 921091
Report generated 10/30/2007 15:50

Login Number: L0710596 Prep Date: 10/25/07 09:31 Sample ID: WG253794-01
Instrument ID: HPMS10 Run Date: 10/25/07 09:31 Prep Method: 5030B
File ID: 10M59853 Analvst: MES Method: 8260B
Workgroup (AAB#): WG253794 Matrix: Water Units: ug/L
Contract #: DACA56-94-D-0020 Cal ID: HPMS10 - 18-OCT-07

| Analytes | SDL | PQL | Concentration | Dilution | Qualifier |
|---|---|---|---|---|---|
| Toluene | 0.250 | 1.00 | 0.250 | 1 | U |
| trans-1,3-Dichloropropene | 0.500 | 1.00 | 0.500 | 1 | U |
| Trichloroethene | 0.250 | 1.00 | 0.250 | 1 | U |
| Trichlorofluoromethane | 0.250 | 1.00 | 0.250 | 1 | U |
| Vinyl chloride | 0.250 | 1.00 | 0.250 | 1 | U |
| Xylenes, Total | 0.500 | 1.00 | 0.500 | 1 | U |

| Surrogates | % Recovery | Surrogate Limits | Qualifier |
|---|---|---|---|
| 1,2-Dichloroethane-d4 | 99.7 | 80 - 120 | PASS |
| Dibromofluoromethane | 101 | 86 - 118 | PASS |
| p-Bromofluorobenzene | 105 | 86 - 115 | PASS |
| Toluene-d8 | 105 | 88 - 110 | PASS |

SDL Method Detection Limit
PQL Reporting/Practical Quantitation Limit
ND Analyte Not detected at or above reporting limit
* Analyte concentration > RL

KEMRON FORMS - Modified 12/07/2006
Version 1.5 PDF File ID: 921091
Report generated 10/30/2007 15:50

Login Number: L0710596 Prep Date: 10/27/07 10:52 Sample ID: WG254006-01
Instrument ID: HPMS10 Run Date: 10/27/07 10:52 Prep Method: 5030B
File ID: 10M59913 Analyst: MES Method: 8260B
Workgroup (AAB#): WG254006 Matrix: Water Units: ug/L
Contract #: DACA56-94-D-0020 Cal ID: HPMS10 - 18-OCT-07

| Analytes | SDL | PQL | Concentration | Dilution | Qualifier |
|---|---|---|---|---|---|
| 1,1,1-Trichloroethane | 0.250 | 1.00 | 0.250 | 1 | U |
| 1,1,2,2-Tetrachloroethane | 0.125 | 1.00 | 0.125 | 1 | U |
| 1,1,2-Trichloro-1,2,2-Trifluoroethane | 0.250 | 5.00 | 0.250 | 1 | U |
| 1,1,2-Trichloroethane | 0.250 | 1.00 | 0.250 | 1 | U |
| 1,1-Dichloroethane | 0.125 | 1.00 | 0.125 | 1 | U |
| 1,1-Dichloroethene | 0.500 | 1.00 | 0.500 | 1 | U |
| 1,2,4-Trichlorobenzene | 0.200 | 1.00 | 0.200 | 1 | U |
| 1,2-Dibromo-3-chloropropane | 1.00 | 5.00 | 1.00 | 1 | U |
| 1,2-Dibromoethane | 0.250 | 1.00 | 0.250 | 1 | U |
| 1,2-Dichlorobenzene | 0.125 | 1.00 | 0.125 | 1 | U |
| 1,2-Dichloroethane | 0.250 | 1.00 | 0.250 | 1 | U |
| cis-1,2-Dichloroethene | 0.250 | 1.00 | 0.250 | 1 | U |
| trans-1,2-Dichloroethene | 0.250 | 1.00 | 0.250 | 1 | U |
| 1,2-Dichloropropane | 0.200 | 1.00 | 0.200 | 1 | U |
| 1,3-Dichlorobenzene | 0.250 | 1.00 | 0.250 | 1 | U |
| 1,4-Dichlorobenzene | 0.125 | 1.00 | 0.125 | 1 | U |
| 2-Butanone | 2.50 | 10.0 | 2.50 | 1 | U |
| 2-Hexanone | 2.50 | 10.0 | 2.50 | 1 | U |
| 4-Methyl-2-pentanone | 2.50 | 10.0 | 2.50 | 1 | U |
| Acetone | 2.50 | 10.0 | 2.50 | 1 | U |
| Benzene | 0.125 | 1.00 | 0.125 | 1 | U |
| Bromodichloromethane | 0.250 | 1.00 | 0.250 | 1 | U |
| Bromoform | 0.500 | 1.00 | 0.500 | 1 | U |
| Bromomethane | 0.500 | 1.00 | 0.500 | 1 | U |
| Carbon disulfide | 0.500 | 1.00 | 0.500 | 1 | U |
| Carbon tetrachloride | 0.250 | 1.00 | 0.250 | 1 | U |
| Chlorobenzene | 0.125 | 1.00 | 0.125 | 1 | U |
| Chloroethane | 0.500 | 1.00 | 0.500 | 1 | U |
| Chloroform | 0.125 | 1.00 | 0.125 | 1 | U |
| Chloromethane | 0.250 | 1.00 | 0.250 | 1 | U |
| cis-1,3-Dichloropropene | 0.250 | 1.00 | 0.250 | 1 | U |
| Cyclohexane | 0.250 | 5.00 | 0.250 | 1 | U |
| Dibromochloromethane | 0.250 | 1.00 | 0.250 | 1 | U |
| Dichlorodifluoromethane | 0.250 | 1.00 | 0.250 | 1 | U |
| Ethyl benzene | 0.250 | 1.00 | 0.250 | 1 | U |
| Isopropylbenzene | 0.250 | 1.00 | 0.250 | 1 | U |
| Methyl acetate | 0.250 | 10.0 | 0.250 | 1 | U |
| Methyl tert-butyl ether | 0.500 | 5.00 | 0.500 | 1 | U |
| Methylcyclohexane | 0.250 | 10.0 | 0.250 | 1 | U |
| Methylene chloride | 0.250 | 2.00 | 0.250 | 1 | U |
| Styrene | 0.125 | 1.00 | 0.125 | 1 | U |
| Tetrachloroethene | 0.250 | 1.00 | 0.250 | 1 | U |

KEMRON Environmental Services

METHOD BLANK REPORT

Login Number: L0710596 Prep Date: 10/27/07 10:52 Sample ID: WG254006-01
Instrument ID: HPMS10 Run Date: 10/27/07 10:52 Prep Method: 5030B
File ID: 10M59913 Analvst: MES Method: 8260B
Workgroup (AAB#): WG254006 Matrix: Water Units: ug/L
Contract #: DACA56-94-D-0020 Cal ID: HPMS10 - 18-OCT-07

| Analytes | SDL | PQL | Concentration | Dilution | Qualifier |
|---|---|---|---|---|---|
| Toluene | 0.250 | 1.00 | 0.250 | 1 | U |
| trans-1,3-Dichloropropene | 0.500 | 1.00 | 0.500 | 1 | U |
| Trichloroethene | 0.250 | 1.00 | 0.250 | 1 | U |
| Trichlorofluoromethane | 0.250 | 1.00 | 0.250 | 1 | U |
| Vinyl chloride | 0.250 | 1.00 | 0.250 | 1 | U |
| Xylenes, Total | 0.500 | 1.00 | 0.500 | 1 | U |

| Surrogates | % Recovery | Surrogate Limits | Qualifier |
|---|---|---|---|
| 1,2-Dichloroethane-d4 | 98.2 | 80 - 120 | PASS |
| Dibromofluoromethane | 96.5 | 86 - 118 | PASS |
| p-Bromofluorobenzene | 97.5 | 86 - 115 | PASS |
| Toluene-d8 | 94.7 | 88 - 110 | PASS |

SDL Method Detection Limit
PQL Reporting/Practical Quantitation Limit
ND Analyte Not detected at or above reporting limit
* Analyte concentration > RL

KEMRON FORMS - Modified 12/07/2006
Version 1.5 PDF File ID: 921091
Report generated 10/30/2007 15:50

00078675

# METHOD BLANK REPORT

Login Number: L0710596
Prep Date: 10/24/07 10:51
Sample ID: WG253678-01
Instrument ID: HPMS11
Run Date: 10/24/07 10:51
Prep Method: 5030B
File ID: 11M46853
Analyst: MES
Method: 8260B
Workgroup (AAB#): WG253678
Matrix: Water
Units: ug/L
Contract #: DACA56-94-D-0020
Cal ID: HPMS11 - 01-OCT-07

| Analytes | SDL | PQL | Concentration | Dilution | Qualifier |
|---|---|---|---|---|---|
| 1,1,1-Trichloroethane | 0.250 | 1.00 | 0.250 | 1 | U |
| 1,1,2,2-Tetrachloroethane | 0.125 | 1.00 | 0.125 | 1 | U |
| 1,1,2-Trichloro-1,2,2-Trifluoroethane | 0.250 | 5.00 | 0.250 | 1 | U |
| 1,1,2-Trichloroethane | 0.250 | 1.00 | 0.250 | 1 | U |
| 1,1-Dichloroethane | 0.125 | 1.00 | 0.125 | 1 | U |
| 1,1-Dichloroethene | 0.500 | 1.00 | 0.500 | 1 | U |
| 1,2,4-Trichlorobenzene | 0.200 | 1.00 | 0.200 | 1 | U |
| 1,2-Dibromo-3-chloropropane | 1.00 | 5.00 | 1.00 | 1 | U |
| 1,2-Dibromoethane | 0.250 | 1.00 | 0.250 | 1 | U |
| 1,2-Dichlorobenzene | 0.125 | 1.00 | 0.125 | 1 | U |
| 1,2-Dichloroethane | 0.250 | 1.00 | 0.250 | 1 | U |
| cis-1,2-Dichloroethene | 0.250 | 1.00 | 0.250 | 1 | U |
| trans-1,2-Dichloroethene | 0.250 | 1.00 | 0.250 | 1 | U |
| 1,2-Dichloropropane | 0.200 | 1.00 | 0.200 | 1 | U |
| 1,3-Dichlorobenzene | 0.250 | 1.00 | 0.250 | 1 | U |
| 1,4-Dichlorobenzene | 0.125 | 1.00 | 0.125 | 1 | U |
| 2-Butanone | 2.50 | 10.0 | 2.50 | 1 | U |
| 2-Hexanone | 2.50 | 10.0 | 2.50 | 1 | U |
| 4-Methyl-2-pentanone | 2.50 | 10.0 | 2.50 | 1 | U |
| Acetone | 2.50 | 10.0 | 2.50 | 1 | U |
| Benzene | 0.125 | 1.00 | 0.125 | 1 | U |
| Bromodichloromethane | 0.250 | 1.00 | 0.250 | 1 | U |
| Bromoform | 0.500 | 1.00 | 0.500 | 1 | U |
| Bromomethane | 0.500 | 1.00 | 0.500 | 1 | U |
| Carbon disulfide | 0.500 | 1.00 | 0.500 | 1 | U |
| Carbon tetrachloride | 0.250 | 1.00 | 0.250 | 1 | U |
| Chlorobenzene | 0.125 | 1.00 | 0.125 | 1 | U |
| Chloroethane | 0.500 | 1.00 | 0.500 | 1 | U |
| Chloroform | 0.125 | 1.00 | 0.125 | 1 | U |
| Chloromethane | 0.250 | 1.00 | 0.250 | 1 | U |
| cis-1,3-Dichloropropene | 0.250 | 1.00 | 0.250 | 1 | U |
| Cyclohexane | 0.250 | 5.00 | 0.250 | 1 | U |
| Dibromochloromethane | 0.250 | 1.00 | 0.250 | 1 | U |
| Dichlorodifluoromethane | 0.250 | 1.00 | 0.250 | 1 | U |
| Ethyl benzene | 0.250 | 1.00 | 0.250 | 1 | U |
| Isopropylbenzene | 0.250 | 1.00 | 0.250 | 1 | U |
| Methyl acetate | 0.250 | 10.0 | 0.250 | 1 | U |
| Methyl tert-butyl ether | 0.500 | 5.00 | 0.500 | 1 | U |
| Methylcyclohexane | 0.250 | 10.0 | 0.250 | 1 | U |
| Methylene chloride | 0.250 | 2.00 | 0.250 | 1 | U |
| Styrene | 0.125 | 1.00 | 0.125 | 1 | U |
| Tetrachloroethene | 0.250 | 1.00 | 0.250 | 1 | U |

KEMRON FORMS - Modified 12/07/2006
Version 1.5 PDF File ID: 921091
Report generated 10/30/2007 15:50

# KEMRON Environmental Services

## METHOD BLANK REPORT

Login Number: L0710596 | Prep Date: 10/24/07 10:51 | Sample ID: WG253678-01
Instrument ID: HPMS11 | Run Date: 10/24/07 10:51 | Prep Method: 5030B
File ID: 11M46853 | Analyst: MES | Method: 8260B
Workgroup (AAB#): WG253678 | Matrix: Water | Units: ug/L
Contract #: DACA56-94-D-0020 | Cal ID: HPMS11 - 01-OCT-07

| Analytes | SDL | PQL | Concentration | Dilution | Qualifier |
|---|---|---|---|---|---|
| Toluene | 0.250 | 1.00 | 0.250 | 1 | U |
| trans-1,3-Dichloropropene | 0.500 | 1.00 | 0.500 | 1 | U |
| Trichloroethene | 0.250 | 1.00 | 0.250 | 1 | U |
| Trichlorofluoromethane | 0.250 | 1.00 | 0.250 | 1 | U |
| Vinyl chloride | 0.250 | 1.00 | 0.250 | 1 | U |
| Xylenes, Total | 0.500 | 1.00 | 0.500 | 1 | U |

| Surrogates | % Recovery | Surrogate Limits | Qualifier |
|---|---|---|---|
| 1,2-Dichloroethane-d4 | 90.9 | 80 - 120 | PASS |
| Dibromofluoromethane | 90.6 | 86 - 118 | PASS |
| p-Bromofluorobenzene | 88.4 | 86 - 115 | PASS |
| Toluene-d8 | 87.6 | 88 - 110 | FAIL |

SDL Method Detection Limit
PQL Reporting/Practical Quantitation Limit
ND Analyte Not detected at or above reporting limit
* Analyte concentration > RL

KEMRON FORMS - Modified 12/07/2006
Version 1.5 PDF File ID: 921091
Report generated 10/30/2007 15:50

LABORATORY CONTROL SAMPLE (LCS)

Login Number: L0710596 Analvst: MES Prep Method: 5030B
Instrument ID: HPMS10 Matrix: Water Method: 8260B
Workgroup (AAB#): WG254006 Units: ug/L
QC Key: STD Lot #: STD22574

Sample ID: WG254006-02 LCS File ID: 10M59914 Run Date: 10/27/2007 11:24
Sample ID: WG254006-03 LCS2 File ID: 10M59915 Run Date: 10/27/2007 11:56

| Analytes | LCS | | | LCS2 | | | %RPD | %Rec Limits | RPD Lmt | Q |
|---|---|---|---|---|---|---|---|---|---|---|
| | Known | Found | % REC | Known | Found | % REC | | | | |
| 1,1,1-Trichloroethane | 20.0 | 22.5 | 112 | 20.0 | 21.6 | 108 | 4.00 | 80 - 134 | 20 | |
| 1,1,2,2-Tetrachloroethane | 20.0 | 20.6 | 103 | 20.0 | 20.2 | 101 | 2.12 | 79 - 125 | 20 | |
| 1,1,2-Trichloro-1,2,2-Trifluoroethane | 20.0 | 20.4 | 102 | 20.0 | 19.0 | 94.9 | 7.11 | 80 - 130 | 20 | |
| 1,1,2-Trichloroethane | 20.0 | 21.5 | 108 | 20.0 | 20.7 | 104 | 4.00 | 80 - 125 | 20 | |
| 1,1-Dichloroethane | 20.0 | 21.2 | 106 | 20.0 | 20.3 | 102 | 4.33 | 80 - 125 | 20 | |
| 1,1-Dichloroethene | 20.0 | 19.8 | 99.2 | 20.0 | 19.1 | 95.3 | 4.04 | 80 - 132 | 20 | |
| 1,2,4-Trichlorobenzene | 20.0 | 18.9 | 94.4 | 20.0 | 19.3 | 96.7 | 2.43 | 65 - 135 | 20 | |
| 1,2-Dibromo-3-chloropropane | 20.0 | 18.1 | 90.4 | 20.0 | 16.2 | 81.1 | 10.8 | 50 - 130 | 20 | |
| 1,2-Dibromoethane | 20.0 | 22.2 | 111 | 20.0 | 21.5 | 107 | 3.44 | 80 - 125 | 20 | |
| 1,2-Dichlorobenzene | 20.0 | 19.8 | 99.1 | 20.0 | 19.7 | 98.6 | 0.557 | 80 - 125 | 20 | |
| 1,2-Dichloroethane | 20.0 | 22.4 | 112 | 20.0 | 21.3 | 106 | 5.26 | 80 - 129 | 20 | |
| cis-1,2-Dichloroethene | 20.0 | 22.1 | 111 | 20.0 | 21.5 | 107 | 2.97 | 70 - 125 | 20 | |
| trans-1,2-Dichloroethene | 20.0 | 21.9 | 109 | 20.0 | 20.9 | 105 | 4.47 | 80 - 127 | 20 | |
| 1,2-Dichloropropane | 20.0 | 21.8 | 109 | 20.0 | 21.6 | 108 | 0.854 | 80 - 120 | 20 | |
| 1,3-Dichlorobenzene | 20.0 | 18.8 | 94.2 | 20.0 | 19.0 | 94.9 | 0.788 | 80 - 120 | 20 | |
| 1,4-Dichlorobenzene | 20.0 | 18.2 | 91.1 | 20.0 | 18.4 | 92.0 | 0.915 | 80 - 120 | 20 | |
| 2-Butanone | 20.0 | 15.0 | 74.9 | 20.0 | 13.1 | 65.3 | 13.6 | 30 - 150 | 20 | |
| 2-Hexanone | 20.0 | 17.8 | 88.8 | 20.0 | 15.7 | 78.6 | 12.2 | 55 - 130 | 20 | |
| 4-Methyl-2-pentanone | 20.0 | 20.0 | 99.8 | 20.0 | 18.7 | 93.6 | 6.36 | 64 - 140 | 20 | |
| Acetone | 20.0 | 15.1 | 75.5 | 20.0 | 14.2 | 70.8 | 6.45 | 40 - 142 | 20 | |
| Benzene | 20.0 | 20.0 | 99.8 | 20.0 | 19.6 | 98.0 | 1.86 | 80 - 121 | 20 | |
| Bromodichloromethane | 20.0 | 23.2 | 116 | 20.0 | 22.2 | 111 | 4.51 | 80 - 131 | 20 | |
| Bromoform | 20.0 | 22.1 | 110 | 20.0 | 21.0 | 105 | 4.93 | 70 - 130 | 20 | |
| Bromomethane | 20.0 | 23.9 | 120 | 20.0 | 23.5 | 117 | 1.88 | 30 - 145 | 20 | |
| Carbon disulfide | 20.0 | 17.9 | 89.7 | 20.0 | 17.2 | 86.1 | 4.12 | 58 - 138 | 20 | |
| Carbon tetrachloride | 20.0 | 23.1 | 116 | 20.0 | 21.7 | 109 | 6.29 | 65 - 140 | 20 | |
| Chlorobenzene | 20.0 | 19.6 | 97.9 | 20.0 | 19.3 | 96.7 | 1.17 | 80 - 120 | 20 | |
| Chloroethane | 20.0 | 21.7 | 109 | 20.0 | 21.1 | 105 | 3.14 | 60 - 135 | 20 | |
| Chloroform | 20.0 | 22.0 | 110 | 20.0 | 21.1 | 106 | 4.23 | 80 - 125 | 20 | |
| Chloromethane | 20.0 | 19.8 | 98.8 | 20.0 | 18.9 | 94.7 | 4.26 | 40 - 125 | 20 | |
| cis-1,3-Dichloropropene | 20.0 | 23.3 | 117 | 20.0 | 22.4 | 112 | 3.83 | 70 - 130 | 20 | |
| Cyclohexane | 20.0 | 21.0 | 105 | 20.0 | 20.0 | 100 | 4.86 | 80 - 130 | 20 | |
| Dibromochloromethane | 20.0 | 22.1 | 110 | 20.0 | 21.6 | 108 | 2.01 | 60 - 135 | 20 | |
| Dichlorodifluoromethane | 20.0 | 24.1 | 121 | 20.0 | 22.2 | 111 | 8.18 | 50 - 133 | 20 | |
| Ethyl benzene | 20.0 | 20.8 | 104 | 20.0 | 20.4 | 102 | 1.99 | 80 - 122 | 20 | |
| Isopropylbenzene | 20.0 | 17.5 | 87.5 | 20.0 | 17.2 | 86.0 | 1.76 | 80 - 122 | 20 | |
| Methyl acetate | 20.0 | 25.9 | 130 | 20.0 | 22.7 | 113 | 13.4 | 80 - 130 | 20 | |
| Methyl tert-butyl ether | 20.0 | 23.9 | 119 | 20.0 | 22.5 | 113 | 5.70 | 65 - 125 | 20 | |
| Methylcyclohexane | 20.0 | 20.8 | 104 | 20.0 | 20.0 | 100 | 3.75 | 80 - 130 | 20 | |
| Methylene chloride | 20.0 | 21.0 | 105 | 20.0 | 20.0 | 100 | 4.81 | 80 - 123 | 20 | |

KEMRON FORMS - Modified 02/08/2007
Version 1.5 PDF File ID: 917004
Report generated 10/30/2007 15:50

LABORATORY CONTROL SAMPLE (LCS)

Login Number: L0710596 Analvst: MES Prep Method: 5030B
Instrument ID: HPMS10 Matrix: Water Method: 8260B
Workgroup (AAB#): WG254006 Units: ug/L
QC Key: STD Lot #: STD22574

Sample ID: WG254006-02 LCS File ID: 10M59914 Run Date: 10/27/2007 11:24
Sample ID: WG254006-03 LCS2 File ID: 10M59915 Run Date: 10/27/2007 11:56

| Analytes | LCS | | | LCS2 | | | %RPD | %Rec Limits | RPD Lmt | Q |
|---|---|---|---|---|---|---|---|---|---|---|
| | Known | Found | % REC | Known | Found | % REC | | | | |
| Styrene | 20.0 | 19.3 | 96.6 | 20.0 | 19.0 | 95.0 | 1.66 | 80 - 123 | 20 | |
| Tetrachloroethene | 20.0 | 21.1 | 105 | 20.0 | 20.1 | 100 | 4.93 | 80 - 124 | 20 | |
| Toluene | 20.0 | 21.1 | 105 | 20.0 | 20.6 | 103 | 2.05 | 80 - 124 | 20 | |
| trans-1,3-Dichloropropene | 20.0 | 21.3 | 107 | 20.0 | 20.4 | 102 | 4.49 | 80 - 130 | 20 | |
| Trichloroethene | 20.0 | 22.2 | 111 | 20.0 | 21.0 | 105 | 5.56 | 80 - 122 | 20 | |
| Trichlorofluoromethane | 20.0 | 17.9 | 89.4 | 20.0 | 16.8 | 83.9 | 6.34 | 62 - 151 | 20 | |
| Vinyl chloride | 20.0 | 23.2 | 116 | 20.0 | 20.4 | 102 | 12.5 | 65 - 140 | 20 | |
| Xylenes, Total | 60.0 | 63.5 | 106 | 60.0 | 62.3 | 104 | 1.87 | 80 - 121 | 20 | |

| Surogates | LCS | LCS2 | Surrogate Limits | Qualifier |
|---|---|---|---|---|
| | % Recovery | % Recovery | | |
| Dibromofluoromethane | 102 | 101 | 86 - 118 | PASS |
| 1,2-Dichloroethane-d4 | 102 | 98.3 | 80 - 120 | PASS |
| Toluene-d8 | 97.3 | 99.4 | 88 - 110 | PASS |
| p-Bromofluorobenzene | 97.1 | 101 | 86 - 115 | PASS |

* FAILS %REC LIMIT

# FAILS RPD LIMIT

KEMRON FORMS - Modified 02/08/2007
Version 1.5 PDF File ID: 917004
Report generated 10/30/2007 15:50

00078679

# LABORATORY CONTROL SAMPLE (LCS)

Login Number: L0710596 Analyst: MES Prep Method: 5030B
Instrument ID: HPMS10 Matrix: Water Method: 8260B
Workgroup (AAB#): WG253794 Units: ug/L
QC Key: STD Lot #: STD22574

Sample ID: WG253794-02 LCS File ID: 10M59854 Run Date: 10/25/2007 10:03
Sample ID: WG253794-03 LCS2 File ID: 10M59855 Run Date: 10/25/2007 10:35

| Analytes | LCS | | | LCS2 | | | %RPD | %Rec Limits | RPD Lmt | Q |
|---|---|---|---|---|---|---|---|---|---|---|
| | Known | Found | % REC | Known | Found | % REC | | | | |
| 1,1,1-Trichloroethane | 20.0 | 21.5 | 107 | 20.0 | 19.5 | 97.3 | 9.80 | 80 - 134 | 20 | |
| 1,1,2,2-Tetrachloroethane | 20.0 | 20.3 | 102 | 20.0 | 20.1 | 101 | 0.954 | 79 - 125 | 20 | |
| 1,1,2-Trichloro-1,2,2-Trifluoroethane | 20.0 | 19.7 | 98.7 | 20.0 | 17.8 | 89.1 | 10.2 | 80 - 130 | 20 | |
| 1,1,2-Trichloroethane | 20.0 | 21.1 | 105 | 20.0 | 20.3 | 101 | 3.93 | 80 - 125 | 20 | |
| 1,1-Dichloroethane | 20.0 | 20.8 | 104 | 20.0 | 19.2 | 95.9 | 8.14 | 80 - 125 | 20 | |
| 1,1-Dichloroethene | 20.0 | 19.9 | 99.5 | 20.0 | 18.5 | 92.3 | 7.51 | 80 - 132 | 20 | |
| 1,2,4-Trichlorobenzene | 20.0 | 19.7 | 98.3 | 20.0 | 19.3 | 96.5 | 1.86 | 65 - 135 | 20 | |
| 1,2-Dibromo-3-chloropropane | 20.0 | 17.4 | 87.2 | 20.0 | 17.8 | 89.0 | 2.05 | 50 - 130 | 20 | |
| 1,2-Dibromoethane | 20.0 | 22.0 | 110 | 20.0 | 20.9 | 104 | 5.45 | 80 - 125 | 20 | |
| 1,2-Dichlorobenzene | 20.0 | 19.7 | 98.4 | 20.0 | 19.4 | 97.2 | 1.24 | 80 - 125 | 20 | |
| 1,2-Dichloroethane | 20.0 | 21.1 | 106 | 20.0 | 19.5 | 97.3 | 8.14 | 80 - 129 | 20 | |
| cis-1,2-Dichloroethene | 20.0 | 22.4 | 112 | 20.0 | 20.7 | 104 | 7.83 | 70 - 125 | 20 | |
| trans-1,2-Dichloroethene | 20.0 | 21.4 | 107 | 20.0 | 20.1 | 101 | 6.37 | 80 - 127 | 20 | |
| 1,2-Dichloropropane | 20.0 | 21.9 | 110 | 20.0 | 20.1 | 101 | 8.65 | 80 - 120 | 20 | |
| 1,3-Dichlorobenzene | 20.0 | 19.1 | 95.5 | 20.0 | 18.6 | 93.1 | 2.53 | 80 - 120 | 20 | |
| 1,4-Dichlorobenzene | 20.0 | 18.5 | 92.4 | 20.0 | 17.7 | 88.4 | 4.40 | 80 - 120 | 20 | |
| 2-Butanone | 20.0 | 19.6 | 98.2 | 20.0 | 19.2 | 96.0 | 2.31 | 30 - 150 | 20 | |
| 2-Hexanone | 20.0 | 17.7 | 88.7 | 20.0 | 17.9 | 89.3 | 0.714 | 55 - 130 | 20 | |
| 4-Methyl-2-pentanone | 20.0 | 19.3 | 96.5 | 20.0 | 18.3 | 91.4 | 5.40 | 64 - 140 | 20 | |
| Acetone | 20.0 | 18.2 | 90.8 | 20.0 | 17.6 | 87.9 | 3.23 | 40 - 142 | 20 | |
| Benzene | 20.0 | 20.0 | 100 | 20.0 | 18.8 | 94.0 | 6.21 | 80 - 121 | 20 | |
| Bromodichloromethane | 20.0 | 22.0 | 110 | 20.0 | 20.4 | 102 | 7.57 | 80 - 131 | 20 | |
| Bromoform | 20.0 | 20.6 | 103 | 20.0 | 19.8 | 98.9 | 4.17 | 70 - 130 | 20 | |
| Bromomethane | 20.0 | 24.6 | 123 | 20.0 | 22.5 | 112 | 8.78 | 30 - 145 | 20 | |
| Carbon disulfide | 20.0 | 17.9 | 89.6 | 20.0 | 16.3 | 81.7 | 9.15 | 58 - 138 | 20 | |
| Carbon tetrachloride | 20.0 | 21.9 | 109 | 20.0 | 19.7 | 98.3 | 10.8 | 65 - 140 | 20 | |
| Chlorobenzene | 20.0 | 19.8 | 98.9 | 20.0 | 18.5 | 92.5 | 6.69 | 80 - 120 | 20 | |
| Chloroethane | 20.0 | 21.6 | 108 | 20.0 | 19.8 | 99.0 | 8.47 | 60 - 135 | 20 | |
| Chloroform | 20.0 | 21.2 | 106 | 20.0 | 19.7 | 98.4 | 7.44 | 80 - 125 | 20 | |
| Chloromethane | 20.0 | 18.7 | 93.3 | 20.0 | 17.5 | 87.7 | 6.16 | 40 - 125 | 20 | |
| cis-1,3-Dichloropropene | 20.0 | 22.9 | 115 | 20.0 | 21.7 | 108 | 5.61 | 70 - 130 | 20 | |
| Cyclohexane | 20.0 | 20.9 | 105 | 20.0 | 19.2 | 96.1 | 8.60 | 80 - 130 | 20 | |
| Dibromochloromethane | 20.0 | 21.6 | 108 | 20.0 | 20.5 | 102 | 5.24 | 60 - 135 | 20 | |
| Dichlorodifluoromethane | 20.0 | 23.4 | 117 | 20.0 | 21.1 | 105 | 10.2 | 50 - 133 | 20 | |
| Ethyl benzene | 20.0 | 21.3 | 106 | 20.0 | 19.9 | 99.7 | 6.39 | 80 - 122 | 20 | |
| Isopropylbenzene | 20.0 | 17.5 | 87.7 | 20.0 | 16.3 | 81.6 | 7.22 | 80 - 122 | 20 | |
| Methyl acetate | 20.0 | 24.9 | 125 | 20.0 | 24.1 | 121 | 3.21 | 80 - 130 | 20 | |
| Methyl tert-butyl ether | 20.0 | 25.6 | 128 | 20.0 | 24.1 | 121 | 6.03 | 65 - 125 | 20 | * |
| Methylcyclohexane | 20.0 | 20.7 | 104 | 20.0 | 18.9 | 94.3 | 9.55 | 80 - 130 | 20 | |
| Methylene chloride | 20.0 | 20.5 | 102 | 20.0 | 19.4 | 97.0 | 5.44 | 80 - 123 | 20 | |

KEMRON FORMS - Modified 02/08/2007
Version 1.5 PDF File ID: 917004
Report generated 10/30/2007 15:50

00078680

# LABORATORY CONTROL SAMPLE (LCS)

Login Number: L0710596 Analvst: MES Prep Method: 5030B
Instrument ID: HPMS10 Matrix: Water Method: 8260B
Workgroup (AAB#): WG253794 Units: ug/L
QC Key: STD Lot #: STD22574

Sample ID: WG253794-02 LCS File ID: 10M59854 Run Date: 10/25/2007 10:03
Sample ID: WG253794-03 LCS2 File ID: 10M59855 Run Date: 10/25/2007 10:35

| Analytes | LCS | | | LCS2 | | | %RPD | %Rec Limits | RPD Lmt | Q |
|---|---|---|---|---|---|---|---|---|---|---|
| | Known | Found | % REC | Known | Found | % REC | | | | |
| Styrene | 20.0 | 19.3 | 96.7 | 20.0 | 18.1 | 90.7 | 6.37 | 80 - 123 | 20 | |
| Tetrachloroethene | 20.0 | 20.4 | 102 | 20.0 | 18.5 | 92.7 | 9.62 | 80 - 124 | 20 | |
| Toluene | 20.0 | 21.5 | 108 | 20.0 | 19.9 | 99.5 | 7.75 | 80 - 124 | 20 | |
| trans-1,3-Dichloropropene | 20.0 | 20.5 | 102 | 20.0 | 19.2 | 96.1 | 6.23 | 80 - 130 | 20 | |
| Trichloroethene | 20.0 | 21.8 | 109 | 20.0 | 20.3 | 102 | 6.91 | 80 - 122 | 20 | |
| Trichlorofluoromethane | 20.0 | 16.9 | 84.3 | 20.0 | 15.2 | 76.0 | 10.4 | 62 - 151 | 20 | |
| Vinyl chloride | 20.0 | 20.9 | 105 | 20.0 | 17.8 | 88.8 | 16.5 | 65 - 140 | 20 | |
| Xylenes, Total | 60.0 | 63.7 | 106 | 60.0 | 59.4 | 99.0 | 7.02 | 80 - 121 | 20 | |

| Surogates | LCS | LCS2 | Surrogate Limits | Qualifier |
|---|---|---|---|---|
| | % Recovery | % Recovery | | |
| Dibromofluoromethane | 102 | 96.4 | 86 - 118 | PASS |
| 1,2-Dichloroethane-d4 | 99.3 | 93.7 | 80 - 120 | PASS |
| Toluene-d8 | 98.5 | 96.5 | 88 - 110 | PASS |
| p-Bromofluorobenzene | 96.6 | 95.9 | 86 - 115 | PASS |

* FAILS %REC LIMIT
\# FAILS RPD LIMIT

00078681

# LABORATORY CONTROL SAMPLE (LCS)

Login Number: L0710596 Analvst: MES Prep Method: 5030B
Instrument ID: HPMS11 Matrix: Water Method: 8260B
Workgroup (AAB#): WG253678 Units: ug/L
QC Key: STD Lot #: STD22574

Sample ID: WG253678-02 LCS File ID: 11M46854 Run Date: 10/24/2007 11:21
Sample ID: WG253678-03 LCS2 File ID: 11M46855 Run Date: 10/24/2007 11:52

| Analytes | LCS | | | LCS2 | | | %RPD | %Rec Limits | RPD Lmt | Q |
|---|---|---|---|---|---|---|---|---|---|---|
| | Known | Found | % REC | Known | Found | % REC | | | | |
| 1,1,1-Trichloroethane | 20.0 | 21.5 | 108 | 20.0 | 21.0 | 105 | 2.46 | 80 - 134 | 20 | |
| 1,1,2,2-Tetrachloroethane | 20.0 | 22.3 | 111 | 20.0 | 22.4 | 112 | 0.512 | 79 - 125 | 20 | |
| 1,1,2-Trichloro-1,2,2-Trifluoroethane | 20.0 | 20.3 | 102 | 20.0 | 19.8 | 99.0 | 2.56 | 80 - 130 | 20 | |
| 1,1,2-Trichloroethane | 20.0 | 22.6 | 113 | 20.0 | 22.6 | 113 | 0.118 | 80 - 125 | 20 | |
| 1,1-Dichloroethane | 20.0 | 21.6 | 108 | 20.0 | 21.1 | 106 | 2.12 | 80 - 125 | 20 | |
| 1,1-Dichloroethene | 20.0 | 20.4 | 102 | 20.0 | 20.1 | 101 | 1.35 | 80 - 132 | 20 | |
| 1,2,4-Trichlorobenzene | 20.0 | 22.1 | 111 | 20.0 | 22.0 | 110 | 0.611 | 65 - 135 | 20 | |
| 1,2-Dibromo-3-chloropropane | 20.0 | 21.7 | 109 | 20.0 | 21.2 | 106 | 2.15 | 50 - 130 | 20 | |
| 1,2-Dibromoethane | 20.0 | 22.2 | 111 | 20.0 | 22.0 | 110 | 0.915 | 80 - 125 | 20 | |
| 1,2-Dichlorobenzene | 20.0 | 21.2 | 106 | 20.0 | 21.0 | 105 | 0.693 | 80 - 125 | 20 | |
| 1,2-Dichloroethane | 20.0 | 21.3 | 107 | 20.0 | 20.9 | 105 | 1.89 | 80 - 129 | 20 | |
| cis-1,2-Dichloroethene | 20.0 | 22.3 | 111 | 20.0 | 22.1 | 111 | 0.760 | 70 - 125 | 20 | |
| trans-1,2-Dichloroethene | 20.0 | 21.1 | 106 | 20.0 | 21.0 | 105 | 0.447 | 80 - 127 | 20 | |
| 1,2-Dichloropropane | 20.0 | 21.2 | 106 | 20.0 | 21.6 | 108 | 1.94 | 80 - 120 | 20 | |
| 1,3-Dichlorobenzene | 20.0 | 20.7 | 103 | 20.0 | 20.8 | 104 | 0.299 | 80 - 120 | 20 | |
| 1,4-Dichlorobenzene | 20.0 | 20.7 | 103 | 20.0 | 20.5 | 103 | 0.823 | 80 - 120 | 20 | |
| 2-Butanone | 20.0 | 20.1 | 101 | 20.0 | 19.9 | 99.7 | 0.901 | 30 - 150 | 20 | |
| 2-Hexanone | 20.0 | 21.0 | 105 | 20.0 | 20.5 | 102 | 2.70 | 55 - 130 | 20 | |
| 4-Methyl-2-pentanone | 20.0 | 21.4 | 107 | 20.0 | 20.6 | 103 | 4.02 | 64 - 140 | 20 | |
| Acetone | 20.0 | 21.2 | 106 | 20.0 | 22.0 | 110 | 3.80 | 40 - 142 | 20 | |
| Benzene | 20.0 | 21.1 | 105 | 20.0 | 21.3 | 106 | 0.861 | 80 - 121 | 20 | |
| Bromodichloromethane | 20.0 | 22.6 | 113 | 20.0 | 22.7 | 113 | 0.615 | 80 - 131 | 20 | |
| Bromoform | 20.0 | 21.8 | 109 | 20.0 | 21.4 | 107 | 1.63 | 70 - 130 | 20 | |
| Bromomethane | 20.0 | 25.6 | 128 | 20.0 | 26.1 | 131 | 1.99 | 30 - 145 | 20 | |
| Carbon disulfide | 20.0 | 18.6 | 92.8 | 20.0 | 17.7 | 88.6 | 4.63 | 58 - 138 | 20 | |
| Carbon tetrachloride | 20.0 | 19.5 | 97.4 | 20.0 | 19.0 | 95.1 | 2.38 | 65 - 140 | 20 | |
| Chlorobenzene | 20.0 | 20.1 | 100 | 20.0 | 20.1 | 100 | 0.177 | 80 - 120 | 20 | |
| Chloroethane | 20.0 | 22.4 | 112 | 20.0 | 22.7 | 113 | 1.09 | 60 - 135 | 20 | |
| Chloroform | 20.0 | 21.8 | 109 | 20.0 | 21.5 | 108 | 1.30 | 80 - 125 | 20 | |
| Chloromethane | 20.0 | 21.7 | 109 | 20.0 | 22.0 | 110 | 1.23 | 40 - 125 | 20 | |
| cis-1,3-Dichloropropene | 20.0 | 21.5 | 108 | 20.0 | 21.7 | 108 | 0.573 | 70 - 130 | 20 | |
| Cyclohexane | 20.0 | 20.0 | 99.8 | 20.0 | 19.5 | 97.7 | 2.07 | 80 - 130 | 20 | |
| Dibromochloromethane | 20.0 | 22.4 | 112 | 20.0 | 22.2 | 111 | 0.862 | 60 - 135 | 20 | |
| Dichlorodifluoromethane | 20.0 | 21.8 | 109 | 20.0 | 21.4 | 107 | 1.68 | 50 - 133 | 20 | |
| Ethyl benzene | 20.0 | 21.3 | 106 | 20.0 | 21.1 | 106 | 0.513 | 80 - 122 | 20 | |
| Isopropylbenzene | 20.0 | 17.5 | 87.6 | 20.0 | 17.5 | 87.5 | 0.139 | 80 - 122 | 20 | |
| Methyl acetate | 20.0 | 29.2 | 146 | 20.0 | 28.8 | 144 | 1.33 | 80 - 130 | 20 | * |
| Methyl tert-butyl ether | 20.0 | 25.4 | 127 | 20.0 | 24.8 | 124 | 2.36 | 65 - 125 | 20 | * |
| Methylcyclohexane | 20.0 | 19.7 | 98.6 | 20.0 | 19.5 | 97.7 | 0.909 | 80 - 130 | 20 | |
| Methylene chloride | 20.0 | 21.0 | 105 | 20.0 | 21.1 | 105 | 0.497 | 80 - 123 | 20 | |

KEMRON FORMS - Modified 02/08/2007
Version 1.5 PDF File ID: 917004
Report generated 10/30/2007 15:50

00078682

# LABORATORY CONTROL SAMPLE (LCS)

Login Number: L0710596 Analvst: MES Prep Method: 5030B
Instrument ID: HPMS11 Matrix: Water Method: 8260B
Workgroup (AAB#): WG253678 Units: ug/L
QC Key: STD Lot #: STD22574

Sample ID: WG253678-02 LCS File ID: 11M46854 Run Date: 10/24/2007 11:21
Sample ID: WG253678-03 LCS2 File ID: 11M46855 Run Date: 10/24/2007 11:52

| Analytes | LCS | | | LCS2 | | | %RPD | %Rec Limits | RPD Lmt | Q |
|---|---|---|---|---|---|---|---|---|---|---|
| | Known | Found | % REC | Known | Found | % REC | | | | |
| Styrene | 20.0 | 19.6 | 97.9 | 20.0 | 19.7 | 98.3 | 0.428 | 80 - 123 | 20 | |
| Tetrachloroethene | 20.0 | 19.0 | 95.1 | 20.0 | 18.7 | 93.5 | 1.61 | 80 - 124 | 20 | |
| Toluene | 20.0 | 20.8 | 104 | 20.0 | 20.8 | 104 | 0.0245 | 80 - 124 | 20 | |
| trans-1,3-Dichloropropene | 20.0 | 20.4 | 102 | 20.0 | 20.0 | 99.9 | 2.04 | 80 - 130 | 20 | |
| Trichloroethene | 20.0 | 21.8 | 109 | 20.0 | 21.3 | 106 | 2.30 | 80 - 122 | 20 | |
| Trichlorofluoromethane | 20.0 | 17.0 | 84.9 | 20.0 | 16.5 | 82.3 | 3.10 | 62 - 151 | 20 | |
| Vinyl chloride | 20.0 | 21.6 | 108 | 20.0 | 20.7 | 103 | 4.60 | 65 - 140 | 20 | |
| Xylenes, Total | 60.0 | 62.1 | 103 | 60.0 | 62.6 | 104 | 0.762 | 80 - 121 | 20 | |

| Surogates | LCS | LCS2 | Surrogate Limits | Qualifier |
|---|---|---|---|---|
| | % Recovery | % Recovery | | |
| Dibromofluoromethane | 93.1 | 93.3 | 86 - 118 | PASS |
| 1,2-Dichloroethane-d4 | 89.4 | 90.1 | 80 - 120 | PASS |
| Toluene-d8 | 88.0 | 89.5 | 88 - 110 | PASS |
| p-Bromofluorobenzene | 87.1 | 87.5 | 86 - 115 | PASS |

* FAILS %REC LIMIT
# FAILS RPD LIMIT

KEMRON FORMS - Modified 02/08/2007
Version 1.5 PDF File ID: 917004
Report generated 10/30/2007 15:50

KEMRON ENVIRONMENTAL SERVICES
ORGANIC INSTRUMENT CHECK

BFB

Login Number: L0710596
Instrument: HPMS10
Analyst: MES
Workgroup: WG253187

Tune ID: WG253187-01
Run Date: 10/18/2007
Run Time: 08:52
File ID: 10M59716
Cal ID: HPMS10 - 18-OCT-07

| Target | Rel. to | Lower | Upper | Rel. | Raw | Result |
|---|---|---|---|---|---|---|
| 50.0 | 95.0 | 15.0 | 40.0 | 22.0 | 7983 | PASS |
| 75.0 | 95.0 | 30.0 | 60.0 | 48.9 | 17728 | PASS |
| 95.0 | 95.0 | 100 | 100 | 100 | 36237 | PASS |
| 96.0 | 95.0 | 5.00 | 9.00 | 6.76 | 2448 | PASS |
| 173 | 174 | 0 | 2.00 | 0 | 0 | PASS |
| 174 | 95.0 | 50.0 | 100 | 80.4 | 29150 | PASS |
| 175 | 174 | 5.00 | 9.00 | 6.19 | 1804 | PASS |
| 176 | 174 | 95.0 | 101 | 98.5 | 28710 | PASS |
| 177 | 176 | 5.00 | 9.00 | 5.73 | 1644 | PASS |

This check relates to the following samples:

| Lab ID | Client ID | Tag | Date Analyzed | Q |
|---|---|---|---|---|
| WG253187-02 | STD | 01 | 10/18/2007 09:57 | |
| WG253187-04 | STD | 01 | 10/18/2007 11:00 | |
| WG253187-05 | STD | 01 | 10/18/2007 11:31 | |
| WG253187-06 | STD | 01 | 10/18/2007 12:03 | |
| WG253187-07 | STD | 01 | 10/18/2007 12:35 | |
| WG253187-08 | STD-CCV | 01 | 10/18/2007 13:07 | |
| WG253187-09 | STD | 01 | 10/18/2007 13:45 | |
| WG253187-10 | STD | 01 | 10/18/2007 14:16 | |
| WG253187-11 | STD | 01 | 10/18/2007 14:47 | |
| WG253187-03 | STD | 01 | 10/18/2007 16:51 | |
| WG253187-12 | SSCV | 02 | 10/18/2007 18:23 | |
| WG253187-12 | SSCV | 01 | 10/18/2007 18:55 | |
| WG253187-13 | SSCV | 01 | 10/18/2007 19:37 | |

* Sample past 12 hour tune limit

KEMRON FORMS - Modified 03/12/2007
Version 1.3 PDF File ID: 921094
Report generated 10/30/2007 15:50

# KEMRON ENVIRONMENTAL SERVICES
## ORGANIC INSTRUMENT CHECK

### BFB

Login Number: L0710596
Instrument: HPMS10
Analyst: MES
Workgroup: WG253793

Tune ID: WG253793-01
Run Date: 10/25/2007
Run Time: 08:04
File ID: 10M59850
Cal ID: HPMS10 - 18-OCT-07

| Target | Rel. to | Lower | Upper | Rel. | Raw | Result |
|---|---|---|---|---|---|---|
| 50.0 | 95.0 | 15.0 | 40.0 | 21.8 | 8388 | PASS |
| 75.0 | 95.0 | 30.0 | 60.0 | 50.3 | 19337 | PASS |
| 95.0 | 95.0 | 100 | 100 | 100 | 38432 | PASS |
| 96.0 | 95.0 | 5.00 | 9.00 | 7.10 | 2727 | PASS |
| 173 | 174 | 0 | 2.00 | 0.648 | 205 | PASS |
| 174 | 95.0 | 50.0 | 100 | 82.3 | 31629 | PASS |
| 175 | 174 | 5.00 | 9.00 | 7.63 | 2414 | PASS |
| 176 | 174 | 95.0 | 101 | 97.0 | 30678 | PASS |
| 177 | 176 | 5.00 | 9.00 | 6.81 | 2088 | PASS |

This check relates to the following samples:

| Lab ID | Client ID | Tag | Date Analyzed | Q |
|---|---|---|---|---|
| WG253793-02 | CCV | 01 | 10/25/2007 08:27 | |
| WG253794-01 | BLANK | 01 | 10/25/2007 09:31 | |
| WG253794-02 | LCS | 01 | 10/25/2007 10:03 | |
| WG253794-03 | LCS2 | 01 | 10/25/2007 10:35 | |
| L0710596-05 | 47WW23-101907 | 01 | 10/25/2007 12:40 | |
| L0710596-07 | 47WW21-101807 | 01 | 10/25/2007 13:11 | |
| L0710596-10 | 47WW04-101807 | 01 | 10/25/2007 13:42 | |

* Sample past 12 hour tune limit

KEMRON FORMS - Modified 03/12/2007
Version 1.3 PDF File ID: 921094
Report generated 10/30/2007 15:50

# KEMRON ENVIRONMENTAL SERVICES
## ORGANIC INSTRUMENT CHECK

### BFB

Login Number: L0710596
Instrument: HPMS10
Analyst: MES
Workgroup: WG254005

Tune ID: WG254005-01
Run Date: 10/27/2007
Run Time: 09:21
File ID: 10M59910
Cal ID: HPMS10 - 18-OCT-07

| Target | Rel. to | Lower | Upper | Rel. | Raw | Result |
|---|---|---|---|---|---|---|
| 50.0 | 95.0 | 15.0 | 40.0 | 23.6 | 8981 | PASS |
| 75.0 | 95.0 | 30.0 | 60.0 | 51.6 | 19625 | PASS |
| 95.0 | 95.0 | 100 | 100 | 100 | 38013 | PASS |
| 96.0 | 95.0 | 5.00 | 9.00 | 7.25 | 2756 | PASS |
| 173 | 174 | 0 | 2.00 | 0 | 0 | PASS |
| 174 | 95.0 | 50.0 | 100 | 79.5 | 30227 | PASS |
| 175 | 174 | 5.00 | 9.00 | 6.41 | 1937 | PASS |
| 176 | 174 | 95.0 | 101 | 96.7 | 29243 | PASS |
| 177 | 176 | 5.00 | 9.00 | 6.31 | 1844 | PASS |

This check relates to the following samples:

| Lab ID | Client ID | Tag | Date Analyzed | Q |
|---|---|---|---|---|
| WG254005-02 | CCV | 01 | 10/27/2007 09:47 | |
| WG254006-01 | BLANK | 01 | 10/27/2007 10:52 | |
| WG254006-02 | LCS | 01 | 10/27/2007 11:24 | |
| WG254006-03 | LCS2 | 01 | 10/27/2007 11:56 | |
| L0710596-01 | LHSMW56-102007 | DL01 | 10/27/2007 12:28 | |
| L0710596-02 | 47WW05-102007 | DL01 | 10/27/2007 13:00 | |
| L0710596-09 | 47WW01-101807 | DL01 | 10/27/2007 13:32 | |
| L0710596-11 | 47WWZZ-101807 | 02 | 10/27/2007 14:05 | |

* Sample past 12 hour tune limit

KEMRON FORMS - Modified 03/12/2007
Version 1.3 PDF File ID: 921094
Report generated 10/30/2007 15:50

KEMRON ENVIRONMENTAL SERVICES
ORGANIC INSTRUMENT CHECK

BFB

Login Number: L0710596
Instrument: HPMS11
Analyst: MES
Workgroup: WG251532

Tune ID: WG251532-01
Run Date: 10/01/2007
Run Time: 11:15
File ID: 11M46050
Cal ID: HPMS11 - 01-OCT-07

| Target | Rel. to | Lower | Upper | Rel. | Raw | Result |
|---|---|---|---|---|---|---|
| 50.0 | 95.0 | 15.0 | 40.0 | 28.5 | 12940 | PASS |
| 75.0 | 95.0 | 30.0 | 60.0 | 55.6 | 25260 | PASS |
| 95.0 | 95.0 | 100 | 100 | 100 | 45413 | PASS |
| 96.0 | 95.0 | 5.00 | 9.00 | 7.38 | 3351 | PASS |
| 173 | 174 | 0 | 2.00 | 0 | 0 | PASS |
| 174 | 95.0 | 50.0 | 100 | 55.4 | 25144 | PASS |
| 175 | 174 | 5.00 | 9.00 | 7.53 | 1894 | PASS |
| 176 | 174 | 95.0 | 101 | 98.4 | 24744 | PASS |
| 177 | 176 | 5.00 | 9.00 | 7.33 | 1814 | PASS |

This check relates to the following samples:

| Lab ID | Client ID | Tag | Date Analyzed | Q |
|---|---|---|---|---|
| WG251532-02 | STD | 01 | 10/01/2007 11:40 | |
| WG251532-03 | STD | 01 | 10/01/2007 12:11 | |
| WG251532-04 | STD | 01 | 10/01/2007 12:42 | |
| WG251532-05 | STD | 01 | 10/01/2007 13:12 | |
| WG251532-06 | STD | 01 | 10/01/2007 13:42 | |
| WG251532-07 | STD | 01 | 10/01/2007 14:18 | |
| WG251532-08 | STD-CCV | 01 | 10/01/2007 14:48 | |
| WG251532-09 | STD | 01 | 10/01/2007 15:18 | |
| WG251532-10 | STD | 01 | 10/01/2007 15:48 | |

* Sample past 12 hour tune limit

KEMRON FORMS - Modified 03/12/2007
Version 1.3 PDF File ID: 921094
Report generated 10/30/2007 15:50

# KEMRON ENVIRONMENTAL SERVICES
## ORGANIC INSTRUMENT CHECK

### BFB

Login Number: L0710596
Instrument: HPMS11
Analyst: MES
Workgroup: WG251618

Tune ID: WG251618-01
Run Date: 10/01/2007
Run Time: 18:38
File ID: 11M46064
Cal ID: HPMS11 - 01-OCT-07

| Target | Rel. to | Lower | Upper | Rel. | Raw | Result |
|---|---|---|---|---|---|---|
| 50.0 | 95.0 | 15.0 | 40.0 | 28.1 | 15873 | PASS |
| 75.0 | 95.0 | 30.0 | 60.0 | 54.1 | 30544 | PASS |
| 95.0 | 95.0 | 100 | 100 | 100 | 56448 | PASS |
| 96.0 | 95.0 | 5.00 | 9.00 | 6.83 | 3854 | PASS |
| 173 | 174 | 0 | 2.00 | 0 | 0 | PASS |
| 174 | 95.0 | 50.0 | 100 | 59.4 | 33531 | PASS |
| 175 | 174 | 5.00 | 9.00 | 7.80 | 2616 | PASS |
| 176 | 174 | 95.0 | 101 | 98.1 | 32907 | PASS |
| 177 | 176 | 5.00 | 9.00 | 7.16 | 2357 | PASS |

This check relates to the following samples:

| Lab ID | Client ID | Tag | Date Analyzed | Q |
|---|---|---|---|---|
| WG251532-11 | SSCV | 01 | 10/01/2007 20:02 | |

* Sample past 12 hour tune limit

KEMRON FORMS - Modified 03/12/2007
Version 1.3 PDF File ID: 921094
Report generated 10/30/2007 15:50

KEMRON ENVIRONMENTAL SERVICES

ORGANIC INSTRUMENT CHECK

BFB

Login Number: L0710596
Instrument: HPMS11
Analyst: MES
Workgroup: WG253676

Tune ID: WG253676-01
Run Date: 10/24/2007
Run Time: 09:19
File ID: 11M46850
Cal ID: HPMS11 - 01-OCT-07

| Target | Rel. to | Lower | Upper | Rel. | Raw | Result |
|---|---|---|---|---|---|---|
| 50.0 | 95.0 | 15.0 | 40.0 | 26.8 | 21342 | PASS |
| 75.0 | 95.0 | 30.0 | 60.0 | 54.4 | 43360 | PASS |
| 95.0 | 95.0 | 100 | 100 | 100 | 79645 | PASS |
| 96.0 | 95.0 | 5.00 | 9.00 | 6.91 | 5507 | PASS |
| 173 | 174 | 0 | 2.00 | 0 | 0 | PASS |
| 174 | 95.0 | 50.0 | 100 | 66.8 | 53218 | PASS |
| 175 | 174 | 5.00 | 9.00 | 7.97 | 4242 | PASS |
| 176 | 174 | 95.0 | 101 | 98.9 | 52613 | PASS |
| 177 | 176 | 5.00 | 9.00 | 5.91 | 3107 | PASS |

This check relates to the following samples:

| Lab ID | Client ID | Tag | Date Analyzed | Q |
|---|---|---|---|---|
| WG253676-02 | CCV | 01 | 10/24/2007 09:42 | |
| WG253678-01 | BLANK | 01 | 10/24/2007 10:51 | |
| WG253678-02 | LCS | 01 | 10/24/2007 11:21 | |
| WG253678-03 | LCS2 | 01 | 10/24/2007 11:52 | |
| L0710596-15 | TRIP BLANK | 01 | 10/24/2007 13:22 | |
| L0710596-01 | LHSMW56-102007 | 01 | 10/24/2007 16:23 | |
| L0710596-02 | 47WW05-102007 | 01 | 10/24/2007 16:53 | |
| L0710596-08 | 47WW21-101807-QC | 01 | 10/24/2007 18:55 | |
| L0710596-09 | 47WW01-101807 | 01 | 10/24/2007 19:25 | |
| WG253678-04 | BLANK2 | 01 | 10/24/2007 21:57 | * |

* Sample past 12 hour tune limit

KEMRON FORMS - Modified 03/12/2007
Version 1.3 PDF File ID: 921094
Report generated 10/30/2007 15:50

Login Number: L0710596
Analytical Method: 8260B
ICAL Workgroup: WG253187

Instrument ID: HPMS10
Initial Calibration Date: 18-OCT-07 16:51
Column ID: F

| Analyte | | AVG RF | % RSD | LINEAR (R) | QUAD($R^2$) |
|---|---|---|---|---|---|
| 1,1-Dichloroethene | CCC | 0.2800 | 17.8 | | 1.00 |
| 1,2-Dichloropropane | CCC | 0.2830 | 6.65 | | |
| Chloroform | CCC | 0.6766 | 4.91 | | |
| Ethylbenzene | CCC | 0.5538 | 7.95 | | |
| Toluene | CCC | 1.496 | 9.86 | | |
| Vinyl Chloride | CCC | 0.2666 | 14.5 | | |
| 1,1,2,2-Tetrachloroethane | SPCC | 0.4069 | 11.9 | | |
| 1,1-Dichloroethane | SPCC | 0.6342 | 4.48 | | |
| Bromoform | SPCC | 0.2059 | 9.21 | | |
| Chlorobenzene | SPCC | 1.084 | 6.35 | | |
| Chloromethane | SPCC | 0.3466 | 14.3 | | |
| 1,1,1-Trichloroethane | | 0.6678 | 9.32 | | |
| 1,1,2-Trichloro-1,2,2-Trifluoroethane | | 0.3924 | 3.52 | | |
| 1,1,2-Trichloroethane | | 0.2498 | 6.24 | | |
| 1,2,4-Trichlorobenzene | | 0.8839 | 9.53 | | |
| 1,2-Dibromo-3-Chloropropane | | 0.07583 | 11.1 | | |
| 1,2-Dibromoethane | | 0.2388 | 9.88 | | |
| 1,2-Dichlorobenzene | | 1.366 | 7.24 | | |
| 1,2-Dichloroethane | | 0.5033 | 6.76 | | |
| 1,3-Dichlorobenzene | | 1.624 | 5.76 | | |
| 1,4-Dichlorobenzene | | 1.710 | 4.91 | | |
| 2-Butanone | | 0.06795 | 4.65 | | |
| 2-Hexanone | | 0.1080 | 4.50 | | |
| 4-Methyl-2-Pentanone | | 0.04997 | 8.69 | | |
| Acetone | | 0.05652 | 11.3 | | |
| Benzene | | 1.263 | 7.31 | | |
| Bromodichloromethane | | 0.4657 | 7.07 | | |
| Bromomethane | | 0.2330 | 6.15 | | |
| Carbon Disulfide | | 0.9550 | 8.03 | | |
| Carbon Tetrachloride | | 0.6168 | 13.0 | | |
| Chloroethane | | 0.2335 | 2.95 | | |
| Cyclohexane | | 0.5127 | 14.1 | | |
| Dibromochloromethane | | 0.3471 | 9.68 | | |
| Dichlorodifluoromethane | | 0.5643 | 7.39 | | |
| Isopropylbenzene | | 1.550 | 20.1 | | 1.00 |
| Methyl Tert Butyl Ether | | 0.6201 | 8.48 | | |
| Methyl acetate | | 0.1325 | 6.24 | | |
| Methylcyclohexane | | 0.4898 | 11.1 | | |
| Methylene Chloride | | 0.5198 | 63.2 | | 1.00 |
| Styrene | | 0.9348 | 24.3 | | 1.00 |
| Tetrachloroethene | | 0.3687 | 7.07 | | |
| Trichloroethene | | 0.3392 | 9.82 | | |
| Trichlorofluoromethane | | 0.7826 | 19.2 | | 1.00 |
| cis-1,2-Dichloroethene | | 0.3348 | 9.30 | | |
| cis-1,3-Dichloropropene | | 0.4349 | 14.4 | | |

KEMRON FORMS - Modified 01/18/2007
Version 1.5 PDF File ID: 921092
Report generated 10/30/2007 15:50

Login Number: L0710596
Analytical Method: 8260B
ICAL Workgroup: WG253187

Instrument ID: HPMS10
Initial Calibration Date: 18-OCT-07 16:51
Column ID: F

| Analyte | | AVG RF | % RSD | LINEAR (R) | QUAD($R^2$) |
|---|---|---|---|---|---|
| m-,p-Xylene | | 0.6626 | 10.9 | | |
| o-Xylene | | 0.6097 | 13.2 | | |
| trans-1,2-Dichloroethene | | 0.3243 | 10.7 | | |
| trans-1,3-Dichloropropene | | 0.5039 | 9.73 | | |

**R = Correlation coefficient; 0.995 minimum**
**$R^2$ = Coefficient of determination; 0.99 minimum**

Login Number: L0710596
Analytical Method: 8260B
ICAL Workgroup: WG251532

Instrument ID: HPMS11
Initial Calibration Date: 01-OCT-07 15:48
Column ID: F

| Analyte | | AVG RF | % RSD | LINEAR (R) | QUAD($R^2$) |
|---|---|---|---|---|---|
| 1,1-Dichloroethene | CCC | 0.5856 | 17.3 | | 1.00 |
| 1,2-Dichloropropane | CCC | 0.2949 | 9.42 | | |
| Chloroform | CCC | 0.5438 | 9.08 | | |
| Ethylbenzene | CCC | 0.5272 | 14.3 | | |
| Toluene | CCC | 1.521 | 10.7 | | |
| Vinyl Chloride | CCC | 0.3573 | 16.5 | | 1.00 |
| 1,1,2,2-Tetrachloroethane | SPCC | 0.4632 | 5.71 | | |
| 1,1-Dichloroethane | SPCC | 0.6413 | 9.75 | | |
| Bromoform | SPCC | 0.1592 | 10.4 | | |
| Chlorobenzene | SPCC | 0.9874 | 7.61 | | |
| Chloromethane | SPCC | 0.4467 | 6.42 | | |
| 1,1,1-Trichloroethane | | 0.5202 | 15.0 | | |
| 1,1,2-Trichloro-1,2,2-Trifluoroethane | | 0.2517 | 5.80 | | |
| 1,1,2-Trichloroethane | | 0.2287 | 9.70 | | |
| 1,2,4-Trichlorobenzene | | 0.8233 | 9.27 | | |
| 1,2-Dibromo-3-Chloropropane | | 0.09771 | 8.36 | | |
| 1,2-Dibromoethane | | 0.2272 | 8.17 | | |
| 1,2-Dichlorobenzene | | 1.212 | 7.65 | | |
| 1,2-Dichloroethane | | 0.5005 | 6.73 | | |
| 1,3-Dichlorobenzene | | 1.377 | 12.8 | | |
| 1,4-Dichlorobenzene | | 1.396 | 10.3 | | |
| 2-Butanone | | 0.06584 | 5.59 | | |
| 2-Hexanone | | 0.1555 | 4.45 | | |
| 4-Methyl-2-Pentanone | | 0.06512 | 4.74 | | |
| Acetone | | 0.05000 | 11.0 | | |
| Benzene | | 1.001 | 6.65 | | |
| Bromodichloromethane | | 0.3822 | 10.1 | | |
| Bromomethane | | 0.1750 | 13.3 | | |
| Carbon Disulfide | | 0.7795 | 3.36 | | |
| Carbon Tetrachloride | | 0.4032 | 19.5 | | 1.00 |
| Chloroethane | | 0.2473 | 2.57 | | |
| Cyclohexane | | 0.5961 | 4.69 | | |
| Dibromochloromethane | | 0.3012 | 13.2 | | |
| Dichlorodifluoromethane | | 0.4914 | 7.24 | | |
| Isopropylbenzene | | 1.639 | 17.5 | | 1.00 |
| Methyl Tert Butyl Ether | | 0.6091 | 3.55 | | |
| Methyl acetate | | 0.1281 | 4.38 | | |
| Methylcyclohexane | | 0.3806 | 6.86 | | |
| Methylene Chloride | | 0.3950 | 54.7 | | 1.00 |
| Styrene | | 1.018 | 15.9 | 1.00 | |
| Tetrachloroethene | | 0.2559 | 16.3 | | 1.00 |
| Trichloroethene | | 0.2327 | 13.2 | | |
| Trichlorofluoromethane | | 0.5591 | 24.6 | | 1.00 |
| cis-1,2-Dichloroethene | | 0.2615 | 12.4 | | |
| cis-1,3-Dichloropropene | | 0.3993 | 11.2 | | |

**KEMRON FORMS - Modified 01/18/2007**
**Version 1.5 PDF File ID: 921092**
**Report generated 10/30/2007 15:50**

# INITIAL CALIBRATION SUMMARY



Login Number: L0710596
Analytical Method: 8260B
ICAL Workgroup: WG251532

Instrument ID: HPMS11
Initial Calibration Date: 01-OCT-07 15:48
Column ID: F

| Analyte | | AVG RF | % RSD | LINEAR (R) | QUAD($R^2$) |
|---|---|---|---|---|---|
| m-,p-Xylene | | 0.6669 | 10.4 | | |
| o-Xylene | | 0.6374 | 11.6 | | |
| trans-1,2-Dichloroethene | | 0.2601 | 10.0 | | |
| trans-1,3-Dichloropropene | | 0.5556 | 11.1 | | |

**R = Correlation coefficient; 0.995 minimum**
**$R^2$ = Coefficient of determination; 0.99 minimum**

KEMRON FORMS - Modified 01/18/2007
Version 1.5 PDF File ID: 921092
Report generated 10/30/2007 15:50

## INITIAL CALIBRATION DATA

Login Number: L0710596
Analytical Method: 8260B
Instrument ID: HPMS10
Initial Calibration Date: 18-OCT-07 16:51
Column ID: F

| Analyte | WG253187-02 | | | WG253187-03 | | | WG253187-04 | | |
|---|---|---|---|---|---|---|---|---|---|
| | CONC | RESP | RF | CONC | RESP | RF | CONC | RESP | RF |
| 1,1-Dichloroethene | NA | NA | NA | 0.400 | 1885.00000 | 0.1667 | 1.00 | 7305.00000 | 0.2607 |
| 1,2-Dichloropropane | NA | NA | NA | 0.400 | 2756.00000 | 0.2438 | 1.00 | 8147.00000 | 0.2907 |
| Chloroform | 0.300 | 6277.00000 | 0.6701 | 0.400 | 7102.00000 | 0.6282 | 1.00 | 18487.0000 | 0.6597 |
| Ethylbenzene | NA | NA | NA | 0.400 | 4131.00000 | 0.4594 | 1.00 | 12304.0000 | 0.5551 |
| Toluene | NA | NA | NA | 0.400 | 10642.0000 | 1.183 | 1.00 | 31152.0000 | 1.405 |
| Vinyl Chloride | NA | NA | NA | 0.400 | 2511.00000 | 0.2221 | 1.00 | 8865.00000 | 0.3163 |
| 1,1,2,2-Tetrachloroethane | NA | NA | NA | 0.400 | 1555.00000 | 0.3143 | 1.00 | 4829.00000 | 0.3879 |
| 1,1-Dichloroethane | NA | NA | NA | 0.400 | 6860.00000 | 0.6068 | 1.00 | 16737.0000 | 0.5972 |
| Bromoform | NA | NA | NA | NA | NA | NA | 1.00 | 3644.00000 | 0.1644 |
| Chlorobenzene | NA | NA | NA | 0.400 | 10238.0000 | 1.139 | 1.00 | 24273.0000 | 1.095 |
| Chloromethane | NA | NA | NA | NA | NA | NA | 1.00 | 11127.0000 | 0.3971 |
| 1,1,1-Trichloroethane | NA | NA | NA | 0.400 | 6190.00000 | 0.5475 | 1.00 | 18148.0000 | 0.6476 |
| 1,1,2-Trichloro-1,2,2-Trifluoroethane | NA | NA | NA | NA | NA | NA | 1.00 | 11449.0000 | 0.4086 |
| 1,1,2-Trichloroethane | NA | NA | NA | 0.400 | 2302.00000 | 0.2560 | 1.00 | 5477.00000 | 0.2471 |
| 1,2,4-Trichlorobenzene | NA | NA | NA | 0.400 | 4890.00000 | 0.9882 | 1.00 | 9046.00000 | 0.7267 |
| 1,2-Dibromo-3-Chloropropane | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| 1,2-Dibromoethane | NA | NA | NA | 0.400 | 1667.00000 | 0.1854 | 1.00 | 5085.00000 | 0.2294 |
| 1,2-Dichlorobenzene | 0.300 | 4812.00000 | 1.230 | 0.400 | 6405.00000 | 1.294 | 1.00 | 15369.0000 | 1.235 |
| 1,2-Dichloroethane | NA | NA | NA | 0.400 | 5429.00000 | 0.4802 | 1.00 | 13527.0000 | 0.4827 |
| 1,3-Dichlorobenzene | NA | NA | NA | 0.400 | 7661.00000 | 1.548 | 1.00 | 18239.0000 | 1.465 |
| 1,4-Dichlorobenzene | 0.300 | 6633.00000 | 1.695 | 0.400 | 8734.00000 | 1.765 | 1.00 | 21411.0000 | 1.720 |
| 2-Butanone | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| 2-Hexanone | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| 4-Methyl-2-Pentanone | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Acetone | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Benzene | NA | NA | NA | 0.400 | 12905.0000 | 1.142 | 1.00 | 31706.0000 | 1.131 |
| Bromodichloromethane | NA | NA | NA | 0.400 | 4864.00000 | 0.4302 | 1.00 | 11718.0000 | 0.4181 |
| Bromomethane | NA | NA | NA | NA | NA | NA | 1.00 | 5818.00000 | 0.2076 |
| Carbon Disulfide | NA | NA | NA | 0.400 | 8792.00000 | 0.7777 | 1.00 | 27106.0000 | 0.9673 |
| Carbon Tetrachloride | NA | NA | NA | 0.400 | 5024.00000 | 0.4444 | 1.00 | 16646.0000 | 0.5940 |
| Chloroethane | NA | NA | NA | NA | NA | NA | 1.00 | 6624.00000 | 0.2364 |
| Cyclohexane | NA | NA | NA | NA | NA | NA | 1.00 | 10681.0000 | 0.3811 |
| Dibromochloromethane | NA | NA | NA | 0.400 | 2474.00000 | 0.2751 | 1.00 | 7187.00000 | 0.3242 |
| Dichlorodifluoromethane | NA | NA | NA | NA | NA | NA | 1.00 | 15250.0000 | 0.5442 |
| Isopropylbenzene | NA | NA | NA | 0.400 | 8559.00000 | 0.9518 | 1.00 | 27917.0000 | 1.260 |
| Methyl Tert Butyl Ether | NA | NA | NA | NA | NA | NA | 1.00 | 15287.0000 | 0.5455 |
| Methyl acetate | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Methylcyclohexane | NA | NA | NA | NA | NA | NA | 1.00 | 11442.0000 | 0.4083 |
| Methylene Chloride | NA | NA | NA | 0.400 | 14063.0000 | 1.244 | 1.00 | 20344.0000 | 0.7260 |
| Styrene | NA | NA | NA | 0.400 | 5375.00000 | 0.5977 | 1.00 | 13384.0000 | 0.6038 |
| Tetrachloroethene | NA | NA | NA | 0.400 | 2821.00000 | 0.3137 | 1.00 | 8350.00000 | 0.3767 |
| Trichloroethene | NA | NA | NA | 0.400 | 2997.00000 | 0.2651 | 1.00 | 9091.00000 | 0.3244 |

KEMRON FORMS - Modified 10/13/2006
Version 1.6 PDF File ID: 921092
Report generated 10/30/2007 15:50

**Login Number:** L0710596
**Analytical Method:** 8260B
**Instrument ID:** HPMS10
**Initial Calibration Date:** 18-OCT-07 16:51
**Column ID:** F

| Analyte | WG253187-05 | | | WG253187-06 | | | WG253187-07 | | |
|---|---|---|---|---|---|---|---|---|---|
| | CONC | RESP | RF | CONC | RESP | RF | CONC | RESP | RF |
| 1,1-Dichloroethene | 2.00 | 15287.0000 | 0.2715 | 5.00 | 42558.0000 | 0.3022 | 20.0 | 180665.000 | 0.3069 |
| 1,2-Dichloropropane | 2.00 | 15196.0000 | 0.2699 | 5.00 | 41344.0000 | 0.2936 | 20.0 | 174588.000 | 0.2966 |
| Chloroform | 2.00 | 37694.0000 | 0.6694 | 5.00 | 102622.000 | 0.7287 | 20.0 | 419725.000 | 0.7130 |
| Ethylbenzene | 2.00 | 24162.0000 | 0.5439 | 5.00 | 65558.0000 | 0.5717 | 20.0 | 284174.000 | 0.5971 |
| Toluene | 2.00 | 65823.0000 | 1.482 | 5.00 | 182916.000 | 1.595 | 20.0 | 776711.000 | 1.632 |
| Vinyl Chloride | 2.00 | 17139.0000 | 0.3044 | 5.00 | 41513.0000 | 0.2948 | 20.0 | 152646.000 | 0.2593 |
| 1,1,2,2-Tetrachloroethane | 2.00 | 12038.0000 | 0.4829 | 5.00 | 28928.0000 | 0.4454 | 20.0 | 112932.000 | 0.4174 |
| 1,1-Dichloroethane | 2.00 | 35723.0000 | 0.6344 | 5.00 | 94651.0000 | 0.6721 | 20.0 | 388959.000 | 0.6607 |
| Bromoform | 2.00 | 9401.00000 | 0.2116 | 5.00 | 24005.0000 | 0.2093 | 20.0 | 104250.000 | 0.2190 |
| Chlorobenzene | 2.00 | 50576.0000 | 1.139 | 5.00 | 131659.000 | 1.148 | 20.0 | 528062.000 | 1.110 |
| Chloromethane | 2.00 | 23206.0000 | 0.4121 | 5.00 | 51889.0000 | 0.3684 | 20.0 | 202508.000 | 0.3440 |
| 1,1,1-Trichloroethane | 2.00 | 37393.0000 | 0.6640 | 5.00 | 103358.000 | 0.7339 | 20.0 | 427717.000 | 0.7266 |
| 1,1,2-Trichloro-1,2,2-Trifluoroethane | 2.00 | 22033.0000 | 0.3913 | 5.00 | 55893.0000 | 0.3969 | 20.0 | 236212.000 | 0.4012 |
| 1,1,2-Trichloroethane | 2.00 | 12183.0000 | 0.2743 | 5.00 | 30420.0000 | 0.2653 | 20.0 | 119382.000 | 0.2508 |
| 1,2,4-Trichlorobenzene | 2.00 | 20290.0000 | 0.8140 | 5.00 | 55085.0000 | 0.8481 | 20.0 | 242118.000 | 0.8949 |
| 1,2-Dibromo-3-Chloropropane | 2.00 | 1595.00000 | 0.06400 | 5.00 | 4769.00000 | 0.07340 | 20.0 | 19160.0000 | 0.07080 |
| 1,2-Dibromoethane | 2.00 | 11008.0000 | 0.2478 | 5.00 | 28597.0000 | 0.2494 | 20.0 | 124466.000 | 0.2615 |
| 1,2-Dichlorobenzene | 2.00 | 37062.0000 | 1.487 | 5.00 | 95260.0000 | 1.467 | 20.0 | 392539.000 | 1.451 |
| 1,2-Dichloroethane | 2.00 | 29116.0000 | 0.5170 | 5.00 | 78320.0000 | 0.5561 | 20.0 | 315717.000 | 0.5363 |
| 1,3-Dichlorobenzene | 2.00 | 43128.0000 | 1.730 | 5.00 | 110836.000 | 1.707 | 20.0 | 456925.000 | 1.689 |
| 1,4-Dichlorobenzene | 2.00 | 45641.0000 | 1.831 | 5.00 | 116311.000 | 1.791 | 20.0 | 465766.000 | 1.722 |
| 2-Butanone | NA | NA | NA | 5.00 | 10391.0000 | 0.07380 | 20.0 | 38950.0000 | 0.06620 |
| 2-Hexanone | NA | NA | NA | 5.00 | 11580.0000 | 0.1010 | 20.0 | 50374.0000 | 0.1058 |
| 4-Methyl-2-Pentanone | NA | NA | NA | 5.00 | 5894.00000 | 0.04190 | 20.0 | 28737.0000 | 0.04880 |
| Acetone | NA | NA | NA | 5.00 | 9425.00000 | 0.06690 | 20.0 | 34128.0000 | 0.05800 |
| Benzene | 2.00 | 72788.0000 | 1.293 | 5.00 | 195190.000 | 1.386 | 20.0 | 791095.000 | 1.344 |
| Bromodichloromethane | 2.00 | 25970.0000 | 0.4612 | 5.00 | 70082.0000 | 0.4976 | 20.0 | 295680.000 | 0.5023 |
| Bromomethane | 2.00 | 12425.0000 | 0.2206 | 5.00 | 33063.0000 | 0.2348 | 20.0 | 138556.000 | 0.2354 |
| Carbon Disulfide | 2.00 | 53362.0000 | 0.9476 | 5.00 | 143650.000 | 1.020 | 20.0 | 589489.000 | 1.001 |
| Carbon Tetrachloride | 2.00 | 36557.0000 | 0.6492 | 5.00 | 95481.0000 | 0.6780 | 20.0 | 404158.000 | 0.6865 |
| Chloroethane | 2.00 | 12862.0000 | 0.2284 | 5.00 | 34147.0000 | 0.2425 | 20.0 | 140133.000 | 0.2380 |
| Cyclohexane | 2.00 | 25145.0000 | 0.4465 | 5.00 | 73667.0000 | 0.5231 | 20.0 | 333963.000 | 0.5673 |
| Dibromochloromethane | 2.00 | 16000.0000 | 0.3602 | 5.00 | 42545.0000 | 0.3710 | 20.0 | 176475.000 | 0.3708 |
| Dichlorodifluoromethane | 2.00 | 33123.0000 | 0.5882 | 5.00 | 85934.0000 | 0.6102 | 20.0 | 350987.000 | 0.5962 |
| Isopropylbenzene | 2.00 | 64554.0000 | 1.453 | 5.00 | 186995.000 | 1.631 | 20.0 | 868228.000 | 1.824 |
| Methyl Tert Butyl Ether | 2.00 | 31379.0000 | 0.5572 | 5.00 | 85244.0000 | 0.6053 | 20.0 | 370990.000 | 0.6302 |
| Methyl acetate | 2.00 | 8322.00000 | 0.1478 | 5.00 | 19185.0000 | 0.1362 | 20.0 | 75160.0000 | 0.1277 |
| Methylcyclohexane | 2.00 | 23891.0000 | 0.4243 | 5.00 | 67543.0000 | 0.4796 | 20.0 | 308513.000 | 0.5241 |
| Methylene Chloride | 2.00 | 30324.0000 | 0.5385 | 5.00 | 57224.0000 | 0.4063 | 20.0 | 195986.000 | 0.3329 |
| Styrene | 2.00 | 37636.0000 | 0.8472 | 5.00 | 111666.000 | 0.9737 | 20.0 | 532640.000 | 1.119 |
| Tetrachloroethene | 2.00 | 17301.0000 | 0.3895 | 5.00 | 44134.0000 | 0.3848 | 20.0 | 185017.000 | 0.3887 |
| Trichloroethene | 2.00 | 19229.0000 | 0.3415 | 5.00 | 49536.0000 | 0.3517 | 20.0 | 213441.000 | 0.3626 |

**KEMRON FORMS - Modified 10/13/2006**
**Version 1.6 PDF File ID: 921092**
**Report generated 10/30/2007 15:50**

Login Number: L0710596
Analytical Method: 8260B

Instrument ID: HPMS10
Initial Calibration Date: 18-OCT-07 16:51
Column ID: F

| Analyte | WG253187-08 | | | WG253187-09 | | | WG253187-10 | | |
|---|---|---|---|---|---|---|---|---|---|
| | CONC | RESP | RF | CONC | RESP | RF | CONC | RESP | RF |
| 1,1-Dichloroethene | 50.0 | 475779.000 | 0.3158 | 100 | 1003530.00 | 0.3152 | 200 | 1935564.00 | 0.3013 |
| 1,2-Dichloropropane | 50.0 | 453632.000 | 0.3011 | 100 | 925271.000 | 0.2906 | 200 | 1784915.00 | 0.2779 |
| Chloroform | 50.0 | 1059062.00 | 0.7029 | 100 | 2158957.00 | 0.6780 | 200 | 4108683.00 | 0.6396 |
| Ethylbenzene | 50.0 | 749151.000 | 0.5951 | 100 | 1522153.00 | 0.5722 | 200 | 2832832.00 | 0.5357 |
| Toluene | 50.0 | 2026967.00 | 1.610 | 100 | 4162783.00 | 1.565 | 200 | 7913474.00 | 1.496 |
| Vinyl Chloride | 50.0 | 370547.000 | 0.2459 | 100 | 711287.000 | 0.2234 | NA | NA | NA |
| 1,1,2,2-Tetrachloroethane | 50.0 | 291547.000 | 0.4102 | 100 | 594295.000 | 0.4006 | 200 | 1178290.00 | 0.3965 |
| 1,1-Dichloroethane | 50.0 | 989348.000 | 0.6566 | 100 | 2039676.00 | 0.6405 | 200 | 3886735.00 | 0.6051 |
| Bromoform | 50.0 | 277168.000 | 0.2202 | 100 | 557539.000 | 0.2096 | 200 | 1095949.00 | 0.2072 |
| Chlorobenzene | 50.0 | 1347846.00 | 1.071 | 100 | 2704431.00 | 1.017 | 200 | 5030440.00 | 0.9512 |
| Chloromethane | 50.0 | 488540.000 | 0.3242 | 100 | 975213.000 | 0.3063 | 200 | 1761549.00 | 0.2742 |
| 1,1,1-Trichloroethane | 50.0 | 1084473.00 | 0.7197 | 100 | 2151763.00 | 0.6757 | 200 | 4029238.00 | 0.6273 |
| 1,1,2-Trichloro-1,2,2-Trifluoroethane | 50.0 | 597836.000 | 0.3968 | 100 | 1229619.00 | 0.3862 | 200 | 2347796.00 | 0.3655 |
| 1,1,2-Trichloroethane | 50.0 | 308262.000 | 0.2449 | 100 | 619384.000 | 0.2328 | 200 | 1202179.00 | 0.2273 |
| 1,2,4-Trichlorobenzene | 50.0 | 665354.000 | 0.9361 | 100 | 1404460.00 | 0.9467 | 200 | 2723271.00 | 0.9165 |
| 1,2-Dibromo-3-Chloropropane | 50.0 | 54813.0000 | 0.07710 | 100 | 121349.000 | 0.08180 | 200 | 261127.000 | 0.08790 |
| 1,2-Dibromoethane | 50.0 | 317907.000 | 0.2526 | 100 | 654907.000 | 0.2462 | 200 | 1257275.00 | 0.2377 |
| 1,2-Dichlorobenzene | 50.0 | 1009013.00 | 1.420 | 100 | 2058619.00 | 1.388 | 200 | 3929616.00 | 1.323 |
| 1,2-Dichloroethane | 50.0 | 778177.000 | 0.5164 | 100 | 1543687.00 | 0.4848 | 200 | 2907627.00 | 0.4527 |
| 1,3-Dichlorobenzene | 50.0 | 1189583.00 | 1.674 | 100 | 2421127.00 | 1.632 | 200 | 4604178.00 | 1.550 |
| 1,4-Dichlorobenzene | 50.0 | 1190942.00 | 1.676 | 100 | 2433385.00 | 1.640 | 200 | 4604639.00 | 1.550 |
| 2-Butanone | 50.0 | 100214.000 | 0.06650 | 100 | 206535.000 | 0.06490 | 200 | 433307.000 | 0.06750 |
| 2-Hexanone | 50.0 | 137209.000 | 0.1090 | 100 | 281710.000 | 0.1059 | 200 | 588886.000 | 0.1114 |
| 4-Methyl-2-Pentanone | 50.0 | 78046.0000 | 0.05180 | 100 | 162869.000 | 0.05110 | 200 | 333244.000 | 0.05190 |
| Acetone | 50.0 | 86089.0000 | 0.05710 | 100 | 178522.000 | 0.05610 | 200 | 344201.000 | 0.05360 |
| Benzene | 50.0 | 1986629.00 | 1.318 | 100 | 4052802.00 | 1.273 | 200 | 7833302.00 | 1.220 |
| Bromodichloromethane | 50.0 | 752284.000 | 0.4993 | 100 | 1507757.00 | 0.4735 | 200 | 2847056.00 | 0.4432 |
| Bromomethane | 50.0 | 358758.000 | 0.2381 | 100 | 784455.000 | 0.2464 | 200 | 1592103.00 | 0.2479 |
| Carbon Disulfide | 50.0 | 1514838.00 | 1.005 | 100 | 3111933.00 | 0.9773 | 200 | 6059794.00 | 0.9434 |
| Carbon Tetrachloride | 50.0 | 1015653.00 | 0.6740 | 100 | 2017377.00 | 0.6335 | 200 | 3693004.00 | 0.5749 |
| Chloroethane | 50.0 | 355448.000 | 0.2359 | 100 | 738239.000 | 0.2318 | 200 | 1423490.00 | 0.2216 |
| Cyclohexane | 50.0 | 861588.000 | 0.5718 | 100 | 1796218.00 | 0.5641 | 200 | 3437904.00 | 0.5352 |
| Dibromochloromethane | 50.0 | 471939.000 | 0.3749 | 100 | 950867.000 | 0.3574 | 200 | 1816062.00 | 0.3434 |
| Dichlorodifluoromethane | 50.0 | 868912.000 | 0.5767 | 100 | 1742871.00 | 0.5473 | 200 | 3132081.00 | 0.4876 |
| Isopropylbenzene | 50.0 | 2306871.00 | 1.833 | 100 | 4702832.00 | 1.768 | 200 | 8880968.00 | 1.679 |
| Methyl Tert Butyl Ether | 50.0 | 1000841.00 | 0.6642 | 100 | 2125328.00 | 0.6674 | 200 | 4309140.00 | 0.6708 |
| Methyl acetate | 50.0 | 190839.000 | 0.1267 | 100 | 406224.000 | 0.1276 | 200 | 828426.000 | 0.1290 |
| Methylcyclohexane | 50.0 | 819734.000 | 0.5440 | 100 | 1708235.00 | 0.5365 | 200 | 3288453.00 | 0.5119 |
| Methylene Chloride | 50.0 | 477284.000 | 0.3168 | 100 | 967262.000 | 0.3038 | 200 | 1864238.00 | 0.2902 |
| Styrene | 50.0 | 1428212.00 | 1.135 | 100 | 2974118.00 | 1.118 | 200 | 5735911.00 | 1.085 |
| Tetrachloroethene | 50.0 | 479876.000 | 0.3812 | 100 | 974917.000 | 0.3665 | 200 | 1843044.00 | 0.3485 |
| Trichloroethene | 50.0 | 559436.000 | 0.3713 | 100 | 1137581.00 | 0.3572 | 200 | 2183560.00 | 0.3399 |

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Version 1.6 PDF File ID: 921092
Report generated 10/30/2007 15:50

# INITIAL CALIBRATION DATA



Login Number: L0710596
Analytical Method: 8260B

Instrument ID: HPMS10
Initial Calibration Date: 18-OCT-07 16:51
Column ID: F

| Analyte | WG253187-11 | | |
|---|---|---|---|
| | CONC | RESP | RF |
| 1,1-Dichloroethene | NA | NA | NA |
| 1,2-Dichloropropane | NA | NA | NA |
| Chloroform | NA | NA | NA |
| Ethylbenzene | NA | NA | NA |
| Toluene | NA | NA | NA |
| Vinyl Chloride | NA | NA | NA |
| 1,1,2,2-Tetrachloroethane | NA | NA | NA |
| 1,1-Dichloroethane | NA | NA | NA |
| Bromoform | NA | NA | NA |
| Chlorobenzene | NA | NA | NA |
| Chloromethane | NA | NA | NA |
| 1,1,1-Trichloroethane | NA | NA | NA |
| 1,1,2-Trichloro-1,2,2-Trifluoroethane | NA | NA | NA |
| 1,1,2-Trichloroethane | NA | NA | NA |
| 1,2,4-Trichlorobenzene | NA | NA | NA |
| 1,2-Dibromo-3-Chloropropane | NA | NA | NA |
| 1,2-Dibromoethane | NA | NA | NA |
| 1,2-Dichlorobenzene | NA | NA | NA |
| 1,2-Dichloroethane | NA | NA | NA |
| 1,3-Dichlorobenzene | NA | NA | NA |
| 1,4-Dichlorobenzene | NA | NA | NA |
| 2-Butanone | 300 | 663381.000 | 0.06880 |
| 2-Hexanone | 300 | 886864.000 | 0.1149 |
| 4-Methyl-2-Pentanone | 300 | 523327.000 | 0.05430 |
| Acetone | 300 | 457084.000 | 0.04740 |
| Benzene | NA | NA | NA |
| Bromodichloromethane | NA | NA | NA |
| Bromomethane | NA | NA | NA |
| Carbon Disulfide | NA | NA | NA |
| Carbon Tetrachloride | NA | NA | NA |
| Chloroethane | NA | NA | NA |
| Cyclohexane | NA | NA | NA |
| Dibromochloromethane | NA | NA | NA |
| Dichlorodifluoromethane | NA | NA | NA |
| Isopropylbenzene | NA | NA | NA |
| Methyl Tert Butyl Ether | NA | NA | NA |
| Methyl acetate | NA | NA | NA |
| Methylcyclohexane | NA | NA | NA |
| Methylene Chloride | NA | NA | NA |
| Styrene | NA | NA | NA |
| Tetrachloroethene | NA | NA | NA |
| Trichloroethene | NA | NA | NA |

**KEMRON FORMS - Modified 10/13/2006**
**Version 1.6 PDF File ID: 921092**
**Report generated 10/30/2007 15:50**

# INITIAL CALIBRATION DATA

Login Number: L0710596
Analytical Method: 8260B

Instrument ID: HPMS10
Initial Calibration Date: 18-OCT-07 16:51
Column ID: F

| Analyte | WG253187-02 | | | WG253187-03 | | | WG253187-04 | | |
|---|---|---|---|---|---|---|---|---|---|
| | CONC | RESP | RF | CONC | RESP | RF | CONC | RESP | RF |
| Trichlorofluoromethane | NA | NA | NA | 0.400 | 4902.00000 | 0.4336 | 1.00 | 22532.0000 | 0.8040 |
| cis-1,2-Dichloroethene | NA | NA | NA | 0.400 | 3261.00000 | 0.2884 | 1.00 | 8145.00000 | 0.2906 |
| cis-1,3-Dichloropropene | NA | NA | NA | 0.400 | 3962.00000 | 0.3504 | 1.00 | 9845.00000 | 0.3513 |
| m-,p-Xylene | NA | NA | NA | 0.800 | 9552.00000 | 0.5311 | 2.00 | 25634.0000 | 0.5782 |
| o-Xylene | NA | NA | NA | NA | NA | NA | 1.00 | 10610.0000 | 0.4787 |
| trans-1,2-Dichloroethene | NA | NA | NA | 0.400 | 2815.00000 | 0.2490 | 1.00 | 8887.00000 | 0.3171 |
| trans-1,3-Dichloropropene | NA | NA | NA | 0.400 | 3805.00000 | 0.4231 | 1.00 | 9940.00000 | 0.4484 |

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# INITIAL CALIBRATION DATA

Login Number: L0710596
Analytical Method: 8260B

Instrument ID: HPMS10
Initial Calibration Date: 18-OCT-07 16:51
Column ID: F

| Analyte | WG253187-05 | | | WG253187-06 | | | WG253187-07 | | |
|---|---|---|---|---|---|---|---|---|---|
| | CONC | RESP | RF | CONC | RESP | RF | CONC | RESP | RF |
| Trichlorofluoromethane | 2.00 | 49072.0000 | 0.8714 | 5.00 | 125093.000 | 0.8882 | 20.0 | 518777.000 | 0.8812 |
| cis-1,2-Dichloroethene | 2.00 | 18147.0000 | 0.3223 | 5.00 | 48051.0000 | 0.3412 | 20.0 | 212252.000 | 0.3605 |
| cis-1,3-Dichloropropene | 2.00 | 21974.0000 | 0.3902 | 5.00 | 62793.0000 | 0.4459 | 20.0 | 287579.000 | 0.4885 |
| m-,p-Xylene | 4.00 | 59006.0000 | 0.6641 | 10.0 | 162481.000 | 0.7084 | 40.0 | 699373.000 | 0.7347 |
| o-Xylene | 2.00 | 23047.0000 | 0.5188 | 5.00 | 69801.0000 | 0.6087 | 20.0 | 320013.000 | 0.6724 |
| trans-1,2-Dichloroethene | 2.00 | 17095.0000 | 0.3036 | 5.00 | 47628.0000 | 0.3382 | 20.0 | 204636.000 | 0.3476 |
| trans-1,3-Dichloropropene | 2.00 | 21539.0000 | 0.4849 | 5.00 | 61213.0000 | 0.5338 | 20.0 | 266332.000 | 0.5596 |

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# INITIAL CALIBRATION DATA

Login Number: L0710596
Analytical Method: 8260B

Instrument ID: HPMS10
Initial Calibration Date: 18-OCT-07 16:51
Column ID: F

| Analyte | WG253187-08 | | | WG253187-09 | | | WG253187-10 | | |
|---|---|---|---|---|---|---|---|---|---|
| | CONC | RESP | RF | CONC | RESP | RF | CONC | RESP | RF |
| Trichlorofluoromethane | 50.0 | 1276651.00 | 0.8473 | 100 | 2556058.00 | 0.8027 | 200 | 4705785.00 | 0.7326 |
| cis-1,2-Dichloroethene | 50.0 | 551863.000 | 0.3662 | 100 | 1146237.00 | 0.3600 | 200 | 2243726.00 | 0.3493 |
| cis-1,3-Dichloropropene | 50.0 | 759522.000 | 0.5041 | 100 | 1553167.00 | 0.4878 | 200 | 2959906.00 | 0.4608 |
| m-,p-Xylene | 100 | 1811635.00 | 0.7196 | 200 | 3722563.00 | 0.6997 | 400 | 7035503.00 | 0.6652 |
| o-Xylene | 50.0 | 858507.000 | 0.6820 | 100 | 1764641.00 | 0.6633 | 200 | 3404334.00 | 0.6437 |
| trans-1,2-Dichloroethene | 50.0 | 529464.000 | 0.3514 | 100 | 1113115.00 | 0.3496 | 200 | 2168851.00 | 0.3376 |
| trans-1,3-Dichloropropene | 50.0 | 695994.000 | 0.5529 | 100 | 1398472.00 | 0.5257 | 200 | 2658193.00 | 0.5026 |

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Login Number: L0710596
Analytical Method: 8260B

Instrument ID: HPMS10
Initial Calibration Date: 18-OCT-07 16:51
Column ID: F

| Analyte | WG253187-11 | | |
|---|---|---|---|
| | CONC | RESP | RF |
| Trichlorofluoromethane | NA | NA | NA |
| cis-1,2-Dichloroethene | NA | NA | NA |
| cis-1,3-Dichloropropene | NA | NA | NA |
| m-,p-Xylene | NA | NA | NA |
| o-Xylene | NA | NA | NA |
| trans-1,2-Dichloroethene | NA | NA | NA |
| trans-1,3-Dichloropropene | NA | NA | NA |

Login Number: L0710596
Analytical Method: 8260B
Instrument ID: HPMS11
Initial Calibration Date: 01-OCT-07 15:48
Column ID: F

| Analyte | WG251532-02 | | | WG251532-03 | | | WG251532-04 | | |
|---|---|---|---|---|---|---|---|---|---|
| | CONC | RESP | RF | CONC | RESP | RF | CONC | RESP | RF |
| 1,1-Dichloroethene | NA | NA | NA | 0.400 | 5459.00000 | 0.3406 | 1.00 | 22956.0000 | 0.5767 |
| 1,2-Dichloropropane | NA | NA | NA | 0.400 | 3683.00000 | 0.2298 | 1.00 | 11307.0000 | 0.2841 |
| Chloroform | 0.300 | 6893.00000 | 0.5373 | 0.400 | 6707.00000 | 0.4185 | 1.00 | 22279.0000 | 0.5597 |
| Ethylbenzene | NA | NA | NA | 0.400 | 3644.00000 | 0.3495 | 1.00 | 13022.0000 | 0.5067 |
| Toluene | NA | NA | NA | 0.400 | 11758.0000 | 1.128 | 1.00 | 39735.0000 | 1.546 |
| Vinyl Chloride | NA | NA | NA | 0.400 | 4333.00000 | 0.2703 | 1.00 | 17176.0000 | 0.4315 |
| 1,1,2,2-Tetrachloroethane | NA | NA | NA | 0.400 | 2458.00000 | 0.4556 | 1.00 | 5562.00000 | 0.4178 |
| 1,1-Dichloroethane | NA | NA | NA | 0.400 | 7965.00000 | 0.4969 | 1.00 | 24401.0000 | 0.6131 |
| Bromoform | NA | NA | NA | NA | NA | NA | 1.00 | 3393.00000 | 0.1320 |
| Chlorobenzene | NA | NA | NA | 0.400 | 8476.00000 | 0.8130 | 1.00 | 25625.0000 | 0.9972 |
| Chloromethane | NA | NA | NA | 0.400 | 7022.00000 | 0.4381 | 1.00 | 17646.0000 | 0.4433 |
| 1,1,1-Trichloroethane | NA | NA | NA | 0.400 | 5415.00000 | 0.3378 | 1.00 | 20488.0000 | 0.5147 |
| 1,1,2-Trichloro-1,2,2-Trifluoroethane | NA | NA | NA | NA | NA | NA | 1.00 | 9564.00000 | 0.2403 |
| 1,1,2-Trichloroethane | NA | NA | NA | 0.400 | 1851.00000 | 0.1775 | 1.00 | 5710.00000 | 0.2222 |
| 1,2,4-Trichlorobenzene | NA | NA | NA | 0.400 | 3539.00000 | 0.6560 | 1.00 | 10704.0000 | 0.8041 |
| 1,2-Dibromo-3-Chloropropane | NA | NA | NA | NA | NA | NA | 1.00 | 1140.00000 | 0.08560 |
| 1,2-Dibromoethane | NA | NA | NA | 0.400 | 2030.00000 | 0.1947 | 1.00 | 5190.00000 | 0.2020 |
| 1,2-Dichlorobenzene | 0.300 | 4763.00000 | 1.183 | 0.400 | 5312.00000 | 0.9846 | 1.00 | 16208.0000 | 1.218 |
| 1,2-Dichloroethane | NA | NA | NA | 0.400 | 7081.00000 | 0.4418 | 1.00 | 20110.0000 | 0.5052 |
| 1,3-Dichlorobenzene | NA | NA | NA | 0.400 | 5186.00000 | 0.9613 | 1.00 | 17647.0000 | 1.326 |
| 1,4-Dichlorobenzene | 0.300 | 5161.00000 | 1.282 | 0.400 | 5753.00000 | 1.066 | 1.00 | 18398.0000 | 1.382 |
| 2-Butanone | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| 2-Hexanone | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| 4-Methyl-2-Pentanone | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Acetone | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Benzene | NA | NA | NA | 0.400 | 13570.0000 | 0.8466 | 1.00 | 38743.0000 | 0.9734 |
| Bromodichloromethane | NA | NA | NA | 0.400 | 4690.00000 | 0.2926 | 1.00 | 14758.0000 | 0.3708 |
| Bromomethane | NA | NA | NA | NA | NA | NA | 1.00 | 5941.00000 | 0.1493 |
| Carbon Disulfide | NA | NA | NA | NA | NA | NA | 1.00 | 29560.0000 | 0.7427 |
| Carbon Tetrachloride | NA | NA | NA | 0.400 | 3443.00000 | 0.2148 | 1.00 | 15952.0000 | 0.4008 |
| Chloroethane | NA | NA | NA | NA | NA | NA | 1.00 | 9542.00000 | 0.2397 |
| Cyclohexane | NA | NA | NA | NA | NA | NA | 1.00 | 22543.0000 | 0.5664 |
| Dibromochloromethane | NA | NA | NA | 0.400 | 2533.00000 | 0.2430 | 1.00 | 6241.00000 | 0.2429 |
| Dichlorodifluoromethane | NA | NA | NA | NA | NA | NA | 1.00 | 18761.0000 | 0.4714 |
| Isopropylbenzene | NA | NA | NA | 0.400 | 9883.00000 | 0.9479 | 1.00 | 40841.0000 | 1.589 |
| Methyl Tert Butyl Ether | NA | NA | NA | NA | NA | NA | 1.00 | 23664.0000 | 0.5945 |
| Methyl acetate | NA | NA | NA | NA | NA | NA | 1.00 | 4790.00000 | 0.1203 |
| Methylcyclohexane | NA | NA | NA | NA | NA | NA | 1.00 | 13313.0000 | 0.3345 |
| Methylene Chloride | NA | NA | NA | 0.400 | 13939.0000 | 0.8697 | 1.00 | 21650.0000 | 0.5439 |
| Styrene | NA | NA | NA | 0.400 | 7224.00000 | 0.6929 | 1.00 | 22881.0000 | 0.8904 |
| Tetrachloroethene | NA | NA | NA | 0.400 | 1692.00000 | 0.1623 | 1.00 | 5980.00000 | 0.2327 |
| Trichloroethene | NA | NA | NA | 0.400 | 2552.00000 | 0.1592 | 1.00 | 9457.00000 | 0.2376 |

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Initial Calibration Date: 01-OCT-07 15:48
Column ID: F

| Analyte | WG251532-05 | | | WG251532-06 | | | WG251532-07 | | |
|---|---|---|---|---|---|---|---|---|---|
| | CONC | RESP | RF | CONC | RESP | RF | CONC | RESP | RF |
| 1,1-Dichloroethene | 2.00 | 48476.0000 | 0.6182 | 5.00 | 125622.000 | 0.6336 | 20.0 | 535695.000 | 0.6421 |
| 1,2-Dichloropropane | 2.00 | 24026.0000 | 0.3064 | 5.00 | 60721.0000 | 0.3063 | 20.0 | 255504.000 | 0.3063 |
| Chloroform | 2.00 | 44355.0000 | 0.5657 | 5.00 | 112252.000 | 0.5662 | 20.0 | 484435.000 | 0.5807 |
| Ethylbenzene | 2.00 | 27498.0000 | 0.5335 | 5.00 | 73404.0000 | 0.5622 | 20.0 | 307082.000 | 0.5615 |
| Toluene | 2.00 | 79868.0000 | 1.550 | 5.00 | 198698.000 | 1.522 | 20.0 | 872465.000 | 1.595 |
| Vinyl Chloride | 2.00 | 33432.0000 | 0.4264 | 5.00 | 75335.0000 | 0.3800 | 20.0 | 315490.000 | 0.3782 |
| 1,1,2,2-Tetrachloroethane | 2.00 | 12732.0000 | 0.4763 | 5.00 | 33959.0000 | 0.5071 | 20.0 | 126680.000 | 0.4520 |
| 1,1-Dichloroethane | 2.00 | 52354.0000 | 0.6677 | 5.00 | 132096.000 | 0.6663 | 20.0 | 573339.000 | 0.6872 |
| Bromoform | 2.00 | 7526.00000 | 0.1460 | 5.00 | 19891.0000 | 0.1523 | 20.0 | 89511.0000 | 0.1637 |
| Chlorobenzene | 2.00 | 55132.0000 | 1.070 | 5.00 | 128985.000 | 0.9879 | 20.0 | 549650.000 | 1.005 |
| Chloromethane | 2.00 | 39610.0000 | 0.5052 | 5.00 | 89663.0000 | 0.4523 | 20.0 | 388504.000 | 0.4657 |
| 1,1,1-Trichloroethane | 2.00 | 44026.0000 | 0.5615 | 5.00 | 111298.000 | 0.5614 | 20.0 | 479025.000 | 0.5742 |
| 1,1,2-Trichloro-1,2,2-Trifluoroethane | 2.00 | 19426.0000 | 0.2478 | 5.00 | 55122.0000 | 0.2780 | 20.0 | 218986.000 | 0.2625 |
| 1,1,2-Trichloroethane | 2.00 | 11873.0000 | 0.2303 | 5.00 | 31952.0000 | 0.2447 | 20.0 | 128006.000 | 0.2341 |
| 1,2,4-Trichlorobenzene | 2.00 | 23534.0000 | 0.8804 | 5.00 | 58779.0000 | 0.8777 | 20.0 | 242679.000 | 0.8658 |
| 1,2-Dibromo-3-Chloropropane | 2.00 | 2948.00000 | 0.1103 | 5.00 | 6744.00000 | 0.1007 | 20.0 | 26187.0000 | 0.09340 |
| 1,2-Dibromoethane | 2.00 | 12526.0000 | 0.2430 | 5.00 | 30764.0000 | 0.2356 | 20.0 | 129058.000 | 0.2360 |
| 1,2-Dichlorobenzene | 2.00 | 34537.0000 | 1.292 | 5.00 | 84559.0000 | 1.263 | 20.0 | 346990.000 | 1.238 |
| 1,2-Dichloroethane | 2.00 | 41756.0000 | 0.5325 | 5.00 | 104639.000 | 0.5278 | 20.0 | 437462.000 | 0.5244 |
| 1,3-Dichlorobenzene | 2.00 | 39948.0000 | 1.495 | 5.00 | 97419.0000 | 1.455 | 20.0 | 407476.000 | 1.454 |
| 1,4-Dichlorobenzene | 2.00 | 40610.0000 | 1.519 | 5.00 | 99812.0000 | 1.490 | 20.0 | 415174.000 | 1.481 |
| 2-Butanone | NA | NA | NA | 5.00 | 14161.0000 | 0.07140 | 20.0 | 53500.0000 | 0.06410 |
| 2-Hexanone | NA | NA | NA | 5.00 | 21234.0000 | 0.1626 | 20.0 | 82590.0000 | 0.1510 |
| 4-Methyl-2-Pentanone | NA | NA | NA | 5.00 | 13461.0000 | 0.06790 | 20.0 | 50386.0000 | 0.06040 |
| Acetone | NA | NA | NA | 5.00 | 11470.0000 | 0.05790 | 20.0 | 42030.0000 | 0.05040 |
| Benzene | 2.00 | 80625.0000 | 1.028 | 5.00 | 202501.000 | 1.021 | 20.0 | 855276.000 | 1.025 |
| Bromodichloromethane | 2.00 | 30555.0000 | 0.3897 | 5.00 | 78106.0000 | 0.3940 | 20.0 | 336034.000 | 0.4028 |
| Bromomethane | 2.00 | 12430.0000 | 0.1585 | 5.00 | 29313.0000 | 0.1479 | 20.0 | 147898.000 | 0.1773 |
| Carbon Disulfide | 2.00 | 58739.0000 | 0.7491 | 5.00 | 152424.000 | 0.7688 | 20.0 | 661644.000 | 0.7931 |
| Carbon Tetrachloride | 2.00 | 32747.0000 | 0.4176 | 5.00 | 89399.0000 | 0.4509 | 20.0 | 372854.000 | 0.4469 |
| Chloroethane | 2.00 | 19584.0000 | 0.2498 | 5.00 | 48803.0000 | 0.2462 | 20.0 | 213904.000 | 0.2564 |
| Cyclohexane | 2.00 | 44380.0000 | 0.5660 | 5.00 | 126424.000 | 0.6377 | 20.0 | 513595.000 | 0.6156 |
| Dibromochloromethane | 2.00 | 14878.0000 | 0.2886 | 5.00 | 40156.0000 | 0.3075 | 20.0 | 178082.000 | 0.3256 |
| Dichlorodifluoromethane | 2.00 | 38939.0000 | 0.4966 | 5.00 | 107316.000 | 0.5413 | 20.0 | 440739.000 | 0.5283 |
| Isopropylbenzene | 2.00 | 88988.0000 | 1.726 | 5.00 | 225803.000 | 1.729 | 20.0 | 965695.000 | 1.766 |
| Methyl Tert Butyl Ether | 2.00 | 48149.0000 | 0.6141 | 5.00 | 123625.000 | 0.6236 | 20.0 | 518361.000 | 0.6213 |
| Methyl acetate | 2.00 | 10311.0000 | 0.1315 | 5.00 | 25413.0000 | 0.1282 | 20.0 | 110460.000 | 0.1324 |
| Methylcyclohexane | 2.00 | 28563.0000 | 0.3643 | 5.00 | 83180.0000 | 0.4196 | 20.0 | 320406.000 | 0.3841 |
| Methylene Chloride | 2.00 | 30890.0000 | 0.3940 | 5.00 | 60073.0000 | 0.3030 | 20.0 | 228546.000 | 0.2740 |
| Styrene | 2.00 | 50686.0000 | 0.9833 | 5.00 | 133672.000 | 1.024 | 20.0 | 599855.000 | 1.097 |
| Tetrachloroethene | 2.00 | 13373.0000 | 0.2594 | 5.00 | 36376.0000 | 0.2786 | 20.0 | 154520.000 | 0.2825 |
| Trichloroethene | 2.00 | 20157.0000 | 0.2571 | 5.00 | 45951.0000 | 0.2318 | 20.0 | 205345.000 | 0.2461 |

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| Analyte | WG251532-08 | | | WG251532-09 | | | WG251532-10 | | |
|---|---|---|---|---|---|---|---|---|---|
| | CONC | RESP | RF | CONC | RESP | RF | CONC | RESP | RF |
| 1,1-Dichloroethene | 50.0 | 1358330.00 | 0.6364 | 100 | 2768992.00 | 0.6282 | 200 | 5351788.00 | 0.6087 |
| 1,2-Dichloropropane | 50.0 | 666385.000 | 0.3122 | 100 | 1378462.00 | 0.3127 | 200 | 2646333.00 | 0.3010 |
| Chloroform | 50.0 | 1219971.00 | 0.5715 | 100 | 2470299.00 | 0.5604 | 200 | 4693723.00 | 0.5339 |
| Ethylbenzene | 50.0 | 811958.000 | 0.5700 | 100 | 1688680.00 | 0.5795 | 200 | 3271888.00 | 0.5543 |
| Toluene | 50.0 | 2287163.00 | 1.606 | 100 | 4789895.00 | 1.644 | 200 | 9297898.00 | 1.575 |
| Vinyl Chloride | 50.0 | 746728.000 | 0.3498 | 100 | 1474420.00 | 0.3345 | 200 | 2526768.00 | 0.2874 |
| 1,1,2,2-Tetrachloroethane | 50.0 | 342935.000 | 0.4708 | 100 | 732844.000 | 0.4789 | 200 | 1407385.00 | 0.4472 |
| 1,1-Dichloroethane | 50.0 | 1439098.00 | 0.6742 | 100 | 2975247.00 | 0.6750 | 200 | 5716785.00 | 0.6502 |
| Bromoform | 50.0 | 245089.000 | 0.1721 | 100 | 520920.000 | 0.1788 | 200 | 1001987.00 | 0.1698 |
| Chlorobenzene | 50.0 | 1424429.00 | 1.000 | 100 | 2995035.00 | 1.028 | 200 | 5893335.00 | 0.9984 |
| Chloromethane | 50.0 | 922415.000 | 0.4321 | 100 | 1824763.00 | 0.4140 | 200 | 3716884.00 | 0.4227 |
| 1,1,1-Trichloroethane | 50.0 | 1204813.00 | 0.5644 | 100 | 2398980.00 | 0.5442 | 200 | 4428050.00 | 0.5036 |
| 1,1,2-Trichloro-1,2,2-Trifluoroethane | 50.0 | 535729.000 | 0.2510 | 100 | 1092963.00 | 0.2480 | 200 | 2058927.00 | 0.2342 |
| 1,1,2-Trichloroethane | 50.0 | 345205.000 | 0.2423 | 100 | 716499.000 | 0.2459 | 200 | 1374339.00 | 0.2328 |
| 1,2,4-Trichlorobenzene | 50.0 | 633338.000 | 0.8695 | 100 | 1299497.00 | 0.8492 | 200 | 2466328.00 | 0.7837 |
| 1,2-Dibromo-3-Chloropropane | 50.0 | 73182.0000 | 0.1005 | 100 | 156360.000 | 0.1022 | 200 | 287283.000 | 0.09130 |
| 1,2-Dibromoethane | 50.0 | 338403.000 | 0.2376 | 100 | 704616.000 | 0.2418 | 200 | 1336701.00 | 0.2265 |
| 1,2-Dichlorobenzene | 50.0 | 922841.000 | 1.267 | 100 | 1943041.00 | 1.270 | 200 | 3765189.00 | 1.196 |
| 1,2-Dichloroethane | 50.0 | 1097447.00 | 0.5141 | 100 | 2211026.00 | 0.5016 | 200 | 4013581.00 | 0.4565 |
| 1,3-Dichlorobenzene | 50.0 | 1071140.00 | 1.471 | 100 | 2217552.00 | 1.449 | 200 | 4425935.00 | 1.406 |
| 1,4-Dichlorobenzene | 50.0 | 1077757.00 | 1.480 | 100 | 2240937.00 | 1.465 | 200 | 4410249.00 | 1.401 |
| 2-Butanone | 50.0 | 139442.000 | 0.06530 | 100 | 294843.000 | 0.06690 | 200 | 540964.000 | 0.06150 |
| 2-Hexanone | 50.0 | 219714.000 | 0.1542 | 100 | 473751.000 | 0.1626 | 200 | 868705.000 | 0.1472 |
| 4-Methyl-2-Pentanone | 50.0 | 139434.000 | 0.06530 | 100 | 298847.000 | 0.06780 | 200 | 564567.000 | 0.06420 |
| Acetone | 50.0 | 103145.000 | 0.04830 | 100 | 224035.000 | 0.05080 | 200 | 374421.000 | 0.04260 |
| Benzene | 50.0 | 2236743.00 | 1.048 | 100 | 4623566.00 | 1.049 | 200 | 8913761.00 | 1.014 |
| Bromodichloromethane | 50.0 | 880197.000 | 0.4124 | 100 | 1801325.00 | 0.4087 | 200 | 3398229.00 | 0.3865 |
| Bromomethane | 50.0 | 405016.000 | 0.1897 | 100 | 887551.000 | 0.2014 | 200 | 1763726.00 | 0.2006 |
| Carbon Disulfide | 50.0 | 1700768.00 | 0.7968 | 100 | 3574373.00 | 0.8109 | 200 | 6992893.00 | 0.7954 |
| Carbon Tetrachloride | 50.0 | 956758.000 | 0.4482 | 100 | 1933183.00 | 0.4386 | 200 | 3582234.00 | 0.4074 |
| Chloroethane | 50.0 | 537813.000 | 0.2520 | 100 | 1094406.00 | 0.2483 | 200 | 2100042.00 | 0.2389 |
| Cyclohexane | 50.0 | 1295094.00 | 0.6067 | 100 | 2679162.00 | 0.6078 | 200 | 5035624.00 | 0.5727 |
| Dibromochloromethane | 50.0 | 476639.000 | 0.3346 | 100 | 1001787.00 | 0.3438 | 200 | 1911288.00 | 0.3238 |
| Dichlorodifluoromethane | 50.0 | 1048920.00 | 0.4914 | 100 | 2093046.00 | 0.4748 | 200 | 3836174.00 | 0.4363 |
| Isopropylbenzene | 50.0 | 2539791.00 | 1.783 | 100 | 5283210.00 | 1.813 | 200 | 10385710.0 | 1.760 |
| Methyl Tert Butyl Ether | 50.0 | 1333866.00 | 0.6249 | 100 | 2730573.00 | 0.6195 | 200 | 4976901.00 | 0.5661 |
| Methyl acetate | 50.0 | 282808.000 | 0.1325 | 100 | 581867.000 | 0.1320 | 200 | 1055829.00 | 0.1201 |
| Methylcyclohexane | 50.0 | 817556.000 | 0.3830 | 100 | 1727764.00 | 0.3920 | 200 | 3399088.00 | 0.3866 |
| Methylene Chloride | 50.0 | 561775.000 | 0.2632 | 100 | 1150287.00 | 0.2610 | 200 | 2208724.00 | 0.2512 |
| Styrene | 50.0 | 1609485.00 | 1.130 | 100 | 3420981.00 | 1.174 | 200 | 6804235.00 | 1.153 |
| Tetrachloroethene | 50.0 | 404909.000 | 0.2843 | 100 | 821236.000 | 0.2818 | 200 | 1568099.00 | 0.2657 |
| Trichloroethene | 50.0 | 527492.000 | 0.2471 | 100 | 1085515.00 | 0.2463 | 200 | 2074840.00 | 0.2360 |

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Instrument ID: HPMS11
Initial Calibration Date: 01-OCT-07 15:48
Column ID: F

| Analyte | WG251532-02 | | | WG251532-03 | | | WG251532-04 | | |
|---|---|---|---|---|---|---|---|---|---|
| | CONC | RESP | RF | CONC | RESP | RF | CONC | RESP | RF |
| Trichlorofluoromethane | NA | NA | NA | 0.400 | 3610.00000 | 0.2252 | 1.00 | 23603.0000 | 0.5930 |
| cis-1,2-Dichloroethene | NA | NA | NA | 0.400 | 3018.00000 | 0.1883 | 1.00 | 9585.00000 | 0.2408 |
| cis-1,3-Dichloropropene | NA | NA | NA | 0.400 | 5024.00000 | 0.3134 | 1.00 | 14105.0000 | 0.3544 |
| m-,p-Xylene | NA | NA | NA | 0.800 | 10564.0000 | 0.5066 | 2.00 | 32904.0000 | 0.6402 |
| o-Xylene | NA | NA | NA | 0.400 | 4810.00000 | 0.4614 | 1.00 | 15978.0000 | 0.6218 |
| trans-1,2-Dichloroethene | NA | NA | NA | 0.400 | 3162.00000 | 0.1973 | 1.00 | 10260.0000 | 0.2578 |
| trans-1,3-Dichloropropene | NA | NA | NA | 0.400 | 4463.00000 | 0.4281 | 1.00 | 12893.0000 | 0.5017 |

KEMRON FORMS - Modified 10/13/2006
Version 1.6 PDF File ID: 921092
Report generated 10/30/2007 15:50

Login Number: L0710596

Analytical Method: 8260B

Instrument ID: HPMS11

Initial Calibration Date: 01-OCT-07 15:48

Column ID: F

| Analyte | WG251532-05 | | | WG251532-06 | | | WG251532-07 | | |
|---|---|---|---|---|---|---|---|---|---|
| | CONC | RESP | RF | CONC | RESP | RF | CONC | RESP | RF |
| Trichlorofluoromethane | 2.00 | 47095.0000 | 0.6006 | 5.00 | 130638.000 | 0.6589 | 20.0 | 525028.000 | 0.6293 |
| cis-1,2-Dichloroethene | 2.00 | 21372.0000 | 0.2726 | 5.00 | 54650.0000 | 0.2757 | 20.0 | 233209.000 | 0.2795 |
| cis-1,3-Dichloropropene | 2.00 | 30331.0000 | 0.3868 | 5.00 | 82462.0000 | 0.4159 | 20.0 | 355044.000 | 0.4256 |
| m-,p-Xylene | 4.00 | 70508.0000 | 0.6839 | 10.0 | 177033.000 | 0.6779 | 40.0 | 766250.000 | 0.7005 |
| o-Xylene | 2.00 | 34116.0000 | 0.6619 | 5.00 | 85256.0000 | 0.6529 | 20.0 | 363364.000 | 0.6644 |
| trans-1,2-Dichloroethene | 2.00 | 20908.0000 | 0.2667 | 5.00 | 53357.0000 | 0.2691 | 20.0 | 230105.000 | 0.2758 |
| trans-1,3-Dichloropropene | 2.00 | 28922.0000 | 0.5611 | 5.00 | 76148.0000 | 0.5832 | 20.0 | 322114.000 | 0.5890 |

KEMRON FORMS - Modified 10/13/2006
Version 1.6 PDF File ID: 921092
Report generated 10/30/2007 15:50

Login Number: L0710596
Analytical Method: 8260B

Instrument ID: HPMS11
Initial Calibration Date: 01-OCT-07 15:48
Column ID: F

| Analyte | WG251532-08 | | | WG251532-09 | | | WG251532-10 | | |
|---|---|---|---|---|---|---|---|---|---|
| | CONC | RESP | RF | CONC | RESP | RF | CONC | RESP | RF |
| Trichlorofluoromethane | 50.0 | 1288293.00 | 0.6036 | 100 | 2623720.00 | 0.5952 | 200 | 4987810.00 | 0.5673 |
| cis-1,2-Dichloroethene | 50.0 | 598151.000 | 0.2802 | 100 | 1235747.00 | 0.2803 | 200 | 2413546.00 | 0.2745 |
| cis-1,3-Dichloropropene | 50.0 | 929595.000 | 0.4355 | 100 | 1935212.00 | 0.4390 | 200 | 3726097.00 | 0.4238 |
| m-,p-Xylene | 100 | 2029456.00 | 0.7124 | 200 | 4227699.00 | 0.7254 | 400 | 8126794.00 | 0.6884 |
| o-Xylene | 50.0 | 962946.000 | 0.6760 | 100 | 2001020.00 | 0.6867 | 200 | 3979858.00 | 0.6742 |
| trans-1,2-Dichloroethene | 50.0 | 585527.000 | 0.2743 | 100 | 1203115.00 | 0.2729 | 200 | 2348922.00 | 0.2672 |
| trans-1,3-Dichloropropene | 50.0 | 861380.000 | 0.6047 | 100 | 1775450.00 | 0.6093 | 200 | 3349096.00 | 0.5674 |

KEMRON FORMS - Modified 10/13/2006
Version 1.6 PDF File ID: 921092
Report generated 10/30/2007 15:50

# ALTERNATE SOURCE CALIBRATION REPORT



Login Number: L0710596 | Run Date: 10/18/2007 | Sample ID: WG253187-12
Instrument ID: HPMS10 | Run Time: 18:23 | Method: 8260B
File ID: 10M59732 | Analvst: MES | QC Key: STD
ICal Workgroup: WG253187 | Cal ID: HPMS10 - 18-OCT-07

| Analyte | | Expected | Found | Units | RF | %D | UCL | Q |
|---|---|---|---|---|---|---|---|---|
| 1,1-Dichloroethene | CCC | 20.0 | 20.4 | ug/L | 0.324 | 1.90 | 30 | |
| 1,2-Dichloropropane | CCC | 20.0 | 21.3 | ug/L | 0.301 | 6.30 | 30 | |
| Chloroform | CCC | 20.0 | 21.0 | ug/L | 0.711 | 5.10 | 30 | |
| Ethylbenzene | CCC | 20.0 | 21.7 | ug/L | 0.601 | 8.60 | 30 | |
| Toluene | CCC | 20.0 | 22.3 | ug/L | 1.67 | 11.6 | 30 | |
| Vinyl Chloride | CCC | 20.0 | 21.2 | ug/L | 0.282 | 5.80 | 30 | |
| 1,1,2,2-Tetrachloroethane | SPCC | 20.0 | 19.9 | ug/L | 0.404 | 0.600 | 30 | |
| 1,1-Dichloroethane | SPCC | 20.0 | 20.6 | ug/L | 0.654 | 3.10 | 30 | |
| Bromoform | SPCC | 20.0 | 19.4 | ug/L | 0.199 | 3.10 | 30 | |
| Chlorobenzene | SPCC | 20.0 | 20.2 | ug/L | 1.10 | 1.20 | 30 | |
| Chloromethane | SPCC | 20.0 | 21.3 | ug/L | 0.369 | 6.30 | 30 | |
| 1,1,1-Trichloroethane | | 20.0 | 21.6 | ug/L | 0.720 | 7.90 | 30 | |
| 1,1,2-Trichloro-1,2,2-Trifluoroethane | | 20.0 | 20.4 | ug/L | 0.401 | 2.10 | 30 | |
| 1,1,2-Trichloroethane | | 20.0 | 20.0 | ug/L | 0.250 | 0.100 | 30 | |
| 1,2,4-Trichlorobenzene | | 20.0 | 20.9 | ug/L | 0.925 | 4.60 | 30 | |
| 1,2-Dibromo-3-Chloropropane | | 20.0 | 18.4 | ug/L | 0.0698 | 8.00 | 30 | |
| 1,2-Dibromoethane | | 20.0 | 20.6 | ug/L | 0.246 | 3.00 | 30 | |
| 1,2-Dichlorobenzene | | 20.0 | 21.0 | ug/L | 1.43 | 4.80 | 30 | |
| 1,2-Dichloroethane | | 20.0 | 19.9 | ug/L | 0.502 | 0.300 | 30 | |
| cis-1,2-Dichloroethene | | 20.0 | 22.2 | ug/L | 0.371 | 10.9 | 30 | |
| trans-1,2-Dichloroethene | | 20.0 | 22.0 | ug/L | 0.356 | 9.80 | 30 | |
| 1,3-Dichlorobenzene | | 20.0 | 20.9 | ug/L | 1.70 | 4.50 | 30 | |
| 1,4-Dichlorobenzene | | 20.0 | 19.7 | ug/L | 1.68 | 1.70 | 30 | |
| 2-Butanone | | 20.0 | 16.7 | ug/L | 0.0566 | 16.7 | 30 | |
| 2-Hexanone | | 20.0 | 17.1 | ug/L | 0.0926 | 14.3 | 30 | |
| 4-Methyl-2-Pentanone | | 20.0 | 17.8 | ug/L | 0.0445 | 10.8 | 30 | |
| Acetone | | 20.0 | 19.4 | ug/L | 0.0547 | 3.20 | 30 | |
| Benzene | | 20.0 | 20.2 | ug/L | 1.28 | 1.10 | 30 | |
| Bromodichloromethane | | 20.0 | 20.9 | ug/L | 0.486 | 4.40 | 30 | |
| Bromomethane | | 20.0 | 24.8 | ug/L | 0.289 | 23.9 | 30 | |
| Carbon Disulfide | | 20.0 | 19.2 | ug/L | 0.918 | 3.90 | 30 | |
| Carbon Tetrachloride | | 20.0 | 21.5 | ug/L | 0.662 | 7.30 | 30 | |
| Chloroethane | | 20.0 | 22.2 | ug/L | 0.260 | 11.2 | 30 | |
| cis-1,3-Dichloropropene | | 20.0 | 22.3 | ug/L | 0.484 | 11.3 | 30 | |
| Cyclohexane | | 20.0 | 21.3 | ug/L | 0.547 | 6.60 | 30 | |
| Dibromochloromethane | | 20.0 | 20.9 | ug/L | 0.362 | 4.40 | 30 | |
| Dichlorodifluoromethane | | 20.0 | 25.0 | ug/L | 0.706 | 25.2 | 30 | |
| Isopropylbenzene | | 20.0 | 18.4 | ug/L | 1.68 | 7.90 | 30 | |
| Methyl acetate | | 20.0 | 19.2 | ug/L | 0.127 | 4.10 | 30 | |
| Methyl Tert Butyl Ether | | 20.0 | 23.6 | ug/L | 0.732 | 18.0 | 30 | |
| Methylcyclohexane | | 20.0 | 21.1 | ug/L | 0.517 | 5.60 | 30 | |
| Methylene Chloride | | 20.0 | 20.6 | ug/L | 0.341 | 3.00 | 30 | |

KEMRON FORMS - Modified 09/06/2007 - (ALT)
Version 1.5 PDF File ID: 921093
Report generated 10/30/2007 15:50

Login Number: L0710596 | Run Date: 10/18/2007 | Sample ID: WG253187-12
Instrument ID: HPMS10 | Run Time: 18:23 | Method: 8260B
File ID: 10M59732 | Analvst: MES | QC Key: STD
ICal Workgroup: WG253187 | Cal ID: HPMS10 - 18-OCT-07

| Analyte | | Expected | Found | Units | RF | %D | UCL | Q |
|---|---|---|---|---|---|---|---|---|
| Styrene | | 20.0 | 19.9 | ug/L | 1.12 | 0.300 | 30 | |
| Tetrachloroethene | | 20.0 | 21.2 | ug/L | 0.390 | 5.90 | 30 | |
| trans-1,3-Dichloropropene | | 20.0 | 20.2 | ug/L | 0.508 | 0.900 | 30 | |
| Trichloroethene | | 20.0 | 22.1 | ug/L | 0.375 | 10.4 | 30 | |
| Trichlorofluoromethane | | 20.0 | 17.1 | ug/L | 0.742 | 14.5 | 30 | |
| Xylenes | | 60.0 | 66.7 | ug/L | 0.709 | 11.2 | 30 | |
| m-,p-Xylene | | 40.0 | 44.2 | ug/L | 0.733 | 10.6 | 30 | |
| o-Xylene | | 20.0 | 22.4 | ug/L | 0.684 | 12.2 | 30 | |
| 1,2-Dichloroethene | | 40.0 | 44.1 | ug/L | 0.364 | 10.3 | 30 | |

* Exceeds %D Limit

CCC Calibration Check Compounds
SPCC System Performance Check Compounds

KEMRON FORMS - Modified 09/06/2007 - (ALT)
Version 1.5 PDF File ID: 921093
Report generated 10/30/2007 15:50

Login Number: L0710596 | Run Date: 10/01/2007 | Sample ID: WG251532-11
Instrument ID: HPMS11 | Run Time: 20:02 | Method: 8260B
File ID: 11M46067 | Analyst: MES | QC Key: STD
ICal Workgroup: WG251532 | Cal ID: HPMS11 - 01-OCT-07

| Analyte | | Expected | Found | Units | RF | %D | UCL | Q |
|---|---|---|---|---|---|---|---|---|
| 1,1-Dichloroethene | CCC | 20.0 | 19.5 | ug/L | 0.624 | 2.60 | 30 | |
| 1,2-Dichloropropane | CCC | 20.0 | 21.3 | ug/L | 0.314 | 6.60 | 30 | |
| Chloroform | CCC | 20.0 | 20.9 | ug/L | 0.567 | 4.30 | 30 | |
| Ethylbenzene | CCC | 20.0 | 22.1 | ug/L | 0.582 | 10.4 | 30 | |
| Toluene | CCC | 20.0 | 21.7 | ug/L | 1.65 | 8.50 | 30 | |
| Vinyl Chloride | CCC | 20.0 | 19.9 | ug/L | 0.369 | 0.500 | 30 | |
| 1,1,2,2-Tetrachloroethane | SPCC | 20.0 | 20.8 | ug/L | 0.481 | 3.90 | 30 | |
| 1,1-Dichloroethane | SPCC | 20.0 | 20.9 | ug/L | 0.672 | 4.70 | 30 | |
| Bromoform | SPCC | 20.0 | 19.5 | ug/L | 0.155 | 2.60 | 30 | |
| Chlorobenzene | SPCC | 20.0 | 20.9 | ug/L | 1.03 | 4.30 | 30 | |
| Chloromethane | SPCC | 20.0 | 20.1 | ug/L | 0.450 | 0.700 | 30 | |
| 1,1,1-Trichloroethane | | 20.0 | 20.7 | ug/L | 0.539 | 3.50 | 30 | |
| 1,1,2-Trichloro-1,2,2-Trifluoroethane | | 20.0 | 19.8 | ug/L | 0.249 | 1.00 | 30 | |
| 1,1,2-Trichloroethane | | 20.0 | 22.1 | ug/L | 0.253 | 10.6 | 30 | |
| 1,2,4-Trichlorobenzene | | 20.0 | 21.1 | ug/L | 0.869 | 5.60 | 30 | |
| 1,2-Dibromo-3-Chloropropane | | 20.0 | 19.0 | ug/L | 0.0928 | 5.00 | 30 | |
| 1,2-Dibromoethane | | 20.0 | 20.7 | ug/L | 0.235 | 3.70 | 30 | |
| 1,2-Dichlorobenzene | | 20.0 | 20.8 | ug/L | 1.26 | 4.00 | 30 | |
| 1,2-Dichloroethane | | 20.0 | 19.7 | ug/L | 0.492 | 1.60 | 30 | |
| cis-1,2-Dichloroethene | | 20.0 | 21.9 | ug/L | 0.286 | 9.50 | 30 | |
| trans-1,2-Dichloroethene | | 20.0 | 20.7 | ug/L | 0.269 | 3.50 | 30 | |
| 1,3-Dichlorobenzene | | 20.0 | 21.5 | ug/L | 1.48 | 7.70 | 30 | |
| 1,4-Dichlorobenzene | | 20.0 | 21.1 | ug/L | 1.48 | 5.70 | 30 | |
| 2-Butanone | | 20.0 | 19.4 | ug/L | 0.0639 | 3.00 | 30 | |
| 2-Hexanone | | 20.0 | 18.8 | ug/L | 0.146 | 6.20 | 30 | |
| 4-Methyl-2-Pentanone | | 20.0 | 19.4 | ug/L | 0.0631 | 3.00 | 30 | |
| Acetone | | 20.0 | 20.2 | ug/L | 0.0504 | 0.800 | 30 | |
| Benzene | | 20.0 | 21.2 | ug/L | 1.06 | 6.20 | 30 | |
| Bromodichloromethane | | 20.0 | 21.2 | ug/L | 0.405 | 5.90 | 30 | |
| Bromomethane | | 20.0 | 24.7 | ug/L | 0.216 | 23.4 | 30 | |
| Carbon Disulfide | | 20.0 | 19.2 | ug/L | 0.748 | 4.00 | 30 | |
| Carbon Tetrachloride | | 20.0 | 18.5 | ug/L | 0.422 | 7.50 | 30 | |
| Chloroethane | | 20.0 | 22.3 | ug/L | 0.275 | 11.3 | 30 | |
| cis-1,3-Dichloropropene | | 20.0 | 21.4 | ug/L | 0.428 | 7.20 | 30 | |
| Cyclohexane | | 20.0 | 19.8 | ug/L | 0.590 | 1.10 | 30 | |
| Dibromochloromethane | | 20.0 | 21.3 | ug/L | 0.321 | 6.70 | 30 | |
| Dichlorodifluoromethane | | 20.0 | 21.5 | ug/L | 0.527 | 7.30 | 30 | |
| Isopropylbenzene | | 20.0 | 18.2 | ug/L | 1.64 | 8.90 | 30 | |
| Methyl acetate | | 20.0 | 26.2 | ug/L | 0.168 | 31.2 | 30 | * |
| Methyl Tert Butyl Ether | | 20.0 | 21.2 | ug/L | 0.647 | 6.20 | 30 | |
| Methylcyclohexane | | 20.0 | 20.0 | ug/L | 0.381 | 0 | 30 | |
| Methylene Chloride | | 20.0 | 20.3 | ug/L | 0.279 | 1.50 | 30 | |

KEMRON FORMS - Modified 09/06/2007 - (ALT)
Version 1.5 PDF File ID: 921093
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# KEMRON Environmental Services

## ALTERNATE SOURCE CALIBRATION REPORT

Login Number: L0710596
Run Date: 10/01/2007
Sample ID: WG251532-11
Instrument ID: HPMS11
Run Time: 20:02
Method: 8260B
File ID: 11M46067
Analvst: MES
QC Key: STD
ICal Workgroup: WG251532
Cal ID: HPMS11 - 01-OCT-07

| Analyte | | Expected | Found | Units | RF | %D | UCL | Q |
|---|---|---|---|---|---|---|---|---|
| Styrene | | 20.0 | 20.3 | ug/L | 1.15 | 1.50 | 30 | |
| Tetrachloroethene | | 20.0 | 19.9 | ug/L | 0.288 | 0.300 | 30 | |
| trans-1,3-Dichloropropene | | 20.0 | 19.8 | ug/L | 0.551 | 0.900 | 30 | |
| Trichloroethene | | 20.0 | 21.5 | ug/L | 0.250 | 7.60 | 30 | |
| Trichlorofluoromethane | | 20.0 | 15.8 | ug/L | 0.488 | 21.1 | 30 | |
| Xylenes | | 60.0 | 64.5 | ug/L | 0.699 | 7.40 | 30 | |
| o-Xylene | | 20.0 | 21.2 | ug/L | 0.677 | 6.20 | 30 | |
| m-,p-Xylene | | 40.0 | 43.2 | ug/L | 0.720 | 8.00 | 30 | |
| 1,2-Dichloroethene | | 40.0 | 42.6 | ug/L | 0.278 | 6.50 | 30 | |

* Exceeds %D Limit

CCC Calibration Check Compounds
SPCC System Performance Check Compounds

KEMRON FORMS - Modified 09/06/2007 - (ALT)
Version 1.5 PDF File ID: 921093
Report generated 10/30/2007 15:50

CONTINUING CALIBRATION VERIFICATION (CCV)



Login Number: L0710596 | Run Date: 10/25/2007 | Sample ID: WG253793-02
Instrument ID: HPMS10 | Run Time: 08:27 | Method: 8260B
File ID: 10M59851 | Analyst: MES | QC Key: STD
Workgroup (AAB#): WG253794 | Cal ID: HPMS10 - 18-OCT-07

| Analyte | | Expected | Found | UNITS | RF | %D | UCL | Q |
|---|---|---|---|---|---|---|---|---|
| 1,1-Dichloroethene | CCC | 50.0 | 52.1 | ug/L | 0.332 | 4.24 | 20 | |
| 1,2-Dichloropropane | CCC | 50.0 | 53.0 | ug/L | 0.300 | 5.92 | 20 | |
| Chloroform | CCC | 50.0 | 52.4 | ug/L | 0.709 | 4.84 | 20 | |
| Ethylbenzene | CCC | 50.0 | 51.6 | ug/L | 0.572 | 3.26 | 20 | |
| Toluene | CCC | 50.0 | 53.3 | ug/L | 1.60 | 6.62 | 20 | |
| Vinyl Chloride | CCC | 50.0 | 47.1 | ug/L | 0.251 | 5.76 | 20 | |
| 1,1,2,2-Tetrachloroethane | SPCC | 50.0 | 48.8 | ug/L | 0.397 | 2.48 | 40 | |
| 1,1-Dichloroethane | SPCC | 50.0 | 51.9 | ug/L | 0.658 | 3.79 | 40 | |
| Bromoform | SPCC | 50.0 | 51.3 | ug/L | 0.211 | 2.54 | 40 | |
| Chlorobenzene | SPCC | 50.0 | 48.4 | ug/L | 1.05 | 3.11 | 40 | |
| Chloromethane | SPCC | 50.0 | 45.2 | ug/L | 0.314 | 9.54 | 40 | |
| 1,1,1-Trichloroethane | | 50.0 | 52.9 | ug/L | 0.707 | 5.87 | 40 | |
| 1,1,2-Trichloro-1,2,2-Trifluoroethane | | 50.0 | 51.9 | ug/L | 0.407 | 3.78 | 40 | |
| 1,1,2-Trichloroethane | | 50.0 | 49.1 | ug/L | 0.245 | 1.88 | 40 | |
| 1,2,4-Trichlorobenzene | | 50.0 | 50.5 | ug/L | 0.892 | 0.955 | 40 | |
| 1,2-Dibromo-3-Chloropropane | | 50.0 | 46.8 | ug/L | 0.0709 | 6.45 | 40 | |
| 1,2-Dibromoethane | | 50.0 | 52.6 | ug/L | 0.251 | 5.11 | 40 | |
| 1,2-Dichlorobenzene | | 50.0 | 50.1 | ug/L | 1.37 | 0.176 | 40 | |
| 1,2-Dichloroethane | | 50.0 | 49.7 | ug/L | 0.501 | 0.543 | 40 | |
| cis-1,2-Dichloroethene | | 50.0 | 55.8 | ug/L | 0.374 | 11.6 | 40 | |
| trans-1,2-Dichloroethene | | 50.0 | 55.9 | ug/L | 0.363 | 11.8 | 40 | |
| 1,3-Dichlorobenzene | | 50.0 | 49.5 | ug/L | 1.61 | 0.962 | 40 | |
| 1,4-Dichlorobenzene | | 50.0 | 47.5 | ug/L | 1.62 | 4.99 | 40 | |
| 2-Butanone | | 50.0 | 45.1 | ug/L | 0.0612 | 9.87 | 40 | |
| 2-Hexanone | | 50.0 | 47.1 | ug/L | 0.102 | 5.82 | 40 | |
| 4-Methyl-2-Pentanone | | 50.0 | 49.9 | ug/L | 0.0499 | 0.121 | 40 | |
| Acetone | | 50.0 | 44.5 | ug/L | 0.0503 | 10.9 | 40 | |
| Benzene | | 50.0 | 53.1 | ug/L | 1.34 | 6.12 | 40 | |
| Bromodichloromethane | | 50.0 | 52.4 | ug/L | 0.488 | 4.77 | 40 | |
| Bromomethane | | 50.0 | 54.8 | ug/L | 0.256 | 9.68 | 40 | |
| Carbon Disulfide | | 50.0 | 52.4 | ug/L | 1.00 | 4.81 | 40 | |
| Carbon Tetrachloride | | 50.0 | 53.2 | ug/L | 0.656 | 6.30 | 40 | |
| Chloroethane | | 50.0 | 52.9 | ug/L | 0.247 | 5.90 | 40 | |
| cis-1,3-Dichloropropene | | 50.0 | 57.6 | ug/L | 0.501 | 15.2 | 40 | |
| Cyclohexane | | 50.0 | 55.9 | ug/L | 0.574 | 11.9 | 40 | |
| Dibromochloromethane | | 50.0 | 52.8 | ug/L | 0.366 | 5.51 | 40 | |
| Dichlorodifluoromethane | | 50.0 | 50.3 | ug/L | 0.568 | 0.629 | 40 | |
| Isopropylbenzene | | 50.0 | 48.8 | ug/L | 1.77 | 2.37 | 40 | |
| Methyl acetate | | 50.0 | 58.5 | ug/L | 0.155 | 17.0 | 40 | |
| Methyl Tert Butyl Ether | | 50.0 | 55.7 | ug/L | 0.690 | 11.3 | 40 | |
| Methylcyclohexane | | 50.0 | 54.9 | ug/L | 0.538 | 9.88 | 40 | |
| Methylene Chloride | | 50.0 | 51.4 | ug/L | 0.323 | 2.73 | 40 | |

KEMRON FORMS - Modified 09/06/2007 - (CCV)
Version 1.5 PDF File ID: 921095
Report generated 10/30/2007 15:50

CONTINUING CALIBRATION VERIFICATION (CCV)



Login Number: L0710596
Run Date: 10/25/2007
Sample ID: WG253793-02
Instrument ID: HPMS10
Run Time: 08:27
Method: 8260B
File ID: 10M59851
Analyst: MES
QC Key: STD
Workgroup (AAB#): WG253794
Cal ID: HPMS10 - 18-OCT-07

| Analyte | | Expected | Found | UNITS | RF | %D | UCL | Q |
|---|---|---|---|---|---|---|---|---|
| Styrene | | 50.0 | 49.1 | ug/L | 1.11 | 1.72 | 40 | |
| Tetrachloroethene | | 50.0 | 51.3 | ug/L | 0.378 | 2.61 | 40 | |
| trans-1,3-Dichloropropene | | 50.0 | 53.8 | ug/L | 0.542 | 7.53 | 40 | |
| Trichloroethene | | 50.0 | 55.5 | ug/L | 0.377 | 11.0 | 40 | |
| Trichlorofluoromethane | | 50.0 | 50.4 | ug/L | 0.848 | 0.734 | 40 | |
| Xylenes | | 150 | 163 | ug/L | 0.695 | 8.80 | 40 | |
| 1,2-Dichloroethene | | 100 | 112 | ug/L | 0.368 | 11.7 | 40 | |
| m-,p-Xylene | | 100 | 108 | ug/L | 0.713 | 7.64 | 40 | |
| o-Xylene | | 50.0 | 55.6 | ug/L | 0.678 | 11.1 | 40 | |

* Exceeds %D Criteria

CCC Calibration Check Compounds
SPCC System Performance Check Compounds

KEMRON FORMS - Modified 09/06/2007 - (CCV)
Version 1.5 PDF File ID: 921095
Report generated 10/30/2007 15:50

CONTINUING CALIBRATION VERIFICATION (CCV)

00078713

Login Number: L0710596 Run Date: 10/27/2007 Sample ID: WG254005-02
Instrument ID: HPMS10 Run Time: 09:47 Method: 8260B
File ID: 10M59911 Analyst: MES QC Key: STD
Workgroup (AAB#): WG254006 Cal ID: HPMS10 - 18-OCT-07

| Analyte | | Expected | Found | UNITS | RF | %D | UCL | Q |
|---|---|---|---|---|---|---|---|---|
| 1,1-Dichloroethene | CCC | 50.0 | 49.1 | ug/L | 0.312 | 1.87 | 20 | |
| 1,2-Dichloropropane | CCC | 50.0 | 52.0 | ug/L | 0.294 | 3.91 | 20 | |
| Chloroform | CCC | 50.0 | 51.6 | ug/L | 0.698 | 3.17 | 20 | |
| Ethylbenzene | CCC | 50.0 | 49.0 | ug/L | 0.543 | 1.91 | 20 | |
| Toluene | CCC | 50.0 | 50.7 | ug/L | 1.52 | 1.32 | 20 | |
| Vinyl Chloride | CCC | 50.0 | 49.8 | ug/L | 0.266 | 0.411 | 20 | |
| 1,1,2,2-Tetrachloroethane | SPCC | 50.0 | 48.7 | ug/L | 0.397 | 2.50 | 40 | |
| 1,1-Dichloroethane | SPCC | 50.0 | 50.7 | ug/L | 0.643 | 1.35 | 40 | |
| Bromoform | SPCC | 50.0 | 53.6 | ug/L | 0.221 | 7.12 | 40 | |
| Chlorobenzene | SPCC | 50.0 | 46.2 | ug/L | 1.00 | 7.63 | 40 | |
| Chloromethane | SPCC | 50.0 | 46.4 | ug/L | 0.321 | 7.29 | 40 | |
| 1,1,1-Trichloroethane | | 50.0 | 51.9 | ug/L | 0.693 | 3.74 | 40 | |
| 1,1,2-Trichloro-1,2,2-Trifluoroethane | | 50.0 | 50.8 | ug/L | 0.399 | 1.67 | 40 | |
| 1,1,2-Trichloroethane | | 50.0 | 48.9 | ug/L | 0.244 | 2.16 | 40 | |
| 1,2,4-Trichlorobenzene | | 50.0 | 49.3 | ug/L | 0.872 | 1.31 | 40 | |
| 1,2-Dibromo-3-Chloropropane | | 50.0 | 44.6 | ug/L | 0.0677 | 10.8 | 40 | |
| 1,2-Dibromoethane | | 50.0 | 52.6 | ug/L | 0.251 | 5.21 | 40 | |
| 1,2-Dichlorobenzene | | 50.0 | 48.3 | ug/L | 1.32 | 3.32 | 40 | |
| 1,2-Dichloroethane | | 50.0 | 52.0 | ug/L | 0.523 | 3.90 | 40 | |
| cis-1,2-Dichloroethene | | 50.0 | 54.6 | ug/L | 0.366 | 9.21 | 40 | |
| trans-1,2-Dichloroethene | | 50.0 | 53.5 | ug/L | 0.347 | 6.95 | 40 | |
| 1,3-Dichlorobenzene | | 50.0 | 46.7 | ug/L | 1.52 | 6.62 | 40 | |
| 1,4-Dichlorobenzene | | 50.0 | 45.3 | ug/L | 1.55 | 9.34 | 40 | |
| 2-Butanone | | 50.0 | 43.0 | ug/L | 0.0585 | 13.9 | 40 | |
| 2-Hexanone | | 50.0 | 46.9 | ug/L | 0.101 | 6.20 | 40 | |
| 4-Methyl-2-Pentanone | | 50.0 | 50.6 | ug/L | 0.0506 | 1.21 | 40 | |
| Acetone | | 50.0 | 41.2 | ug/L | 0.0466 | 17.6 | 40 | |
| Benzene | | 50.0 | 50.6 | ug/L | 1.28 | 1.10 | 40 | |
| Bromodichloromethane | | 50.0 | 53.2 | ug/L | 0.495 | 6.33 | 40 | |
| Bromomethane | | 50.0 | 53.4 | ug/L | 0.249 | 6.88 | 40 | |
| Carbon Disulfide | | 50.0 | 48.2 | ug/L | 0.920 | 3.67 | 40 | |
| Carbon Tetrachloride | | 50.0 | 51.8 | ug/L | 0.639 | 3.63 | 40 | |
| Chloroethane | | 50.0 | 52.6 | ug/L | 0.246 | 5.25 | 40 | |
| cis-1,3-Dichloropropene | | 50.0 | 57.7 | ug/L | 0.502 | 15.4 | 40 | |
| Cyclohexane | | 50.0 | 52.1 | ug/L | 0.535 | 4.28 | 40 | |
| Dibromochloromethane | | 50.0 | 53.3 | ug/L | 0.370 | 6.66 | 40 | |
| Dichlorodifluoromethane | | 50.0 | 52.1 | ug/L | 0.588 | 4.13 | 40 | |
| Isopropylbenzene | | 50.0 | 46.5 | ug/L | 1.69 | 6.99 | 40 | |
| Methyl acetate | | 50.0 | 61.1 | ug/L | 0.162 | 22.2 | 40 | |
| Methyl Tert Butyl Ether | | 50.0 | 58.0 | ug/L | 0.719 | 16.0 | 40 | |
| Methylcyclohexane | | 50.0 | 51.3 | ug/L | 0.502 | 2.54 | 40 | |
| Methylene Chloride | | 50.0 | 51.5 | ug/L | 0.324 | 2.98 | 40 | |

KEMRON FORMS - Modified 09/06/2007 - (CCV)
Version 1.5 PDF File ID: 921095
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CONTINUING CALIBRATION VERIFICATION (CCV)

00078714

Login Number: L0710596
Run Date: 10/27/2007
Sample ID: WG254005-02
Instrument ID: HPMS10
Run Time: 09:47
Method: 8260B
File ID: 10M59911
Analyst: MES
QC Key: STD
Workgroup (AAB#): WG254006
Cal ID: HPMS10 - 18-OCT-07

| Analyte | | Expected | Found | UNITS | RF | %D | UCL | Q |
|---|---|---|---|---|---|---|---|---|
| Styrene | | 50.0 | 47.8 | ug/L | 1.08 | 4.42 | 40 | |
| Tetrachloroethene | | 50.0 | 48.2 | ug/L | 0.356 | 3.58 | 40 | |
| trans-1,3-Dichloropropene | | 50.0 | 53.9 | ug/L | 0.543 | 7.85 | 40 | |
| Trichloroethene | | 50.0 | 52.1 | ug/L | 0.354 | 4.25 | 40 | |
| Trichlorofluoromethane | | 50.0 | 50.8 | ug/L | 0.856 | 1.69 | 40 | |
| Xylenes | | 150 | 155 | ug/L | 0.663 | 3.26 | 40 | |
| 1,2-Dichloroethene | | 100 | 108 | ug/L | 0.356 | 8.08 | 40 | |
| m-,p-Xylene | | 100 | 101 | ug/L | 0.670 | 1.15 | 40 | |
| o-Xylene | | 50.0 | 53.7 | ug/L | 0.655 | 7.47 | 40 | |

* Exceeds %D Criteria

CCC Calibration Check Compounds
SPCC System Performance Check Compounds

KEMRON FORMS - Modified 09/06/2007 - (CCV)
Version 1.5 PDF File ID: 921095
Report generated 10/30/2007 15:50

CONTINUING CALIBRATION VERIFICATION (CCV)

00078715

Login Number: L0710596 | Run Date: 10/24/2007 | Sample ID: WG253676-02
Instrument ID: HPMS11 | Run Time: 09:42 | Method: 8260B
File ID: 11M46851 | Analyst: MES | QC Key: STD
Workgroup (AAB#): WG253678 | Cal ID: HPMS11 - 01-OCT-07

| Analyte | | Expected | Found | UNITS | RF | %D | UCL | Q |
|---|---|---|---|---|---|---|---|---|
| 1,1-Dichloroethene | CCC | 50.0 | 51.0 | ug/L | 0.650 | 2.01 | 20 | |
| 1,2-Dichloropropane | CCC | 50.0 | 50.7 | ug/L | 0.299 | 1.43 | 20 | |
| Chloroform | CCC | 50.0 | 52.5 | ug/L | 0.571 | 5.02 | 20 | |
| Ethylbenzene | CCC | 50.0 | 50.5 | ug/L | 0.532 | 0.980 | 20 | |
| Toluene | CCC | 50.0 | 50.1 | ug/L | 1.52 | 0.222 | 20 | |
| Vinyl Chloride | CCC | 50.0 | 54.2 | ug/L | 0.384 | 8.46 | 20 | |
| 1,1,2,2-Tetrachloroethane | SPCC | 50.0 | 47.2 | ug/L | 0.437 | 5.63 | 40 | |
| 1,1-Dichloroethane | SPCC | 50.0 | 52.8 | ug/L | 0.677 | 5.55 | 40 | |
| Bromoform | SPCC | 50.0 | 50.2 | ug/L | 0.160 | 0.456 | 40 | |
| Chlorobenzene | SPCC | 50.0 | 47.4 | ug/L | 0.937 | 5.11 | 40 | |
| Chloromethane | SPCC | 50.0 | 52.5 | ug/L | 0.469 | 5.04 | 40 | |
| 1,1,1-Trichloroethane | | 50.0 | 53.4 | ug/L | 0.556 | 6.87 | 40 | |
| 1,1,2-Trichloro-1,2,2-Trifluoroethane | | 50.0 | 58.4 | ug/L | 0.294 | 16.9 | 40 | |
| 1,1,2-Trichloroethane | | 50.0 | 49.8 | ug/L | 0.228 | 0.323 | 40 | |
| 1,2,4-Trichlorobenzene | | 50.0 | 50.7 | ug/L | 0.834 | 1.33 | 40 | |
| 1,2-Dibromo-3-Chloropropane | | 50.0 | 47.5 | ug/L | 0.0928 | 5.00 | 40 | |
| 1,2-Dibromoethane | | 50.0 | 49.3 | ug/L | 0.224 | 1.32 | 40 | |
| 1,2-Dichlorobenzene | | 50.0 | 48.8 | ug/L | 1.18 | 2.38 | 40 | |
| 1,2-Dichloroethane | | 50.0 | 49.3 | ug/L | 0.494 | 1.32 | 40 | |
| cis-1,2-Dichloroethene | | 50.0 | 52.8 | ug/L | 0.276 | 5.65 | 40 | |
| trans-1,2-Dichloroethene | | 50.0 | 52.9 | ug/L | 0.275 | 5.85 | 40 | |
| 1,3-Dichlorobenzene | | 50.0 | 49.8 | ug/L | 1.37 | 0.352 | 40 | |
| 1,4-Dichlorobenzene | | 50.0 | 49.3 | ug/L | 1.38 | 1.48 | 40 | |
| 2-Butanone | | 50.0 | 47.6 | ug/L | 0.0627 | 4.73 | 40 | |
| 2-Hexanone | | 50.0 | 47.3 | ug/L | 0.147 | 5.33 | 40 | |
| 4-Methyl-2-Pentanone | | 50.0 | 47.1 | ug/L | 0.0614 | 5.73 | 40 | |
| Acetone | | 50.0 | 48.3 | ug/L | 0.0483 | 3.36 | 40 | |
| Benzene | | 50.0 | 51.0 | ug/L | 1.02 | 1.98 | 40 | |
| Bromodichloromethane | | 50.0 | 52.0 | ug/L | 0.397 | 3.99 | 40 | |
| Bromomethane | | 50.0 | 59.1 | ug/L | 0.207 | 18.1 | 40 | |
| Carbon Disulfide | | 50.0 | 53.5 | ug/L | 0.834 | 7.02 | 40 | |
| Carbon Tetrachloride | | 50.0 | 49.4 | ug/L | 0.446 | 1.13 | 40 | |
| Chloroethane | | 50.0 | 56.4 | ug/L | 0.279 | 12.9 | 40 | |
| cis-1,3-Dichloropropene | | 50.0 | 51.3 | ug/L | 0.410 | 2.70 | 40 | |
| Cyclohexane | | 50.0 | 54.3 | ug/L | 0.647 | 8.57 | 40 | |
| Dibromochloromethane | | 50.0 | 51.9 | ug/L | 0.313 | 3.76 | 40 | |
| Dichlorodifluoromethane | | 50.0 | 51.0 | ug/L | 0.501 | 1.98 | 40 | |
| Isopropylbenzene | | 50.0 | 46.5 | ug/L | 1.69 | 6.99 | 40 | |
| Methyl acetate | | 50.0 | 59.4 | ug/L | 0.152 | 18.8 | 40 | |
| Methyl Tert Butyl Ether | | 50.0 | 50.6 | ug/L | 0.617 | 1.24 | 40 | |
| Methylcyclohexane | | 50.0 | 54.1 | ug/L | 0.412 | 8.28 | 40 | |
| Methylene Chloride | | 50.0 | 49.1 | ug/L | 0.261 | 1.86 | 40 | |

KEMRON FORMS - Modified 09/06/2007 - (CCV)
Version 1.5 PDF File ID: 921095
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# CONTINUING CALIBRATION VERIFICATION (CCV)

00078716

Login Number: L0710596
Run Date: 10/24/2007
Sample ID: WG253676-02
Instrument ID: HPMS11
Run Time: 09:42
Method: 8260B
File ID: 11M46851
Analyst: MES
QC Key: STD
Workgroup (AAB#): WG253678
Cal ID: HPMS11 - 01-OCT-07

| Analyte | | Expected | Found | UNITS | RF | %D | UCL | Q |
|---|---|---|---|---|---|---|---|---|
| Styrene | | 50.0 | 46.3 | ug/L | 1.06 | 7.38 | 40 | |
| Tetrachloroethene | | 50.0 | 46.8 | ug/L | 0.269 | 6.45 | 40 | |
| trans-1,3-Dichloropropene | | 50.0 | 50.7 | ug/L | 0.563 | 1.31 | 40 | |
| Trichloroethene | | 50.0 | 51.7 | ug/L | 0.241 | 3.38 | 40 | |
| Trichlorofluoromethane | | 50.0 | 54.5 | ug/L | 0.661 | 8.91 | 40 | |
| Xylenes | | 150 | 150 | ug/L | 0.651 | 0.0155 | 40 | |
| 1,2-Dichloroethene | | 100 | 106 | ug/L | 0.276 | 5.75 | 40 | |
| m-,p-Xylene | | 100 | 100 | ug/L | 0.669 | 0.265 | 40 | |
| o-Xylene | | 50.0 | 49.7 | ug/L | 0.634 | 0.577 | 40 | |

* Exceeds %D Criteria

CCC Calibration Check Compounds
SPCC System Performance Check Compounds

KEMRON FORMS - Modified 09/06/2007 - (CCV)
Version 1.5 PDF File ID: 921095
Report generated 10/30/2007 15:50

# KEMRON ENVIRONMENTAL SERVICES
# INTERNAL STANDARD AREA SUMMARY
# (COMPARED TO CCV)

Login Number: L0710596
Instrument ID: HPMS11
Workgroup (AAB#): WG253678

CCV Number: WG253676-02
CAL ID: HPMS11 - 01-OCT-07
Matrix: WATER

| Sample Number | Dilution | Tag | IS-1 | IS-2 | IS-3 |
|---|---|---|---|---|---|
| WG253676-02 | NA | NA | 367509 | 701985 | 1053473 |
| Upper Limit | NA | NA | 735018 | 1403970 | 2106946 |
| Lower Limit | NA | NA | 183755 | 350993 | 526737 |
| L0710596-01 | 1.00 | 01 | 317248 | 618124 | 926379 |
| L0710596-02 | 1.00 | 01 | 306278 | 603804 | 897293 |
| L0710596-08 | 1.00 | 01 | 284886 | 564007 | 834082 |
| L0710596-09 | 1.00 | 01 | 289842 | 566609 | 839954 |
| L0710596-15 | 1.00 | 01 | 326693 | 633168 | 952321 |
| WG253678-01 | 1.00 | 01 | 341476 | 665863 | 982937 |
| WG253678-02 | 1.00 | 01 | 357133 | 677099 | 998823 |
| WG253678-03 | 1.00 | 01 | 355489 | 672208 | 996951 |
| WG253678-04 | 1.00 | 01 | 271454 | 532147 | 787697 |

IS-1 - 1,4-Dichlorobenzene-d4
IS-2 - Chlorobenzene-d5
IS-3 - Fluorobenzene

Underline = Response outside limits

KEMRON FORMS - Modified 02/20/2007
Version 1.3 PDF File ID: 921096
Report generated 10/30/2007 15:50

# KEMRON ENVIRONMENTAL SERVICES
## INTERNAL STANDARD AREA SUMMARY
## (COMPARED TO CCV)

Login Number: L0710596
Instrument ID: HPMS10
Workgroup (AAB#): WG253794

CCV Number: WG253793-02
CAL ID: HPMS10 - 18-OCT-07
Matrix: WATER

| Sample Number | Dilution | Tag | IS-1 | IS-2 | IS-3 |
|---|---|---|---|---|---|
| WG253793-02 | NA | NA | 413338 | 728620 | 873658 |
| Upper Limit | NA | NA | 826676 | 1457240 | 1747316 |
| Lower Limit | NA | NA | 206669 | 364310 | 436829 |
| L0710596-05 | 1.00 | 01 | 303260 | 547597 | 663618 |
| L0710596-07 | 1.00 | 01 | 305159 | 550987 | 667655 |
| L0710596-10 | 1.00 | 01 | 293671 | 525023 | 633960 |
| WG253794-01 | 1.00 | 01 | 327196 | 585923 | 726288 |
| WG253794-02 | 1.00 | 01 | 385292 | 646316 | 769398 |
| WG253794-03 | 1.00 | 01 | 393152 | 679167 | 813970 |

IS-1 - 1,4-Dichlorobenzene-d4
IS-2 - Chlorobenzene-d5
IS-3 - Fluorobenzene

Underline = Response outside limits

KEMRON FORMS - Modified 02/20/2007
Version 1.3 PDF File ID: 921096
Report generated 10/30/2007 15:50

# KEMRON ENVIRONMENTAL SERVICES
## INTERNAL STANDARD AREA SUMMARY
## (COMPARED TO CCV)

Login Number: L0710596
Instrument ID: HPMS10
Workgroup (AAB#): WG254006

CCV Number: WG254005-02
CAL ID: HPMS10 - 18-OCT-07
Matrix: WATER

| Sample Number | Dilution | Tag | IS-1 | IS-2 | IS-3 |
|---|---|---|---|---|---|
| WG254005-02 | NA | NA | 413238 | 705438 | 829307 |
| Upper Limit | NA | NA | 826476 | 1410876 | 1658614 |
| Lower Limit | NA | NA | 206619 | 352719 | 414654 |
| L0710596-01 | 100 | DL01 | 325884 | 596208 | 727364 |
| L0710596-02 | 10.0 | DL01 | 311882 | 571245 | 687668 |
| L0710596-09 | 20.0 | DL01 | 292113 | 532866 | 652346 |
| L0710596-11 | 1.00 | 02 | 289200 | 516269 | 628595 |
| WG254006-01 | 1.00 | 01 | 342368 | 607071 | 730405 |
| WG254006-02 | 1.00 | 01 | 377408 | 623479 | 725085 |
| WG254006-03 | 1.00 | 01 | 367276 | 622980 | 739807 |

IS-1 - 1,4-Dichlorobenzene-d4
IS-2 - Chlorobenzene-d5
IS-3 - Fluorobenzene

Underline = Response outside limits

KEMRON FORMS - Modified 02/20/2007
Version 1.3 PDF File ID: 921096
Report generated 10/30/2007 15:50

# KEMRON ENVIRONMENTAL SERVICES
## INTERNAL STANDARD RETENTION TIME SUMMARY
## (COMPARED TO CCV)

Login Number: L0710596
Instrument ID: HPMS11
Workgroup (AAB#): WG253678

CCV Number: WG253676-02
CAL ID: HPMS11 - 01-OCT-07
Matrix: WATER

| Sample Number | Dilution | Tag | IS-1 | IS-2 | IS-3 |
|---|---|---|---|---|---|
| WG253676-02 | NA | NA | 16.81 | 14.01 | 10.38 |
| Upper Limit | NA | NA | 17.31 | 14.51 | 10.88 |
| Lower Limit | NA | NA | 16.31 | 13.51 | 9.88 |
| L0710596-01 | 1.00 | 01 | 16.812 | 14.01 | 10.381 |
| L0710596-02 | 1.00 | 01 | 16.812 | 14.01 | 10.381 |
| L0710596-08 | 1.00 | 01 | 16.812 | 14.01 | 10.381 |
| L0710596-09 | 1.00 | 01 | 16.812 | 14.01 | 10.381 |
| L0710596-15 | 1.00 | 01 | 16.812 | 14.01 | 10.381 |
| WG253678-01 | 1.00 | 01 | 16.812 | 14.01 | 10.381 |
| WG253678-02 | 1.00 | 01 | 16.812 | 14.01 | 10.381 |
| WG253678-03 | 1.00 | 01 | 16.812 | 14.01 | 10.381 |
| WG253678-04 | 1.00 | 01 | 16.812 | 14.01 | 10.381 |

IS-1 - 1,4-Dichlorobenzene-d4
IS-2 - Chlorobenzene-d5
IS-3 - Fluorobenzene

Underline = Response outside limits

KEMRON FORMS - Modified 02/20/2007
Version 1.3 PDF File ID: 921098
Report generated 10/30/2007 15:50

KEMRON ENVIRONMENTAL SERVICES
INTERNAL STANDARD RETENTION TIME SUMMARY
(COMPARED TO CCV)

Login Number: L0710596
Instrument ID: HPMS10
Workgroup (AAB#): WG253794

CCV Number: WG253793-02
CAL ID: HPMS10 - 18-OCT-07
Matrix: WATER

| Sample Number | Dilution | Tag | IS-1 | IS-2 | IS-3 |
|---|---|---|---|---|---|
| WG253793-02 | NA | NA | 17.74 | 14.73 | 10.85 |
| Upper Limit | NA | NA | 18.24 | 15.23 | 11.35 |
| Lower Limit | NA | NA | 17.24 | 14.23 | 10.35 |
| L0710596-05 | 1.00 | 01 | 17.74 | 14.73 | 10.85 |
| L0710596-07 | 1.00 | 01 | 17.75 | 14.73 | 10.85 |
| L0710596-10 | 1.00 | 01 | 17.74 | 14.73 | 10.85 |
| WG253794-01 | 1.00 | 01 | 17.74 | 14.73 | 10.85 |
| WG253794-02 | 1.00 | 01 | 17.74 | 14.73 | 10.85 |
| WG253794-03 | 1.00 | 01 | 17.74 | 14.73 | 10.85 |

IS-1 - 1,4-Dichlorobenzene-d4
IS-2 - Chlorobenzene-d5
IS-3 - Fluorobenzene

Underline = Response outside limits

KEMRON FORMS - Modified 02/20/2007
Version 1.3 PDF File ID: 921098
Report generated 10/30/2007 15:50

# KEMRON ENVIRONMENTAL SERVICES
## INTERNAL STANDARD RETENTION TIME SUMMARY
## (COMPARED TO CCV)

Login Number: L0710596
Instrument ID: HPMS10
Workgroup (AAB#): WG254006

CCV Number: WG254005-02
CAL ID: HPMS10 - 18-OCT-07
Matrix: WATER

| Sample Number | Dilution | Tag | IS-1 | IS-2 | IS-3 |
|---|---|---|---|---|---|
| WG254005-02 | NA | NA | 17.74 | 14.73 | 10.85 |
| Upper Limit | NA | NA | 18.24 | 15.23 | 11.35 |
| Lower Limit | NA | NA | 17.24 | 14.23 | 10.35 |
| L0710596-01 | 100 | DL01 | 17.74 | 14.73 | 10.85 |
| L0710596-02 | 10.0 | DL01 | 17.73 | 14.73 | 10.85 |
| L0710596-09 | 20.0 | DL01 | 17.74 | 14.73 | 10.85 |
| L0710596-11 | 1.00 | 02 | 17.73 | 14.73 | 10.85 |
| WG254006-01 | 1.00 | 01 | 17.73 | 14.73 | 10.85 |
| WG254006-02 | 1.00 | 01 | 17.74 | 14.73 | 10.85 |
| WG254006-03 | 1.00 | 01 | 17.73 | 14.73 | 10.85 |

IS-1 - 1,4-Dichlorobenzene-d4
IS-2 - Chlorobenzene-d5
IS-3 - Fluorobenzene

Underline = Response outside limits

KEMRON FORMS - Modified 02/20/2007
Version 1.3 PDF File ID: 921098
Report generated 10/30/2007 15:50

# 2.2 Metals Data

# 2.2.1 Metals I C P Data

# 2.2.1.1 Summary Data

# LABORATORY REPORT

**L0710596**

**11/02/07 10:41**

**Submitted By**

**KEMRON Environmental Services**
**156 Starlite Drive**
**Marietta , OH 45750**
**( 740 ) 373 - 4071**

**For**

Account Name: Shaw E & I, Inc.
ABB Lummus Biulding
3010 Briarpark Drive Suite 4N
Houston, TX 77042
Attention: Larry Duty

Account Number: 2773
Work ID: LHAAD

P.O. Number: 322255 OP

## Sample Analysis Summary

| Client ID | Lab ID | Method | Dilution | Date Received |
|---|---|---|---|---|
| 47WWZZ-101807 | L0710596-12 | 6010B | 1 | 23-OCT-07 |
| 47WWZZ-101807 | L0710596-12 | 6010B | 10 | 23-OCT-07 |
| EQUIPMENT RINSE | L0710596-14 | 6010B | 1 | 23-OCT-07 |

Sample Number: L0710596-12
Client ID: 47WWZZ-101807
Matrix: Water
Workgroup Number: WG254046
Collect Date: 10/18/2007 09:55
Sample Tag: 01

PrePrep Method: NONE
Prep Method: 3005A
Analytical Method: 6010B
Analyst: KHR
Dilution: 1
Units: mg/L

Instrument: PE-ICP2
Prep Date: 10/26/2007 05:30
Cal Date: 10/31/2007 09:29
Run Date: 10/31/2007 18:16
File ID: P2.103107.181650

| Analyte | CAS. Number | Result | Qual | PQL | SDL |
|---|---|---|---|---|---|
| Aluminum, Dissolved | 7429-90-5 | | U | 0.100 | 0.0500 |
| Beryllium, Dissolved | 7440-41-7 | | U | 0.00200 | 0.000500 |
| Calcium, Dissolved | 7440-70-2 | 307 | | 0.200 | 0.100 |
| Cobalt, Dissolved | 7440-48-4 | 0.102 | | 0.00500 | 0.00250 |
| Iron, Dissolved | 7439-89-6 | 16.7 | | 0.100 | 0.0250 |
| Potassium, Dissolved | 7440-09-7 | 5.29 | | 1.00 | 0.250 |
| Magnesium, Dissolved | 7439-95-4 | 192 | | 0.500 | 0.250 |
| Zinc, Dissolved | 7440-66-6 | 0.0127 | J | 0.0200 | 0.00500 |

U Not detected at or above adjusted sample detection limit
J The analyte was positively identified, but the quantitation was below the RL

Sample Number: **L0710596-12**
Client ID: **47WWZZ-101807**
Matrix: **Water**
Workgroup Number: **WG254046**
Collect Date: **10/18/2007 09:55**
Sample Tag: **DL01**

PrePrep Method: **NONE**
Prep Method: **3005A**
Analytical Method: **6010B**
Analyst: **KRV**
Dilution: **10**
Units: **mg/L**

Instrument: **PE-ICP2**
Prep Date: **10/26/2007 05:30**
Cal Date: **11/01/2007 08:36**
Run Date: **11/01/2007 10:04**
File ID: **P2.110107.100455**

| Analyte | CAS. Number | Result | Qual | PQL | SDL |
|---|---|---|---|---|---|
| Sodium, Dissolved | 7440-23-5 | 873 | | 5.00 | 2.50 |
| Vanadium, Dissolved | 7440-62-2 | | U | 0.100 | 0.0500 |

**U Not detected at or above adjusted sample detection limit**

| | | | | | |
|---|---|---|---|---|---|
| Sample Number: | L0710596-14 | PrePrep Method: | NONE | Instrument: | PE-ICP2 |
| Client ID: | EQUIPMENT RINSE | Prep Method: | 3005A | Prep Date: | 10/26/2007 05:30 |
| Matrix: | Water | Analytical Method: | 6010B | Cal Date: | 10/31/2007 09:29 |
| Workgroup Number: | WG254046 | Analyst: | KHR | Run Date: | 10/31/2007 18:22 |
| Collect Date: | 10/22/2007 14:20 | Dilution: | 1 | File ID: | P2.103107.182219 |
| Sample Tag: | 01 | Units: | mg/L | | |

| Analyte | CAS. Number | Result | Qual | PQL | SDL |
|---|---|---|---|---|---|
| Aluminum, Dissolved | 7429-90-5 | | U | 0.100 | 0.0500 |
| Beryllium, Dissolved | 7440-41-7 | | U | 0.00200 | 0.000500 |
| Calcium, Dissolved | 7440-70-2 | 0.332 | | 0.200 | 0.100 |
| Cobalt, Dissolved | 7440-48-4 | | U | 0.00500 | 0.00250 |
| Iron, Dissolved | 7439-89-6 | | U | 0.100 | 0.0250 |
| Potassium, Dissolved | 7440-09-7 | | U | 1.00 | 0.250 |
| Magnesium, Dissolved | 7439-95-4 | | U | 0.500 | 0.250 |
| Sodium, Dissolved | 7440-23-5 | 24.0 | | 0.500 | 0.250 |
| Vanadium, Dissolved | 7440-62-2 | | U | 0.0100 | 0.00500 |
| Zinc, Dissolved | 7440-66-6 | | U | 0.0200 | 0.00500 |

U Not detected at or above adjusted sample detection limit

# 2.2.1.2 QC Summary Data

**Example 6010 Calculations**
**Perkin Elmer Optima 4300 DV**

**1.0 Initial Calibration (ICAL) Parameters**
The system performs linear regression from data consisting of a blank and three standards.

**2.0 Calculating the concentration (C) of an element in water using data from prep log, run log, and quantitation report (note:the data system performs this calculation automatically when correction factors have been entered):**

$$Cx = Cs \times \frac{Vf}{Vi} \times D$$

| Where: | **Example:** |
|---|---|
| $Cs$ = Concentration computed by the data system in ug/mL (ppm) | 0.1 |
| $Vf$ = Final volume (mL) | 50 |
| $Vi$ = Initial volume (mL) | 50 |
| $D$ = Dilution factor as a multiplier (10X = 10) | 1 |
| | |
| $Cx$ = Concentration of element in ug/mL (mg/L) | 0.1 |

**3.0 Calculating the concentration (C) of an element in soil using data from prep log, run log, and quantitation report (note: the data system performs this calculation automatically when correction factors have been entered):**

$$Cx = Cs \times \frac{Vf}{Vi} \times D$$

| Where: | **Example:** |
|---|---|
| $Cs$ = Concentration computed by the data system (mg/L) (ppm) | 0.1 |
| $Vf$ = Final volume (mL) | 50 |
| $Vi$ = Initial weight (g) | 1 |
| $D$ = Dilution factor as a multiplier (10X = 10) | 1 |
| | |
| $Cx$ = Concentration of element in ug/g (mg/kg) | 5 |

**4.0 Adjusting the concentration to dry weight:**

$$Cdry = \frac{Cx \times 100}{Px}$$

| Where: | **Example:** |
|---|---|
| $Cx$ = Concentration calculated as received (wet basis) | 5 |
| $Px$ = Percent solids of sample (%wt) | 80 |
| | |
| $Cdry$ = Concentration calculated as dry weight (mg/kg) | 6.25 |

**Example 6010 Calculations**
**Thermo Scientific IRIS Advantage**

**1.0 Initial Calibration (ICAL) Parameters**
The system performs linear regression from data consisting of a blank and three standards.

**2.0 Calculating the concentration (C) of an element in water using data from prep log, run log, and quantitation report (note:the data system performs this calculation automatically when correction factors have been entered):**

$$Cx = Cs \times \frac{Vf}{Vi} \times D$$

| Where: | **Example:** |
|---|---|
| $Cs$ = Concentration computed by the data system in ug/mL (ppm) | 0.1 |
| $Vf$ = Final volume (mL) | 50 |
| $Vi$ = Initial volume (mL) | 50 |
| $D$ = Dilution factor as a multiplier (10X = 10) | 1 |
| | |
| $Cx$ = Concentration of element in ug/mL (mg/L) | 0.1 |

**3.0 Calculating the concentration (C) of an element in soil using data from prep log, run log, and quantitation report (note: the data system performs this calculation automatically when correction factors have been entered):**

$$Cx = Cs \times \frac{Vf}{Vi} \times D$$

| Where: | **Example:** |
|---|---|
| $Cs$ = Concentration computed by the data system (mg/L) (ppm) | 0.1 |
| $Vf$ = Final volume (mL) | 50 |
| $Vi$ = Initial weight (g) | 1 |
| $D$ = Dilution factor as a multiplier (10X = 10) | 1 |
| | |
| $Cx$ = Concentration of element in ug/g (mg/kg) | 5 |

**4.0 Adjusting the concentration to dry weight:**

$$Cdry = \frac{Cx \times 100}{Px}$$

| Where: | **Example:** |
|---|---|
| $Cx$ = Concentration calculated as received (wet basis) | 5 |
| $Px$ = Percent solids of sample (%wt) | 80 |
| | |
| $Cdry$ = Concentration calculated as dry weight (mg/kg) | 6.25 |

KEMRON ENVIRONMENTAL SERVICES

# Metals Digest Log

**Document Control No.: MP0100 Page 29 of 100**

Analyst(s): pm
Date: 10/26/07
LCS: 5ml 550 22494
MS/MSD: 5ml 550 22494
Witness: N
$HNO_3$ Lot #: CDO 12617
$1:1 HNO_3$: N/A
HCl Lot #: CDO 12634
$H_2O_2$ Lot #: N/A
Earliest Sample Due Date: 10/30/07
Digest Tube Lot #: CDO 12609
Hotblock #: 6
Hotblock Temp - Start: 95.0°C 0530
Hotblock Temp - End: 95.4°C 0930

Box: 09
Digestion Work Group: WG 253902

General Digestion
**ME401 Revision #** 12 - Method 3005A-Water
**ME403 Revision #** ______ - Method 3050B-Soil

Furnace Digestion
**ME402 Revision #** ______ - Method 3020A-Water
**ME403 Revision #** ______ - Method 3050B-Soil

AS/SE Digestion
**ME410 Revision #** ______ - Method 7060/7740-Water

Relinquished By: pm
Digest Received By: Ed Date: 10-26-07

| | KEMRON # | Initial WT/Vol | Final Volume | Comments | Due Date |
|---|---|---|---|---|---|
| 1 | PBW | 50ml | 50ml | 100 filt -02 | |
| 2 | LCW | | | -03 | |
| 3 | 10-~~599~~596-12 | | | | 10/30 |
| 4 | -14 | | | | |
| 5 | 10-648-02 | | | | 10/31 |
| 6 | -04 | | | -01 | |
| 7 | -04MS | | | -04 | |
| 8 | -04MD | | | -05 | |
| 9 | | | | | |
| 10 | | | | | |
| 11 | | | | | |
| 12 | | | | | |
| 13 | | | | | |
| 14 | | | | | |
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| 17 | | | | | |
| 18 | | | | | |
| 19 | | | | | |
| 20 | | | | | |
| 21 | | | | | |
| 22 | | pm 10/26/07 | | | |
| 23 | | | | | |
| 24 | | | | | |
| 25 | | | | | |
| 26 | | | | | |
| 27 | | | | | |
| 28 | | | | | |

Comments: ______

Primary Review: [signature] 10/26/07 Secondary Review: [signature] 10/26/07

**KEMRON Environmental Services**

Instrument Run Log

Instrument: PE-ICP2 Dataset: 103107HR.CSV
Analyst1: KHR Analyst2: N/A
Method: 6010B SOP: ME600E Rev: 6
Maintenance Log ID: 21515

Calibration Std: STD22439 ICV/CCV Std: STD22609 Post Spike: STD22493
ICSA: STD22610 ICSAB: STD22567

Workgroups: 254205, 254206, 254046, 254208, 254193

Comments:

| Seq. | File ID | Sample | ID | Prep | Dil | Reference | Date/Time |
|---|---|---|---|---|---|---|---|
| 1 | P2.103107.090411 | WG254405-01 | Calibration Point | | 1 | | 10/31/07 09:04 |
| 2 | P2.103107.091028 | WG254405-02 | Calibration Point | | 1 | | 10/31/07 09:10 |
| 3 | P2.103107.091655 | WG254405-03 | Calibration Point | | 1 | | 10/31/07 09:16 |
| 4 | P2.103107.092320 | WG254405-04 | Calibration Point | | 1 | | 10/31/07 09:23 |
| 5 | P2.103107.092948 | WG254405-05 | Calibration Point | | 1 | | 10/31/07 09:29 |
| 6 | P2.103107.093521 | WG254405-06 | Initial Calibration Verification | | 1 | | 10/31/07 09:35 |
| 7 | P2.103107.094150 | WG254405-07 | Initial Calib Blank | | 1 | | 10/31/07 09:41 |
| 8 | P2.103107.094822 | WG254405-08 | Interference Check | | 1 | | 10/31/07 09:48 |
| 9 | P2.103107.095342 | WG254405-09 | Interference Check | | 1 | | 10/31/07 09:53 |
| 10 | P2.103107.101817 | WG254405-10 | CCV | | 1 | | 10/31/07 10:18 |
| 11 | P2.103107.102434 | WG254405-11 | CCB | | 1 | | 10/31/07 10:24 |
| 12 | P2.103107.103051 | L0710200-04 | BGA006 | 50/50 | 1 | | 10/31/07 10:30 |
| 13 | P2.103107.103715 | L0710675-02 | SS007MW010231007 | 50/50 | 1 | | 10/31/07 10:37 |
| 14 | P2.103107.104337 | L0710675-03 | SS007MW010231007DUP | 50/50 | 1 | | 10/31/07 10:43 |
| 15 | P2.103107.105006 | L0710675-04 | MW4-35231007 | 50/50 | 1 | | 10/31/07 10:50 |
| 16 | P2.103107.105633 | L0710675-05 | SS007MW006231007 | 50/50 | 1 | | 10/31/07 10:56 |
| 17 | P2.103107.110255 | L0710675-06 | EB23100701 | 50/50 | 1 | | 10/31/07 11:02 |
| 18 | P2.103107.110913 | L0710675-07 | 313WINDHAM231007 | 50/50 | 1 | | 10/31/07 11:09 |
| 19 | P2.103107.111542 | WG254405-12 | CCV | | 1 | | 10/31/07 11:15 |
| 20 | P2.103107.112201 | WG254405-13 | CCB | | 1 | | 10/31/07 11:22 |
| 21 | P2.103107.112817 | L0710675-09 | SS007MW009231007 | 50/50 | 1 | | 10/31/07 11:28 |
| 22 | P2.103107.113542 | L0710675-10 | SS007MW008231007 | 50/50 | 1 | | 10/31/07 11:35 |
| 23 | P2.103107.114159 | L0710675-11 | MW4-36231007 | 50/50 | 1 | | 10/31/07 11:41 |
| 24 | P2.103107.114819 | L0710675-12 | MW4-36231007DUP | 50/50 | 1 | | 10/31/07 11:48 |
| 25 | P2.103107.115443 | L0710675-13 | EB23100702 | 50/50 | 1 | | 10/31/07 11:54 |
| 26 | P2.103107.120058 | WG253477-02 | Method/Prep Blank | 50/50 | 1 | | 10/31/07 12:00 |
| 27 | P2.103107.120718 | WG254405-14 | CCV | | 1 | | 10/31/07 12:07 |
| 28 | P2.103107.121339 | WG254405-15 | CCB | | 1 | | 10/31/07 12:13 |
| 29 | P2.103107.121954 | WG253477-03 | Laboratory Control Sample | 50/50 | 1 | | 10/31/07 12:19 |
| 30 | P2.103107.122612 | WG253477-01 | Reference Sample | | 1 | L0710444-01 | 10/31/07 12:26 |
| 31 | P2.103107.123231 | WG253477-04 | Matrix Spike | 50/50 | 1 | | 10/31/07 12:32 |
| 32 | P2.103107.123854 | WG253477-05 | Matrix Spike Duplicate | 50/50 | 1 | | 10/31/07 12:38 |
| 33 | P2.103107.124519 | L0710444-02 | MW-3 | 50/50 | 1 | | 10/31/07 12:45 |
| 34 | P2.103107.125143 | L0710444-03 | MW-7 | 50/50 | 1 | | 10/31/07 12:51 |
| 35 | P2.103107.125814 | L0710496-04 | MW-8A | 50/50 | 1 | | 10/31/07 12:58 |
| 36 | P2.103107.130430 | WG254206-01 | Post Digestion Spike | | 1 | | 10/31/07 13:04 |
| 37 | P2.103107.131059 | WG254206-02 | Serial Dilution | | 5 | | 10/31/07 13:10 |

Page: 1 Approved: November 01, 2007

Maren Beery

**KEMRON Environmental Services**

Instrument Run Log

Instrument: PE-ICP2 Dataset: 103107HR.CSV

Analyst1: KHR Analyst2: N/A

Method: 6010B SOP: ME600E Rev: 6

Maintenance Log ID: 21515

Calibration Std: STD22439 ICV/CCV Std: STD22609 Post Spike: STD22493

ICSA: STD22610 ICSAB: STD22567

Workgroups: 254205, 254206, 254046, 254208, 254193

Comments:

| Seq. | File ID | Sample | ID | Prep | Dil | Reference | Date/Time |
|---|---|---|---|---|---|---|---|
| 38 | P2.103107.131725 | WG254405-16 | CCV | | 1 | | 10/31/07 13:17 |
| 39 | P2.103107.132343 | WG254405-17 | CCB | | 1 | | 10/31/07 13:23 |
| 40 | P2.103107.133004 | L0710444-04 | MW-1S | 50/50 | 1 | | 10/31/07 13:30 |
| 41 | P2.103107.133628 | L0710444-05 | MW-2S | 50/50 | 1 | | 10/31/07 13:36 |
| 42 | P2.103107.134246 | L0710444-06 | MW-3S | 50/50 | 1 | | 10/31/07 13:42 |
| 43 | P2.103107.134904 | L0710444-07 | MW-7S | 50/50 | 1 | | 10/31/07 13:49 |
| 44 | P2.103107.135527 | L0710496-01 | MW-2A | 50/50 | 1 | | 10/31/07 13:55 |
| 45 | P2.103107.140044 | L0710496-02 | MW-2B | 50/50 | 1 | | 10/31/07 14:00 |
| 46 | P2.103107.140705 | L0710496-03 | MW-2C | 50/50 | 1 | | 10/31/07 14:07 |
| 47 | P2.103107.141325 | L0710496-05 | MW-8B | 50/50 | 1 | | 10/31/07 14:13 |
| 48 | P2.103107.141947 | L0710496-06 | MW-7A | 50/50 | 1 | | 10/31/07 14:19 |
| 49 | P2.103107.142504 | WG254405-18 | CCV | | 1 | | 10/31/07 14:25 |
| 50 | P2.103107.143125 | WG254405-19 | CCB | | 1 | | 10/31/07 14:31 |
| 51 | P2.103107.143743 | L0710496-07 | MW-7B | 50/50 | 1 | | 10/31/07 14:37 |
| 52 | P2.103107.144405 | L0710513-01 | MW-1 | 50/50 | 1 | | 10/31/07 14:44 |
| 53 | P2.103107.145029 | L0710513-02 | MW-4 | 50/50 | 1 | | 10/31/07 14:50 |
| 54 | P2.103107.145646 | L0710513-03 | MW-6 | 50/50 | 1 | | 10/31/07 14:56 |
| 55 | P2.103107.150311 | L0710513-04 | MW-4S | 50/50 | 1 | | 10/31/07 15:03 |
| 56 | P2.103107.150935 | L0710513-05 | MW-6S | 50/50 | 1 | | 10/31/07 15:09 |
| 57 | P2.103107.151549 | WG254405-20 | CCV | | 1 | | 10/31/07 15:15 |
| 58 | P2.103107.152215 | WG254405-21 | CCB | | 1 | | 10/31/07 15:22 |
| 59 | P2.103107.152637 | L0710675-04 | MW4-35231007 | 50/50 | 10 | | 10/31/07 15:26 |
| 60 | P2.103107.153254 | L0710675-12 | MW4-36231007DUP | 50/50 | 10 | | 10/31/07 15:32 |
| 61 | P2.103107.153916 | WG253477-01 | Reference Sample | | 5 | L0710444-01 | 10/31/07 15:39 |
| 62 | P2.103107.154540 | WG253477-04 | Matrix Spike | 50/50 | 5 | | 10/31/07 15:45 |
| 63 | P2.103107.155157 | WG253477-05 | Matrix Spike Duplicate | 50/50 | 5 | | 10/31/07 15:51 |
| 64 | P2.103107.155822 | L0710444-02 | MW-3 | 50/50 | 5 | | 10/31/07 15:58 |
| 65 | P2.103107.160447 | L0710444-03 | MW-7 | 50/50 | 5 | | 10/31/07 16:04 |
| 66 | P2.103107.161139 | L0710444-04 | MW-1S | 50/50 | 5 | | 10/31/07 16:11 |
| 67 | P2.103107.161757 | WG254405-22 | CCV | | 1 | | 10/31/07 16:17 |
| 68 | P2.103107.162420 | WG254405-23 | CCB | | 1 | | 10/31/07 16:24 |
| 69 | P2.103107.163045 | L0710444-05 | MW-2S | 50/50 | 5 | | 10/31/07 16:30 |
| 70 | P2.103107.163703 | L0710444-06 | MW-3S | | 5 | | 10/31/07 16:37 |
| 71 | P2.103107.164327 | L0710444-07 | MW-7S | 50/50 | 5 | | 10/31/07 16:43 |
| 72 | P2.103107.164952 | L0710513-01 | MW-1 | 50/50 | 5 | | 10/31/07 16:49 |
| 73 | P2.103107.165610 | L0710513-02 | MW-4 | 50/50 | 5 | | 10/31/07 16:56 |
| 74 | P2.103107.170235 | L0710513-03 | MW-6 | 50/50 | 5 | | 10/31/07 17:02 |

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Maren Beery

# KEMRON Environmental Services

## Instrument Run Log

Instrument: PE-ICP2 Dataset: 103107HR.CSV
Analyst1: KHR Analyst2: N/A
Method: 6010B SOP: ME600E Rev: 6
Maintenance Log ID: 21515

Calibration Std: STD22439 ICV/CCV Std: STD22609 Post Spike: STD22493
ICSA: STD22610 ICSAB: STD22567

Workgroups: 254205, 254206, 254046, 254208, 254193

Comments:

| Seq. | File ID | Sample | ID | Prep | Dil | Reference | Date/Time |
|---|---|---|---|---|---|---|---|
| 75 | P2.103107.170900 | L0710513-04 | MW-4S | 50/50 | 5 | | 10/31/07 17:09 |
| 76 | P2.103107.171518 | L0710513-05 | MW-6S | 50/50 | 5 | | 10/31/07 17:15 |
| 77 | P2.103107.172139 | WG254405-24 | CCV | | 1 | | 10/31/07 17:21 |
| 78 | P2.103107.172757 | WG254405-25 | CCB | | 1 | | 10/31/07 17:27 |
| 79 | P2.103107.173830 | WG253902-02 | Method/Prep Blank | 50/50 | 1 | | 10/31/07 17:38 |
| 80 | P2.103107.174444 | WG253902-03 | Laboratory Control Sample | 50/50 | 1 | | 10/31/07 17:44 |
| 81 | P2.103107.175112 | L0710648-02 | 49WW01-102307 | 50/50 | 1 | | 10/31/07 17:51 |
| 82 | P2.103107.175734 | WG253902-01 | Reference Sample | | 1 | L0710648-04 | 10/31/07 17:57 |
| 83 | P2.103107.180358 | WG253902-04 | Matrix Spike | 50/50 | 1 | | 10/31/07 18:03 |
| 84 | P2.103107.181024 | WG253902-05 | Matrix Spike Duplicate | 50/50 | 1 | | 10/31/07 18:10 |
| 85 | P2.103107.181650 | L0710596-12 | 47WWZZ-101807 | 50/50 | 1 | | 10/31/07 18:16 |
| 86 | P2.103107.182219 | L0710596-14 | EQUIPMENT RINSE | 50/50 | 1 | | 10/31/07 18:22 |
| 87 | P2.103107.182844 | WG254046-01 | Post Digestion Spike | | 1 | | 10/31/07 18:28 |
| 88 | P2.103107.183508 | WG254046-02 | Serial Dilution | | 5 | | 10/31/07 18:35 |
| 89 | P2.103107.184129 | WG254405-26 | CCV | | 1 | | 10/31/07 18:41 |
| 90 | P2.103107.184746 | WG254405-27 | CCB | | 1 | | 10/31/07 18:47 |
| 91 | P2.103107.185402 | WG253791-02 | Method/Prep Blank | 50/50 | 1 | | 10/31/07 18:54 |
| 92 | P2.103107.190021 | WG253791-03 | Laboratory Control Sample | 50/50 | 1 | | 10/31/07 19:00 |
| 93 | P2.103107.190643 | L0710602-02 | ST14-MW05-102 | 50/50 | 1 | | 10/31/07 19:06 |
| 94 | P2.103107.191304 | WG253791-01 | Reference Sample | | 1 | L0710602-03 | 10/31/07 19:13 |
| 95 | P2.103107.191919 | WG253791-04 | Matrix Spike | 50/50 | 1 | | 10/31/07 19:19 |
| 96 | P2.103107.192543 | WG253791-05 | Matrix Spike Duplicate | 50/50 | 1 | | 10/31/07 19:25 |
| 97 | P2.103107.193215 | L0710657-02 | AV-NCB-EB-1-102307 | 50/50 | 1 | | 10/31/07 19:32 |
| 98 | P2.103107.193829 | L0710613-40 | 5248-W0001 | 50/50 | 1 | | 10/31/07 19:38 |
| 99 | P2.103107.194449 | WG254208-01 | Post Digestion Spike | | 1 | | 10/31/07 19:44 |
| 100 | P2.103107.195114 | WG254208-02 | Serial Dilution | | 5 | | 10/31/07 19:51 |
| 101 | P2.103107.195734 | WG254405-28 | CCV | | 1 | | 10/31/07 19:57 |
| 102 | P2.103107.200355 | WG254405-29 | CCB | | 1 | | 10/31/07 20:03 |
| 103 | P2.103107.201014 | L0710575-01 | WAR 01 | 50/50 | 5 | | 10/31/07 20:10 |
| 104 | P2.103107.201538 | L0710575-03 | WAR 02 | 50/50 | 5 | | 10/31/07 20:15 |
| 105 | P2.103107.202100 | L0710575-05 | WAR 03 | 50/50 | 5 | | 10/31/07 20:21 |
| 106 | P2.103107.202722 | L0710613-41 | 5248-W0002 | 50/50 | 1 | | 10/31/07 20:27 |
| 107 | P2.103107.203337 | L0710613-42 | 5248-W0004 | 50/50 | 1 | | 10/31/07 20:33 |
| 108 | P2.103107.203957 | L0710602-04 | ST14-MW23-102 | 50/50 | 1 | | 10/31/07 20:39 |
| 109 | P2.103107.204624 | L0710602-05 | ST14-MW19-103 | 50/50 | 1 | | 10/31/07 20:46 |
| 110 | P2.103107.205240 | L0710602-06 | ST14-MW12-102 | 50/50 | 1 | | 10/31/07 20:52 |
| 111 | P2.103107.205904 | L0710599-22 | 5248-W0005 | 50/50 | 1 | | 10/31/07 20:59 |

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Approved: November 01, 2007

Maren Beery

**KEMRON Environmental Services**

Instrument Run Log

Instrument: PE-ICP2 Dataset: 103107HR.CSV

Analyst1: KHR Analyst2: N/A

Method: 6010B SOP: ME600E Rev: 6

Maintenance Log ID: 21515

Calibration Std: STD22439 ICV/CCV Std: STD22609 Post Spike: STD22493

ICSA: STD22610 ICSAB: STD22567

Workgroups: 254205, 254206, 254046, 254208, 254193

Comments:

| Seq. | File ID | Sample | ID | Prep | Dil | Reference | Date/Time |
|---|---|---|---|---|---|---|---|
| 112 | P2.103107.210525 | WG254405-30 | CCV | | 1 | | 10/31/07 21:05 |
| 113 | P2.103107.211143 | WG254405-31 | CCB | | 1 | | 10/31/07 21:11 |
| 114 | P2.103107.211759 | L0710599-23 | 5248-W0009 | 50/50 | 1 | | 10/31/07 21:17 |
| 115 | P2.103107.212420 | L0710611-02 | WG-ST24-MW-19-040 | 50/50 | 1 | | 10/31/07 21:24 |
| 116 | P2.103107.212939 | L0710611-04 | WG-ST24-MW-20-040 | 50/50 | 1 | | 10/31/07 21:29 |
| 117 | P2.103107.213603 | L0710611-06 | WG-ST24-MW-4-040 | 50/50 | 1 | | 10/31/07 21:36 |
| 118 | P2.103107.214228 | L0710611-08 | WG-ST24-MW-16-040 | 50/50 | 1 | | 10/31/07 21:42 |
| 119 | P2.103107.214843 | WG253903-02 | Method/Prep Blank | 50/50 | 1 | | 10/31/07 21:48 |
| 120 | P2.103107.215506 | WG254405-32 | CCV | | 1 | | 10/31/07 21:55 |
| 121 | P2.103107.220125 | WG254405-33 | CCB | | 1 | | 10/31/07 22:01 |
| 122 | P2.103107.220740 | WG253903-03 | Laboratory Control Sample | 50/50 | 1 | | 10/31/07 22:07 |
| 123 | P2.103107.221404 | WG253903-01 | Reference Sample | | 1 | L0710661-01 | 10/31/07 22:14 |
| 124 | P2.103107.222030 | WG253903-04 | Matrix Spike | 50/50 | 1 | | 10/31/07 22:20 |
| 125 | P2.103107.222656 | WG253903-05 | Matrix Spike Duplicate | 50/50 | 1 | | 10/31/07 22:26 |
| 126 | P2.103107.223321 | L0710661-02 | SW07-BRR-2 | 50/50 | 1 | | 10/31/07 22:33 |
| 127 | P2.103107.223945 | L0710655-01 | SW07 | 50/50 | 1 | | 10/31/07 22:39 |
| 128 | P2.103107.224612 | L0710677-04 | OUTFALL 003/COMP | 50/50 | 1 | | 10/31/07 22:46 |
| 129 | P2.103107.225231 | L0710679-01 | OUTFALL 002/COMP | 50/50 | 1 | | 10/31/07 22:52 |
| 130 | P2.103107.225850 | WG254193-01 | Post Digestion Spike | | 1 | | 10/31/07 22:58 |
| 131 | P2.103107.230510 | WG254193-02 | Serial Dilution | | 5 | | 10/31/07 23:05 |
| 132 | P2.103107.231129 | WG254405-34 | CCV | | 1 | | 10/31/07 23:11 |
| 133 | P2.103107.231742 | WG254405-35 | CCB | | 1 | | 10/31/07 23:17 |
| 134 | P2.103107.232355 | L0710667-01 | 72 FLUME | 5/50 | 1 | | 10/31/07 23:23 |
| 135 | P2.103107.233013 | L0710667-02 | AFC EFFLUENT | 5/50 | 1 | | 10/31/07 23:30 |
| 136 | P2.103107.233722 | L0710667-03 | AFC BLEED | 5/50 | 1 | | 10/31/07 23:37 |
| 137 | P2.103107.234347 | L0710677-06 | OUTFALL 800/COMP | 50/50 | 1 | | 10/31/07 23:43 |
| 138 | P2.103107.235006 | L0710680-01 | DRL-Z-OUTLET 006 | 50/50 | 1 | | 10/31/07 23:50 |
| 139 | P2.103107.235623 | L0710681-01 | DRL-Z-SS-1 | 50/50 | 1 | | 10/31/07 23:56 |
| 140 | P2.110107.000143 | L0710681-02 | DRL-Z-SS-2 | 50/50 | 1 | | 11/01/07 00:01 |
| 141 | P2.110107.000702 | L0710684-01 | SITE 1 | 50/50 | 1 | | 11/01/07 00:07 |
| 142 | P2.110107.001318 | L0710684-02 | SITE 2 | 50/50 | 1 | | 11/01/07 00:13 |
| 143 | P2.110107.001933 | WG254405-36 | CCV | | 1 | | 11/01/07 00:19 |
| 144 | P2.110107.002547 | WG254405-37 | CCB | | 1 | | 11/01/07 00:25 |
| 145 | P2.110107.003200 | L0710691-02 | OUTFALL 001/COMP | 50/50 | 1 | | 11/01/07 00:32 |
| 146 | P2.110107.003816 | L0710691-04 | OUTFALL 002/COMP | 50/50 | 1 | | 11/01/07 00:38 |
| 147 | P2.110107.004432 | L0710696-01 | 001 | 50/50 | 1 | | 11/01/07 00:44 |
| 148 | P2.110107.005052 | L0710716-01 | VEMH-4012 | 50/50 | 1 | | 11/01/07 00:50 |



Approved: November 01, 2007

Maren Beery

**KEMRON Environmental Services**

Instrument Run Log

Instrument: PE-ICP2
Dataset: 103107HR.CSV
Analyst1: KHR
Analyst2: N/A
Method: 6010B
SOP: ME600E
Rev: 6
Maintenance Log ID: 21515

Calibration Std: STD22439
ICV/CCV Std: STD22609
Post Spike: STD22493
ICSA: STD22610
ICSAB: STD22567

Workgroups: 254205, 254206, 254046, 254208, 254193

Comments:

| Seq. | File ID | Sample | ID | Prep | Dil | Reference | Date/Time |
|---|---|---|---|---|---|---|---|
| 149 | P2.110107.005612 | L0710735-01 | OHIO RIVER/Z07134 | 50/50 | 1 | | 11/01/07 00:56 |
| 150 | P2.110107.010232 | L0710735-02 | RANNEY WELL/Z07135 | 50/50 | 1 | | 11/01/07 01:02 |
| 151 | P2.110107.010849 | WG254405-38 | CCV | | 1 | | 11/01/07 01:08 |
| 152 | P2.110107.011502 | WG254405-39 | CCB | | 1 | | 11/01/07 01:15 |

Page: 5

Approved: November 01, 2007

Maren Beery

KEMRON Environmental Services
Data Checklist

Date: 31-OCT-2007
Analyst: KHR
Analyst: NA
Method: 6010B
Instrument: PE-ICP2
Curve Workgroup: 254405
Runlog ID: 19043
Analytical Workgroups: 254205, 254206, 254046, 254208, 254193

| | |
|---|---|
| Calibration/Linearity | X |
| ICV/CCV | X |
| ICB/CCB | X |
| ICSA/ICSAB | X |
| CRI | |
| Blank/LCS | X |
| MS/MSD | X |
| Post Spike/Serial Dilution | X |
| Upload Results | X |
| Data Qualifiers | |
| Generate PDF Instrument Data | X |
| Sign/Annotate PDF Data | X |
| Upload Curve Data | X |
| Workgroup Forms | X |
| Case Narrative | X |
| Client Forms | X |
| Level X | 444, 513, 575 |
| Level 3 | 596, 611, 648 |
| Level 4 | 200, 496, 599, 602, 613, 657, 675 |
| Check for compliance with method and project specific requirements | X |
| Check the completeness of reported information | X |
| Check the information for the report narrative | X |
| Primary Reviewer | KHR |
| Secondary Reviewer | MMB |
| | |
| Comments | |

Primary Reviewer: 01-NOV-2007
Kim H. Rhodes

Secondary Reviewer: 01-NOV-2007
Maren Beery

Generated: NOV-01-2007 15:08:33

KEMRON Environmental Services
HOLDING TIMES
EQUIVALENT TO AFCEE FORM 9

Analytical Method: 6010B
AAB#: WG254046
Login Number: L0710596

| Client ID | Date Collected | Date Received | Date Extracted | Max Hold Time Ext. | Time Held Ext. | Date Analyzed | Max Hold Time Anal | Time Held Anal. | Q |
|---|---|---|---|---|---|---|---|---|---|
| 47WWZZ-101807 | 10/18/07 | 10/23/07 | 10/26/07 | 180 | 7.82 | 11/01/07 | 180 | 6.19 | |
| EQUIPMENT RINSE | 10/22/07 | 10/23/07 | 10/26/07 | 180 | 3.63 | 10/31/07 | 180 | 5.54 | |
| 47WWZZ-101807 | 10/18/07 | 10/23/07 | 10/26/07 | 180 | 7.82 | 10/31/07 | 180 | 5.53 | |

* EXT = SEE PROJECT QAPP REQUIREMENTS
*ANAL = SEE PROJECT QAPP REQUIREMENTS

KEMRON FORMS - Modified 11/20/2006
Version 1.5 PDF File ID: 922471
Report generated 11/01/2007 11:49

# METHOD BLANK SUMMARY

Login Number: L0710596
Blank File ID: P2.103107.173830
Prep Date: 10/26/07 05:30
Analyzed Date: 10/31/07 17:38
Analyst: KHR

Work Group: WG254046
Blank Sample ID: WG253902-02
Instrument ID: PE-ICP2
Method: 6010B

This Method Blank Applies To The Following Samples:

| Client ID | Lab Sample ID | Lab File ID | Time Analyzed | TAG |
|---|---|---|---|---|
| LCS | WG253902-03 | P2.103107.174444 | 10/31/07 17:44 | 01 |
| 47WWZZ-101807 | L0710596-12 | P2.103107.181650 | 10/31/07 18:16 | 01 |
| EQUIPMENT RINSE | L0710596-14 | P2.103107.182219 | 10/31/07 18:22 | 01 |
| 47WWZZ-101807 | L0710596-12 | P2.110107.100455 | 11/01/07 10:04 | DL01 |

KEMRON FORMS - Modified 01/31/2007
Version 1.5 PDF File ID: 922472
Report generated 11/01/2007 11:49

# KEMRON Environmental Services

## METHOD BLANK REPORT

Login Number: L0710596
Prep Date: 10/26/07 05:30
Sample ID: WG253902-02
Instrument ID: PE-ICP2
Run Date: 10/31/07 17:38
Prep Method: 3005A
File ID: P2.103107.173830
Analyst: KHR
Method: 6010B
Workgroup (AAB#): WG254046
Matrix: Water
Units: mg/L
Contract #: DACA56-94-D-0020
Cal ID: PE-ICP - 31-OCT-07

| Analytes | SDL | PQL | Concentration | Dilution | Qualifier |
|---|---|---|---|---|---|
| Aluminum, Dissolved | 0.0500 | 0.100 | 0.0500 | 1 | U |
| Beryllium, Dissolved | 0.000500 | 0.00200 | 0.000500 | 1 | U |
| Calcium, Dissolved | 0.100 | 0.200 | 0.100 | 1 | U |
| Cobalt, Dissolved | 0.00250 | 0.00500 | 0.00250 | 1 | U |
| Iron, Dissolved | 0.0250 | 0.100 | 0.0250 | 1 | U |
| Potassium, Dissolved | 0.250 | 1.00 | 0.250 | 1 | U |
| Magnesium, Dissolved | 0.250 | 0.500 | 0.250 | 1 | U |
| Sodium, Dissolved | 0.250 | 0.500 | 0.250 | 1 | U |
| Vanadium, Dissolved | 0.00500 | 0.0100 | 0.00500 | 1 | U |
| Zinc, Dissolved | 0.00500 | 0.0200 | 0.00500 | 1 | U |

SDL Method Detection Limit
PQL Reporting/Practical Quantitation Limit
ND Analyte Not detected at or above reporting limit
* Analyte concentration > RL

KEMRON FORMS - Modified 12/07/2006
Version 1.5 PDF File ID: 922473
Report generated 11/01/2007 09:24

# KEMRON Environmental Services

## LABORATORY CONTROL SAMPLE (LCS)

Login Number: L0710596 Run Date: 10/31/2007 Sample ID: WG253902-03
Instrument ID: PE-ICP2 Run Time: 17:44 Prep Method: 3005A
File ID: P2.103107.174444 Analyst: KHR Method: 6010B
Workgroup (AAB#): WG254046 Matrix: Water Units: mg/L
QC Key: STD Lot#: MI0058-81 Cal ID: PE-ICP - 31-OCT-07

| Analytes | Expected | Found | % Rec | LCS Limits | Q |
|---|---|---|---|---|---|
| Aluminum, Dissolved | 5.00 | 4.89 | 97.9 | 85 - 115 | |
| Beryllium, Dissolved | 0.0250 | 0.0238 | 95.0 | 85 - 115 | |
| Calcium, Dissolved | 5.00 | 4.88 | 97.7 | 85 - 115 | |
| Cobalt, Dissolved | 0.100 | 0.0959 | 95.9 | 85 - 115 | |
| Iron, Dissolved | 2.00 | 1.92 | 96.2 | 85 - 115 | |
| Potassium, Dissolved | 25.0 | 24.6 | 98.5 | 85 - 115 | |
| Magnesium, Dissolved | 5.00 | 4.80 | 95.9 | 85 - 115 | |
| Sodium, Dissolved | 25.0 | 24.4 | 97.6 | 85 - 115 | |
| Vanadium, Dissolved | 0.500 | 0.465 | 92.9 | 85 - 115 | |
| Zinc, Dissolved | 0.500 | 0.476 | 95.3 | 85 - 115 | |

KEMRON FORMS - Modified 09/06/2007
Version 1.5 PDF File ID: 922474
Report generated 11/01/2007 09:24

# MATRIX SPIKE AND MATRIX SPIKE DUP (MS/MSD)

00078744

Loginnum: L0710596 Cal ID: PE-ICP2 - Worknum: WG254046
Instrument ID: PE-ICP2 Contract #: DACA56-94-D-0020 Method: 6010B
Parent ID: WG253902-01 File ID: P2.103107.175734 Dil: 1 Matrix: WATER
Sample ID: WG253902-04 MS File ID: P2.103107.180358 Dil: 1 Units: mg/L
Sample ID: WG253902-05 MSD File ID: P2.103107.181024 Dil: 1

| Analyte | Parent | MS Spiked | MS Found | MS %Rec | MSD Spiked | MSD Found | MSD %Rec | %RPD | %Rec Limits | RPD Limit | Q |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Beryllium, Dissolved | ND | 0.0250 | 0.0235 | 94.1 | 0.0250 | 0.0236 | 94.3 | 0.130 | 80 - 120 | 20 | |
| Calcium, Dissolved | 346 | 5.00 | 347 | 19.6 | 5.00 | 343 | -64.0 | 1.21 | 80 - 120 | 20 | * |
| Cobalt, Dissolved | ND | 0.100 | 0.0898 | 89.8 | 0.100 | 0.0904 | 90.4 | 0.580 | 80 - 120 | 20 | |
| Iron, Dissolved | ND | 2.00 | 1.82 | 90.9 | 2.00 | 1.80 | 89.8 | 1.22 | 80 - 120 | 20 | |
| Magnesium, Dissolved | 282 | 5.00 | 289 | 146 | 5.00 | 285 | 59.5 | 1.51 | 80 - 120 | 20 | * |
| Potassium, Dissolved | 9.57 | 25.0 | 43.5 | 136 | 25.0 | 44.8 | 141 | 3.05 | 80 - 120 | 20 | * |
| Zinc, Dissolved | 0.00573 | 0.500 | 0.450 | 88.9 | 0.500 | 0.455 | 89.9 | 1.15 | 80 - 120 | 20 | |

* FAILS %REC LIMIT

# FAILS RPD LIMIT

NOTE: This is an internal quality control sample.

KEMRON Environmental Services

MATRIX SPIKE AND MATRIX SPIKE DUP (MS/MSD)

Loginnum:L0710596 Cal ID: PE-ICP2 - Worknum:WG254046
Instrument ID:PE-ICP2 Contract #:DACA56-94-D-0020 Method:6010B
Parent ID:WG253902-01 File ID:P2.110107.101730 Dil:10 Matrix:WATER
Sample ID:WG253902-04 MS File ID:P2.110107.102354 Dil:10 Units:mg/L
Sample ID:WG253902-05 MSD File ID:P2.110107.103011 Dil:10

| Analyte | Parent | MS Spiked | MS Found | MS %Rec | MSD Spiked | MSD Found | MSD %Rec | %RPD | %Rec Limits | RPD Limit | Q |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Aluminum, Dissolved | 0.0506 | 5.00 | 5.33 | 106 | 5.00 | 5.26 | 104 | 1.28 | 80 - 120 | 20 | |
| Sodium, Dissolved | 545 | 25.0 | 573 | 111 | 25.0 | 562 | 68.3 | 1.90 | 80 - 120 | 20 | * |
| Vanadium, Dissolved | ND | 0.500 | 0.423 | 84.5 | 0.500 | 0.425 | 85.0 | 0.542 | 80 - 120 | 20 | |

* FAILS %REC LIMIT

# FAILS RPD LIMIT

NOTE: This is an internal quality control sample.

KEMRON FORMS - Modified 09/25/2007 (wg_ms_msd_drywt)

Version 1.5 PDF File ID: 922475
Report generated 11/01/2007 11:49

# KEMRON ENVIRONMENTAL SERVICES
## SERIAL DILUTION REPORT

Sample Login ID: L0710596
Worknum: WG254046
Instrument ID: PE-ICP2
Method: 6010B
Sample ID: L0710596-14 File ID: P2.103107.182219 Dil: 1
Units: mg/L
Serial Dilution ID: WG254046-02 File ID: P2.103107.183508 Dil: 5

| Analyte | Sample | C | Serial Dilution | C | % Difference | Q |
|---|---|---|---|---|---|---|
| Aluminum | ND | U | ND | U | | |
| Beryllium | 0 | U | 0 | U | | |
| Calcium | 0.332 | X | 0.797 | F | 140 | X |
| Cobalt | ND | U | ND | U | | |
| Iron | ND | U | ND | U | | |
| Magnesium | 0 | U | 0 | U | | |
| Potassium | 0 | U | 0 | U | | |
| Sodium | 24.0 | | 24.2 | X | 0.833 | |
| Vanadium | ND | U | ND | U | | |
| Zinc | 0 | U | 0 | U | | |

U = Result is below MDL
F = Result is between MDL and RL
X = Result is greater than RL and less than 50 times the MDL
E = %D exceeds control limit of 10% and initial
sample result is greater than or equal to 50 times the MDL

KEMRON FORMS - Modified 02/14/2006
Version 1.3 PDF File ID: 922469
Report generated 11/01/2007 09:24

# KEMRON ENVIRONMENTAL SERVICES
## POST SPIKE REPORT

**Sample Login ID:** L0710596 **Worknum:** WG254046
**Instrument ID:** PE-ICP2 **Method:** 6010B
**Post Spike ID:** WG254046-01 **File ID:** P2.103107.182844 **Dil:** 1 **Units:** mg/L
**Sample ID:** L0710596-14 **File ID:** P2.103107.182219 **Dil:** 1 **Matrix:** Water

| Analyte | Post Spike Result | C | Sample Result | C | Spike Added(SA) | % R | Control Limit %R | Q |
|---|---|---|---|---|---|---|---|---|
| ALUMINUM | 4.72 | | 0 | U | 5 | 94.5 | 75 - 125 | |
| BERYLLIUM | 0.0239 | | 0 | U | .025 | 95.6 | 75 - 125 | |
| CALCIUM | 5.19 | | 0.332 | | 5 | 97.7 | 75 - 125 | |
| COBALT | 0.0954 | | 0 | U | .1 | 95.4 | 75 - 125 | |
| IRON | 1.80 | | 0 | U | 2 | 90.2 | 75 - 125 | |
| MAGNESIUM | 4.63 | | 0 | U | 5 | 92.7 | 75 - 125 | |
| POTASSIUM | 24.8 | | 0 | U | 25 | 99.4 | 75 - 125 | |
| SODIUM | 45.5 | | 24.0 | | 25 | 95.8 | 75 - 125 | |
| VANADIUM | 0.476 | | 0 | U | .5 | 95.2 | 75 - 125 | |
| ZINC | 0.483 | | 0 | U | .5 | 96.5 | 75 - 125 | |

**N = % Recovery exceeds control limits**
**F = Result is between MDL and RL**
**U = Sample result is below MDL. A value of zero is used in the calculation**

**KEMRON FORMS - Modified 04/20/2007 - POST_SPIKE**
**Version 2.0 PDF File ID: 922470**
**Report generated 11/01/2007 09:24**

KEMRON Environmental Services

INITIAL CALIBRATION SUMMARY

Login Number: L0710596
Workgroup (AAB#): WG254046
Analytical Method: 6010B
Instrument ID: PE-ICP2
ICAL Worknum: WG254405
Initial Calibration Date: 31-OCT-2007 09:29

| Analyte | WG254405-01 | | WG254405-02 | | WG254405-03 | | WG254405-04 | | WG254405-05 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | STD | INT | STD | INT | STD | INT | STD | INT | STD | INT | R | Q |
| Aluminum | 0 | 625.5001312 | .1 | 905.2598355 | .2 | 1705.212423 | 10 | 81147.55744 | 20 | 160061.4196 | 0.999978 | |
| Beryllium | 0 | -767.551029 | .0005 | 160.7462449 | .001 | 352.0625377 | .05 | 17896.7155 | .1 | 36110.38222 | 0.999991 | |
| Calcium | 0 | -35.0008123 | .1 | 17.75105213 | .2 | 19.21006838 | 10 | 1230.210192 | 20 | 2518.368668 | 0.999931 | |
| Cobalt | 0 | -46.6942808 | .002 | 37.48564352 | .004 | 93.13731387 | .1 | 4524.779821 | .4 | 8949.21028 | 0.999984 | |
| Iron | 0 | -.180230761 | .04 | 28.24068599 | .08 | 52.95571411 | 4 | 2440.903419 | 8 | 4825.771882 | 0.999985 | |
| Magnesium | 0 | 24.8648807 | .1 | 59.21922232 | .2 | 112.4104987 | 10 | 5604.210786 | 20 | 11160.53034 | 0.999998 | |
| Potassium | 0 | -54.2371874 | .5 | 2373.749357 | 1 | 4526.152084 | 50 | 302641.9815 | 100 | 653115.0405 | 0.999999 | |
| Sodium | 0 | 419.2909972 | .5 | 5167.542095 | 1 | 9898.627452 | 50 | 528065.0704 | 100 | 1069683.303 | 1.00000 | |
| Vanadium | 0 | 3577.093024 | .01 | 910.316234 | .02 | 1528.366813 | 1 | 76846.35599 | 2 | 154249.6719 | 0.999998 | |
| Zinc | 0 | .3724934012 | .01 | 134.1543087 | .02 | 211.0579649 | 1 | 10515.71254 | 2 | 21207.5188 | 0.999990 | |

INT = Instrument intensity
R = Coefficient of correlation
Q = Data Qualifier
* = Out of Compliance; R < 0.995

KEMRON FORMS - Modified 03/08/2007
Version 1.5 PDF File ID: 922478
Report generated 11/01/2007 11:49

# INITIAL CALIBRATION SUMMARY



Login Number: L0710596
Workgroup (AAB#): WG254046
Analytical Method: 6010B
Instrument ID: PE-ICP2
ICAL Worknum: WG254439
Initial Calibration Date: 01-NOV-2007 08:36

| Analyte | WG254439-01 | | WG254439-02 | | WG254439-03 | | WG254439-04 | | WG254439-05 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | STD | INT | STD | INT | STD | INT | STD | INT | STD | INT | R | Q |
| Aluminum | 0 | 471.4750489 | .1 | 763.0876076 | .2 | 1485.677134 | 10 | 75609.34942 | 20 | 152114.4356 | 0.999996 | |
| Beryllium | 0 | -761.806768 | .0005 | 187.0849547 | .001 | 353.5988314 | .05 | 16952.69238 | .1 | 34856.49787 | 0.999910 | |
| Calcium | 0 | -39.4352849 | .1 | 13.08955827 | .2 | 20.12598308 | 10 | 1163.19205 | 20 | 2403.849664 | 0.999877 | |
| Cobalt | 0 | -53.5925967 | .002 | 49.37365729 | .004 | 99.65836886 | .1 | 4299.796783 | .4 | 8580.308794 | 0.999999 | |
| Iron | 0 | .1500506897 | .04 | 20.53037645 | .08 | 43.04205002 | 4 | 2069.379937 | 8 | 4125.701525 | 0.999999 | |
| Magnesium | 0 | 18.84600223 | .1 | 52.11523527 | .2 | 97.96557357 | 10 | 4945.144736 | 20 | 9899.605427 | 1.00000 | |
| Potassium | 0 | -35.0182110 | .5 | 2280.000383 | 1 | 4440.252232 | 50 | 286749.5832 | 100 | 617382.9618 | 1.00000 | |
| Sodium | 0 | 708.1935609 | .5 | 4631.55991 | 1 | 9195.329489 | 50 | 497046.404 | 100 | 1022406.727 | 1.00000 | |
| Vanadium | 0 | 3805.383002 | .01 | 580.6514282 | .02 | 1467.41639 | 1 | 72429.12977 | 2 | 148595.1123 | 0.999927 | |
| Zinc | 0 | 6.979116265 | .01 | 117.2644459 | .02 | 211.3238193 | 1 | 9962.190919 | 2 | 20382.66521 | 0.999937 | |

INT = Instrument intensity
R = Coefficient of correlation
Q = Data Qualifier
* = Out of Compliance; R < 0.995

KEMRON FORMS - Modified 03/08/2007
Version 1.5 PDF File ID: 922478
Report generated 11/01/2007 11:49

KEMRON Environmental Services

INITIAL CALIBRATION BLANK (ICB)

Login Number: L0710596
Run Date: 10/31/2007
Sample ID: WG254405-07
Instrument ID: PE-ICP2
Run Time: 09:41
Method: 6010
File ID: P2.103107.094150
Analvst: KHR
Units: mg/L
Workgroup (AAB#): WG254046
Cal ID: PE-ICP2 - 31-OCT-07
Matrix: WATER

| Analytes | MDL | RDL | Concentration | Dilution | Qualifier |
|---|---|---|---|---|---|
| ALUMINUM | .05 | .1 | -.0204 | 1 | U |
| BERYLLIUM | .0005 | .002 | .000164 | 1 | U |
| CALCIUM | .1 | .2 | .0702 | 1 | U |
| COBALT | .0025 | .005 | -.000227 | 1 | U |
| IRON | .025 | .1 | -.007 | 1 | U |
| MAGNESIUM | .25 | .5 | -.0172 | 1 | U |
| POTASSIUM | .25 | 1 | .103 | 1 | U |
| SODIUM | .25 | .5 | .0361 | 1 | U |
| VANADIUM | .005 | .01 | .000767 | 1 | U |
| ZINC | .005 | .02 | .000519 | 1 | U |

KEMRON FORMS - Modified 10/02/2007
Version 2.0 PDF File ID: 922480
Report generated 11/01/2007 11:49

# KEMRON Environmental Services
## INITIAL CALIBRATION BLANK (ICB)

Login Number: L0710596
Run Date: 11/01/2007
Sample ID: WG254439-07
Instrument ID: PE-ICP2
Run Time: 08:47
Method: 6010
File ID: P2.110107.084744
Analyst: KRV
Units: mg/L
Workgroup (AAB#): WG254046
Cal ID: PE-ICP2 - 01-NOV-07
Matrix: WATER

| Analytes | MDL | RDL | Concentration | Dilution | Qualifier |
|---|---|---|---|---|---|
| ALUMINUM | .05 | .1 | .0082 | 1 | U |
| BERYLLIUM | .0005 | .002 | .000232 | 1 | U |
| CALCIUM | .1 | .2 | .0145 | 1 | U |
| COBALT | .0025 | .005 | .000147 | 1 | U |
| IRON | .025 | .1 | -.00184 | 1 | U |
| MAGNESIUM | .25 | .5 | -.0000589 | 1 | U |
| POTASSIUM | .25 | 1 | .098 | 1 | U |
| SODIUM | .25 | .5 | .0367 | 1 | U |
| VANADIUM | .005 | .01 | .00277 | 1 | U |
| ZINC | .005 | .02 | .0021 | 1 | U |

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# CONTINUING CALIBRATION BLANK (CCB)



Login Number: L0710596
Run Date: 10/31/2007
Sample ID: WG254405-11
Instrument ID: PE-ICP2
Run Time: 10:24
Method: 6010B
File ID: P2.103107.102434
Analyst: KHR
Units: mg/L
Workgroup (AAB#): WG254046
Cal ID: PE-ICP - 31-OCT-07
Matrix: WATER

| Analytes | MDL | RDL | Concentration | Dilution | Qualifier |
|---|---|---|---|---|---|
| Aluminum | 0.0500 | 0.100 | -0.0145 | 1 | U |
| Beryllium | 0.000500 | 0.00200 | 0.000158 | 1 | U |
| Calcium | 0.100 | 0.200 | 0.0383 | 1 | U |
| Cobalt | 0.00250 | 0.00500 | -0.000389 | 1 | U |
| Iron | 0.0250 | 0.100 | -0.00820 | 1 | U |
| Potassium | 0.250 | 1.00 | 0.0908 | 1 | U |
| Magnesium | 0.250 | 0.500 | -0.00861 | 1 | U |
| Sodium | 0.250 | 0.500 | 0.0344 | 1 | U |
| Vanadium | 0.00500 | 0.0100 | -0.000171 | 1 | U |
| Zinc | 0.00500 | 0.0200 | 0.000413 | 1 | U |

U = Result is less than MDL
F = Result is between MDL and RL
* = Result is above RL

# KEMRON Environmental Services

## CONTINUING CALIBRATION BLANK (CCB)

Login Number: L0710596
Run Date: 10/31/2007
Sample ID: WG254405-25
Instrument ID: PE-ICP2
Run Time: 17:27
Method: 6010B
File ID: P2.103107.172757
Analyst: KHR
Units: mg/L
Workgroup (AAB#): WG254046
Cal ID: PE-ICP - 31-OCT-07
Matrix: WATER

| Analytes | MDL | RDL | Concentration | Dilution | Qualifier |
|---|---|---|---|---|---|
| Aluminum | 0.0500 | 0.100 | -0.0315 | 1 | U |
| Beryllium | 0.000500 | 0.00200 | 0.000203 | 1 | U |
| Calcium | 0.100 | 0.200 | 0.103 | 1 | F |
| Cobalt | 0.00250 | 0.00500 | -0.000466 | 1 | U |
| Iron | 0.0250 | 0.100 | -0.00794 | 1 | U |
| Potassium | 0.250 | 1.00 | 0.0688 | 1 | U |
| Magnesium | 0.250 | 0.500 | -0.0172 | 1 | U |
| Sodium | 0.250 | 0.500 | 0.0381 | 1 | U |
| Vanadium | 0.00500 | 0.0100 | -0.00306 | 1 | U |
| Zinc | 0.00500 | 0.0200 | 0.000510 | 1 | U |

U = Result is less than MDL
F = Result is between MDL and RL
* = Result is above RL

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KEMRON Environmental Services

# CONTINUING CALIBRATION BLANK (CCB)

Login Number: L0710596
Run Date: 10/31/2007
Sample ID: WG254405-27
Instrument ID: PE-ICP2
Run Time: 18:47
Method: 6010B
File ID: P2.103107.184746
Analyst: KHR
Units: mg/L
Workgroup (AAB#): WG254046
Cal ID: PE-ICP - 31-OCT-07
Matrix: WATER

| Analytes | MDL | RDL | Concentration | Dilution | Qualifier |
|---|---|---|---|---|---|
| Aluminum | 0.0500 | 0.100 | -0.0274 | 1 | U |
| Beryllium | 0.000500 | 0.00200 | 0.000243 | 1 | U |
| Calcium | 0.100 | 0.200 | 0.105 | 1 | F |
| Cobalt | 0.00250 | 0.00500 | -0.000266 | 1 | U |
| Iron | 0.0250 | 0.100 | -0.00878 | 1 | U |
| Potassium | 0.250 | 1.00 | 0.0795 | 1 | U |
| Magnesium | 0.250 | 0.500 | -0.00629 | 1 | U |
| Sodium | 0.250 | 0.500 | 0.0743 | 1 | U |
| Vanadium | 0.00500 | 0.0100 | -0.00329 | 1 | U |
| Zinc | 0.00500 | 0.0200 | 0.000681 | 1 | U |

U = Result is less than MDL
F = Result is between MDL and RL
* = Result is above RL

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00078755

## CONTINUING CALIBRATION BLANK (CCB)

Login Number: L0710596
Run Date: 11/01/2007
Sample ID: WG254439-11
Instrument ID: PE-ICP2
Run Time: 09:11
Method: 6010B
File ID: P2.110107.091105
Analyst: KRV
Units: mg/L
Workgroup (AAB#): WG254046
Cal ID: PE-ICP - 01-NOV-07
Matrix: WATER

| Analytes | MDL | RDL | Concentration | Dilution | Qualifier |
|---|---|---|---|---|---|
| Aluminum | 0.0500 | 0.100 | 0.00345 | 1 | U |
| Beryllium | 0.000500 | 0.00200 | 0.000242 | 1 | U |
| Calcium | 0.100 | 0.200 | 0.0341 | 1 | U |
| Cobalt | 0.00250 | 0.00500 | 0.000202 | 1 | U |
| Iron | 0.0250 | 0.100 | -0.00251 | 1 | U |
| Potassium | 0.250 | 1.00 | 0.102 | 1 | U |
| Magnesium | 0.250 | 0.500 | -0.00505 | 1 | U |
| Sodium | 0.250 | 0.500 | 0.0230 | 1 | U |
| Vanadium | 0.00500 | 0.0100 | 0.00258 | 1 | U |
| Zinc | 0.00500 | 0.0200 | 0.00200 | 1 | U |

U = Result is less than MDL
F = Result is between MDL and RL
* = Result is above RL

KEMRON FORMS - Modified 09/27/2006
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Report generated 11/01/2007 11:50

00078756

# CONTINUING CALIBRATION BLANK (CCB)

Login Number: L0710596
Run Date: 11/01/2007
Sample ID: WG254439-13
Instrument ID: PE-ICP2
Run Time: 10:42
Method: 6010B
File ID: P2.110107.104257
Analyst: KRV
Units: mg/L
Workgroup (AAB#): WG254046
Cal ID: PE-ICP - 01-NOV-07
Matrix: WATER

| Analytes | MDL | RDL | Concentration | Dilution | Qualifier |
|---|---|---|---|---|---|
| Aluminum | 0.0500 | 0.100 | 0.00822 | 1 | U |
| Beryllium | 0.000500 | 0.00200 | 0.000205 | 1 | U |
| Calcium | 0.100 | 0.200 | 0.0343 | 1 | U |
| Cobalt | 0.00250 | 0.00500 | 0.000160 | 1 | U |
| Iron | 0.0250 | 0.100 | -0.00126 | 1 | U |
| Potassium | 0.250 | 1.00 | 0.0699 | 1 | U |
| Magnesium | 0.250 | 0.500 | -0.00338 | 1 | U |
| Sodium | 0.250 | 0.500 | 0.0300 | 1 | U |
| Vanadium | 0.00500 | 0.0100 | 0.00261 | 1 | U |
| Zinc | 0.00500 | 0.0200 | 0.00215 | 1 | U |

U = Result is less than MDL
F = Result is between MDL and RL
* = Result is above RL

KEMRON FORMS - Modified 09/27/2006
Version 2.0 PDF File ID: 922483
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# INITIAL CALIBRATION VERIFICATION (ICV)

00078757

Login Number: L0710596
Run Date: 10/31/2007
Sample ID: WG254405-06
Instrument ID: PE-ICP2
Run Time: 09:35
Method: 6010B
File ID: P2.103107.093521
Analyst: KHR
Units: mg/L
Workgroup (AAB#): WG254046
Cal ID: PE-ICP - 31-OCT-07
QC Key: STD

| Analyte | | Expected | Found | %REC | LIMITS | Q |
|---|---|---|---|---|---|---|
| Aluminum | | 10 | 10.1 | 101 | 90 - 110 | |
| Beryllium | | .05 | 0.0507 | 101 | 90 - 110 | |
| Calcium | | 10 | 10.4 | 104 | 90 - 110 | |
| Cobalt | | .2 | 0.201 | 100 | 90 - 110 | |
| Iron | | 4 | 4.07 | 102 | 90 - 110 | |
| Potassium | | 50 | 50.5 | 101 | 90 - 110 | |
| Magnesium | | 10 | 9.95 | 99.5 | 90 - 110 | |
| Sodium | | 50 | 49.4 | 98.8 | 90 - 110 | |
| Vanadium | | 1 | 0.996 | 99.6 | 90 - 110 | |
| Zinc | | 1 | 1.04 | 104 | 90 - 110 | |

* Exceeds LIMITS Limit

KEMRON FORMS - Modified 09/06/2007 (ICV)
Version 1.5 PDF File ID: 922479
Report generated 11/01/2007 11:49

INITIAL CALIBRATION VERIFICATION (ICV)



Login Number: L0710596
Run Date: 11/01/2007
Sample ID: WG254439-06
Instrument ID: PE-ICP2
Run Time: 08:41
Method: 6010B
File ID: P2.110107.084128
Analyst: KRV
Units: mg/L
Workgroup (AAB#): WG254046
Cal ID: PE-ICP - 01-NOV-07
QC Key: STD

| Analyte | | Expected | Found | %REC | LIMITS | Q |
|---|---|---|---|---|---|---|
| Aluminum | | 10 | 10.1 | 101 | 90 - 110 | |
| Beryllium | | .05 | 0.0497 | 99.4 | 90 - 110 | |
| Calcium | | 10 | 10.4 | 104 | 90 - 110 | |
| Cobalt | | .2 | 0.203 | 101 | 90 - 110 | |
| Iron | | 4 | 4.14 | 103 | 90 - 110 | |
| Potassium | | 50 | 52.0 | 104 | 90 - 110 | |
| Magnesium | | 10 | 10.1 | 101 | 90 - 110 | |
| Sodium | | 50 | 50.5 | 101 | 90 - 110 | |
| Vanadium | | 1 | 0.980 | 98.0 | 90 - 110 | |
| Zinc | | 1 | 1.02 | 102 | 90 - 110 | |

* Exceeds LIMITS Limit

KEMRON FORMS - Modified 09/06/2007 (ICV)
Version 1.5 PDF File ID: 922479
Report generated 11/01/2007 11:49

CONTINUING CALIBRATION VERIFICATION (CCV)

00078759

Login Number: L0710596 | Run Date: 10/31/2007 | Sample ID: WG254405-10
Instrument ID: PE-ICP2 | Run Time: 10:18 | Method: 6010B
File ID: P2.103107.101817 | Analyst: KHR | QC Key: STD
Workgroup (AAB#): WG254046 | Cal ID: PE-ICP - 31-OCT-07

| Analyte | | Expected | Found | UNITS | %REC | LIMITS | | Q |
|---|---|---|---|---|---|---|---|---|
| Aluminum | | 10.0 | 9.79 | mg/L | 97.9 | 90 - 110 | | |
| Beryllium | | 0.0500 | 0.0486 | mg/L | 97.2 | 90 - 110 | | |
| Calcium | | 10.0 | 10.0 | mg/L | 100 | 90 - 110 | | |
| Cobalt | | 0.200 | 0.194 | mg/L | 96.8 | 90 - 110 | | |
| Iron | | 4.00 | 3.98 | mg/L | 99.5 | 90 - 110 | | |
| Potassium | | 50.0 | 49.0 | mg/L | 98.0 | 90 - 110 | | |
| Magnesium | | 10.0 | 9.70 | mg/L | 97.0 | 90 - 110 | | |
| Sodium | | 50.0 | 48.0 | mg/L | 96.0 | 90 - 110 | | |
| Vanadium | | 1.00 | 0.949 | mg/L | 94.9 | 90 - 110 | | |
| Zinc | | 1.00 | 0.994 | mg/L | 99.4 | 90 - 110 | | |

* Exceeds LIMITS Criteria

KEMRON FORMS - Modified 09/06/2007 - (CCV)
Version 1.5 PDF File ID: 922482
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# CONTINUING CALIBRATION VERIFICATION (CCV)

00078760

Login Number: L0710596
Run Date: 10/31/2007
Sample ID: WG254405-24
Instrument ID: PE-ICP2
Run Time: 17:21
Method: 6010B
File ID: P2.103107.172139
Analvst: KHR
QC Key: STD
Workgroup (AAB#): WG254046
Cal ID: PE-ICP - 31-OCT-07

| Analyte | | Expected | Found | UNITS | %REC | LIMITS | | Q |
|---|---|---|---|---|---|---|---|---|
| Aluminum | | 10.0 | 9.63 | mg/L | 96.3 | 90 - 110 | | |
| Beryllium | | 0.0500 | 0.0475 | mg/L | 94.9 | 90 - 110 | | |
| Calcium | | 10.0 | 9.85 | mg/L | 98.5 | 90 - 110 | | |
| Cobalt | | 0.200 | 0.190 | mg/L | 94.8 | 90 - 110 | | |
| Iron | | 4.00 | 3.77 | mg/L | 94.3 | 90 - 110 | | |
| Potassium | | 50.0 | 49.3 | mg/L | 98.7 | 90 - 110 | | |
| Magnesium | | 10.0 | 9.26 | mg/L | 92.6 | 90 - 110 | | |
| Sodium | | 50.0 | 47.5 | mg/L | 95.0 | 90 - 110 | | |
| Vanadium | | 1.00 | 0.929 | mg/L | 92.9 | 90 - 110 | | |
| Zinc | | 1.00 | 0.970 | mg/L | 97.0 | 90 - 110 | | |

* Exceeds LIMITS Criteria

KEMRON FORMS - Modified 09/06/2007 - (CCV)
Version 1.5 PDF File ID: 922482
Report generated 11/01/2007 11:49

CONTINUING CALIBRATION VERIFICATION (CCV)

00078761

Login Number: L0710596 Run Date: 10/31/2007 Sample ID: WG254405-26
Instrument ID: PE-ICP2 Run Time: 18:41 Method: 6010B
File ID: P2.103107.184129 Analyst: KHR QC Key: STD
Workgroup (AAB#): WG254046 Cal ID: PE-ICP - 31-OCT-07

| Analyte | | Expected | Found | UNITS | %REC | LIMITS | | Q |
|---|---|---|---|---|---|---|---|---|
| Aluminum | | 10.0 | 9.59 | mg/L | 95.9 | 90 - 110 | | |
| Beryllium | | 0.0500 | 0.0472 | mg/L | 94.4 | 90 - 110 | | |
| Calcium | | 10.0 | 9.81 | mg/L | 98.1 | 90 - 110 | | |
| Cobalt | | 0.200 | 0.189 | mg/L | 94.4 | 90 - 110 | | |
| Iron | | 4.00 | 3.74 | mg/L | 93.5 | 90 - 110 | | |
| Potassium | | 50.0 | 48.0 | mg/L | 96.0 | 90 - 110 | | |
| Magnesium | | 10.0 | 9.33 | mg/L | 93.3 | 90 - 110 | | |
| Sodium | | 50.0 | 47.4 | mg/L | 94.9 | 90 - 110 | | |
| Vanadium | | 1.00 | 0.924 | mg/L | 92.4 | 90 - 110 | | |
| Zinc | | 1.00 | 0.960 | mg/L | 96.0 | 90 - 110 | | |

* Exceeds LIMITS Criteria

KEMRON FORMS - Modified 09/06/2007 - (CCV)
Version 1.5 PDF File ID: 922482
Report generated 11/01/2007 11:49

CONTINUING CALIBRATION VERIFICATION (CCV)

00078762

Login Number: L0710596 Run Date: 11/01/2007 Sample ID: WG254439-10
Instrument ID: PE-ICP2 Run Time: 09:04 Method: 6010B
File ID: P2.110107.090441 Analvst: KRV QC Key: STD
Workgroup (AAB#): WG254046 Cal ID: PE-ICP - 01-NOV-07

| Analyte | | Expected | Found | UNITS | %REC | LIMITS | | Q |
|---|---|---|---|---|---|---|---|---|
| Aluminum | | 10.0 | 10.2 | mg/L | 102 | 90 - 110 | | |
| Beryllium | | 0.0500 | 0.0505 | mg/L | 101 | 90 - 110 | | |
| Calcium | | 10.0 | 10.3 | mg/L | 103 | 90 - 110 | | |
| Cobalt | | 0.200 | 0.202 | mg/L | 101 | 90 - 110 | | |
| Iron | | 4.00 | 4.08 | mg/L | 102 | 90 - 110 | | |
| Potassium | | 50.0 | 52.1 | mg/L | 104 | 90 - 110 | | |
| Magnesium | | 10.0 | 9.95 | mg/L | 99.5 | 90 - 110 | | |
| Sodium | | 50.0 | 50.8 | mg/L | 102 | 90 - 110 | | |
| Vanadium | | 1.00 | 0.988 | mg/L | 98.8 | 90 - 110 | | |
| Zinc | | 1.00 | 1.04 | mg/L | 104 | 90 - 110 | | |

* Exceeds LIMITS Criteria

KEMRON FORMS - Modified 09/06/2007 - (CCV)
Version 1.5 PDF File ID: 922482
Report generated 11/01/2007 11:49

CONTINUING CALIBRATION VERIFICATION (CCV)

00078763

Login Number: L0710596 | Run Date: 11/01/2007 | Sample ID: WG254439-12
Instrument ID: PE-ICP2 | Run Time: 10:36 | Method: 6010B
File ID: P2.110107.103640 | Analyst: KRV | QC Key: STD
Workgroup (AAB#): WG254046 | Cal ID: PE-ICP - 01-NOV-07

| Analyte | | Expected | Found | UNITS | %REC | LIMITS | | Q |
|---|---|---|---|---|---|---|---|---|
| Aluminum | | 10.0 | 10.3 | mg/L | 103 | 90 - 110 | | |
| Beryllium | | 0.0500 | 0.0512 | mg/L | 102 | 90 - 110 | | |
| Calcium | | 10.0 | 10.6 | mg/L | 106 | 90 - 110 | | |
| Cobalt | | 0.200 | 0.207 | mg/L | 103 | 90 - 110 | | |
| Iron | | 4.00 | 4.19 | mg/L | 105 | 90 - 110 | | |
| Potassium | | 50.0 | 51.7 | mg/L | 103 | 90 - 110 | | |
| Magnesium | | 10.0 | 10.2 | mg/L | 102 | 90 - 110 | | |
| Sodium | | 50.0 | 51.1 | mg/L | 102 | 90 - 110 | | |
| Vanadium | | 1.00 | 1.01 | mg/L | 101 | 90 - 110 | | |
| Zinc | | 1.00 | 1.06 | mg/L | 106 | 90 - 110 | | |

* Exceeds LIMITS Criteria

KEMRON FORMS - Modified 09/06/2007 - (CCV)
Version 1.5 PDF File ID: 922482
Report generated 11/01/2007 11:49

# KEMRON ENVIRONMENTAL SERVICES
## INTERFERENCE CHECK SAMPLES

**Login number:** L0710596
**Instrument ID:** PE-ICP2
**Sol. A :** WG254405-08 **File ID:** P2.103107.094822
**Sol. AB :** WG254405-09 **File ID:** P2.103107.095342

**Workgroup (AAB#):** WG254046
**Method:** 6010B
**Units:** mg/L

| | Sol. A | | | Sol. AB | | | |
|---|---|---|---|---|---|---|---|
| ANALYTE | True | Found | %Recovery | True | Found | %Recovery | Q |
| Aluminum | 250 | 247 | 98.8 | 250 | 247 | 98.8 | |
| Beryllium | NS | 0.000300 | NS | 0.250 | 0.247 | 98.8 | |
| Calcium | 250 | 255 | 102 | 250 | 261 | 104 | |
| Cobalt | NS | 0.000420 | NS | 0.250 | 0.235 | 94.0 | |
| Iron | 100 | 98.2 | 98.2 | 100 | 99.6 | 99.6 | |
| Magnesium | 250 | 254 | 102 | 250 | 258 | 103 | |
| Potassium | NS | -0.411 | NS | 5.00 | 5.85 | 117 | |
| Sodium | NS | 0.0668 | NS | 5.00 | 5.36 | 107 | |
| Vanadium | NS | 0.00800 | NS | 0.250 | 0.252 | 101 | |
| Zinc | NS | -0.00707 | NS | 0.500 | 0.466 | 93.2 | |

**NS = Not spiked**
*** = Recovery of spiked element is outside acceptance limit of 80% - 120% of true value.**
**# = Result for unspiked element is outside the acceptance limits of (+/-) the project reporting limit (RL).**

**KEMRON FORMS - Modified 03/05/2007**
**Version 1.3 PDF File ID: 922481**
**Report generated 11/01/2007 11:49**

**Login number:** L0710596 **Workgroup (AAB#):** WG254046
**Instrument ID:** PE-ICP2 **Method:** 6010B
**Sol. A :** WG254439-08 **File ID:** P2.110107.085358 **Units:** mg/L
**Sol. AB :** WG254439-09 **File ID:** P2.110107.085917

| | **Sol. A** | | | **Sol. AB** | | | |
|---|---|---|---|---|---|---|---|
| ANALYTE | True | Found | %Recovery | True | Found | %Recovery | Q |
| Aluminum | 250 | 253 | 101 | 250 | 253 | 101 | |
| Beryllium | NS | -0.000100 | NS | 0.250 | 0.250 | 100 | |
| Calcium | 250 | 258 | 103 | 250 | 267 | 107 | |
| Cobalt | NS | 0.000720 | NS | 0.250 | 0.241 | 96.4 | |
| Iron | 100 | 102 | 102 | 100 | 103 | 103 | |
| Magnesium | 250 | 264 | 106 | 250 | 265 | 106 | |
| Potassium | NS | -0.493 | NS | 5.00 | 5.98 | 120 | |
| Sodium | NS | 0.0621 | NS | 5.00 | 5.65 | 113 | |
| Vanadium | NS | 0.00604 | NS | 0.250 | 0.257 | 103 | |
| Zinc | NS | -0.00559 | NS | 0.500 | 0.479 | 95.8 | |

**NS = Not spiked**
*** = Recovery of spiked element is outside acceptance limit of 80% - 120% of true value.**
**# = Result for unspiked element is outside the acceptance limits of (+/-) the project reporting limit (RL).**

**KEMRON FORMS - Modified 03/05/2007**
**Version 1.3 PDF File ID: 922481**
**Report generated 11/01/2007 11:49**

 00078766

**Login Number:** L0710596 **Date:** 01/08/2007
**Insturment ID:** PE-ICP2 **Method:** 6010B

| Analyte | Wave Length | AG | AL | AS | B | BA |
|---|---|---|---|---|---|---|
| ALUMINUM | 396.15 | 0 | 0 | 0.206 | 0 | 0 |
| ANTIMONY | 206.84 | 0 | 0 | -0.740 | 0 | 0 |
| ARSENIC | 188.98 | 0 | 0.0237 | 0 | 0 | 0 |
| BARIUM | 233.53 | 0 | 0 | 0 | 0 | 0 |
| BERYLLIUM | 234.86 | 0 | 0 | 0 | 0 | 0 |
| BORON | 249.68 | 0 | 0 | 0 | 0 | 0 |
| CADMIUM | 228.80 | 0 | -0.000453 | 1.00 | 0 | 0 |
| CALCIUM | 227.55 | 0 | -0.370 | 0.0414 | 0 | 0 |
| CHROMIUM | 267.72 | 0 | 0 | 0 | 0 | 0 |
| COBALT | 228.62 | 0 | 0 | 0 | 0 | -0.0647 |
| COPPER | 327.39 | 0 | 0 | 0 | 0 | 0 |
| IRON | 239.56 | 0 | 0 | 0 | 0 | 0 |
| LEAD | 220.35 | 0 | -0.143 | 0 | 0 | 0 |
| LITHIUM | 670.78 | 0 | 0 | 0 | 0 | 0 |
| MAGNESIUM | 279.08 | 0 | 0 | 0 | 0 | 0 |
| MANGANESE | 257.61 | -0.185 | 0 | -0.231 | -0.0949 | -0.230 |
| MOLYBDENUM | 202.03 | 0 | 0 | 0 | 0 | 0 |
| NICKEL | 231.60 | 0 | 0 | 0 | 0 | 0 |
| POTASSIUM | 766.49 | 0 | 0 | 0 | 0 | 0 |
| SELENIUM | 196.03 | 0 | 0.0416 | 0 | 0 | 0 |
| SILICON | 251.61 | 0 | 0 | 0 | 0 | 0 |
| SILVER | 328.07 | 0 | 0 | 0 | 0 | 0 |
| SODIUM | 589.59 | 0 | 0 | 0 | 0 | 0 |
| STRONTIUM | 407.77 | 0 | 0 | 0 | 0 | 0 |
| THALLIUM | 190.80 | 0 | 0 | 0 | 0 | 0 |
| TIN | 189.93 | 0 | 0 | 0 | 0 | 0 |
| TITANIUM | 334.94 | 0 | 0 | 0 | 0 | 0 |
| VANADIUM | 290.88 | 0.504 | 0 | 0.200 | 0 | -0.130 |
| ZINC | 206.20 | 0 | 0 | 0 | 0 | 0 |

**Login Number:** L0710596 **Date:** 01/08/2007
**Insturment ID:** PE-ICP2 **Method:** 6010B

| Analyte | Wave Length | BE | CA | CD | CO | CR |
|---|---|---|---|---|---|---|
| ALUMINUM | 396.15 | 0 | 0.274 | 0 | 0 | 0 |
| ANTIMONY | 206.84 | 0 | 0 | 0 | 0 | 19.8 |
| ARSENIC | 188.98 | 0 | -0.0104 | -0.0875 | 0 | -3.78 |
| BARIUM | 233.53 | 0 | 0 | 0 | 0 | 0 |
| BERYLLIUM | 234.86 | 0 | 0 | 0 | 0 | -0.0105 |
| BORON | 249.68 | 0 | 0.0238 | 50.1 | 3.51 | 1.50 |
| CADMIUM | 228.80 | 0 | 0 | 0 | -7.33 | 0 |
| CALCIUM | 227.55 | 0 | 0 | 0 | 174 | -21.8 |
| CHROMIUM | 267.72 | 0 | 0 | 0 | 0 | 0 |
| COBALT | 228.62 | 0 | 0 | 0 | 0 | 0.436 |
| COPPER | 327.39 | 0 | -0.0137 | 0 | 0.380 | -0.0467 |
| IRON | 239.56 | 0 | 0.0227 | 0 | 1.91 | 0.331 |
| LEAD | 220.35 | 0 | -0.0214 | 0 | 0.666 | -0.100 |
| LITHIUM | 670.78 | 0 | 0 | 0 | 0 | 0 |
| MAGNESIUM | 279.08 | 0 | 0.638 | 0 | 0 | 0 |
| MANGANESE | 257.61 | -1.04 | -0.0173 | -0.755 | -0.0418 | -0.110 |
| MOLYBDENUM | 202.03 | 0 | 0 | 0 | 0 | 0 |
| NICKEL | 231.60 | 0 | 0 | 0 | 0.948 | 0 |
| POTASSIUM | 766.49 | 0 | 0 | 0 | 0 | 0 |
| SELENIUM | 196.03 | 0 | 0.0228 | 0 | -0.382 | 0 |
| SILICON | 251.61 | 0 | 0 | 0 | 0 | 0 |
| SILVER | 328.07 | 0 | 0 | 0 | 0 | 0 |
| SODIUM | 589.59 | 0 | 0 | 0 | 0 | 0 |
| STRONTIUM | 407.77 | 0 | 0 | 0 | 0 | 0 |
| THALLIUM | 190.80 | 0 | 0 | 0 | 2.97 | 0 |
| TIN | 189.93 | 0 | 0 | 0 | 0 | 0 |
| TITANIUM | 334.94 | 0 | -0.0233 | 0 | 0 | 0.297 |
| VANADIUM | 290.88 | 0 | 0.00481 | 0 | 0 | 0 |
| ZINC | 206.20 | 0 | 0.00300 | 0 | 0 | -6.39 |

**Login Number:** L0710596 **Date:** 01/08/2007
**Insturment ID:** PE-ICP2 **Method:** 6010B

| Analyte | Wave Length | CU | FE | K | LI | MG |
|---|---|---|---|---|---|---|
| ALUMINUM | 396.15 | 0 | 0.108 | 0 | 0 | 0 |
| ANTIMONY | 206.84 | 0 | 0 | 0 | 0 | 0 |
| ARSENIC | 188.98 | 0 | -0.115 | 0 | 0 | 0.0133 |
| BARIUM | 233.53 | 0 | 0.0217 | 0 | 0 | 0 |
| BERYLLIUM | 234.86 | 0 | 0.171 | 0 | 0 | 0 |
| BORON | 249.68 | 0 | -4.09 | 0 | 0 | 0 |
| CADMIUM | 228.80 | 0 | -0.00172 | 0 | 0 | 0 |
| CALCIUM | 227.55 | -2.44 | -8.15 | 0 | 0 | 0.104 |
| CHROMIUM | 267.72 | 0 | -0.0115 | 0 | 0 | 0 |
| COBALT | 228.62 | 0 | 0 | 0 | 0 | 0 |
| COPPER | 327.39 | 0 | -0.0550 | 0 | 0 | 0 |
| IRON | 239.56 | 0 | 0 | 0 | 0 | 0.0276 |
| LEAD | 220.35 | 0.341 | 0.0593 | 0 | 0 | 0 |
| LITHIUM | 670.78 | 0 | 0 | 0 | 0 | 0 |
| MAGNESIUM | 279.08 | 0 | 0.174 | 0 | 0 | 0 |
| MANGANESE | 257.61 | -0.0457 | -0.0659 | -0.0181 | -0.794 | 0.0147 |
| MOLYBDENUM | 202.03 | 0 | -0.0342 | 0 | 11.9 | 0 |
| NICKEL | 231.60 | 0 | 0 | 0 | 0 | 0 |
| POTASSIUM | 766.49 | 0 | 0.831 | 0 | 0 | 0 |
| SELENIUM | 196.03 | 0 | -0.444 | 0 | 0 | 0.00120 |
| SILICON | 251.61 | 0 | 0 | 0 | 0 | 0 |
| SILVER | 328.07 | 0.0717 | -0.0541 | 0 | 0 | 0.00521 |
| SODIUM | 589.59 | 0 | 0 | 0 | 0 | 0 |
| STRONTIUM | 407.77 | 0 | -16.4 | 0 | 0 | 0 |
| THALLIUM | 190.80 | 0 | 0 | 0 | 0 | 0 |
| TIN | 189.93 | 0 | 0 | 0 | 0 | 0 |
| TITANIUM | 334.94 | 0 | 0 | 0 | 0 | 0.0284 |
| VANADIUM | 290.88 | 0 | -0.0723 | 0 | 0 | -0.0542 |
| ZINC | 206.20 | -0.309 | 0.00450 | 0 | 0 | 0 |

**Login Number:** L0710596 **Date:** 01/08/2007
**Insturment ID:** PE-ICP2 **Method:** 6010B

| Analyte | Wave Length | MN | MO | NA | NI | PB |
|---|---|---|---|---|---|---|
| ALUMINUM | 396.15 | 0 | 51.0 | 0 | 0 | 0 |
| ANTIMONY | 206.84 | 0 | -17.4 | 0 | 0 | 0 |
| ARSENIC | 188.98 | 0 | 3.15 | 0 | 0 | 0 |
| BARIUM | 233.53 | 0 | -0.740 | 0 | 0 | 0 |
| BERYLLIUM | 234.86 | -0.131 | -0.545 | 0 | -0.00974 | 0 |
| BORON | 249.68 | 0 | -2.08 | 0 | 0 | 0 |
| CADMIUM | 228.80 | 0 | 0 | 0 | -0.0660 | 0 |
| CALCIUM | 227.55 | 0 | -25.0 | 0 | -1100 | 0 |
| CHROMIUM | 267.72 | 0.554 | -0.0135 | 0 | 0 | 0 |
| COBALT | 228.62 | 0 | -0.668 | 0 | 0.129 | 0 |
| COPPER | 327.39 | 0 | -0.519 | 0 | -0.0905 | -0.0630 |
| IRON | 239.56 | -1.38 | 0 | 0 | 0 | 0 |
| LEAD | 220.35 | 0.232 | -2.35 | 0 | 0 | 0 |
| LITHIUM | 670.78 | 0 | 0 | 0 | 0 | 0 |
| MAGNESIUM | 279.08 | 0 | -5.58 | 0 | 0 | 0.0252 |
| MANGANESE | 257.61 | 0 | -0.0482 | -0.00916 | -0.0340 | -0.0413 |
| MOLYBDENUM | 202.03 | -0.209 | 0 | 0 | 0.134 | 0 |
| NICKEL | 231.60 | 0 | 0 | 0 | 0 | 0 |
| POTASSIUM | 766.49 | 0 | 0 | 0.0278 | 0 | 0 |
| SELENIUM | 196.03 | 1.11 | 0.199 | 0 | -0.202 | 0 |
| SILICON | 251.61 | 0 | 12.9 | 0 | 0 | 0 |
| SILVER | 328.07 | 0.130 | 0.0781 | 0 | 0 | 0 |
| SODIUM | 589.59 | 0 | 0 | 0.181 | 0 | 0 |
| STRONTIUM | 407.77 | 0 | 0 | 0 | 0 | 0 |
| THALLIUM | 190.80 | -1.50 | 0.660 | 0 | 0 | 0 |
| TIN | 189.93 | 0 | 0 | 0 | 0 | 0 |
| TITANIUM | 334.94 | 0 | 0 | 0 | 0 | 0 |
| VANADIUM | 290.88 | 0 | 0.578 | 0 | 0 | 0 |
| ZINC | 206.20 | 0 | 0 | 0 | -0.244 | -0.330 |

**Login Number:** L0710596 **Date:** 01/08/2007
**Insturment ID:** PE-ICP2 **Method:** 6010B

| Analyte | Wave Length | SB | SE | SI | SN | SR |
|---|---|---|---|---|---|---|
| ALUMINUM | 396.15 | 0 | 0 | 0 | 0 | 0 |
| ANTIMONY | 206.84 | 0 | 0 | 0 | -7.64 | 0 |
| ARSENIC | 188.98 | 0 | 0 | 0 | 0 | 0 |
| BARIUM | 233.53 | 0 | 0 | 0 | 0 | 0 |
| BERYLLIUM | 234.86 | 0 | 0 | 0 | 0 | 0 |
| BORON | 249.68 | 0 | 0 | 0 | 0 | 0 |
| CADMIUM | 228.80 | 0 | 0 | 0 | 0 | 0 |
| CALCIUM | 227.55 | 0 | 0 | 2.79 | 0 | 0 |
| CHROMIUM | 267.72 | 0 | -0.0706 | 0 | 0 | 0 |
| COBALT | 228.62 | 0 | 0 | 0 | 0 | 0 |
| COPPER | 327.39 | 0 | 0 | 0 | 0 | 0 |
| IRON | 239.56 | 0 | 0 | 0 | 0 | 0 |
| LEAD | 220.35 | -0.117 | 0 | 0 | 0 | 0 |
| LITHIUM | 670.78 | 0 | 0 | 0 | 0 | 0 |
| MAGNESIUM | 279.08 | 0 | -0.0924 | 0 | 0 | 0 |
| MANGANESE | 257.61 | -0.0505 | -0.0281 | -0.185 | -0.0445 | -0.625 |
| MOLYBDENUM | 202.03 | 0 | 0 | 0 | 0 | 0 |
| NICKEL | 231.60 | -0.288 | -0.262 | 0 | 0 | 0 |
| POTASSIUM | 766.49 | 0 | 0 | 0 | 0 | 0 |
| SELENIUM | 196.03 | 0 | 0 | 0 | 0 | 0 |
| SILICON | 251.61 | 0 | 0 | 0 | 0 | 0 |
| SILVER | 328.07 | 0 | 0 | 0 | 0 | 1.61 |
| SODIUM | 589.59 | 0 | 0 | 0 | 0 | 0 |
| STRONTIUM | 407.77 | 0 | 0 | 0 | 0 | 0 |
| THALLIUM | 190.80 | 0 | 0 | 0 | 0 | 0 |
| TIN | 189.93 | 0 | 0 | 0 | 0 | 0 |
| TITANIUM | 334.94 | 0 | 0 | 0 | 0 | 0 |
| VANADIUM | 290.88 | 0 | 0 | 0 | 0 | 0 |
| ZINC | 206.20 | -0.420 | 0 | 0 | 0 | 0 |

**Login Number:** L0710596 **Date:** 01/08/2007
**Insturment ID:** PE-ICP2 **Method:** 6010B

| Analyte | Wave Length | TI | TL | V | ZN |
|---|---|---|---|---|---|
| ALUMINUM | 396.15 | 0 | 0 | 0 | 0 |
| ANTIMONY | 206.84 | 0 | 0 | -3.59 | 0 |
| ARSENIC | 188.98 | 0 | 0 | 0.0930 | 0 |
| BARIUM | 233.53 | 0 | 0 | -2.27 | 0 |
| BERYLLIUM | 234.86 | 0 | 0 | 0 | 0 |
| BORON | 249.68 | 0 | 0 | 0 | 0 |
| CADMIUM | 228.80 | 0 | 0 | 0.0980 | 0 |
| CALCIUM | 227.55 | 0 | 0 | 11.3 | 0 |
| CHROMIUM | 267.72 | 0 | 0 | -0.605 | -0.0845 |
| COBALT | 228.62 | 2.07 | 0 | 0 | 0 |
| COPPER | 327.39 | -1.79 | 0 | -0.842 | -0.0613 |
| IRON | 239.56 | 0 | 0 | 0 | 0 |
| LEAD | 220.35 | -0.776 | 0 | -0.153 | 0 |
| LITHIUM | 670.78 | 0 | 0 | 0 | 0 |
| MAGNESIUM | 279.08 | 0 | 0 | -0.0280 | 0 |
| MANGANESE | 257.61 | -0.227 | -0.0414 | -0.0601 | -0.0553 |
| MOLYBDENUM | 202.03 | 0 | 0 | -0.288 | 0 |
| NICKEL | 231.60 | 0 | 0.286 | 0 | 0 |
| POTASSIUM | 766.49 | 0 | 0 | 0 | 0 |
| SELENIUM | 196.03 | 0 | 0 | 0.593 | 0 |
| SILICON | 251.61 | 0 | 0 | 0 | 0 |
| SILVER | 328.07 | 0 | 0 | -6.38 | 0 |
| SODIUM | 589.59 | 0 | 0 | 0 | 0 |
| STRONTIUM | 407.77 | 0 | 0 | 0 | 0 |
| THALLIUM | 190.80 | -10.1 | 0 | 0 | 0 |
| TIN | 189.93 | 0 | 0 | 0 | 0 |
| TITANIUM | 334.94 | 0 | 0 | 0 | 0 |
| VANADIUM | 290.88 | 0 | 0 | 0 | 0 |
| ZINC | 206.20 | 0 | 0 | -0.100 | 0 |

# LINEAR RANGE (QUARTERLY)

00078772

**Login Number:** L0710596 **Date:** 09/11/2007
**Insturment ID:** PE-ICP2 **Method:** 6010B

| Analyte | Integration Time (Sec.) | Concentration (mg/L) |
|---|---|---|
| Aluminum | 10.00 | 450.0 |
| Antimony | 10.00 | 36.0 |
| Arsenic | 10.00 | 9.0 |
| Barium | 10.00 | 9.0 |
| Beryllium | 10.00 | 1.8 |
| Boron | 10.00 | 18.0 |
| Cadmium | 10.00 | 2.7 |
| Calcium | 10.00 | 450.0 |
| Chromium | 10.00 | 45.0 |
| Cobalt | 10.00 | 45.0 |
| Copper | 10.00 | 45.0 |
| Iron | 10.00 | 360.0 |
| Lead | 10.00 | 45.0 |
| Lithium | 10.00 | 1.8 |
| Magnesium | 10.00 | 450.0 |
| Manganese | 10.00 | 27.0 |
| Molybdenum | 10.00 | 45.0 |
| Nickel | 10.00 | 45.0 |
| Potassium | 10.00 | 90.0 |
| Selenium | 10.00 | 45.0 |
| Silicon | 10.00 | 9.0 |
| Silver | 10.00 | 9.0 |
| Sodium | 10.00 | 180.0 |
| Strontium | 10.00 | 2.7 |
| Thallium | 10.00 | 45.0 |
| Tin | 10.00 | 45.0 |
| Titanium | 10.00 | 9.0 |
| Vanadium | 10.00 | 45.0 |
| Zinc | 10.00 | 36.0 |

**Comments:**

# 2.2.2 Metals ICP-MS Data

# 2.2.2.1 Summary Data

# LABORATORY REPORT

00078775

**L0710596**

**11/02/07 10:41**

**Submitted By**

**KEMRON Environmental Services**
**156 Starlite Drive**
**Marietta , OH 45750**
**( 740 ) 373 - 4071**

**For**

Account Name: Shaw E & I, Inc.
ABB Lummus Biulding
3010 Briarpark Drive Suite 4N
Houston, TX 77042
Attention: Larry Duty

Account Number: 2773
Work ID: LHAAD

P.O. Number: 322255 OP

## Sample Analysis Summary

| Client ID | Lab ID | Method | Dilution | Date Received |
|---|---|---|---|---|
| 47WWZZ-101807 | L0710596-12 | 6020 | 10 | 23-OCT-07 |
| 47WWZZ-101807 | L0710596-12 | 6020 | 100 | 23-OCT-07 |
| EQUIPMENT RINSE | L0710596-14 | 6020 | 1 | 23-OCT-07 |

Sample Number:L0710596-12
Client ID:47WWZZ-101807
Matrix:Water
Workgroup Number:WG253774
Collect Date:10/18/2007 09:55
Sample Tag:DL01

PrePrep Method:NONE
Prep Method:3015
Analytical Method:6020
Analyst:JYH
Dilution:10
Units:mg/L

Instrument:ELAN-ICP
Prep Date:10/24/2007 07:00
Cal Date:10/25/2007 09:37
Run Date:10/25/2007 11:20
File ID:EL.102507.112018

| Analyte | CAS. Number | Result | Qual | PQL | SDL |
|---|---|---|---|---|---|
| Silver, Dissolved | 7440-22-4 | | U | 0.0100 | 0.00250 |
| Arsenic, Dissolved | 7440-38-2 | 0.0115 | | 0.0100 | 0.00250 |
| Barium, Dissolved | 7440-39-3 | 0.120 | | 0.0300 | 0.00500 |
| Cadmium, Dissolved | 7440-43-9 | 0.00259 | J | 0.00500 | 0.00125 |
| Chromium, Dissolved | 7440-47-3 | 0.129 | | 0.0200 | 0.00500 |
| Copper, Dissolved | 7440-50-8 | 0.0157 | J | 0.0200 | 0.00500 |
| Lead, Dissolved | 7439-92-1 | 0.00832 | | 0.00500 | 0.00250 |
| Manganese, Dissolved | 7439-96-5 | 1.84 | | 0.0200 | 0.00500 |
| Antimony, Dissolved | 7440-36-0 | | U | 0.0100 | 0.00250 |
| Selenium, Dissolved | 7782-49-2 | 0.0446 | | 0.0100 | 0.00500 |
| Thallium, Dissolved | 7440-28-0 | | U | 0.00200 | 0.000500 |

U Not detected at or above adjusted sample detection limit
J The analyte was positively identified, but the quantitation was below the RL

Report Number: **L0710596**

Report Date : **November 2, 2007**

00078777

Sample Number: **L0710596-12**
Client ID: **47WWZZ-101807**
Matrix: **Water**
Workgroup Number: **WG253774**
Collect Date: **10/18/2007 09:55**
Sample Tag: **DL02**

PrePrep Method: **NONE**
Prep Method: **3015**
Analytical Method: **6020**
Analyst: **JYH**
Dilution: **100**
Units: **mg/L**

Instrument: **ELAN-ICP**
Prep Date: **10/24/2007 07:00**
Cal Date: **10/25/2007 09:37**
Run Date: **10/25/2007 14:04**
File ID: **EL.102507.140430**

| Analyte | CAS. Number | Result | Qual | PQL | SDL |
|---|---|---|---|---|---|
| Nickel, Dissolved | 7440-02-0 | 9.49 | | 0.400 | 0.100 |

Sample Number:L0710596-14
Client ID:EQUIPMENT RINSE
Matrix:Water
Workgroup Number:WG253774
Collect Date:10/22/2007 14:20
Sample Tag:01

PrePrep Method:NONE
Prep Method:3015
Analytical Method:6020
Analyst:JYH
Dilution:1
Units:mg/L

Instrument:ELAN-ICP
Prep Date:10/24/2007 07:00
Cal Date:10/25/2007 09:37
Run Date:10/25/2007 11:39
File ID:EL.102507.113954

| Analyte | CAS. Number | Result | Qual | PQL | SDL |
|---|---|---|---|---|---|
| Silver, Dissolved | 7440-22-4 | | U | 0.00100 | 0.000250 |
| Arsenic, Dissolved | 7440-38-2 | | U | 0.00100 | 0.000250 |
| Barium, Dissolved | 7440-39-3 | 0.0109 | | 0.00300 | 0.000500 |
| Cadmium, Dissolved | 7440-43-9 | | U | 0.000500 | 0.000125 |
| Chromium, Dissolved | 7440-47-3 | 0.00496 | | 0.00200 | 0.000500 |
| Copper, Dissolved | 7440-50-8 | 0.00147 | J | 0.00200 | 0.000500 |
| Lead, Dissolved | 7439-92-1 | 0.000791 | | 0.000500 | 0.000250 |
| Manganese, Dissolved | 7439-96-5 | 0.0285 | | 0.00200 | 0.000500 |
| Nickel, Dissolved | 7440-02-0 | 0.00239 | J | 0.00400 | 0.00100 |
| Antimony, Dissolved | 7440-36-0 | | U | 0.00100 | 0.000250 |
| Selenium, Dissolved | 7782-49-2 | | U | 0.00100 | 0.000500 |
| Thallium, Dissolved | 7440-28-0 | | U | 0.000200 | 0.0000500 |

U Not detected at or above adjusted sample detection limit
J The analyte was positively identified, but the quantitation was below the RL

# 2.2.2.2 QC Summary Data

**Example 6020 Calculations**
**Perkin Elmer ELAN 6100**

**1.0 Initial Calibration (ICAL) Parameters**
The system performs linear regression from data consisting of a blank and three standards.

**2.0 Calculating the concentration (C) of an element in water using data from prep log, run log, and quantitation report (note:the data system performs this calculation automatically when correction factors have been entered):**

$$Cx = Cs \times \frac{Vf}{Vi} \times D$$

| Where: | **Example:** |
|---|---|
| $Cs$ = Concentration computed by the data system (ug/L) | 0.1 |
| $Vf$ = Final volume | 100 |
| $Vi$ = Initial volume | 40 |
| $D$ = Dilution factor as a multiplier (10X = 10) | 1 |
| | |
| $Cx$ = Concentration of element in (ug/L) | 0.25 |

**3.0 Calculating the concentration (C) of an element in soil using data from prep log, run log, and quantitation report (note: the data system performs this calculation automatically when correction factors have been entered):**

$$Cx = Cs \times \frac{Vf}{Vi} \times D$$

| Where: | **Example:** |
|---|---|
| $Cs$ = Concentration computed by the data system (ug/L) | 0.1 |
| $Vf$ = Final volume | 200 |
| $Vi$ = Initial volume | 0.5 |
| $D$ = Dilution factor as a multiplier (10X = 10) | 1 |
| | |
| $Cx$ = Concentration of element in (ug/kg) | 40 |

**4.0 Adjusting the concentration to dry weight:**

$$Cdry = \frac{Cx \times 100}{Px}$$

| Where: | **Example:** |
|---|---|
| $Cx$ = Concentration calculated as received (wet basis) | 40 |
| $Px$ = Percent solids of sample (%wt) | 80 |
| | |
| $Cdry$ = Concentration calculated as dry weight (ug/kg) | 50 |

**50 ug/kg = 0.050 mg/kg**

**Perkin Elmer ELAN ICP/MS**

STANDARDS KEY

**QC Std 1 - ICV**
**QC Std 2 - ICB**
**QC Std 3 - CRI - Soil**
**QC Std 4 - CRI - Water**
**QC Std 5 - ICSA**
**QC Std 6 - ICSAB**
**QC Std 7 - CCV**
**QC Std 8 - CCB**

Calibration Solutions

| Analyte | Stock Conc. (mg/L) | S1 (mg/L) | S2 (mg/L) | S3 (mg/L) | S4 (mg/L) |
|---|---|---|---|---|---|
| Al | 10 | 0 | 0.0004 | 0.05 | 0.1 |
| Sb | 10 | 0 | 0.0004 | 0.05 | 0.1 |
| As | 10 | 0 | 0.0004 | 0.05 | 0.1 |
| Ba | 10 | 0 | 0.0004 | 0.05 | 0.1 |
| Be | 10 | 0 | 0.0004 | 0.05 | 0.1 |
| Ca | 1000 | 0 | 0.04 | 5 | 10 |
| Cd | 10 | 0 | 0.0004 | 0.05 | 0.1 |
| Cr | 10 | 0 | 0.0004 | 0.05 | 0.1 |
| Co | 10 | 0 | 0.0004 | 0.05 | 0.1 |
| Cu | 10 | 0 | 0.0004 | 0.05 | 0.1 |
| Fe | 1000 | 0 | 0.04 | 5 | 10 |
| Pb | 10 | 0 | 0.0004 | 0.05 | 0.1 |
| Mg | 1000 | 0 | 0.04 | 5 | 10 |
| Mn | 10 | 0 | 0.0004 | 0.05 | 0.1 |
| Ni | 10 | 0 | 0.0004 | 0.05 | 0.1 |
| K | 1000 | 0 | 0.04 | 5 | 10 |
| Se | 10 | 0 | 0.0004 | 0.05 | 0.1 |
| Ag | 10 | 0 | 0.0004 | 0.05 | 0.1 |
| Na | 1000 | 0 | 0.04 | 5 | 10 |
| Tl | 10 | 0 | 0.0004 | 0.05 | 0.1 |
| V | 10 | 0 | 0.0004 | 0.05 | 0.1 |
| Zn | 10 | 0 | 0.0004 | 0.05 | 0.1 |

KEMRON ENVIRONMENTAL SERVICES



# Microwave Digestion Log

Analyst(s): VC
Date: 10/24/07 07:00
LCS: .25mL STD 21717
MS/MSD: .25mL STD 21717
Witness: [illegible]
HNO₃ Lot #: 60A12417
HCl Lot #: —
Digest Tube Lot #: C0A12609
Earliest Sample Due Date: 10/26
Microwave #: MW2

Box: 87
1298039
Digestion Work Group: WG 253712
**ME407 Revision #** 8 Method 3015-Water
**ME406 Revision #** ____ Method 3051-Soil-Oil

Relinquished By: VC
Digest Received By: [illegible] Date: 10/24/07

| | KEMRON # | Initial Wt/Vol | Final Volume | Initial Weight | Final Weight | Comments | Due Date |
|---|---|---|---|---|---|---|---|
| 1 | PBW | 40mL | 100mL | 263.31 | 263.30 | 02 | |
| 2 | LCS | | | 204.52 | 204.51 | 03 | |
| 3 | 10-539-01 | | | 208.46 | 208.38 | | |
| 4 | 02 | | | 204.58 | 204.55 | Lab Filtered 05 | 11/1 |
| 5 | 02 MS | | | 204.35 | 204.31 | 04 | |
| 6 | 02 MSD | | | 204.57 | 204.55 | 05 | |
| 7 | 03 | | | 204.68 | 204.66 | | |
| 8 | 04 | | | 208.60 | 208.51 | Lab Filtered | 11/1 |
| 9 | 540 01 | | | 207.53 | 207.48 | | |
| 10 | 02 | | | 207.04 | 207.01 | Lab Filtered | |
| 11 | 03 | | | 205.73 | 205.69 | | |
| 12 | 04 | | | 205.17 | 205.16 | Lab Filtered | |
| 13 | 596-12 | | | 206.09 | 206.07 | Lab Filtered | 10/30 |
| 14 | 14 | | | 206.77 | 206.76 | | |
| 15 | 610 01 | | | 204.87 | 204.86 | | 10/26 |
| 16 | 02 | | | 208.23 | 208.22 | | |
| 17 | 03 | | | 207.59 | 207.58 | | |
| 18 | 04 | | | 207.07 | 207.06 | | |
| 19 | 615 01 | | | 266.71 | 266.71 | | 10/30 |
| 20 | 02 | | | 207.50 | 207.49 | | |
| 21 | 03 | | | 266.71 | 266.70 | | |
| 22 | 04 | | | 208.62 | 208.62 | | |
| 23 | 05 | | | 208.81 | 208.79 | | |
| 24 | 06 | | | 205.52 | 205.50 | | |
| 25 | | | | | | | |
| 26 | | | | | | | |
| 27 | | | | | | | |
| 28 | | | | VC 10/24/07 | | | |
| 29 | | | | | | | |
| 30 | | | | | | | |

Comments:

Primary Review: Vicki Collins 10/24/07 Secondary Review: [illegible] 10/24/07

Run Log ID: 18958 00078783

**KEMRON Environmental Services**

Instrument Run Log

Instrument: ELAN-ICP　　Dataset: 102507A.REP

Analyst1: JYH　　Analyst2: N/A

Method: 6020　　SOP: ME700　　Rev: 4

Maintenance Log ID: 19692

Calibration Std: STD22444　　ICV/CCV Std: STD22445　　Post Spike: STD21680

ICSA: STD22489　　ICSAB: STD22490

Workgroups: 253774,253588,253713

Comments:

| Seq. | File ID | Sample | ID | Prep | Dil | Reference | Date/Time |
|---|---|---|---|---|---|---|---|
| 1 | EL.102507.091113 | Blank | Blank | | 1 | | 10/25/07 09:11 |
| 2 | EL.102507.091743 | WG253869-01 | Calibration Point | | 1 | | 10/25/07 09:17 |
| 3 | EL.102507.092413 | WG253869-02 | Calibration Point | | 1 | | 10/25/07 09:24 |
| 4 | EL.102507.093045 | WG253869-03 | Calibration Point | | 1 | | 10/25/07 09:30 |
| 5 | EL.102507.093716 | WG253869-04 | Calibration Point | | 1 | | 10/25/07 09:37 |
| 6 | EL.102507.094349 | WG253869-05 | Initial Calibration Verification | | 1 | | 10/25/07 09:43 |
| 7 | EL.102507.095031 | WG253869-06 | Initial Calib Blank | | 1 | | 10/25/07 09:50 |
| 8 | EL.102507.095714 | WG253869-07 | CRQL Check Solid | | 1 | | 10/25/07 09:57 |
| 9 | EL.102507.100350 | WG253869-08 | CRQL Check Water | | 1 | | 10/25/07 10:03 |
| 10 | EL.102507.101025 | WG253869-09 | Interference Check | | 1 | | 10/25/07 10:10 |
| 11 | EL.102507.101659 | WG253869-10 | Interference Check | | 1 | | 10/25/07 10:16 |
| 12 | EL.102507.102332 | WG253869-11 | CCV | | 1 | | 10/25/07 10:23 |
| 13 | EL.102507.103014 | WG253869-12 | CCB | | 1 | | 10/25/07 10:30 |
| 14 | EL.102507.103654 | WG253712-02 | Method/Prep Blank | 40/100 | 1 | | 10/25/07 10:36 |
| 15 | EL.102507.104324 | WG253712-03 | Laboratory Control S | 40/100 | 1 | | 10/25/07 10:43 |
| 16 | EL.102507.104954 | WG253712-01 | Reference Sample | | 1 | L0710539-02 | 10/25/07 10:49 |
| 17 | EL.102507.105625 | WG253712-04 | Matrix Spike | 40/100 | 1 | | 10/25/07 10:56 |
| 18 | EL.102507.110256 | WG253712-05 | Matrix Spike Duplica | 40/100 | 1 | | 10/25/07 11:02 |
| 19 | EL.102507.110927 | L0710610-01 | GP-01 | | 1 | | 10/25/07 11:09 |
| 20 | EL.102507.112018 | L0710596-12 | 47WWZZ-101807 | 40/100 | 10 | | 10/25/07 11:20 |
| 21 | EL.102507.112650 | WG253774-01 | Post Digestion Spike | | 10 | L0710596-12 | 10/25/07 11:26 |
| 22 | EL.102507.113322 | WG253774-02 | Serial Dilution | | 50 | L0710596-12 | 10/25/07 11:33 |
| 23 | EL.102507.113954 | L0710596-14 | EQUIPMENT RINSE | 40/100 | 1 | WG253689-01 | 10/25/07 11:39 |
| 24 | EL.102507.114625 | WG253869-13 | CCV | | 1 | | 10/25/07 11:46 |
| 25 | EL.102507.115307 | WG253869-14 | CCB | | 1 | | 10/25/07 11:53 |
| 26 | EL.102507.115947 | L0710610-01 | GP-01 | 40/100 | 10 | | 10/25/07 11:59 |
| 27 | EL.102507.120619 | L0710610-02 | GP-02 | 40/100 | 10 | | 10/25/07 12:06 |
| 28 | EL.102507.121251 | L0710610-03 | GP-03 | 40/100 | 10 | | 10/25/07 12:12 |
| 29 | EL.102507.121924 | L0710610-04 | GP-04 | 40/100 | 10 | | 10/25/07 12:19 |
| 30 | EL.102507.122556 | L0710615-01 | 071000315-1 | 40/100 | 1 | | 10/25/07 12:25 |
| 31 | EL.102507.123227 | L0710615-02 | 071000315-2 | 40/100 | 1 | | 10/25/07 12:32 |
| 32 | EL.102507.123859 | L0710615-03 | 071000315-3 | 40/100 | 1 | | 10/25/07 12:38 |
| 33 | EL.102507.124530 | L0710615-04 | 071000315-4 | 40/100 | 1 | | 10/25/07 12:45 |
| 34 | EL.102507.125202 | L0710615-05 | 071000315-5 | 40/100 | 1 | | 10/25/07 12:52 |
| 35 | EL.102507.125834 | L0710615-06 | 071000315-6 | 40/100 | 1 | | 10/25/07 12:58 |
| 36 | EL.102507.130507 | WG253869-15 | CCV | | 1 | | 10/25/07 13:05 |
| 37 | EL.102507.131149 | WG253869-16 | CCB | | 1 | | 10/25/07 13:11 |

Page: 1　　Approved: October 26, 2007

Maren Beery

# KEMRON Environmental Services

## Instrument Run Log

Instrument: ELAN-ICP
Dataset: 102507A.REP
Analyst1: JYH
Analyst2: N/A
Method: 6020
SOP: ME700
Rev: 4
Maintenance Log ID: 19692

Calibration Std: STD22444
ICV/CCV Std: STD22445
Post Spike: STD21680
ICSA: STD22489
ICSAB: STD22490

Workgroups: 253774,253588,253713

Comments:

| Seq. | File ID | Sample | ID | Prep | Dil | Reference | Date/Time |
|---|---|---|---|---|---|---|---|
| 38 | EL.102507.131830 | L0710539-01 | MIN-01 | 40/100 | 1 | | 10/25/07 13:18 |
| 39 | EL.102507.132503 | L0710539-03 | MIN-02 | 40/100 | 1 | WG253433-04 | 10/25/07 13:25 |
| 40 | EL.102507.133136 | L0710539-04 | MIN-02 | 40/100 | 1 | | 10/25/07 13:31 |
| 41 | EL.102507.133822 | L0710540-01 | SWL-01 | 40/100 | 1 | | 10/25/07 13:38 |
| 42 | EL.102507.134456 | L0710540-02 | SWL-01 | 40/100 | 1 | | 10/25/07 13:44 |
| 43 | EL.102507.135128 | L0710540-03 | SWL-01D | 40/100 | 1 | | 10/25/07 13:51 |
| 44 | EL.102507.135759 | L0710540-04 | SWL-01D | 40/100 | 1 | | 10/25/07 13:57 |
| 45 | EL.102507.140430 | L0710596-12 | 47WWZZ-101807 | 40/100 | 100 | | 10/25/07 14:04 |
| 46 | EL.102507.141102 | WG253774-01 | Post Digestion Spike | | 100 | L0710596-12 | 10/25/07 14:11 |
| 47 | EL.102507.141735 | WG253774-02 | Serial Dilution | | 500 | L0710596-12 | 10/25/07 14:17 |
| 48 | EL.102507.142407 | WG253869-17 | CCV | | 1 | | 10/25/07 14:24 |
| 49 | EL.102507.143049 | WG253869-18 | CCB | | 1 | | 10/25/07 14:30 |
| 50 | EL.102507.143729 | L0710416-01 | MW-05 | 40/100 | 1 | | 10/25/07 14:37 |
| 51 | EL.102507.144400 | L0710416-02 | MW-05D | 40/100 | 1 | | 10/25/07 14:44 |
| 52 | EL.102507.145031 | L0710416-03 | MW-04 | 40/100 | 1 | | 10/25/07 14:50 |
| 53 | EL.102507.145703 | L0710416-04 | MW-03 | 40/100 | 1 | | 10/25/07 14:57 |
| 54 | EL.102507.150701 | L0710557-01 | 47WW08-101707 | 40/100 | 100 | | 10/25/07 15:07 |
| 55 | EL.102507.151332 | WG253869-19 | CCV | | 1 | | 10/25/07 15:13 |
| 56 | EL.102507.152014 | WG253869-20 | CCB | | 1 | | 10/25/07 15:20 |
| 57 | EL.102507.152655 | L0710416-05 | MW-02 | 40/100 | 1 | | 10/25/07 15:26 |
| 58 | EL.102507.153328 | L0710416-06 | MW-01 | 40/100 | 1 | | 10/25/07 15:33 |
| 59 | EL.102507.154001 | L0710416-07 | MW-07 | 40/100 | 1 | | 10/25/07 15:40 |
| 60 | EL.102507.154635 | L0710416-08 | MW-08 | 40/100 | 1 | | 10/25/07 15:46 |
| 61 | EL.102507.155308 | L0710416-09 | MW-09 | 40/100 | 1 | | 10/25/07 15:53 |
| 62 | EL.102507.155943 | L0710416-10 | MW-10 | 40/100 | 1 | | 10/25/07 15:59 |
| 63 | EL.102507.160615 | WG253712-01 | Reference Sample | | 100 | L0710539-02 | 10/25/07 16:06 |
| 64 | EL.102507.161245 | WG253712-04 | Matrix Spike | 40/100 | 100 | | 10/25/07 16:12 |
| 65 | EL.102507.161916 | WG253712-05 | Matrix Spike Duplica | 40/100 | 100 | | 10/25/07 16:19 |
| 66 | EL.102507.162548 | WG253869-21 | CCV | | 1 | | 10/25/07 16:25 |
| 67 | EL.102507.163230 | WG253869-22 | CCB | | 1 | | 10/25/07 16:32 |

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Approved: October 26, 2007

Maren Beery

KEMRON Environmental Services
Data Checklist

Date: 25-OCT-2007
Analyst: JYH
Analyst: NA
Method: 6020
Instrument: ELAN
Curve Workgroup: 253869
Runlog ID: 18958
Analytical Workgroups: 253712,253588,253713

| | |
|---|---|
| | |
| Calibration/Linearity | X |
| ICV/CCV | X |
| ICB/CCB | X |
| ICSA/ICSAB | X |
| CRI | X |
| Blank/LCS | X |
| MS/MSD | X |
| Post Spike/Serial Dilution | X |
| Upload Results | X |
| Data Qualifiers | |
| Generate PDF Instrument Data | X |
| Sign/Annotate PDF Data | X |
| Upload Curve Data | X |
| Workgroup Forms | |
| Case Narrative | 539,540,596,610,615,557,416 |
| Client Forms | X |
| Level X | 539,540 |
| Level 3 | 596,615,557 |
| Level 4 | 416 |
| Check for compliance with method and project specific requirements | X |
| Check the completeness of reported information | X |
| Check the information for the report narrative | X |
| Primary Reviewer | JYH |
| Secondary Reviewer | MMB |
| | |
| Comments | |

Primary Reviewer:

Secondary Reviewer:
26-OCT-2007

Maren Beery

Generated: OCT-26-2007 12:44:44

# KEMRON Environmental Services
## HOLDING TIMES
## EQUIVALENT TO AFCEE FORM 9

Analytical Method: 6020

AAB#: WG253774

Login Number: L0710596

| Client ID | Date Collected | Date Received | Date Extracted | Max Hold Time Ext. | Time Held Ext. | Date Analyzed | Max Hold Time Anal | Time Held Anal. | Q |
|---|---|---|---|---|---|---|---|---|---|
| 47WWZZ-101807 | 10/18/07 | 10/23/07 | 10/24/07 | 180 | 5.88 | 10/25/07 | 180 | 1.18 | |
| EQUIPMENT RINSE | 10/22/07 | 10/23/07 | 10/24/07 | 180 | 1.69 | 10/25/07 | 180 | 1.19 | |
| 47WWZZ-101807 | 10/18/07 | 10/23/07 | 10/24/07 | 180 | 5.88 | 10/25/07 | 180 | 1.29 | |

* EXT = SEE PROJECT QAPP REQUIREMENTS

*ANAL = SEE PROJECT QAPP REQUIREMENTS

KEMRON FORMS - Modified 11/20/2006
Version 1.5 PDF File ID: 917011
Report generated 10/26/2007 08:05

# METHOD BLANK SUMMARY

Login Number: L0710596
Blank File ID: EL.102507.103654
Prep Date: 10/24/07 07:00
Analyzed Date: 10/25/07 10:36
Analyst: JYH

Work Group: WG253774
Blank Sample ID: WG253712-02
Instrument ID: ELAN-ICP
Method: 6020

This Method Blank Applies To The Following Samples:

| Client ID | Lab Sample ID | Lab File ID | Time Analyzed | TAG |
|---|---|---|---|---|
| LCS | WG253712-03 | EL.102507.104324 | 10/25/07 10:43 | 01 |
| 47WWZZ-101807 | L0710596-12 | EL.102507.112018 | 10/25/07 11:20 | DL01 |
| EQUIPMENT RINSE | L0710596-14 | EL.102507.113954 | 10/25/07 11:39 | 01 |
| 47WWZZ-101807 | L0710596-12 | EL.102507.140430 | 10/25/07 14:04 | DL02 |

KEMRON FORMS - Modified 01/31/2007
Version 1.5 PDF File ID: 917012
Report generated 10/26/2007 08:05

# KEMRON Environmental Services

## METHOD BLANK REPORT

Login Number: L0710596  Prep Date: 10/24/07 07:00  Sample ID: WG253712-02
Instrument ID: ELAN-ICP  Run Date: 10/25/07 10:36  Prep Method: 3015
File ID: EL.102507.103654  Analyst: JYH  Method: 6020
Workgroup (AAB#): WG253774  Matrix: Water  Units: mg/L
Contract #: DACA56-94-D-0020  Cal ID: ELAN-I - 25-OCT-07

| Analytes | SDL | PQL | Concentration | Dilution | Qualifier |
|---|---|---|---|---|---|
| Silver, Dissolved | 0.000250 | 0.00100 | 0.000250 | 1 | U |
| Arsenic, Dissolved | 0.000250 | 0.00100 | 0.000250 | 1 | U |
| Barium, Dissolved | 0.000500 | 0.00300 | 0.000500 | 1 | U |
| Cadmium, Dissolved | 0.000125 | 0.000500 | 0.000125 | 1 | U |
| Chromium, Dissolved | 0.000500 | 0.00200 | 0.000500 | 1 | U |
| Copper, Dissolved | 0.000500 | 0.00200 | 0.000500 | 1 | U |
| Lead, Dissolved | 0.000250 | 0.000500 | 0.000250 | 1 | U |
| Manganese, Dissolved | 0.000500 | 0.00200 | 0.000500 | 1 | U |
| Nickel, Dissolved | 0.00100 | 0.00400 | 0.00100 | 1 | U |
| Antimony, Dissolved | 0.000250 | 0.00100 | 0.000250 | 1 | U |
| Selenium, Dissolved | 0.000500 | 0.00100 | 0.000500 | 1 | U |
| Thallium, Dissolved | 0.0000500 | 0.000200 | 0.0000500 | 1 | U |

SDL  Method Detection Limit
PQL  Reporting/Practical Quantitation Limit
ND  Analyte Not detected at or above reporting limit
*  Analyte concentration > RL

KEMRON FORMS - Modified 12/07/2006
Version 1.5  PDF File ID: 917013
Report generated 10/26/2007 08:05

# LABORATORY CONTROL SAMPLE (LCS)

Login Number: L0710596 | Run Date: 10/25/2007 | Sample ID: WG253712-03
Instrument ID: ELAN-ICP | Run Time: 10:43 | Prep Method: 3015
File ID: EL.102507.104324 | Analyst: JYH | Method: 6020
Workgroup (AAB#): WG253774 | Matrix: Water | Units: mg/L
QC Key: STD | Lot#: STD21680 | Cal ID: ELAN-I - 25-OCT-07

| Analytes | Expected | Found | % Rec | LCS Limits | Q |
|---|---|---|---|---|---|
| Silver, Dissolved | 0.0625 | 0.0572 | 91.5 | 80 - 120 | |
| Arsenic, Dissolved | 0.0625 | 0.0598 | 95.6 | 80 - 120 | |
| Barium, Dissolved | 0.0625 | 0.0593 | 94.9 | 80 - 120 | |
| Cadmium, Dissolved | 0.0625 | 0.0586 | 93.8 | 80 - 120 | |
| Chromium, Dissolved | 0.0625 | 0.0616 | 98.6 | 80 - 120 | |
| Copper, Dissolved | 0.0625 | 0.0619 | 99.1 | 80 - 120 | |
| Lead, Dissolved | 0.0625 | 0.0589 | 94.2 | 80 - 120 | |
| Manganese, Dissolved | 0.0625 | 0.0616 | 98.6 | 80 - 120 | |
| Nickel, Dissolved | 0.0625 | 0.0618 | 98.8 | 80 - 120 | |
| Antimony, Dissolved | 0.0625 | 0.0584 | 93.5 | 80 - 120 | |
| Selenium, Dissolved | 0.0625 | 0.0600 | 96.0 | 80 - 120 | |
| Thallium, Dissolved | 0.0625 | 0.0582 | 93.2 | 80 - 120 | |

KEMRON FORMS - Modified 09/06/2007
Version 1.5 PDF File ID: 917014
Report generated 10/26/2007 08:05

00078790

# MATRIX SPIKE AND MATRIX SPIKE DUP (MS/MSD)

Loginnum: L0710596 Cal ID: ELAN-ICP - Worknum: WG253774
Instrument ID: ELAN-ICP Contract #: DACA56-94-D-0020 Method: 6020
Parent ID: WG253712-01 File ID: EL.102507.104954 Dil: 1 Matrix: WATER
Sample ID: WG253712-04 MS File ID: EL.102507.105625 Dil: 1 Units: mg/L
Sample ID: WG253712-05 MSD File ID: EL.102507.110256 Dil: 1

| Analyte | Parent | MS Spiked | MS Found | MS %Rec | MSD Spiked | MSD Found | MSD %Rec | %RPD | %Rec Limits | RPD Limit | Q |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Antimony | 0.000629 | 0.0625 | 0.0645 | 102 | 0.0625 | 0.0624 | 98.8 | 3.37 | 75 - 125 | 20 | |
| Arsenic | 0.0141 | 0.0625 | 0.0770 | 101 | 0.0625 | 0.0751 | 97.6 | 2.51 | 75 - 125 | 20 | |
| Barium | 0.162 | 0.0625 | 0.224 | 97.8 | 0.0625 | 0.218 | 89.0 | 2.49 | 75 - 125 | 20 | |
| Cadmium | ND | 0.0625 | 0.0609 | 97.4 | 0.0625 | 0.0574 | 91.8 | 5.94 | 75 - 125 | 20 | |
| Chromium | 0.0303 | 0.0625 | 0.0903 | 96.1 | 0.0625 | 0.0904 | 96.2 | 0.113 | 75 - 125 | 20 | |
| Copper | 0.00383 | 0.0625 | 0.0648 | 97.5 | 0.0625 | 0.0626 | 94.0 | 3.44 | 75 - 125 | 20 | |
| Lead | 0.000866 | 0.0625 | 0.0667 | 105 | 0.0625 | 0.0644 | 102 | 3.54 | 75 - 125 | 20 | |
| Nickel | 0.0334 | 0.0625 | 0.0918 | 93.4 | 0.0625 | 0.0897 | 90.0 | 2.31 | 75 - 125 | 20 | |
| Selenium | 0.0150 | 0.0625 | 0.0784 | 101 | 0.0625 | 0.0769 | 98.9 | 1.96 | 75 - 125 | 20 | |
| Silver | ND | 0.0625 | 0.0548 | 87.6 | 0.0625 | 0.0527 | 84.3 | 3.87 | 75 - 125 | 20 | |
| Thallium | 0.000153 | 0.0625 | 0.0655 | 105 | 0.0625 | 0.0637 | 102 | 2.74 | 75 - 125 | 20 | |

* FAILS %REC LIMIT

# FAILS RPD LIMIT

NOTE: This is an internal quality control sample.

# MATRIX SPIKE AND MATRIX SPIKE DUP (MS/MSD)

Loginnum:L0710596 Cal ID: ELAN-ICP- Worknum:WG253774
Instrument ID:ELAN-ICP Contract #:DACA56-94-D-0020 Method:6020
Parent ID:WG253712-01 File ID:EL.102507.160615 Dil:100 Matrix:WATER
Sample ID:WG253712-04 MS File ID:EL.102507.161245 Dil:100 Units:mg/L
Sample ID:WG253712-05 MSD File ID:EL.102507.161916 Dil:100

| Analyte | Parent | MS Spiked | MS Found | MS %Rec | MSD Spiked | MSD Found | MSD %Rec | %RPD | %Rec Limits | RPD Limit | Q |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Manganese | 3.52 | 0.0625 | 3.54 | 19.7 | 0.0625 | 3.61 | 129 | 1.92 | 75 - 125 | 20 | * |

* FAILS %REC LIMIT

# FAILS RPD LIMIT

NOTE: This is an internal quality control sample.

KEMRON FORMS - Modified 09/25/2007 (wg_ms_msd_drywt)
Version 1.5 PDF File ID: 917015
Report generated 10/26/2007 12:22

# KEMRON ENVIRONMENTAL SERVICES
## SERIAL DILUTION REPORT

Sample Login ID: L0710596 — Worknum: WG253774
Instrument ID: ELAN-ICP — Method: 6020
Sample ID: L0710596-12 File ID: EL.102507.112018 Dil: 10 — Units: ug/L
Serial Dilution ID: WG253774-02 File ID: EL.102507.113322 Dil: 50

| Analyte | Sample | C | Serial Dilution | C | % Difference | Q |
|---|---|---|---|---|---|---|
| Antimony | ND | U | 0 | U | | |
| Arsenic | 4.59 | X | 8.67 | F | 88.9 | E |
| Barium | 48.1 | X | 37.2 | F | 22.7 | E |
| Cadmium | 1.04 | F | 3.66 | F | 252 | E |
| Chromium | 51.8 | X | 53.8 | X | 3.86 | |
| Copper | 6.28 | F | 0 | U | 100 | E |
| Lead | 3.33 | X | 9.06 | F | 172 | E |
| Manganese | 736 | | 709 | X | 3.67 | |
| Nickel | 3560 | | 3550 | | 0.281 | |
| Selenium | 17.8 | X | 25.8 | X | 44.9 | E |
| Silver | 0 | U | 7.84 | F | 666 | E |
| Thallium | 0 | U | 1.76 | F | 666 | E |

U = Result is below MDL
F = Result is between MDL and RL
X = Result is greater than RL and less than 100 times the MDL
E = %D exceeds control limit of 10% and initial
sample result is greater than or equal to 100 times the MDL

KEMRON FORMS - Modified 02/14/2006
Version 1.3 PDF File ID: 917009
Report generated 10/26/2007 08:05

# KEMRON ENVIRONMENTAL SERVICES
## SERIAL DILUTION REPORT

Sample Login ID: L0710596 Worknum: WG253774
Instrument ID: ELAN-ICP Method: 6020
Sample ID: L0710596-12 File ID: EL.102507.140430 Dil: 100 Units: ug/L
Serial Dilution ID: WG253774-02 File ID: EL.102507.141735 Dil: 500

| Analyte | Sample | C | Serial Dilution | C | % Difference | Q |
|---|---|---|---|---|---|---|
| Antimony | ND | U | 0 | U | | |
| Arsenic | 0 | U | 0 | U | | |
| Barium | 40.8 | F | 0 | U | 100 | E |
| Cadmium | 0 | U | 0 | U | | |
| Chromium | 99.5 | X | 226 | F | 127 | E |
| Copper | 0 | U | 0 | U | | |
| Lead | 0 | U | 0 | U | | |
| Manganese | 737 | X | 675 | X | 8.41 | |
| Nickel | 3800 | X | 3740 | X | 1.58 | |
| Selenium | 34.5 | F | 0 | U | 100 | E |
| Silver | 0 | U | 0 | U | | |
| Thallium | ND | U | 0 | U | | |

U = Result is below MDL
F = Result is between MDL and RL
X = Result is greater than RL and less than 100 times the MDL
E = %D exceeds control limit of 10% and initial
sample result is greater than or equal to 100 times the MDL

KEMRON FORMS - Modified 02/14/2006
Version 1.3 PDF File ID: 917009
Report generated 10/26/2007 08:05

# KEMRON ENVIRONMENTAL SERVICES
## POST SPIKE REPORT

**Sample Login ID:** L0710596 **Worknum:** WG253774
**Instrument ID:** ELAN-ICP **Method:** 6020
**Post Spike ID:** WG253774-01 **File ID:** EL.102507.112650 **Dil:** 10 **Units:** ug/L
**Sample ID:** L0710596-12 **File ID:** EL.102507.112018 **Dil:** 10 **Matrix:** Water

| Analyte | Post Spike Result | C | Sample Result | C | Spike Added(SA) | % R | Control Limit %R | Q |
|---|---|---|---|---|---|---|---|---|
| ANTIMONY | 50.5 | | 0 | U | 50 | 101.0 | 75 - 125 | |
| ARSENIC | 49.6 | | 0.459 | | 50 | 98.3 | 75 - 125 | |
| BARIUM | 51.9 | | 4.81 | | 50 | 94.3 | 75 - 125 | |
| CADMIUM | 48.8 | | 0.104 | F | 50 | 97.5 | 75 - 125 | |
| CHROMIUM | 52.3 | | 5.18 | | 50 | 94.2 | 75 - 125 | |
| COPPER | 48.5 | | 0.628 | F | 50 | 95.7 | 75 - 125 | |
| LEAD | 48.8 | | 0.333 | | 50 | 97.0 | 75 - 125 | |
| MANGANESE | 118 | | 73.6 | | 50 | 89.2 | 75 - 125 | |
| NICKEL | 413 | | 356 | | 50 | 114.3 | 75 - 125 | |
| SELENIUM | 50.6 | | 1.78 | | 50 | 97.6 | 75 - 125 | |
| SILVER | 44.1 | | 0 | U | 50 | 88.2 | 75 - 125 | |
| THALLIUM | 48.4 | | 0 | U | 50 | 96.8 | 75 - 125 | |

**N = % Recovery exceeds control limits**
**F = Result is between MDL and RL**
**U = Sample result is below MDL. A value of zero is used in the calculation**

00078795

# KEMRON ENVIRONMENTAL SERVICES
## POST SPIKE REPORT

**Sample Login ID:** L0710596 **Worknum:** WG253774
**Instrument ID:** ELAN-ICP **Method:** 6020
**Post Spike ID:** WG253774-01 **File ID:** EL.102507.141102 **Dil:** 100 **Units:** ug/L
**Sample ID:** L0710596-12 **File ID:** EL.102507.140430 **Dil:** 100 **Matrix:** Water

| Analyte | Post Spike Result | C | Sample Result | C | Spike Added(SA) | % R | Control Limit %R | Q |
|---|---|---|---|---|---|---|---|---|
| ANTIMONY | 46.6 | | 0 | U | 50 | 93.2 | 75 - 125 | |
| ARSENIC | 46.6 | | 0 | U | 50 | 93.2 | 75 - 125 | |
| BARIUM | 46.0 | | 0.408 | F | 50 | 91.3 | 75 - 125 | |
| CADMIUM | 46.8 | | 0 | U | 50 | 93.6 | 75 - 125 | |
| CHROMIUM | 47.6 | | 0.995 | | 50 | 93.1 | 75 - 125 | |
| COPPER | 46.9 | | 0 | U | 50 | 93.8 | 75 - 125 | |
| LEAD | 44.5 | | 0 | U | 50 | 89.0 | 75 - 125 | |
| MANGANESE | 52.0 | | 7.37 | | 50 | 89.3 | 75 - 125 | |
| NICKEL | 83.8 | | 38.0 | | 50 | 91.6 | 75 - 125 | |
| SELENIUM | 45.1 | | 0.345 | F | 50 | 89.5 | 75 - 125 | |
| SILVER | 43.6 | | 0 | U | 50 | 87.3 | 75 - 125 | |
| THALLIUM | 44.4 | | 0 | U | 50 | 88.7 | 75 - 125 | |

**N = % Recovery exceeds control limits**
**F = Result is between MDL and RL**
**U = Sample result is below MDL. A value of zero is used in the calculation**

KEMRON FORMS - Modified 04/20/2007 - POST_SPIKE
Version 2.0 PDF File ID: 917010
Report generated 10/26/2007 08:05

Login Number: L0710596
Workgroup (AAB#): WG253774
Analytical Method: 6020
Instrument ID: ELAN-ICP
ICAL Worknum: WG253869
Initial Calibration Date: 25-OCT-2007 09:37

| Analyte | WG253869-01 | | WG253869-02 | | WG253869-03 | | WG253869-04 | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | STD | INT | STD | INT | STD | INT | STD | INT | R | Q |
| Antimony | 0 | 32.196 | .4 | 1705.543 | 50 | 168729.889 | 100 | 323333.612 | 0.999988 | |
| Arsenic | 0 | -429.155 | .4 | 255.496 | 50 | 67776.933 | 100 | 130116.491 | 0.999999 | |
| Barium | 0 | 55.001 | .4 | 746.046 | 50 | 81662.124 | 100 | 156761.59 | 0.999998 | |
| Cadmium | 0 | 9.823 | .4 | 447.863 | 50 | 53950.143 | 100 | 105102.54 | 0.999918 | |
| Chromium | 0 | 13541.628 | .4 | 17209.546 | 50 | 447149.527 | 100 | 860087.079 | 0.999962 | |
| Copper | 0 | 140.003 | .4 | 1175.108 | 50 | 114556.801 | 100 | 217242.245 | 0.999984 | |
| Lead | 0 | 279.338 | .4 | 9339.801 | 50 | 1087175.501 | 100 | 2121886.924 | 1.00000 | |
| Manganese | 0 | 2038.98 | .4 | 6913.748 | 50 | 581134.93 | 100 | 1110139.861 | 0.999999 | |
| Nickel | 0 | 38.667 | .4 | 964.742 | 50 | 105369.239 | 100 | 201404.542 | 0.999998 | |
| Selenium | 0 | -12.096 | .4 | 60.019 | 50 | 5631.261 | 100 | 10649.544 | 0.999977 | |
| Silver | 0 | 27.667 | .4 | 2695.536 | 50 | 316308.218 | 100 | 606489.765 | 0.999988 | |
| Thallium | 0 | 31 | .4 | 2895.282 | 50 | 342140.105 | 100 | 664888.358 | 0.999997 | |

INT = Instrument intensity
R = Coefficient of correlation
Q = Data Qualifier
* = Out of Compliance; R < 0.995

KEMRON FORMS - Modified 03/08/2007
Version 1.5 PDF File ID: 917018
Report generated 10/26/2007 08:05

# KEMRON Environmental Services
## INITIAL CALIBRATION BLANK (ICB)

Login Number: L0710596
Run Date: 10/25/2007
Sample ID: WG253869-06
Instrument ID: ELAN-ICP
Run Time: 09:50
Method: 6020
File ID: EL.102507.095031
Analyst: JYH
Units: mg/L
Workgroup (AAB#): WG253774
Cal ID: ELAN-ICP - 25-OCT-07
Matrix: WATER

| Analytes | MDL | RDL | Concentration | Dilution | Qualifier |
|---|---|---|---|---|---|
| SILVER | .0001 | .0004 | .0000137 | 1 | U |
| ARSENIC | .0001 | .0004 | -.0000058 | 1 | U |
| BARIUM | .0002 | .0012 | -.0000031 | 1 | U |
| CADMIUM | .00005 | .0002 | .0000289 | 1 | U |
| CHROMIUM | .0002 | .0008 | .0000417 | 1 | U |
| COPPER | .0002 | .0008 | -.0000174 | 1 | U |
| MANGANESE | .0002 | .0008 | .0000429 | 1 | U |
| NICKEL | .0004 | .0016 | -.000007 | 1 | U |
| LEAD | .0001 | .0002 | .0000086 | 1 | U |
| ANTIMONY | .0001 | .0004 | .000116 | 1 | F |
| SELENIUM | .0002 | .0004 | -.000003 | 1 | U |
| THALLIUM | .00002 | .00008 | .0000053 | 1 | U |

KEMRON FORMS - Modified 10/02/2007
Version 2.0 PDF File ID: 917020
Report generated 10/26/2007 08:05

00078798

## CONTINUING CALIBRATION BLANK (CCB)

Login Number: L0710596
Run Date: 10/25/2007
Sample ID: WG253869-12
Instrument ID: ELAN-ICP
Run Time: 10:30
Method: 6020
File ID: EL.102507.103014
Analyst: JYH
Units: ug/L
Workgroup (AAB#): WG253774
Cal ID: ELAN-I - 25-OCT-07
Matrix: WATER

| Analytes | MDL | RDL | Concentration | Dilution | Qualifier |
|---|---|---|---|---|---|
| Silver | 0.100 | 0.400 | 0.00700 | 1 | U |
| Arsenic | 0.100 | 0.400 | 0.0492 | 1 | U |
| Barium | 0.200 | 1.20 | -0.00220 | 1 | U |
| Cadmium | 0.0500 | 0.200 | 0.0288 | 1 | U |
| Chromium | 0.200 | 0.800 | 0.0505 | 1 | U |
| Copper | 0.200 | 0.800 | -0.0181 | 1 | U |
| Lead | 0.100 | 0.200 | 0.00310 | 1 | U |
| Manganese | 0.200 | 0.800 | 0.0270 | 1 | U |
| Nickel | 0.400 | 1.60 | -0.00830 | 1 | U |
| Antimony | 0.100 | 0.400 | 0.104 | 1 | F |
| Selenium | 0.200 | 0.400 | 0.0367 | 1 | U |
| Thallium | 0.0200 | 0.0800 | -0.000900 | 1 | U |

U = Result is less than MDL
F = Result is between MDL and RL
* = Result is above RL

KEMRON FORMS - Modified 09/27/2006
Version 2.0 PDF File ID: 917023
Report generated 10/26/2007 08:05

KEMRON Environmental Services

CONTINUING CALIBRATION BLANK (CCB)

Login Number: L0710596
Run Date: 10/25/2007
Sample ID: WG253869-14
Instrument ID: ELAN-ICP
Run Time: 11:53
Method: 6020
File ID: EL.102507.115307
Analyst: JYH
Units: ug/L
Workgroup (AAB#): WG253774
Cal ID: ELAN-I - 25-OCT-07
Matrix: WATER

| Analytes | MDL | RDL | Concentration | Dilution | Qualifier |
|---|---|---|---|---|---|
| Silver | 0.100 | 0.400 | 0.00730 | 1 | U |
| Arsenic | 0.100 | 0.400 | 0.0264 | 1 | U |
| Barium | 0.200 | 1.20 | -0.00190 | 1 | U |
| Cadmium | 0.0500 | 0.200 | 0.0287 | 1 | U |
| Chromium | 0.200 | 0.800 | -0.0243 | 1 | U |
| Copper | 0.200 | 0.800 | -0.0112 | 1 | U |
| Lead | 0.100 | 0.200 | 0.00340 | 1 | U |
| Manganese | 0.200 | 0.800 | -0.0236 | 1 | U |
| Nickel | 0.400 | 1.60 | -0.00820 | 1 | U |
| Antimony | 0.100 | 0.400 | 0.119 | 1 | F |
| Selenium | 0.200 | 0.400 | 0.0226 | 1 | U |
| Thallium | 0.0200 | 0.0800 | 0.000300 | 1 | U |

U = Result is less than MDL
F = Result is between MDL and RL
* = Result is above RL

KEMRON FORMS - Modified 09/27/2006
Version 2.0 PDF File ID: 917023
Report generated 10/26/2007 08:05

00078800

# CONTINUING CALIBRATION BLANK (CCB)

Login Number: L0710596
Run Date: 10/25/2007
Sample ID: WG253869-16
Instrument ID: ELAN-ICP
Run Time: 13:11
Method: 6020
File ID: EL.102507.131149
Analyst: JYH
Units: ug/L
Workgroup (AAB#): WG253774
Cal ID: ELAN-I - 25-OCT-07
Matrix: WATER

| Analytes | MDL | RDL | Concentration | Dilution | Qualifier |
|---|---|---|---|---|---|
| Silver | 0.100 | 0.400 | 0.00760 | 1 | U |
| Arsenic | 0.100 | 0.400 | 0.0203 | 1 | U |
| Barium | 0.200 | 1.20 | -0.00400 | 1 | U |
| Cadmium | 0.0500 | 0.200 | 0.0391 | 1 | U |
| Chromium | 0.200 | 0.800 | -0.0192 | 1 | U |
| Copper | 0.200 | 0.800 | -0.0146 | 1 | U |
| Lead | 0.100 | 0.200 | 0.00330 | 1 | U |
| Manganese | 0.200 | 0.800 | -0.0525 | 1 | U |
| Nickel | 0.400 | 1.60 | -0.0120 | 1 | U |
| Antimony | 0.100 | 0.400 | 0.145 | 1 | F |
| Selenium | 0.200 | 0.400 | 0.00990 | 1 | U |
| Thallium | 0.0200 | 0.0800 | -0.000800 | 1 | U |

U = Result is less than MDL
F = Result is between MDL and RL
* = Result is above RL

KEMRON FORMS - Modified 09/27/2006
Version 2.0 PDF File ID: 917023
Report generated 10/26/2007 08:05

KEMRON Environmental Services

# CONTINUING CALIBRATION BLANK (CCB)

Login Number: L0710596
Instrument ID: ELAN-ICP
File ID: EL.102507.143049
Workgroup (AAB#): WG253774
Matrix: WATER

Run Date: 10/25/2007
Run Time: 14:30
Analyst: JYH
Cal ID: ELAN-I - 25-OCT-07

Sample ID: WG253869-18
Method: 6020
Units: ug/L

| Analytes | MDL | RDL | Concentration | Dilution | Qualifier |
|---|---|---|---|---|---|
| Silver | 0.100 | 0.400 | 0.0127 | 1 | U |
| Arsenic | 0.100 | 0.400 | 0.0142 | 1 | U |
| Barium | 0.200 | 1.20 | -0.00270 | 1 | U |
| Cadmium | 0.0500 | 0.200 | 0.0327 | 1 | U |
| Chromium | 0.200 | 0.800 | 0.238 | 1 | F |
| Copper | 0.200 | 0.800 | -0.000800 | 1 | U |
| Lead | 0.100 | 0.200 | 0.00790 | 1 | U |
| Manganese | 0.200 | 0.800 | -0.0747 | 1 | U |
| Nickel | 0.400 | 1.60 | -0.00460 | 1 | U |
| Antimony | 0.100 | 0.400 | 0.0907 | 1 | U |
| Selenium | 0.200 | 0.400 | 0.00760 | 1 | U |
| Thallium | 0.0200 | 0.0800 | 0.00330 | 1 | U |

U = Result is less than MDL
F = Result is between MDL and RL
* = Result is above RL

KEMRON FORMS - Modified 09/27/2006
Version 2.0 PDF File ID: 917023
Report generated 10/26/2007 08:05

00078802

# CONTINUING CALIBRATION BLANK (CCB)

Login Number: L0710596
Run Date: 10/25/2007
Sample ID: WG253869-20
Instrument ID: ELAN-ICP
Run Time: 15:20
Method: 6020
File ID: EL.102507.152014
Analyst: JYH
Units: ug/L
Workgroup (AAB#): WG253774
Cal ID: ELAN-I - 25-OCT-07
Matrix: WATER

| Analytes | MDL | RDL | Concentration | Dilution | Qualifier |
|---|---|---|---|---|---|
| Silver | 0.100 | 0.400 | 0.00920 | 1 | U |
| Arsenic | 0.100 | 0.400 | -0.0315 | 1 | U |
| Barium | 0.200 | 1.20 | -0.00230 | 1 | U |
| Cadmium | 0.0500 | 0.200 | 0.0262 | 1 | U |
| Chromium | 0.200 | 0.800 | 0.159 | 1 | U |
| Copper | 0.200 | 0.800 | -0.0171 | 1 | U |
| Lead | 0.100 | 0.200 | 0.00480 | 1 | U |
| Manganese | 0.200 | 0.800 | -0.0663 | 1 | U |
| Nickel | 0.400 | 1.60 | -0.00690 | 1 | U |
| Antimony | 0.100 | 0.400 | 0.0719 | 1 | U |
| Selenium | 0.200 | 0.400 | -0.0276 | 1 | U |
| Thallium | 0.0200 | 0.0800 | 0.00230 | 1 | U |

U = Result is less than MDL
F = Result is between MDL and RL
* = Result is above RL

KEMRON FORMS - Modified 09/27/2006
Version 2.0 PDF File ID: 917023
Report generated 10/26/2007 08:05

KEMRON Environmental Services

CONTINUING CALIBRATION BLANK (CCB)

Login Number: L0710596
Run Date: 10/25/2007
Sample ID: WG253869-22
Instrument ID: ELAN-ICP
Run Time: 16:32
Method: 6020
File ID: EL.102507.163230
Analyst: JYH
Units: ug/L
Workgroup (AAB#): WG253774
Cal ID: ELAN-I - 25-OCT-07
Matrix: WATER

| Analytes | MDL | RDL | Concentration | Dilution | Qualifier |
|---|---|---|---|---|---|
| Silver | 0.100 | 0.400 | 0.00570 | 1 | U |
| Arsenic | 0.100 | 0.400 | 0.0271 | 1 | U |
| Barium | 0.200 | 1.20 | -0.00240 | 1 | U |
| Cadmium | 0.0500 | 0.200 | 0.0117 | 1 | U |
| Chromium | 0.200 | 0.800 | 0.180 | 1 | U |
| Copper | 0.200 | 0.800 | -0.0146 | 1 | U |
| Lead | 0.100 | 0.200 | 0.000300 | 1 | U |
| Manganese | 0.200 | 0.800 | -0.0743 | 1 | U |
| Nickel | 0.400 | 1.60 | -0.00910 | 1 | U |
| Antimony | 0.100 | 0.400 | 0.0663 | 1 | U |
| Selenium | 0.200 | 0.400 | 0.0866 | 1 | U |
| Thallium | 0.0200 | 0.0800 | -0.00340 | 1 | U |

U = Result is less than MDL
F = Result is between MDL and RL
* = Result is above RL

KEMRON FORMS - Modified 09/27/2006
Version 2.0 PDF File ID: 917023
Report generated 10/26/2007 08:05

# INITIAL CALIBRATION VERIFICATION (ICV)



Login Number: L0710596
Run Date: 10/25/2007
Sample ID: WG253869-05
Instrument ID: ELAN-ICP
Run Time: 09:43
Method: 6020
File ID: EL.102507.094349
Analyst: JYH
Units: ug/L
Workgroup (AAB#): WG253774
Cal ID: ELAN-I - 25-OCT-07
QC Key: STD

| Analyte | | Expected | Found | %REC | LIMITS | Q |
|---|---|---|---|---|---|---|
| Silver | | 50 | 47.7 | 95.3 | 90 - 110 | |
| Arsenic | | 50 | 49.0 | 98.0 | 90 - 110 | |
| Barium | | 50 | 48.9 | 97.7 | 90 - 110 | |
| Cadmium | | 50 | 48.6 | 97.3 | 90 - 110 | |
| Chromium | | 50 | 49.3 | 98.7 | 90 - 110 | |
| Copper | | 50 | 50.7 | 101 | 90 - 110 | |
| Lead | | 50 | 50.2 | 100 | 90 - 110 | |
| Manganese | | 50 | 49.5 | 99.1 | 90 - 110 | |
| Nickel | | 50 | 49.6 | 99.1 | 90 - 110 | |
| Antimony | | 50 | 49.2 | 98.4 | 90 - 110 | |
| Selenium | | 50 | 50.3 | 101 | 90 - 110 | |
| Thallium | | 50 | 49.1 | 98.1 | 90 - 110 | |

* Exceeds LIMITS Limit

KEMRON FORMS - Modified 09/06/2007 (ICV)
Version 1.5 PDF File ID: 917019
Report generated 10/26/2007 08:05

CONTINUING CALIBRATION VERIFICATION (CCV)

00078805

Login Number: L0710596
Run Date: 10/25/2007
Sample ID: WG253869-11
Instrument ID: ELAN-ICP
Run Time: 10:23
Method: 6020
File ID: EL.102507.102332
Analyst: JYH
QC Key: STD
Workgroup (AAB#): WG253774
Cal ID: ELAN-I - 25-OCT-07

| Analyte | | Expected | Found | UNITS | %REC | LIMITS | | Q |
|---|---|---|---|---|---|---|---|---|
| Silver | | 50.0 | 48.1 | ug/L | 96.2 | 90 - 110 | | |
| Arsenic | | 50.0 | 49.8 | ug/L | 99.6 | 90 - 110 | | |
| Barium | | 50.0 | 49.3 | ug/L | 98.5 | 90 - 110 | | |
| Cadmium | | 50.0 | 50.0 | ug/L | 100 | 90 - 110 | | |
| Chromium | | 50.0 | 50.4 | ug/L | 101 | 90 - 110 | | |
| Copper | | 50.0 | 50.8 | ug/L | 102 | 90 - 110 | | |
| Lead | | 50.0 | 51.7 | ug/L | 103 | 90 - 110 | | |
| Manganese | | 50.0 | 50.0 | ug/L | 100 | 90 - 110 | | |
| Nickel | | 50.0 | 50.7 | ug/L | 101 | 90 - 110 | | |
| Antimony | | 50.0 | 50.2 | ug/L | 100 | 90 - 110 | | |
| Selenium | | 50.0 | 49.6 | ug/L | 99.1 | 90 - 110 | | |
| Thallium | | 50.0 | 51.2 | ug/L | 102 | 90 - 110 | | |

* Exceeds LIMITS Criteria

KEMRON FORMS - Modified 09/06/2007 - (CCV)
Version 1.5 PDF File ID: 917022
Report generated 10/26/2007 08:05

CONTINUING CALIBRATION VERIFICATION (CCV)



Login Number: L0710596　Run Date: 10/25/2007　Sample ID: WG253869-13
Instrument ID: ELAN-ICP　Run Time: 11:46　Method: 6020
File ID: EL.102507.114625　Analyst: JYH　QC Key: STD
Workgroup (AAB#): WG253774　Cal ID: ELAN-I - 25-OCT-07

| Analyte | | Expected | Found | UNITS | %REC | LIMITS | | Q |
|---|---|---|---|---|---|---|---|---|
| Silver | | 50.0 | 47.7 | ug/L | 95.3 | 90 - 110 | | |
| Arsenic | | 50.0 | 48.4 | ug/L | 96.8 | 90 - 110 | | |
| Barium | | 50.0 | 49.8 | ug/L | 99.5 | 90 - 110 | | |
| Cadmium | | 50.0 | 49.7 | ug/L | 99.5 | 90 - 110 | | |
| Chromium | | 50.0 | 47.7 | ug/L | 95.3 | 90 - 110 | | |
| Copper | | 50.0 | 48.6 | ug/L | 97.1 | 90 - 110 | | |
| Lead | | 50.0 | 50.6 | ug/L | 101 | 90 - 110 | | |
| Manganese | | 50.0 | 48.8 | ug/L | 97.5 | 90 - 110 | | |
| Nickel | | 50.0 | 48.4 | ug/L | 96.9 | 90 - 110 | | |
| Antimony | | 50.0 | 49.1 | ug/L | 98.1 | 90 - 110 | | |
| Selenium | | 50.0 | 49.2 | ug/L | 98.4 | 90 - 110 | | |
| Thallium | | 50.0 | 49.7 | ug/L | 99.4 | 90 - 110 | | |

* Exceeds LIMITS Criteria

KEMRON FORMS - Modified 09/06/2007 - (CCV)
Version 1.5　PDF File ID: 917022
Report generated 10/26/2007 08:05

# CONTINUING CALIBRATION VERIFICATION (CCV)

00078807

Login Number: L0710596
Instrument ID: ELAN-ICP
File ID: EL.102507.130507
Workgroup (AAB#): WG253774

Run Date: 10/25/2007
Run Time: 13:05
Analvst: JYH
Cal ID: ELAN-I - 25-OCT-07

Sample ID: WG253869-15
Method: 6020
QC Key: STD

| Analyte | | Expected | Found | UNITS | %REC | LIMITS | | Q |
|---|---|---|---|---|---|---|---|---|
| Silver | | 50.0 | 47.7 | ug/L | 95.3 | 90 - 110 | | |
| Arsenic | | 50.0 | 48.5 | ug/L | 96.9 | 90 - 110 | | |
| Barium | | 50.0 | 49.1 | ug/L | 98.1 | 90 - 110 | | |
| Cadmium | | 50.0 | 48.5 | ug/L | 97.0 | 90 - 110 | | |
| Chromium | | 50.0 | 48.5 | ug/L | 97.0 | 90 - 110 | | |
| Copper | | 50.0 | 48.8 | ug/L | 97.7 | 90 - 110 | | |
| Lead | | 50.0 | 50.9 | ug/L | 102 | 90 - 110 | | |
| Manganese | | 50.0 | 49.0 | ug/L | 98.0 | 90 - 110 | | |
| Nickel | | 50.0 | 48.6 | ug/L | 97.2 | 90 - 110 | | |
| Antimony | | 50.0 | 49.3 | ug/L | 98.6 | 90 - 110 | | |
| Selenium | | 50.0 | 49.5 | ug/L | 99.0 | 90 - 110 | | |
| Thallium | | 50.0 | 49.8 | ug/L | 99.6 | 90 - 110 | | |

* Exceeds LIMITS Criteria

KEMRON FORMS - Modified 09/06/2007 - (CCV)
Version 1.5 PDF File ID: 917022
Report generated 10/26/2007 08:05

CONTINUING CALIBRATION VERIFICATION (CCV)

00078808

Login Number: L0710596 | Run Date: 10/25/2007 | Sample ID: WG253869-17
Instrument ID: ELAN-ICP | Run Time: 14:24 | Method: 6020
File ID: EL.102507.142407 | Analyst: JYH | QC Key: STD
Workgroup (AAB#): WG253774 | Cal ID: ELAN-I - 25-OCT-07

| Analyte | | Expected | Found | UNITS | %REC | LIMITS | | Q |
|---|---|---|---|---|---|---|---|---|
| Silver | | 50.0 | 47.3 | ug/L | 94.6 | 90 - 110 | | |
| Arsenic | | 50.0 | 49.9 | ug/L | 99.9 | 90 - 110 | | |
| Barium | | 50.0 | 49.7 | ug/L | 99.4 | 90 - 110 | | |
| Cadmium | | 50.0 | 50.2 | ug/L | 100 | 90 - 110 | | |
| Chromium | | 50.0 | 50.6 | ug/L | 101 | 90 - 110 | | |
| Copper | | 50.0 | 50.5 | ug/L | 101 | 90 - 110 | | |
| Lead | | 50.0 | 50.2 | ug/L | 100 | 90 - 110 | | |
| Manganese | | 50.0 | 47.5 | ug/L | 94.9 | 90 - 110 | | |
| Nickel | | 50.0 | 50.7 | ug/L | 101 | 90 - 110 | | |
| Antimony | | 50.0 | 50.4 | ug/L | 101 | 90 - 110 | | |
| Selenium | | 50.0 | 49.4 | ug/L | 98.8 | 90 - 110 | | |
| Thallium | | 50.0 | 49.0 | ug/L | 97.9 | 90 - 110 | | |

* Exceeds LIMITS Criteria

KEMRON FORMS - Modified 09/06/2007 - (CCV)
Version 1.5 PDF File ID: 917022
Report generated 10/26/2007 08:05

# CONTINUING CALIBRATION VERIFICATION (CCV)

00078809

Login Number: L0710596
Run Date: 10/25/2007
Sample ID: WG253869-19
Instrument ID: ELAN-ICP
Run Time: 15:13
Method: 6020
File ID: EL.102507.151332
Analyst: JYH
QC Key: STD
Workgroup (AAB#): WG253774
Cal ID: ELAN-I - 25-OCT-07

| Analyte | | Expected | Found | UNITS | %REC | LIMITS | | Q |
|---|---|---|---|---|---|---|---|---|
| Silver | | 50.0 | 48.1 | ug/L | 96.2 | 90 - 110 | | |
| Arsenic | | 50.0 | 50.5 | ug/L | 101 | 90 - 110 | | |
| Barium | | 50.0 | 49.8 | ug/L | 99.5 | 90 - 110 | | |
| Cadmium | | 50.0 | 49.9 | ug/L | 99.8 | 90 - 110 | | |
| Chromium | | 50.0 | 51.1 | ug/L | 102 | 90 - 110 | | |
| Copper | | 50.0 | 51.3 | ug/L | 103 | 90 - 110 | | |
| Lead | | 50.0 | 50.4 | ug/L | 101 | 90 - 110 | | |
| Manganese | | 50.0 | 48.9 | ug/L | 97.9 | 90 - 110 | | |
| Nickel | | 50.0 | 51.5 | ug/L | 103 | 90 - 110 | | |
| Antimony | | 50.0 | 50.3 | ug/L | 101 | 90 - 110 | | |
| Selenium | | 50.0 | 50.4 | ug/L | 101 | 90 - 110 | | |
| Thallium | | 50.0 | 49.6 | ug/L | 99.2 | 90 - 110 | | |

* Exceeds LIMITS Criteria

KEMRON FORMS - Modified 09/06/2007 - (CCV)
Version 1.5 PDF File ID: 917022
Report generated 10/26/2007 08:05

# CONTINUING CALIBRATION VERIFICATION (CCV)

00078810

Login Number: L0710596
Run Date: 10/25/2007
Sample ID: WG253869-21
Instrument ID: ELAN-ICP
Run Time: 16:25
Method: 6020
File ID: EL.102507.162548
Analyst: JYH
QC Key: STD
Workgroup (AAB#): WG253774
Cal ID: ELAN-I - 25-OCT-07

| Analyte | | Expected | Found | UNITS | %REC | LIMITS | | Q |
|---|---|---|---|---|---|---|---|---|
| Silver | | 50.0 | 47.3 | ug/L | 94.6 | 90 - 110 | | |
| Arsenic | | 50.0 | 49.8 | ug/L | 99.6 | 90 - 110 | | |
| Barium | | 50.0 | 50.2 | ug/L | 100 | 90 - 110 | | |
| Cadmium | | 50.0 | 50.0 | ug/L | 100 | 90 - 110 | | |
| Chromium | | 50.0 | 51.1 | ug/L | 102 | 90 - 110 | | |
| Copper | | 50.0 | 50.9 | ug/L | 102 | 90 - 110 | | |
| Lead | | 50.0 | 48.7 | ug/L | 97.4 | 90 - 110 | | |
| Manganese | | 50.0 | 48.7 | ug/L | 97.4 | 90 - 110 | | |
| Nickel | | 50.0 | 51.6 | ug/L | 103 | 90 - 110 | | |
| Antimony | | 50.0 | 50.0 | ug/L | 100 | 90 - 110 | | |
| Selenium | | 50.0 | 48.9 | ug/L | 97.8 | 90 - 110 | | |
| Thallium | | 50.0 | 47.9 | ug/L | 95.8 | 90 - 110 | | |

* Exceeds LIMITS Criteria

KEMRON FORMS - Modified 09/06/2007 - (CCV)
Version 1.5 PDF File ID: 917022
Report generated 10/26/2007 08:05

# KEMRON ENVIRONMENTAL SERVICES
## INTERFERENCE CHECK SAMPLES

**Login number:** L0710596
**Instrument ID:** ELAN-ICP
**Sol. A :** WG253869-09 **File ID:** EL.102507.101025
**Sol. AB :** WG253869-10 **File ID:** EL.102507.101659
**Workgroup (AAB#):** WG253774
**Method:** 6020
**Units:** ug/L

| | Sol. A | | | Sol. AB | | | |
|---|---|---|---|---|---|---|---|
| ANALYTE | True | Found | %Recovery | True | Found | %Recovery | Q |
| Antimony | NS | -0.00830 | NS | 100 | 101 | 101 | |
| Arsenic | NS | -0.00460 | NS | 100 | 98.3 | 98.3 | |
| Barium | NS | 0.0366 | NS | 100 | 98.7 | 98.7 | |
| Cadmium | NS | 0.0880 | NS | 100 | 98.8 | 98.8 | |
| Chromium | NS | 0.265 | NS | 100 | 99.1 | 99.1 | |
| Copper | NS | 0.375 | NS | 100 | 96.2 | 96.2 | |
| Lead | NS | 0.0730 | NS | 100 | 96.4 | 96.4 | |
| Manganese | NS | 0.404 | NS | 100 | 97.9 | 97.9 | |
| Nickel | NS | 1.14 | NS | 100 | 97.8 | 97.8 | |
| Selenium | NS | -0.134 | NS | 100 | 95.7 | 95.7 | |
| Silver | NS | 0.00800 | NS | 100 | 94.1 | 94.1 | |
| Thallium | NS | -0.00100 | NS | 100 | 95.9 | 95.9 | |

**NS = Not spiked**
*** = Recovery of spiked element is outside acceptance limit of 80% - 120% of true value.**
**# = Result for unspiked element is outside the acceptance limits of (+/-) the project reporting limit (RL).**

**KEMRON FORMS - Modified 03/05/2007**
**Version 1.3 PDF File ID: 917021**
**Report generated 10/26/2007 08:05**

Login Number: L0710596
Run Date: 10/25/2007
Sample ID: WG253869-08
Instrument ID: ELAN-ICP
Run Time: 10:03
Prep Method: 3015
File ID: EL.102507.100350
Analyst: JYH
Method: 6020
Workgroup (AAB#): WG253869
Matrix: Water
Units: ug/L
Contract #: DACA56-94-D-0020
Cal ID: ELAN-ICP - 25-OCT-2007 09:37

| Analytes | Expected | Found | % Rec | Limits | Q |
|---|---|---|---|---|---|
| Cadmium, Dissolved | 0.200 | 0.193 | 96.5 | 50 - 150 | |
| Thallium, Dissolved | 0.0800 | 0.0804 | 101 | 50 - 150 | |

KEMRON FORMS - Modified 02/14/2006
Version 1.5 PDF File ID: 917017
Report generated 10/25/2007 15:29

# LINEAR RANGE (QUARTERLY)

00078813

**Login Number:** L0710596 **Date:** 09/07/2007
**Insturment ID:** ELAN-ICP **Method:** 6020

| Analyte | Integration Time (Sec.) | Concentration (ug/L) |
|---|---|---|
| Antimony | 1.00 | 100.0 |
| Arsenic | 1.00 | 100.0 |
| Barium | 1.00 | 100.0 |
| Cadmium | 1.00 | 100.0 |
| Chromium | 1.00 | 100.0 |
| Cobalt | 1.00 | 100.0 |
| Copper | 1.00 | 100.0 |
| Lead | 1.00 | 100.0 |
| Manganese | 1.00 | 100.0 |
| Nickel | 1.00 | 100.0 |
| Selenium | 1.00 | 100.0 |
| Silver | 1.00 | 100.0 |
| Thallium | 1.00 | 100.0 |
| Vanadium | 1.00 | 100.0 |
| Zinc | 1.00 | 100.0 |

**Comments:**

# 2.2.3 Metals CVAA Data (Mercury)

# 2.2.3.1 Summary Data

# LABORATORY REPORT

00078816

**L0710596**

**11/02/07 10:41**

**Submitted By**

**KEMRON Environmental Services**
**156 Starlite Drive**
**Marietta , OH 45750**
**( 740 ) 373 - 4071**

**For**

**Account Name:** Shaw E & I, Inc.
ABB Lummus Biulding
3010 Briarpark Drive Suite 4N
Houston, TX 77042
**Attention:** Larry Duty

**Account Number:** 2773
**Work ID:** LHAAD

**P.O. Number:** 322255 OP

## Sample Analysis Summary

| Client ID | Lab ID | Method | Dilution | Date Received |
|---|---|---|---|---|
| 47WWZZ-101807 | L0710596-12 | 7470A | 1 | 23-OCT-07 |
| EQUIPMENT RINSE | L0710596-14 | 7470A | 1 | 23-OCT-07 |

| | | | | | |
|---|---|---|---|---|---|
| Sample Number: | **L0710596-12** | PrePrep Method: | **NONE** | Instrument: | **HYDRA** |
| Client ID: | **47WWZZ-101807** | Prep Method: | **METHOD** | Prep Date: | **10/24/2007 07:30** |
| Matrix: | **Water** | Analytical Method: | **7470A** | Cal Date: | **10/25/2007 13:09** |
| Workgroup Number: | **WG253832** | Analyst: | **ED** | Run Date: | **10/25/2007 13:35** |
| Collect Date: | **10/18/2007 09:55** | Dilution: | **1** | File ID: | **HY.102507.133541** |
| Sample Tag: | **01** | Units: | **mg/L** | | |

| Analyte | CAS. Number | Result | Qual | PQL | SDL |
|---|---|---|---|---|---|
| Mercury, Dissolved | 7439-97-6 | | U | 0.000200 | 0.000100 |

**U Not detected at or above adjusted sample detection limit**

| | | | | | |
|---|---|---|---|---|---|
| Sample Number: | L0710596-14 | PrePrep Method: | NONE | Instrument: | HYDRA |
| Client ID: | EQUIPMENT RINSE | Prep Method: | METHOD | Prep Date: | 10/24/2007 07:30 |
| Matrix: | Water | Analytical Method: | 7470A | Cal Date: | 10/25/2007 13:09 |
| Workgroup Number: | WG253832 | Analyst: | ED | Run Date: | 10/25/2007 13:40 |
| Collect Date: | 10/22/2007 14:20 | Dilution: | 1 | File ID: | HY.102507.134035 |
| Sample Tag: | 01 | Units: | mg/L | | |

| Analyte | CAS. Number | Result | Qual | PQL | SDL |
|---|---|---|---|---|---|
| Mercury, Dissolved | 7439-97-6 | | U | 0.000200 | 0.000100 |

**U Not detected at or above adjusted sample detection limit**

# 2.2.3.2 QC Summary Data

**Example Cold Vapor Mercury Calculations**
**Hydra AA Mercury Analyzer**

**1.0 Initial Calibration (ICAL) Parameters**
The system performs linear regression from data consisting of a blank and five standards.

**2.0 Calculating the concentration (C) of an element in water using data from run log and quantitation report (note:the data system performs this calculation automatically when correction factors have been entered):**

$$Cx = Cs \times \frac{Vf}{Vi} \times D$$

| Where: | **Example:** |
|---|---|
| $Cs$ = Concentration computed by the data system (ug/L) | 0.1 |
| $Vf$ = Diluted to Volume (mL) | 40 |
| $Vi$ = Aliquot Volume (mL) | 40 |
| $D$ = Manual dilution factor, if required (10X = 10) | 1 |
| | |
| $Cx$ = Concentration of element in ppb (ug/L) | 0.1 |

**3.0 Calculating the concentration (C) of an element in soil using data from prep log and quantitation report (note: the data system performs this calculation automatically when correction factors have been entered):**

$$Cx = Cs \times \frac{Vf}{Ws} \times D$$

| Where: | **Example:** |
|---|---|
| $Cs$ = Concentration computed by the data system (ug/L) | 0.1 |
| $Vf$ = Diluted to volume (mL) | 40 |
| $Ws$ = Aliquot weight (g) | 0.6 |
| $D$ = Manual dilution factor | 1 |
| | |
| $Cx$ = Concentration of element in ug/kg | 6.67 |

**4.0 Adjusting the concentration to dry weight:**

$$Cdry = \frac{Cx \times 100}{Px}$$

| | |
|---|---|
| 1 $Cx$ = Concentration calculated as received (wet basis) | 6.67 |
| $Px$ = Percent solids of sample (%wt) | 80 |
| | |
| $Cdry$ = Concentration calculated as dry weight (ug/kg) | 8.33 |

**8.33 ug/kg = 0.00833 mg/kg**

# Mercury Digestion Log

Analyst(s): RAM
Date: 10/24/07
LCS: 4ml STD 22648
MS/MSD: 4ml STD 22648
Witness: VC
$H_2SO_4$ Lot #: COA 12284
$K_2S_2O_8$ Lot #: RCT 12163
$KMNO_4$ Lot #: RCT 12157
$HNO_3$ Lot #: COA 12617
Digest Tube Lot #: COA 12609
Aqua Regia: N/A
Earliest Sample Due Date: 10/26/07
ICV / CCV: STD 22650
Stds: 0, 0.2, 1, 2, 5, 10: STD 22651 to 22656

Box: 85

Digestion Work Group: WG 253689

**ME404 Revision #** 10 - Method 7470A-Water
**ME405 Revision #** ____ - Method 7471A-Soil

Hot Block Temperature at start: 94.9°C 0730

Hot Block Temperature at end: 94.3°C 0930

Relinquished By: RAM
Digest Received By: Ed Date: 10-24-07

| | KEMRON # | Initial Wt/Vol | Final Volume | Comments | Due Date |
|---|---|---|---|---|---|
| 1 | MBW | 40ml | 40ml | LAB FILT 10/22 -02 | |
| 2 | LCW | | | -03 | |
| 3 | 10-539-02 | | | LAB FILT 10/22 | 11/1 |
| 4 | -04 | | | | |
| 5 | 10-540-02 | | | | 11/1 |
| 6 | -04 | | | | |
| 7 | 10-541-02 | | | | 11/1 |
| 8 | 10-542-02 | | | | 11/1 |
| 9 | 10-596-12 | | | LAB FILT 10/24 | 10/30 |
| 10 | -14 | | | -01 | |
| 11 | -14MS | 36ml | | -04 | |
| 12 | -14MSD | | | -05 | |
| 13 | 10-610-01 | 40ml | | | 10/26 |
| 14 | -02 | | | | |
| 15 | -03 | | | | |
| 16 | -04 | | | | |
| 17 | TCBLK 10/23 | 4ml | | WG253629 @ 1300 | |
| 18 | 10-499-01 | | | | 10/29 |
| 19 | -02 | | | | |
| 20 | -03 | | | | |
| 21 | 10-520-01 | | | | 10/29 |
| 22 | 10-522-01 | | | | 10/29 |
| 23 | 10-532-01 | | | | 10/29 |
| 24 | RAM | 10/24/07 | | | |
| 25 | | | | | |

Comments: ____________________

Primary Review: 10/24/07 Secondary Review: Vicki Collins 10/24/07

# KEMRON Environmental Services

## Instrument Run Log

Instrument: HYDRA — Dataset: 102507C.PRN
Analyst1: ED — Analyst2: NA
Method: 7470A — SOP: 404 — Rev: 10
Maintenance Log ID: 21448

Calibration Std: STD22656 — ICV/CCV Std: STD22650 — Post Spike: STD22656
ICSA: N/A — ICSAB: N/A

Workgroups: WG253832

Comments:

| Seq. | File ID | Sample | ID | Prep | Dil | Reference | Date/Time |
|---|---|---|---|---|---|---|---|
| 1 | HY.102507.130002 | WG253865-01 | Calibration Point | | 1 | | 10/25/07 13:00 |
| 2 | HY.102507.130152 | WG253865-02 | Calibration Point | | 1 | | 10/25/07 13:01 |
| 3 | HY.102507.130411 | WG253865-03 | Calibration Point | | 1 | | 10/25/07 13:04 |
| 4 | HY.102507.130548 | WG253865-04 | Calibration Point | | 1 | | 10/25/07 13:05 |
| 5 | HY.102507.130730 | WG253865-05 | Calibration Point | | 1 | | 10/25/07 13:07 |
| 6 | HY.102507.130923 | WG253865-06 | Calibration Point | | 1 | | 10/25/07 13:09 |
| 7 | HY.102507.131112 | WG253865-07 | Initial Calibration Verification | | 1 | | 10/25/07 13:11 |
| 8 | HY.102507.131251 | WG253865-08 | Initial Calib Blank | | 1 | | 10/25/07 13:12 |
| 9 | HY.102507.131432 | WG253865-09 | CCV | | 1 | | 10/25/07 13:14 |
| 10 | HY.102507.131619 | WG253865-10 | CCB | | 1 | | 10/25/07 13:16 |
| 11 | HY.102507.131756 | WG253689-02 | Method/Prep Blank | 40/40 | 1 | | 10/25/07 13:17 |
| 12 | HY.102507.132003 | WG253689-03 | Laboratory Control S | 40/40 | 1 | | 10/25/07 13:20 |
| 13 | HY.102507.132224 | L0710539-02 | MIN-01 | 40/40 | 1 | WG253712-01 | 10/25/07 13:22 |
| 14 | HY.102507.132445 | WG253832-01 | Post Digestion Spike | | 1 | L0710539-02 | 10/25/07 13:24 |
| 15 | HY.102507.132622 | L0710539-04 | MIN-02 | 40/40 | 1 | | 10/25/07 13:26 |
| 16 | HY.102507.132823 | L0710540-02 | SWL-01 | 40/40 | 1 | | 10/25/07 13:28 |
| 17 | HY.102507.133015 | L0710540-04 | SWL-01D | 40/40 | 1 | | 10/25/07 13:30 |
| 18 | HY.102507.133155 | L0710541-02 | MTE-01 | 40/40 | 1 | | 10/25/07 13:31 |
| 19 | HY.102507.133401 | L0710542-02 | STA-01 | 40/40 | 1 | | 10/25/07 13:34 |
| 20 | HY.102507.133541 | L0710596-12 | 47WWZZ-101807 | 40/40 | 1 | | 10/25/07 13:35 |
| 21 | HY.102507.133720 | WG253865-11 | CCV | | 1 | | 10/25/07 13:37 |
| 22 | HY.102507.133857 | WG253865-12 | CCB | | 1 | | 10/25/07 13:38 |
| 23 | HY.102507.134035 | WG253689-01 | Reference Sample | | 1 | L0710596-14 | 10/25/07 13:40 |
| 24 | HY.102507.134214 | WG253689-04 | Matrix Spike | 36/40 | 1 | | 10/25/07 13:42 |
| 25 | HY.102507.134354 | WG253689-05 | Matrix Spike Duplica | 36/40 | 1 | | 10/25/07 13:43 |
| 26 | HY.102507.134536 | L0710610-01 | GP-01 | 40/40 | 1 | | 10/25/07 13:45 |
| 27 | HY.102507.134732 | L0710610-02 | GP-02 | 40/40 | 1 | | 10/25/07 13:47 |
| 28 | HY.102507.134911 | L0710610-03 | GP-03 | 40/40 | 1 | | 10/25/07 13:49 |
| 29 | HY.102507.135110 | L0710610-04 | GP-04 | 40/40 | 1 | | 10/25/07 13:51 |
| 30 | HY.102507.135251 | WG253629-01 | Fluid Blank | | 1 | | 10/25/07 13:52 |
| 31 | HY.102507.135433 | L0710499-01 | LOWER LOT BURN PILE S | 4/40 | 1 | WG253714-01 | 10/25/07 13:54 |
| 32 | HY.102507.135624 | WG253832-02 | Post Digestion Spike | | 1 | L0710499-01 | 10/25/07 13:56 |
| 33 | HY.102507.135805 | WG253865-13 | CCV | | 1 | | 10/25/07 13:58 |
| 34 | HY.102507.135942 | WG253865-14 | CCB | | 1 | | 10/25/07 13:59 |
| 35 | HY.102507.140143 | L0710499-02 | LOWER LOT BURN PILE S | 4/40 | 1 | | 10/25/07 14:01 |
| 36 | HY.102507.140324 | L0710499-03 | LOWER LOT BURN PILE N | 4/40 | 1 | | 10/25/07 14:03 |
| 37 | HY.102507.140522 | L0710520-01 | ATHENS CO | 4/40 | 1 | | 10/25/07 14:05 |

Page: 1

Approved: October 25, 2007

Maren Beery

**KEMRON Environmental Services**

Instrument Run Log

Instrument: HYDRA
Dataset: 102507C.PRN
Analyst1: ED
Analyst2: NA
Method: 7470A
SOP: 404
Rev: 10
Maintenance Log ID: 21448

Calibration Std: STD22656
ICV/CCV Std: STD22650
Post Spike: STD22656
ICSA: N/A
ICSAB: N/A

Workgroups: WG253832

Comments:

| Seq. | File ID | Sample | ID | Prep | Dil | Reference | Date/Time |
|---|---|---|---|---|---|---|---|
| 38 | HY.102507.140722 | L0710522-01 | WASHINGTON CO | 4/40 | 1 | | 10/25/07 14:07 |
| 39 | HY.102507.140910 | L0710532-01 | \#1 STRIPPING COLUMN | 4/40 | 1 | | 10/25/07 14:09 |
| 40 | HY.102507.141100 | WG253865-15 | CCV | | 1 | | 10/25/07 14:11 |
| 41 | HY.102507.141236 | WG253865-16 | CCB | | 1 | | 10/25/07 14:12 |

Page: 2

Approved: October 25, 2007

Maren Beery

KEMRON Environmental Services
Data Checklist

Date: 25-OCT-2007
Analyst: ED
Analyst: NA
Method: 7470A
Instrument: HYDRA
Curve Workgroup: WG253865
Runlog ID: 18963
Analytical Workgroups: WG253832

| | |
|---|---|
| Calibration/Linearity | X |
| ICV/CCV | X |
| ICB/CCB | X |
| ICSA/ICSAB | |
| CRI | |
| Blank/LCS | X |
| MS/MSD | X |
| Post Spike/Serial Dilution | X |
| Upload Results | X |
| Data Qualifiers | |
| Generate PDF Instrument Data | X |
| Sign/Annotate PDF Data | X |
| Upload Curve Data | X |
| Workgroup Forms | X |
| Case Narrative | 539,540,541,542,596,610,520,522 |
| Client Forms | |
| Level X | 539,540,541,542,520,522 |
| Level 3 | 596 |
| Level 4 | |
| Check for compliance with method and project specific requirements | X |
| Check the completeness of reported information | X |
| Check the information for the report narrative | X |
| Primary Reviewer | ED |
| Secondary Reviewer | MMB |
| | |
| Comments | |

Primary Reviewer:
25-OCT-2007
Emily Decker

Secondary Reviewer:
25-OCT-2007
Maren Beery

Generated: OCT-25-2007 19:58:45

KEMRON Environmental Services
HOLDING TIMES
EQUIVALENT TO AFCEE FORM 9

00078825

Analytical Method: 7470A

AAB#: WG253832

Login Number: L0710596

| Client ID | Date Collected | Date Received | Date Extracted | Max Hold Time Ext. | Time Held Ext. | Date Analyzed | Max Hold Time Anal | Time Held Anal. | Q |
|---|---|---|---|---|---|---|---|---|---|
| 47WWZZ-101807 | 10/18/07 | 10/23/07 | 10/24/07 | 28 | 5.90 | 10/25/07 | 28 | 1.25 | |
| EQUIPMENT RINSE | 10/22/07 | 10/23/07 | 10/24/07 | 28 | 1.72 | 10/25/07 | 28 | 1.26 | |

* EXT = SEE PROJECT QAPP REQUIREMENTS
*ANAL = SEE PROJECT QAPP REQUIREMENTS

KEMRON FORMS - Modified 11/20/2006
Version 1.5 PDF File ID: 916886
Report generated 10/25/2007 15:03

# METHOD BLANK SUMMARY

Login Number: L0710596
Blank File ID: HY.102507.131756
Prep Date: 10/24/07 07:30
Analyzed Date: 10/25/07 13:17
Analyst: ED

Work Group: WG253832
Blank Sample ID: WG253689-02
Instrument ID: HYDRA
Method: 7470A

This Method Blank Applies To The Following Samples:

| Client ID | Lab Sample ID | Lab File ID | Time Analyzed | TAG |
|---|---|---|---|---|
| LCS | WG253689-03 | HY.102507.132003 | 10/25/07 13:20 | 01 |
| 47WWZZ-101807 | L0710596-12 | HY.102507.133541 | 10/25/07 13:35 | 01 |
| EQUIPMENT RINSE | L0710596-14 | HY.102507.134035 | 10/25/07 13:40 | 01 |

KEMRON FORMS - Modified 01/31/2007
Version 1.5 PDF File ID: 916887
Report generated 10/25/2007 15:03

# KEMRON Environmental Services

## METHOD BLANK REPORT

Login Number: L0710596
Prep Date: 10/24/07 07:30
Sample ID: WG253689-02
Instrument ID: HYDRA
Run Date: 10/25/07 13:17
Prep Method: METHOD
File ID: HY.102507.131756
Analyst: ED
Method: 7470A
Workgroup (AAB#): WG253832
Matrix: Water
Units: mg/L
Contract #: DACA56-94-D-0020
Cal ID: HYDRA - 25-OCT-07

| Analytes | SDL | PQL | Concentration | Dilution | Qualifier |
|---|---|---|---|---|---|
| Mercury, Dissolved | 0.000100 | 0.000200 | 0.000100 | 1 | U |

SDL Method Detection Limit
PQL Reporting/Practical Quantitation Limit
ND Analyte Not detected at or above reporting limit
* Analyte concentration > RL

KEMRON FORMS - Modified 12/07/2006
Version 1.5 PDF File ID: 916888
Report generated 10/25/2007 15:03

LABORATORY CONTROL SAMPLE (LCS)

Login Number: L0710596 Run Date: 10/25/2007 Sample ID: WG253689-03
Instrument ID: HYDRA Run Time: 13:20 Prep Method: METHOD
File ID: HY.102507.132003 Analyst: ED Method: 7470A
Workgroup (AAB#): WG253832 Matrix: Water Units: mg/L
QC Key: STD Lot#: MI-7470-01 Cal ID: HYDRA - 25-OCT-07

| Analytes | Expected | Found | % Rec | LCS Limits | Q |
|---|---|---|---|---|---|
| Mercury, Dissolved | 0.00400 | 0.00432 | 108 | 85 - 115 | |

KEMRON FORMS - Modified 09/06/2007
Version 1.5 PDF File ID: 916889
Report generated 10/25/2007 15:03

00078829

# MATRIX SPIKE AND MATRIX SPIKE DUP (MS/MSD)

Loginnum:L0710596 Cal ID: HYDRA - Worknum:WG253832
Instrument ID:HYDRA Contract #:DACA56-94-D-0020 Method:7470A
Parent ID:WG253689-01 File ID:HY.102507.134035 Dil:1 Matrix:WATER
Sample ID:WG253689-04 MS File ID:HY.102507.134214 Dil:1 Units:mg/L
Sample ID:WG253689-05 MSD File ID:HY.102507.134354 Dil:1

| Analyte | Parent | MS Spiked | MS Found | MS %Rec | MSD Spiked | MSD Found | MSD %Rec | %RPD | %Rec Limits | RPD Limit | Q |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Mercury, Dissolved | ND | 0.00444 | 0.00500 | 113 | 0.00444 | 0.00483 | 109 | 3.39 | 85 - 115 | 20 | |

* FAILS %REC LIMIT

# FAILS RPD LIMIT

NOTE: This is an internal quality control sample.

KEMRON FORMS - Modified 09/25/2007 (wg_ms_msd_drywt)

Version 1.5 PDF File ID: 916890
Report generated 10/25/2007 15:03

# KEMRON ENVIRONMENTAL SERVICES
## POST SPIKE REPORT

**Sample Login ID:** L0710596 **Worknum:** WG253832
**Instrument ID:** HYDRA **Method:** 7470A
**Post Spike ID:** WG253832-01 **File ID:** HY.102507.132445 **Dil:** 1 **Units:** ug/L
**Sample ID:** L0710539-02 **File ID:** HY.102507.132224 **Dil:** 1 **Matrix:** Water

| Analyte | Post Spike Result | C | Sample Result | C | Spike Added(SA) | % R | Control Limit %R | Q |
|---|---|---|---|---|---|---|---|---|
| MERCURY | 1.13 | | 0 | U | 1 | 113.0 | 85 - 115 | |

**N = % Recovery exceeds control limits**
**F = Result is between MDL and RL**
**U = Sample result is below MDL. A value of zero is used in the calculation**

KEMRON FORMS - Modified 04/20/2007 - POST_SPIKE
Version 2.0 PDF File ID: 916885
Report generated 10/25/2007 15:03

# INITIAL CALIBRATION SUMMARY



Login Number: L0710596
Analytical Method: 7470A
ICAL Worknum: WG253865

Workgroup (AAB#): WG253832
Instrument ID: HYDRA
Initial Calibration Date: 10/25/2007 13:09

| Analyte | WG253865-01 | | WG253865-02 | | WG253865-03 | | WG253865-04 | | WG253865-05 | | WG253865-06 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | STD | INT | STD | INT | STD | INT | STD | INT | STD | INT | STD | INT |
| Mercury | 0 | 2224 | 0.200 | 11934 | 1.00 | 58389 | 2.00 | 109561 | 5.00 | 272243 | 10.0 | 561455 |

INT = Instrument intensity
R = Coefficient of correlation
Q = Data Qualifier
* = Out of Compliance; R < 0.995

KEMRON Environmental Services

INITIAL CALIBRATION SUMMARY

Login Number: L0710596
Analytical Method: 7470A
ICAL Worknum: WG253865

Workgroup (AAB#): WG253832
Instrument ID: HYDRA
Initial Calibration Date: 10/25/2007 13:09

| Analyte | R | Q |
|---|---|---|
| Mercury | 1.000 | |

INT = Instrument intensity
R = Coefficient of correlation
Q = Data Qualifier
* = Out of Compliance; R < 0.995

KEMRON FORMS - Modified 02/02/2007
Version 1.5 PDF File ID: 916891
Report generated 10/25/2007 15:03

# KEMRON Environmental Services
## INITIAL CALIBRATION BLANK (ICB)

Login Number: L0710596
Run Date: 10/25/2007
Sample ID: WG253865-08
Instrument ID: HYDRA
Run Time: 13:12
Method: 7471
File ID: HY.102507.131251
Analyst: ED
Units: mg/L
Workgroup (AAB#): WG253832
Cal ID: HYDRA - 25-OCT-07
Matrix: WATER

| Analytes | MDL | RDL | Concentration | Dilution | Qualifier |
|---|---|---|---|---|---|
| MERCURY | .0001 | .0002 | .00006 | 1 | U |

KEMRON FORMS - Modified 10/02/2007
Version 2.0 PDF File ID: 916893
Report generated 10/25/2007 15:04

KEMRON Environmental Services

CONTINUING CALIBRATION BLANK (CCB)

Login Number: L0710596
Run Date: 10/25/2007
Sample ID: WG253865-10
Instrument ID: HYDRA
Run Time: 13:16
Method: 7470A
File ID: HY.102507.131619
Analyst: ED
Units: ug/L
Workgroup (AAB#): WG253832
Cal ID: HYDRA - 25-OCT-07
Matrix: WATER

| Analytes | MDL | RDL | Concentration | Dilution | Qualifier |
|---|---|---|---|---|---|
| Mercury | 0.100 | 0.200 | 0.0650 | 1 | U |

U = Result is less than MDL
F = Result is between MDL and RL
* = Result is above RL

KEMRON FORMS - Modified 09/27/2006
Version 2.0 PDF File ID: 916895
Report generated 10/25/2007 15:04

00078835

# CONTINUING CALIBRATION BLANK (CCB)

Login Number: L0710596
Run Date: 10/25/2007
Sample ID: WG253865-12
Instrument ID: HYDRA
Run Time: 13:38
Method: 7470A
File ID: HY.102507.133857
Analyst: ED
Units: ug/L
Workgroup (AAB#): WG253832
Cal ID: HYDRA - 25-OCT-07
Matrix: WATER

| Analytes | MDL | RDL | Concentration | Dilution | Qualifier |
|---|---|---|---|---|---|
| Mercury | 0.100 | 0.200 | -0.0280 | 1 | U |

U = Result is less than MDL
F = Result is between MDL and RL
* = Result is above RL

KEMRON FORMS - Modified 09/27/2006
Version 2.0 PDF File ID: 916895
Report generated 10/25/2007 15:04

00078836

# CONTINUING CALIBRATION BLANK (CCB)

Login Number: L0710596
Instrument ID: HYDRA
File ID: HY.102507.135942
Workgroup (AAB#): WG253832
Matrix: WATER

Run Date: 10/25/2007
Run Time: 13:59
Analyst: ED
Cal ID: HYDRA - 25-OCT-07

Sample ID: WG253865-14
Method: 7470A
Units: ug/L

| Analytes | MDL | RDL | Concentration | Dilution | Qualifier |
|---|---|---|---|---|---|
| Mercury | 0.100 | 0.200 | -0.0430 | 1 | U |

U = Result is less than MDL
F = Result is between MDL and RL
* = Result is above RL

KEMRON FORMS - Modified 09/27/2006
Version 2.0 PDF File ID: 916895
Report generated 10/25/2007 15:04

INITIAL CALIBRATION VERIFICATION (ICV)

00078837

Login Number: L0710596
Run Date: 10/25/2007
Sample ID: WG253865-07
Instrument ID: HYDRA
Run Time: 13:11
Method: 7470A
File ID: HY.102507.131112
Analyst: ED
Units: ug/L
Workgroup (AAB#): WG253832
Cal ID: HYDRA - 25-OCT-07
QC Key: STD

| Analyte | | Expected | Found | %REC | LIMITS | Q |
|---|---|---|---|---|---|---|
| Mercury | | 2 | 2.09 | 105 | 90 - 110 | |

* Exceeds LIMITS Limit

KEMRON FORMS - Modified 09/06/2007 (ICV)
Version 1.5 PDF File ID: 916892
Report generated 10/25/2007 15:03

# CONTINUING CALIBRATION VERIFICATION (CCV)

00078838

Login Number: L0710596
Run Date: 10/25/2007
Sample ID: WG253865-09
Instrument ID: HYDRA
Run Time: 13:14
Method: 7470A
File ID: HY.102507.131432
Analyst: ED
QC Key: STD
Workgroup (AAB#): WG253832
Cal ID: HYDRA - 25-OCT-07

| Analyte | | Expected | Found | UNITS | %REC | LIMITS | | Q |
|---|---|---|---|---|---|---|---|---|
| Mercury, Total | | 0.00200 | 0.00203 | mg/L | 102 | 80 - 120 | | |

* Exceeds LIMITS Criteria

KEMRON FORMS - Modified 09/06/2007 - (CCV)
Version 1.5 PDF File ID: 916894
Report generated 10/25/2007 15:04

# CONTINUING CALIBRATION VERIFICATION (CCV)

00078839

Login Number: L0710596
Instrument ID: HYDRA
File ID: HY.102507.133720
Workgroup (AAB#): WG253832

Run Date: 10/25/2007
Run Time: 13:37
Analyst: ED
Cal ID: HYDRA - 25-OCT-07

Sample ID: WG253865-11
Method: 7470A
QC Key: STD

| Analyte | | Expected | Found | UNITS | %REC | LIMITS | | Q |
|---|---|---|---|---|---|---|---|---|
| Mercury, Total | | 0.00200 | 0.00204 | mg/L | 102 | 80 - 120 | | |

* Exceeds LIMITS Criteria

KEMRON FORMS - Modified 09/06/2007 - (CCV)
Version 1.5 PDF File ID: 916894
Report generated 10/25/2007 15:04

# CONTINUING CALIBRATION VERIFICATION (CCV)



Login Number: L0710596
Run Date: 10/25/2007
Sample ID: WG253865-13
Instrument ID: HYDRA
Run Time: 13:58
Method: 7470A
File ID: HY.102507.135805
Analyst: ED
QC Key: STD
Workgroup (AAB#): WG253832
Cal ID: HYDRA - 25-OCT-07

| Analyte | | Expected | Found | UNITS | %REC | LIMITS | | Q |
|---|---|---|---|---|---|---|---|---|
| Mercury, Total | | 0.00200 | 0.00207 | mg/L | 104 | 80 - 120 | | |

* Exceeds LIMITS Criteria

KEMRON FORMS - Modified 09/06/2007 - (CCV)
Version 1.5 PDF File ID: 916894
Report generated 10/25/2007 15:04

# 2.3 General Chemistry Data

# 2.3.1 Perchlorate Data

# 2.3.1.1 Summary Data

# LABORATORY REPORT

00078844

**L0710596**

**11/02/07 10:41**

**Submitted By**

**KEMRON Environmental Services**
**156 Starlite Drive**
**Marietta , OH 45750**
**( 740 ) 373 - 4071**

**For**

Account Name: Shaw E & I, Inc.
ABB Lummus Biulding
3010 Briarpark Drive Suite 4N
Houston, TX 77042
Attention: Larry Duty

Account Number: 2773
Work ID: LHAAD

P.O. Number: 322255 OP

## Sample Analysis Summary

| Client ID | Lab ID | Method | Dilution | Date Received |
|---|---|---|---|---|
| LHSMW60-101807 | L0710596-03 | 314.0 | 1 | 23-OCT-07 |
| LHSMW60-101807-QC | L0710596-04 | 314.0 | 1 | 23-OCT-07 |
| 47WW27-101907 | L0710596-06 | 314.0 | 1 | 23-OCT-07 |
| 47WW27-101907 | L0710596-06 | 314.0 | 15 | 23-OCT-07 |
| EQUIPMENT RINSE | L0710596-13 | 314.0 | 1 | 23-OCT-07 |

Report Number: **L0710596**

Report Date : **November 2, 2007**

00078845

| | | | | | |
|---|---|---|---|---|---|
| Sample Number: | **L0710596-03** | PrePrep Method: | **NONE** | Instrument: | **IC1** |
| Client ID: | **LHSMW60-101807** | Prep Method: | **314.0** | Prep Date: | **10/29/2007 13:39** |
| Matrix: | **Water** | Analytical Method: | **314.0** | Cal Date: | **10/23/2007 12:32** |
| Workgroup Number: | **WG254202** | Analyst: | **DSF** | Run Date: | **10/29/2007 13:39** |
| Collect Date: | **10/18/2007 15:50** | Dilution: | **1** | File ID: | **I11029071339.15** |
| Sample Tag: | **DL01** | Units: | **ug/L** | | |

| Analyte | CAS. Number | Result | Qual | PQL | SDL |
|---|---|---|---|---|---|
| **Perchlorate** | **14797-73-0** | | **U** | **1.00** | **0.500** |

**U Not detected at or above adjusted sample detection limit**

Sample Number: L0710596-04
Client ID: LHSMW60-101807-QC
Matrix: Water
Workgroup Number: WG254202
Collect Date: 10/18/2007 15:50
Sample Tag: DL01

PrePrep Method: NONE
Prep Method: 314.0
Analytical Method: 314.0
Analyst: DSF
Dilution: 1
Units: ug/L

Instrument: IC1
Prep Date: 10/29/2007 13:59
Cal Date: 10/23/2007 12:32
Run Date: 10/29/2007 13:59
File ID: I11029071359.16

| Analyte | CAS. Number | Result | Qual | PQL | SDL |
|---|---|---|---|---|---|
| Perchlorate | 14797-73-0 | | U | 1.00 | 0.500 |

U Not detected at or above adjusted sample detection limit

Sample Number: L0710596-06
Client ID: 47WW27-101907
Matrix: Water
Workgroup Number: WG254202
Collect Date: 10/19/2007 08:20
Sample Tag: 01

PrePrep Method: NONE
Prep Method: 314.0
Analytical Method: 314.0
Analyst: DSF
Dilution: 1
Units: ug/L

Instrument: IC1
Prep Date: 10/29/2007 14:19
Cal Date: 10/23/2007 12:32
Run Date: 10/29/2007 14:19
File ID: I11029071419.17

| Analyte | CAS. Number | Result | Qual | PQL | SDL |
|---|---|---|---|---|---|
| Perchlorate | 14797-73-0 | 969 | I | 1.00 | 0.500 |

I Semiquantitative result (out of instrument calibration range)

Report Number: **L0710596**
Report Date : **November 2, 2007**

00078848

| | | | | | |
|---|---|---|---|---|---|
| Sample Number: | L0710596-06 | PrePrep Method: | NONE | Instrument: | IC1 |
| Client ID: | 47WW27-101907 | Prep Method: | 314.0 | Prep Date: | 10/29/2007 17:03 |
| Matrix: | Water | Analytical Method: | 314.0 | Cal Date: | 10/23/2007 12:32 |
| Workgroup Number: | WG254202 | Analyst: | DSF | Run Date: | 10/29/2007 17:03 |
| Collect Date: | 10/19/2007 08:20 | Dilution: | 15 | File ID: | I11029071703.25 |
| Sample Tag: | DL01 | Units: | ug/L | | |

| Analyte | CAS. Number | Result | Qual | PQL | SDL |
|---|---|---|---|---|---|
| **Perchlorate** | 14797-73-0 | 1170 | | 15.0 | 7.50 |

Sample Number: **L0710596-13**
Client ID: **EQUIPMENT RINSE**
Matrix: **Water**
Workgroup Number: **WG254202**
Collect Date: **10/22/2007 14:20**
Sample Tag: **01**

PrePrep Method: **NONE**
Prep Method: **314.0**
Analytical Method: **314.0**
Analyst: **DSF**
Dilution: **1**
Units: **ug/L**

Instrument: **IC1**
Prep Date: **10/29/2007 14:40**
Cal Date: **10/23/2007 12:32**
Run Date: **10/29/2007 14:40**
File ID: **I11029071440.18**

| Analyte | CAS. Number | Result | Qual | PQL | SDL |
|---|---|---|---|---|---|
| **Perchlorate** | **14797-73-0** | | **U** | **1.00** | **0.500** |

**U Not detected at or above adjusted sample detection limit**

# 2.3.1.2 QC Summary Data

The concentrations (ppm) of the calibration standards and the resulting area counts are used to determine the equation of a linear or quadratic plot.
The slope and y-intercept of that line are used to calculate the quantity of the analyzed unkown samples.
Amount(ppm) = [(slope)(area count of unknown) + y-intercept](dilution)
(The slope is the amt/area also identified as the CF or calibration factor)

**KEMRON Environmental Services**

Instrument Run Log

Instrument: IC1 | Dataset: 102907 CLO4 IC1.SEQ

Analyst1: DSF | Analyst2: NA

Method: CLO4 | SOP: IC2 | Rev: 4

Maintenance Log ID: 21488

Column 1 ID: AS16-4MM | Column 2 ID: NA

Workgroups: WG254202

Internal STD: NA | Surrogate STD: NA | Calibration STD STD20008

Comments:

| Seq. | File ID | Sample Information | Mat | Dil | Reference | Date/Time |
|---|---|---|---|---|---|---|
| 1 | I11029070853.01 | CLO4 @ 100 ppb | 1 | 1 | | 10/29/07 08:53 |
| 2 | I11029070913.02 | CLO4 @ 50 ppb | 1 | 1 | | 10/29/07 09:13 |
| 3 | I11029070934.03 | CLO4 @ 25 ppb | 1 | 1 | | 10/29/07 09:34 |
| 4 | I11029070954.04 | CLO4 @ 10 ppb | 1 | 1 | | 10/29/07 09:54 |
| 5 | I11029071015.05 | CLO4 @ 4 ppb | 1 | 1 | | 10/29/07 10:15 |
| 6 | I11029071035.06 | CLO4 @ 1 ppb | 1 | 1 | | 10/29/07 10:35 |
| 7 | I11029071055.07 | CLO4 ALT @ 25 ppb | 1 | 1 | | 10/29/07 10:55 |
| 8 | I11029071116.08 | ELUENT | 1 | 1 | | 10/29/07 11:16 |
| 9 | I11029071136.09 | MCT \#4 (@25 ppb) | 1 | 1 | | 10/29/07 11:36 |
| 10 | I11029071157.10 | MCT \#5 (@25 ppb) | 1 | 1 | | 10/29/07 11:57 |
| 11 | I11029071217.11 | CCV (1 ppb) CLO4 | 1 | 1 | | 10/29/07 12:17 |
| 12 | I11029071237.12 | WG254202-01 BLANK | 1 | 1 | | 10/29/07 12:37 |
| 13 | I11029071258.13 | WG254202-02 LCS (25 ppb) | 1 | 1 | | 10/29/07 12:58 |
| 14 | I11029071318.14 | L0710597-01 1/10 | 1 | 10 | | 10/29/07 13:18 |
| 15 | I11029071339.15 | L0710596-03 1/2 RS | 1 | 2 | | 10/29/07 13:39 |
| 16 | I11029071359.16 | L0710596-04 1/2 DS | 1 | 2 | | 10/29/07 13:59 |
| 17 | I11029071419.17 | L0710596-06 | 1 | 1 | | 10/29/07 14:19 |
| 18 | I11029071440.18 | L0710596-13 | 1 | 1 | | 10/29/07 14:40 |
| 19 | I11029071500.19 | L0710643-01 1/3 | 1 | 3 | | 10/29/07 15:00 |
| 20 | I11029071521.20 | L0710643-02 1/3 REF | 1 | 3 | | 10/29/07 15:21 |
| 21 | I11029071541.21 | WG254202-04 DUP 643-02 1/3 | 1 | 3 | | 10/29/07 15:41 |
| 22 | I11029071602.22 | CCV (25 ppb) CLO4 | 1 | 1 | | 10/29/07 16:02 |
| 23 | I11029071622.23 | WG254202-05 MS 1/3 643-02 | 1 | 3 | | 10/29/07 16:22 |
| 24 | I11029071642.24 | WG254202-06 MSD 1/3 643-02 | 1 | 3 | | 10/29/07 16:42 |
| 25 | I11029071703.25 | L0710596-06 RR 1/15 | 1 | 15 | | 10/29/07 17:03 |
| 26 | I11029071723.26 | CCV (100 ppb) CLO4 | 1 | 1 | | 10/29/07 17:23 |

**Comments**

| Seq. | Rerun | Dil. | Reason | Analytes |
|---|---|---|---|---|
| 14 | | 10 | | |
| | Sample analyzed at a dilution only due to high conductivity reading. | | | |
| 15 | | 2 | | |
| | Sample analyzed at a dilution only due to high conductivity reading. | | | |
| 16 | | 2 | | |
| | Sample analyzed at a dilution only due to high conductivity reading. | | | |

Page: 1

Approved: 30-OCT-07

**KEMRON Environmental Services**

Instrument Run Log

Instrument: IC1 Dataset: 102907 CLO4 IC1.SEQ

Analyst1: DSF Analyst2: NA

Method: CLO4 SOP: IC2 Rev: 4

Maintenance Log ID: 21488

Column 1 ID: AS16-4MM Column 2 ID: NA

Workgroups: WG254202

Internal STD: NA Surrogate STD: NA STD20008

**Comments**

| Seq. | Rerun | Dil. | Reason | Analytes |
|---|---|---|---|---|
| 17 | X | 15 | Over Calibration Range | Perchlorate |
| 19 | | 3 | | |
| | Sample analyzed at a dilution only due to high conductivity reading. | | | |
| 20 | | 3 | | |
| | Sample analyzed at a dilution only due to high conductivity reading. | | | |

Page: 2 Approved: 30-OCT-07

# KEMRON Environmental Services
## Data Checklist

Date: 29-OCT-2007
Analyst: DSF
Analyst: NA
Method: CLO4
Instrument: IC1
Curve Workgroup: NA
Runlog ID: 19015
Analytical Workgroups: L0710597-01, L0710596, L0710643

| | |
|---|---|
| ANALYTICAL | |
| System Performance Check | X |
| DFTPP (MS) | NA |
| Endrin/DDT breakdown (8081/MS) | NA |
| Pentachlorophenol/benzidine tailing (MS) | NA |
| Eluent check (IC)/system pressure (HPLC) | X |
| Window standard (FID) | NA |
| Initial Calibration | X |
| Average RF | NA |
| Linear regression or higher order curve | X |
| Alternate source standard (ICV) % Difference | X |
| Continuing Calibration (CCV) | X |
| % D/% Drift | X |
| Minimum response factors (MS) | NA |
| Continuing calibration blank (CCB) (IC) | NA |
| Special standards | NA |
| Blanks | X |
| TCL hits | X |
| Surrogate recoveries | NA |
| LCS/LCSD (Laboratory Control Sample) | X |
| Recoveries | X |
| Surrogate recoveries | NA |
| MS/MSD/Sample duplicates | X |
| Recoveries | X |
| %RPD | X |
| Samples | X |
| TCL hits | X |
| Mass spectra (MS/HPLC)/2nd column confirmations (ECD/FID/HPLC) | NA |
| Surrogate recoveries | NA |
| Internal standard areas (MS) | NA |
| Library searches (MS) | NA |
| Calculations & correct factors | X |
| Compounds above calibration range | X |
| Reruns | X |
| Manual integrations | X |
| Project/client specific requirements | X |
| | |
| REPORTING | |
| Upload batch form | X |
| KOBRA workgroup data/forms/bench sheets | X |
| Case narratives | X |
| Check for completeness | X |
| Primary Reviewer | DSF |
| | |
| SUPERVISORY/SECONDARY REVIEW | |
| Check for compliance with method and project specific requirements | X |
| Check the completeness/accuracy of reported information | X |
| Data qualifiers | X |
| Secondary Reviewer | MDC |

Primary Reviewer:
30-OCT-2007
Debra S. Frederick

Secondary Reviewer:
30-OCT-2007

Generated: OCT-30-2007 12:31:54

# KEMRON Environmental Services
## HOLDING TIMES
## EQUIVALENT TO AFCEE FORM 9

Analytical Method: 314.0

AAB#: WG254202

Login Number: L0710596

| Client ID | Date Collected | Date Received | Date Extracted | Max Hold Time Ext. | Time Held Ext. | Date Analyzed | Max Hold Time Anal | Time Held Anal. | Q |
|---|---|---|---|---|---|---|---|---|---|
| 47WW27-101907 | 10/19/07 | 10/23/07 | 10/29/07 | 28 | 10.2 | 10/29/07 | 28 | 10.2 | |
| LHSMW60-101807 | 10/18/07 | 10/23/07 | 10/29/07 | 28 | 10.9 | 10/29/07 | 28 | 10.9 | |
| LHSMW60-101807-QC | 10/18/07 | 10/23/07 | 10/29/07 | 28 | 10.9 | 10/29/07 | 28 | 10.9 | |
| EQUIPMENT RINSE | 10/22/07 | 10/23/07 | 10/29/07 | 28 | 7.01 | 10/29/07 | 28 | 7.01 | |
| 47WW27-101907 | 10/19/07 | 10/23/07 | 10/29/07 | 28 | 10.4 | 10/29/07 | 28 | 10.4 | |

* EXT = SEE PROJECT QAPP REQUIREMENTS

*ANAL = SEE PROJECT QAPP REQUIREMENTS

KEMRON FORMS - Modified 11/20/2006
Version 1.5 PDF File ID: 920477
Report generated 10/30/2007 14:56

# METHOD BLANK SUMMARY

Login Number: L0710596
Blank File ID: I11029071237.12
Prep Date: 10/29/07 12:37
Analyzed Date: 10/29/07 12:37
Analyst: DSF

Work Group: WG254202
Blank Sample ID: WG254202-01
Instrument ID: IC1
Method: 314.0

This Method Blank Applies To The Following Samples:

| Client ID | Lab Sample ID | Lab File ID | Time Analyzed | TAG |
|---|---|---|---|---|
| LCS | WG254202-02 | I11029071258.13 | 10/29/07 12:58 | 01 |
| LHSMW60-101807 | L0710596-03 | I11029071339.15 | 10/29/07 13:39 | DL01 |
| LHSMW60-101807-QC | L0710596-04 | I11029071359.16 | 10/29/07 13:59 | DL01 |
| 47WW27-101907 | L0710596-06 | I11029071419.17 | 10/29/07 14:19 | 01 |
| EQUIPMENT RINSE | L0710596-13 | I11029071440.18 | 10/29/07 14:40 | 01 |
| DUP | WG254202-04 | I11029071541.21 | 10/29/07 15:41 | DL01 |
| 47WW27-101907 | L0710596-06 | I11029071703.25 | 10/29/07 17:03 | DL01 |

KEMRON FORMS - Modified 01/31/2007
Version 1.5 PDF File ID: 920478
Report generated 10/30/2007 14:56

# KEMRON Environmental Services

## METHOD BLANK REPORT

Login Number: L0710596
Prep Date: 10/29/07 12:37
Sample ID: WG254202-01
Instrument ID: IC1
Run Date: 10/29/07 12:37
Prep Method: 314.0
File ID: I11029071237.12
Analyst: DSF
Method: 314.0
Workgroup (AAB#): WG254202
Matrix: Water
Units: ug/L
Contract #: DACA56-94-D-0020
Cal ID: IC1 - 23-OCT-07

| Analytes | SDL | PQL | Concentration | Dilution | Qualifier |
|---|---|---|---|---|---|
| Perchlorate | 0.500 | 1.00 | 0.500 | 1 | U |

SDL Method Detection Limit
PQL Reporting/Practical Quantitation Limit
ND Analyte Not detected at or above reporting limit
* Analyte concentration > RL

KEMRON FORMS - Modified 12/07/2006
Version 1.5 PDF File ID: 920479
Report generated 10/30/2007 14:56

LABORATORY CONTROL SAMPLE (LCS)

Login Number: L0710596 Run Date: 10/29/2007 Sample ID: WG254202-02
Instrument ID: IC1 Run Time: 12:58 Prep Method: 314.0
File ID: I11029071258.13 Analyst: DSF Method: 314.0
Workgroup (AAB#): WG254202 Matrix: Water Units: ug/L
QC Key: STD Lot#: STD20008 Cal ID: IC1 - 23-OCT-07

| Analytes | Expected | Found | % Rec | LCS Limits | Q |
|---|---|---|---|---|---|
| Perchlorate | 25.0 | 23.9 | 95.6 | 85 - 115 | |

KEMRON FORMS - Modified 09/06/2007
Version 1.5 PDF File ID: 920480
Report generated 10/30/2007 14:56

Kemron
ENVIRONMENTAL SERVICES

Conductivity Probe
Calibration Check:
1412/1410 µs/cm

# Perchlorate Conductivity Check

Working MCT Level:
967 µs/cm

| Sample | Conductivity (µs/cm) | Pretreatment or Dilution Needed |
|---|---|---|
| L0710596-01 | 6070, 728 | 1/10 Dil. for Conductivity |
| L0710596-03 | 1261, 662 | 1/2 " " |
| " -04 | 1265, 662 | 1/2 " " |
| " -06 | 336 | |
| " -13 | 6.0 | |
| L0710643-01 | 2190, 766 | 1/3 Dil. for Conductivity |
| " -02 | 2160, 765 | 1/3 " " |
| | | |
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| | | |

ASF
Analyst

10/29/07 10:30
Date/Time

DCN#71622

# 2.3.2 Total Dissolved Solids Data

# 2.3.2.1 Summary Data

# LABORATORY REPORT

00078862

**L0710596**

**11/02/07 10:41**

**Submitted By**

**KEMRON Environmental Services**
**156 Starlite Drive**
**Marietta , OH 45750**
**( 740 ) 373 - 4071**

**For**

**Account Name:** Shaw E & I, Inc.
ABB Lummus Biulding
3010 Briarpark Drive Suite 4N
Houston, TX 77042
**Attention:** Larry Duty

**Account Number:** 2773
**Work ID:** LHAAD

**P.O. Number:** 322255 OP

## Sample Analysis Summary

| Client ID | Lab ID | Method | Dilution | Date Received |
|---|---|---|---|---|
| 47WWZZ-101807 | L0710596-11 | 160.1 | 1 | 23-OCT-07 |
| EQUIPMENT RINSE | L0710596-13 | 160.1 | 1 | 23-OCT-07 |

| | | | | | |
|---|---|---|---|---|---|
| Sample Number: | L0710596-11 | PrePrep Method: | NONE | Instrument: | OVEN |
| Client ID: | 47WWZZ-101807 | Prep Method: | 160.1 | Prep Date: | 10/23/2007 15:45 |
| Matrix: | Water | Analytical Method: | 160.1 | Cal Date: | |
| Workgroup Number: | WG253612 | Analyst: | TMM | Run Date: | 10/23/2007 15:45 |
| Collect Date: | 10/18/2007 09:55 | Dilution: | 1 | File ID: | EN.0710231545-12 |
| | | Units: | mg/L | | |

| Analyte | CAS. Number | Result | Qual | PQL | SDL |
|---|---|---|---|---|---|
| Total Dissolved Solids | | 3960 | | 20.0 | 10.0 |

Sample Number: L0710596-13
Client ID: EQUIPMENT RINSE
Matrix: Water
Workgroup Number: WG253612
Collect Date: 10/22/2007 14:20

PrePrep Method: NONE
Prep Method: 160.1
Analytical Method: 160.1
Analyst: TMM
Dilution: 1
Units: mg/L

Instrument: OVEN
Prep Date: 10/23/2007 15:45
Cal Date:
Run Date: 10/23/2007 15:45
File ID: EN.0710231545-13

| Analyte | CAS. Number | Result | Qual | PQL | SDL |
|---|---|---|---|---|---|
| Total Dissolved Solids | | | U | 10.0 | 5.00 |

U Not detected at or above adjusted sample detection limit

# 2.3.2.2 QC Summary Data

**Example Total Dissolved Solids Calculations**

$$[(WT2 - WT1) * 1000000]/volume = mg/L$$

where:

WT1 = weight (grams) of empty container.
WT2 = weight (grams) of dried sample and container.
1000000 = factor to get to mg/L.
volume = mL of sample used.

KEMRON Environmental Services
Data Checklist

| | |
|---|---|
| Date: | 23-OCT-2007 |
| Analyst: | TMM |
| Analyst: | HJR |
| Method: | TDS |
| Instrument: | OVEN |
| Curve Workgroup: | NA |
| Runlog ID: | |
| Analytical Workgroups: | WG253612 |

| | |
|---|---|
| Calibration/Linearity | 10/23/07 |
| Second Source Check | |
| ICV/CCV (std) | |
| ICB/CCB | |
| Blank | X |
| LCS/LCS Dup | X |
| MS/MSD | |
| Duplicate | X |
| Upload Results | X |
| Client Forms | X |
| QC Violation Sheet | |
| Case Narratives | X |
| Signed Raw Data | X |
| STD/LCS on benchsheet | X |
| Check for compliance with method and project specific requirements | X |
| Check the completeness of reported information | X |
| Check the information for the report narrative | X |
| Primary Reviewer | HJR |
| Secondary Reviewer | DIH |
| | |
| Comments | |

| Primary Reviewer: | Secondary Reviewer: |
|---|---|
| 25-OCT-2007 | 26-OCT-2007 |

Generated: OCT-26-2007 13:03:05

# KEMRON Environmental Services
## HOLDING TIMES
## EQUIVALENT TO AFCEE FORM 9

Analytical Method: 160.1 AAB#: WG253612

Login Number: L0710596

| Client ID | Date Collected | Date Received | Date Extracted | Max Hold Time Ext. | Time Held Ext. | Date Analyzed | Max Hold Time Anal | Time Held Anal. | Q |
|---|---|---|---|---|---|---|---|---|---|
| 47WWZZ-101807 | 10/18/07 | 10/23/07 | 10/23/07 | 7 | 5.24 | 10/23/07 | 7 | 5.24 | |
| EQUIPMENT RINSE | 10/22/07 | 10/23/07 | 10/23/07 | 7 | 1.06 | 10/23/07 | 7 | 1.06 | |

* EXT = SEE PROJECT QAPP REQUIREMENTS

*ANAL = SEE PROJECT QAPP REQUIREMENTS

KEMRON FORMS - Modified 11/20/2006
Version 1.5 PDF File ID: 918095
Report generated 10/26/2007 11:25

# METHOD BLANK SUMMARY

Login Number: L0710596
Work Group: WG253612
Blank File ID: EN.0710231545-01
Blank Sample ID: WG253612-01
Prep Date: 10/23/07 15:45
Instrument ID: OVEN
Analyzed Date: 10/23/07 15:45
Method: 160.1
Analyst: TMM

This Method Blank Applies To The Following Samples:

| Client ID | Lab Sample ID | Lab File ID | Time Analyzed | TAG |
|---|---|---|---|---|
| LCS | WG253612-02 | EN.0710231545-02 | 10/23/07 15:45 | |
| LCS2 | WG253612-03 | EN.0710231545-03 | 10/23/07 15:45 | |
| 47WWZZ-101807 | L0710596-11 | EN.0710231545-12 | 10/23/07 15:45 | |
| EQUIPMENT RINSE | L0710596-13 | EN.0710231545-13 | 10/23/07 15:45 | |
| DUP | WG253612-05 | EN.0710231545-14 | 10/23/07 15:45 | |

KEMRON FORMS - Modified 01/31/2007
Version 1.5 PDF File ID: 918096
Report generated 10/26/2007 11:25

# METHOD BLANK REPORT



Login Number: L0710596 Prep Date: 10/23/07 15:45 Sample ID: WG253612-01
Instrument ID: OVEN Run Date: 10/23/07 15:45 Prep Method: 160.1
File ID: EN.0710231545-01 Analyst: TMM Method: 160.1
Workgroup (AAB#): WG253612 Matrix: Water Units: mg/L
Contract #: DACA56-94-D-0020 Cal ID: OVEN-

| Analytes | SDL | PQL | Concentration | Dilution | Qualifier |
|---|---|---|---|---|---|
| Total Dissolved Solids | 5.00 | 10.0 | 5.00 | 1 | U |

SDL Method Detection Limit
PQL Reporting/Practical Quantitation Limit
ND Analyte Not detected at or above reporting limit
* Analyte concentration > RL

KEMRON FORMS - Modified 12/07/2006
Version 1.5 PDF File ID: 918097
Report generated 10/26/2007 11:25

00078871

# LABORATORY CONTROL SAMPLE (LCS)

Login Number: L0710596  Analyst: TMM  Prep Method: 160.1
Instrument ID: OVEN  Matrix: Water  Method: 160.1
Workgroup (AAB#): WG253612  Units: mg/L
QC Key: STD  Lot #: STD19758

Sample ID: WG253612-02 LCS  File ID: EN.0710231545-02  Run Date: 10/23/2007 15:45
Sample ID: WG253612-03 LCS2  File ID: EN.0710231545-03  Run Date: 10/23/2007 15:45

| Analytes | LCS | | | LCS2 | | | %RPD | %Rec Limits | RPD Lmt | Q |
|---|---|---|---|---|---|---|---|---|---|---|
| | Known | Found | % REC | Known | Found | % REC | | | | |
| Total Dissolved Solids | 500 | 506 | 101 | 500 | 508 | 102 | 0.394 | 80 - 120 | 25 | |

KEMRON FORMS - Modified 02/08/2007
Version 1.5  PDF File ID: 918098
Report generated 10/26/2007 11:25

# 2.3.2.3 Raw Data

WORKGROUP: WG253612

Kemron
ENVIRONMENTAL SERVICES

# TOTAL DISSOLVED SOLIDS

SOP K1601 Revision #: 10
☑ EPA 160.1/ SM2540C
☐ Other:
LCS: Std 19758
Daily Dilution: 5(5000)/50=500

Workgroup #:
Balance: AND GR-202 / Other
Matrix Spike:
Daily Dilution:

| SAMPLE | # | VOLUME (mL) | INITIAL WEIGHT WT1 (g) | DRY WEIGHT WT2A (g) | DRY WEIGHT WT2B (g) | DRY WEIGHT WT2C (g) |
|---|---|---|---|---|---|---|
| BLANK | L5 | 100 | 80.1023 | 80.1025 | 80.1024 | |
| LCS: 500 mg/L | 18 | 50 | 56.8653 | 56.8903 | 56.8906 | |
| LCSDUP: 500 mg/L | 15 | | 50.6211 | 50.6461 | 50.6465 | |
| 10-554-04 | 12B | | 53.3241 | 53.3340 | 53.3341 | |
| -06 | 4 | | 50.9178 | 50.9294 | 50.9294 | |
| 10-572-01 | 16 | | 53.8878 | 53.9371 | 53.9370 | |
| 10-564-01 | 11 | | 49.4519 | 49.4682 | 49.4683 | |
| 10-572-03 | 19 | 25 | 53.0293 | 53.1099 | 53.1100 | |
| 10-573-01 | M3 | | 59.7797 | 59.8434 | 59.8435 | |
| 10-576-01 | J4 | | 57.9495 | 58.0159 | 58.0158 | |
| 10-594-01 | F4 | 50 | 59.8744 | 59.8812 | 59.8814 | |
| 596-11 | 6 | | 51.0824 | 51.2809 | 51.2805 | |
| -13 | X6 | 100 | 46.9719 | 46.9719 | 46.9720 | |
| | | | | | | |
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| | | | | | | |
| | | | | 51.5807 TM 10-24-07 | 51.5810 | |
| DUP 10-594-01 | N1 | 50 | 51.5737 | ~~51.5747~~ | ~~51.5743~~ | |

FL

ANALYST: Tammy Morris

DATE/TIME: (on) 10-23-07 1545
DATE/TIME: (off) 10-24-07 1230
DATE/TIME: (off) 10-24-07 ~~13~~ 1410
DATE/TIME: (off)

DCN#71542

Donna Gosson
Approved: October 26, 2007

KEMRON ENVIRONMENTAL SERVICES
GRAVIMETRIC REPORT

Workgroup (AAB#): WG253612
Analyst: TMM
Product: 160.1
Run Date: 10/23/2007 15:45
Analyte: TOTAL DISSOLVED SOLIDS

| SAMPLE NUMBER | INITIAL VOL | INITIAL WT | FINAL WT | Anal. Conc | Rep. Conc. | Units |
|---|---|---|---|---|---|---|
| WG253612-01 | 100 | 80.1023 | 80.1024 | 1.000 | 1.000 | mg/L |
| WG253612-02 | 50 | 56.8653 | 56.8906 | 506.0 | 506.0 | mg/L |
| WG253612-03 | 50 | 50.6211 | 50.6465 | 508.0 | 508.0 | mg/L |
| L0710554-04 | 50 | 53.3241 | 53.3341 | 200.0 | 200.0 | mg/L |
| L0710554-06 | 50 | 50.9178 | 50.9294 | 232.0 | 232.0 | mg/L |
| L0710572-01 | 50 | 53.8878 | 53.937 | 984.0 | 984.0 | mg/L |
| L0710564-01 | 50 | 49.4519 | 49.4683 | 328.0 | 328.0 | mg/L |
| L0710572-03 | 25 | 53.0293 | 53.11 | 3228 | 3228 | mg/L |
| L0710573-01 | 25 | 59.7797 | 59.8435 | 2552 | 2552 | mg/L |
| L0710576-01 | 25 | 57.9495 | 58.0158 | 2652 | 2652 | mg/L |
| L0710594-01 | 50 | 59.8744 | 59.8814 | 140.0 | 140.0 | mg/L |
| WG253612-04 | 50 | 59.8744 | 59.8814 | 140.0 | 140.0 | mg/L |
| L0710596-11 | 50 | 51.0824 | 51.2805 | 3962 | 3962 | mg/L |
| L0710596-13 | 100 | 46.9719 | 46.972 | 1.000 | ND | mg/L |
| WG253612-05 | 50 | 51.5737 | 51.581 | 146.0 | 146.0 | mg/L |

KEMRON FORMS - Modified 02/26/2007
Version 1.3
Report generated 10/25/2007 10:57

Donna Eason

Approved: October 26, 2007

# 2.3.3 Total Suspended Solids Data

# 2.3.3.1 Summary Data

# LABORATORY REPORT

00078877

**L0710596**

**11/02/07 10:41**

**Submitted By**

**KEMRON Environmental Services**
**156 Starlite Drive**
**Marietta , OH 45750**
**( 740 ) 373 - 4071**

**For**

Account Name: Shaw E & I, Inc.
ABB Lummus Biulding
3010 Briarpark Drive Suite 4N
Houston, TX 77042
Attention: Larry Duty

Account Number: 2773
Work ID: LHAAD

P.O. Number: 322255 OP

## Sample Analysis Summary

| Client ID | Lab ID | Method | Dilution | Date Received |
|---|---|---|---|---|
| 47WWZZ-101807 | L0710596-11 | 160.2 | 1 | 23-OCT-07 |
| EQUIPMENT RINSE | L0710596-13 | 160.2 | 1 | 23-OCT-07 |

Sample Number: L0710596-11
Client ID: 47WWZZ-101807
Matrix: Water
Workgroup Number: WG253700
Collect Date: 10/18/2007 09:55

PrePrep Method: NONE
Prep Method: 160.2
Analytical Method: 160.2
Analyst: TMM
Dilution: 1
Units: mg/L

Instrument: OVEN
Prep Date: 10/24/2007 10:50
Cal Date:
Run Date: 10/24/2007 10:50
File ID: EN.0710241050-04

| Analyte | CAS. Number | Result | Qual | PQL | SDL |
|---|---|---|---|---|---|
| Total Suspended Solids | | 6790 | | 100 | 50.0 |

00078879

Sample Number: L0710596-13
Client ID: EQUIPMENT RINSE
Matrix: Water
Workgroup Number: WG253700
Collect Date: 10/22/2007 14:20

PrePrep Method: NONE
Prep Method: 160.2
Analytical Method: 160.2
Analyst: TMM
Dilution: 1
Units: mg/L

Instrument: OVEN
Prep Date: 10/24/2007 10:50
Cal Date:
Run Date: 10/24/2007 10:50
File ID: EN.0710241050-12

| Analyte | CAS. Number | Result | Qual | PQL | SDL |
|---|---|---|---|---|---|
| Total Suspended Solids | | 12.0 | | 5.00 | 2.50 |

# 2.3.3.2 QC Summary Data

**Example Total Suspended Solids Calculations**

$$[(WT2 - WT1) * 1000000]/volume = mg/L$$

where:

WT1 = weight (grams) of empty container.
WT2 = weight (grams) of dried sample and container.
1000000 = factor to get to mg/L.
volume = mL of sample used.

KEMRON Environmental Services
Data Checklist

Date: 24-OCT-2007
Analyst: TMM
Analyst: HJR
Method: TSS
Instrument: OVEN
Curve Workgroup: NA
Runlog ID:
Analytical Workgroups: WG253700

| | |
|---|---|
| Calibration/Linearity | 10/24/07 |
| Second Source Check | |
| ICV/CCV (std) | |
| ICB/CCB | |
| Blank | X |
| LCS/LCS Dup | X |
| MS/MSD | |
| Duplicate | X |
| Upload Results | X |
| Client Forms | X |
| QC Violation Sheet | |
| Case Narratives | X |
| Signed Raw Data | X |
| STD/LCS on benchsheet | X |
| Check for compliance with method and project specific requirements | X |
| Check the completeness of reported information | X |
| Check the information for the report narrative | X |
| Primary Reviewer | HJR |
| Secondary Reviewer | DIH |
| | |
| Comments | |

Primary Reviewer:
26-OCT-2007

Secondary Reviewer:
26-OCT-2007

Generated: OCT-26-2007 15:58:07

# KEMRON Environmental Services
## HOLDING TIMES
## EQUIVALENT TO AFCEE FORM 9

Analytical Method: 160.2 AAB#: WG253700

Login Number: L0710596

| Client ID | Date Collected | Date Received | Date Extracted | Max Hold Time Ext. | Time Held Ext. | Date Analyzed | Max Hold Time Anal | Time Held Anal. | Q |
|---|---|---|---|---|---|---|---|---|---|
| EQUIPMENT RINSE | 10/22/07 | 10/23/07 | 10/24/07 | 7 | 1.85 | 10/24/07 | 7 | 1.85 | |
| 47WWZZ-101807 | 10/18/07 | 10/23/07 | 10/24/07 | 7 | 6.04 | 10/24/07 | 7 | 6.04 | |

* EXT = SEE PROJECT QAPP REQUIREMENTS
*ANAL = SEE PROJECT QAPP REQUIREMENTS

KEMRON FORMS - Modified 11/20/2006
Version 1.5 PDF File ID: 918554
Report generated 10/26/2007 14:50

# METHOD BLANK SUMMARY

Login Number: L0710596
Blank File ID: EN.0710241050-01
Prep Date: 10/24/07 10:50
Analyzed Date: 10/24/07 10:50
Analyst: TMM

Work Group: WG253700
Blank Sample ID: WG253700-01
Instrument ID: OVEN
Method: 160.2

This Method Blank Applies To The Following Samples:

| Client ID | Lab Sample ID | Lab File ID | Time Analyzed | TAG |
|---|---|---|---|---|
| LCS | WG253700-02 | EN.0710241050-02 | 10/24/07 10:50 | |
| LCS2 | WG253700-03 | EN.0710241050-03 | 10/24/07 10:50 | |
| 47WWZZ-101807 | L0710596-11 | EN.0710241050-04 | 10/24/07 10:50 | |
| EQUIPMENT RINSE | L0710596-13 | EN.0710241050-12 | 10/24/07 10:50 | |
| DUP | WG253700-05 | EN.0710241050-19 | 10/24/07 10:50 | |

# METHOD BLANK REPORT



Login Number: L0710596 Prep Date: 10/24/07 10:50 Sample ID: WG253700-01
Instrument ID: OVEN Run Date: 10/24/07 10:50 Prep Method: 160.2
File ID: EN.0710241050-01 Analyst: TMM Method: 160.2
Workgroup (AAB#): WG253700 Matrix: Water Units: mg/L
Contract #: DACA56-94-D-0020 Cal ID: OVEN -

| Analytes | SDL | PQL | Concentration | Dilution | Qualifier |
|---|---|---|---|---|---|
| Total Suspended Solids | 2.50 | 5.00 | 2.50 | 1 | U |

SDL Method Detection Limit
PQL Reporting/Practical Quantitation Limit
ND Analyte Not detected at or above reporting limit
* Analyte concentration > RL

KEMRON FORMS - Modified 12/07/2006
Version 1.5 PDF File ID: 918556
Report generated 10/26/2007 14:50

00078886

# LABORATORY CONTROL SAMPLE (LCS)

Login Number: L0710596 Analyst: TMM Prep Method: 160.2
Instrument ID: OVEN Matrix: Water Method: 160.2
Workgroup (AAB#): WG253700 Units: mg/L
QC Key: STD Lot #: STD22620

Sample ID: WG253700-02 LCS File ID: EN.0710241050-02 Run Date: 10/24/2007 10:50
Sample ID: WG253700-03 LCS2 File ID: EN.0710241050-03 Run Date: 10/24/2007 10:50

| Analytes | LCS | | | LCS2 | | | %RPD | %Rec Limits | RPD Lmt | Q |
|---|---|---|---|---|---|---|---|---|---|---|
| | Known | Found | % REC | Known | Found | % REC | | | | |
| Total Suspended Solids | 50.0 | 54.0 | 108 | 50.0 | 56.0 | 112 | 3.64 | 75 - 125 | 25 | |

KEMRON FORMS - Modified 02/08/2007
Version 1.5 PDF File ID: 918557
Report generated 10/26/2007 14:50

# 2.3.3.3 Raw Data

KEMRON ENVIRONMENTAL SERVICES

WORKGROUP: WG253700

# TOTAL SUSPENDED SOLIDS

LCS: Std 22620
Workgroup #: ____________
MS: ________ mL LCS & ________ mL sample
Balance: AND GR-202 / Other
Method: EPA 160.2 / SM2540D SOP #: K1602 Revision #: 11

| SAMPLE | # | VOLUME (mL) | INITIAL WEIGHT WT1 (g) | DRY WEIGHT WT2A (g) | DRY WEIGHT WT2B (g) | DRY WEIGHT WT2C (g) |
|---|---|---|---|---|---|---|
| BLANK | Blk | 200 | 0.0921 | 0.0922 | 0.0922 | |
| LCS: 50 mg/L | LCS | 100 | 0.0909 | 0.0965 | 0.0963 | |
| LCSDUP: 50 mg/L | LCS2 | ↓ | 0.0909 | 0.0966 | 0.0965 | |
| 10-596-11 | 1 | 10 | 0.0955 | 0.1635 | 0.1634 | |
| 10-570-08 | 2 | 50 | 0.0961 | 0.1086 | 0.1084 | |
| 10-544-02 | 3 | \| | 0.0942 | 0.1033 | 0.1031 | |
| 600-01 | 4 | 200 | 0.0955 | 0.0959 | 0.0959 | |
| 614-01 | 5 | 50 | 0.0954 | 0.1287 | 0.1288 | |
| -02 | 6 | ↓ | 0.0946 | 0.1108 | 0.1106 | |
| 591-01 | 7 | 200 | 0.0950 | 0.1003 | 0.1001 | |
| 594-01 | 8 | \| | 0.0949 | 0.0952 | 0.0951 | |
| 596-13 | 9 | \| | 0.0931 | 0.0958 | 0.0955 | |
| 641-05 | 10 | \| | 0.0936 | 0.1026 | 0.1025 | |
| -07 | 11 | 50 | 0.0931 | 0.1318 | 0.1316 | |
| -09 | 12 | 200 | 0.0926 | 0.1064 | 0.1064 | |
| 614-~~09~~ 04 | 13 | 50 | 0.0936 | 0.1110 | 0.1109 | |
| -05 | 14 | 100 | 0.0931 | 0.1047 | 0.1045 | |
| -06 | 15 | 10, 0.0950 | ~~0.0931~~ 50 | 0.1678 | 0.1675 | |
| | 16 | ~~80~~ | 0.0936 | TWR 10-24-07 | | |
| | 17 | TWR 10-24-07 | 0.0940 | | | |
| | 18 | | 0.0937 | | | |
| | 19 | | 0.0933 | TWR 10-24-07 | | |
| | 20 | | 0.0926 | | ~~0.09~~ | |
| DUP: 10-614-06 | Dup | 10 | 0.09~~50~~ 31 | 0.1652 | 0.1651 | |

ANALYST: [signature]
Tammy Morris

DATE/TIME: (on) 10-24-07 1050
DATE/TIME: (off) 10-25-07 0915
DATE/TIME: (off) 10-25-07 1315
DATE/TIME: (off) ____________

DCN#71552

Donna Hesson
Approved: October 26, 2007

KEMRON ENVIRONMENTAL SERVICES
GRAVIMETRIC REPORT

Workgroup (AAB#): WG253700
Product: 160.2
Analyte: TOTAL SUSPENDED SOLIDS

Analyst: TMM
Run Date: 10/24/2007 10:50

| SAMPLE NUMBER | INITIAL VOL | INITIAL WT | FINAL WT | Anal. Conc | Rep. Conc. | Units |
|---|---|---|---|---|---|---|
| WG253700-01 | 200 | 0.0921 | 0.0922 | 0.5000 | 0.5000 | mg/L |
| WG253700-02 | 100 | 0.0909 | 0.0963 | 54.00 | 54.00 | mg/L |
| WG253700-03 | 100 | 0.0909 | 0.0965 | 56.00 | 56.00 | mg/L |
| L0710596-11 | 10 | 0.0955 | 0.1634 | 6790 | 6790 | mg/L |
| L0710570-08 | 50 | 0.0961 | 0.1084 | 246.0 | 246.0 | mg/L |
| L0710544-02 | 50 | 0.0942 | 0.1031 | 178.0 | 178.0 | mg/L |
| L0710600-01 | 200 | 0.0955 | 0.0959 | 2.000 | ND | mg/L |
| L0710614-01 | 50 | 0.0954 | 0.1288 | 668.0 | 668.0 | mg/L |
| L0710614-02 | 50 | 0.0946 | 0.1106 | 320.0 | 320.0 | mg/L |
| L0710591-01 | 200 | 0.095 | 0.1001 | 25.50 | 25.50 | mg/L |
| L0710594-01 | 200 | 0.0949 | 0.0951 | 1.000 | ND | mg/L |
| L0710596-13 | 200 | 0.0931 | 0.0955 | 12.00 | 12.00 | mg/L |
| L0710641-05 | 200 | 0.0936 | 0.1025 | 44.50 | 44.50 | mg/L |
| L0710641-07 | 50 | 0.0931 | 0.1316 | 770.0 | 770.0 | mg/L |
| L0710641-09 | 200 | 0.0926 | 0.1064 | 69.00 | 69.00 | mg/L |
| L0710614-04 | 50 | 0.0936 | 0.1109 | 346.0 | 346.0 | mg/L |
| L0710614-05 | 100 | 0.0931 | 0.1045 | 114.0 | 114.0 | mg/L |
| L0710614-06 | 10 | 0.095 | 0.1675 | 7250 | 7250 | mg/L |
| WG253700-04 | 10 | 0.095 | 0.1675 | 7250 | 7250 | mg/L |
| WG253700-05 | 10 | 0.0931 | 0.1651 | 7200 | 7200 | mg/L |

KEMRON FORMS - Modified 02/26/2007
Version 1.3
Report generated 10/26/2007 13:52

Donna Eisson

Approved: October 26, 2007

# 3.0 Attachments

**Kemron Environmental Services**
**Analyst Listing**
**November 2, 2007**

---

| | | |
|---|---|---|
| AJF - AMANDA J. FICKIESEN | ALB - ANNIE L. BROWN | AML - ANTHONY M. LONG |
| ARA - ADRIAN R. ACHTERMANN | ASP - AARON S. PETRIE | BRG - BRENDA R. GREGORY |
| CAA - CASSIE A. AUGENSTEIN | CAF - CHERYL A. FLOWERS | CEB - CHAD E. BARNES |
| CLC - CHRYS L. CRAWFORD | CLW - CHARISSA L. WINTERS | CM - CHARLIE MARTIN |
| CMS - CRYSTAL M. STEPHENS | CPD - CHAD P. DAVIS | CSH - CHRIS S. HILL |
| DD - DIANE M. DENNIS | DDE - DEBRA D. ELLIOTT | DEL - DON E. LIGHTFRITZ |
| DEV - DAVID E. VANDENBERG | DGB - DOUGLAS G. BUTCHER | DIH - DEANNA I. HESSON |
| DLB - DAVID L. BUMGARNER | DLP - DOROTHY L. PAYNE | DLR - DIANNA L. RAUCH |
| DR - DEANNA ROBERTS | DRP - DAVE R. PITZER | DSF - DEBRA S. FREDERICK |
| DST - DENNIS S. TEPE | ECL - ERIC C. LAWSON | ED - EMILY E. DECKER |
| ERE - ERIN R. ELDER | FJB - FRANCES J. BOLDEN | HAV - HEMA VILASAGAR |
| HJR - HOLLY J. REED | JAB - JUANITA A. BECKER | JAL - JOHN A. LENT |
| JBK - JEREMY B. KINNEY | JCO - JOE C. OWENS | JDH - JUSTIN D. HESSON |
| JKP - JACQUELINE K. PARSONS | JKT - JANE K. THOMPSON | JWR - JOHN W. RICHARDS |
| JWS - JACK W. SHEAVES | JYH - JI Y. HU | KCZ - KEVIN C. ZUMBRO |
| KEB - KATHRYN E. BARNES | KHR - KIM H. RHODES | KJW - KATIE J. WIEFERICH |
| KRA - KATHY R. ALBERTSON | KRV - KATHRINE R. VICKERS | LKN - LINDA K. NEDEFF |
| LSB - LESLIE S. BUCINA | MDA - MIKE D. ALBERTSON | MDC - MICHAEL D. COCHRAN |
| MES - MARY E. SCHILLING | MKZ - MARILYN K. ZUMBRO | MLR - MARY L. ROCHOTTE |
| MMB - MAREN M. BEERY | MRT - MICHELLE R. TAYLOR | MSW - MATT S. WILSON |
| NJB - NATALIE J. BOOTH | PJM - PAUL J. MILLER | RAH - ROY A. HALSTEAD |
| RB - ROBERT BUCHANAN | REK - ROBERT E. KYER | RLF - RACHEL L. FRYE |
| RLK - ROBIN L. KLINGER | RNP - RICK N. PETTY | RWC - RODNEY W. CAMPBELL |
| SLM - STEPHANIE L. MOSSBURG | SLP - SHERI L. PFALZGRAF | SMH - SHAUNA M. HYDE |
| TDH - TRICIA D. HUCK | TMB - TIFFANY M. BAILEY | TMM - TAMMY M. MORRIS |
| VC - VICKI COLLIER | WFM - WALTER F. MARTIN | |

**KEMRON Environmental Services**

List of Valid Qualifiers

November 02, 2007

Qualkey: STD

| Qualifier | Description |
|---|---|
| * | Surrogate or spike compound out of range |
| + | Correlation coefficient for the MSA is less than 0.995 |
| < | Result is less than the associated numerical value. |
| > | Result is greater than the associated numerical value. |
| A | See the report narrative |
| B | Analyte present in method blank |
| C | Confirmed by GC/MS |
| CG | Confluent growth |
| DL | Surrogate or spike compound was diluted out |
| E | Estimated concentration due to sample matrix interference |
| EDL | Elevated sample reporting limits, presence of non-target analytes |
| EMPC | Estimated Maximum Possible Concentration |
| FL | Free Liquid |
| I | Semiquantitative result (out of instrument calibration range) |
| J | The analyte was positively identified, but the quantitation was below the RL |
| J,B | Analyte detected in both the method blank and sample above the MDL. |
| J,P | Estimate; columns don't agree to within 40% |
| J,S | Estimated concentration; analyzed by method of standard addition (MSA) |
| L | Sample reporting limits elevated due to matrix interference |
| M | Matrix effect; the concentration is an estimate due to matrix effect. |
| N | Tentatively identified compound(TIC) |
| NA | Not applicable |
| ND | Not detected at or above the reporting limit |
| ND,L | Not detected; sample reporting limit (RL) elevated due to interference |
| ND,S | Not detected; analyzed by method of standard addition (MSA) |
| NF | Not found by library search |
| NFL | No free liquid |
| NI | Non-ignitable |
| NR | Analyte is not required to be analyzed |
| NS | Not spiked |
| P | Concentrations >40% difference between the two GC columns |
| Q | One or more quality control criteria fail. See narrative. |
| QNS | Quantity of sample not sufficient to perform analysis |
| RA | Reanalysis confirms reported results |
| RE | Reanalysis confirms sample matrix interference |
| S | Analyzed by method of standard addition (MSA) |
| SMI | Sample matrix interference on surrogate |
| SP | Reported results are for spike compounds only |
| TIC | Library Search Compound |
| TNTC | Too numerous to count |
| U | Undetected; the concentration is below the reported MDL. |
| UJ | Undetected; the MDL and RL are estimated due to quality control discrepancies. |
| W | Post-digestion spike for furnace AA out of control limits |
| X | Exceeds regulatory limit |
| X, S | Exceeds regulatory limit; method of standard additions (MSA) |
| Z | Cannot be resolved from isomer - see below |

***Special Notes for Organic Analytes

1. Acrolein and acrylonitrile by method 624 are semi-quantitative screens only.
2. 1,2-Diphenylhydrazine is unstable and is reported as azobenzene.
3. N-nitrosodiphenylamine cannot be separated from diphenylamine.
4. 3-Methylphenol and 4-Methylphenol are unresolvable compounds.
5. m-Xylene and p-Xylene are unresolvable compounds.
6. The reporting limits for Appendix II/IX compounds by method 8270 are based on EPA estimated PQLs referenced in 40 CFR Part 264, Appendix IX. They are not always achievable for every compound an are matrix dependent.

00078893

Shaw® Shaw Environmental & Infrastructure, Inc.
3010 Briarpark Drive, Suite 400
Houston, TX 77042
(713) 996-4400

# Chain of Custody

NO. 10305

Laboratory Name: Kemron Labs
Address: 154 Starlite Drive, Marietta, Ohio
Contact: Stephanie Mossburg

Project Name: LHAAP
Project Location: Karnack, Texas
Project No.: 117591.0009A130
Project Contact: Allen Willmore
Project Telephone No.: (713) 247-9292
Point of Contact: Larry Duty
Telephone No.: (713) 996-4547
Project Manager/Supervisor: Praveen Srivastav

Analysis and Method Desired (Indicate separate containers)

Remarks: * To Be Filtered @ Lab. TRIP BLANK INCL.

| Item No. | ~~Telephone~~ Sample Number | Date | Time | Comp | Grab | Matrix | Sample Description, Location | Number of Containers | VOCs 8260 | Perchlorate | TAL Metals * | TSS /TDS | | | | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | LHSMW56-102007 | 10/20/07 | 08:10 | | ✓ | W | LHSMW56 | 3 | X | | | | | | | |
| 2 | 47WW05-102007 | 10/20/07 | 08:56 | | ✓ | W | 47WW05 | 3 | X | | | | | | | |
| 3 | LHSMW60-101807 | 10/18/07 | 15:50 | | ✓ | W | LHSMW60 | 2 | | X | | | | | | Field Duplicate + Reg. |
| 4 | 47WW23-101907 | 10/19/07 | 09:45 | | ✓ | W | 47WW23 | 3 | X | | | | | | | |
| 5 | 47WW27-101907 | 10/19/07 | 08:20 | | ✓ | W | 47WW27 | 1 | | X | | | | | | |
| 6 | 47WW21-101807 | 10/18/07 | 14:20 | | ✓ | W | 47WW21 | 6 | X | | | | | | | Field Dup + Regular Sample |
| 7 | 47WW01-101807 | 10/18/07 | 10:15 | | ✓ | W | 47WW01 | 3 | X | | | | | | | |
| 8 | 47WW04-101807 | 10/18/07 | 11:30 | | ✓ | W | 47WW04 | 3 | X | | | | | | | |
| 9 | 47WW22-101807 | 10/18/07 | 09:55 | | ✓ | W | 47WW22 | 4 | X | | X | X | | | | 1 VOA Broke |
| 10 | EQUIPMENT RINSE #2 | 10/22/07 | 14:20 | | ✓ | W | ER#2 | 2 | | X | | X | | | | From Bladder Pump |

| Transfers Relinquished By (signature) | Date/Time | Transfers Accepted By (signature) | Date/Time |
|---|---|---|---|
| [signature] | 10/22/07 17:30 | | |
| | | | |
| | | | |
| | | Laboratory [signature] | 10/23/07 0950 |

Special Instructions: TAL Metals are to be filtered @ lab. 7-day TAT

FedEx Airbill No.:

Sampler's Signature: [signature]

TAT: _____ Standard _____ Rush Date _____ Seals Intact? ✓ Y ~~N~~ Received Good Condition ✓ Y _____ N _____ Cold

White - Lab Copy   Canary - Field Copy   Pink - File Copy

Form Number: 433_1
Rev. 03-19-07

KEMRON Environmental Services

156 Starlite Drive
Marietta, OH 45750
(740) 373-4071

# SAMPLE RECEIPT FORM

| | |
|---|---|
| **Client:** | Shaw - LHAAP |
| **Workorder Number:** | B —— |
| **Date Received:** | 10-23-07 |
| **Delivered by:** | ( ) Fedx (✓) UPS ( ) Client ( ) Courier **Time:** 0950 |
| **Opened by:** | RLK |
| **IR Temp Gun:** | (✓) ~~D~~ ( ) G |
| **Logged by:** | T.L. **L** 10-596 |

**Cooler Information**

| Cooler ID | Temp C | Airbill# | COC# | Other |
|---|---|---|---|---|
| 1822 | 4 | 1Z401 663221005 5867 | 10305, 10301<br>10304 | Soil, water |
| | | | | |
| | | | | |
| | | | | |

| Inspection Checklist | Y | N | NA | Discrepancy ID |
|---|---|---|---|---|
| Were shipping coolers sealed? | ✓ | | | |
| Were custody seals intact? | ✓ | | | |
| Were cooler temperatures in range of 0 - 6? | ✓ | | | |
| Was ice present? | ✓ | | | |
| Were COC's received/ information complete/signed and dated? | RK ~~✓~~ | ✓ | | 1 |
| Were sample containers and labels intact and match COC? | | ✓ | | |
| Were the correct containers and volumes received? | ✓ | | | |
| Were correct preservatives used? (water only) | ✓ | | | |
| Were pH ranges acceptable? (voa's excluded) | | | ✓ | |
| Were VOA samples free of headspace? | ~~✓~~ | ✓ | | 2 |
| Were samples received within EPA hold times? | ✓ | | | |

**Discrepancy/Comments/Other Problems**

1 On chain 10304: A Did not Rec. 3 bottles labeled 47WW18 - 101807 (Field Dup)
B Did Rec. 3 bottles Labeled "Dup 3" but no time on bottle
C Did not Rec. 3 bottles Labeled 47WW36 - 101907
D Did Rec. 3 bottles Labeled LHS MW36 - 101907 same time
E Rec. 3 bottles Labeled Labeled "Equipment Blank"; Chain says "Equipment Rinse #1".
2 RK ~~A~~ Both trip Blanks have Bubbles the size of a pea.
F Equipment Rinse #2 - Rec'd Metals Bottle, Chain Says TSS/TDS

**Distribution**

| | |
|---|---|
| Name of KEMRON representative | |
| Client/Company: | |
| Person Contacted: | |
| Date contacted: | |

**Resolution/other comments:**

| |
|---|
| |
| |
| |
| |

00078895

**KEMRON Environmental Services**

Internal Chain of Custody Report

**Login:** L0710596
**Account:** 2773
**Project:** 2773.025
**Samples:** 15
**Due Date:** 30-OCT-2007

| Samplenum | Container ID | Products |
|---|---|---|
| **L0710596-04** | 387487 | CLO4 |

Bottle: 1

| Seq. | Purpose | From | To | Date/Time | Accept | Relinquish |
|---|---|---|---|---|---|---|
| 1 | LOGIN | COOLER | W1 | 23-OCT-2007 11:01 | AML | |
| 2 | ANALYZ | W1 | SEM | 29-OCT-2007 07:29 | DSF | ERE |
| 3 | STORE | SEM | A1 | 01-NOV-2007 12:25 | JKT | DSF |

| Samplenum | Container ID | Products |
|---|---|---|
| **L0710596-01** | 387484 | 826-SPE |

Bottle: 1

| Seq. | Purpose | From | To | Date/Time | Accept | Relinquish |
|---|---|---|---|---|---|---|
| 1 | LOGIN | COOLER | V1 | 23-OCT-2007 11:00 | AML | |
| 2 | ANALYZ | V1 | ORG4 | 24-OCT-2007 09:31 | KJW | ERE |

Bottle: 2

| Seq. | Purpose | From | To | Date/Time | Accept | Relinquish |
|---|---|---|---|---|---|---|
| 1 | LOGIN | COOLER | V1 | 23-OCT-2007 11:00 | AML | |
| 2 | ANALYZ | V1 | ORG4 | 24-OCT-2007 09:31 | KJW | ERE |

Bottle: 3

| Seq. | Purpose | From | To | Date/Time | Accept | Relinquish |
|---|---|---|---|---|---|---|
| 1 | LOGIN | COOLER | V1 | 23-OCT-2007 11:00 | AML | |
| 2 | ANALYZ | V1 | ORG4 | 24-OCT-2007 09:31 | KJW | ERE |

| Samplenum | Container ID | Products |
|---|---|---|
| **L0710596-08** | 387491 | 826-SPE |

Bottle: 1

| Seq. | Purpose | From | To | Date/Time | Accept | Relinquish |
|---|---|---|---|---|---|---|
| 1 | LOGIN | COOLER | V1 | 23-OCT-2007 11:01 | AML | |
| 2 | ANALYZ | V1 | ORG4 | 24-OCT-2007 09:31 | KJW | ERE |

Bottle: 2

| Seq. | Purpose | From | To | Date/Time | Accept | Relinquish |
|---|---|---|---|---|---|---|
| 1 | LOGIN | COOLER | V1 | 23-OCT-2007 11:01 | AML | |
| 2 | ANALYZ | V1 | ORG4 | 24-OCT-2007 09:31 | KJW | ERE |

Bottle: 3

| Seq. | Purpose | From | To | Date/Time | Accept | Relinquish |
|---|---|---|---|---|---|---|
| 1 | LOGIN | COOLER | V1 | 23-OCT-2007 11:01 | AML | |
| 2 | ANALYZ | V1 | ORG4 | 24-OCT-2007 09:31 | KJW | ERE |

A1 - Sample Archive (COLD)
A2 - Sample Archive (AMBIENT)
F1 - Volatiles Freezer in Login
V1 - Volatiles Refrigerator in Login
W1 - Walkin Cooler in Login

**KEMRON Environmental Services**
Internal Chain of Custody Report
**Login:** L0710596
**Account:** 2773
**Project:** 2773.025
**Samples:** 15
**Due Date:** 30-OCT-2007

| Samplenum | Container ID | Products |
|---|---|---|
| **L0710596-09** | 387492 | 826-SPE |

Bottle: 1

| Seq. | Purpose | From | To | Date/Time | Accept | Relinquish |
|---|---|---|---|---|---|---|
| 1 | LOGIN | COOLER | V1 | 23-OCT-2007 11:01 | AML | |
| 2 | ANALYZ | V1 | ORG4 | 24-OCT-2007 09:31 | KJW | ERE |

Bottle: 2

| Seq. | Purpose | From | To | Date/Time | Accept | Relinquish |
|---|---|---|---|---|---|---|
| 1 | LOGIN | COOLER | V1 | 23-OCT-2007 11:01 | AML | |
| 2 | ANALYZ | V1 | ORG4 | 24-OCT-2007 09:31 | KJW | ERE |

Bottle: 3

| Seq. | Purpose | From | To | Date/Time | Accept | Relinquish |
|---|---|---|---|---|---|---|
| 1 | LOGIN | COOLER | V1 | 23-OCT-2007 11:01 | AML | |
| 2 | ANALYZ | V1 | ORG4 | 24-OCT-2007 09:31 | KJW | ERE |

| Samplenum | Container ID | Products |
|---|---|---|
| **L0710596-03** | 387486 | CLO4 |

Bottle: 1

| Seq. | Purpose | From | To | Date/Time | Accept | Relinquish |
|---|---|---|---|---|---|---|
| 1 | LOGIN | COOLER | W1 | 23-OCT-2007 11:01 | AML | |
| 2 | ANALYZ | W1 | SEM | 29-OCT-2007 07:30 | DSF | ERE |
| 3 | STORE | SEM | A1 | 01-NOV-2007 12:25 | JKT | DSF |

| Samplenum | Container ID | Products |
|---|---|---|
| **L0710596-11** | 387495 | TSS |

Bottle: 1

| Seq. | Purpose | From | To | Date/Time | Accept | Relinquish |
|---|---|---|---|---|---|---|
| 1 | LOGIN | COOLER | W1 | 23-OCT-2007 11:02 | AML | |
| 2 | ANALYZ | W1 | WET | 23-OCT-2007 15:38 | HJR | ERE |
| 3 | STORE | WET | A1 | 25-OCT-2007 08:49 | ERE | HJR |

| Samplenum | Container ID | Products |
|---|---|---|
| **L0710596-15** | 387797 | 826-SPE |

Bottle: 1

| Seq. | Purpose | From | To | Date/Time | Accept | Relinquish |
|---|---|---|---|---|---|---|
| 1 | LOGIN | COOLER | V1 | 23-OCT-2007 14:33 | BRG | |
| 2 | ANALYZ | V1 | ORG4 | 24-OCT-2007 09:32 | KJW | ERE |

A1 - Sample Archive (COLD)
A2 - Sample Archive (AMBIENT)
F1 - Volatiles Freezer in Login
V1 - Volatiles Refrigerator in Login
W1 - Walkin Cooler in Login

**KEMRON Environmental Services**
Internal Chain of Custody Report
**Login:** L0710596
**Account:** 2773
**Project:** 2773.025
**Samples:** 15
**Due Date:** 30-OCT-2007

| Samplenum | Container ID | Products |
|---|---|---|
| **L0710596-07** | 387490 | 826-SPE |

Bottle: 1

| Seq. | Purpose | From | To | Date/Time | Accept | Relinquish |
|---|---|---|---|---|---|---|
| 1 | LOGIN | COOLER | V1 | 23-OCT-2007 11:01 | AML | |
| 2 | ANALYZ | V1 | ORG4 | 24-OCT-2007 09:31 | KJW | ERE |

Bottle: 2

| Seq. | Purpose | From | To | Date/Time | Accept | Relinquish |
|---|---|---|---|---|---|---|
| 1 | LOGIN | COOLER | V1 | 23-OCT-2007 11:01 | AML | |
| 2 | ANALYZ | V1 | ORG4 | 24-OCT-2007 09:31 | KJW | ERE |

Bottle: 3

| Seq. | Purpose | From | To | Date/Time | Accept | Relinquish |
|---|---|---|---|---|---|---|
| 1 | LOGIN | COOLER | V1 | 23-OCT-2007 11:01 | AML | |
| 2 | ANALYZ | V1 | ORG4 | 24-OCT-2007 09:31 | KJW | ERE |

| Samplenum | Container ID | Products |
|---|---|---|
| **L0710596-02** | 387485 | 826-SPE |

Bottle: 1

| Seq. | Purpose | From | To | Date/Time | Accept | Relinquish |
|---|---|---|---|---|---|---|
| 1 | LOGIN | COOLER | V1 | 23-OCT-2007 11:01 | AML | |
| 2 | ANALYZ | V1 | ORG4 | 24-OCT-2007 09:31 | KJW | ERE |

Bottle: 2

| Seq. | Purpose | From | To | Date/Time | Accept | Relinquish |
|---|---|---|---|---|---|---|
| 1 | LOGIN | COOLER | V1 | 23-OCT-2007 11:01 | AML | |
| 2 | ANALYZ | V1 | ORG4 | 24-OCT-2007 09:31 | KJW | ERE |

Bottle: 3

| Seq. | Purpose | From | To | Date/Time | Accept | Relinquish |
|---|---|---|---|---|---|---|
| 1 | LOGIN | COOLER | V1 | 23-OCT-2007 11:01 | AML | |
| 2 | ANALYZ | V1 | ORG4 | 24-OCT-2007 09:31 | KJW | ERE |

A1 - Sample Archive (COLD)
A2 - Sample Archive (AMBIENT)
F1 - Volatiles Freezer in Login
V1 - Volatiles Refrigerator in Login
W1 - Walkin Cooler in Login

**KEMRON Environmental Services**

Internal Chain of Custody Report

**Login:** L0710596
**Account:** 2773
**Project:** 2773.025
**Samples:** 15
**Due Date:** 30-OCT-2007

| Samplenum | Container ID | Products |
|---|---|---|
| **L0710596-05** | 387488 | 826-SPE |

Bottle: 1

| Seq. | Purpose | From | To | Date/Time | Accept | Relinquish |
|---|---|---|---|---|---|---|
| 1 | LOGIN | COOLER | V1 | 23-OCT-2007 11:01 | AML | |
| 2 | ANALYZ | V1 | ORG4 | 24-OCT-2007 09:31 | KJW | ERE |

Bottle: 2

| Seq. | Purpose | From | To | Date/Time | Accept | Relinquish |
|---|---|---|---|---|---|---|
| 1 | LOGIN | COOLER | V1 | 23-OCT-2007 11:01 | AML | |
| 2 | ANALYZ | V1 | ORG4 | 24-OCT-2007 09:31 | KJW | ERE |

Bottle: 3

| Seq. | Purpose | From | To | Date/Time | Accept | Relinquish |
|---|---|---|---|---|---|---|
| 1 | LOGIN | COOLER | V1 | 23-OCT-2007 11:01 | AML | |
| 2 | ANALYZ | V1 | ORG4 | 24-OCT-2007 09:31 | KJW | ERE |

| Samplenum | Container ID | Products |
|---|---|---|
| **L0710596-14** | 387499 | |

Bottle: 1

| Seq. | Purpose | From | To | Date/Time | Accept | Relinquish |
|---|---|---|---|---|---|---|
| 1 | LOGIN | COOLER | | 23-OCT-2007 11:02 | AML | |

Bottle: 2

| Seq. | Purpose | From | To | Date/Time | Accept | Relinquish |
|---|---|---|---|---|---|---|
| 1 | LOGIN | COOLER | | 23-OCT-2007 11:02 | AML | |

| Samplenum | Container ID | Products |
|---|---|---|
| **L0710596-06** | 387489 | CLO4 |

Bottle: 1

| Seq. | Purpose | From | To | Date/Time | Accept | Relinquish |
|---|---|---|---|---|---|---|
| 1 | LOGIN | COOLER | W1 | 23-OCT-2007 11:01 | AML | |
| 2 | ANALYZ | W1 | SEM | 29-OCT-2007 07:29 | DSF | ERE |
| 3 | STORE | SEM | A1 | 01-NOV-2007 12:25 | JKT | DSF |

| Samplenum | Container ID | Products |
|---|---|---|
| **L0710596-13** | 387497 | CLO4 |

Bottle: 1

| Seq. | Purpose | From | To | Date/Time | Accept | Relinquish |
|---|---|---|---|---|---|---|
| 1 | LOGIN | COOLER | W1 | 23-OCT-2007 11:02 | AML | |
| 2 | ANALYZ | W1 | SEM | 29-OCT-2007 07:29 | DSF | ERE |
| 3 | STORE | SEM | A1 | 01-NOV-2007 12:25 | JKT | DSF |

A1 - Sample Archive (COLD)
A2 - Sample Archive (AMBIENT)
F1 - Volatiles Freezer in Login
V1 - Volatiles Refrigerator in Login
W1 - Walkin Cooler in Login

**KEMRON Environmental Services**

Internal Chain of Custody Report

**Login:** L0710596
**Account:** 2773
**Project:** 2773.025
**Samples:** 15
**Due Date:** 30-OCT-2007

| Samplenum | Container ID | Products |
|---|---|---|
| **L0710596-11** | 387494 | 826-SPE |

Bottle: 1

| Seq. | Purpose | From | To | Date/Time | Accept | Relinquish |
|---|---|---|---|---|---|---|
| 1 | LOGIN | COOLER | V1 | 23-OCT-2007 11:02 | AML | |
| 2 | ANALYZ | V1 | ORG4 | 24-OCT-2007 09:31 | KJW | ERE |

Bottle: 2

| Seq. | Purpose | From | To | Date/Time | Accept | Relinquish |
|---|---|---|---|---|---|---|
| 1 | LOGIN | COOLER | V1 | 23-OCT-2007 11:02 | AML | |
| 2 | ANALYZ | V1 | ORG4 | 24-OCT-2007 09:32 | KJW | ERE |

| Samplenum | Container ID | Products |
|---|---|---|
| **L0710596-12** | 387496 | V-D NA-D ZN-D K-D AL-D CA-D FE-D HG-D MG-D CO- |

Bottle: 1

| Seq. | Purpose | From | To | Date/Time | Accept | Relinquish |
|---|---|---|---|---|---|---|
| 1 | LOGIN | COOLER | W1 | 23-OCT-2007 11:02 | AML | |
| 2 | PREP | W1 | DIG | 24-OCT-2007 05:52 | REK | ERE |
| 3 | STORE | DIG | A1 | 24-OCT-2007 09:03 | RLK | REK |
| 4 | PREP | W1 | DIG | 25-OCT-2007 14:18 | REK | ERE |
| 5 | STORE | DIG | A1 | 26-OCT-2007 14:12 | ERE | REK |

| Samplenum | Container ID | Products |
|---|---|---|
| **L0710596-14** | 387796 | AL-D AS-MS-D BA-MS-D BE-AX-D CA-D CD-MS-D CO-A |

Bottle: 1

| Seq. | Purpose | From | To | Date/Time | Accept | Relinquish |
|---|---|---|---|---|---|---|
| 1 | LOGIN | COOLER | W1 | 23-OCT-2007 14:32 | BRG | |
| 2 | PREP | W1 | DIG | 24-OCT-2007 05:52 | REK | ERE |
| 3 | STORE | DIG | A1 | 24-OCT-2007 09:03 | RLK | REK |
| 4 | PREP | W1 | DIG | 25-OCT-2007 14:18 | REK | ERE |
| 5 | STORE | DIG | A1 | 26-OCT-2007 14:12 | ERE | REK |

| Samplenum | Container ID | Products |
|---|---|---|
| **L0710596-13** | 387498 | TSS |

Bottle: 1

| Seq. | Purpose | From | To | Date/Time | Accept | Relinquish |
|---|---|---|---|---|---|---|
| 1 | LOGIN | COOLER | W1 | 23-OCT-2007 11:02 | AML | |
| 2 | ANALYZ | W1 | WET | 23-OCT-2007 15:38 | HJR | ERE |
| 3 | STORE | WET | A1 | 25-OCT-2007 08:49 | ERE | HJR |

A1 - Sample Archive (COLD)
A2 - Sample Archive (AMBIENT)
F1 - Volatiles Freezer in Login
V1 - Volatiles Refrigerator in Login
W1 - Walkin Cooler in Login

**KEMRON Environmental Services**

Internal Chain of Custody Report

**Login:** L0710596
**Account:** 2773
**Project:** 2773.025
**Samples:** 15
**Due Date:** 30-OCT-2007

| Samplenum | Container ID | Products |
|---|---|---|
| **L0710596-10** | 387493 | 826-SPE |

Bottle: 1

| Seq. | Purpose | From | To | Date/Time | Accept | Relinquish |
|---|---|---|---|---|---|---|
| 1 | LOGIN | COOLER | V1 | 23-OCT-2007 11:01 | AML | |
| 2 | ANALYZ | V1 | ORG4 | 24-OCT-2007 09:31 | KJW | ERE |

Bottle: 2

| Seq. | Purpose | From | To | Date/Time | Accept | Relinquish |
|---|---|---|---|---|---|---|
| 1 | LOGIN | COOLER | V1 | 23-OCT-2007 11:01 | AML | |
| 2 | ANALYZ | V1 | ORG4 | 24-OCT-2007 09:31 | KJW | ERE |

Bottle: 3

| Seq. | Purpose | From | To | Date/Time | Accept | Relinquish |
|---|---|---|---|---|---|---|
| 1 | LOGIN | COOLER | V1 | 23-OCT-2007 11:01 | AML | |
| 2 | ANALYZ | V1 | ORG4 | 24-OCT-2007 09:31 | KJW | ERE |

A1 - Sample Archive (COLD)
A2 - Sample Archive (AMBIENT)
F1 - Volatiles Freezer in Login
V1 - Volatiles Refrigerator in Login
W1 - Walkin Cooler in Login

KEMRON
ENVIRONMENTAL SERVICES

156 Starlite Drive, Marietta, OH 45750 • TEL 740-373-4071 • FAX 740-373-4835 • http://www.kemron.com

**Laboratory Report Number: L08020524**

Please find enclosed the analytical results for the samples you submitted to KEMRON Environmental Services.

Review and compilation of your report was completed by KEMRON's Sales and Service Team. If you have questions, comments or require further assistance regarding this report, please contact your team member noted in the reviewed box bleow at 800-373-4071. Team member e-mail addresses also appear here for your convenience.

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This report was reviewed on February 29, 2008.

Stephanie Mossburg

STEPHANIE MOSSBURG - Team Chemist/Data Specialist

I certify that all test results meet all of the requirements of the NELAP standards and other applicable contract terms and conditions. All results for soil samples are reported on a 'dry-weight' basis unless specified otherwise. Analytical results for water and wastes are reported on a 'as received' basis unless specified otherwise. A statement of uncertainty for each analysis is available upon request. This laboratory report shall not be reproduced, except in full, without the written approval of KEMRON Environmental Services.

This report was certified on February 29, 2008.

David E. Vandenberg

David Vandenberg - Vice President

FL DOH NELAP ID: E8755
This report contains a total of 53 pages.

**Protecting Our Environmental Future**

# KEMRON REPORT L08020524
# PREPARED FOR Shaw E I, Inc.
# WORK ID: LONGHORN AAP KARNACK TX

# 1.0 Introduction

KEMRON ENVIRONMENTAL SERVICES
REPORT NARRATIVE

**KEMRON Login No.:** L08020524

**CHAIN OF CUSTODY:** The chain of custody number was 5420.

**SHIPMENT CONDITIONS:** The chain of custody forms were received sealed in a cooler. The cooler temperature was 0 degrees C.

**SAMPLE MANAGEMENT:** All samples received were intact.

I certify that this data package is in compliance with the terms and conditions agreed to by the client and KEMRON Environmental Services, both technically and for completeness, except for the conditions noted above. Release of the data contained in this hardcopy data package has been authorized by the Laboratory Manager or designated person, as verified by the following signature.

| Approved: 27-FEB-08 |
| --- |
| Stephanie Mossburg |

# Laboratory Data Package Cover Page



This data Package consists of:

This signature page, the laboratory review checklists, and the following reportable data:

✓R1 Field chain-of-custody documentation;
✓R2 sample identification cross-reference;
R3 Test reports (analytical data sheets) for each enviornmental sample that includes:
- a) Items consistant with NELAC 5.13 or ISO/IEC 17025 Section 5.10
- b) dilution factors,
- c) preparation methods,
- d) Cleanup methods, and
- e) If required for the project, tentatively identified compounds (TICs)

✓R4 Surrogate recovery data including:
- a) Calculated recovery (%R) for each analyte, and
- b) The laboratory's surrogate QC limits.

✓R5 Test reports/summary forms for blank samples;
✓R6 Test reports/summary forms for laboratory control samples (LCSs) including:
- a) LCS spiking amount,
- b) Calculated %R for each analyte, and
- c) The laboratory"s LCS QC limits.

✓R7 Test reports for project matrix spike/matrix spike duplicates (MS/MSDs) including:
- a) Samples associated with the MS/MSD clearly identified,
- b) MS/MSD spiking amounts,
- c) Concentration of each MS/MSD analyte measured in the parent and spiked samples,
- d) Calculated %R and relative percent differences (RPDs), and
- e) The laboratory's MS/MSD QC limits

✓R8 Laboratory analytical duplicate (if applicable) revocery and precision:
- a) the amount of analyte measured in the duplicate,
- b) the calculated RPD, and
- c) the laboratory's QC limits for anlytical duplicates.

✓R9 List of method quantitation limits (MQLs) for each analyte for each method and matrix;
✓R10 Other problems or anomalies.
✓The exception Report for every "No" or "Not Reviewed (NR)" item IN laboratory review checklist.

**Release statement:** I am responsible for the release of this laboratory data package. This data package has been reviewed by the laboratory and is complete and technically compliant with the requirements of the methods used, except where noted by the laboratory in the attached exceptions reports. By my signature below, I affirm to the best of my knowledge, all problems/anomalies, observed by the laboratory as having the potential to affect the quality of the data, have been identified by the laboratoy in the Laboratory Review Checklist, and no information or data have been knowingly withheld that would affect the quality of the data.

**Check, if applicable: []** This laboratory is an in-house laboratory controlled by the person repsonding to rule. The official signing the cover page of the rule-required report (for example, the APAR) in which these data are used is responsible for releasing this data package and is by signature affirming the above release statement is true.

| MIKE D. ALBERTSON | [signature] | Volatiles Lab Supervisor | February 28, 2008 |
|---|---|---|---|
| Name (Printed) | Signature | Official Title (printed) | DATE |

RG-366/TRRP-13 December 2002 A1

**KEMRON Environmental Services**
Laboratory Review Checklist

| | |
|---|---|
| Laboratory Name: | KEMRON |
| Laboratory Log Number: | L08020524 |
| Project Name: | 798-LONGHORN |
| Method: | 8260B |
| Prep Batch Number(s): | 263965 |
| Reviewer Name: | MIKE D. ALBERTSON |
| LRC Date: | February 28, 2008 |

| Description | Yes | No | NA(1) | NR(2) | ER(3) |
|---|---|---|---|---|---|
| **Chain-Of-Custody (C-O-C)** | | | | | |
| Did samples meet the laboratory's standard conditions of sample acceptability upon receipt? | ✓ | | | | |
| Were all departures from standard conditions described in an exception report? | ✓ | | | | |
| **Sample and quality control (QC) identification** | | | | | |
| Are all field sample ID numbers cross-referenced to the laboratory ID numbers? | ✓ | | | | |
| Are all laboratory ID numbers cross-referenced to the corresponding QC data? | ✓ | | | | |
| **Test reports** | | | | | |
| Were all samples prepared and analyzed within holding times? | ✓ | | | | |
| Other than those results <MQL, were all other raw values bracketed by calibration standards? | ✓ | | | | |
| Were calculations checked by a peer or supervisor? | ✓ | | | | |
| Were all analyte identifications checked by a peer or supervisor? | ✓ | | | | |
| Were sample quantitation limits reported for all analytes not detected? | ✓ | | | | |
| Were all results for soil and sediment samples reported on a dry weight basis? | ✓ | | | | |
| Were % moisture (or solids) reported for all soil and sediment samples? | ✓ | | | | |
| If required for the project, TICs reported? | | | ✓ | | |
| **Surrogate recovery data** | | | | | |
| Were surrogates added prior to extraction? | ✓ | | | | |
| Were surrogate percent recoveries in all samples within the laboratory QC limits? | ✓ | | | | |
| **Test reports/summary forms for blank samples** | | | | | |
| Were appropriate type(s) of blanks analyzed? | ✓ | | | | |
| Were blanks analyzed at the appropriate frequency? | ✓ | | | | |
| Were method blanks taken through the entire analytical process, including preparation and, if applicable, cleanup procedures? | ✓ | | | | |
| Were blank concentrations <MQL? | ✓ | | | | |
| **Laboratory control samples (LCS):** | | | | | |
| Were all COCs included in the LCS? | ✓ | | | | |
| Was each LCS taken through the entire analytical procedure, including prep and cleanup steps? | ✓ | | | | |
| Were LCSs analyzed at the required frequency? | ✓ | | | | |
| Were LCS (and LCSD, if applicable) %Rs within the laboratory QC limits? | | ✓ | | | 1 |
| Does the detectability data document the laboratorys capability to detect the COCs at the MDL used to calculate the SQLs? | ✓ | | | | |
| Was the LCSD RPD within QC limits? | ✓ | | | | |
| **Matrix spike (MS) and matrix spike duplicate (MSD) data** | | | | | |
| Were the project/method specified analytes included in the MS and MSD? | | | ✓ | | |
| Were MS/MSD analyzed at the appropriate frequency? | | | ✓ | | |
| Were MS (and MSD, if applicable) %Rs within the laboratory QC limits? | | | ✓ | | |

| Description | Yes | No | NA(1) | NR(2) | ER(3) |
|---|---|---|---|---|---|
| Were MS/MSD RPDs within laboratory QC limits? | | | ✓ | | |
| **Analytical duplicate data** | | | | | |
| Were appropriate analytical duplicates analyzed for each matrix? | | | ✓ | | |
| Were analytical duplicates analyzed at the appropriate frequency? | | | ✓ | | |
| Were RPDs or relative standard deviations within the laboratory QC limits? | | | ✓ | | |
| **Method quantitation limits (MQLs):** | | | | | |
| Are the MQLs for each method analyte included in the laboratory data package? | ✓ | | | | |
| Do the MQLs correspond to the concentration of the lowest non-zero calibration standard? | ✓ | | | | |
| Are unadjusted MQLs included in the laboratory data package? | ✓ | | | | |
| **Other problems/anomalies** | | | | | |
| Are all known problems/anomalies/special conditions noted in this LRC and ER? | ✓ | | | | |
| Were all necessary corrective actions performed for the reported data? | ✓ | | | | |
| Was applicable and available technology used to lower the SQL minimize the matrix interference affects on the sample results? | ✓ | | | | |
| **ICAL** | | | | | |
| Were response factors and/or relative response factors for each analyte within QC limits? | ✓ | | | | |
| Were percent RSDs or correlation coefficient criteria met? | ✓ | | | | |
| Was the number of standards recommended in the method used for all analytes? | ✓ | | | | |
| Were all points generated between the lowest and highest standard used to calculate the curve? | ✓ | | | | |
| Are ICAL data available for all instruments used? | ✓ | | | | |
| Has the initial calibration curve been verified using an appropriate second source standard? | ✓ | | | | |
| **Initial and continuing calibration verification (ICV and CCV) and continuing calibration blank (CCB):** | | | | | |
| Was the CCV analyzed at the method-required frequency? | ✓ | | | | |
| Were percent differences for each analyte within the method-required QC limits? | ✓ | | | | |
| Was the ICAL curve verified for each analyte? | ✓ | | | | |
| Was the absolute value of the analyte concentration in the inorganic CCB <MDL? | | | ✓ | | |
| **Mass spectral tuning:** | | | | | |
| Was the appropriate compound for the method used for tuning? | ✓ | | | | |
| Were ion abundance data within the method-required QC limits? | ✓ | | | | |
| **Internal standards (IS):** | | | | | |
| Were IS area counts and retention times within the method-required QC limits? | ✓ | | | | |
| **Raw data (NELAC section 1 appendix A glossary, and section 5.12 or ISO/IEC 17025 section 4.12.2)** | | | | | |
| Were the raw data (for example, chromatograms, spectral data) reviewed by an analyst? | ✓ | | | | |
| Were data associated with manual integrations flagged on the raw data? | ✓ | | | | |
| **Dual column confirmation** | | | | | |
| Did dual column confirmation results meet the method-required QC? | | | ✓ | | |
| **Tentatively identified compounds (TICs):** | | | | | |
| If TICs were requested, were the mass spectra and TIC data subject to appropriate checks? | | | ✓ | | |
| **Interference Check Sample (ICS) results:** | | | | | |
| Were percent recoveries within method QC limits? | | | ✓ | | |
| **Serial dilutions, post digestion spikes, and method of standard additions** | | | | | |
| Were percent differences, recoveries, and the linearity within the QC limits specified in the method? | | | ✓ | | |
| **Method detection limit (MDL) studies** | | | | | |
| Was a MDL study performed for each reported analyte? | ✓ | | | | |
| Is the MDL either adjusted or supported by the analysis of DCSs? | ✓ | | | | |
| **Proficiency test reports:** | | | | | |
| Was the laboratory's performance acceptable on the applicable proficiency tests or evaluation studies? | ✓ | | | | |

| Description | Yes | No | NA(1) | NR(2) | ER(3) |
|---|---|---|---|---|---|
| **Standards documentation** | | | | | |
| Are all standards used in the analyses NIST-traceable or obtained from other appropriate sources? | ✓ | | | | |
| **Compound/analyte identification procedures** | | | | | |
| Are the procedures for compound/analyte identification documented? | ✓ | | | | |
| **Demonstration of analyst competency (DOC)** | | | | | |
| Was DOC conducted consistent with NELAC Chapter 5C or ISO/IEC 4? | ✓ | | | | |
| Is documentation of the analyst's competency up-to-date and on file? | ✓ | | | | |
| **Verification/validation documentation for methods (NELAC Chap 5 or ISO/IEC 17025 Section 5)** | | | | | |
| Are all the methods used to generate the data documented, verified, and validated, where applicable? | ✓ | | | | |
| **Laboratory standard operating procedures (SOPs):** | | | | | |
| Are laboratory SOPs current and on file for each method performed? | ✓ | | | | |

**EXCEPTIONS REPORT**
**ER# - Description**
#1: Dichlorodifluoromethane exceeded the upper advisory limit.

Footnotes:
(1) NA = Not applicable to method or project
(2) NR = Not reviewed
(3) ER# = Exception report number

# 2.1 Volatiles Data

# 2.1.1 Volatiles GCMS Data (8260)

# 2.1.1.1 Summary Data

# LABORATORY REPORT

00078912

**L08020524**

**02/29/08 11:39**

**Submitted By**

**KEMRON Environmental Services**
**156 Starlite Drive**
**Marietta , OH 45750**
**( 740 ) 373 - 4071**

**For**

**Account Name:** Shaw E & I, Inc.
ABB Lummus Biulding
3010 Briarpark Drive Suite 4N
Houston, TX 77042
**Attention:** Larry Duty

**Project Number:** 2773.025
**Project:** Longhorn AAP
**Site:** LONGHORN AAP KARNACK TX

**P.O. Number:** 322255 OP

## Sample Analysis Summary

| Client ID | Lab ID | Method | Dilution | Date Received |
|---|---|---|---|---|
| 50WW07-021908 | L08020524-01 | 8260B | 1 | 23-FEB-08 |

Sample Number: L08020524-01
Client ID: 50WW07-021908
Matrix: Water
Workgroup Number: WG263965
Collect Date: 02/19/2008 11:15
Sample Tag: 01

PrePrep Method: NONE
Prep Method: 5030B
Analytical Method: 8260B
Analyst: CMS
Dilution: 1
Units: ug/L

Instrument: HPMS14
Prep Date: 02/25/2008 19:50
Cal Date: 02/11/2008 22:54
Run Date: 02/25/2008 19:50
File ID: 14M03789

| Analyte | CAS. Number | Result | Qual | PQL | SDL |
|---|---|---|---|---|---|
| Acetone | 67-64-1 | 3.54 | J | 10.0 | 2.50 |
| Benzene | 71-43-2 | | U | 1.00 | 0.125 |
| Bromobenzene | 108-86-1 | | U | 1.00 | 0.125 |
| Bromochloromethane | 74-97-5 | | U | 1.00 | 0.200 |
| Bromodichloromethane | 75-27-4 | | U | 1.00 | 0.250 |
| Bromoform | 75-25-2 | | U | 1.00 | 0.500 |
| Bromomethane | 74-83-9 | | U | 1.00 | 0.500 |
| 2-Butanone | 78-93-3 | | U | 10.0 | 2.50 |
| n-Butylbenzene | 104-51-8 | | U | 1.00 | 0.250 |
| sec-Butylbenzene | 135-98-8 | | U | 1.00 | 0.250 |
| tert-Butylbenzene | 98-06-6 | | U | 1.00 | 0.250 |
| Carbon disulfide | 75-15-0 | | U | 1.00 | 0.500 |
| Carbon tetrachloride | 56-23-5 | | U | 1.00 | 0.250 |
| Chlorobenzene | 108-90-7 | | U | 1.00 | 0.125 |
| Chlorodibromomethane | 124-48-1 | | U | 1.00 | 0.250 |
| Chloroethane | 75-00-3 | | U | 1.00 | 0.500 |
| 2-Chloroethyl vinyl ether | 110-75-8 | | U | 10.0 | 2.00 |
| Chloroform | 67-66-3 | | U | 1.00 | 0.125 |
| Chloromethane | 74-87-3 | | U | 1.00 | 0.250 |
| 2-Chlorotoluene | 95-49-8 | | U | 1.00 | 0.125 |
| 4-Chlorotoluene | 106-43-4 | | U | 1.00 | 0.250 |
| 1,2-Dibromo-3-chloropropane | 96-12-8 | | U | 5.00 | 1.00 |
| 1,2-Dibromoethane | 106-93-4 | | U | 1.00 | 0.250 |
| Dibromomethane | 74-95-3 | | U | 1.00 | 0.250 |
| 1,2-Dichlorobenzene | 95-50-1 | | U | 1.00 | 0.125 |
| 1,3-Dichlorobenzene | 541-73-1 | | U | 1.00 | 0.250 |
| 1,4-Dichlorobenzene | 106-46-7 | | U | 1.00 | 0.125 |
| Dichlorodifluoromethane | 75-71-8 | | U | 1.00 | 0.250 |
| 1,1-Dichloroethane | 75-34-3 | | U | 1.00 | 0.125 |
| 1,2-Dichloroethane | 107-06-2 | | U | 1.00 | 0.250 |
| 1,1-Dichloroethene | 75-35-4 | | U | 1.00 | 0.500 |
| cis-1,2-Dichloroethene | 156-59-2 | | U | 1.00 | 0.250 |
| trans-1,2-Dichloroethene | 156-60-5 | | U | 1.00 | 0.250 |
| 1,2-Dichloropropane | 78-87-5 | | U | 1.00 | 0.200 |
| 1,3-Dichloropropane | 142-28-9 | | U | 1.00 | 0.200 |
| 2,2-Dichloropropane | 594-20-7 | | U | 1.00 | 0.250 |
| cis-1,3-Dichloropropene | 10061-01-5 | | U | 1.00 | 0.250 |
| trans-1,3-Dichloropropene | 10061-02-6 | | U | 1.00 | 0.500 |
| 1,1-Dichloropropene | 563-58-6 | | U | 1.00 | 0.250 |
| Ethylbenzene | 100-41-4 | | U | 1.00 | 0.250 |
| 2-Hexanone | 591-78-6 | | U | 10.0 | 2.50 |
| Hexachlorobutadiene | 87-68-3 | | U | 1.00 | 0.250 |
| Isopropylbenzene | 98-82-8 | | U | 1.00 | 0.250 |
| p-Isopropyltoluene | 99-87-6 | | U | 1.00 | 0.250 |
| 4-Methyl-2-pentanone | 108-10-1 | | U | 10.0 | 2.50 |
| Methylene chloride | 75-09-2 | | U | 5.00 | 0.250 |
| Naphthalene | 91-20-3 | | U | 1.00 | 0.200 |
| n-Propylbenzene | 103-65-1 | | U | 1.00 | 0.125 |

Report Number: **L08020524**
Report Date : **February 29, 2008**

00078914

| | | | | | |
|---|---|---|---|---|---|
| Sample Number: | L08020524-01 | PrePrep Method: | NONE | Instrument: | HPMS14 |
| Client ID: | 50WW07-021908 | Prep Method: | 5030B | Prep Date: | 02/25/2008 19:50 |
| Matrix: | Water | Analytical Method: | 8260B | Cal Date: | 02/11/2008 22:54 |
| Workgroup Number: | WG263965 | Analyst: | CMS | Run Date: | 02/25/2008 19:50 |
| Collect Date: | 02/19/2008 11:15 | Dilution: | 1 | File ID: | 14M03789 |
| Sample Tag: | 01 | Units: | ug/L | | |

| Analyte | CAS. Number | Result | Qual | PQL | SDL |
|---|---|---|---|---|---|
| Styrene | 100-42-5 | | U | 1.00 | 0.125 |
| 1,1,1,2-Tetrachloroethane | 630-20-6 | | U | 1.00 | 0.250 |
| 1,1,2,2-Tetrachloroethane | 79-34-5 | | U | 1.00 | 0.125 |
| Tetrachloroethene | 127-18-4 | | U | 1.00 | 0.250 |
| Toluene | 108-88-3 | | U | 1.00 | 0.250 |
| 1,2,3-Trichlorobenzene | 87-61-6 | | U | 1.00 | 0.125 |
| 1,2,4-Trichlorobenzene | 120-82-1 | | U | 1.00 | 0.200 |
| 1,1,1-Trichloroethane | 71-55-6 | | U | 1.00 | 0.250 |
| 1,1,2-Trichloroethane | 79-00-5 | | U | 1.00 | 0.250 |
| Trichloroethene | 79-01-6 | | U | 1.00 | 0.250 |
| Trichlorofluoromethane | 75-69-4 | | U | 1.00 | 0.250 |
| 1,2,3-Trichloropropane | 96-18-4 | | U | 1.00 | 0.500 |
| 1,2,4-Trimethylbenzene | 95-63-6 | | U | 1.00 | 0.250 |
| 1,3,5-Trimethylbenzene | 108-67-8 | | U | 1.00 | 0.250 |
| Vinyl acetate | 108-05-4 | | U | 10.0 | 2.50 |
| Vinyl chloride | 75-01-4 | | U | 1.00 | 0.250 |
| o-Xylene | 95-47-6 | | U | 1.00 | 0.250 |
| m-,p-Xylene | 136777-61-2 | | U | 1.00 | 0.500 |

| Surrogate | % Recovery | Lower | Upper | Qual |
|---|---|---|---|---|
| Dibromofluoromethane | 104 | 86 | 118 | |
| 1,2-Dichloroethane-d4 | 103 | 80 | 120 | |
| Toluene-d8 | 106 | 88 | 110 | |
| 4-Bromofluorobenzene | 102 | 86 | 115 | |

U Not detected at or above adjusted sample detection limit
J The analyte was positively identified, but the quantitation was below the RL

# 2.1.1.2 QC Summary Data

# Example 8260 Calculations

**1.0 Calculating the Response Factor (RF) from the initial calibration (ICAL) data:**

RF = [ (Ax) (Cis) ] / [ (Ais) (Cx) ]

where:

| | Example |
|---|---|
| Ax = Area of the characteristic ion for the compound being measured: | 3399156 |
| Cis = Concentration of the specific internal standard (ug/mL) | 25 |
| Ais = Area of the characteristic ion of the specific internal standard | 846471 |
| Cx = Concentration of the compound in the standard being measured (ug/mL) | 100 |
| RF = Calculated Response Factor | **1.0039** |

**2.0 Calculating the concentration ( C ) of a compound in water using the average RF: ***

Cx = [ (Ax) (Cis) (Vn)(D)] / [ (Ais) (RF) (Vs) ]

where:

| | **Example** |
|---|---|
| Ax = Area of the characteristic ion for the compound being measured | **3122498** |
| Cis = Concentration of the specific internal standard (ug/L) | **25** |
| D = Dilution factor for sample as a multiplier ( 10x = 10) | **1** |
| Ais = Area of the characteristic ion of the specific internal standard | **611048** |
| RF = Average RF from the ICAL | **1.004** |
| Vs = Purge volume of sample (mL) | **10** |
| Vn = Nominal purge volume of sample (mL) ( 10.0 mL ) | **10** |
| Cx = Concentration of the compound in the sample being measured (ug/L) | **127.2428** |

**3.0 Calculating the concentration ( C ) of a compound in soil using the average RF: ***

Cx = [ (Ax) (Cis) (Wn)(D)] / [ (Ais) (RF) (Ws) ]

where:

| | **Example** |
|---|---|
| Ax = Area of the characteristic ion for the compound being measured | **3122498** |
| Cis = Concentration of the specific internal standard (ug/L) | **25** |
| D = Dilution factor for sample as a multiplier ( 10x = 10) | **1** |
| Ais = Area of the characteristic ion of the specific internal standard | **611048** |
| RF = Average RF from the ICAL | **1.004** |
| Ws = Weight of sample purged (g) | **5** |
| Wn = Nominal purge weight (g) ( 5.0 g) | **5** |
| Cx = Concentration of the compound in the sample being measured (ug/L) | **127.2428** |

Dry weight correction:

| | |
|---|---|
| Percent solids (PCT_S) | **50** |
| Cd = (Cx) (100)/PCT_S | **254.4856** |

* Concentrations appearing on the instrument quantitation reports are on-column results and do not take into account initial volume, final volume, and the dilution factor.

**4.0 Concentration from Linear Regression**

**Step 1: Retrieve Curve Data From Plot, y = mx + b**

y = response ratio = response of analyte / response of IS = Ax/Ais

x = amount ratio = concentration analyte/concentration internal standard = Cx / Cis

m = slope from curve = 0.213

b = intercept from curve = - 0.00642

**Step 2: Calculate y from Quantitation Report**

y = 86550/593147 = 0.1459

**Step 3: Solve for x**

x = (y - b)/m = [( 0.1459 -( - 0.00642)]/ 0.213 = 0.7152

**Step 4: Solve for analyte concentration Cx**

Cx = Cis ( x ) = (25.0)(0.7152) = 17.88

**Example Spreadsheet Calculation:**

| | |
|---|---|
| Slope from curve, m: | **0.213** |
| Intercept from curve, b: | **-0.00642** |
| Area of analyte, Ax: | **86550** |
| Area of Internal Standard , Ais: | **593147** |
| Concentration of IS, Cis | **25.00** |
| Response Ratio: | **0.145917** |
| Amount Ratio: | **0.715195** |
| Concentration: | **17.87988** |
| Units of Internal Standard: | **ug/L** |

**5.0 Concentration from Quadratic Regression**

**Step 1 - Retrieve Curve Data from Plot, y = Ax^2 + Bx + C**
Where:
Ax^2 + Bx + (C - y) = 0
A, B, C = constants from the ICAL quadratic regression
y = Response ratio = Area of analyte/Area of internal standard (IS)
x = Amount ratio = Concentration of analyte/concentration of IS

**Step 2: Calculate y from Quantitation Report**

y = Ax/Ais

**Step 3: Solve for x using the quadratic formula**
Ax^2 + Bx + C - y = 0

$$x = \frac{b \pm \sqrt{\left(b^2 - 4a\left(c - y\right)\right)}}{2a}$$ (Two possible solutions)

**Step 4: Solve for analyte concentration Cx**

Cx = ( Cis )( Amount ratio)

**Example Spreadsheet Calculation:**

| | | |
|---|---|---|
| Value of A from plot: | **-0.00629** | |
| Value of B from plot: | **0.511** | |
| Value of C from plot: | **-0.0276** | |
| Area of unknown from quantitation report: | **293821** | |
| Area of IS from quantiation report: | **784848** | |
| Response ratio, y: | **0.374367** | |
| C - y: | **-0.40197** | |
| Root 1 - Computed amount ratio , X1: | **80.44567** | |
| Root 2 - Computed amount ratio , X2: | **0.794396** | use this solution |
| Concentration of IS, Cis: | **25.00** | |
| Concentration of analyte, Cx: | **19.86** | ug/L |

**KEMRON Environmental Services**

Instrument Run Log

Instrument: HPMS14 Dataset: 021108

Analyst1: CMS Analyst2: NA

Method: 8260B SOP: MSV01 Rev: 10

Method: 624 SOP: MSV10 Rev: 9

Method: 5030B SOP: PAT01 Rev: 10

Maintenance Log ID: 22912

Internal Standard: STD24496 Surrogate Standard: STD24497

CCV: STD24465 LCS: STD24411 MS/MSD: NA

Column 1 ID: RTX502.2 Column 2 ID: NA

Workgroups: WG262907

Comments:

| Seq. | File ID | Sample Information | pH | Mat | Dil | Reference | Date/Time |
|---|---|---|---|---|---|---|---|
| 1 | 14M03425 | WG262819-01 BFB 50ng STD 8260 | NA | 1 | 1 | STD24474 | 02/11/08 08:58 |
| 2 | 14M03427 | WG262819-02 50ug/L STD 8260 | NA | 1 | 1 | STD24465 | 02/11/08 10:06 |
| 3 | 14M03428 | BLANK-NEW TRAP+SPARGE | NA | 1 | 1 | | 02/11/08 11:38 |
| 4 | 14M03429 | BLANK-NEW TRAP+SPARGE | NA | 1 | 1 | | 02/11/08 12:09 |
| 5 | 14M03431 | WG262819-01 BFB 50ng STD 8260 | NA | 1 | 1 | STD24474 | 02/11/08 12:56 |
| 6 | 14M03432 | WG262819-01 BFB 50ng STD 8260 | NA | 1 | 1 | STD24474 | 02/11/08 13:11 |
| 7 | 14M03433 | WG262819-02 50ug/L STD 8260 | NA | 1 | 1 | STD24465 | 02/11/08 13:34 |
| 8 | 14M03434 | SYSTEM BLANK | NA | 1 | 1 | | 02/11/08 14:08 |
| 9 | 14M03435 | SYSTEM BLANK NEW TRAP 2 | NA | 1 | 1 | | 02/11/08 16:31 |
| 10 | 14M03436 | STD CHK | NA | 1 | 1 | | 02/11/08 17:20 |
| 11 | 14M03437 | WG262907-01 BFB 50ng STD 8260 | NA | 1 | 1 | STD24474 | 02/11/08 17:49 |
| 12 | 14M03438 | WG262907-02 0.30ug/L STD 8260 | NA | 1 | 1 | STD24465 | 02/11/08 18:15 |
| 13 | 14M03439 | WG262907-03 0.40ug/L STD 8260 | NA | 1 | 1 | STD24465 | 02/11/08 18:46 |
| 14 | 14M03440 | WG262907-04 1ug/L STD 8260 | NA | 1 | 1 | STD24465 | 02/11/08 19:18 |
| 15 | 14M03441 | WG262907-05 2ug/L STD 8260 | NA | 1 | 1 | STD24465 | 02/11/08 19:49 |
| 16 | 14M03442 | WG262907-06 5ug/L STD 8260 | NA | 1 | 1 | STD24465 | 02/11/08 20:19 |
| 17 | 14M03443 | WG262907-07 20ug/L STD 8260 | NA | 1 | 1 | STD24465 | 02/11/08 20:51 |
| 18 | 14M03444 | WG262907-08 50ug/L STD 8260 | NA | 1 | 1 | STD24465 | 02/11/08 21:21 |
| 19 | 14M03445 | WG262907-09 100ug/L STD 8260 | NA | 1 | 1 | STD24465 | 02/11/08 21:52 |
| 20 | 14M03446 | WG262907-10 200ug/L STD 8260 | NA | 1 | 1 | STD24465 | 02/11/08 22:23 |
| 21 | 14M03447 | WG262907-11 300ug/L STD 8260 | NA | 1 | 1 | STD24465 | 02/11/08 22:54 |
| 22 | 14M03448 | SYSTEM BLANK | NA | 1 | 1 | | 02/11/08 23:27 |
| 23 | 14M03449 | SYSTEM BLANK | NA | 1 | 1 | | 02/11/08 23:57 |
| 24 | 14M03450 | WG262907-12 20ug/L ALT SRC STD 8260 | NA | 1 | 1 | STD24411 | 02/12/08 00:28 |
| 25 | 14M03451 | SYSTEM BLANK | NA | 1 | 1 | | 02/12/08 00:59 |

Approved: February 18, 2008

**KEMRON Environmental Services**

Instrument Run Log

Instrument: HPMS14 Dataset: 022508

Analyst1: CMS Analyst2: NA

Method: 8260B SOP: MSV01 Rev: 10

Method: 624 SOP: MSV10 Rev: 7

Maintenance Log ID: 23076

Internal Standard: STD24496 Surrogate Standard: STD24497

CCV: STD24688 LCS: STD24700 MS/MSD: NA

Column 1 ID: RTX502.2 Column 2 ID: NA

Workgroups: WG263965

Comments:

| Seq. | File ID | Sample Information | pH | Mat | Dil | Reference | Date/Time |
|---|---|---|---|---|---|---|---|
| 1 | 14M03774 | WG263964-01 50ng BFB STD | NA | 1 | 1 | STD24474 | 02/25/08 12:07 |
| 2 | 14M03775 | WG263964-02 50ug/L STD 8260 | NA | 1 | 1 | STD24688 | 02/25/08 12:34 |
| 3 | 14M03776 | WG263964-02 50ug/L STD 8260 | NA | 1 | 1 | STD24688 | 02/25/08 13:07 |
| 4 | 14M03777 | WG263965-01 VBLK0225 BLANK 8260 | NA | 1 | 1 | | 02/25/08 13:38 |
| 5 | 14M03778 | WG263965-01 VBLK0225 BLANK 8261 | NA | 1 | 1 | | 02/25/08 14:09 |
| 6 | 14M03779 | WG263965-02 20ug/L LCS STD 8260 | NA | 1 | 1 | STD24700 | 02/25/08 14:39 |
| 7 | 14M03780 | WG263965-03 20ug/L LCSDUP STD 8260 | NA | 1 | 1 | STD24700 | 02/25/08 15:10 |
| 8 | 14M03781 | WG263965-04 624 BLANK | NA | 2 | 1 | | 02/25/08 15:41 |
| 9 | 14M03782 | L08020478-02 B 2.5X 624 | 7 | 2 | 2.5 | | 02/25/08 16:13 |
| 10 | 14M03783 | L08020479-02 B 5X 625 | 7 | 2 | 5 | | 02/25/08 16:44 |
| 11 | 14M03784 | L08020402-01 B 826-LOW | <2 | 1 | 1 | | 02/25/08 17:15 |
| 12 | 14M03785 | L08020444-04 B 50X 826-LOW | <2 | 1 | 50 | | 02/25/08 17:46 |
| 13 | 14M03786 | L08020414-01 A 25X 826-SPE | <2 | 1 | 25 | | 02/25/08 18:16 |
| 14 | 14M03787 | L08020377-03 A 826-SPLP | NA | 18 | 1 | | 02/25/08 18:47 |
| 15 | 14M03788 | L08020523-01 A 826-LOW | <2 | 1 | 1 | | 02/25/08 19:18 |
| 16 | 14M03789 | L08020524-01 A 826-LOW | <2 | 1 | 1 | | 02/25/08 19:50 |
| 17 | 14M03790 | L08020525-01 A 826-LOW | <2 | 1 | 1 | | 02/25/08 20:20 |
| 18 | 14M03791 | L08020525-02 A 826-LOW | <2 | 1 | 1 | | 02/25/08 20:52 |
| 19 | 14M03792 | L08020525-03 A 826-LOW | <2 | 1 | 1 | | 02/25/08 21:23 |
| 20 | 14M03793 | L08020513-03 A 826-LOW | <2 | 1 | 1 | | 02/25/08 21:54 |
| 21 | 14M03794 | L08020513-05 A 826-LOW | <2 | 1 | 1 | | 02/25/08 22:25 |
| 22 | 14M03795 | L08020513-01 A 826-LOW | <2 | 1 | 1 | | 02/25/08 22:56 |
| 23 | 14M03796 | L08020513-07 A 826-LOW | <2 | 1 | 1 | | 02/25/08 23:27 |
| 24 | 14M03797 | L08020376-01 A 500X 8260 | 11 | 12 | 500 | | 02/25/08 23:58 |
| 25 | 14M03798 | SYSTEM BLANK | NA | 1 | 1 | | 02/26/08 00:29 |
| 26 | 14M03799 | SYSTEM BLANK | NA | 1 | 1 | | 02/26/08 01:01 |

**Comments**

| Seq. | Rerun | Dil. | Reason | Analytes |
|---|---|---|---|---|
| 2 | X | | | |
| File ID: 14M03775 | | | | |
| 4 | X | | | |

Approved: February 28, 2008

**KEMRON Environmental Services**

Instrument Run Log

| | | | | | |
|---|---|---|---|---|---|
| Instrument: | HPMS14 | Dataset: | 022508 | | |
| Analyst1: | CMS | Analyst2: | NA | | |
| Method: | 8260B | SOP: | MSV01 | Rev: | 10 |
| Method: | 624 | SOP: | MSV10 | Rev: | 7 |

Maintenance Log ID: 23076

| | | | | | |
|---|---|---|---|---|---|
| Internal Standard: | STD24496 | Surrogate Standard: | STD24497 | | |
| CCV: | STD24688 | LCS: | STD24700 | MS/MSD: | NA |

Column 1 ID: RTX502.2 Column 2 ID: NA

Workgroups: WG263965

Comments:

**Comments**

| Seq. | Rerun | Dil. | Reason | Analytes |
|---|---|---|---|---|
| File ID: 14M03777 | | | | |
| 9 | X | 10 | Over Calibration Range | VC |
| File ID: 14M03782 | | | | |
| 13 | X | 100 | Over Calibration Range | CT |
| File ID: 14M03786 | | | | |
| 15 | X | 10 | Over Calibration Range | MECL |
| File ID: 14M03788 | | | | |
| 18 | X | 50 | Over Calibration Range | CIS12DCE, TCE |
| File ID: 14M03791 | | | | |
| 19 | X | | Carry-over contamination | |
| File ID: 14M03792 | | | | |
| 20 | X | | Carry-over contamination | |
| File ID: 14M03793 | | | | |
| 21 | X | | Carry-over contamination | |
| File ID: 14M03794 | | | | |
| 22 | X | | Carry-over contamination | |
| File ID: 14M03795 | | | | |

Approved: February 28, 2008

# KEMRON Environmental Services
## Data Checklist

Date: 11-FEB-2008

Analyst: CMS

Analyst: NA

Method: 8260B/624

Instrument: HPMS14

Curve Workgroup: NA

Runlog ID: 20708

Analytical Workgroups: WG262907

| | |
|---|---|
| System Performance Check | X |
| BFB | X |
| Initial Calibration | X |
| Average RF | X |
| Linear Reg or Higher Order Curve | X |
| Second Source standard % Difference | X |
| Continuing Calibration /Check Standards | NA |
| Project/Client Specific Requirements | NA |
| Special Standards | NA |
| Blanks | NA |
| TCL's | NA |
| Surrogates | NA |
| LCS (Laboratory Control Sample) | NA |
| Recoveries | NA |
| Surrogates | NA |
| MS/MSD/Duplicates | NA |
| Samples | NA |
| TCL Hits | NA |
| Spectra of TCL Hits | NA |
| Surrogates | NA |
| Internal Standards Criteria | NA |
| Library Searches | NA |
| Calculations & Correct Factors | NA |
| Dilutions Run | NA |
| Reruns | NA |
| Manual Integrations | X |
| Case Narrative | NA |
| Results Reporting/Data Qualifiers | X |
| KOBRA Workgroup Data | X |
| Check for Completeness | X |
| Primary Reviewer | CMS |
| Secondary Reviewer | MDA |
| | |
| Check for compliance with method and project specific requirements | X |
| Check the completeness of reported information | X |
| Check the information for the report narrative | X |
| Check the reasonableness of the results | X |

Primary Reviewer:
14-FEB-2008

Secondary Reviewer:
18-FEB-2008

Generated: FEB-18-2008 09:08:00

KEMRON Environmental Services
Data Checklist

Date: 25-FEB-2008
Analyst: CMS
Analyst: NA
Method: 8260
Instrument: HPMS14
Curve Workgroup: NA
Runlog ID: 20913
Analytical Workgroups: WG263695

| | |
|---|---|
| System Performance Check | NA |
| BFB | X |
| Initial Calibration | X |
| Average RF | X |
| Linear Reg or Higher Order Curve | X |
| Second Source standard % Difference | X |
| Continuing Calibration /Check Standards | X |
| Project/Client Specific Requirements | X |
| Special Standards | X |
| Blanks | X |
| TCL's | X |
| Surrogates | X |
| LCS (Laboratory Control Sample) | X |
| Recoveries | X |
| Surrogates | X |
| MS/MSD/Duplicates | X |
| Samples | X |
| TCL Hits | X |
| Spectra of TCL Hits | X |
| Surrogates | X |
| Internal Standards Criteria | X |
| Calculations & Correct Factors | X |
| Dilutions Run | X |
| Reruns | X |
| Manual Integrations | X |
| Excel Spreadsheets | X |
| Case Narrative | X |
| Narrative Summary | NA |
| Results Reporting/Data Qualifiers | X |
| Client Data Package Assembly | X |
| Check for Completeness | X |
| Primary Reviewer | SMH |
| Secondary Reviewer | MDA |
| | |
| | |
| Check for compliance with method and project specific requirements | X |
| Check the completeness of reported information | X |
| Check the information for the report narrative | X |
| Check the resonableness of the results | X |
| | |

Primary Reviewer:
28-FEB-2008
Shauna Hyde

Secondary Reviewer:
28-FEB-2008

Generated: FEB-28-2008 14:41:58

# KEMRON Environmental Services
## HOLDING TIMES
## EQUIVALENT TO AFCEE FORM 9

Analytical Method: 8260B

AAB#: WG263965

Login Number: L08020524

| Client ID | Date Collected | Date Received | Date Extracted | Max Hold Time Ext. | Time Held Ext. | Date Analyzed | Max Hold Time Anal | Time Held Anal. | Q |
|---|---|---|---|---|---|---|---|---|---|
| 50WW07-021908 | 02/19/08 | 02/23/08 | 02/25/08 | 14 | 6.36 | 02/25/08 | 14 | 6.36 | |

* EXT = SEE PROJECT QAPP REQUIREMENTS
*ANAL = SEE PROJECT QAPP REQUIREMENTS

KEMRON FORMS - Modified 11/20/2006
Version 1.5 PDF File ID: 1030014
Report generated 02/28/2008 16:26

SURROGATE STANDARDS

Login Number: L08020524
Instrument Id: HPMS14
Workgroup (AAB#): WG263965

Method: 8260
CAL ID: HPMS14-11-FEB-08
Matrix: Water

| Sample Number | Dilution | Tag | 1 | 2 | 3 | 4 |
|---|---|---|---|---|---|---|
| L08020524-01 | 1.00 | 01 | 103 | 104 | 102 | 106 |
| WG263965-01 | 1.00 | 01 | 93.5 | 99.8 | 101 | 107 |
| WG263965-02 | 1.00 | 01 | 94.3 | 102 | 102 | 104 |
| WG263965-03 | 1.00 | 01 | 93.0 | 102 | 100 | 104 |
| WG263965-04 | 1.00 | 01 | 94.5 | 100 | 101 | 107 |

| Surrogates | Surrogate Limits | | |
|---|---|---|---|
| 1 - 1,2-Dichloroethane-d4 | 80 | - | 120 |
| 2 - Dibromofluoromethane | 86 | - | 118 |
| 3 - 4-Bromofluorobenzene | 86 | - | 115 |
| 4 - Toluene-d8 | 88 | - | 110 |

Underline = Result out of surrogate limits

DL = surrogate diluted out
ND = surrogate not detected

## METHOD BLANK SUMMARY

Login Number: L08020524
Blank File ID: 14M03778
Prep Date: 02/25/08 14:09
Analyzed Date: 02/25/08 14:09
Analyst: CMS

Work Group: WG263965
Blank Sample ID: WG263965-01
Instrument ID: HPMS14
Method: 8260B

This Method Blank Applies To The Following Samples:

| Client ID | Lab Sample ID | Lab File ID | Time Analyzed | TAG |
|---|---|---|---|---|
| LCS | WG263965-02 | 14M03779 | 02/25/08 14:39 | 01 |
| LCS2 | WG263965-03 | 14M03780 | 02/25/08 15:10 | 01 |
| 50WW07-021908 | L08020524-01 | 14M03789 | 02/25/08 19:50 | 01 |

00078926

# METHOD BLANK REPORT

Login Number: L08020524 | Prep Date: 02/25/08 14:09 | Sample ID: WG263965-01
Instrument ID: HPMS14 | Run Date: 02/25/08 14:09 | Prep Method: 5030B
File ID: 14M03778 | Analyst: CMS | Method: 8260B
Workgroup (AAB#): WG263965 | Matrix: Water | Units: ug/L
Contract #: DACA56-94-D-0020 | Cal ID: HPMS14 - 11-FEB-08

| Analytes | SDL | PQL | Concentration | Dilution | Qualifier |
|---|---|---|---|---|---|
| Acetone | 2.50 | 10.0 | 2.50 | 1 | U |
| Benzene | 0.125 | 1.00 | 0.125 | 1 | U |
| Bromobenzene | 0.125 | 1.00 | 0.125 | 1 | U |
| Bromochloromethane | 0.200 | 1.00 | 0.200 | 1 | U |
| Bromodichloromethane | 0.250 | 1.00 | 0.250 | 1 | U |
| Bromoform | 0.500 | 1.00 | 0.500 | 1 | U |
| Bromomethane | 0.500 | 1.00 | 0.500 | 1 | U |
| 2-Butanone | 2.50 | 10.0 | 2.50 | 1 | U |
| n-Butylbenzene | 0.250 | 1.00 | 0.250 | 1 | U |
| sec-Butylbenzene | 0.250 | 1.00 | 0.250 | 1 | U |
| tert-Butylbenzene | 0.250 | 1.00 | 0.250 | 1 | U |
| Carbon disulfide | 0.500 | 1.00 | 0.500 | 1 | U |
| Carbon tetrachloride | 0.250 | 1.00 | 0.250 | 1 | U |
| Chlorobenzene | 0.125 | 1.00 | 0.125 | 1 | U |
| Chlorodibromomethane | 0.250 | 1.00 | 0.250 | 1 | U |
| Chloroethane | 0.500 | 1.00 | 0.500 | 1 | U |
| 2-Chloroethyl vinyl ether | 2.00 | 10.0 | 2.00 | 1 | U |
| Chloroform | 0.125 | 1.00 | 0.125 | 1 | U |
| Chloromethane | 0.250 | 1.00 | 0.250 | 1 | U |
| 2-Chlorotoluene | 0.125 | 1.00 | 0.125 | 1 | U |
| 4-Chlorotoluene | 0.250 | 1.00 | 0.250 | 1 | U |
| 1,2-Dibromo-3-chloropropane | 1.00 | 5.00 | 1.00 | 1 | U |
| 1,2-Dibromoethane | 0.250 | 1.00 | 0.250 | 1 | U |
| Dibromomethane | 0.250 | 1.00 | 0.250 | 1 | U |
| 1,2-Dichlorobenzene | 0.125 | 1.00 | 0.125 | 1 | U |
| 1,3-Dichlorobenzene | 0.250 | 1.00 | 0.250 | 1 | U |
| 1,4-Dichlorobenzene | 0.125 | 1.00 | 0.125 | 1 | U |
| Dichlorodifluoromethane | 0.250 | 1.00 | 0.250 | 1 | U |
| 1,1-Dichloroethane | 0.125 | 1.00 | 0.125 | 1 | U |
| 1,2-Dichloroethane | 0.250 | 1.00 | 0.250 | 1 | U |
| 1,1-Dichloroethene | 0.500 | 1.00 | 0.500 | 1 | U |
| cis-1,2-Dichloroethene | 0.250 | 1.00 | 0.250 | 1 | U |
| trans-1,2-Dichloroethene | 0.250 | 1.00 | 0.250 | 1 | U |
| 1,2-Dichloropropane | 0.200 | 1.00 | 0.200 | 1 | U |
| 1,3-Dichloropropane | 0.200 | 1.00 | 0.200 | 1 | U |
| 2,2-Dichloropropane | 0.250 | 1.00 | 0.250 | 1 | U |
| cis-1,3-Dichloropropene | 0.250 | 1.00 | 0.250 | 1 | U |
| trans-1,3-Dichloropropene | 0.500 | 1.00 | 0.500 | 1 | U |
| 1,1-Dichloropropene | 0.250 | 1.00 | 0.250 | 1 | U |
| Ethylbenzene | 0.250 | 1.00 | 0.250 | 1 | U |
| 2-Hexanone | 2.50 | 10.0 | 2.50 | 1 | U |
| Hexachlorobutadiene | 0.250 | 1.00 | 0.250 | 1 | U |

KEMRON FORMS - Modified 12/07/2006
Version 1.5 PDF File ID: 1030016
Report generated 02/28/2008 16:26

# METHOD BLANK REPORT

00078927

Login Number: L08020524 Prep Date: 02/25/08 14:09 Sample ID: WG263965-01
Instrument ID: HPMS14 Run Date: 02/25/08 14:09 Prep Method: 5030B
File ID: 14M03778 Analyst: CMS Method: 8260B
Workgroup (AAB#): WG263965 Matrix: Water Units: ug/L
Contract #: DACA56-94-D-0020 Cal ID: HPMS14 - 11-FEB-08

| Analytes | SDL | PQL | Concentration | Dilution | Qualifier |
|---|---|---|---|---|---|
| Isopropylbenzene | 0.250 | 1.00 | 0.250 | 1 | U |
| p-Isopropyltoluene | 0.250 | 1.00 | 0.250 | 1 | U |
| 4-Methyl-2-pentanone | 2.50 | 10.0 | 2.50 | 1 | U |
| Methylene chloride | 0.250 | 5.00 | 0.250 | 1 | U |
| Naphthalene | 0.200 | 1.00 | 0.200 | 1 | U |
| n-Propylbenzene | 0.125 | 1.00 | 0.125 | 1 | U |
| Styrene | 0.125 | 1.00 | 0.125 | 1 | U |
| 1,1,1,2-Tetrachloroethane | 0.250 | 1.00 | 0.250 | 1 | U |
| 1,1,2,2-Tetrachloroethane | 0.125 | 1.00 | 0.125 | 1 | U |
| Tetrachloroethene | 0.250 | 1.00 | 0.250 | 1 | U |
| Toluene | 0.250 | 1.00 | 0.250 | 1 | U |
| 1,2,3-Trichlorobenzene | 0.125 | 1.00 | 0.125 | 1 | U |
| 1,2,4-Trichlorobenzene | 0.200 | 1.00 | 0.200 | 1 | U |
| 1,1,1-Trichloroethane | 0.250 | 1.00 | 0.250 | 1 | U |
| 1,1,2-Trichloroethane | 0.250 | 1.00 | 0.250 | 1 | U |
| Trichloroethene | 0.250 | 1.00 | 0.250 | 1 | U |
| Trichlorofluoromethane | 0.250 | 1.00 | 0.250 | 1 | U |
| 1,2,3-Trichloropropane | 0.500 | 1.00 | 0.500 | 1 | U |
| 1,2,4-Trimethylbenzene | 0.250 | 1.00 | 0.250 | 1 | U |
| 1,3,5-Trimethylbenzene | 0.250 | 1.00 | 0.250 | 1 | U |
| Vinyl acetate | 2.50 | 10.0 | 2.50 | 1 | U |
| Vinyl chloride | 0.250 | 1.00 | 0.250 | 1 | U |
| o-Xylene | 0.250 | 1.00 | 0.250 | 1 | U |
| m-,p-Xylene | 0.500 | 1.00 | 0.500 | 1 | U |

| Surrogates | % Recovery | Surrogate Limits | Qualifier |
|---|---|---|---|
| Dibromofluoromethane | 99.8 | 86 - 118 | PASS |
| 1,2-Dichloroethane-d4 | 93.5 | 80 - 120 | PASS |
| Toluene-d8 | 107 | 88 - 110 | PASS |
| 4-Bromofluorobenzene | 101 | 86 - 115 | PASS |

SDL Method Detection Limit
PQL Reporting/Practical Quantitation Limit
ND Analyte Not detected at or above reporting limit
* Analyte concentration > RL

KEMRON FORMS - Modified 12/07/2006
Version 1.5 PDF File ID: 1030016
Report generated 02/28/2008 16:26

# LABORATORY CONTROL SAMPLE (LCS)

Login Number: L08020524 Analyst: CMS Prep Method: 5030B
Instrument ID: HPMS14 Matrix: Water Method: 8260B
Workgroup (AAB#): WG263965 Units: ug/L
QC Key: STD Lot #: STD24700

Sample ID: WG263965-02 LCS File ID: 14M03779 Run Date: 02/25/2008 14:39
Sample ID: WG263965-03 LCS2 File ID: 14M03780 Run Date: 02/25/2008 15:10

| Analytes | LCS | | | LCS2 | | | %RPD | %Rec Limits | RPD Lmt | Q |
|---|---|---|---|---|---|---|---|---|---|---|
| | Known | Found | % REC | Known | Found | % REC | | | | |
| Acetone | 20.0 | 18.4 | 91.9 | 20.0 | 18.6 | 93.1 | 1.25 | 40 - 142 | 20 | |
| Benzene | 20.0 | 20.8 | 104 | 20.0 | 20.1 | 101 | 3.44 | 80 - 121 | 20 | |
| Bromobenzene | 20.0 | 20.7 | 104 | 20.0 | 20.1 | 101 | 2.94 | 80 - 120 | 20 | |
| Bromochloromethane | 20.0 | 20.2 | 101 | 20.0 | 19.7 | 98.6 | 2.58 | 65 - 130 | 20 | |
| Bromodichloromethane | 20.0 | 22.0 | 110 | 20.0 | 21.4 | 107 | 2.77 | 80 - 131 | 20 | |
| Bromoform | 20.0 | 17.4 | 87.0 | 20.0 | 17.2 | 85.9 | 1.30 | 70 - 130 | 20 | |
| Bromomethane | 20.0 | 26.1 | 131 | 20.0 | 25.6 | 128 | 2.19 | 30 - 145 | 20 | |
| 2-Butanone | 20.0 | 19.7 | 98.6 | 20.0 | 19.9 | 99.3 | 0.695 | 30 - 150 | 20 | |
| n-Butylbenzene | 20.0 | 22.8 | 114 | 20.0 | 21.7 | 109 | 4.56 | 80 - 131 | 20 | |
| sec-Butylbenzene | 20.0 | 22.8 | 114 | 20.0 | 21.8 | 109 | 4.82 | 80 - 127 | 20 | |
| tert-Butylbenzene | 20.0 | 22.3 | 112 | 20.0 | 21.4 | 107 | 4.06 | 80 - 126 | 20 | |
| Carbon disulfide | 20.0 | 22.5 | 113 | 20.0 | 21.4 | 107 | 5.19 | 58 - 138 | 20 | |
| Carbon tetrachloride | 20.0 | 23.5 | 118 | 20.0 | 22.1 | 110 | 6.35 | 65 - 140 | 20 | |
| Chlorobenzene | 20.0 | 20.7 | 103 | 20.0 | 20.1 | 100 | 2.81 | 80 - 120 | 20 | |
| Chlorodibromomethane | 20.0 | 18.5 | 92.3 | 20.0 | 18.1 | 90.5 | 1.89 | 60 - 135 | 20 | |
| Chloroethane | 20.0 | 22.7 | 114 | 20.0 | 22.1 | 111 | 2.71 | 60 - 135 | 20 | |
| 2-Chloroethyl vinyl ether | 20.0 | 13.8 | 69.0 | 20.0 | 12.9 | 64.3 | 6.97 | 58 - 151 | 20 | |
| Chloroform | 20.0 | 21.3 | 106 | 20.0 | 20.5 | 102 | 3.86 | 80 - 125 | 20 | |
| Chloromethane | 20.0 | 22.2 | 111 | 20.0 | 21.6 | 108 | 2.96 | 40 - 125 | 20 | |
| 2-Chlorotoluene | 20.0 | 21.0 | 105 | 20.0 | 20.4 | 102 | 2.86 | 80 - 127 | 20 | |
| 4-Chlorotoluene | 20.0 | 21.2 | 106 | 20.0 | 20.4 | 102 | 3.61 | 80 - 126 | 20 | |
| 1,2-Dibromo-3-chloropropane | 20.0 | 16.6 | 82.9 | 20.0 | 16.8 | 83.8 | 1.11 | 50 - 130 | 20 | |
| 1,2-Dibromoethane | 20.0 | 20.0 | 99.9 | 20.0 | 19.8 | 99.1 | 0.839 | 80 - 125 | 20 | |
| Dibromomethane | 20.0 | 20.8 | 104 | 20.0 | 20.5 | 103 | 1.24 | 75 - 125 | 20 | |
| 1,2-Dichlorobenzene | 20.0 | 19.7 | 98.6 | 20.0 | 19.5 | 97.6 | 1.04 | 80 - 125 | 20 | |
| 1,3-Dichlorobenzene | 20.0 | 20.3 | 102 | 20.0 | 19.8 | 99.0 | 2.62 | 80 - 120 | 20 | |
| 1,4-Dichlorobenzene | 20.0 | 19.6 | 97.8 | 20.0 | 19.1 | 95.6 | 2.33 | 80 - 120 | 20 | |
| Dichlorodifluoromethane | 20.0 | 29.6 | 148 | 20.0 | 27.6 | 138 | 6.96 | 50 - 133 | 20 | * |
| 1,1-Dichloroethane | 20.0 | 21.4 | 107 | 20.0 | 20.6 | 103 | 3.93 | 80 - 125 | 20 | |
| 1,2-Dichloroethane | 20.0 | 20.3 | 102 | 20.0 | 19.8 | 99.0 | 2.62 | 80 - 129 | 20 | |
| 1,1-Dichloroethene | 20.0 | 22.9 | 114 | 20.0 | 21.7 | 108 | 5.34 | 80 - 132 | 20 | |
| cis-1,2-Dichloroethene | 20.0 | 22.2 | 111 | 20.0 | 21.2 | 106 | 4.77 | 70 - 125 | 20 | |
| trans-1,2-Dichloroethene | 20.0 | 22.1 | 111 | 20.0 | 21.0 | 105 | 5.41 | 80 - 127 | 20 | |
| 1,2-Dichloropropane | 20.0 | 20.7 | 103 | 20.0 | 20.1 | 101 | 2.77 | 80 - 120 | 20 | |
| 1,3-Dichloropropane | 20.0 | 19.8 | 99.2 | 20.0 | 19.5 | 97.5 | 1.71 | 80 - 120 | 20 | |
| 2,2-Dichloropropane | 20.0 | 24.9 | 125 | 20.0 | 23.3 | 117 | 6.51 | 80 - 133 | 20 | |
| cis-1,3-Dichloropropene | 20.0 | 21.0 | 105 | 20.0 | 20.6 | 103 | 1.68 | 70 - 130 | 20 | |
| trans-1,3-Dichloropropene | 20.0 | 19.3 | 96.5 | 20.0 | 19.3 | 96.4 | 0.152 | 80 - 130 | 20 | |
| 1,1-Dichloropropene | 20.0 | 22.5 | 112 | 20.0 | 21.2 | 106 | 5.87 | 75 - 130 | 20 | |
| Ethylbenzene | 20.0 | 22.3 | 112 | 20.0 | 21.4 | 107 | 4.00 | 80 - 122 | 20 | |

KEMRON FORMS - Modified 02/08/2007
Version 1.5 PDF File ID: 1029691
Report generated 02/28/2008 16:27

# LABORATORY CONTROL SAMPLE (LCS)

Login Number: L08020524  Analyst: CMS  Prep Method: 5030B
Instrument ID: HPMS14  Matrix: Water  Method: 8260B
Workgroup (AAB#): WG263965  Units: ug/L
QC Key: STD  Lot #: STD24700

Sample ID: WG263965-02 LCS  File ID: 14M03779  Run Date: 02/25/2008 14:39
Sample ID: WG263965-03 LCS2  File ID: 14M03780  Run Date: 02/25/2008 15:10

| Analytes | LCS | | | LCS2 | | | %RPD | %Rec Limits | RPD Lmt | Q |
|---|---|---|---|---|---|---|---|---|---|---|
| | Known | Found | % REC | Known | Found | % REC | | | | |
| 2-Hexanone | 20.0 | 17.5 | 87.6 | 20.0 | 18.1 | 90.3 | 2.94 | 55 - 130 | 20 | |
| Hexachlorobutadiene | 20.0 | 21.5 | 108 | 20.0 | 20.4 | 102 | 5.39 | 72 - 132 | 20 | |
| Isopropylbenzene | 20.0 | 20.1 | 101 | 20.0 | 19.5 | 97.3 | 3.46 | 80 - 122 | 20 | |
| p-Isopropyltoluene | 20.0 | 22.4 | 112 | 20.0 | 21.3 | 107 | 4.78 | 80 - 122 | 20 | |
| 4-Methyl-2-pentanone | 20.0 | 18.2 | 90.8 | 20.0 | 18.5 | 92.7 | 2.11 | 64 - 140 | 20 | |
| Methylene chloride | 20.0 | 20.7 | 104 | 20.0 | 20.4 | 102 | 1.68 | 80 - 123 | 20 | |
| Naphthalene | 20.0 | 16.7 | 83.4 | 20.0 | 17.1 | 85.3 | 2.20 | 59 - 149 | 20 | |
| n-Propylbenzene | 20.0 | 23.0 | 115 | 20.0 | 21.9 | 109 | 5.01 | 80 - 129 | 20 | |
| Styrene | 20.0 | 21.6 | 108 | 20.0 | 21.2 | 106 | 2.12 | 80 - 123 | 20 | |
| 1,1,1,2-Tetrachloroethane | 20.0 | 21.7 | 108 | 20.0 | 21.2 | 106 | 2.21 | 80 - 130 | 20 | |
| 1,1,2,2-Tetrachloroethane | 20.0 | 19.2 | 96.1 | 20.0 | 19.3 | 96.5 | 0.442 | 79 - 125 | 20 | |
| Tetrachloroethene | 20.0 | 22.4 | 112 | 20.0 | 21.3 | 107 | 4.97 | 80 - 124 | 20 | |
| Toluene | 20.0 | 21.2 | 106 | 20.0 | 20.5 | 103 | 3.46 | 80 - 124 | 20 | |
| 1,2,3-Trichlorobenzene | 20.0 | 17.4 | 87.2 | 20.0 | 17.3 | 86.5 | 0.746 | 55 - 140 | 20 | |
| 1,2,4-Trichlorobenzene | 20.0 | 18.5 | 92.7 | 20.0 | 18.2 | 90.9 | 1.98 | 65 - 135 | 20 | |
| 1,1,1-Trichloroethane | 20.0 | 22.8 | 114 | 20.0 | 21.5 | 108 | 5.56 | 80 - 134 | 20 | |
| 1,1,2-Trichloroethane | 20.0 | 19.7 | 98.3 | 20.0 | 19.3 | 96.5 | 1.86 | 80 - 125 | 20 | |
| Trichloroethene | 20.0 | 22.1 | 111 | 20.0 | 21.4 | 107 | 3.42 | 80 - 122 | 20 | |
| Trichlorofluoromethane | 20.0 | 20.4 | 102 | 20.0 | 19.1 | 95.6 | 6.66 | 62 - 151 | 20 | |
| 1,2,3-Trichloropropane | 20.0 | 19.1 | 95.6 | 20.0 | 18.9 | 94.6 | 1.02 | 75 - 125 | 20 | |
| 1,2,4-Trimethylbenzene | 20.0 | 21.8 | 109 | 20.0 | 21.1 | 106 | 3.35 | 80 - 125 | 20 | |
| 1,3,5-Trimethylbenzene | 20.0 | 22.6 | 113 | 20.0 | 21.7 | 109 | 3.98 | 80 - 127 | 20 | |
| Vinyl acetate | 20.0 | 16.3 | 81.7 | 20.0 | 15.5 | 77.4 | 5.49 | 10 - 150 | 20 | |
| Vinyl chloride | 20.0 | 24.0 | 120 | 20.0 | 22.5 | 113 | 6.31 | 65 - 140 | 20 | |
| o-Xylene | 20.0 | 21.7 | 109 | 20.0 | 21.2 | 106 | 2.41 | 80 - 122 | 20 | |
| m-,p-Xylene | 40.0 | 44.0 | 110 | 40.0 | 42.7 | 107 | 2.97 | 80 - 122 | 20 | |

| Surogates | LCS | LCS2 | Surrogate Limits | Qualifier |
|---|---|---|---|---|
| | % Recovery | % Recovery | | |
| Dibromofluoromethane | 102 | 102 | 86 - 118 | PASS |
| 1,2-Dichloroethane-d4 | 94.3 | 93.0 | 80 - 120 | PASS |
| Toluene-d8 | 104 | 104 | 88 - 110 | PASS |
| 4-Bromofluorobenzene | 102 | 100 | 86 - 115 | PASS |

* FAILS %REC LIMIT

# FAILS RPD LIMIT

KEMRON FORMS - Modified 02/08/2007
Version 1.5  PDF File ID: 1029691
Report generated 02/28/2008 16:27

# KEMRON ENVIRONMENTAL SERVICES
## ORGANIC INSTRUMENT CHECK

### BFB

Login Number: L08020524
Instrument: HPMS14
Analyst: CMS
Workgroup: WG262907

Tune ID: WG262907-01
Run Date: 02/11/2008
Run Time: 17:49
File ID: 14M03437
Cal ID: HPMS14 - 11-FEB-08

| Target | Rel. to | Lower | Upper | Rel. | Raw | Result |
|---|---|---|---|---|---|---|
| 50.0 | 95.0 | 15.0 | 40.0 | 21.4 | 3989 | PASS |
| 75.0 | 95.0 | 30.0 | 60.0 | 48.9 | 9097 | PASS |
| 95.0 | 95.0 | 100 | 100 | 100 | 18599 | PASS |
| 96.0 | 95.0 | 5.00 | 9.00 | 7.05 | 1312 | PASS |
| 173 | 174 | 0 | 2.00 | 0.266 | 35 | PASS |
| 174 | 95.0 | 50.0 | 100 | 70.7 | 13145 | PASS |
| 175 | 174 | 5.00 | 9.00 | 7.05 | 927 | PASS |
| 176 | 174 | 95.0 | 101 | 96.2 | 12649 | PASS |
| 177 | 176 | 5.00 | 9.00 | 6.59 | 834 | PASS |

This check relates to the following samples:

| Lab ID | Client ID | Tag | Date Analyzed | Q |
|---|---|---|---|---|
| WG262907-02 | STD | 01 | 02/11/2008 18:15 | |
| WG262907-03 | STD | 01 | 02/11/2008 18:46 | |
| WG262907-04 | STD | 01 | 02/11/2008 19:18 | |
| WG262907-05 | STD | 01 | 02/11/2008 19:49 | |
| WG262907-06 | STD | 01 | 02/11/2008 20:19 | |
| WG262907-07 | STD | 01 | 02/11/2008 20:51 | |
| WG262907-08 | STD-CCV | 01 | 02/11/2008 21:21 | |
| WG262907-09 | STD | 01 | 02/11/2008 21:52 | |
| WG262907-10 | STD | 01 | 02/11/2008 22:23 | |
| WG262907-11 | STD | 01 | 02/11/2008 22:54 | |
| WG262907-12 | SSCV | 01 | 02/12/2008 00:28 | |

* Sample past 12 hour tune limit

KEMRON FORMS - Modified 03/12/2007
Version 1.3 PDF File ID: 1030018
Report generated 02/28/2008 16:27

KEMRON ENVIRONMENTAL SERVICES

ORGANIC INSTRUMENT CHECK

BFB

Login Number: L08020524
Instrument: HPMS14
Analyst: CMS
Workgroup: WG263964

Tune ID: WG263964-01
Run Date: 02/25/2008
Run Time: 12:07
File ID: 14M03774
Cal ID: HPMS14 - 11-FEB-08

| Target | Rel. to | Lower | Upper | Rel. | Raw | Result |
|---|---|---|---|---|---|---|
| 50.0 | 95.0 | 15.0 | 40.0 | 21.1 | 3922 | PASS |
| 75.0 | 95.0 | 30.0 | 60.0 | 49.4 | 9168 | PASS |
| 95.0 | 95.0 | 100 | 100 | 100 | 18553 | PASS |
| 96.0 | 95.0 | 5.00 | 9.00 | 6.79 | 1260 | PASS |
| 173 | 174 | 0 | 2.00 | 0.368 | 50 | PASS |
| 174 | 95.0 | 50.0 | 100 | 73.3 | 13601 | PASS |
| 175 | 174 | 5.00 | 9.00 | 7.33 | 997 | PASS |
| 176 | 174 | 95.0 | 101 | 96.2 | 13087 | PASS |
| 177 | 176 | 5.00 | 9.00 | 6.35 | 831 | PASS |

This check relates to the following samples:

| Lab ID | Client ID | Tag | Date Analyzed | Q |
|---|---|---|---|---|
| WG263964-02 | CCV | 01 | 02/25/2008 13:07 | |
| WG263965-01 | BLANK | 01 | 02/25/2008 14:09 | |
| WG263965-02 | LCS | 01 | 02/25/2008 14:39 | |
| WG263965-03 | LCS2 | 01 | 02/25/2008 15:10 | |
| WG263965-04 | BLANK2 | 01 | 02/25/2008 15:41 | |
| L08020524-01 | 50WW07-021908 | 01 | 02/25/2008 19:50 | |

* Sample past 12 hour tune limit

KEMRON FORMS - Modified 03/12/2007
Version 1.3 PDF File ID: 1030018
Report generated 02/28/2008 16:27

Login Number: L08020524
Analytical Method: 8260B
ICAL Workgroup: WG262907

Instrument ID: HPMS14
Initial Calibration Date: 11-FEB-08 22:54
Column ID: F

| Analyte | | AVG RF | % RSD | LINEAR (R) | QUAD($R^2$) |
|---|---|---|---|---|---|
| 1,1-Dichloroethene | CCC | 0.3950 | 12.2 | | |
| 1,2-Dichloropropane | CCC | 0.2687 | 5.93 | | |
| Chloroform | CCC | 0.4822 | 7.13 | | |
| Ethylbenzene | CCC | 0.5065 | 10.9 | | |
| Toluene | CCC | 1.437 | 7.40 | | |
| Vinyl Chloride | CCC | 0.1332 | 14.9 | | |
| 1,1,2,2-Tetrachloroethane | SPCC | 0.4451 | 8.24 | | |
| 1,1-Dichloroethane | SPCC | 0.5160 | 6.60 | | |
| Bromoform | SPCC | 0.1423 | 21.7 | | 1.00 |
| Chlorobenzene | SPCC | 0.9520 | 9.47 | | |
| Chloromethane | SPCC | 0.1996 | 22.2 | | 1.00 |
| 1,1,1,2-Tetrachloroethane | | 0.3154 | 9.67 | | |
| 1,1,1-Trichloroethane | | 0.4229 | 11.8 | | |
| 1,1,2-Trichloroethane | | 0.2215 | 4.59 | | |
| 1,1-Dichloropropene | | 0.3619 | 12.1 | | |
| 1,2,3-Trichlorobenzene | | 0.9424 | 10.1 | | |
| 1,2,3-Trichloropropane | | 0.1377 | 6.58 | | |
| 1,2,4-Trichlorobenzene | | 1.090 | 10.2 | | |
| 1,2,4-Trimethylbenzene | | 2.791 | 7.95 | | |
| 1,2-Dibromo-3-Chloropropane | | 0.08567 | 16.9 | | 1.00 |
| 1,2-Dibromoethane | | 0.2102 | 9.52 | | |
| 1,2-Dichlorobenzene | | 1.353 | 4.23 | | |
| 1,2-Dichloroethane | | 0.3534 | 4.13 | | |
| 1,3,5-Trimethylbenzene | | 2.592 | 11.9 | | |
| 1,3-Dichlorobenzene | | 1.513 | 5.18 | | |
| 1,3-Dichloropropane | | 0.4123 | 3.67 | | |
| 1,4-Dichlorobenzene | | 1.558 | 6.87 | | |
| 2,2-Dichloropropane | | 0.3876 | 14.2 | | |
| 2-Butanone | | 0.07142 | 9.33 | | |
| 2-Chloroethyl Vinyl Ether | | 0.08980 | 13.0 | | |
| 2-Chlorotoluene | | 2.373 | 4.66 | | |
| 2-Hexanone | | 0.1317 | 10.0 | | |
| 4-Chlorotoluene | | 2.443 | 11.2 | | |
| 4-Methyl-2-Pentanone | | 0.05564 | 12.7 | | |
| Acetone | | 0.05118 | 14.6 | | |
| Benzene | | 1.061 | 4.32 | | |
| Bromobenzene | | 0.7001 | 4.59 | | |
| Bromochloromethane | | 0.1376 | 6.04 | | |
| Bromodichloromethane | | 0.3248 | 11.3 | | |
| Bromomethane | | 0.1345 | 16.3 | | 1.00 |
| Carbon Disulfide | | 0.6697 | 17.8 | | 1.00 |
| Carbon Tetrachloride | | 0.3646 | 14.6 | | |
| Chloroethane | | 0.1765 | 6.04 | | |
| Dibromochloromethane | | 0.2603 | 16.1 | 1.00 | |
| Dibromomethane | | 0.1178 | 8.69 | | |

KEMRON FORMS - Modified 01/18/2007
Version 1.5 PDF File ID: 1030017
Report generated 02/28/2008 16:27

Login Number: L08020524
Analytical Method: 8260B
ICAL Workgroup: WG262907

Instrument ID: HPMS14
Initial Calibration Date: 11-FEB-08 22:54
Column ID: F

| Analyte | | AVG RF | % RSD | LINEAR (R) | QUAD($R^2$) |
|---|---|---|---|---|---|
| Dichlorodifluoromethane | | 0.2993 | 7.27 | | |
| Hexachlorobutadiene | | 0.4814 | 7.88 | | |
| Isopropylbenzene | | 1.556 | 12.1 | | |
| Methylene Chloride | | 0.2852 | 20.4 | | 1.00 |
| Naphthalene | | 1.883 | 7.12 | | |
| Styrene | | 0.9719 | 13.1 | | |
| Tetrachloroethene | | 0.3372 | 11.6 | | |
| Trichloroethene | | 0.2527 | 11.6 | | |
| Trichlorofluoromethane | | 0.4375 | 13.6 | | |
| Vinyl Acetate | | 0.2641 | 14.4 | | |
| cis-1,2-Dichloroethene | | 0.2695 | 7.05 | | |
| cis-1,3-Dichloropropene | | 0.3635 | 13.0 | | |
| m-,p-Xylene | | 0.6271 | 10.4 | | |
| n-Butylbenzene | | 2.805 | 11.5 | | |
| n-Propylbenzene | | 3.648 | 13.2 | | |
| o-Xylene | | 0.6094 | 9.84 | | |
| p-Isopropyltoluene | | 2.798 | 13.0 | | |
| sec-Butylbenzene | | 3.313 | 13.0 | | |
| tert-Butylbenzene | | 0.5381 | 11.2 | | |
| trans-1,2-Dichloroethene | | 0.2481 | 10.5 | | |
| trans-1,3-Dichloropropene | | 0.4152 | 12.8 | | |

**R = Correlation coefficient; 0.995 minimum**
**$R^2$ = Coefficient of determination; 0.99 minimum**

KEMRON FORMS - Modified 01/18/2007
Version 1.5 PDF File ID: 1030017
Report generated 02/28/2008 16:27

Login Number: L08020524
Analytical Method: 8260B
Instrument ID: HPMS14
Initial Calibration Date: 11-FEB-08 22:54
Column ID: F

| Analyte | WG262907-02 | | | WG262907-03 | | | WG262907-04 | | |
|---|---|---|---|---|---|---|---|---|---|
| | CONC | RESP | RF | CONC | RESP | RF | CONC | RESP | RF |
| 1,1-Dichloroethene | NA | NA | NA | NA | NA | NA | 1.00 | 4809.00000 | 0.3299 |
| 1,2-Dichloropropane | NA | NA | NA | 0.400 | 1450.00000 | 0.2447 | 1.00 | 3639.00000 | 0.2497 |
| Chloroform | 0.300 | 2378.00000 | 0.5245 | 0.400 | 2531.00000 | 0.4271 | 1.00 | 6378.00000 | 0.4376 |
| Ethylbenzene | NA | NA | NA | 0.400 | 1974.00000 | 0.4772 | 1.00 | 5014.00000 | 0.4910 |
| Toluene | NA | NA | NA | 0.400 | 5556.00000 | 1.343 | 1.00 | 13872.0000 | 1.358 |
| Vinyl Chloride | NA | NA | NA | 0.400 | 900.000000 | 0.1519 | 1.00 | 2402.00000 | 0.1648 |
| 1,1,2,2-Tetrachloroethane | NA | NA | NA | 0.400 | 797.000000 | 0.3812 | 1.00 | 2179.00000 | 0.4132 |
| 1,1-Dichloroethane | NA | NA | NA | 0.400 | 2763.00000 | 0.4662 | 1.00 | 7056.00000 | 0.4841 |
| Bromoform | NA | NA | NA | NA | NA | NA | 1.00 | 1002.00000 | 0.09810 |
| Chlorobenzene | NA | NA | NA | 0.400 | 4258.00000 | 1.029 | 1.00 | 9980.00000 | 0.9773 |
| Chloromethane | NA | NA | NA | NA | NA | NA | 1.00 | 2396.00000 | 0.1644 |
| 1,1,1,2-Tetrachloroethane | NA | NA | NA | 0.400 | 1168.00000 | 0.2824 | 1.00 | 3059.00000 | 0.2996 |
| 1,1,1-Trichloroethane | NA | NA | NA | NA | NA | NA | 1.00 | 5069.00000 | 0.3478 |
| 1,1,2-Trichloroethane | NA | NA | NA | 0.400 | 840.000000 | 0.2031 | 1.00 | 2308.00000 | 0.2260 |
| 1,1-Dichloropropene | NA | NA | NA | NA | NA | NA | 1.00 | 4375.00000 | 0.3001 |
| 1,2,3-Trichlorobenzene | NA | NA | NA | 0.400 | 2360.00000 | 1.129 | 1.00 | 5075.00000 | 0.9623 |
| 1,2,3-Trichloropropane | NA | NA | NA | NA | NA | NA | 1.00 | 630.000000 | 0.1195 |
| 1,2,4-Trichlorobenzene | NA | NA | NA | 0.400 | 2713.00000 | 1.298 | 1.00 | 6102.00000 | 1.157 |
| 1,2,4-Trimethylbenzene | NA | NA | NA | 0.400 | 5373.00000 | 2.570 | 1.00 | 13808.0000 | 2.618 |
| 1,2-Dibromo-3-Chloropropane | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| 1,2-Dibromoethane | NA | NA | NA | 0.400 | 701.000000 | 0.1695 | 1.00 | 2109.00000 | 0.2065 |
| 1,2-Dichlorobenzene | NA | NA | NA | 0.400 | 3000.00000 | 1.435 | 1.00 | 6987.00000 | 1.325 |
| 1,2-Dichloroethane | NA | NA | NA | 0.400 | 2017.00000 | 0.3403 | 1.00 | 5047.00000 | 0.3463 |
| 1,3,5-Trimethylbenzene | NA | NA | NA | 0.400 | 4525.00000 | 2.164 | 1.00 | 12005.0000 | 2.277 |
| 1,3-Dichlorobenzene | NA | NA | NA | 0.400 | 3385.00000 | 1.619 | 1.00 | 7842.00000 | 1.487 |
| 1,3-Dichloropropane | NA | NA | NA | 0.400 | 1632.00000 | 0.3946 | 1.00 | 4174.00000 | 0.4087 |
| 1,4-Dichlorobenzene | NA | NA | NA | 0.400 | 3652.00000 | 1.747 | 1.00 | 8467.00000 | 1.606 |
| 2,2-Dichloropropane | NA | NA | NA | 0.400 | 1739.00000 | 0.2934 | 1.00 | 5065.00000 | 0.3475 |
| 2-Butanone | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| 2-Chloroethyl Vinyl Ether | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| 2-Chlorotoluene | NA | NA | NA | 0.400 | 4757.00000 | 2.275 | 1.00 | 12080.0000 | 2.291 |
| 2-Hexanone | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| 4-Chlorotoluene | NA | NA | NA | 0.400 | 5123.00000 | 2.450 | 1.00 | 12527.0000 | 2.375 |
| 4-Methyl-2-Pentanone | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Acetone | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Benzene | NA | NA | NA | 0.400 | 6423.00000 | 1.084 | 1.00 | 15534.0000 | 1.066 |
| Bromobenzene | NA | NA | NA | 0.400 | 1423.00000 | 0.6805 | 1.00 | 3684.00000 | 0.6986 |
| Bromochloromethane | NA | NA | NA | 0.400 | 749.000000 | 0.1264 | 1.00 | 1883.00000 | 0.1292 |
| Bromodichloromethane | NA | NA | NA | 0.400 | 1586.00000 | 0.2676 | 1.00 | 4246.00000 | 0.2913 |
| Bromomethane | NA | NA | NA | NA | NA | NA | 1.00 | 1633.00000 | 0.1120 |
| Carbon Disulfide | NA | NA | NA | NA | NA | NA | 1.00 | 7848.00000 | 0.5384 |
| Carbon Tetrachloride | NA | NA | NA | NA | NA | NA | 1.00 | 4182.00000 | 0.2869 |

**KEMRON FORMS - Modified 10/13/2006**
**Version 1.6 PDF File ID: 1030017**
**Report generated 02/28/2008 16:27**

00078935

Login Number: L08020524
Analytical Method: 8260B

Instrument ID: HPMS14
Initial Calibration Date: 11-FEB-08 22:54
Column ID: F

| Analyte | WG262907-05 | | | WG262907-06 | | | WG262907-07 | | |
|---|---|---|---|---|---|---|---|---|---|
| | CONC | RESP | RF | CONC | RESP | RF | CONC | RESP | RF |
| 1,1-Dichloroethene | 2.00 | 9354.00000 | 0.3238 | 5.00 | 29512.0000 | 0.4117 | 20.0 | 128362.000 | 0.4388 |
| 1,2-Dichloropropane | 2.00 | 7547.00000 | 0.2612 | 5.00 | 20217.0000 | 0.2820 | 20.0 | 82707.0000 | 0.2827 |
| Chloroform | 2.00 | 13261.0000 | 0.4590 | 5.00 | 36535.0000 | 0.5097 | 20.0 | 148252.000 | 0.5068 |
| Ethylbenzene | 2.00 | 9888.00000 | 0.4857 | 5.00 | 28936.0000 | 0.5630 | 20.0 | 120555.000 | 0.5720 |
| Toluene | 2.00 | 28574.0000 | 1.403 | 5.00 | 79917.0000 | 1.555 | 20.0 | 332159.000 | 1.576 |
| Vinyl Chloride | 2.00 | 3372.00000 | 0.1167 | 5.00 | 9700.00000 | 0.1353 | 20.0 | 38465.0000 | 0.1315 |
| 1,1,2,2-Tetrachloroethane | 2.00 | 4411.00000 | 0.4198 | 5.00 | 12035.0000 | 0.4564 | 20.0 | 49931.0000 | 0.4562 |
| 1,1-Dichloroethane | 2.00 | 13898.0000 | 0.4810 | 5.00 | 38739.0000 | 0.5404 | 20.0 | 161570.000 | 0.5523 |
| Bromoform | 2.00 | 2178.00000 | 0.1070 | 5.00 | 6870.00000 | 0.1337 | 20.0 | 30686.0000 | 0.1456 |
| Chlorobenzene | 2.00 | 19167.0000 | 0.9414 | 5.00 | 52857.0000 | 1.029 | 20.0 | 212121.000 | 1.007 |
| Chloromethane | 2.00 | 4727.00000 | 0.1636 | 5.00 | 12073.0000 | 0.1684 | 20.0 | 53760.0000 | 0.1838 |
| 1,1,1,2-Tetrachloroethane | 2.00 | 6445.00000 | 0.3166 | 5.00 | 17473.0000 | 0.3400 | 20.0 | 73625.0000 | 0.3493 |
| 1,1,1-Trichloroethane | 2.00 | 10269.0000 | 0.3554 | 5.00 | 31613.0000 | 0.4410 | 20.0 | 135370.000 | 0.4628 |
| 1,1,2-Trichloroethane | 2.00 | 4382.00000 | 0.2152 | 5.00 | 11954.0000 | 0.2326 | 20.0 | 47184.0000 | 0.2239 |
| 1,1-Dichloropropene | 2.00 | 8728.00000 | 0.3021 | 5.00 | 27068.0000 | 0.3776 | 20.0 | 118643.000 | 0.4056 |
| 1,2,3-Trichlorobenzene | 2.00 | 9951.00000 | 0.9470 | 5.00 | 25758.0000 | 0.9769 | 20.0 | 103462.000 | 0.9453 |
| 1,2,3-Trichloropropane | 2.00 | 1401.00000 | 0.1333 | 5.00 | 3741.00000 | 0.1419 | 20.0 | 15335.0000 | 0.1401 |
| 1,2,4-Trichlorobenzene | 2.00 | 11014.0000 | 1.048 | 5.00 | 29425.0000 | 1.116 | 20.0 | 121377.000 | 1.109 |
| 1,2,4-Trimethylbenzene | 2.00 | 28067.0000 | 2.671 | 5.00 | 80542.0000 | 3.055 | 20.0 | 334246.000 | 3.054 |
| 1,2-Dibromo-3-Chloropropane | 2.00 | 652.000000 | 0.06200 | 5.00 | 2041.00000 | 0.07740 | 20.0 | 9070.00000 | 0.08290 |
| 1,2-Dibromoethane | 2.00 | 3978.00000 | 0.1954 | 5.00 | 11149.0000 | 0.2169 | 20.0 | 45953.0000 | 0.2180 |
| 1,2-Dichlorobenzene | 2.00 | 13839.0000 | 1.317 | 5.00 | 36418.0000 | 1.381 | 20.0 | 151265.000 | 1.382 |
| 1,2-Dichloroethane | 2.00 | 10056.0000 | 0.3481 | 5.00 | 27103.0000 | 0.3781 | 20.0 | 105786.000 | 0.3616 |
| 1,3,5-Trimethylbenzene | 2.00 | 25244.0000 | 2.402 | 5.00 | 75490.0000 | 2.863 | 20.0 | 326364.000 | 2.982 |
| 1,3-Dichlorobenzene | 2.00 | 15171.0000 | 1.444 | 5.00 | 41261.0000 | 1.565 | 20.0 | 171427.000 | 1.566 |
| 1,3-Dichloropropane | 2.00 | 8106.00000 | 0.3981 | 5.00 | 21961.0000 | 0.4273 | 20.0 | 88467.0000 | 0.4198 |
| 1,4-Dichlorobenzene | 2.00 | 15960.0000 | 1.519 | 5.00 | 42205.0000 | 1.601 | 20.0 | 172123.000 | 1.573 |
| 2,2-Dichloropropane | 2.00 | 9616.00000 | 0.3328 | 5.00 | 29452.0000 | 0.4109 | 20.0 | 128220.000 | 0.4383 |
| 2-Butanone | NA | NA | NA | 5.00 | 5959.00000 | 0.08310 | 20.0 | 20477.0000 | 0.07000 |
| 2-Chloroethyl Vinyl Ether | NA | NA | NA | 5.00 | 5055.00000 | 0.07050 | 20.0 | 24490.0000 | 0.08370 |
| 2-Chlorotoluene | 2.00 | 23873.0000 | 2.272 | 5.00 | 67113.0000 | 2.545 | 20.0 | 275238.000 | 2.515 |
| 2-Hexanone | 2.00 | 2212.00000 | 0.1086 | 5.00 | 6269.00000 | 0.1220 | 20.0 | 27050.0000 | 0.1284 |
| 4-Chlorotoluene | 2.00 | 25631.0000 | 2.439 | 5.00 | 71053.0000 | 2.695 | 20.0 | 293527.000 | 2.682 |
| 4-Methyl-2-Pentanone | 2.00 | 1285.00000 | 0.04450 | 5.00 | 3564.00000 | 0.04970 | 20.0 | 15712.0000 | 0.05370 |
| Acetone | NA | NA | NA | 5.00 | 4611.00000 | 0.06430 | 20.0 | 13680.0000 | 0.04680 |
| Benzene | 2.00 | 29487.0000 | 1.021 | 5.00 | 79481.0000 | 1.109 | 20.0 | 323440.000 | 1.106 |
| Bromobenzene | 2.00 | 7236.00000 | 0.6886 | 5.00 | 19657.0000 | 0.7455 | 20.0 | 80408.0000 | 0.7347 |
| Bromochloromethane | 2.00 | 3725.00000 | 0.1289 | 5.00 | 10328.0000 | 0.1441 | 20.0 | 42410.0000 | 0.1450 |
| Bromodichloromethane | 2.00 | 8318.00000 | 0.2879 | 5.00 | 24195.0000 | 0.3375 | 20.0 | 101750.000 | 0.3478 |
| Bromomethane | 2.00 | 3046.00000 | 0.1054 | 5.00 | 8481.00000 | 0.1183 | 20.0 | 41602.0000 | 0.1422 |
| Carbon Disulfide | 2.00 | 13477.0000 | 0.4665 | 5.00 | 48738.0000 | 0.6799 | 20.0 | 221991.000 | 0.7589 |
| Carbon Tetrachloride | 2.00 | 8380.00000 | 0.2900 | 5.00 | 27273.0000 | 0.3805 | 20.0 | 119617.000 | 0.4089 |

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# INITIAL CALIBRATION DATA

Login Number: L08020524
Instrument ID: HPMS14
Analytical Method: 8260B
Initial Calibration Date: 11-FEB-08 22:54
Column ID: F

| Analyte | WG262907-08 | | | WG262907-09 | | | WG262907-10 | | |
|---|---|---|---|---|---|---|---|---|---|
| | CONC | RESP | RF | CONC | RESP | RF | CONC | RESP | RF |
| 1,1-Dichloroethene | 50.0 | 314916.000 | 0.4356 | 100 | 608178.000 | 0.4182 | 200 | 1192499.00 | 0.4068 |
| 1,2-Dichloropropane | 50.0 | 208066.000 | 0.2878 | 100 | 399821.000 | 0.2749 | 200 | 781926.000 | 0.2668 |
| Chloroform | 50.0 | 367170.000 | 0.5079 | 100 | 712703.000 | 0.4900 | 200 | 1399215.00 | 0.4774 |
| Ethylbenzene | 50.0 | 293335.000 | 0.5508 | 100 | 550451.000 | 0.5071 | 200 | 939058.000 | 0.4052 |
| Toluene | 50.0 | 810948.000 | 1.523 | 100 | 1573720.00 | 1.450 | 200 | 2984598.00 | 1.288 |
| Vinyl Chloride | 50.0 | 90430.0000 | 0.1251 | 100 | 155641.000 | 0.1070 | NA | NA | NA |
| 1,1,2,2-Tetrachloroethane | 50.0 | 143200.000 | 0.4867 | 100 | 283596.000 | 0.4697 | 200 | 614258.000 | 0.4779 |
| 1,1-Dichloroethane | 50.0 | 397542.000 | 0.5499 | 100 | 775783.000 | 0.5334 | 200 | 1525360.00 | 0.5204 |
| Bromoform | 50.0 | 90313.0000 | 0.1696 | 100 | 182568.000 | 0.1682 | 200 | 403518.000 | 0.1741 |
| Chlorobenzene | 50.0 | 518957.000 | 0.9745 | 100 | 979451.000 | 0.9023 | 200 | 1752466.00 | 0.7562 |
| Chloromethane | 50.0 | 144212.000 | 0.1995 | 100 | 341933.000 | 0.2351 | 200 | 826901.000 | 0.2821 |
| 1,1,1,2-Tetrachloroethane | 50.0 | 185413.000 | 0.3482 | 100 | 346969.000 | 0.3196 | 200 | 619250.000 | 0.2672 |
| 1,1,1-Trichloroethane | 50.0 | 335814.000 | 0.4645 | 100 | 657416.000 | 0.4520 | 200 | 1279997.00 | 0.4367 |
| 1,1,2-Trichloroethane | 50.0 | 124872.000 | 0.2345 | 100 | 239108.000 | 0.2203 | 200 | 501862.000 | 0.2166 |
| 1,1-Dichloropropene | 50.0 | 288598.000 | 0.3992 | 100 | 559389.000 | 0.3846 | 200 | 1066554.00 | 0.3639 |
| 1,2,3-Trichlorobenzene | 50.0 | 270747.000 | 0.9201 | 100 | 518149.000 | 0.8581 | 200 | 1029389.00 | 0.8009 |
| 1,2,3-Trichloropropane | 50.0 | 43089.0000 | 0.1464 | 100 | 83899.0000 | 0.1389 | 200 | 185063.000 | 0.1440 |
| 1,2,4-Trichlorobenzene | 50.0 | 313541.000 | 1.066 | 100 | 610002.000 | 1.010 | 200 | 1181430.00 | 0.9192 |
| 1,2,4-Trimethylbenzene | 50.0 | 877339.000 | 2.982 | 100 | 1723923.00 | 2.855 | 200 | 3242101.00 | 2.522 |
| 1,2-Dibromo-3-Chloropropane | 50.0 | 28624.0000 | 0.09730 | 100 | 57149.0000 | 0.09460 | 200 | 128241.000 | 0.09980 |
| 1,2-Dibromoethane | 50.0 | 124916.000 | 0.2346 | 100 | 239119.000 | 0.2203 | 200 | 511552.000 | 0.2207 |
| 1,2-Dichlorobenzene | 50.0 | 408615.000 | 1.389 | 100 | 812279.000 | 1.345 | 200 | 1603114.00 | 1.247 |
| 1,2-Dichloroethane | 50.0 | 267459.000 | 0.3700 | 100 | 497921.000 | 0.3423 | 200 | 998374.000 | 0.3406 |
| 1,3,5-Trimethylbenzene | 50.0 | 840465.000 | 2.856 | 100 | 1661417.00 | 2.752 | 200 | 3138105.00 | 2.442 |
| 1,3-Dichlorobenzene | 50.0 | 454474.000 | 1.545 | 100 | 907880.000 | 1.504 | 200 | 1763970.00 | 1.372 |
| 1,3-Dichloropropane | 50.0 | 233026.000 | 0.4376 | 100 | 447946.000 | 0.4126 | 200 | 926420.000 | 0.3998 |
| 1,4-Dichlorobenzene | 50.0 | 456670.000 | 1.552 | 100 | 906403.000 | 1.501 | 200 | 1759744.00 | 1.369 |
| 2,2-Dichloropropane | 50.0 | 316565.000 | 0.4379 | 100 | 619139.000 | 0.4257 | 200 | 1214901.00 | 0.4145 |
| 2-Butanone | 50.0 | 52786.0000 | 0.07300 | 100 | 97817.0000 | 0.06730 | 200 | 209781.000 | 0.07160 |
| 2-Chloroethyl Vinyl Ether | 50.0 | 71626.0000 | 0.09910 | 100 | 139167.000 | 0.09570 | 200 | 299345.000 | 0.1021 |
| 2-Chlorotoluene | 50.0 | 702998.000 | 2.389 | 100 | 1380574.00 | 2.286 | 200 | 3100587.00 | 2.412 |
| 2-Hexanone | 50.0 | 77894.0000 | 0.1463 | 100 | 150813.000 | 0.1389 | 200 | 333066.000 | 0.1437 |
| 4-Chlorotoluene | 50.0 | 759077.000 | 2.580 | 100 | 1506774.00 | 2.495 | 200 | 2349446.00 | 1.828 |
| 4-Methyl-2-Pentanone | 50.0 | 44930.0000 | 0.06210 | 100 | 85457.0000 | 0.05880 | 200 | 189588.000 | 0.06470 |
| Acetone | 50.0 | 34592.0000 | 0.04780 | 100 | 67883.0000 | 0.04670 | 200 | 147370.000 | 0.05030 |
| Benzene | 50.0 | 786167.000 | 1.088 | 100 | 1512234.00 | 1.040 | 200 | 2862744.00 | 0.9767 |
| Bromobenzene | 50.0 | 211359.000 | 0.7183 | 100 | 416258.000 | 0.6894 | 200 | 829413.000 | 0.6453 |
| Bromochloromethane | 50.0 | 106934.000 | 0.1479 | 100 | 201825.000 | 0.1388 | 200 | 410701.000 | 0.1401 |
| Bromodichloromethane | 50.0 | 262704.000 | 0.3634 | 100 | 511323.000 | 0.3516 | 200 | 1029287.00 | 0.3512 |
| Bromomethane | 50.0 | 110314.000 | 0.1526 | 100 | 226059.000 | 0.1554 | 200 | 455966.000 | 0.1556 |
| Carbon Disulfide | 50.0 | 555091.000 | 0.7678 | 100 | 1079406.00 | 0.7421 | 200 | 2151367.00 | 0.7340 |
| Carbon Tetrachloride | 50.0 | 296183.000 | 0.4097 | 100 | 569763.000 | 0.3917 | 200 | 1126507.00 | 0.3843 |

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Login Number: L08020524
Analytical Method: 8260B
Instrument ID: HPMS14
Initial Calibration Date: 11-FEB-08 22:54
Column ID: F

| Analyte | WG262907-11 | | |
|---|---|---|---|
| | CONC | RESP | RF |
| 1,1-Dichloroethene | NA | NA | NA |
| 1,2-Dichloropropane | NA | NA | NA |
| Chloroform | NA | NA | NA |
| Ethylbenzene | NA | NA | NA |
| Toluene | NA | NA | NA |
| Vinyl Chloride | NA | NA | NA |
| 1,1,2,2-Tetrachloroethane | NA | NA | NA |
| 1,1-Dichloroethane | NA | NA | NA |
| Bromoform | NA | NA | NA |
| Chlorobenzene | NA | NA | NA |
| Chloromethane | NA | NA | NA |
| 1,1,1,2-Tetrachloroethane | NA | NA | NA |
| 1,1,1-Trichloroethane | NA | NA | NA |
| 1,1,2-Trichloroethane | NA | NA | NA |
| 1,1-Dichloropropene | NA | NA | NA |
| 1,2,3-Trichlorobenzene | NA | NA | NA |
| 1,2,3-Trichloropropane | NA | NA | NA |
| 1,2,4-Trichlorobenzene | NA | NA | NA |
| 1,2,4-Trimethylbenzene | NA | NA | NA |
| 1,2-Dibromo-3-Chloropropane | NA | NA | NA |
| 1,2-Dibromoethane | NA | NA | NA |
| 1,2-Dichlorobenzene | NA | NA | NA |
| 1,2-Dichloroethane | NA | NA | NA |
| 1,3,5-Trimethylbenzene | NA | NA | NA |
| 1,3-Dichlorobenzene | NA | NA | NA |
| 1,3-Dichloropropane | NA | NA | NA |
| 1,4-Dichlorobenzene | NA | NA | NA |
| 2,2-Dichloropropane | NA | NA | NA |
| 2-Butanone | 300 | 283421.000 | 0.06350 |
| 2-Chloroethyl Vinyl Ether | 300 | 391301.000 | 0.08770 |
| 2-Chlorotoluene | NA | NA | NA |
| 2-Hexanone | 300 | 437212.000 | 0.1339 |
| 4-Chlorotoluene | NA | NA | NA |
| 4-Methyl-2-Pentanone | 300 | 250026.000 | 0.05600 |
| Acetone | NA | NA | NA |
| Benzene | NA | NA | NA |
| Bromobenzene | NA | NA | NA |
| Bromochloromethane | NA | NA | NA |
| Bromodichloromethane | NA | NA | NA |
| Bromomethane | NA | NA | NA |
| Carbon Disulfide | NA | NA | NA |
| Carbon Tetrachloride | NA | NA | NA |

Login Number: L08020524
Analytical Method: 8260B
Instrument ID: HPMS14
Initial Calibration Date: 11-FEB-08 22:54
Column ID: F

| Analyte | WG262907-02 | | | WG262907-03 | | | WG262907-04 | | |
|---|---|---|---|---|---|---|---|---|---|
| | CONC | RESP | RF | CONC | RESP | RF | CONC | RESP | RF |
| Chloroethane | NA | NA | NA | NA | NA | NA | 1.00 | 2725.00000 | 0.1869 |
| Dibromochloromethane | NA | NA | NA | 0.400 | 824.000000 | 0.1992 | 1.00 | 2166.00000 | 0.2121 |
| Dibromomethane | NA | NA | NA | 0.400 | 579.000000 | 0.09770 | 1.00 | 1613.00000 | 0.1107 |
| Dichlorodifluoromethane | NA | NA | NA | NA | NA | NA | 1.00 | 4624.00000 | 0.3172 |
| Hexachlorobutadiene | NA | NA | NA | 0.400 | 902.000000 | 0.4314 | 1.00 | 2391.00000 | 0.4534 |
| Isopropylbenzene | NA | NA | NA | NA | NA | NA | 1.00 | 13170.0000 | 1.290 |
| Methylene Chloride | NA | NA | NA | NA | NA | NA | 1.00 | 5763.00000 | 0.3954 |
| Naphthalene | NA | NA | NA | 0.400 | 4547.00000 | 2.175 | 1.00 | 9777.00000 | 1.854 |
| Styrene | NA | NA | NA | NA | NA | NA | 1.00 | 7909.00000 | 0.7745 |
| Tetrachloroethene | NA | NA | NA | 0.400 | 1093.00000 | 0.2643 | 1.00 | 3241.00000 | 0.3174 |
| Trichloroethene | NA | NA | NA | 0.400 | 1171.00000 | 0.1976 | 1.00 | 3467.00000 | 0.2379 |
| Trichlorofluoromethane | NA | NA | NA | 0.400 | 1858.00000 | 0.3135 | 1.00 | 6918.00000 | 0.4746 |
| Vinyl Acetate | NA | NA | NA | NA | NA | NA | 1.00 | 3424.00000 | 0.2349 |
| cis-1,2-Dichloroethene | NA | NA | NA | 0.400 | 1435.00000 | 0.2421 | 1.00 | 3576.00000 | 0.2453 |
| cis-1,3-Dichloropropene | NA | NA | NA | 0.400 | 1763.00000 | 0.2975 | 1.00 | 4542.00000 | 0.3116 |
| m-,p-Xylene | NA | NA | NA | 0.800 | 4893.00000 | 0.5915 | 2.00 | 12427.0000 | 0.6085 |
| n-Butylbenzene | NA | NA | NA | 0.400 | 5107.00000 | 2.442 | 1.00 | 13173.0000 | 2.498 |
| n-Propylbenzene | NA | NA | NA | 0.400 | 6057.00000 | 2.897 | 1.00 | 17083.0000 | 3.239 |
| o-Xylene | NA | NA | NA | 0.400 | 2140.00000 | 0.5174 | 1.00 | 5843.00000 | 0.5722 |
| p-Isopropyltoluene | NA | NA | NA | 0.400 | 4635.00000 | 2.217 | 1.00 | 13226.0000 | 2.508 |
| sec-Butylbenzene | NA | NA | NA | 0.400 | 5510.00000 | 2.635 | 1.00 | 15799.0000 | 2.996 |
| tert-Butylbenzene | NA | NA | NA | 0.400 | 926.000000 | 0.4429 | 1.00 | 2704.00000 | 0.5127 |
| trans-1,2-Dichloroethene | NA | NA | NA | 0.400 | 1194.00000 | 0.2015 | 1.00 | 3322.00000 | 0.2279 |
| trans-1,3-Dichloropropene | NA | NA | NA | 0.400 | 1386.00000 | 0.3351 | 1.00 | 3639.00000 | 0.3563 |

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Version 1.6 PDF File ID: 1030017
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Login Number: L08020524 Instrument ID: HPMS14
Analytical Method: 8260B Initial Calibration Date: 11-FEB-08 22:54
Column ID: F

| Analyte | WG262907-05 | | | WG262907-06 | | | WG262907-07 | | |
|---|---|---|---|---|---|---|---|---|---|
| | CONC | RESP | RF | CONC | RESP | RF | CONC | RESP | RF |
| Chloroethane | 2.00 | 4936.00000 | 0.1708 | 5.00 | 13128.0000 | 0.1831 | 20.0 | 54596.0000 | 0.1866 |
| Dibromochloromethane | 2.00 | 4651.00000 | 0.2284 | 5.00 | 13512.0000 | 0.2629 | 20.0 | 58525.0000 | 0.2777 |
| Dibromomethane | 2.00 | 3251.00000 | 0.1125 | 5.00 | 8839.00000 | 0.1233 | 20.0 | 35669.0000 | 0.1219 |
| Dichlorodifluoromethane | 2.00 | 7502.00000 | 0.2597 | 5.00 | 22345.0000 | 0.3117 | 20.0 | 93332.0000 | 0.3191 |
| Hexachlorobutadiene | 2.00 | 4595.00000 | 0.4373 | 5.00 | 13436.0000 | 0.5096 | 20.0 | 57752.0000 | 0.5277 |
| Isopropylbenzene | 2.00 | 27037.0000 | 1.328 | 5.00 | 84522.0000 | 1.645 | 20.0 | 364983.000 | 1.732 |
| Methylene Chloride | 2.00 | 9486.00000 | 0.3283 | 5.00 | 20425.0000 | 0.2849 | 20.0 | 75701.0000 | 0.2588 |
| Naphthalene | 2.00 | 18589.0000 | 1.769 | 5.00 | 50319.0000 | 1.908 | 20.0 | 204969.000 | 1.873 |
| Styrene | 2.00 | 16988.0000 | 0.8344 | 5.00 | 51174.0000 | 0.9958 | 20.0 | 227298.000 | 1.079 |
| Tetrachloroethene | 2.00 | 6523.00000 | 0.3204 | 5.00 | 18914.0000 | 0.3680 | 20.0 | 79874.0000 | 0.3790 |
| Trichloroethene | 2.00 | 6589.00000 | 0.2281 | 5.00 | 19396.0000 | 0.2706 | 20.0 | 82058.0000 | 0.2805 |
| Trichlorofluoromethane | 2.00 | 11124.0000 | 0.3850 | 5.00 | 33699.0000 | 0.4701 | 20.0 | 142109.000 | 0.4858 |
| Vinyl Acetate | 2.00 | 9120.00000 | 0.3157 | 5.00 | 23178.0000 | 0.3233 | 20.0 | 78316.0000 | 0.2677 |
| cis-1,2-Dichloroethene | 2.00 | 7390.00000 | 0.2558 | 5.00 | 20301.0000 | 0.2832 | 20.0 | 83901.0000 | 0.2868 |
| cis-1,3-Dichloropropene | 2.00 | 9245.00000 | 0.3200 | 5.00 | 26253.0000 | 0.3662 | 20.0 | 115068.000 | 0.3934 |
| m-,p-Xylene | 4.00 | 24961.0000 | 0.6130 | 10.0 | 71287.0000 | 0.6936 | 40.0 | 296777.000 | 0.7041 |
| n-Butylbenzene | 2.00 | 26362.0000 | 2.509 | 5.00 | 81395.0000 | 3.087 | 20.0 | 353204.000 | 3.227 |
| n-Propylbenzene | 2.00 | 35673.0000 | 3.395 | 5.00 | 108544.000 | 4.117 | 20.0 | 467418.000 | 4.271 |
| o-Xylene | 2.00 | 11752.0000 | 0.5772 | 5.00 | 33647.0000 | 0.6547 | 20.0 | 142289.000 | 0.6752 |
| p-Isopropyltoluene | 2.00 | 26439.0000 | 2.516 | 5.00 | 80824.0000 | 3.065 | 20.0 | 351816.000 | 3.215 |
| sec-Butylbenzene | 2.00 | 30851.0000 | 2.936 | 5.00 | 96197.0000 | 3.648 | 20.0 | 416473.000 | 3.805 |
| tert-Butylbenzene | 2.00 | 5168.00000 | 0.4918 | 5.00 | 15846.0000 | 0.6010 | 20.0 | 67132.0000 | 0.6134 |
| trans-1,2-Dichloroethene | 2.00 | 6691.00000 | 0.2316 | 5.00 | 18976.0000 | 0.2647 | 20.0 | 79787.0000 | 0.2727 |
| trans-1,3-Dichloropropene | 2.00 | 7557.00000 | 0.3712 | 5.00 | 22236.0000 | 0.4327 | 20.0 | 95028.0000 | 0.4509 |

KEMRON FORMS - Modified 10/13/2006
Version 1.6 PDF File ID: 1030017
Report generated 02/28/2008 16:27

00078940

# INITIAL CALIBRATION DATA

Login Number:L08020524
Instrument ID:HPMS14
Analytical Method:8260B
Initial Calibration Date:11-FEB-08 22:54
Column ID:F

| Analyte | WG262907-08 | | | WG262907-09 | | | WG262907-10 | | |
|---|---|---|---|---|---|---|---|---|---|
| | CONC | RESP | RF | CONC | RESP | RF | CONC | RESP | RF |
| Chloroethane | 50.0 | 130198.000 | 0.1801 | 100 | 247729.000 | 0.1703 | 200 | 463071.000 | 0.1580 |
| Dibromochloromethane | 50.0 | 163147.000 | 0.3064 | 100 | 323816.000 | 0.2983 | 200 | 688878.000 | 0.2973 |
| Dibromomethane | 50.0 | 93674.0000 | 0.1296 | 100 | 177947.000 | 0.1223 | 200 | 364867.000 | 0.1245 |
| Dichlorodifluoromethane | 50.0 | 223717.000 | 0.3095 | 100 | 429185.000 | 0.2951 | 200 | 828281.000 | 0.2826 |
| Hexachlorobutadiene | 50.0 | 150515.000 | 0.5115 | 100 | 308426.000 | 0.5108 | 200 | 603538.000 | 0.4696 |
| Isopropylbenzene | 50.0 | 922363.000 | 1.732 | 100 | 1820586.00 | 1.677 | 200 | 3456951.00 | 1.492 |
| Methylene Chloride | 50.0 | 185227.000 | 0.2562 | 100 | 349739.000 | 0.2405 | 200 | 680934.000 | 0.2323 |
| Naphthalene | 50.0 | 568450.000 | 1.932 | 100 | 1083862.00 | 1.795 | 200 | 2256734.00 | 1.756 |
| Styrene | 50.0 | 589286.000 | 1.107 | 100 | 1157917.00 | 1.067 | 200 | 2194423.00 | 0.9469 |
| Tetrachloroethene | 50.0 | 199053.000 | 0.3738 | 100 | 385757.000 | 0.3554 | 200 | 740163.000 | 0.3194 |
| Trichloroethene | 50.0 | 201705.000 | 0.2790 | 100 | 392018.000 | 0.2695 | 200 | 756882.000 | 0.2582 |
| Trichlorofluoromethane | 50.0 | 344190.000 | 0.4761 | 100 | 664612.000 | 0.4570 | 200 | 1283651.00 | 0.4379 |
| Vinyl Acetate | 50.0 | 190603.000 | 0.2636 | 100 | 369198.000 | 0.2538 | 200 | 698581.000 | 0.2383 |
| cis-1,2-Dichloroethene | 50.0 | 208616.000 | 0.2886 | 100 | 409135.000 | 0.2813 | 200 | 800725.000 | 0.2732 |
| cis-1,3-Dichloropropene | 50.0 | 301701.000 | 0.4173 | 100 | 583008.000 | 0.4008 | 200 | 1175474.00 | 0.4010 |
| m-,p-Xylene | 100 | 723575.000 | 0.6794 | 200 | 1350421.00 | 0.6220 | 400 | 2340557.00 | 0.5050 |
| n-Butylbenzene | 50.0 | 911744.000 | 3.099 | 100 | 1792562.00 | 2.969 | 200 | 3351021.00 | 2.607 |
| n-Propylbenzene | 50.0 | 1182597.00 | 4.019 | 100 | 2317334.00 | 3.838 | 200 | 4385046.00 | 3.412 |
| o-Xylene | 50.0 | 359586.000 | 0.6752 | 100 | 698144.000 | 0.6431 | 200 | 1298066.00 | 0.5601 |
| p-Isopropyltoluene | 50.0 | 924901.000 | 3.143 | 100 | 1831149.00 | 3.033 | 200 | 3455418.00 | 2.688 |
| sec-Butylbenzene | 50.0 | 1088663.00 | 3.700 | 100 | 2163141.00 | 3.583 | 200 | 4113472.00 | 3.200 |
| tert-Butylbenzene | 50.0 | 171826.000 | 0.5839 | 100 | 337501.000 | 0.5590 | 200 | 642802.000 | 0.5001 |
| trans-1,2-Dichloroethene | 50.0 | 197848.000 | 0.2737 | 100 | 388061.000 | 0.2668 | 200 | 720964.000 | 0.2460 |
| trans-1,3-Dichloropropene | 50.0 | 254956.000 | 0.4787 | 100 | 494108.000 | 0.4552 | 200 | 1022492.00 | 0.4412 |

KEMRON FORMS - Modified 10/13/2006
Version 1.6 PDF File ID: 1030017
Report generated 02/28/2008 16:27

Login Number: L08020524
Analytical Method: 8260B

Instrument ID: HPMS14
Initial Calibration Date: 11-FEB-08 22:54
Column ID: F

| Analyte | WG262907-11 | | |
|---|---|---|---|
| | CONC | RESP | RF |
| Chloroethane | NA | NA | NA |
| Dibromochloromethane | NA | NA | NA |
| Dibromomethane | NA | NA | NA |
| Dichlorodifluoromethane | NA | NA | NA |
| Hexachlorobutadiene | NA | NA | NA |
| Isopropylbenzene | NA | NA | NA |
| Methylene Chloride | NA | NA | NA |
| Naphthalene | NA | NA | NA |
| Styrene | NA | NA | NA |
| Tetrachloroethene | NA | NA | NA |
| Trichloroethene | NA | NA | NA |
| Trichlorofluoromethane | NA | NA | NA |
| Vinyl Acetate | 300 | 960960.000 | 0.2153 |
| cis-1,2-Dichloroethene | NA | NA | NA |
| cis-1,3-Dichloropropene | NA | NA | NA |
| m-,p-Xylene | NA | NA | NA |
| n-Butylbenzene | NA | NA | NA |
| n-Propylbenzene | NA | NA | NA |
| o-Xylene | NA | NA | NA |
| p-Isopropyltoluene | NA | NA | NA |
| sec-Butylbenzene | NA | NA | NA |
| tert-Butylbenzene | NA | NA | NA |
| trans-1,2-Dichloroethene | NA | NA | NA |
| trans-1,3-Dichloropropene | NA | NA | NA |

# ALTERNATE SOURCE CALIBRATION REPORT

Login Number: L08020524 Run Date: 02/12/2008 Sample ID: WG262907-12
Instrument ID: HPMS14 Run Time: 00:28 Method: 8260B
File ID: 14M03450 Analvst: CMS QC Key: STD
ICal Workgroup: WG262907 Cal ID: HPMS14 - 11-FEB-08

| Analyte | | Expected | Found | Units | RF | %D | UCL | Q |
|---|---|---|---|---|---|---|---|---|
| Chloroform | CCC | 20.0 | 20.7 | ug/L | 0.499 | 3.50 | 30 | |
| 1,1-Dichloroethene | CCC | 20.0 | 20.9 | ug/L | 0.412 | 4.30 | 30 | |
| 1,2-Dichloropropane | CCC | 20.0 | 20.9 | ug/L | 0.281 | 4.50 | 30 | |
| Ethylbenzene | CCC | 20.0 | 22.2 | ug/L | 0.563 | 11.2 | 30 | |
| Toluene | CCC | 20.0 | 21.3 | ug/L | 1.53 | 6.60 | 30 | |
| Vinyl Chloride | CCC | 20.0 | 19.7 | ug/L | 0.132 | 1.30 | 30 | |
| Bromoform | SPCC | 20.0 | 17.7 | ug/L | 0.140 | 11.4 | 30 | |
| Chlorobenzene | SPCC | 20.0 | 20.7 | ug/L | 0.985 | 3.50 | 30 | |
| Chloromethane | SPCC | 20.0 | 18.8 | ug/L | 0.176 | 5.90 | 30 | |
| 1,1-Dichloroethane | SPCC | 20.0 | 20.8 | ug/L | 0.536 | 3.90 | 30 | |
| 1,1,2,2-Tetrachloroethane | SPCC | 20.0 | 21.0 | ug/L | 0.467 | 4.80 | 30 | |
| Acetone | | 20.0 | 22.1 | ug/L | 0.0566 | 10.6 | 30 | |
| Benzene | | 20.0 | 20.5 | ug/L | 1.09 | 2.40 | 30 | |
| Bromobenzene | | 20.0 | 21.0 | ug/L | 0.736 | 5.20 | 30 | |
| Bromochloromethane | | 20.0 | 21.1 | ug/L | 0.145 | 5.30 | 30 | |
| Bromodichloromethane | | 20.0 | 21.7 | ug/L | 0.353 | 8.50 | 30 | |
| Bromomethane | | 20.0 | 21.4 | ug/L | 0.160 | 7.00 | 30 | |
| 2-Butanone | | 20.0 | 21.8 | ug/L | 0.0777 | 8.80 | 30 | |
| n-Butylbenzene | | 20.0 | 22.1 | ug/L | 3.10 | 10.4 | 30 | |
| sec-Butylbenzene | | 20.0 | 22.2 | ug/L | 3.68 | 11.0 | 30 | |
| tert-Butylbenzene | | 20.0 | 22.1 | ug/L | 0.596 | 10.7 | 30 | |
| Carbon Disulfide | | 20.0 | 21.9 | ug/L | 0.821 | 9.40 | 30 | |
| Carbon Tetrachloride | | 20.0 | 21.4 | ug/L | 0.391 | 7.20 | 30 | |
| Dibromochloromethane | | 20.0 | 19.0 | ug/L | 0.279 | 5.00 | 30 | |
| Chloroethane | | 20.0 | 21.3 | ug/L | 0.189 | 6.70 | 30 | |
| 2-Chloroethyl Vinyl Ether | | 20.0 | 19.3 | ug/L | 0.0866 | 3.60 | 30 | |
| 2-Chlorotoluene | | 20.0 | 20.9 | ug/L | 2.48 | 4.50 | 30 | |
| 4-Chlorotoluene | | 20.0 | 21.0 | ug/L | 2.56 | 4.90 | 30 | |
| 1,2-Dibromo-3-Chloropropane | | 20.0 | 19.0 | ug/L | 0.0847 | 5.20 | 30 | |
| 1,2-Dibromoethane | | 20.0 | 21.0 | ug/L | 0.221 | 5.20 | 30 | |
| Dibromomethane | | 20.0 | 21.2 | ug/L | 0.125 | 6.00 | 30 | |
| 1,2-Dichlorobenzene | | 20.0 | 20.3 | ug/L | 1.37 | 1.40 | 30 | |
| 1,3-Dichlorobenzene | | 20.0 | 20.2 | ug/L | 1.53 | 1.20 | 30 | |
| 1,4-Dichlorobenzene | | 20.0 | 19.7 | ug/L | 1.53 | 1.60 | 30 | |
| Dichlorodifluoromethane | | 20.0 | 20.1 | ug/L | 0.301 | 0.400 | 30 | |
| 1,2-Dichloroethane | | 20.0 | 20.0 | ug/L | 0.354 | 0.100 | 30 | |
| cis-1,2-Dichloroethene | | 20.0 | 21.7 | ug/L | 0.292 | 8.30 | 30 | |
| trans-1,2-Dichloroethene | | 20.0 | 21.2 | ug/L | 0.262 | 5.80 | 30 | |
| 1,3-Dichloropropane | | 20.0 | 20.9 | ug/L | 0.430 | 4.40 | 30 | |
| 2,2-Dichloropropane | | 20.0 | 20.2 | ug/L | 0.393 | 1.20 | 30 | |
| cis-1,3-Dichloropropene | | 20.0 | 20.8 | ug/L | 0.378 | 4.00 | 30 | |
| trans-1,3-Dichloropropene | | 20.0 | 19.6 | ug/L | 0.406 | 2.10 | 30 | |

KEMRON FORMS - Modified 09/06/2007 - (ALT)
Version 1.5 PDF File ID: 1029692
Report generated 02/28/2008 16:27

Login Number: L08020524 | Run Date: 02/12/2008 | Sample ID: WG262907-12
Instrument ID: HPMS14 | Run Time: 00:28 | Method: 8260B
File ID: 14M03450 | Analvst: CMS | QC Key: STD
ICal Workgroup: WG262907 | Cal ID: HPMS14 - 11-FEB-08

| Analyte | | Expected | Found | Units | RF | %D | UCL | Q |
|---|---|---|---|---|---|---|---|---|
| 1,1-Dichloropropene | | 20.0 | 21.4 | ug/L | 0.388 | 7.20 | 30 | |
| 2-Hexanone | | 20.0 | 20.8 | ug/L | 0.137 | 4.00 | 30 | |
| Hexachlorobutadiene | | 20.0 | 21.2 | ug/L | 0.510 | 6.00 | 30 | |
| Isopropylbenzene | | 20.0 | 20.2 | ug/L | 1.57 | 0.900 | 30 | |
| p-Isopropyltoluene | | 20.0 | 21.8 | ug/L | 3.05 | 8.90 | 30 | |
| 4-Methyl-2-Pentanone | | 20.0 | 21.1 | ug/L | 0.0586 | 5.30 | 30 | |
| Methylene Chloride | | 20.0 | 20.3 | ug/L | 0.262 | 1.30 | 30 | |
| Naphthalene | | 20.0 | 20.3 | ug/L | 1.91 | 1.30 | 30 | |
| n-Propylbenzene | | 20.0 | 22.3 | ug/L | 4.07 | 11.6 | 30 | |
| Styrene | | 20.0 | 22.4 | ug/L | 1.09 | 12.0 | 30 | |
| 1,1,1,2-Tetrachloroethane | | 20.0 | 21.7 | ug/L | 0.342 | 8.30 | 30 | |
| Tetrachloroethene | | 20.0 | 21.8 | ug/L | 0.367 | 8.80 | 30 | |
| 1,2,3-Trichlorobenzene | | 20.0 | 19.9 | ug/L | 0.939 | 0.300 | 30 | |
| 1,2,4-Trichlorobenzene | | 20.0 | 19.8 | ug/L | 1.08 | 1.10 | 30 | |
| 1,1,1-Trichloroethane | | 20.0 | 21.3 | ug/L | 0.451 | 6.70 | 30 | |
| 1,1,2-Trichloroethane | | 20.0 | 20.7 | ug/L | 0.229 | 3.30 | 30 | |
| Trichloroethene | | 20.0 | 21.8 | ug/L | 0.276 | 9.00 | 30 | |
| Trichlorofluoromethane | | 20.0 | 17.8 | ug/L | 0.390 | 10.8 | 30 | |
| 1,2,3-Trichloropropane | | 20.0 | 20.7 | ug/L | 0.142 | 3.30 | 30 | |
| 1,2,4-Trimethylbenzene | | 20.0 | 21.7 | ug/L | 3.02 | 8.40 | 30 | |
| 1,3,5-Trimethylbenzene | | 20.0 | 22.4 | ug/L | 2.90 | 12.0 | 30 | |
| Vinyl Acetate | | 20.0 | 20.4 | ug/L | 0.269 | 2.00 | 40 | |
| o-Xylene | | 20.0 | 22.1 | ug/L | 0.674 | 10.6 | 30 | |
| m-,p-Xylene | | 40.0 | 43.9 | ug/L | 0.688 | 9.70 | 30 | |

* Exceeds %D Limit

CCC Calibration Check Compounds
SPCC System Performance Check Compounds

KEMRON FORMS - Modified 09/06/2007 - (ALT)
Version 1.5 PDF File ID: 1029692
Report generated 02/28/2008 16:27

CONTINUING CALIBRATION VERIFICATION (CCV)

00078944

Login Number: L08020524 | Run Date: 02/25/2008 | Sample ID: WG263964-02
Instrument ID: HPMS14 | Run Time: 13:07 | Method: 8260B
File ID: 14M03776 | Analyst: CMS | QC Key: STD
Workgroup (AAB#): WG263965 | Cal ID: HPMS14 - 11-FEB-08

| Analyte | | Expected | Found | UNITS | RF | %D | UCL | Q |
|---|---|---|---|---|---|---|---|---|
| Chloroform | CCC | 50.0 | 53.4 | ug/L | 0.515 | 6.78 | 20 | |
| 1,1-Dichloroethene | CCC | 50.0 | 57.5 | ug/L | 0.454 | 14.9 | 20 | |
| 1,2-Dichloropropane | CCC | 50.0 | 52.4 | ug/L | 0.282 | 4.77 | 20 | |
| Ethylbenzene | CCC | 50.0 | 55.5 | ug/L | 0.562 | 11.0 | 20 | |
| Toluene | CCC | 50.0 | 53.2 | ug/L | 1.53 | 6.39 | 20 | |
| Vinyl Chloride | CCC | 50.0 | 50.1 | ug/L | 0.133 | 0.121 | 20 | |
| Bromoform | SPCC | 50.0 | 48.1 | ug/L | 0.159 | 3.73 | 40 | |
| Chlorobenzene | SPCC | 50.0 | 51.7 | ug/L | 0.984 | 3.38 | 40 | |
| Chloromethane | SPCC | 50.0 | 49.4 | ug/L | 0.204 | 1.19 | 40 | |
| 1,1-Dichloroethane | SPCC | 50.0 | 53.7 | ug/L | 0.554 | 7.42 | 40 | |
| 1,1,2,2-Tetrachloroethane | SPCC | 50.0 | 49.3 | ug/L | 0.439 | 1.34 | 40 | |
| Acetone | | 50.0 | 41.1 | ug/L | 0.0421 | 17.8 | 40 | |
| Benzene | | 50.0 | 51.6 | ug/L | 1.09 | 3.11 | 40 | |
| Bromobenzene | | 50.0 | 51.3 | ug/L | 0.719 | 2.66 | 40 | |
| Bromochloromethane | | 50.0 | 50.6 | ug/L | 0.139 | 1.27 | 40 | |
| Bromodichloromethane | | 50.0 | 55.6 | ug/L | 0.361 | 11.2 | 40 | |
| Bromomethane | | 50.0 | 62.8 | ug/L | 0.193 | 25.7 | 40 | |
| 2-Butanone | | 50.0 | 40.4 | ug/L | 0.0577 | 19.2 | 40 | |
| n-Butylbenzene | | 50.0 | 56.2 | ug/L | 3.15 | 12.5 | 40 | |
| sec-Butylbenzene | | 50.0 | 57.0 | ug/L | 3.78 | 14.0 | 40 | |
| tert-Butylbenzene | | 50.0 | 55.8 | ug/L | 0.600 | 11.5 | 40 | |
| Carbon Disulfide | | 50.0 | 56.0 | ug/L | 0.843 | 12.0 | 40 | |
| Carbon Tetrachloride | | 50.0 | 59.2 | ug/L | 0.431 | 18.3 | 40 | |
| Dibromochloromethane | | 50.0 | 49.9 | ug/L | 0.296 | 0.285 | 40 | |
| Chloroethane | | 50.0 | 51.4 | ug/L | 0.182 | 2.77 | 40 | |
| 2-Chloroethyl Vinyl Ether | | 50.0 | 37.7 | ug/L | 0.0678 | 24.5 | 40 | |
| 2-Chlorotoluene | | 50.0 | 51.1 | ug/L | 2.43 | 2.24 | 40 | |
| 4-Chlorotoluene | | 50.0 | 53.3 | ug/L | 2.61 | 6.69 | 40 | |
| 1,2-Dibromo-3-Chloropropane | | 50.0 | 43.7 | ug/L | 0.0809 | 12.7 | 40 | |
| 1,2-Dibromoethane | | 50.0 | 52.1 | ug/L | 0.219 | 4.14 | 40 | |
| Dibromomethane | | 50.0 | 52.4 | ug/L | 0.124 | 4.82 | 40 | |
| 1,2-Dichlorobenzene | | 50.0 | 50.5 | ug/L | 1.36 | 0.902 | 40 | |
| 1,3-Dichlorobenzene | | 50.0 | 51.9 | ug/L | 1.57 | 3.84 | 40 | |
| 1,4-Dichlorobenzene | | 50.0 | 50.4 | ug/L | 1.57 | 0.764 | 40 | |
| Dichlorodifluoromethane | | 50.0 | 56.3 | ug/L | 0.337 | 12.6 | 40 | |
| 1,2-Dichloroethane | | 50.0 | 50.8 | ug/L | 0.359 | 1.62 | 40 | |
| cis-1,2-Dichloroethene | | 50.0 | 54.3 | ug/L | 0.293 | 8.54 | 40 | |
| trans-1,2-Dichloroethene | | 50.0 | 56.8 | ug/L | 0.282 | 13.5 | 40 | |
| 1,3-Dichloropropane | | 50.0 | 50.0 | ug/L | 0.412 | 0.0368 | 40 | |
| 2,2-Dichloropropane | | 50.0 | 63.5 | ug/L | 0.492 | 26.9 | 40 | |
| cis-1,3-Dichloropropene | | 50.0 | 57.0 | ug/L | 0.414 | 14.0 | 40 | |
| trans-1,3-Dichloropropene | | 50.0 | 56.4 | ug/L | 0.469 | 12.8 | 40 | |

KEMRON FORMS - Modified 09/06/2007 - (CCV)
Version 1.5 PDF File ID: 1029693
Report generated 02/28/2008 16:27

CONTINUING CALIBRATION VERIFICATION (CCV)

00078945

Login Number: L08020524 Run Date: 02/25/2008 Sample ID: WG263964-02
Instrument ID: HPMS14 Run Time: 13:07 Method: 8260B
File ID: 14M03776 Analyst: CMS QC Key: STD
Workgroup (AAB#): WG263965 Cal ID: HPMS14 - 11-FEB-08

| Analyte | | Expected | Found | UNITS | RF | %D | UCL | Q |
|---|---|---|---|---|---|---|---|---|
| 1,1-Dichloropropene | | 50.0 | 56.4 | ug/L | 0.409 | 12.9 | 40 | |
| 2-Hexanone | | 50.0 | 43.6 | ug/L | 0.115 | 12.9 | 40 | |
| Hexachlorobutadiene | | 50.0 | 54.9 | ug/L | 0.529 | 9.79 | 40 | |
| Isopropylbenzene | | 50.0 | 56.9 | ug/L | 1.77 | 13.7 | 40 | |
| p-Isopropyltoluene | | 50.0 | 57.8 | ug/L | 3.23 | 15.6 | 40 | |
| 4-Methyl-2-Pentanone | | 50.0 | 44.2 | ug/L | 0.0491 | 11.7 | 40 | |
| Methylene Chloride | | 50.0 | 50.7 | ug/L | 0.253 | 1.43 | 40 | |
| Naphthalene | | 50.0 | 43.3 | ug/L | 1.63 | 13.3 | 40 | |
| n-Propylbenzene | | 50.0 | 56.8 | ug/L | 4.14 | 13.5 | 40 | |
| Styrene | | 50.0 | 56.5 | ug/L | 1.10 | 13.1 | 40 | |
| 1,1,1,2-Tetrachloroethane | | 50.0 | 55.6 | ug/L | 0.351 | 11.2 | 40 | |
| Tetrachloroethene | | 50.0 | 57.3 | ug/L | 0.387 | 14.6 | 40 | |
| 1,2,3-Trichlorobenzene | | 50.0 | 43.9 | ug/L | 0.828 | 12.1 | 40 | |
| 1,2,4-Trichlorobenzene | | 50.0 | 46.8 | ug/L | 1.02 | 6.31 | 40 | |
| 1,1,1-Trichloroethane | | 50.0 | 57.2 | ug/L | 0.484 | 14.4 | 40 | |
| 1,1,2-Trichloroethane | | 50.0 | 49.3 | ug/L | 0.218 | 1.47 | 40 | |
| Trichloroethene | | 50.0 | 56.3 | ug/L | 0.285 | 12.6 | 40 | |
| Trichlorofluoromethane | | 50.0 | 58.8 | ug/L | 0.514 | 17.5 | 40 | |
| 1,2,3-Trichloropropane | | 50.0 | 48.2 | ug/L | 0.133 | 3.62 | 40 | |
| 1,2,4-Trimethylbenzene | | 50.0 | 54.2 | ug/L | 3.03 | 8.45 | 40 | |
| 1,3,5-Trimethylbenzene | | 50.0 | 56.9 | ug/L | 2.95 | 13.8 | 40 | |
| Vinyl Acetate | | 50.0 | 53.8 | ug/L | 0.284 | 7.61 | 40 | |
| o-Xylene | | 50.0 | 56.0 | ug/L | 0.683 | 12.1 | 40 | |
| m-,p-Xylene | | 100 | 110 | ug/L | 0.692 | 10.3 | 40 | |
| 1,2-Dichloroethene | | 100 | 111 | ug/L | 0.287 | 11.0 | 40 | |
| Xylenes | | 150 | 166 | ug/L | 0.688 | 10.9 | 40 | |

* Exceeds %D Criteria

CCC Calibration Check Compounds
SPCC System Performance Check Compounds

KEMRON FORMS - Modified 09/06/2007 - (CCV)
Version 1.5 PDF File ID: 1029693
Report generated 02/28/2008 16:27

# KEMRON ENVIRONMENTAL SERVICES
## INTERNAL STANDARD AREA SUMMARY
## (COMPARED TO CCV)

Login Number: L08020524
Instrument ID: HPMS14
Workgroup (AAB#): WG263965

CCV Number: WG263964-02
CAL ID: HPMS14 - 11-FEB-08
Matrix: WATER

| Sample Number | Dilution | Tag | IS-1 | IS-2 | IS-3 |
|---|---|---|---|---|---|
| WG263964-02 | NA | NA | 162517 | 296787 | 400038 |
| Upper Limit | NA | NA | 325034 | 593574 | 800076 |
| Lower Limit | NA | NA | 81259 | 148394 | 200019 |
| L08020524-01 | 1.00 | 01 | 123044 | 233289 | 329026 |
| WG263965-01 | 1.00 | 01 | 141650 | 266963 | 376753 |
| WG263965-02 | 1.00 | 01 | 146498 | 279315 | 377116 |
| WG263965-03 | 1.00 | 01 | 149101 | 280320 | 379583 |
| WG263965-04 | 1.00 | 01 | 138601 | 264286 | 370022 |

IS-1 - 1,4-Dichlorobenzene-d4
IS-2 - Chlorobenzene-d5
IS-3 - Fluorobenzene

Underline = Response outside limits

KEMRON FORMS - Modified 02/20/2007
Version 1.3 PDF File ID: 1030019
Report generated 02/28/2008 16:27

# KEMRON ENVIRONMENTAL SERVICES
## INTERNAL STANDARD RETENTION TIME SUMMARY
## (COMPARED TO CCV)

Login Number: L08020524
Instrument ID: HPMS14
Workgroup (AAB#): WG263965

CCV Number: WG263964-02
CAL ID: HPMS14 - 11-FEB-08
Matrix: WATER

| Sample Number | Dilution | Tag | IS-1 | IS-2 | IS-3 |
|---|---|---|---|---|---|
| WG263964-02 | NA | NA | 17.24 | 14.45 | 10.84 |
| Upper Limit | NA | NA | 17.74 | 14.95 | 11.34 |
| Lower Limit | NA | NA | 16.74 | 13.95 | 10.34 |
| L08020524-01 | 1.00 | 01 | 17.242 | 14.454 | 10.847 |
| WG263965-01 | 1.00 | 01 | 17.242 | 14.454 | 10.847 |
| WG263965-02 | 1.00 | 01 | 17.242 | 14.454 | 10.847 |
| WG263965-03 | 1.00 | 01 | 17.242 | 14.454 | 10.847 |
| WG263965-04 | 1.00 | 01 | 17.242 | 14.454 | 10.847 |

IS-1 - 1,4-Dichlorobenzene-d4
IS-2 - Chlorobenzene-d5
IS-3 - Fluorobenzene

Underline = Response outside limits

KEMRON FORMS - Modified 02/20/2007
Version 1.3 PDF File ID: 1030021
Report generated 02/28/2008 16:27

# 3.0 Attachments

**Kemron Environmental Services**
**Analyst Listing**
**February 29, 2008**

---

| | | |
|---|---|---|
| AJF - AMANDA J. FICKIESEN | ALB - ANNIE L. BROWN | AML - ANTHONY M. LONG |
| ARA - ADRIAN R. ACHTERMANN | ASP - AARON S. PETRIE | BRG - BRENDA R. GREGORY |
| CAA - CASSIE A. AUGENSTEIN | CAF - CHERYL A. FLOWERS | CAH - CHARLES A. HALL |
| CEB - CHAD E. BARNES | CLC - CHRYS L. CRAWFORD | CLW - CHARISSA L. WINTERS |
| CM - CHARLIE MARTIN | CMS - CRYSTAL M. STEPHENS | CPD - CHAD P. DAVIS |
| CSH - CHRIS S. HILL | DD - DIANE M. DENNIS | DDE - DEBRA D. ELLIOTT |
| DEL - DON E. LIGHTFRITZ | DEV - DAVID E. VANDENBERG | DGB - DOUGLAS G. BUTCHER |
| DIH - DEANNA I. HESSON | DLB - DAVID L. BUMGARNER | DLP - DOROTHY L. PAYNE |
| DLR - DIANNA L. RAUCH | DR - DEANNA ROBERTS | DRP - DAVE R. PITZER |
| DSF - DEBRA S. FREDERICK | ECL - ERIC C. LAWSON | ED - EMILY E. DECKER |
| ERE - ERIN R. ELDER | FJB - FRANCES J. BOLDEN | HAV - HEMA VILASAGAR |
| HJR - HOLLY J. REED | JAB - JUANITA A. BECKER | JAL - JOHN A. LENT |
| JBK - JEREMY B. KINNEY | JDH - JUSTIN D. HESSON | JKP - JACQUELINE K. PARSONS |
| JKT - JANE K. THOMPSON | JLK - JUSTEN L. KNOPP | JWR - JOHN W. RICHARDS |
| JWS - JACK W. SHEAVES | JYH - JI Y. HU | KCZ - KEVIN C. ZUMBRO |
| KEB - KATHRYN E. BARNES | KHR - KIM H. RHODES | KJW - KATIE J. WIEFERICH |
| KRA - KATHY R. ALBERTSON | LKN - LINDA K. NEDEFF | LSB - LESLIE S. BUCINA |
| MDA - MIKE D. ALBERTSON | MDC - MICHAEL D. COCHRAN | MES - MARY E. SCHILLING |
| MKZ - MARILYN K. ZUMBRO | MLR - MARY L. ROCHOTTE | MMB - MAREN M. BEERY |
| MRT - MICHELLE R. TAYLOR | MSW - MATT S. WILSON | NJB - NATALIE J. BOOTH |
| NPM - NATHANIEL P. MILLER | PJM - PAUL J. MILLER | RAH - ROY A. HALSTEAD |
| RB - ROBERT BUCHANAN | REK - ROBERT E. KYER | RLF - RACHEL L. FRYE |
| RLK - ROBIN L. KLINGER | RNP - RICK N. PETTY | RWC - RODNEY W. CAMPBELL |
| SLM - STEPHANIE L. MOSSBURG | SLP - SHERI L. PFALZGRAF | SMH - SHAUNA M. HYDE |
| TDH - TRICIA D. HUCK | TMB - TIFFANY M. BAILEY | TMM - TAMMY M. MORRIS |
| VC - VICKI COLLIER | WFM - WALTER F. MARTIN | |

**KEMRON Environmental Services**

List of Valid Qualifiers

February 29, 2008

Qualkey: STD

| Qualifier | Description |
|---|---|
| * | Surrogate or spike compound out of range |
| + | Correlation coefficient for the MSA is less than 0.995 |
| < | Result is less than the associated numerical value. |
| > | Result is greater than the associated numerical value. |
| A | See the report narrative |
| B | Analyte present in method blank |
| C | Confirmed by GC/MS |
| CG | Confluent growth |
| DL | Surrogate or spike compound was diluted out |
| E | Estimated concentration due to sample matrix interference |
| EDL | Elevated sample reporting limits, presence of non-target analytes |
| EMPC | Estimated Maximum Possible Concentration |
| FL | Free Liquid |
| I | Semiquantitative result (out of instrument calibration range) |
| J | The analyte was positively identified, but the quantitation was below the RL |
| J,B | Analyte detected in both the method blank and sample above the MDL. |
| J,P | Estimate; columns don't agree to within 40% |
| J,S | Estimated concentration; analyzed by method of standard addition (MSA) |
| L | Sample reporting limits elevated due to matrix interference |
| M | Matrix effect; the concentration is an estimate due to matrix effect. |
| N | Tentatively identified compound(TIC) |
| NA | Not applicable |
| ND | Not detected at or above the reporting limit |
| ND,L | Not detected; sample reporting limit (RL) elevated due to interference |
| ND,S | Not detected; analyzed by method of standard addition (MSA) |
| NF | Not found by library search |
| NFL | No free liquid |
| NI | Non-ignitable |
| NR | Analyte is not required to be analyzed |
| NS | Not spiked |
| P | Concentrations >40% difference between the two GC columns |
| Q | One or more quality control criteria fail. See narrative. |
| QNS | Quantity of sample not sufficient to perform analysis |
| RA | Reanalysis confirms reported results |
| RE | Reanalysis confirms sample matrix interference |
| S | Analyzed by method of standard addition (MSA) |
| SMI | Sample matrix interference on surrogate |
| SP | Reported results are for spike compounds only |
| TIC | Library Search Compound |
| TNTC | Too numerous to count |
| U | Undetected; the concentration is below the reported MDL. |
| UJ | Undetected; the MDL and RL are estimated due to quality control discrepancies. |
| W | Post-digestion spike for furnace AA out of control limits |
| X | Exceeds regulatory limit |
| X, S | Exceeds regulatory limit; method of standard additions (MSA) |
| Z | Cannot be resolved from isomer - see below |

*****Special Notes for Organic Analytes**

1. Acrolein and acrylonitrile by method 624 are semi-quantitative screens only.
2. 1,2-Diphenylhydrazine is unstable and is reported as azobenzene.
3. N-nitrosodiphenylamine cannot be separated from diphenylamine.
4. 3-Methylphenol and 4-Methylphenol are unresolvable compounds.
5. m-Xylene and p-Xylene are unresolvable compounds.
6. The reporting limits for Appendix II/IX compounds by method 8270 are based on EPA estimated PQLs referenced in 40 CFR Part 264, Appendix IX. They are not always achievable for every compound an are matrix dependent.

00078951

B2199

# Chain of Custody

NO. 5420

Shaw® Shaw Environmental & Infrastructure, Inc.
3010 Briarpark Drive, Suite 400
Houston, TX 77042
(713) 996-4400

Laboratory Name: Kemron
Address: 156 Starlite Drive Marrietta, Ohio
Contact: Stephanie Mossburg (740) 373-4071

Project Name: Longhorn AAP
Project Location: Karnack Tx
Project No.: * SEE REMARKS
Project Contact: ALLEN WILLMORE
Project Telephone No.: (713) 247-9292
Point of Contact: Jennifer Hoang
Telephone No. (713) 996-4409
Project Manager/Supervisor: Praveen Srivastav

Analysis and Method Desired (Indicate separate containers)

| Item No. | Sample Number | Date | Time | Comp | Grab | Matrix | Sample Description, Location | Number of Containers | VOCs by 8260 | TCLP VOC | TCLP METALS | REACTIVITY | IGNITABILITY | CORROSIVITY | | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | | | | | 7-day TAT |
| 1 | 17WW17-021908 | 2/19/08 | 13:10 | | ✓ | W | Site 17 | 3 | X | | | | | | | 117591.00048800 |
| 2 | 47WW33-022008 | 2/20/08 | 9:20 | | ✓ | W | Site 47 | 3 | X | | | | | | | 117591.00098810 |
| 3 | 47WW34-021908 | 2/19/08 | 17:10 | | ✓ | W | Site 47 | 3 | X | | | | | | | 117591.00098810 |
| 4 | 50WW07-021908 | 2/19/08 | 11:15 | | ✓ | W | Site 50 | 3 | X | | | | | | | 117591.00098820 |
| 5 | Waste Characterization 022008 | 2/20/08 | 11:25 | ✓ | | S | All Sites | 3 | | X | X | X | X | X | | 117591.00048800 |
| 6 | 47WW33-022008-QC | 2/20/08 | 9:20 | | ✓ | W | Site 47 | 3 | X | | | | | | | 117591.00098810 |
| 7 | | | | | | | | | | | | | | | | |
| 8 | | | | | | | | | | | | | | | | |
| 9 | | | | | | | | | | | | | | | | |
| 10 | | | | | | | | | | | | | | | | |

| Transfers Relinquished By (signature) | Date/Time | Transfers Accepted By (signature) | Date/Time |
|---|---|---|---|
| [signature] | 2/21/08 15:30 | [signature] 2-23-08 | 10:25 |
| | | | |
| | | | |
| | | Laboratory | |

Special Instructions * See remarks for project #s
* 7-day TAT

FedEx Airbill No.:

Sampler's Signature [signature]

TAT: 7-day Standard ____ Rush Date ____ Seals Intact? ____ Y ____ N Received Good Condition ____ Y ____ N ____ Cold

White - Lab Copy Canary - Field Copy Pink - File Copy

Form Number: 433_2
Rev. 10-19-07

KEMRON Environmental Services

156 Starlite Drive
Marietta, OH 45750
(740) 373-4071

# SAMPLE RECEIPT FORM

| | |
|---|---|
| Client: Shaw - Longhorn | |
| Workorder Number: B — | |
| Date Received: 2/23/08 | |
| Delivered by: ( ) Fedx (X) UPS ( ) Client ( ) Courier | Time: 10:25 |
| Opened by: RKR | |
| IR Temp Gun: (X) D ( ) G | |
| Logged by: RLK | L 08020524 |

**Cooler Information**

| Cooler ID | Temp C | Airbill# | COC# | Other |
|---|---|---|---|---|
| 0798 | 0 | J 208 643 291 7 | | 7day |
| | | | | |
| | | | | |
| | | | | |
| | | | | |

| Inspection Checklist | Y | N | NA | Discrepancy ID |
|---|---|---|---|---|
| Were shipping coolers sealed? | ✓ | | | |
| Were custody seals intact? | ✓ | | | |
| Were cooler temperatures in range of 0 - 6? | ✓ | | | |
| Was ice present? | ✓ | | | |
| Were COC's received/ information complete/signed and dated? | ✓ | | | |
| Were sample containers and labels intact and match COC? | | ✓ | | 1 |
| Were the correct containers and volumes received? | ✓ | | | |
| Were correct preservatives used? (water only) | | | ✓ | |
| Were pH ranges acceptable? (voa's excluded) | | | ✓ | |
| Were VOA samples free of headspace? | | | ✓ | |
| Were samples received within EPA hold times? | ✓ | | | |

**Discrepancy/Comments/Other Problems**

1 Sample: Waste Characteration - 2 jars lost labels in cooler
A TCLP, Metals; TCLP VOC
B Reactivity, ignitability, Corrosivity } 11:25 on 2/20/08

**Distribution**

| | |
|---|---|
| Name of KEMRON representative | |
| Client/Company: | |
| Person Contacted: | |
| Date contacted: | |

**Resolution/other comments:**

| |
|---|
| |
| |
| |
| |

**KEMRON Environmental Services**

Internal Chain of Custody Report

**Login:** L08020524
**Account:** 2773
**Project:** 2773.025
**Samples:** 1
**Due Date:** 03-MAR-2008

| **Samplenum** | **Container ID** | **Products** |
|---|---|---|
| **L08020524-01** | 428602 | 826-LOW |

Bottle: 1

| Seq. | Purpose | From | To | Date/Time | Accept | Relinquish |
|---|---|---|---|---|---|---|
| 1 | LOGIN | COOLER | V1 | 25-FEB-2008 13:15 | RLK | |
| 2 | ANALYZ | V1 | ORG4 | 25-FEB-2008 15:05 | KJW | ERE |

Bottle: 2

| Seq. | Purpose | From | To | Date/Time | Accept | Relinquish |
|---|---|---|---|---|---|---|
| 1 | LOGIN | COOLER | V1 | 25-FEB-2008 13:15 | RLK | |
| 2 | ANALYZ | V1 | ORG4 | 25-FEB-2008 15:05 | KJW | ERE |

Bottle: 3

| Seq. | Purpose | From | To | Date/Time | Accept | Relinquish |
|---|---|---|---|---|---|---|
| 1 | LOGIN | COOLER | V1 | 25-FEB-2008 13:15 | RLK | |
| 2 | ANALYZ | V1 | ORG4 | 25-FEB-2008 15:05 | KJW | ERE |

A1 - Sample Archive (COLD)
A2 - Sample Archive (AMBIENT)
F1 - Volatiles Freezer in Login
V1 - Volatiles Refrigerator in Login
W1 - Walkin Cooler in Login

Gulf Coast ACCUTEST Laboratories

IT'S ALL IN THE CHEMISTRY

04/10/07

# Technical Report for

Shaw E & I, Inc.

Longhorn Army Ammunition Plant

PROJECT #117591

Accutest Job Number: T16445

Sampling Dates: 02/22/07 - 02/23/07

Report to:

Shaw E & I, Inc.

diane.meyer@shawgrp.com

ATTN: Diane Meyer

Total number of pages in report: **187**

ACCREDITED IN ACCORDANCE WITH nelac

Test results contained within this data package meet the requirements of the National Environmental Laboratory Accreditation Conference and/or state specific certification programs as applicable.

Ron Martino
Laboratory Manager

ACCUTEST LABORATORIES 50 YEARS 1956-2006

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# Table of Contents

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Accutest Laboratories

## Sample Summary

Shaw E & I, Inc.

**Job No:** T16445

Longhorn Army Ammunition Plant
Project No: PROJECT #117591

| Sample Number | Collected Date | Time By | Received | Matrix Code | Type | Client Sample ID |
|---|---|---|---|---|---|---|
| T16445-1 | 02/22/07 | 09:30 SMC | 02/24/07 | AQ | Ground Water | 29WW38-FEB2007 |
| T16445-2 | 02/22/07 | 09:41 SMC | 02/24/07 | AQ | Ground Water | 47WW30-FEB2007 |
| T16445-3 | 02/22/07 | 11:00 SMC | 02/24/07 | AQ | Ground Water | LHSMW43-FEB2007 |
| T16445-4 | 02/22/07 | 15:36 SMC | 02/24/07 | AQ | Ground Water | 50WW06-FEB2007 |
| T16445-5 | 02/23/07 | 10:46 SMC | 02/24/07 | AQ | Ground Water | 50WW05-FEB2007 |
| T16445-5D | 02/23/07 | 10:46 SMC | 02/24/07 | AQ | Water Dup/MSD | 50WW05-FEB2007 MSD |
| T16445-5S | 02/23/07 | 10:46 SMC | 02/24/07 | AQ | Water Matrix Spike | 50WW05-FEB2007 MS |
| T16445-6 | 02/23/07 | 14:53 SMC | 02/24/07 | AQ | Ground Water | 50WW02-FEB2007 |
| T16445-7 | 02/22/07 | 10:30 SMC | 02/24/07 | AQ | Ground Water | 17WW16-FEB2007 |
| T16445-8 | 02/22/07 | 14:18 SMC | 02/24/07 | AQ | Ground Water | 17WW02-FEB2007 |
| T16445-9 | 02/22/07 | 14:18 SMC | 02/24/07 | AQ | Ground Water | 17WW02-FEB2007 FD |
| T16445-10 | 02/22/07 | 12:45 SMC | 02/24/07 | AQ | Ground Water | 29WW35-FEB2007 |
| T16445-11 | 02/22/07 | 12:45 SMC | 02/24/07 | AQ | Ground Water | 29WW35-FEB2007 FD |

Accutest Laboratories

# Sample Summary

(continued)

Shaw E & I, Inc.

**Job No:** T16445

Longhorn Army Ammunition Plant
Project No: PROJECT #117591

| Sample Number | Collected Date | Time By | Received | Matrix Code | Type | Client Sample ID |
|---|---|---|---|---|---|---|
| T16445-12 | 02/22/07 | 15:00 SMC | 02/24/07 | AQ | Ground Water | 29WW06-FEB2007 |
| T16445-13 | 02/23/07 | 15:33 SMC | 02/24/07 | AQ | Ground Water | 17WW05-FEB2007 |
| T16445-14 | 02/23/07 | 16:30 SMC | 02/24/07 | AQ | Ground Water | 7WW06-FEB2007 |
| T16445-15 | 02/22/07 | 00:00 SMC | 02/24/07 | AQ | Trip Blank Water | TRIP BLANK |
| T16445-18 | 02/23/07 | 10:47 SMC | 02/24/07 | AQ | Ground Water | 17WW130-FEB2007 |

2

# SAMPLE DELIVERY GROUP CASE NARRATIVE

| | | | |
|---|---|---|---|
| **Client:** | Shaw E & I, Inc. | **Job No** | T16445 |
| **Site:** | Longhorn Army Ammunition Plant | **Report Date** | 3/19/2007 4:57:35 PM |

15 Samples and 1 Trip Blank were collected on between 02/22/2007 and 02/23/2007 and were received at Accutest on 02/24/2007 properly preserved, at 11 Deg. C and intact. These Samples received an Accutest job number of T16445. A listing of the Laboratory Sample ID, Client Sample ID and dates of collection are presented in the Results Summary Section of this report.

Except as noted below, all method specified calibrations and quality control performance criteria were met for this job. For more information, please refer to QC summary pages.

## Volatiles by GCMS By Method SW846 8260B

**Matrix** AQ **Batch ID:** VF2314

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) T16445-5MS, T16445-5MSD were used as the QC samples indicated.
- Matrix Spike Recovery(s) for Trichloroethylene are outside control limits. Outside control limits due to high level in sample relative to spike amount.

**Matrix** AQ **Batch ID:** VF2315

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) T16445-3MS, T16445-3MSD were used as the QC samples indicated.
- Matrix Spike Recovery(s) for cis-1,2-Dichloroethylene, Trichloroethylene are outside control limits. Outside control limits due to high level in sample relative to spike amount.
- T16445-3: For QC only.

**Matrix** AQ **Batch ID:** VF2318

- All method blanks for this batch meet method specific criteria.
- Sample(s) T16445-4MS, T16445-4MSD were used as the QC samples indicated.

## Volatiles by GC By Method RSKSOP-147/175

**Matrix** AQ **Batch ID:** F:GXY992

- Analysis performed at Accutest Laboratories, Orlando, FL.

## Extractables by GC By Method SW846 8330A

**Matrix** AQ **Batch ID:** F:OP19677

- All hits confirmed by reanalysis on a dissimilar column. Analysis performed at Accutest Laboratories, Orlando, FL.

### Wet Chemistry By Method EPA 120.1

| **Matrix** AQ | **Batch ID:** F:R17941 |
|---|---|

- Specific Conductivity: Analysis performed at Accutest Laboratories, Orlando, FL.

| **Matrix** AQ | **Batch ID:** GN11355 |
|---|---|

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) T16445-5DUP were used as the QC samples for Specific Conductivity.

### Wet Chemistry By Method EPA 150.1/9040

| **Matrix** AQ | **Batch ID:** GN11323 |
|---|---|

- Sample(s) T16445-18DUP, T16445-5DUP, T16445-7DUP were used as the QC samples for pH.

### Wet Chemistry By Method EPA 310.1

| **Matrix** AQ | **Batch ID:** GN11375 |
|---|---|

- All method blanks for this batch meet method specific criteria.
- Sample(s) T16445-5DUP, T16445-5MS were used as the QC samples for Alkalinity, Total as CaCO3.

### Wet Chemistry By Method EPA 314

| **Matrix** AQ | **Batch ID:** F:GP9044 |
|---|---|

- Perchlorate: Analysis performed at Accutest Laboratories, Orlando, FL.
- Estimated value, above calibration range. Analysis performed at Accutest Laboratories, Orlando, FL.

### Wet Chemistry By Method EPA 325.3

| **Matrix** AQ | **Batch ID:** GN11343 |
|---|---|

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) T16445-5DUP, T16445-5MS were used as the QC samples for Chloride.

### Wet Chemistry By Method EPA 353.2

| **Matrix** AQ | **Batch ID:** GN11290 |
|---|---|

- All method blanks for this batch meet method specific criteria.
- Sample(s) T16445-5DUP, T16445-5MS were used as the QC samples for Nitrogen, Nitrite.

| **Matrix** AQ | **Batch ID:** GN11291 |
|---|---|

- All method blanks for this batch meet method specific criteria.
- Sample(s) T16445-5DUP, T16445-5MS were used as the QC samples for Nitrogen, Nitrate + Nitrite.

| **Matrix** AQ | **Batch ID:** GN11300 |
|---|---|

- All method blanks for this batch meet method specific criteria.
- Sample(s) T16445-18DUP, T16445-18MS were used as the QC samples for Nitrogen, Nitrite.

| **Matrix** AQ | **Batch ID:** GN11301 |
|---|---|

- All method blanks for this batch meet method specific criteria.
- Sample(s) T16445-18DUP, T16445-18MS were used as the QC samples for Nitrogen, Nitrate + Nitrite.
- The following samples were run outside of holding time for method EPA 353.2: T16445-18

## Wet Chemistry By Method EPA 375.3

| **Matrix** AQ | **Batch ID:** GN11356 |
|---|---|

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) T16445-5DUP, T16445-5MS were used as the QC samples for Sulfate.

## Wet Chemistry By Method EPA 376.1

| **Matrix** AQ | **Batch ID:** GN11313 |
|---|---|

- All method blanks for this batch meet method specific criteria.
- Sample(s) T16445-5DUP were used as the QC samples for Sulfide.

## Wet Chemistry By Method EPA 415.1/9060

| **Matrix** AQ | **Batch ID:** GN11304 |
|---|---|

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) T16445-18DUP, T16445-18MS were used as the QC samples for Total Organic Carbon.

| **Matrix** AQ | **Batch ID:** GN11311 |
|---|---|

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) T16445-5DUP, T16445-5MS were used as the QC samples for Total Organic Carbon.

| **Matrix** AQ | **Batch ID:** GN11317 |
|---|---|

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) T16445-8DUP, T16445-8MS were used as the QC samples for Total Organic Carbon.

## Wet Chemistry By Method SM18 4500NO3E/NO2B

| **Matrix** AQ | **Batch ID:** R15434 |
|---|---|

- Nitrogen, Nitrate: Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

Accutest Laboratories Gulf Coast (ALGC) certifies that this report meets the project requirements for analytical data produced for the samples as received at ALGC and as stated on the COC. ALGC certifies that the data meets the Data QualityObjectives for precision, accuracy and completeness as specified in the ALGC Quality Manual except as noted above. This report is to be used in its entirety. ALGC is not responsible for any assumptions of data quality if partial data packages are used

# SAMPLE DELIVERY GROUP CASE NARRATIVE

**Client:** Accutest Laboratories Gulf Coast, Inc. **Job No:** T16445

**Site:** ITTXHO: Longhorn Army Ammunition Plant **Report Date:** 3/19/2007 10:48:45

16 Samples were collected on between 02/22/2007 and 02/23/2007 and were received at Accutest SE on 02/28/2007 properly preserved, at 1.8 Deg. C and intact. These Samples had an Accutest job number of T16445. A listing of the Laboratory Sample ID, Client Sample ID and dates of collection are presented in the Results Summary Section of this report.

Except as noted below, all method specified calibrations and quality control performance criteria were met for this job. For more information, please refer to QC summary pages.

## Volatiles by GC by Method RSKSOP-147/175

**Matrix:** AQ **Batch ID:** GXY992

All samples were analyzed within the recommended method holding time.

All method blanks for this batch meet method specific criteria.

Samples T16445-5DUP, T16445-5MS were used as the QC samples indicated.

## Extractables by GC by Method SW846 8330A

**Matrix:** AQ **Batch ID:** OP19677

All samples were extracted within the recommended method holding time.

All samples were analyzed within the recommended method holding time.

All method blanks for this batch meet method specific criteria.

Samples F47539-3MS, F47539-3MSD were used as the QC samples indicated.

T16445-12: Confirmation run.

T16445-12: All hits confirmed by reanalysis on a dissimilar column.

## Wet Chemistry by Method EPA 314

**Matrix:** AQ **Batch ID:** GP9044

All samples were prepped within the recommended method holding time.

All samples were analyzed within the recommended method holding time.

All method blanks for this batch meet method specific criteria.

Samples T16445-5DUP, T16445-5MS, T16445-6DUP, T16445-6MS were used as the QC samples for Perchlorate.

T16445-12 for Perchlorate: Dilution required due to matrix interference.

T16445-6 for Perchlorate: Estimated value, above calibration range. Results confirmed by re-analysis.

Accutest Laboratories Southeast (ALSE) certifies that this report meets the project requirements for analytical data produced for the samples as received at ALSE and as stated on the COC. ALSE certifies that the data meets the Data Quality Objectives for precision, accuracy and completeness as specified in the ALSE Quality Manual except as noted above. This report is to be used in its entirety. ALSE is not responsible for any assumptions of data quality if partial data packages are used.

Narrative prepared by:

______________________________________ Date: March 19, 2007

Ellen Pampel, Inorganic QA (signature on file)

**Monday, March 19, 2007**

## Sample Results

Report of Analysis

Accutest Laboratories

# Report of Analysis





| | | | |
|---|---|---|---|
| **Client Sample ID:** | 29WW38-FEB2007 | | |
| **Lab Sample ID:** | T16445-1 | **Date Sampled:** | 02/22/07 |
| **Matrix:** | AQ - Ground Water | **Date Received:** | 02/24/07 |
| **Method:** | SW846 8260B | **Percent Solids:** | n/a |
| **Project:** | Longhorn Army Ammunition Plant | | |

| | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|---|---|---|---|---|---|---|---|
| Run #1 | F0079178.D | 1 | 03/07/07 | LJ | n/a | n/a | VF2314 |
| Run #2 | | | | | | | |

| | Purge Volume |
|---|---|
| Run #1 | 5.0 ml |
| Run #2 | |

**VOA TCL List**

| CAS No. | Compound | Result | RL | MDL | Units | Q |
|---|---|---|---|---|---|---|
| 67-64-1 | Acetone | 2.8 U | 50 | 2.8 | ug/l | |
| 71-43-2 | Benzene | 0.23 U | 2.0 | 0.23 | ug/l | |
| 75-27-4 | Bromodichloromethane | 0.33 U | 2.0 | 0.33 | ug/l | |
| 75-25-2 | Bromoform | 0.65 U | 2.0 | 0.65 | ug/l | |
| 108-90-7 | Chlorobenzene | 0.54 U | 2.0 | 0.54 | ug/l | |
| 75-00-3 | Chloroethane | 0.46 U | 2.0 | 0.46 | ug/l | |
| 67-66-3 | Chloroform | 0.66 U | 2.0 | 0.66 | ug/l | |
| 75-15-0 | Carbon disulfide | 0.62 U | 2.0 | 0.62 | ug/l | |
| 56-23-5 | Carbon tetrachloride | 0.52 U | 2.0 | 0.52 | ug/l | |
| 75-34-3 | 1,1-Dichloroethane | 0.52 U | 2.0 | 0.52 | ug/l | |
| 75-35-4 | 1,1-Dichloroethylene | 0.68 U | 2.0 | 0.68 | ug/l | |
| 107-06-2 | 1,2-Dichloroethane | 0.53 U | 2.0 | 0.53 | ug/l | |
| 78-87-5 | 1,2-Dichloropropane | 0.59 U | 2.0 | 0.59 | ug/l | |
| 124-48-1 | Dibromochloromethane | 0.68 U | 2.0 | 0.68 | ug/l | |
| 156-59-2 | cis-1,2-Dichloroethylene | 0.83 U | 2.0 | 0.83 | ug/l | |
| 10061-01-5 | cis-1,3-Dichloropropene | 0.59 U | 2.0 | 0.59 | ug/l | |
| 156-60-5 | trans-1,2-Dichloroethylene | 0.75 U | 2.0 | 0.75 | ug/l | |
| 10061-02-6 | trans-1,3-Dichloropropene | 0.61 U | 2.0 | 0.61 | ug/l | |
| 100-41-4 | Ethylbenzene | 0.48 U | 2.0 | 0.48 | ug/l | |
| 591-78-6 | 2-Hexanone | 1.9 U | 10 | 1.9 | ug/l | |
| 108-10-1 | 4-Methyl-2-pentanone | 7.3 U | 10 | 7.3 | ug/l | |
| 74-83-9 | Methyl bromide | 0.47 U | 2.0 | 0.47 | ug/l | |
| 74-87-3 | Methyl chloride | 0.60 U | 2.0 | 0.60 | ug/l | |
| 75-09-2 | Methylene chloride | 0.67 U | 5.0 | 0.67 | ug/l | |
| 78-93-3 | Methyl ethyl ketone | 3.0 U | 10 | 3.0 | ug/l | |
| 100-42-5 | Styrene | 0.50 U | 2.0 | 0.50 | ug/l | |
| 71-55-6 | 1,1,1-Trichloroethane | 0.37 U | 2.0 | 0.37 | ug/l | |
| 79-34-5 | 1,1,2,2-Tetrachloroethane | 0.46 U | 2.0 | 0.46 | ug/l | |
| 79-00-5 | 1,1,2-Trichloroethane | 0.66 U | 2.0 | 0.66 | ug/l | |
| 127-18-4 | Tetrachloroethylene | 0.74 U | 2.0 | 0.74 | ug/l | |
| 108-88-3 | Toluene | 0.54 U | 2.0 | 0.54 | ug/l | |
| 79-01-6 | Trichloroethylene | 0.63 U | 2.0 | 0.63 | ug/l | |

U = Not detected    MDL - Method Detection Limit    J = Indicates an estimated value
RL = Reporting Limit    B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range    N = Indicates presumptive evidence of a compound

Accutest Laboratories

# Report of Analysis





| | | | |
|---|---|---|---|
| **Client Sample ID:** | 29WW38-FEB2007 | | |
| **Lab Sample ID:** | T16445-1 | **Date Sampled:** | 02/22/07 |
| **Matrix:** | AQ - Ground Water | **Date Received:** | 02/24/07 |
| **Method:** | SW846 8260B | **Percent Solids:** | n/a |
| **Project:** | Longhorn Army Ammunition Plant | | |

**VOA TCL List**

| CAS No. | Compound | Result | RL | MDL | Units | Q |
|---|---|---|---|---|---|---|
| 75-01-4 | Vinyl chloride | 0.32 U | 2.0 | 0.32 | ug/l | |
| 1330-20-7 | Xylene (total) | 1.1 U | 6.0 | 1.1 | ug/l | |

| CAS No. | Surrogate Recoveries | Run# 1 | Run# 2 | Limits |
|---|---|---|---|---|
| 1868-53-7 | Dibromofluoromethane | 109% | | 73-139% |
| 17060-07-0 | 1,2-Dichloroethane-D4 | 103% | | 66-139% |
| 2037-26-5 | Toluene-D8 | 109% | | 77-148% |
| 460-00-4 | 4-Bromofluorobenzene | 129% | | 84-150% |

U = Not detected MDL - Method Detection Limit J = Indicates an estimated value
RL = Reporting Limit B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

Accutest Laboratories

# Report of Analysis





| | | | |
|---|---|---|---|
| **Client Sample ID:** | 29WW38-FEB2007 | | |
| **Lab Sample ID:** | T16445-1 | **Date Sampled:** | 02/22/07 |
| **Matrix:** | AQ - Ground Water | **Date Received:** | 02/24/07 |
| **Method:** | RSKSOP-147/175 | **Percent Solids:** | n/a |
| **Project:** | Longhorn Army Ammunition Plant | | |

| | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|---|---|---|---|---|---|---|---|
| Run #1 [a] | XY025255.D | 1 | 03/01/07 | AFL | n/a | n/a | F:GXY992 |
| Run #2 | | | | | | | |

| CAS No. | Compound | Result | RL | MDL | Units | Q |
|---|---|---|---|---|---|---|
| 74-82-8 | Methane | 0.46 | 0.50 | 0.30 | ug/l | J |
| 74-84-0 | Ethane | 0.60 U | 1.0 | 0.60 | ug/l | |
| 74-85-1 | Ethene | 0.80 U | 1.0 | 0.80 | ug/l | |

(a) Analysis performed at Accutest Laboratories, Orlando, FL.

U = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Accutest Laboratories

# Report of Analysis





| | | | |
|---|---|---|---|
| **Client Sample ID:** | 29WW38-FEB2007 | | |
| **Lab Sample ID:** | T16445-1 | **Date Sampled:** | 02/22/07 |
| **Matrix:** | AQ - Ground Water | **Date Received:** | 02/24/07 |
| **Method:** | SW846 8330A SW846 3535A | **Percent Solids:** | n/a |
| **Project:** | Longhorn Army Ammunition Plant | | |

| | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|---|---|---|---|---|---|---|---|
| Run #1 [a] | GG020214.D | 1 | 03/02/07 | AFL | 03/01/07 | F:OP19677 | F:GGG906 |
| Run #2 | | | | | | | |

| | Initial Volume | Final Volume |
|---|---|---|
| Run #1 | 1050 ml | 10.0 ml |
| Run #2 | | |

| CAS No. | Compound | Result | RL | MDL | Units | Q |
|---|---|---|---|---|---|---|
| 2691-41-0 | HMX | 0.057 U | 0.19 | 0.057 | ug/l | |
| 121-82-4 | RDX | 0.071 U | 0.19 | 0.071 | ug/l | |
| 99-65-0 | 1,3-Dinitrobenzene | 0.067 U | 0.19 | 0.067 | ug/l | |
| 606-20-2 | 2,6-Dinitrotoluene | 0.062 U | 0.19 | 0.062 | ug/l | |
| 121-14-2 | 2,4-Dinitrotoluene | 0.071 U | 0.19 | 0.071 | ug/l | |
| 35572-78-2 | 2-amino-4,6-Dinitrotoluene | 0.067 U | 0.19 | 0.067 | ug/l | |
| 19406-51-0 | 4-amino-2,6-Dinitrotoluene | 0.076 U | 0.19 | 0.076 | ug/l | |
| 98-95-3 | Nitrobenzene | 0.057 U | 0.19 | 0.057 | ug/l | |
| 88-72-2 | o-Nitrotoluene | 0.057 U | 0.19 | 0.057 | ug/l | |
| 99-08-1 | m-Nitrotoluene | 0.071 U | 0.19 | 0.071 | ug/l | |
| 99-99-0 | p-Nitrotoluene | 0.071 U | 0.19 | 0.071 | ug/l | |
| 479-45-8 | Tetryl | 0.071 U | 0.19 | 0.071 | ug/l | |
| 99-35-4 | 1,3,5-Trinitrobenzene | 0.090 U | 0.19 | 0.090 | ug/l | |
| 118-96-7 | 2,4,6-Trinitrotoluene | 0.076 U | 0.19 | 0.076 | ug/l | |

| CAS No. | Surrogate Recoveries | Run# 1 | Run# 2 | Limits |
|---|---|---|---|---|
| 610-39-9 | 3,4-Dinitrotoluene | 82% | | 70-136% |

(a) Analysis performed at Accutest Laboratories, Orlando, FL.

U = Not detected MDL - Method Detection Limit J = Indicates an estimated value
RL = Reporting Limit B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

Accutest Laboratories

# Report of Analysis





| | | | |
|---|---|---|---|
| **Client Sample ID:** | 29WW38-FEB2007 | | |
| **Lab Sample ID:** | T16445-1 | **Date Sampled:** | 02/22/07 |
| **Matrix:** | AQ - Ground Water | **Date Received:** | 02/24/07 |
| | | **Percent Solids:** | n/a |
| **Project:** | Longhorn Army Ammunition Plant | | |

**General Chemistry**

| Analyte | Result | RL | MDL | Units | DF | Analyzed | By | Method |
|---|---|---|---|---|---|---|---|---|
| **Perchlorate by IC** | | | | | | | | |
| Perchlorate [a] | 4.0 U | 10 | 4.0 | ug/l | 1 | 03/02/07 16:00 | AFL | EPA 314 |
| Alkalinity, Total as CaCO3 | 132 | 10 | 0.30 | mg/l | 2 | 03/08/07 12:50 | EB | EPA 310.1 |
| Carbon Dioxide | 83.0 | 5.0 | | mg/l | 1 | 03/12/07 | RM | SM18 4500CO2D |
| Chloride | 9.0 | 1.0 | 0.57 | mg/l | 1 | 03/05/07 12:15 | EB | EPA 325.3 |
| Nitrogen, Nitrate [b] | < 0.10 | 0.10 | 0.0050 | mg/l | 1 | 02/26/07 09:23 | LN | SM18 4500NO3E/NO2B |
| Nitrogen, Nitrate + Nitrite | 0.030 B | 0.050 | 0.0050 | mg/l | 1 | 02/26/07 09:23 | LN | EPA 353.2 |
| Nitrogen, Nitrite | 0.0030 U | 0.050 | 0.0030 | mg/l | 1 | 02/24/07 14:28 | LN | EPA 353.2 |
| Specific Conductivity [a] | 408 | 0.50 | 0.50 | umhos/cm | 1 | 03/06/07 | AFL | EPA 120.1 |
| Sulfate | 126 | 20 | 2.6 | mg/l | 2 | 03/06/07 18:00 | EB | EPA 375.3 |
| Sulfide | 0.0 B | 0.20 | | mg/l | 1 | 03/01/07 12:10 | LN | EPA 376.1 |
| Total Organic Carbon | 1.0 | 1.0 | 0.092 | mg/l | 1 | 02/27/07 15:10 | LN | EPA 415.1/9060 |
| pH | 6.5 | | | su | 1 | 03/01/07 13:00 | TW | EPA 150.1/9040 |

(a) Analysis performed at Accutest Laboratories, Orlando, FL.
(b) Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

RL = Reporting Limit
MDL = Method Detection Limit

U = Indicates a result < MDL
B = Indicates a result > = MDL but < RL

Accutest Laboratories

# Report of Analysis





| | | | |
|---|---|---|---|
| **Client Sample ID:** | 47WW30-FEB2007 | | |
| **Lab Sample ID:** | T16445-2 | **Date Sampled:** | 02/22/07 |
| **Matrix:** | AQ - Ground Water | **Date Received:** | 02/24/07 |
| **Method:** | SW846 8260B | **Percent Solids:** | n/a |
| **Project:** | Longhorn Army Ammunition Plant | | |

| | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|---|---|---|---|---|---|---|---|
| Run #1 | F0079173.D | 1 | 03/07/07 | LJ | n/a | n/a | VF2314 |
| Run #2 | F0079179.D | 10 | 03/07/07 | LJ | n/a | n/a | VF2314 |

| | Purge Volume |
|---|---|
| Run #1 | 5.0 ml |
| Run #2 | 5.0 ml |

**VOA TCL List**

| CAS No. | Compound | Result | RL | MDL | Units | Q |
|---|---|---|---|---|---|---|
| 67-64-1 | Acetone | 2.8 U | 50 | 2.8 | ug/l | |
| 71-43-2 | Benzene | 0.23 U | 2.0 | 0.23 | ug/l | |
| 75-27-4 | Bromodichloromethane | 0.33 U | 2.0 | 0.33 | ug/l | |
| 75-25-2 | Bromoform | 0.65 U | 2.0 | 0.65 | ug/l | |
| 108-90-7 | Chlorobenzene | 0.54 U | 2.0 | 0.54 | ug/l | |
| 75-00-3 | Chloroethane | 0.46 U | 2.0 | 0.46 | ug/l | |
| 67-66-3 | Chloroform | 0.66 U | 2.0 | 0.66 | ug/l | |
| 75-15-0 | Carbon disulfide | 0.62 U | 2.0 | 0.62 | ug/l | |
| 56-23-5 | Carbon tetrachloride | 0.52 U | 2.0 | 0.52 | ug/l | |
| 75-34-3 | 1,1-Dichloroethane | 0.52 U | 2.0 | 0.52 | ug/l | |
| 75-35-4 | 1,1-Dichloroethylene | 1.9 | 2.0 | 0.68 | ug/l | J |
| 107-06-2 | 1,2-Dichloroethane | 0.53 U | 2.0 | 0.53 | ug/l | |
| 78-87-5 | 1,2-Dichloropropane | 0.59 U | 2.0 | 0.59 | ug/l | |
| 124-48-1 | Dibromochloromethane | 0.68 U | 2.0 | 0.68 | ug/l | |
| 156-59-2 | cis-1,2-Dichloroethylene | 6.8 | 2.0 | 0.83 | ug/l | |
| 10061-01-5 | cis-1,3-Dichloropropene | 0.59 U | 2.0 | 0.59 | ug/l | |
| 156-60-5 | trans-1,2-Dichloroethylene | 0.75 U | 2.0 | 0.75 | ug/l | |
| 10061-02-6 | trans-1,3-Dichloropropene | 0.61 U | 2.0 | 0.61 | ug/l | |
| 100-41-4 | Ethylbenzene | 0.48 U | 2.0 | 0.48 | ug/l | |
| 591-78-6 | 2-Hexanone | 1.9 U | 10 | 1.9 | ug/l | |
| 108-10-1 | 4-Methyl-2-pentanone | 7.3 U | 10 | 7.3 | ug/l | |
| 74-83-9 | Methyl bromide | 0.47 U | 2.0 | 0.47 | ug/l | |
| 74-87-3 | Methyl chloride | 0.60 U | 2.0 | 0.60 | ug/l | |
| 75-09-2 | Methylene chloride | 0.67 U | 5.0 | 0.67 | ug/l | |
| 78-93-3 | Methyl ethyl ketone | 3.0 U | 10 | 3.0 | ug/l | |
| 100-42-5 | Styrene | 0.50 U | 2.0 | 0.50 | ug/l | |
| 71-55-6 | 1,1,1-Trichloroethane | 0.37 U | 2.0 | 0.37 | ug/l | |
| 79-34-5 | 1,1,2,2-Tetrachloroethane | 0.46 U | 2.0 | 0.46 | ug/l | |
| 79-00-5 | 1,1,2-Trichloroethane | 0.66 U | 2.0 | 0.66 | ug/l | |
| 127-18-4 | Tetrachloroethylene | 0.74 U | 2.0 | 0.74 | ug/l | |
| 108-88-3 | Toluene | 0.54 U | 2.0 | 0.54 | ug/l | |
| 79-01-6 | Trichloroethylene | 1060 [a] | 20 | 6.3 | ug/l | |

U = Not detected MDL - Method Detection Limit J = Indicates an estimated value
RL = Reporting Limit B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

Accutest Laboratories

# Report of Analysis






| | | | |
|---|---|---|---|
| **Client Sample ID:** | 47WW30-FEB2007 | | |
| **Lab Sample ID:** | T16445-2 | **Date Sampled:** | 02/22/07 |
| **Matrix:** | AQ - Ground Water | **Date Received:** | 02/24/07 |
| **Method:** | SW846 8260B | **Percent Solids:** | n/a |
| **Project:** | Longhorn Army Ammunition Plant | | |

**VOA TCL List**

| CAS No. | Compound | Result | RL | MDL | Units | Q |
|---|---|---|---|---|---|---|
| 75-01-4 | Vinyl chloride | 0.32 U | 2.0 | 0.32 | ug/l | |
| 1330-20-7 | Xylene (total) | 1.1 U | 6.0 | 1.1 | ug/l | |

| CAS No. | Surrogate Recoveries | Run# 1 | Run# 2 | Limits |
|---|---|---|---|---|
| 1868-53-7 | Dibromofluoromethane | 107% | 104% | 73-139% |
| 17060-07-0 | 1,2-Dichloroethane-D4 | 104% | 101% | 66-139% |
| 2037-26-5 | Toluene-D8 | 106% | 107% | 77-148% |
| 460-00-4 | 4-Bromofluorobenzene | 118% | 128% | 84-150% |

(a) Result is from Run# 2

U = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Accutest Laboratories

# Report of Analysis





| | | | |
|---|---|---|---|
| **Client Sample ID:** | 47WW30-FEB2007 | | |
| **Lab Sample ID:** | T16445-2 | **Date Sampled:** | 02/22/07 |
| **Matrix:** | AQ - Ground Water | **Date Received:** | 02/24/07 |
| **Method:** | RSKSOP-147/175 | **Percent Solids:** | n/a |
| **Project:** | Longhorn Army Ammunition Plant | | |

| | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|---|---|---|---|---|---|---|---|
| Run #1 [a] | XY025256.D | 1 | 03/01/07 | AFL | n/a | n/a | F:GXY992 |
| Run #2 | | | | | | | |

| CAS No. | Compound | Result | RL | MDL | Units | Q |
|---|---|---|---|---|---|---|
| 74-82-8 | Methane | 1.68 | 0.50 | 0.30 | ug/l | |
| 74-84-0 | Ethane | 0.60 U | 1.0 | 0.60 | ug/l | |
| 74-85-1 | Ethene | 0.80 U | 1.0 | 0.80 | ug/l | |

(a) Analysis performed at Accutest Laboratories, Orlando, FL.

U = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Accutest Laboratories

# Report of Analysis





| | | | |
|---|---|---|---|
| **Client Sample ID:** | 47WW30-FEB2007 | | |
| **Lab Sample ID:** | T16445-2 | **Date Sampled:** | 02/22/07 |
| **Matrix:** | AQ - Ground Water | **Date Received:** | 02/24/07 |
| | | **Percent Solids:** | n/a |
| **Project:** | Longhorn Army Ammunition Plant | | |

**General Chemistry**

| Analyte | Result | RL | MDL | Units | DF | Analyzed | By | Method |
|---|---|---|---|---|---|---|---|---|
| **Perchlorate by IC** | | | | | | | | |
| Perchlorate [a] | 4.0 U | 10 | 4.0 | ug/l | 1 | 03/02/07 16:15 | AFL | EPA 314 |
| Alkalinity, Total as CaCO3 | 752 | 25 | 0.30 | mg/l | 5 | 03/08/07 12:50 | EB | EPA 310.1 |
| Carbon Dioxide | 150 | 5.0 | | mg/l | 1 | 03/12/07 | RM | SM18 4500CO2D |
| Chloride | 726 | 20 | 0.57 | mg/l | 20 | 03/05/07 12:15 | EB | EPA 325.3 |
| Nitrogen, Nitrate [b] | < 0.10 | 0.10 | 0.0050 | mg/l | 1 | 02/26/07 09:23 | LN | SM18 4500NO3E/NO2B |
| Nitrogen, Nitrate + Nitrite | 0.0050 U | 0.050 | 0.0050 | mg/l | 1 | 02/26/07 09:23 | LN | EPA 353.2 |
| Nitrogen, Nitrite | 0.0030 U | 0.050 | 0.0030 | mg/l | 1 | 02/24/07 14:28 | LN | EPA 353.2 |
| Specific Conductivity [a] | 4130 | 0.50 | 0.50 | umhos/cm | 1 | 03/06/07 | AFL | EPA 120.1 |
| Sulfate | 637 | 40 | 2.6 | mg/l | 4 | 03/06/07 18:00 | EB | EPA 375.3 |
| Sulfide | 0.0 B | 0.20 | | mg/l | 1 | 03/01/07 12:10 | LN | EPA 376.1 |
| Total Organic Carbon | 2.0 | 1.0 | 0.092 | mg/l | 1 | 02/27/07 15:10 | LN | EPA 415.1/9060 |
| pH | 7.1 | | | su | 1 | 03/01/07 13:00 | TW | EPA 150.1/9040 |

(a) Analysis performed at Accutest Laboratories, Orlando, FL.
(b) Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

RL = Reporting Limit
MDL = Method Detection Limit
U = Indicates a result < MDL
B = Indicates a result > = MDL but < RL

Accutest Laboratories

# Report of Analysis





| | | | |
|---|---|---|---|
| **Client Sample ID:** | LHSMW43-FEB2007 | | |
| **Lab Sample ID:** | T16445-3 | **Date Sampled:** | 02/22/07 |
| **Matrix:** | AQ - Ground Water | **Date Received:** | 02/24/07 |
| **Method:** | SW846 8260B | **Percent Solids:** | n/a |
| **Project:** | Longhorn Army Ammunition Plant | | |

| | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|---|---|---|---|---|---|---|---|
| Run #1 | F0079232.D | 1 | 03/08/07 | LJ | n/a | n/a | VF2318 |
| Run #2 [a] | F0079190.D | 1 | 03/07/07 | LJ | n/a | n/a | VF2315 |
| Run #3 | F0079233.D | 100 | 03/08/07 | LJ | n/a | n/a | VF2318 |

| | Purge Volume |
|---|---|
| Run #1 | 5.0 ml |
| Run #2 | 5.0 ml |
| Run #3 | 5.0 ml |

**VOA TCL List**

| CAS No. | Compound | Result | RL | MDL | Units | Q |
|---|---|---|---|---|---|---|
| 67-64-1 | Acetone | 2.8 U | 50 | 2.8 | ug/l | |
| 71-43-2 | Benzene | 0.23 U | 2.0 | 0.23 | ug/l | |
| 75-27-4 | Bromodichloromethane | 0.33 U | 2.0 | 0.33 | ug/l | |
| 75-25-2 | Bromoform | 0.65 U | 2.0 | 0.65 | ug/l | |
| 108-90-7 | Chlorobenzene | 0.54 U | 2.0 | 0.54 | ug/l | |
| 75-00-3 | Chloroethane | 0.46 U | 2.0 | 0.46 | ug/l | |
| 67-66-3 | Chloroform | 0.66 U | 2.0 | 0.66 | ug/l | |
| 75-15-0 | Carbon disulfide | 0.62 U | 2.0 | 0.62 | ug/l | |
| 56-23-5 | Carbon tetrachloride | 0.52 U | 2.0 | 0.52 | ug/l | |
| 75-34-3 | 1,1-Dichloroethane | 1.8 | 2.0 | 0.52 | ug/l | J |
| 75-35-4 | 1,1-Dichloroethylene | 10.3 | 2.0 | 0.68 | ug/l | |
| 107-06-2 | 1,2-Dichloroethane | 0.53 U | 2.0 | 0.53 | ug/l | |
| 78-87-5 | 1,2-Dichloropropane | 0.59 U | 2.0 | 0.59 | ug/l | |
| 124-48-1 | Dibromochloromethane | 0.68 U | 2.0 | 0.68 | ug/l | |
| 156-59-2 | cis-1,2-Dichloroethylene | 605 [b] | 200 | 83 | ug/l | |
| 10061-01-5 | cis-1,3-Dichloropropene | 0.59 U | 2.0 | 0.59 | ug/l | |
| 156-60-5 | trans-1,2-Dichloroethylene | 1.9 | 2.0 | 0.75 | ug/l | J |
| 10061-02-6 | trans-1,3-Dichloropropene | 0.61 U | 2.0 | 0.61 | ug/l | |
| 100-41-4 | Ethylbenzene | 0.48 U | 2.0 | 0.48 | ug/l | |
| 591-78-6 | 2-Hexanone | 1.9 U | 10 | 1.9 | ug/l | |
| 108-10-1 | 4-Methyl-2-pentanone | 7.3 U | 10 | 7.3 | ug/l | |
| 74-83-9 | Methyl bromide | 0.47 U | 2.0 | 0.47 | ug/l | |
| 74-87-3 | Methyl chloride | 0.60 U | 2.0 | 0.60 | ug/l | |
| 75-09-2 | Methylene chloride | 0.67 U | 5.0 | 0.67 | ug/l | |
| 78-93-3 | Methyl ethyl ketone | 3.0 U | 10 | 3.0 | ug/l | |
| 100-42-5 | Styrene | 0.50 U | 2.0 | 0.50 | ug/l | |
| 71-55-6 | 1,1,1-Trichloroethane | 0.37 U | 2.0 | 0.37 | ug/l | |
| 79-34-5 | 1,1,2,2-Tetrachloroethane | 0.46 U | 2.0 | 0.46 | ug/l | |
| 79-00-5 | 1,1,2-Trichloroethane | 1.8 | 2.0 | 0.66 | ug/l | J |
| 127-18-4 | Tetrachloroethylene | 82.0 | 2.0 | 0.74 | ug/l | |

U = Not detected　　MDL - Method Detection Limit　　J = Indicates an estimated value
RL = Reporting Limit　　B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range　　N = Indicates presumptive evidence of a compound


ACCUTEST Laboratories
T16445

Accutest Laboratories

# Report of Analysis





| | | | |
|---|---|---|---|
| **Client Sample ID:** | LHSMW43-FEB2007 | | |
| **Lab Sample ID:** | T16445-3 | **Date Sampled:** | 02/22/07 |
| **Matrix:** | AQ - Ground Water | **Date Received:** | 02/24/07 |
| **Method:** | SW846 8260B | **Percent Solids:** | n/a |
| **Project:** | Longhorn Army Ammunition Plant | | |

**VOA TCL List**

| CAS No. | Compound | Result | RL | MDL | Units | Q |
|---|---|---|---|---|---|---|
| 108-88-3 | Toluene | 0.54 U | 2.0 | 0.54 | ug/l | |
| 79-01-6 | Trichloroethylene | 11600 [b] | 200 | 63 | ug/l | |
| 75-01-4 | Vinyl chloride | 3.7 | 2.0 | 0.32 | ug/l | |
| 1330-20-7 | Xylene (total) | 1.1 U | 6.0 | 1.1 | ug/l | |

| CAS No. | Surrogate Recoveries | Run# 1 | Run# 2 | Run# 3 | Limits |
|---|---|---|---|---|---|
| 1868-53-7 | Dibromofluoromethane | 107% | 106% | 102% | 73-139% |
| 17060-07-0 | 1,2-Dichloroethane-D4 | 102% | 106% | 94% | 66-139% |
| 2037-26-5 | Toluene-D8 | 100% | 102% | 104% | 77-148% |
| 460-00-4 | 4-Bromofluorobenzene | 112% | 123% | 111% | 84-150% |

(a) For QC only.
(b) Result is from Run# 3

U = Not detected MDL - Method Detection Limit J = Indicates an estimated value
RL = Reporting Limit B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

Accutest Laboratories

# Report of Analysis





| | | | |
|---|---|---|---|
| **Client Sample ID:** | LHSMW43-FEB2007 | | |
| **Lab Sample ID:** | T16445-3 | **Date Sampled:** | 02/22/07 |
| **Matrix:** | AQ - Ground Water | **Date Received:** | 02/24/07 |
| **Method:** | RSKSOP-147/175 | **Percent Solids:** | n/a |
| **Project:** | Longhorn Army Ammunition Plant | | |

| | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|---|---|---|---|---|---|---|---|
| Run #1 [a] | XY025257.D | 1 | 03/01/07 | AFL | n/a | n/a | F:GXY992 |
| Run #2 | | | | | | | |

| CAS No. | Compound | Result | RL | MDL | Units | Q |
|---|---|---|---|---|---|---|
| 74-82-8 | Methane | 7.07 | 0.50 | 0.30 | ug/l | |
| 74-84-0 | Ethane | 0.62 | 1.0 | 0.60 | ug/l | J |
| 74-85-1 | Ethene | 2.7 | 1.0 | 0.80 | ug/l | |

(a) Analysis performed at Accutest Laboratories, Orlando, FL.

U = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Accutest Laboratories

# Report of Analysis





| | | | |
|---|---|---|---|
| **Client Sample ID:** | LHSMW43-FEB2007 | | |
| **Lab Sample ID:** | T16445-3 | **Date Sampled:** | 02/22/07 |
| **Matrix:** | AQ - Ground Water | **Date Received:** | 02/24/07 |
| | | **Percent Solids:** | n/a |
| **Project:** | Longhorn Army Ammunition Plant | | |

## General Chemistry

| Analyte | Result | RL | MDL | Units | DF | Analyzed | By | Method |
|---|---|---|---|---|---|---|---|---|
| **Perchlorate by IC** | | | | | | | | |
| Perchlorate [a] | 4.0 U | 10 | 4.0 | ug/l | 1 | 03/02/07 16:29 | AFL | EPA 314 |
| Alkalinity, Total as CaCO3 | 295 | 25 | 0.30 | mg/l | 5 | 03/08/07 12:50 | EB | EPA 310.1 |
| Carbon Dioxide | 93.0 | 5.0 | | mg/l | 1 | 03/12/07 | RM | SM18 4500CO2D |
| Chloride | 290 | 33 | 0.57 | mg/l | 33.3 | 03/05/07 12:15 | EB | EPA 325.3 |
| Nitrogen, Nitrate [b] | < 0.10 | 0.10 | 0.0050 | mg/l | 1 | 02/26/07 09:23 | LN | SM18 4500NO3E/NO2B |
| Nitrogen, Nitrate + Nitrite | 0.0050 U | 0.050 | 0.0050 | mg/l | 1 | 02/26/07 09:23 | LN | EPA 353.2 |
| Nitrogen, Nitrite | 0.0030 U | 0.050 | 0.0030 | mg/l | 1 | 02/24/07 14:28 | LN | EPA 353.2 |
| Specific Conductivity [a] | 2920 | 0.50 | 0.50 | umhos/cm | 1 | 03/27/07 | AFL | EPA 120.1 |
| Sulfate | 756 | 40 | 2.6 | mg/l | 4 | 03/06/07 18:00 | EB | EPA 375.3 |
| Sulfide | 0.0 B | 0.20 | | mg/l | 1 | 03/01/07 12:10 | LN | EPA 376.1 |
| Total Organic Carbon | 4.0 | 1.0 | 0.092 | mg/l | 1 | 02/27/07 15:10 | LN | EPA 415.1/9060 |
| pH | 6.8 | | | su | 1 | 03/01/07 13:00 | TW | EPA 150.1/9040 |

(a) Analysis performed at Accutest Laboratories, Orlando, FL.
(b) Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

RL = Reporting Limit
MDL = Method Detection Limit

U = Indicates a result < MDL
B = Indicates a result > = MDL but < RL

Accutest Laboratories

# Report of Analysis





| | | | |
|---|---|---|---|
| **Client Sample ID:** | 50WW06-FEB2007 | | |
| **Lab Sample ID:** | T16445-4 | **Date Sampled:** | 02/22/07 |
| **Matrix:** | AQ - Ground Water | **Date Received:** | 02/24/07 |
| **Method:** | SW846 8260B | **Percent Solids:** | n/a |
| **Project:** | Longhorn Army Ammunition Plant | | |

| | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|---|---|---|---|---|---|---|---|
| Run #1 | F0079226.D | 1 | 03/08/07 | LJ | n/a | n/a | VF2318 |
| Run #2 | | | | | | | |

| | Purge Volume |
|---|---|
| Run #1 | 5.0 ml |
| Run #2 | |

**VOA TCL List**

| CAS No. | Compound | Result | RL | MDL | Units | Q |
|---|---|---|---|---|---|---|
| 67-64-1 | Acetone | 2.8 U | 50 | 2.8 | ug/l | |
| 71-43-2 | Benzene | 0.23 U | 2.0 | 0.23 | ug/l | |
| 75-27-4 | Bromodichloromethane | 0.33 U | 2.0 | 0.33 | ug/l | |
| 75-25-2 | Bromoform | 0.65 U | 2.0 | 0.65 | ug/l | |
| 108-90-7 | Chlorobenzene | 0.54 U | 2.0 | 0.54 | ug/l | |
| 75-00-3 | Chloroethane | 0.46 U | 2.0 | 0.46 | ug/l | |
| 67-66-3 | Chloroform | 0.66 U | 2.0 | 0.66 | ug/l | |
| 75-15-0 | Carbon disulfide | 0.62 U | 2.0 | 0.62 | ug/l | |
| 56-23-5 | Carbon tetrachloride | 0.52 U | 2.0 | 0.52 | ug/l | |
| 75-34-3 | 1,1-Dichloroethane | 0.52 U | 2.0 | 0.52 | ug/l | |
| 75-35-4 | 1,1-Dichloroethylene | 0.68 U | 2.0 | 0.68 | ug/l | |
| 107-06-2 | 1,2-Dichloroethane | 0.53 U | 2.0 | 0.53 | ug/l | |
| 78-87-5 | 1,2-Dichloropropane | 0.59 U | 2.0 | 0.59 | ug/l | |
| 124-48-1 | Dibromochloromethane | 0.68 U | 2.0 | 0.68 | ug/l | |
| 156-59-2 | cis-1,2-Dichloroethylene | 0.83 U | 2.0 | 0.83 | ug/l | |
| 10061-01-5 | cis-1,3-Dichloropropene | 0.59 U | 2.0 | 0.59 | ug/l | |
| 156-60-5 | trans-1,2-Dichloroethylene | 0.75 U | 2.0 | 0.75 | ug/l | |
| 10061-02-6 | trans-1,3-Dichloropropene | 0.61 U | 2.0 | 0.61 | ug/l | |
| 100-41-4 | Ethylbenzene | 0.48 U | 2.0 | 0.48 | ug/l | |
| 591-78-6 | 2-Hexanone | 1.9 U | 10 | 1.9 | ug/l | |
| 108-10-1 | 4-Methyl-2-pentanone | 7.3 U | 10 | 7.3 | ug/l | |
| 74-83-9 | Methyl bromide | 0.47 U | 2.0 | 0.47 | ug/l | |
| 74-87-3 | Methyl chloride | 0.60 U | 2.0 | 0.60 | ug/l | |
| 75-09-2 | Methylene chloride | 0.67 U | 5.0 | 0.67 | ug/l | |
| 78-93-3 | Methyl ethyl ketone | 3.0 U | 10 | 3.0 | ug/l | |
| 100-42-5 | Styrene | 0.50 U | 2.0 | 0.50 | ug/l | |
| 71-55-6 | 1,1,1-Trichloroethane | 0.37 U | 2.0 | 0.37 | ug/l | |
| 79-34-5 | 1,1,2,2-Tetrachloroethane | 0.46 U | 2.0 | 0.46 | ug/l | |
| 79-00-5 | 1,1,2-Trichloroethane | 0.66 U | 2.0 | 0.66 | ug/l | |
| 127-18-4 | Tetrachloroethylene | 0.74 U | 2.0 | 0.74 | ug/l | |
| 108-88-3 | Toluene | 0.54 U | 2.0 | 0.54 | ug/l | |
| 79-01-6 | Trichloroethylene | 2.0 | 2.0 | 0.63 | ug/l | |

U = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Accutest Laboratories

# Report of Analysis






| | | | |
|---|---|---|---|
| **Client Sample ID:** | 50WW06-FEB2007 | | |
| **Lab Sample ID:** | T16445-4 | **Date Sampled:** | 02/22/07 |
| **Matrix:** | AQ - Ground Water | **Date Received:** | 02/24/07 |
| **Method:** | SW846 8260B | **Percent Solids:** | n/a |
| **Project:** | Longhorn Army Ammunition Plant | | |

**VOA TCL List**

| CAS No. | Compound | Result | RL | MDL | Units | Q |
|---|---|---|---|---|---|---|
| 75-01-4 | Vinyl chloride | 0.32 U | 2.0 | 0.32 | ug/l | |
| 1330-20-7 | Xylene (total) | 1.1 U | 6.0 | 1.1 | ug/l | |

| CAS No. | Surrogate Recoveries | Run# 1 | Run# 2 | Limits |
|---|---|---|---|---|
| 1868-53-7 | Dibromofluoromethane | 102% | | 73-139% |
| 17060-07-0 | 1,2-Dichloroethane-D4 | 98% | | 66-139% |
| 2037-26-5 | Toluene-D8 | 106% | | 77-148% |
| 460-00-4 | 4-Bromofluorobenzene | 119% | | 84-150% |

U = Not detected MDL - Method Detection Limit J = Indicates an estimated value
RL = Reporting Limit B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

Accutest Laboratories

# Report of Analysis



| | | | |
|---|---|---|---|
| **Client Sample ID:** | 50WW06-FEB2007 | | |
| **Lab Sample ID:** | T16445-4 | **Date Sampled:** | 02/22/07 |
| **Matrix:** | AQ - Ground Water | **Date Received:** | 02/24/07 |
| **Method:** | RSKSOP-147/175 | **Percent Solids:** | n/a |
| **Project:** | Longhorn Army Ammunition Plant | | |

| | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|---|---|---|---|---|---|---|---|
| Run #1 [a] | XY025258.D | 1 | 03/01/07 | AFL | n/a | n/a | F:GXY992 |
| Run #2 | | | | | | | |

| CAS No. | Compound | Result | RL | MDL | Units | Q |
|---|---|---|---|---|---|---|
| 74-82-8 | Methane | 2.50 | 0.50 | 0.30 | ug/l | |
| 74-84-0 | Ethane | 0.60 U | 1.0 | 0.60 | ug/l | |
| 74-85-1 | Ethene | 0.80 U | 1.0 | 0.80 | ug/l | |

(a) Analysis performed at Accutest Laboratories, Orlando, FL.

U = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Accutest Laboratories

# Report of Analysis





| | | | |
|---|---|---|---|
| **Client Sample ID:** | 50WW06-FEB2007 | | |
| **Lab Sample ID:** | T16445-4 | **Date Sampled:** | 02/22/07 |
| **Matrix:** | AQ - Ground Water | **Date Received:** | 02/24/07 |
| | | **Percent Solids:** | n/a |
| **Project:** | Longhorn Army Ammunition Plant | | |

**General Chemistry**

| Analyte | Result | RL | MDL | Units | DF | Analyzed | By | Method |
|---|---|---|---|---|---|---|---|---|
| **Perchlorate by IC** | | | | | | | | |
| Perchlorate [a] | 4.0 U | 10 | 4.0 | ug/l | 1 | 03/02/07 16:43 | AFL | EPA 314 |
| | | | | | | | | |
| Alkalinity, Total as CaCO3 | 278 | 25 | 0.30 | mg/l | 5 | 03/08/07 12:50 | EB | EPA 310.1 |
| Carbon Dioxide | 44.0 | 5.0 | | mg/l | 1 | 03/12/07 | RM | SM18 4500CO2D |
| Chloride | 209 | 20 | 0.57 | mg/l | 20 | 03/05/07 12:15 | EB | EPA 325.3 |
| Nitrogen, Nitrate [b] | < 0.10 | 0.10 | 0.0050 | mg/l | 1 | 02/26/07 09:23 | LN | SM18 4500NO3E/NO2B |
| Nitrogen, Nitrate + Nitrite | 0.040 B | 0.050 | 0.0050 | mg/l | 1 | 02/26/07 09:23 | LN | EPA 353.2 |
| Nitrogen, Nitrite | 0.0030 U | 0.050 | 0.0030 | mg/l | 1 | 02/24/07 14:28 | LN | EPA 353.2 |
| Specific Conductivity [a] | 1260 | 0.50 | 0.50 | umhos/cm | 1 | 03/06/07 | AFL | EPA 120.1 |
| Sulfate | 203 | 20 | 2.6 | mg/l | 2 | 03/06/07 18:00 | EB | EPA 375.3 |
| Sulfide | 0.0 B | 0.20 | | mg/l | 1 | 03/01/07 12:10 | LN | EPA 376.1 |
| Total Organic Carbon | 3.0 | 1.0 | 0.092 | mg/l | 1 | 02/27/07 15:10 | LN | EPA 415.1/9060 |
| pH | 7.1 | | | su | 1 | 03/01/07 13:00 | TW | EPA 150.1/9040 |

(a) Analysis performed at Accutest Laboratories, Orlando, FL.
(b) Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

RL = Reporting Limit
MDL = Method Detection Limit

U = Indicates a result < MDL
B = Indicates a result > = MDL but < RL

Accutest Laboratories

# Report of Analysis





| | | | |
|---|---|---|---|
| **Client Sample ID:** | 50WW05-FEB2007 | | |
| **Lab Sample ID:** | T16445-5 | **Date Sampled:** | 02/23/07 |
| **Matrix:** | AQ - Ground Water | **Date Received:** | 02/24/07 |
| **Method:** | SW846 8260B | **Percent Solids:** | n/a |
| **Project:** | Longhorn Army Ammunition Plant | | |

| | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|---|---|---|---|---|---|---|---|
| Run #1 | F0079169.D | 1 | 03/07/07 | LJ | n/a | n/a | VF2314 |
| Run #2 | F0079180.D | 20 | 03/07/07 | LJ | n/a | n/a | VF2314 |

| | Purge Volume |
|---|---|
| Run #1 | 5.0 ml |
| Run #2 | 5.0 ml |

**VOA TCL List**

| CAS No. | Compound | Result | RL | MDL | Units | Q |
|---|---|---|---|---|---|---|
| 67-64-1 | Acetone | 2.8 U | 50 | 2.8 | ug/l | |
| 71-43-2 | Benzene | 0.23 U | 2.0 | 0.23 | ug/l | |
| 75-27-4 | Bromodichloromethane | 0.33 U | 2.0 | 0.33 | ug/l | |
| 75-25-2 | Bromoform | 0.65 U | 2.0 | 0.65 | ug/l | |
| 108-90-7 | Chlorobenzene | 0.54 U | 2.0 | 0.54 | ug/l | |
| 75-00-3 | Chloroethane | 0.46 U | 2.0 | 0.46 | ug/l | |
| 67-66-3 | Chloroform | 0.66 U | 2.0 | 0.66 | ug/l | |
| 75-15-0 | Carbon disulfide | 0.62 U | 2.0 | 0.62 | ug/l | |
| 56-23-5 | Carbon tetrachloride | 0.52 U | 2.0 | 0.52 | ug/l | |
| 75-34-3 | 1,1-Dichloroethane | 1.3 | 2.0 | 0.52 | ug/l | J |
| 75-35-4 | 1,1-Dichloroethylene | 12.9 | 2.0 | 0.68 | ug/l | |
| 107-06-2 | 1,2-Dichloroethane | 13.5 | 2.0 | 0.53 | ug/l | |
| 78-87-5 | 1,2-Dichloropropane | 0.59 U | 2.0 | 0.59 | ug/l | |
| 124-48-1 | Dibromochloromethane | 0.68 U | 2.0 | 0.68 | ug/l | |
| 156-59-2 | cis-1,2-Dichloroethylene | 48.2 | 2.0 | 0.83 | ug/l | |
| 10061-01-5 | cis-1,3-Dichloropropene | 0.59 U | 2.0 | 0.59 | ug/l | |
| 156-60-5 | trans-1,2-Dichloroethylene | 0.75 U | 2.0 | 0.75 | ug/l | |
| 10061-02-6 | trans-1,3-Dichloropropene | 0.61 U | 2.0 | 0.61 | ug/l | |
| 100-41-4 | Ethylbenzene | 0.48 U | 2.0 | 0.48 | ug/l | |
| 591-78-6 | 2-Hexanone | 1.9 U | 10 | 1.9 | ug/l | |
| 108-10-1 | 4-Methyl-2-pentanone | 7.3 U | 10 | 7.3 | ug/l | |
| 74-83-9 | Methyl bromide | 0.47 U | 2.0 | 0.47 | ug/l | |
| 74-87-3 | Methyl chloride | 0.60 U | 2.0 | 0.60 | ug/l | |
| 75-09-2 | Methylene chloride | 0.67 U | 5.0 | 0.67 | ug/l | |
| 78-93-3 | Methyl ethyl ketone | 3.0 U | 10 | 3.0 | ug/l | |
| 100-42-5 | Styrene | 0.50 U | 2.0 | 0.50 | ug/l | |
| 71-55-6 | 1,1,1-Trichloroethane | 0.37 U | 2.0 | 0.37 | ug/l | |
| 79-34-5 | 1,1,2,2-Tetrachloroethane | 0.46 U | 2.0 | 0.46 | ug/l | |
| 79-00-5 | 1,1,2-Trichloroethane | 0.66 U | 2.0 | 0.66 | ug/l | |
| 127-18-4 | Tetrachloroethylene | 5.1 | 2.0 | 0.74 | ug/l | |
| 108-88-3 | Toluene | 0.54 U | 2.0 | 0.54 | ug/l | |
| 79-01-6 | Trichloroethylene | 1460 [a] | 40 | 13 | ug/l | |

U = Not detected  MDL - Method Detection Limit  J = Indicates an estimated value
RL = Reporting Limit  B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range  N = Indicates presumptive evidence of a compound

Accutest Laboratories

# Report of Analysis





| | | | |
|---|---|---|---|
| **Client Sample ID:** | 50WW05-FEB2007 | | |
| **Lab Sample ID:** | T16445-5 | **Date Sampled:** | 02/23/07 |
| **Matrix:** | AQ - Ground Water | **Date Received:** | 02/24/07 |
| **Method:** | SW846 8260B | **Percent Solids:** | n/a |
| **Project:** | Longhorn Army Ammunition Plant | | |

**VOA TCL List**

| CAS No. | Compound | Result | RL | MDL | Units | Q |
|---|---|---|---|---|---|---|
| 75-01-4 | Vinyl chloride | 2.5 | 2.0 | 0.32 | ug/l | |
| 1330-20-7 | Xylene (total) | 1.1 U | 6.0 | 1.1 | ug/l | |

| CAS No. | Surrogate Recoveries | Run# 1 | Run# 2 | Limits |
|---|---|---|---|---|
| 1868-53-7 | Dibromofluoromethane | 107% | 105% | 73-139% |
| 17060-07-0 | 1,2-Dichloroethane-D4 | 105% | 104% | 66-139% |
| 2037-26-5 | Toluene-D8 | 105% | 108% | 77-148% |
| 460-00-4 | 4-Bromofluorobenzene | 114% | 129% | 84-150% |

(a) Result is from Run# 2

U = Not detected MDL - Method Detection Limit J = Indicates an estimated value
RL = Reporting Limit B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

# Report of Analysis





| | | | |
|---|---|---|---|
| **Client Sample ID:** | 50WW05-FEB2007 | | |
| **Lab Sample ID:** | T16445-5 | **Date Sampled:** | 02/23/07 |
| **Matrix:** | AQ - Ground Water | **Date Received:** | 02/24/07 |
| **Method:** | RSKSOP-147/175 | **Percent Solids:** | n/a |
| **Project:** | Longhorn Army Ammunition Plant | | |

| | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|---|---|---|---|---|---|---|---|
| Run #1 [a] | XY025259.D | 1 | 03/01/07 | AFL | n/a | n/a | F:GXY992 |
| Run #2 | | | | | | | |

| CAS No. | Compound | Result | RL | MDL | Units | Q |
|---|---|---|---|---|---|---|
| 74-82-8 | Methane | 2.93 | 0.50 | 0.30 | ug/l | |
| 74-84-0 | Ethane | 0.60 U | 1.0 | 0.60 | ug/l | |
| 74-85-1 | Ethene | 0.80 U | 1.0 | 0.80 | ug/l | |

(a) Analysis performed at Accutest Laboratories, Orlando, FL.

U = Not detected
MDL - Method Detection Limit
J = Indicates an estimated value
RL = Reporting Limit
B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range
N = Indicates presumptive evidence of a compound

Accutest Laboratories

# Report of Analysis





| | | | |
|---|---|---|---|
| **Client Sample ID:** | 50WW05-FEB2007 | | |
| **Lab Sample ID:** | T16445-5 | **Date Sampled:** | 02/23/07 |
| **Matrix:** | AQ - Ground Water | **Date Received:** | 02/24/07 |
| | | **Percent Solids:** | n/a |
| **Project:** | Longhorn Army Ammunition Plant | | |

## General Chemistry

| Analyte | Result | RL | MDL | Units | DF | Analyzed | By | Method |
|---|---|---|---|---|---|---|---|---|
| **Perchlorate by IC** | | | | | | | | |
| Perchlorate [a] | 27.8 | 10 | 4.0 | ug/l | 1 | 03/02/07 16:58 | AFL | EPA 314 |
| | | | | | | | | |
| Alkalinity, Total as CaCO3 | 457 | 25 | 0.30 | mg/l | 5 | 03/08/07 12:50 | EB | EPA 310.1 |
| Carbon Dioxide | 73.0 | 5.0 | | mg/l | 1 | 03/12/07 | RM | SM18 4500CO2D |
| Chloride | 253 | 20 | 0.57 | mg/l | 20 | 03/05/07 12:15 | EB | EPA 325.3 |
| Nitrogen, Nitrate [b] | < 0.10 | 0.10 | 0.0050 | mg/l | 1 | 02/26/07 09:23 | LN | SM18 4500NO3E/NO2B |
| Nitrogen, Nitrate + Nitrite | 0.0050 U | 0.050 | 0.0050 | mg/l | 1 | 02/26/07 09:23 | LN | EPA 353.2 |
| Nitrogen, Nitrite | 0.0030 U | 0.050 | 0.0030 | mg/l | 1 | 02/24/07 14:28 | LN | EPA 353.2 |
| Specific Conductivity [a] | 1800 | 0.50 | 0.50 | umhos/cm | 1 | 03/06/07 | AFL | EPA 120.1 |
| Sulfate | 286 | 40 | 2.6 | mg/l | 4 | 03/06/07 18:00 | EB | EPA 375.3 |
| Sulfide | 0.0 B | 0.20 | | mg/l | 1 | 03/01/07 12:10 | LN | EPA 376.1 |
| Total Organic Carbon | 2.0 | 1.0 | 0.092 | mg/l | 1 | 02/27/07 15:10 | LN | EPA 415.1/9060 |
| pH | 7.1 | | | su | 1 | 03/01/07 13:00 | TW | EPA 150.1/9040 |

(a) Analysis performed at Accutest Laboratories, Orlando, FL.
(b) Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

RL = Reporting Limit
MDL = Method Detection Limit

U = Indicates a result < MDL
B = Indicates a result > = MDL but < RL

Accutest Laboratories

# Report of Analysis





| | | | |
|---|---|---|---|
| **Client Sample ID:** | 50WW02-FEB2007 | | |
| **Lab Sample ID:** | T16445-6 | **Date Sampled:** | 02/23/07 |
| **Matrix:** | AQ - Ground Water | **Date Received:** | 02/24/07 |
| **Method:** | SW846 8260B | **Percent Solids:** | n/a |
| **Project:** | Longhorn Army Ammunition Plant | | |

| | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|---|---|---|---|---|---|---|---|
| Run #1 | F0079194.D | 1 | 03/07/07 | LJ | n/a | n/a | VF2315 |
| Run #2 | F0079234.D | 100 | 03/08/07 | LJ | n/a | n/a | VF2318 |

| | Purge Volume |
|---|---|
| Run #1 | 5.0 ml |
| Run #2 | 5.0 ml |

**VOA TCL List**

| CAS No. | Compound | Result | RL | MDL | Units | Q |
|---|---|---|---|---|---|---|
| 67-64-1 | Acetone | 2.8 U | 50 | 2.8 | ug/l | |
| 71-43-2 | Benzene | 0.46 | 2.0 | 0.23 | ug/l | J |
| 75-27-4 | Bromodichloromethane | 0.33 U | 2.0 | 0.33 | ug/l | |
| 75-25-2 | Bromoform | 0.65 U | 2.0 | 0.65 | ug/l | |
| 108-90-7 | Chlorobenzene | 0.54 U | 2.0 | 0.54 | ug/l | |
| 75-00-3 | Chloroethane | 0.46 U | 2.0 | 0.46 | ug/l | |
| 67-66-3 | Chloroform | 4.2 | 2.0 | 0.66 | ug/l | |
| 75-15-0 | Carbon disulfide | 0.62 U | 2.0 | 0.62 | ug/l | |
| 56-23-5 | Carbon tetrachloride | 0.52 U | 2.0 | 0.52 | ug/l | |
| 75-34-3 | 1,1-Dichloroethane | 5.4 | 2.0 | 0.52 | ug/l | |
| 75-35-4 | 1,1-Dichloroethylene | 6.5 | 2.0 | 0.68 | ug/l | |
| 107-06-2 | 1,2-Dichloroethane | 18.8 | 2.0 | 0.53 | ug/l | |
| 78-87-5 | 1,2-Dichloropropane | 0.59 U | 2.0 | 0.59 | ug/l | |
| 124-48-1 | Dibromochloromethane | 0.68 U | 2.0 | 0.68 | ug/l | |
| 156-59-2 | cis-1,2-Dichloroethylene | 855 [a] | 200 | 83 | ug/l | |
| 10061-01-5 | cis-1,3-Dichloropropene | 0.59 U | 2.0 | 0.59 | ug/l | |
| 156-60-5 | trans-1,2-Dichloroethylene | 2.6 | 2.0 | 0.75 | ug/l | |
| 10061-02-6 | trans-1,3-Dichloropropene | 0.61 U | 2.0 | 0.61 | ug/l | |
| 100-41-4 | Ethylbenzene | 0.48 U | 2.0 | 0.48 | ug/l | |
| 591-78-6 | 2-Hexanone | 1.9 U | 10 | 1.9 | ug/l | |
| 108-10-1 | 4-Methyl-2-pentanone | 7.3 U | 10 | 7.3 | ug/l | |
| 74-83-9 | Methyl bromide | 0.47 U | 2.0 | 0.47 | ug/l | |
| 74-87-3 | Methyl chloride | 0.60 U | 2.0 | 0.60 | ug/l | |
| 75-09-2 | Methylene chloride | 0.67 U | 5.0 | 0.67 | ug/l | |
| 78-93-3 | Methyl ethyl ketone | 3.0 U | 10 | 3.0 | ug/l | |
| 100-42-5 | Styrene | 0.50 U | 2.0 | 0.50 | ug/l | |
| 71-55-6 | 1,1,1-Trichloroethane | 0.37 U | 2.0 | 0.37 | ug/l | |
| 79-34-5 | 1,1,2,2-Tetrachloroethane | 0.46 U | 2.0 | 0.46 | ug/l | |
| 79-00-5 | 1,1,2-Trichloroethane | 0.92 | 2.0 | 0.66 | ug/l | J |
| 127-18-4 | Tetrachloroethylene | 9.3 | 2.0 | 0.74 | ug/l | |
| 108-88-3 | Toluene | 0.54 U | 2.0 | 0.54 | ug/l | |
| 79-01-6 | Trichloroethylene | 5420 [a] | 200 | 63 | ug/l | |

U = Not detected  MDL - Method Detection Limit  J = Indicates an estimated value
RL = Reporting Limit  B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range  N = Indicates presumptive evidence of a compound

Accutest Laboratories

# Report of Analysis





| | | | |
|---|---|---|---|
| **Client Sample ID:** | 50WW02-FEB2007 | | |
| **Lab Sample ID:** | T16445-6 | **Date Sampled:** | 02/23/07 |
| **Matrix:** | AQ - Ground Water | **Date Received:** | 02/24/07 |
| **Method:** | SW846 8260B | **Percent Solids:** | n/a |
| **Project:** | Longhorn Army Ammunition Plant | | |

**VOA TCL List**

| CAS No. | Compound | Result | RL | MDL | Units | Q |
|---|---|---|---|---|---|---|
| 75-01-4 | Vinyl chloride | 15.2 | 2.0 | 0.32 | ug/l | |
| 1330-20-7 | Xylene (total) | 1.1 U | 6.0 | 1.1 | ug/l | |

| CAS No. | Surrogate Recoveries | Run# 1 | Run# 2 | Limits |
|---|---|---|---|---|
| 1868-53-7 | Dibromofluoromethane | 108% | 103% | 73-139% |
| 17060-07-0 | 1,2-Dichloroethane-D4 | 109% | 98% | 66-139% |
| 2037-26-5 | Toluene-D8 | 109% | 105% | 77-148% |
| 460-00-4 | 4-Bromofluorobenzene | 133% | 115% | 84-150% |

(a) Result is from Run# 2

U = Not detected MDL - Method Detection Limit J = Indicates an estimated value
RL = Reporting Limit B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

# Report of Analysis





| | | | |
|---|---|---|---|
| **Client Sample ID:** | 50WW02-FEB2007 | | |
| **Lab Sample ID:** | T16445-6 | **Date Sampled:** | 02/23/07 |
| **Matrix:** | AQ - Ground Water | **Date Received:** | 02/24/07 |
| **Method:** | RSKSOP-147/175 | **Percent Solids:** | n/a |
| **Project:** | Longhorn Army Ammunition Plant | | |

| | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|---|---|---|---|---|---|---|---|
| Run #1 [a] | XY025260.D | 1 | 03/01/07 | AFL | n/a | n/a | F:GXY992 |
| Run #2 | | | | | | | |

| CAS No. | Compound | Result | RL | MDL | Units | Q |
|---|---|---|---|---|---|---|
| 74-82-8 | Methane | 1.87 | 0.50 | 0.30 | ug/l | |
| 74-84-0 | Ethane | 0.60 U | 1.0 | 0.60 | ug/l | |
| 74-85-1 | Ethene | 0.80 U | 1.0 | 0.80 | ug/l | |

(a) Analysis performed at Accutest Laboratories, Orlando, FL.

U = Not detected　　MDL - Method Detection Limit　　J = Indicates an estimated value
RL = Reporting Limit　　B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range　　N = Indicates presumptive evidence of a compound

Accutest Laboratories

# Report of Analysis






| | | | |
|---|---|---|---|
| **Client Sample ID:** | 50WW02-FEB2007 | | |
| **Lab Sample ID:** | T16445-6 | **Date Sampled:** | 02/23/07 |
| **Matrix:** | AQ - Ground Water | **Date Received:** | 02/24/07 |
| | | **Percent Solids:** | n/a |
| **Project:** | Longhorn Army Ammunition Plant | | |

## General Chemistry

| Analyte | Result | RL | MDL | Units | DF | Analyzed | By | Method |
|---|---|---|---|---|---|---|---|---|
| **Perchlorate by IC** | | | | | | | | |
| Perchlorate [a] | 532 | 10 | 4.0 | ug/l | 1 | 03/02/07 17:12 | AFL | EPA 314 |
| | | | | | | | | |
| Alkalinity, Total as CaCO3 | 138 | 5.0 | 0.30 | mg/l | 1 | 03/08/07 12:50 | EB | EPA 310.1 |
| Carbon Dioxide | 140 | 5.0 | | mg/l | 1 | 03/12/07 | RM | SM18 4500CO2D |
| Chloride | 219 | 10 | 0.57 | mg/l | 10 | 03/05/07 12:15 | EB | EPA 325.3 |
| Nitrogen, Nitrate [b] | < 0.10 | 0.10 | 0.0050 | mg/l | 1 | 02/26/07 09:23 | LN | SM18 4500NO3E/NO2B |
| Nitrogen, Nitrate + Nitrite | 0.020 B | 0.050 | 0.0050 | mg/l | 1 | 02/26/07 09:23 | LN | EPA 353.2 |
| Nitrogen, Nitrite | 0.0030 U | 0.050 | 0.0030 | mg/l | 1 | 02/24/07 14:28 | LN | EPA 353.2 |
| Specific Conductivity [c] | 1400 | 0.50 | 0.50 | umhos/cm | 1 | 03/06/07 | AFL | EPA 120.1 |
| Sulfate | 198 | 20 | 2.6 | mg/l | 2 | 03/06/07 18:00 | EB | EPA 375.3 |
| Sulfide | 0.0 B | 0.20 | | mg/l | 1 | 03/01/07 12:10 | LN | EPA 376.1 |
| Total Organic Carbon | 3.0 | 1.0 | 0.092 | mg/l | 1 | 02/27/07 15:10 | LN | EPA 415.1/9060 |
| pH | 6.3 | | | su | 1 | 03/01/07 13:00 | TW | EPA 150.1/9040 |

(a) Estimated value, above calibration range. Analysis performed at Accutest Laboratories, Orlando, FL.
(b) Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)
(c) Analysis performed at Accutest Laboratories, Orlando, FL.

RL = Reporting Limit
MDL = Method Detection Limit
U = Indicates a result < MDL
B = Indicates a result > = MDL but < RL

Accutest Laboratories

# Report of Analysis





| | | | |
|---|---|---|---|
| **Client Sample ID:** | 17WW16-FEB2007 | | |
| **Lab Sample ID:** | T16445-7 | **Date Sampled:** | 02/22/07 |
| **Matrix:** | AQ - Ground Water | **Date Received:** | 02/24/07 |
| **Method:** | SW846 8260B | **Percent Solids:** | n/a |
| **Project:** | Longhorn Army Ammunition Plant | | |

| | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|---|---|---|---|---|---|---|---|
| Run #1 | F0079229.D | 1 | 03/08/07 | LJ | n/a | n/a | VF2318 |
| Run #2 | | | | | | | |

| | Purge Volume |
|---|---|
| Run #1 | 5.0 ml |
| Run #2 | |

**VOA TCL List**

| CAS No. | Compound | Result | RL | MDL | Units | Q |
|---|---|---|---|---|---|---|
| 67-64-1 | Acetone | 5.6 | 50 | 2.8 | ug/l | J |
| 71-43-2 | Benzene | 0.23 U | 2.0 | 0.23 | ug/l | |
| 75-27-4 | Bromodichloromethane | 0.33 U | 2.0 | 0.33 | ug/l | |
| 75-25-2 | Bromoform | 0.65 U | 2.0 | 0.65 | ug/l | |
| 108-90-7 | Chlorobenzene | 0.54 U | 2.0 | 0.54 | ug/l | |
| 75-00-3 | Chloroethane | 0.46 U | 2.0 | 0.46 | ug/l | |
| 67-66-3 | Chloroform | 0.66 U | 2.0 | 0.66 | ug/l | |
| 75-15-0 | Carbon disulfide | 0.62 U | 2.0 | 0.62 | ug/l | |
| 56-23-5 | Carbon tetrachloride | 0.52 U | 2.0 | 0.52 | ug/l | |
| 75-34-3 | 1,1-Dichloroethane | 0.52 U | 2.0 | 0.52 | ug/l | |
| 75-35-4 | 1,1-Dichloroethylene | 0.68 U | 2.0 | 0.68 | ug/l | |
| 107-06-2 | 1,2-Dichloroethane | 0.53 U | 2.0 | 0.53 | ug/l | |
| 78-87-5 | 1,2-Dichloropropane | 0.59 U | 2.0 | 0.59 | ug/l | |
| 124-48-1 | Dibromochloromethane | 0.68 U | 2.0 | 0.68 | ug/l | |
| 156-59-2 | cis-1,2-Dichloroethylene | 0.83 U | 2.0 | 0.83 | ug/l | |
| 10061-01-5 | cis-1,3-Dichloropropene | 0.59 U | 2.0 | 0.59 | ug/l | |
| 156-60-5 | trans-1,2-Dichloroethylene | 0.75 U | 2.0 | 0.75 | ug/l | |
| 10061-02-6 | trans-1,3-Dichloropropene | 0.61 U | 2.0 | 0.61 | ug/l | |
| 100-41-4 | Ethylbenzene | 0.48 U | 2.0 | 0.48 | ug/l | |
| 591-78-6 | 2-Hexanone | 1.9 U | 10 | 1.9 | ug/l | |
| 108-10-1 | 4-Methyl-2-pentanone | 7.3 U | 10 | 7.3 | ug/l | |
| 74-83-9 | Methyl bromide | 0.47 U | 2.0 | 0.47 | ug/l | |
| 74-87-3 | Methyl chloride | 0.60 U | 2.0 | 0.60 | ug/l | |
| 75-09-2 | Methylene chloride | 0.67 U | 5.0 | 0.67 | ug/l | |
| 78-93-3 | Methyl ethyl ketone | 3.0 U | 10 | 3.0 | ug/l | |
| 100-42-5 | Styrene | 0.50 U | 2.0 | 0.50 | ug/l | |
| 71-55-6 | 1,1,1-Trichloroethane | 0.37 U | 2.0 | 0.37 | ug/l | |
| 79-34-5 | 1,1,2,2-Tetrachloroethane | 0.46 U | 2.0 | 0.46 | ug/l | |
| 79-00-5 | 1,1,2-Trichloroethane | 0.66 U | 2.0 | 0.66 | ug/l | |
| 127-18-4 | Tetrachloroethylene | 0.74 U | 2.0 | 0.74 | ug/l | |
| 108-88-3 | Toluene | 0.54 U | 2.0 | 0.54 | ug/l | |
| 79-01-6 | Trichloroethylene | 0.63 U | 2.0 | 0.63 | ug/l | |

U = Not detected  MDL - Method Detection Limit  J = Indicates an estimated value
RL = Reporting Limit  B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range  N = Indicates presumptive evidence of a compound

Accutest Laboratories

# Report of Analysis





| | | | |
|---|---|---|---|
| **Client Sample ID:** | 17WW16-FEB2007 | | |
| **Lab Sample ID:** | T16445-7 | **Date Sampled:** | 02/22/07 |
| **Matrix:** | AQ - Ground Water | **Date Received:** | 02/24/07 |
| **Method:** | SW846 8260B | **Percent Solids:** | n/a |
| **Project:** | Longhorn Army Ammunition Plant | | |

**VOA TCL List**

| CAS No. | Compound | Result | RL | MDL | Units | Q |
|---|---|---|---|---|---|---|
| 75-01-4 | Vinyl chloride | 0.32 U | 2.0 | 0.32 | ug/l | |
| 1330-20-7 | Xylene (total) | 1.1 U | 6.0 | 1.1 | ug/l | |

| CAS No. | Surrogate Recoveries | Run# 1 | Run# 2 | Limits |
|---|---|---|---|---|
| 1868-53-7 | Dibromofluoromethane | 104% | | 73-139% |
| 17060-07-0 | 1,2-Dichloroethane-D4 | 94% | | 66-139% |
| 2037-26-5 | Toluene-D8 | 104% | | 77-148% |
| 460-00-4 | 4-Bromofluorobenzene | 106% | | 84-150% |

U = Not detected MDL - Method Detection Limit J = Indicates an estimated value
RL = Reporting Limit B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

Accutest Laboratories

# Report of Analysis





| | | | |
|---|---|---|---|
| **Client Sample ID:** | 17WW16-FEB2007 | | |
| **Lab Sample ID:** | T16445-7 | **Date Sampled:** | 02/22/07 |
| **Matrix:** | AQ - Ground Water | **Date Received:** | 02/24/07 |
| **Method:** | RSKSOP-147/175 | **Percent Solids:** | n/a |
| **Project:** | Longhorn Army Ammunition Plant | | |

| | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|---|---|---|---|---|---|---|---|
| Run #1 [a] | XY025261.D | 1 | 03/01/07 | AFL | n/a | n/a | F:GXY992 |
| Run #2 | | | | | | | |

| CAS No. | Compound | Result | RL | MDL | Units | Q |
|---|---|---|---|---|---|---|
| 74-82-8 | Methane | 804 | 0.50 | 0.30 | ug/l | |
| 74-84-0 | Ethane | 1.7 | 1.0 | 0.60 | ug/l | |
| 74-85-1 | Ethene | 2.1 | 1.0 | 0.80 | ug/l | |

(a) Analysis performed at Accutest Laboratories, Orlando, FL.

U = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Accutest Laboratories

# Report of Analysis





| | | | |
|---|---|---|---|
| **Client Sample ID:** | 17WW16-FEB2007 | | |
| **Lab Sample ID:** | T16445-7 | **Date Sampled:** | 02/22/07 |
| **Matrix:** | AQ - Ground Water | **Date Received:** | 02/24/07 |
| **Method:** | SW846 8330A SW846 3535A | **Percent Solids:** | n/a |
| **Project:** | Longhorn Army Ammunition Plant | | |

| | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|---|---|---|---|---|---|---|---|
| Run #1 [a] | GG020215.D | 1 | 03/02/07 | AFL | 03/01/07 | F:OP19677 | F:GGG906 |
| Run #2 | | | | | | | |

| | Initial Volume | Final Volume |
|---|---|---|
| Run #1 | 1000 ml | 10.0 ml |
| Run #2 | | |

| CAS No. | Compound | Result | RL | MDL | Units | Q |
|---|---|---|---|---|---|---|
| 2691-41-0 | HMX | 0.060 U | 0.20 | 0.060 | ug/l | |
| 121-82-4 | RDX | 0.075 U | 0.20 | 0.075 | ug/l | |
| 99-65-0 | 1,3-Dinitrobenzene | 0.070 U | 0.20 | 0.070 | ug/l | |
| 606-20-2 | 2,6-Dinitrotoluene | 0.065 U | 0.20 | 0.065 | ug/l | |
| 121-14-2 | 2,4-Dinitrotoluene | 0.075 U | 0.20 | 0.075 | ug/l | |
| 35572-78-2 | 2-amino-4,6-Dinitrotoluene | 0.070 U | 0.20 | 0.070 | ug/l | |
| 19406-51-0 | 4-amino-2,6-Dinitrotoluene | 0.080 U | 0.20 | 0.080 | ug/l | |
| 98-95-3 | Nitrobenzene | 0.060 U | 0.20 | 0.060 | ug/l | |
| 88-72-2 | o-Nitrotoluene | 0.060 U | 0.20 | 0.060 | ug/l | |
| 99-08-1 | m-Nitrotoluene | 0.075 U | 0.20 | 0.075 | ug/l | |
| 99-99-0 | p-Nitrotoluene | 0.075 U | 0.20 | 0.075 | ug/l | |
| 479-45-8 | Tetryl | 0.075 U | 0.20 | 0.075 | ug/l | |
| 99-35-4 | 1,3,5-Trinitrobenzene | 0.095 U | 0.20 | 0.095 | ug/l | |
| 118-96-7 | 2,4,6-Trinitrotoluene | 0.080 U | 0.20 | 0.080 | ug/l | |

| CAS No. | Surrogate Recoveries | Run# 1 | Run# 2 | Limits |
|---|---|---|---|---|
| 610-39-9 | 3,4-Dinitrotoluene | 109% | | 70-136% |

(a) Analysis performed at Accutest Laboratories, Orlando, FL.

U = Not detected  MDL - Method Detection Limit  J = Indicates an estimated value
RL = Reporting Limit  B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range  N = Indicates presumptive evidence of a compound

Accutest Laboratories

# Report of Analysis





| | | | |
|---|---|---|---|
| **Client Sample ID:** | 17WW16-FEB2007 | | |
| **Lab Sample ID:** | T16445-7 | **Date Sampled:** | 02/22/07 |
| **Matrix:** | AQ - Ground Water | **Date Received:** | 02/24/07 |
| | | **Percent Solids:** | n/a |
| **Project:** | Longhorn Army Ammunition Plant | | |

## General Chemistry

| Analyte | Result | RL | MDL | Units | DF | Analyzed | By | Method |
|---|---|---|---|---|---|---|---|---|
| **Perchlorate by IC** | | | | | | | | |
| Perchlorate [a] | 4.0 U | 10 | 4.0 | ug/l | 1 | 03/02/07 17:55 | AFL | EPA 314 |
| Alkalinity, Total as CaCO3 | 457 | 25 | 0.30 | mg/l | 5 | 03/08/07 12:50 | EB | EPA 310.1 |
| Carbon Dioxide | 0.0 B | 5.0 | | mg/l | 1 | 03/12/07 | RM | SM18 4500CO2D |
| Chloride | 216 | 10 | 0.57 | mg/l | 10 | 03/05/07 12:15 | EB | EPA 325.3 |
| Nitrogen, Nitrate [b] | 0.30 | 0.10 | 0.0050 | mg/l | 1 | 02/26/07 09:23 | LN | SM18 4500NO3E/NO2B |
| Nitrogen, Nitrate + Nitrite | 0.30 | 0.050 | 0.0050 | mg/l | 1 | 02/26/07 09:23 | LN | EPA 353.2 |
| Nitrogen, Nitrite | 0.0030 U | 0.050 | 0.0030 | mg/l | 1 | 02/24/07 14:28 | LN | EPA 353.2 |
| Specific Conductivity [a] | 1700 | 0.50 | 0.50 | umhos/cm | 1 | 03/06/07 | AFL | EPA 120.1 |
| Sulfate | 44.0 | 20 | 2.6 | mg/l | 2 | 03/06/07 18:00 | EB | EPA 375.3 |
| Sulfide | 0.0 B | 0.20 | | mg/l | 1 | 03/01/07 12:10 | LN | EPA 376.1 |
| Total Organic Carbon | 14.0 | 1.0 | 0.092 | mg/l | 1 | 02/27/07 15:10 | LN | EPA 415.1/9060 |
| pH | 11.2 | | | su | 1 | 03/01/07 13:00 | TW | EPA 150.1/9040 |

(a) Analysis performed at Accutest Laboratories, Orlando, FL.
(b) Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

RL = Reporting Limit
MDL = Method Detection Limit
U = Indicates a result < MDL
B = Indicates a result > = MDL but < RL

Accutest Laboratories

# Report of Analysis





| | | | |
|---|---|---|---|
| **Client Sample ID:** | 17WW02-FEB2007 | | |
| **Lab Sample ID:** | T16445-8 | **Date Sampled:** | 02/22/07 |
| **Matrix:** | AQ - Ground Water | **Date Received:** | 02/24/07 |
| **Method:** | SW846 8260B | **Percent Solids:** | n/a |
| **Project:** | Longhorn Army Ammunition Plant | | |

| | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|---|---|---|---|---|---|---|---|
| Run #1 | F0079196.D | 1 | 03/07/07 | LJ | n/a | n/a | VF2315 |
| Run #2 | F0079235.D | 5 | 03/08/07 | LJ | n/a | n/a | VF2318 |

| | Purge Volume |
|---|---|
| Run #1 | 5.0 ml |
| Run #2 | 5.0 ml |

**VOA TCL List**

| CAS No. | Compound | Result | RL | MDL | Units | Q |
|---|---|---|---|---|---|---|
| 67-64-1 | Acetone | 2.8 U | 50 | 2.8 | ug/l | |
| 71-43-2 | Benzene | 0.23 U | 2.0 | 0.23 | ug/l | |
| 75-27-4 | Bromodichloromethane | 0.33 U | 2.0 | 0.33 | ug/l | |
| 75-25-2 | Bromoform | 0.65 U | 2.0 | 0.65 | ug/l | |
| 108-90-7 | Chlorobenzene | 0.54 U | 2.0 | 0.54 | ug/l | |
| 75-00-3 | Chloroethane | 0.46 U | 2.0 | 0.46 | ug/l | |
| 67-66-3 | Chloroform | 0.66 U | 2.0 | 0.66 | ug/l | |
| 75-15-0 | Carbon disulfide | 0.62 U | 2.0 | 0.62 | ug/l | |
| 56-23-5 | Carbon tetrachloride | 0.52 U | 2.0 | 0.52 | ug/l | |
| 75-34-3 | 1,1-Dichloroethane | 0.52 U | 2.0 | 0.52 | ug/l | |
| 75-35-4 | 1,1-Dichloroethylene | 5.3 | 2.0 | 0.68 | ug/l | |
| 107-06-2 | 1,2-Dichloroethane | 40.7 | 2.0 | 0.53 | ug/l | |
| 78-87-5 | 1,2-Dichloropropane | 0.59 U | 2.0 | 0.59 | ug/l | |
| 124-48-1 | Dibromochloromethane | 0.68 U | 2.0 | 0.68 | ug/l | |
| 156-59-2 | cis-1,2-Dichloroethylene | 4.5 | 2.0 | 0.83 | ug/l | |
| 10061-01-5 | cis-1,3-Dichloropropene | 0.59 U | 2.0 | 0.59 | ug/l | |
| 156-60-5 | trans-1,2-Dichloroethylene | 0.85 | 2.0 | 0.75 | ug/l | J |
| 10061-02-6 | trans-1,3-Dichloropropene | 0.61 U | 2.0 | 0.61 | ug/l | |
| 100-41-4 | Ethylbenzene | 0.48 U | 2.0 | 0.48 | ug/l | |
| 591-78-6 | 2-Hexanone | 1.9 U | 10 | 1.9 | ug/l | |
| 108-10-1 | 4-Methyl-2-pentanone | 7.3 U | 10 | 7.3 | ug/l | |
| 74-83-9 | Methyl bromide | 0.47 U | 2.0 | 0.47 | ug/l | |
| 74-87-3 | Methyl chloride | 0.60 U | 2.0 | 0.60 | ug/l | |
| 75-09-2 | Methylene chloride | 0.67 U | 5.0 | 0.67 | ug/l | |
| 78-93-3 | Methyl ethyl ketone | 3.0 U | 10 | 3.0 | ug/l | |
| 100-42-5 | Styrene | 0.50 U | 2.0 | 0.50 | ug/l | |
| 71-55-6 | 1,1,1-Trichloroethane | 0.37 U | 2.0 | 0.37 | ug/l | |
| 79-34-5 | 1,1,2,2-Tetrachloroethane | 0.46 U | 2.0 | 0.46 | ug/l | |
| 79-00-5 | 1,1,2-Trichloroethane | 0.66 U | 2.0 | 0.66 | ug/l | |
| 127-18-4 | Tetrachloroethylene | 0.74 U | 2.0 | 0.74 | ug/l | |
| 108-88-3 | Toluene | 0.54 U | 2.0 | 0.54 | ug/l | |
| 79-01-6 | Trichloroethylene | 479 [a] | 10 | 3.2 | ug/l | |

U = Not detected
MDL - Method Detection Limit
J = Indicates an estimated value
RL = Reporting Limit
B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range
N = Indicates presumptive evidence of a compound

Accutest Laboratories

# Report of Analysis



| | | | |
|---|---|---|---|
| **Client Sample ID:** | 17WW02-FEB2007 | | |
| **Lab Sample ID:** | T16445-8 | **Date Sampled:** | 02/22/07 |
| **Matrix:** | AQ - Ground Water | **Date Received:** | 02/24/07 |
| **Method:** | SW846 8260B | **Percent Solids:** | n/a |
| **Project:** | Longhorn Army Ammunition Plant | | |

**VOA TCL List**

| CAS No. | Compound | Result | RL | MDL | Units | Q |
|---|---|---|---|---|---|---|
| 75-01-4 | Vinyl chloride | 0.32 U | 2.0 | 0.32 | ug/l | |
| 1330-20-7 | Xylene (total) | 1.1 U | 6.0 | 1.1 | ug/l | |

| CAS No. | Surrogate Recoveries | Run# 1 | Run# 2 | Limits |
|---|---|---|---|---|
| 1868-53-7 | Dibromofluoromethane | 102% | 105% | 73-139% |
| 17060-07-0 | 1,2-Dichloroethane-D4 | 100% | 103% | 66-139% |
| 2037-26-5 | Toluene-D8 | 106% | 107% | 77-148% |
| 460-00-4 | 4-Bromofluorobenzene | 113% | 118% | 84-150% |

(a) Result is from Run# 2

U = Not detected MDL - Method Detection Limit J = Indicates an estimated value
RL = Reporting Limit B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

Accutest Laboratories

# Report of Analysis





| | | | |
|---|---|---|---|
| **Client Sample ID:** | 17WW02-FEB2007 | | |
| **Lab Sample ID:** | T16445-8 | **Date Sampled:** | 02/22/07 |
| **Matrix:** | AQ - Ground Water | **Date Received:** | 02/24/07 |
| **Method:** | RSKSOP-147/175 | **Percent Solids:** | n/a |
| **Project:** | Longhorn Army Ammunition Plant | | |

| | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|---|---|---|---|---|---|---|---|
| Run #1 [a] | XY025264.D | 1 | 03/01/07 | AFL | n/a | n/a | F:GXY992 |
| Run #2 | | | | | | | |

| CAS No. | Compound | Result | RL | MDL | Units | Q |
|---|---|---|---|---|---|---|
| 74-82-8 | Methane | 7.48 | 0.50 | 0.30 | ug/l | |
| 74-84-0 | Ethane | 0.60 U | 1.0 | 0.60 | ug/l | |
| 74-85-1 | Ethene | 0.80 U | 1.0 | 0.80 | ug/l | |

(a) Analysis performed at Accutest Laboratories, Orlando, FL.

U = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Accutest Laboratories

# Report of Analysis





| | | | |
|---|---|---|---|
| **Client Sample ID:** | 17WW02-FEB2007 | | |
| **Lab Sample ID:** | T16445-8 | **Date Sampled:** | 02/22/07 |
| **Matrix:** | AQ - Ground Water | **Date Received:** | 02/24/07 |
| **Method:** | SW846 8330A SW846 3535A | **Percent Solids:** | n/a |
| **Project:** | Longhorn Army Ammunition Plant | | |

| | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|---|---|---|---|---|---|---|---|
| Run #1 [a] | GG020216.D | 1 | 03/02/07 | AFL | 03/01/07 | F:OP19677 | F:GGG906 |
| Run #2 | | | | | | | |

| | Initial Volume | Final Volume |
|---|---|---|
| Run #1 | 1000 ml | 10.0 ml |
| Run #2 | | |

| CAS No. | Compound | Result | RL | MDL | Units | Q |
|---|---|---|---|---|---|---|
| 2691-41-0 | HMX | 0.060 U | 0.20 | 0.060 | ug/l | |
| 121-82-4 | RDX | 0.075 U | 0.20 | 0.075 | ug/l | |
| 99-65-0 | 1,3-Dinitrobenzene | 0.070 U | 0.20 | 0.070 | ug/l | |
| 606-20-2 | 2,6-Dinitrotoluene | 0.065 U | 0.20 | 0.065 | ug/l | |
| 121-14-2 | 2,4-Dinitrotoluene | 0.075 U | 0.20 | 0.075 | ug/l | |
| 35572-78-2 | 2-amino-4,6-Dinitrotoluene | 0.070 U | 0.20 | 0.070 | ug/l | |
| 19406-51-0 | 4-amino-2,6-Dinitrotoluene | 0.080 U | 0.20 | 0.080 | ug/l | |
| 98-95-3 | Nitrobenzene | 0.060 U | 0.20 | 0.060 | ug/l | |
| 88-72-2 | o-Nitrotoluene | 0.060 U | 0.20 | 0.060 | ug/l | |
| 99-08-1 | m-Nitrotoluene | 0.075 U | 0.20 | 0.075 | ug/l | |
| 99-99-0 | p-Nitrotoluene | 0.075 U | 0.20 | 0.075 | ug/l | |
| 479-45-8 | Tetryl | 0.075 U | 0.20 | 0.075 | ug/l | |
| 99-35-4 | 1,3,5-Trinitrobenzene | 0.095 U | 0.20 | 0.095 | ug/l | |
| 118-96-7 | 2,4,6-Trinitrotoluene | 0.080 U | 0.20 | 0.080 | ug/l | |

| CAS No. | Surrogate Recoveries | Run# 1 | Run# 2 | Limits |
|---|---|---|---|---|
| 610-39-9 | 3,4-Dinitrotoluene | 107% | | 70-136% |

(a) Analysis performed at Accutest Laboratories, Orlando, FL.

U = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Accutest Laboratories

# Report of Analysis





| | | | |
|---|---|---|---|
| **Client Sample ID:** | 17WW02-FEB2007 | | |
| **Lab Sample ID:** | T16445-8 | **Date Sampled:** | 02/22/07 |
| **Matrix:** | AQ - Ground Water | **Date Received:** | 02/24/07 |
| | | **Percent Solids:** | n/a |
| **Project:** | Longhorn Army Ammunition Plant | | |

## General Chemistry

| Analyte | Result | RL | MDL | Units | DF | Analyzed | By | Method |
|---|---|---|---|---|---|---|---|---|
| **Perchlorate by IC** | | | | | | | | |
| Perchlorate [a] | 4.0 U | 10 | 4.0 | ug/l | 1 | 03/02/07 18:10 | AFL | EPA 314 |
| | | | | | | | | |
| Alkalinity, Total as CaCO3 | 347 | 25 | 0.30 | mg/l | 5 | 03/08/07 12:50 | EB | EPA 310.1 |
| Carbon Dioxide | 110 | 5.0 | | mg/l | 1 | 03/12/07 | RM | SM18 4500CO2D |
| Chloride | 994 | 50 | 0.57 | mg/l | 50 | 03/05/07 12:15 | EB | EPA 325.3 |
| Nitrogen, Nitrate [b] | < 0.10 | 0.10 | 0.0050 | mg/l | 1 | 02/26/07 09:23 | LN | SM18 4500NO3E/NO2B |
| Nitrogen, Nitrate + Nitrite | 0.060 | 0.050 | 0.0050 | mg/l | 1 | 02/26/07 09:23 | LN | EPA 353.2 |
| Nitrogen, Nitrite | 0.0030 U | 0.050 | 0.0030 | mg/l | 1 | 02/24/07 14:28 | LN | EPA 353.2 |
| Specific Conductivity [a] | 3450 | 0.50 | 0.50 | umhos/cm | 1 | 03/06/07 | AFL | EPA 120.1 |
| Sulfate | 123 | 40 | 2.6 | mg/l | 4 | 03/06/07 18:00 | EB | EPA 375.3 |
| Sulfide | 0.0 B | 0.20 | | mg/l | 1 | 03/01/07 12:10 | LN | EPA 376.1 |
| Total Organic Carbon | 3.0 | 1.0 | 0.092 | mg/l | 1 | 02/28/07 09:08 | LN | EPA 415.1/9060 |
| pH | 6.8 | | | su | 1 | 03/01/07 13:00 | TW | EPA 150.1/9040 |

(a) Analysis performed at Accutest Laboratories, Orlando, FL.
(b) Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

RL = Reporting Limit
MDL = Method Detection Limit

U = Indicates a result < MDL
B = Indicates a result > = MDL but < RL

Accutest Laboratories

# Report of Analysis





| | | | |
|---|---|---|---|
| **Client Sample ID:** | 17WW02-FEB2007 FD | | |
| **Lab Sample ID:** | T16445-9 | **Date Sampled:** | 02/22/07 |
| **Matrix:** | AQ - Ground Water | **Date Received:** | 02/24/07 |
| **Method:** | SW846 8260B | **Percent Solids:** | n/a |
| **Project:** | Longhorn Army Ammunition Plant | | |

| | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|---|---|---|---|---|---|---|---|
| Run #1 | F0079197.D | 1 | 03/07/07 | LJ | n/a | n/a | VF2315 |
| Run #2 | F0079236.D | 5 | 03/08/07 | LJ | n/a | n/a | VF2318 |

| | Purge Volume |
|---|---|
| Run #1 | 5.0 ml |
| Run #2 | 5.0 ml |

**VOA TCL List**

| CAS No. | Compound | Result | RL | MDL | Units | Q |
|---|---|---|---|---|---|---|
| 67-64-1 | Acetone | 2.8 U | 50 | 2.8 | ug/l | |
| 71-43-2 | Benzene | 0.23 U | 2.0 | 0.23 | ug/l | |
| 75-27-4 | Bromodichloromethane | 0.33 U | 2.0 | 0.33 | ug/l | |
| 75-25-2 | Bromoform | 0.65 U | 2.0 | 0.65 | ug/l | |
| 108-90-7 | Chlorobenzene | 0.54 U | 2.0 | 0.54 | ug/l | |
| 75-00-3 | Chloroethane | 0.46 U | 2.0 | 0.46 | ug/l | |
| 67-66-3 | Chloroform | 0.66 U | 2.0 | 0.66 | ug/l | |
| 75-15-0 | Carbon disulfide | 0.62 U | 2.0 | 0.62 | ug/l | |
| 56-23-5 | Carbon tetrachloride | 0.52 U | 2.0 | 0.52 | ug/l | |
| 75-34-3 | 1,1-Dichloroethane | 0.52 U | 2.0 | 0.52 | ug/l | |
| 75-35-4 | 1,1-Dichloroethylene | 5.2 | 2.0 | 0.68 | ug/l | |
| 107-06-2 | 1,2-Dichloroethane | 42.1 | 2.0 | 0.53 | ug/l | |
| 78-87-5 | 1,2-Dichloropropane | 0.59 U | 2.0 | 0.59 | ug/l | |
| 124-48-1 | Dibromochloromethane | 0.68 U | 2.0 | 0.68 | ug/l | |
| 156-59-2 | cis-1,2-Dichloroethylene | 4.2 | 2.0 | 0.83 | ug/l | |
| 10061-01-5 | cis-1,3-Dichloropropene | 0.59 U | 2.0 | 0.59 | ug/l | |
| 156-60-5 | trans-1,2-Dichloroethylene | 0.88 | 2.0 | 0.75 | ug/l | J |
| 10061-02-6 | trans-1,3-Dichloropropene | 0.61 U | 2.0 | 0.61 | ug/l | |
| 100-41-4 | Ethylbenzene | 0.48 U | 2.0 | 0.48 | ug/l | |
| 591-78-6 | 2-Hexanone | 1.9 U | 10 | 1.9 | ug/l | |
| 108-10-1 | 4-Methyl-2-pentanone | 7.3 U | 10 | 7.3 | ug/l | |
| 74-83-9 | Methyl bromide | 0.47 U | 2.0 | 0.47 | ug/l | |
| 74-87-3 | Methyl chloride | 0.60 U | 2.0 | 0.60 | ug/l | |
| 75-09-2 | Methylene chloride | 0.67 U | 5.0 | 0.67 | ug/l | |
| 78-93-3 | Methyl ethyl ketone | 3.0 U | 10 | 3.0 | ug/l | |
| 100-42-5 | Styrene | 0.50 U | 2.0 | 0.50 | ug/l | |
| 71-55-6 | 1,1,1-Trichloroethane | 0.37 U | 2.0 | 0.37 | ug/l | |
| 79-34-5 | 1,1,2,2-Tetrachloroethane | 0.46 U | 2.0 | 0.46 | ug/l | |
| 79-00-5 | 1,1,2-Trichloroethane | 0.66 U | 2.0 | 0.66 | ug/l | |
| 127-18-4 | Tetrachloroethylene | 0.74 U | 2.0 | 0.74 | ug/l | |
| 108-88-3 | Toluene | 0.54 U | 2.0 | 0.54 | ug/l | |
| 79-01-6 | Trichloroethylene | 468 [a] | 10 | 3.2 | ug/l | |

U = Not detected MDL - Method Detection Limit J = Indicates an estimated value
RL = Reporting Limit B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

Accutest Laboratories

# Report of Analysis






| | | | |
|---|---|---|---|
| **Client Sample ID:** | 17WW02-FEB2007 FD | | |
| **Lab Sample ID:** | T16445-9 | **Date Sampled:** | 02/22/07 |
| **Matrix:** | AQ - Ground Water | **Date Received:** | 02/24/07 |
| **Method:** | SW846 8260B | **Percent Solids:** | n/a |
| **Project:** | Longhorn Army Ammunition Plant | | |

**VOA TCL List**

| CAS No. | Compound | Result | RL | MDL | Units | Q |
|---|---|---|---|---|---|---|
| 75-01-4 | Vinyl chloride | 0.32 U | 2.0 | 0.32 | ug/l | |
| 1330-20-7 | Xylene (total) | 1.1 U | 6.0 | 1.1 | ug/l | |

| CAS No. | Surrogate Recoveries | Run# 1 | Run# 2 | Limits |
|---|---|---|---|---|
| 1868-53-7 | Dibromofluoromethane | 107% | 105% | 73-139% |
| 17060-07-0 | 1,2-Dichloroethane-D4 | 104% | 101% | 66-139% |
| 2037-26-5 | Toluene-D8 | 109% | 107% | 77-148% |
| 460-00-4 | 4-Bromofluorobenzene | 117% | 117% | 84-150% |

(a) Result is from Run# 2

U = Not detected   MDL - Method Detection Limit   J = Indicates an estimated value
RL = Reporting Limit   B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range   N = Indicates presumptive evidence of a compound

Accutest Laboratories

# Report of Analysis



| | | | |
|---|---|---|---|
| **Client Sample ID:** | 17WW02-FEB2007 FD | | |
| **Lab Sample ID:** | T16445-9 | **Date Sampled:** | 02/22/07 |
| **Matrix:** | AQ - Ground Water | **Date Received:** | 02/24/07 |
| **Method:** | RSKSOP-147/175 | **Percent Solids:** | n/a |
| **Project:** | Longhorn Army Ammunition Plant | | |

| | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|---|---|---|---|---|---|---|---|
| Run #1 [a] | XY025265.D | 1 | 03/01/07 | AFL | n/a | n/a | F:GXY992 |
| Run #2 | | | | | | | |

| CAS No. | Compound | Result | RL | MDL | Units | Q |
|---|---|---|---|---|---|---|
| 74-82-8 | Methane | 5.95 | 0.50 | 0.30 | ug/l | |
| 74-84-0 | Ethane | 0.60 U | 1.0 | 0.60 | ug/l | |
| 74-85-1 | Ethene | 0.80 U | 1.0 | 0.80 | ug/l | |

(a) Analysis performed at Accutest Laboratories, Orlando, FL.

U = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Accutest Laboratories

# Report of Analysis





| | | | |
|---|---|---|---|
| **Client Sample ID:** | 17WW02-FEB2007 FD | | |
| **Lab Sample ID:** | T16445-9 | **Date Sampled:** | 02/22/07 |
| **Matrix:** | AQ - Ground Water | **Date Received:** | 02/24/07 |
| | | **Percent Solids:** | n/a |
| **Project:** | Longhorn Army Ammunition Plant | | |

## General Chemistry

| Analyte | Result | RL | MDL | Units | DF | Analyzed | By | Method |
|---|---|---|---|---|---|---|---|---|
| **Perchlorate by IC** | | | | | | | | |
| Perchlorate [a] | 4.0 U | 10 | 4.0 | ug/l | 1 | 03/02/07 18:24 | AFL | EPA 314 |
| Alkalinity, Total as CaCO3 | 336 | 25 | 0.30 | mg/l | 5 | 03/08/07 12:50 | EB | EPA 310.1 |
| Carbon Dioxide | 110 | 5.0 | | mg/l | 1 | 03/12/07 | RM | SM18 4500CO2D |
| Chloride | 969 | 50 | 0.57 | mg/l | 50 | 03/05/07 12:15 | EB | EPA 325.3 |
| Nitrogen, Nitrate [b] | < 0.10 | 0.10 | 0.0050 | mg/l | 1 | 02/26/07 09:23 | LN | SM18 4500NO3E/NO2B |
| Nitrogen, Nitrate + Nitrite | 0.050 | 0.050 | 0.0050 | mg/l | 1 | 02/26/07 09:23 | LN | EPA 353.2 |
| Nitrogen, Nitrite | 0.0030 U | 0.050 | 0.0030 | mg/l | 1 | 02/24/07 14:28 | LN | EPA 353.2 |
| Specific Conductivity [a] | 3540 | 0.50 | 0.50 | umhos/cm | 1 | 03/06/07 | AFL | EPA 120.1 |
| Sulfate | 130 | 40 | 2.6 | mg/l | 4 | 03/06/07 18:00 | EB | EPA 375.3 |
| Sulfide | 0.0 B | 0.20 | | mg/l | 1 | 03/01/07 12:10 | LN | EPA 376.1 |
| Total Organic Carbon | 3.0 | 1.0 | 0.092 | mg/l | 1 | 02/28/07 09:08 | LN | EPA 415.1/9060 |
| pH | 6.8 | | | su | 1 | 03/01/07 13:00 | TW | EPA 150.1/9040 |

(a) Analysis performed at Accutest Laboratories, Orlando, FL.
(b) Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

RL = Reporting Limit
MDL = Method Detection Limit

U = Indicates a result < MDL
B = Indicates a result > = MDL but < RL

Accutest Laboratories

# Report of Analysis





| | | | |
|---|---|---|---|
| **Client Sample ID:** | 29WW35-FEB2007 | | |
| **Lab Sample ID:** | T16445-10 | **Date Sampled:** | 02/22/07 |
| **Matrix:** | AQ - Ground Water | **Date Received:** | 02/24/07 |
| **Method:** | SW846 8260B | **Percent Solids:** | n/a |
| **Project:** | Longhorn Army Ammunition Plant | | |

| | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|---|---|---|---|---|---|---|---|
| Run #1 | F0079198.D | 1 | 03/07/07 | LJ | n/a | n/a | VF2315 |
| Run #2 | F0079237.D | 5 | 03/08/07 | LJ | n/a | n/a | VF2318 |

| | Purge Volume |
|---|---|
| Run #1 | 5.0 ml |
| Run #2 | 5.0 ml |

**VOA TCL List**

| CAS No. | Compound | Result | RL | MDL | Units | Q |
|---|---|---|---|---|---|---|
| 67-64-1 | Acetone | 2.8 U | 50 | 2.8 | ug/l | |
| 71-43-2 | Benzene | 0.23 U | 2.0 | 0.23 | ug/l | |
| 75-27-4 | Bromodichloromethane | 0.33 U | 2.0 | 0.33 | ug/l | |
| 75-25-2 | Bromoform | 0.65 U | 2.0 | 0.65 | ug/l | |
| 108-90-7 | Chlorobenzene | 0.54 U | 2.0 | 0.54 | ug/l | |
| 75-00-3 | Chloroethane | 0.46 U | 2.0 | 0.46 | ug/l | |
| 67-66-3 | Chloroform | 0.66 U | 2.0 | 0.66 | ug/l | |
| 75-15-0 | Carbon disulfide | 3.7 | 2.0 | 0.62 | ug/l | |
| 56-23-5 | Carbon tetrachloride | 0.52 U | 2.0 | 0.52 | ug/l | |
| 75-34-3 | 1,1-Dichloroethane | 0.52 U | 2.0 | 0.52 | ug/l | |
| 75-35-4 | 1,1-Dichloroethylene | 0.68 U | 2.0 | 0.68 | ug/l | |
| 107-06-2 | 1,2-Dichloroethane | 0.53 U | 2.0 | 0.53 | ug/l | |
| 78-87-5 | 1,2-Dichloropropane | 0.59 U | 2.0 | 0.59 | ug/l | |
| 124-48-1 | Dibromochloromethane | 0.68 U | 2.0 | 0.68 | ug/l | |
| 156-59-2 | cis-1,2-Dichloroethylene | 0.83 U | 2.0 | 0.83 | ug/l | |
| 10061-01-5 | cis-1,3-Dichloropropene | 0.59 U | 2.0 | 0.59 | ug/l | |
| 156-60-5 | trans-1,2-Dichloroethylene | 0.75 U | 2.0 | 0.75 | ug/l | |
| 10061-02-6 | trans-1,3-Dichloropropene | 0.61 U | 2.0 | 0.61 | ug/l | |
| 100-41-4 | Ethylbenzene | 0.48 U | 2.0 | 0.48 | ug/l | |
| 591-78-6 | 2-Hexanone | 1.9 U | 10 | 1.9 | ug/l | |
| 108-10-1 | 4-Methyl-2-pentanone | 7.3 U | 10 | 7.3 | ug/l | |
| 74-83-9 | Methyl bromide | 0.47 U | 2.0 | 0.47 | ug/l | |
| 74-87-3 | Methyl chloride | 0.60 U | 2.0 | 0.60 | ug/l | |
| 75-09-2 | Methylene chloride | 237 [a] | 25 | 3.4 | ug/l | |
| 78-93-3 | Methyl ethyl ketone | 3.0 U | 10 | 3.0 | ug/l | |
| 100-42-5 | Styrene | 0.50 U | 2.0 | 0.50 | ug/l | |
| 71-55-6 | 1,1,1-Trichloroethane | 0.37 U | 2.0 | 0.37 | ug/l | |
| 79-34-5 | 1,1,2,2-Tetrachloroethane | 0.46 U | 2.0 | 0.46 | ug/l | |
| 79-00-5 | 1,1,2-Trichloroethane | 0.66 U | 2.0 | 0.66 | ug/l | |
| 127-18-4 | Tetrachloroethylene | 0.74 U | 2.0 | 0.74 | ug/l | |
| 108-88-3 | Toluene | 0.54 U | 2.0 | 0.54 | ug/l | |
| 79-01-6 | Trichloroethylene | 25.6 | 2.0 | 0.63 | ug/l | |

U = Not detected  MDL - Method Detection Limit  J = Indicates an estimated value
RL = Reporting Limit  B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range  N = Indicates presumptive evidence of a compound

Accutest Laboratories

# Report of Analysis



| | | | |
|---|---|---|---|
| **Client Sample ID:** | 29WW35-FEB2007 | | |
| **Lab Sample ID:** | T16445-10 | **Date Sampled:** | 02/22/07 |
| **Matrix:** | AQ - Ground Water | **Date Received:** | 02/24/07 |
| **Method:** | SW846 8260B | **Percent Solids:** | n/a |
| **Project:** | Longhorn Army Ammunition Plant | | |

**VOA TCL List**

| CAS No. | Compound | Result | RL | MDL | Units | Q |
|---|---|---|---|---|---|---|
| 75-01-4 | Vinyl chloride | 0.32 U | 2.0 | 0.32 | ug/l | |
| 1330-20-7 | Xylene (total) | 1.1 U | 6.0 | 1.1 | ug/l | |

| CAS No. | Surrogate Recoveries | Run# 1 | Run# 2 | Limits |
|---|---|---|---|---|
| 1868-53-7 | Dibromofluoromethane | 109% | 104% | 73-139% |
| 17060-07-0 | 1,2-Dichloroethane-D4 | 107% | 100% | 66-139% |
| 2037-26-5 | Toluene-D8 | 108% | 104% | 77-148% |
| 460-00-4 | 4-Bromofluorobenzene | 116% | 115% | 84-150% |

(a) Result is from Run# 2

U = Not detected  MDL - Method Detection Limit  J = Indicates an estimated value
RL = Reporting Limit  B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range  N = Indicates presumptive evidence of a compound

Accutest Laboratories

# Report of Analysis





| | | | |
|---|---|---|---|
| **Client Sample ID:** | 29WW35-FEB2007 | | |
| **Lab Sample ID:** | T16445-10 | **Date Sampled:** | 02/22/07 |
| **Matrix:** | AQ - Ground Water | **Date Received:** | 02/24/07 |
| **Method:** | RSKSOP-147/175 | **Percent Solids:** | n/a |
| **Project:** | Longhorn Army Ammunition Plant | | |

| | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|---|---|---|---|---|---|---|---|
| Run #1 [a] | XY025266.D | 1 | 03/01/07 | AFL | n/a | n/a | F:GXY992 |
| Run #2 | | | | | | | |

| CAS No. | Compound | Result | RL | MDL | Units | Q |
|---|---|---|---|---|---|---|
| 74-82-8 | Methane | 5.08 | 0.50 | 0.30 | ug/l | |
| 74-84-0 | Ethane | 0.60 U | 1.0 | 0.60 | ug/l | |
| 74-85-1 | Ethene | 0.80 U | 1.0 | 0.80 | ug/l | |

(a) Analysis performed at Accutest Laboratories, Orlando, FL.

U = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Accutest Laboratories

# Report of Analysis





| | | | |
|---|---|---|---|
| **Client Sample ID:** | 29WW35-FEB2007 | | |
| **Lab Sample ID:** | T16445-10 | **Date Sampled:** | 02/22/07 |
| **Matrix:** | AQ - Ground Water | **Date Received:** | 02/24/07 |
| **Method:** | SW846 8330A SW846 3535A | **Percent Solids:** | n/a |
| **Project:** | Longhorn Army Ammunition Plant | | |

| | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|---|---|---|---|---|---|---|---|
| Run #1 [a] | GG020217.D | 1 | 03/02/07 | AFL | 03/01/07 | F:OP19677 | F:GGG906 |
| Run #2 | | | | | | | |

| | Initial Volume | Final Volume |
|---|---|---|
| Run #1 | 1050 ml | 10.0 ml |
| Run #2 | | |

| CAS No. | Compound | Result | RL | MDL | Units | Q |
|---|---|---|---|---|---|---|
| 2691-41-0 | HMX | 0.057 U | 0.19 | 0.057 | ug/l | |
| 121-82-4 | RDX | 0.071 U | 0.19 | 0.071 | ug/l | |
| 99-65-0 | 1,3-Dinitrobenzene | 0.067 U | 0.19 | 0.067 | ug/l | |
| 606-20-2 | 2,6-Dinitrotoluene | 0.062 U | 0.19 | 0.062 | ug/l | |
| 121-14-2 | 2,4-Dinitrotoluene | 0.071 U | 0.19 | 0.071 | ug/l | |
| 35572-78-2 | 2-amino-4,6-Dinitrotoluene | 0.067 U | 0.19 | 0.067 | ug/l | |
| 19406-51-0 | 4-amino-2,6-Dinitrotoluene | 0.076 U | 0.19 | 0.076 | ug/l | |
| 98-95-3 | Nitrobenzene | 0.057 U | 0.19 | 0.057 | ug/l | |
| 88-72-2 | o-Nitrotoluene | 0.057 U | 0.19 | 0.057 | ug/l | |
| 99-08-1 | m-Nitrotoluene | 0.071 U | 0.19 | 0.071 | ug/l | |
| 99-99-0 | p-Nitrotoluene | 0.071 U | 0.19 | 0.071 | ug/l | |
| 479-45-8 | Tetryl | 0.071 U | 0.19 | 0.071 | ug/l | |
| 99-35-4 | 1,3,5-Trinitrobenzene | 0.090 U | 0.19 | 0.090 | ug/l | |
| 118-96-7 | 2,4,6-Trinitrotoluene | 0.076 U | 0.19 | 0.076 | ug/l | |

| CAS No. | Surrogate Recoveries | Run# 1 | Run# 2 | Limits |
|---|---|---|---|---|
| 610-39-9 | 3,4-Dinitrotoluene | 98% | | 70-136% |

(a) Analysis performed at Accutest Laboratories, Orlando, FL.

U = Not detected MDL - Method Detection Limit J = Indicates an estimated value
RL = Reporting Limit B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

Accutest Laboratories

# Report of Analysis





| | | | |
|---|---|---|---|
| **Client Sample ID:** | 29WW35-FEB2007 | | |
| **Lab Sample ID:** | T16445-10 | **Date Sampled:** | 02/22/07 |
| **Matrix:** | AQ - Ground Water | **Date Received:** | 02/24/07 |
| | | **Percent Solids:** | n/a |
| **Project:** | Longhorn Army Ammunition Plant | | |

## General Chemistry

| Analyte | Result | RL | MDL | Units | DF | Analyzed | By | Method |
|---|---|---|---|---|---|---|---|---|
| **Perchlorate by IC** | | | | | | | | |
| Perchlorate [a] | 21.5 | 10 | 4.0 | ug/l | 1 | 03/02/07 18:39 | AFL | EPA 314 |
| Alkalinity, Total as CaCO3 | 295 | 25 | 0.30 | mg/l | 5 | 03/08/07 12:50 | EB | EPA 310.1 |
| Carbon Dioxide | 19.0 | 5.0 | | mg/l | 1 | 03/12/07 | RM | SM18 4500CO2D |
| Chloride [b] | 77.0 | 2.0 | 0.57 | mg/l | 2 | 04/04/07 13:20 | EB | EPA 325.3 |
| Nitrogen, Nitrate [c] | < 0.10 | 0.10 | 0.0050 | mg/l | 1 | 02/26/07 09:23 | LN | SM18 4500NO3E/NO2B |
| Nitrogen, Nitrate + Nitrite | 0.0050 U | 0.050 | 0.0050 | mg/l | 1 | 02/26/07 09:23 | LN | EPA 353.2 |
| Nitrogen, Nitrite | 0.0030 U | 0.050 | 0.0030 | mg/l | 1 | 02/24/07 14:28 | LN | EPA 353.2 |
| Specific Conductivity [a] | 618 | 0.50 | 0.50 | umhos/cm | 1 | 03/06/07 | AFL | EPA 120.1 |
| Sulfate | 49.0 | 20 | 2.6 | mg/l | 2 | 03/06/07 18:00 | EB | EPA 375.3 |
| Sulfide | 0.0 B | 0.20 | | mg/l | 1 | 03/01/07 12:10 | LN | EPA 376.1 |
| Total Organic Carbon | 0.70 B | 1.0 | 0.092 | mg/l | 1 | 02/28/07 09:08 | LN | EPA 415.1/9060 |
| pH | 7.5 | | | su | 1 | 03/01/07 13:00 | TW | EPA 150.1/9040 |

(a) Analysis performed at Accutest Laboratories, Orlando, FL.
(b) Confirmation Sample. Analyzed outside of hold time.
(c) Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

RL = Reporting Limit
MDL = Method Detection Limit
U = Indicates a result < MDL
B = Indicates a result > = MDL but < RL

Accutest Laboratories

# Report of Analysis





| | | | |
|---|---|---|---|
| **Client Sample ID:** | 29WW35-FEB2007 FD | | |
| **Lab Sample ID:** | T16445-11 | **Date Sampled:** | 02/22/07 |
| **Matrix:** | AQ - Ground Water | **Date Received:** | 02/24/07 |
| **Method:** | SW846 8260B | **Percent Solids:** | n/a |
| **Project:** | Longhorn Army Ammunition Plant | | |

| | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|---|---|---|---|---|---|---|---|
| Run #1 | F0079199.D | 1 | 03/07/07 | LJ | n/a | n/a | VF2315 |
| Run #2 | | | | | | | |

| | Purge Volume |
|---|---|
| Run #1 | 5.0 ml |
| Run #2 | |

**VOA TCL List**

| CAS No. | Compound | Result | RL | MDL | Units | Q |
|---|---|---|---|---|---|---|
| 67-64-1 | Acetone | 2.8 U | 50 | 2.8 | ug/l | |
| 71-43-2 | Benzene | 0.23 U | 2.0 | 0.23 | ug/l | |
| 75-27-4 | Bromodichloromethane | 0.33 U | 2.0 | 0.33 | ug/l | |
| 75-25-2 | Bromoform | 0.65 U | 2.0 | 0.65 | ug/l | |
| 108-90-7 | Chlorobenzene | 0.54 U | 2.0 | 0.54 | ug/l | |
| 75-00-3 | Chloroethane | 0.46 U | 2.0 | 0.46 | ug/l | |
| 67-66-3 | Chloroform | 0.66 U | 2.0 | 0.66 | ug/l | |
| 75-15-0 | Carbon disulfide | 2.8 | 2.0 | 0.62 | ug/l | |
| 56-23-5 | Carbon tetrachloride | 0.52 U | 2.0 | 0.52 | ug/l | |
| 75-34-3 | 1,1-Dichloroethane | 0.52 U | 2.0 | 0.52 | ug/l | |
| 75-35-4 | 1,1-Dichloroethylene | 0.68 U | 2.0 | 0.68 | ug/l | |
| 107-06-2 | 1,2-Dichloroethane | 0.53 U | 2.0 | 0.53 | ug/l | |
| 78-87-5 | 1,2-Dichloropropane | 0.59 U | 2.0 | 0.59 | ug/l | |
| 124-48-1 | Dibromochloromethane | 0.68 U | 2.0 | 0.68 | ug/l | |
| 156-59-2 | cis-1,2-Dichloroethylene | 0.83 U | 2.0 | 0.83 | ug/l | |
| 10061-01-5 | cis-1,3-Dichloropropene | 0.59 U | 2.0 | 0.59 | ug/l | |
| 156-60-5 | trans-1,2-Dichloroethylene | 0.75 U | 2.0 | 0.75 | ug/l | |
| 10061-02-6 | trans-1,3-Dichloropropene | 0.61 U | 2.0 | 0.61 | ug/l | |
| 100-41-4 | Ethylbenzene | 0.48 U | 2.0 | 0.48 | ug/l | |
| 591-78-6 | 2-Hexanone | 1.9 U | 10 | 1.9 | ug/l | |
| 108-10-1 | 4-Methyl-2-pentanone | 7.3 U | 10 | 7.3 | ug/l | |
| 74-83-9 | Methyl bromide | 0.47 U | 2.0 | 0.47 | ug/l | |
| 74-87-3 | Methyl chloride | 0.60 U | 2.0 | 0.60 | ug/l | |
| 75-09-2 | Methylene chloride | 168 | 5.0 | 0.67 | ug/l | |
| 78-93-3 | Methyl ethyl ketone | 3.0 U | 10 | 3.0 | ug/l | |
| 100-42-5 | Styrene | 0.50 U | 2.0 | 0.50 | ug/l | |
| 71-55-6 | 1,1,1-Trichloroethane | 0.37 U | 2.0 | 0.37 | ug/l | |
| 79-34-5 | 1,1,2,2-Tetrachloroethane | 0.46 U | 2.0 | 0.46 | ug/l | |
| 79-00-5 | 1,1,2-Trichloroethane | 0.66 U | 2.0 | 0.66 | ug/l | |
| 127-18-4 | Tetrachloroethylene | 0.74 U | 2.0 | 0.74 | ug/l | |
| 108-88-3 | Toluene | 0.54 U | 2.0 | 0.54 | ug/l | |
| 79-01-6 | Trichloroethylene | 23.4 | 2.0 | 0.63 | ug/l | |

U = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Accutest Laboratories

# Report of Analysis





| | | | |
|---|---|---|---|
| **Client Sample ID:** | 29WW35-FEB2007 FD | | |
| **Lab Sample ID:** | T16445-11 | **Date Sampled:** | 02/22/07 |
| **Matrix:** | AQ - Ground Water | **Date Received:** | 02/24/07 |
| **Method:** | SW846 8260B | **Percent Solids:** | n/a |
| **Project:** | Longhorn Army Ammunition Plant | | |

**VOA TCL List**

| CAS No. | Compound | Result | RL | MDL | Units | Q |
|---|---|---|---|---|---|---|
| 75-01-4 | Vinyl chloride | 0.32 U | 2.0 | 0.32 | ug/l | |
| 1330-20-7 | Xylene (total) | 1.1 U | 6.0 | 1.1 | ug/l | |

| CAS No. | Surrogate Recoveries | Run# 1 | Run# 2 | Limits |
|---|---|---|---|---|
| 1868-53-7 | Dibromofluoromethane | 105% | | 73-139% |
| 17060-07-0 | 1,2-Dichloroethane-D4 | 99% | | 66-139% |
| 2037-26-5 | Toluene-D8 | 108% | | 77-148% |
| 460-00-4 | 4-Bromofluorobenzene | 118% | | 84-150% |

U = Not detected MDL - Method Detection Limit J = Indicates an estimated value
RL = Reporting Limit B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

Accutest Laboratories

# Report of Analysis





| | | | |
|---|---|---|---|
| **Client Sample ID:** | 29WW35-FEB2007 FD | | |
| **Lab Sample ID:** | T16445-11 | **Date Sampled:** | 02/22/07 |
| **Matrix:** | AQ - Ground Water | **Date Received:** | 02/24/07 |
| **Method:** | RSKSOP-147/175 | **Percent Solids:** | n/a |
| **Project:** | Longhorn Army Ammunition Plant | | |

| | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|---|---|---|---|---|---|---|---|
| Run #1 [a] | XY025267.D | 1 | 03/01/07 | AFL | n/a | n/a | F:GXY992 |
| Run #2 | | | | | | | |

| CAS No. | Compound | Result | RL | MDL | Units | Q |
|---|---|---|---|---|---|---|
| 74-82-8 | Methane | 5.70 | 0.50 | 0.30 | ug/l | |
| 74-84-0 | Ethane | 0.60 U | 1.0 | 0.60 | ug/l | |
| 74-85-1 | Ethene | 0.80 U | 1.0 | 0.80 | ug/l | |

(a) Analysis performed at Accutest Laboratories, Orlando, FL.

U = Not detected    MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Accutest Laboratories

# Report of Analysis



| | | | |
|---|---|---|---|
| **Client Sample ID:** | 29WW35-FEB2007 FD | | |
| **Lab Sample ID:** | T16445-11 | **Date Sampled:** | 02/22/07 |
| **Matrix:** | AQ - Ground Water | **Date Received:** | 02/24/07 |
| **Method:** | SW846 8330A SW846 3535A | **Percent Solids:** | n/a |
| **Project:** | Longhorn Army Ammunition Plant | | |

| | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|---|---|---|---|---|---|---|---|
| Run #1 [a] | GG020218.D | 1 | 03/02/07 | AFL | 03/01/07 | F:OP19677 | F:GGG906 |
| Run #2 | | | | | | | |

| | Initial Volume | Final Volume |
|---|---|---|
| Run #1 | 1050 ml | 10.0 ml |
| Run #2 | | |

| CAS No. | Compound | Result | RL | MDL | Units | Q |
|---|---|---|---|---|---|---|
| 2691-41-0 | HMX | 0.057 U | 0.19 | 0.057 | ug/l | |
| 121-82-4 | RDX | 0.071 U | 0.19 | 0.071 | ug/l | |
| 99-65-0 | 1,3-Dinitrobenzene | 0.067 U | 0.19 | 0.067 | ug/l | |
| 606-20-2 | 2,6-Dinitrotoluene | 0.062 U | 0.19 | 0.062 | ug/l | |
| 121-14-2 | 2,4-Dinitrotoluene | 0.071 U | 0.19 | 0.071 | ug/l | |
| 35572-78-2 | 2-amino-4,6-Dinitrotoluene | 0.067 U | 0.19 | 0.067 | ug/l | |
| 19406-51-0 | 4-amino-2,6-Dinitrotoluene | 0.076 U | 0.19 | 0.076 | ug/l | |
| 98-95-3 | Nitrobenzene | 0.057 U | 0.19 | 0.057 | ug/l | |
| 88-72-2 | o-Nitrotoluene | 0.057 U | 0.19 | 0.057 | ug/l | |
| 99-08-1 | m-Nitrotoluene | 0.071 U | 0.19 | 0.071 | ug/l | |
| 99-99-0 | p-Nitrotoluene | 0.071 U | 0.19 | 0.071 | ug/l | |
| 479-45-8 | Tetryl | 0.071 U | 0.19 | 0.071 | ug/l | |
| 99-35-4 | 1,3,5-Trinitrobenzene | 0.090 U | 0.19 | 0.090 | ug/l | |
| 118-96-7 | 2,4,6-Trinitrotoluene | 0.076 U | 0.19 | 0.076 | ug/l | |

| CAS No. | Surrogate Recoveries | Run# 1 | Run# 2 | Limits |
|---|---|---|---|---|
| 610-39-9 | 3,4-Dinitrotoluene | 117% | | 70-136% |

(a) Analysis performed at Accutest Laboratories, Orlando, FL.

U = Not detected MDL - Method Detection Limit J = Indicates an estimated value
RL = Reporting Limit B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

Accutest Laboratories

# Report of Analysis



| | | | |
|---|---|---|---|
| **Client Sample ID:** | 29WW35-FEB2007 FD | | |
| **Lab Sample ID:** | T16445-11 | **Date Sampled:** | 02/22/07 |
| **Matrix:** | AQ - Ground Water | **Date Received:** | 02/24/07 |
| | | **Percent Solids:** | n/a |
| **Project:** | Longhorn Army Ammunition Plant | | |

## General Chemistry

| Analyte | Result | RL | MDL | Units | DF | Analyzed | By | Method |
|---|---|---|---|---|---|---|---|---|
| **Perchlorate by IC** | | | | | | | | |
| Perchlorate [a] | 5.1 B | 10 | 4.0 | ug/l | 1 | 03/02/07 18:53 | AFL | EPA 314 |
| Alkalinity, Total as CaCO3 | 303 | 10 | 0.30 | mg/l | 2 | 03/08/07 12:50 | EB | EPA 310.1 |
| Carbon Dioxide | 15.0 | 5.0 | | mg/l | 1 | 03/12/07 | RM | SM18 4500CO2D |
| Chloride [b] | 77.0 | 2.0 | 0.57 | mg/l | 2 | 04/04/07 13:20 | EB | EPA 325.3 |
| Nitrogen, Nitrate [c] | < 0.10 | 0.10 | 0.0050 | mg/l | 1 | 02/26/07 09:23 | LN | SM18 4500NO3E/NO2B |
| Nitrogen, Nitrate + Nitrite | 0.0050 U | 0.050 | 0.0050 | mg/l | 1 | 02/26/07 09:23 | LN | EPA 353.2 |
| Nitrogen, Nitrite | 0.0030 U | 0.050 | 0.0030 | mg/l | 1 | 02/24/07 14:28 | LN | EPA 353.2 |
| Specific Conductivity [a] | 796 | 0.50 | 0.50 | umhos/cm | 1 | 03/06/07 | AFL | EPA 120.1 |
| Sulfate | 36.0 | 20 | 2.6 | mg/l | 2 | 03/06/07 18:00 | EB | EPA 375.3 |
| Sulfide | 0.0 B | 0.20 | | mg/l | 1 | 03/01/07 12:10 | LN | EPA 376.1 |
| Total Organic Carbon | 0.90 B | 1.0 | 0.092 | mg/l | 1 | 02/28/07 09:08 | LN | EPA 415.1/9060 |
| pH | 7.6 | | | su | 1 | 03/01/07 13:00 | TW | EPA 150.1/9040 |

(a) Analysis performed at Accutest Laboratories, Orlando, FL.
(b) Confirmation Sample. Analyzed outside of hold time.
(c) Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

RL = Reporting Limit
MDL = Method Detection Limit

U = Indicates a result < MDL
B = Indicates a result > = MDL but < RL

Accutest Laboratories

# Report of Analysis





| | | | | |
|---|---|---|---|---|
| **Client Sample ID:** | 29WW06-FEB2007 | | | |
| **Lab Sample ID:** | T16445-12 | | **Date Sampled:** | 02/22/07 |
| **Matrix:** | AQ - Ground Water | | **Date Received:** | 02/24/07 |
| **Method:** | SW846 8260B | | **Percent Solids:** | n/a |
| **Project:** | Longhorn Army Ammunition Plant | | | |

| | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|---|---|---|---|---|---|---|---|
| Run #1 | F0079230.D | 1 | 03/08/07 | LJ | n/a | n/a | VF2318 |
| Run #2 | | | | | | | |

| | Purge Volume |
|---|---|
| Run #1 | 5.0 ml |
| Run #2 | |

**VOA TCL List**

| CAS No. | Compound | Result | RL | MDL | Units | Q |
|---|---|---|---|---|---|---|
| 67-64-1 | Acetone | 2.8 U | 50 | 2.8 | ug/l | |
| 71-43-2 | Benzene | 0.23 U | 2.0 | 0.23 | ug/l | |
| 75-27-4 | Bromodichloromethane | 0.33 U | 2.0 | 0.33 | ug/l | |
| 75-25-2 | Bromoform | 0.65 U | 2.0 | 0.65 | ug/l | |
| 108-90-7 | Chlorobenzene | 0.54 U | 2.0 | 0.54 | ug/l | |
| 75-00-3 | Chloroethane | 0.46 U | 2.0 | 0.46 | ug/l | |
| 67-66-3 | Chloroform | 0.66 U | 2.0 | 0.66 | ug/l | |
| 75-15-0 | Carbon disulfide | 0.62 U | 2.0 | 0.62 | ug/l | |
| 56-23-5 | Carbon tetrachloride | 0.52 U | 2.0 | 0.52 | ug/l | |
| 75-34-3 | 1,1-Dichloroethane | 0.52 U | 2.0 | 0.52 | ug/l | |
| 75-35-4 | 1,1-Dichloroethylene | 0.68 U | 2.0 | 0.68 | ug/l | |
| 107-06-2 | 1,2-Dichloroethane | 0.53 U | 2.0 | 0.53 | ug/l | |
| 78-87-5 | 1,2-Dichloropropane | 0.59 U | 2.0 | 0.59 | ug/l | |
| 124-48-1 | Dibromochloromethane | 0.68 U | 2.0 | 0.68 | ug/l | |
| 156-59-2 | cis-1,2-Dichloroethylene | 0.83 U | 2.0 | 0.83 | ug/l | |
| 10061-01-5 | cis-1,3-Dichloropropene | 0.59 U | 2.0 | 0.59 | ug/l | |
| 156-60-5 | trans-1,2-Dichloroethylene | 0.75 U | 2.0 | 0.75 | ug/l | |
| 10061-02-6 | trans-1,3-Dichloropropene | 0.61 U | 2.0 | 0.61 | ug/l | |
| 100-41-4 | Ethylbenzene | 0.48 U | 2.0 | 0.48 | ug/l | |
| 591-78-6 | 2-Hexanone | 1.9 U | 10 | 1.9 | ug/l | |
| 108-10-1 | 4-Methyl-2-pentanone | 7.3 U | 10 | 7.3 | ug/l | |
| 74-83-9 | Methyl bromide | 0.47 U | 2.0 | 0.47 | ug/l | |
| 74-87-3 | Methyl chloride | 0.60 U | 2.0 | 0.60 | ug/l | |
| 75-09-2 | Methylene chloride | 0.67 U | 5.0 | 0.67 | ug/l | |
| 78-93-3 | Methyl ethyl ketone | 3.0 U | 10 | 3.0 | ug/l | |
| 100-42-5 | Styrene | 0.50 U | 2.0 | 0.50 | ug/l | |
| 71-55-6 | 1,1,1-Trichloroethane | 0.37 U | 2.0 | 0.37 | ug/l | |
| 79-34-5 | 1,1,2,2-Tetrachloroethane | 0.46 U | 2.0 | 0.46 | ug/l | |
| 79-00-5 | 1,1,2-Trichloroethane | 0.66 U | 2.0 | 0.66 | ug/l | |
| 127-18-4 | Tetrachloroethylene | 0.74 U | 2.0 | 0.74 | ug/l | |
| 108-88-3 | Toluene | 0.54 U | 2.0 | 0.54 | ug/l | |
| 79-01-6 | Trichloroethylene | 0.63 U | 2.0 | 0.63 | ug/l | |

U = Not detected  MDL - Method Detection Limit  J = Indicates an estimated value
RL = Reporting Limit  B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range  N = Indicates presumptive evidence of a compound

Accutest Laboratories

# Report of Analysis





| | | | |
|---|---|---|---|
| **Client Sample ID:** | 29WW06-FEB2007 | | |
| **Lab Sample ID:** | T16445-12 | **Date Sampled:** | 02/22/07 |
| **Matrix:** | AQ - Ground Water | **Date Received:** | 02/24/07 |
| **Method:** | SW846 8260B | **Percent Solids:** | n/a |
| **Project:** | Longhorn Army Ammunition Plant | | |

**VOA TCL List**

| CAS No. | Compound | Result | RL | MDL | Units | Q |
|---|---|---|---|---|---|---|
| 75-01-4 | Vinyl chloride | 0.32 U | 2.0 | 0.32 | ug/l | |
| 1330-20-7 | Xylene (total) | 1.1 U | 6.0 | 1.1 | ug/l | |

| CAS No. | Surrogate Recoveries | Run# 1 | Run# 2 | Limits |
|---|---|---|---|---|
| 1868-53-7 | Dibromofluoromethane | 105% | | 73-139% |
| 17060-07-0 | 1,2-Dichloroethane-D4 | 98% | | 66-139% |
| 2037-26-5 | Toluene-D8 | 104% | | 77-148% |
| 460-00-4 | 4-Bromofluorobenzene | 105% | | 84-150% |

U = Not detected MDL - Method Detection Limit J = Indicates an estimated value
RL = Reporting Limit B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

Accutest Laboratories



# Report of Analysis



| | | | |
|---|---|---|---|
| **Client Sample ID:** | 29WW06-FEB2007 | | |
| **Lab Sample ID:** | T16445-12 | **Date Sampled:** | 02/22/07 |
| **Matrix:** | AQ - Ground Water | **Date Received:** | 02/24/07 |
| **Method:** | RSKSOP-147/175 | **Percent Solids:** | n/a |
| **Project:** | Longhorn Army Ammunition Plant | | |

| | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|---|---|---|---|---|---|---|---|
| Run #1 [a] | XY025268.D | 1 | 03/01/07 | AFL | n/a | n/a | F:GXY992 |
| Run #2 | | | | | | | |

| CAS No. | Compound | Result | RL | MDL | Units | Q |
|---|---|---|---|---|---|---|
| 74-82-8 | Methane | 0.30 U | 0.50 | 0.30 | ug/l | |
| 74-84-0 | Ethane | 0.60 U | 1.0 | 0.60 | ug/l | |
| 74-85-1 | Ethene | 0.80 U | 1.0 | 0.80 | ug/l | |

(a) Analysis performed at Accutest Laboratories, Orlando, FL.

U = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Accutest Laboratories

# Report of Analysis





| | | | |
|---|---|---|---|
| **Client Sample ID:** | 29WW06-FEB2007 | | |
| **Lab Sample ID:** | T16445-12 | **Date Sampled:** | 02/22/07 |
| **Matrix:** | AQ - Ground Water | **Date Received:** | 02/24/07 |
| **Method:** | SW846 8330A SW846 3535A | **Percent Solids:** | n/a |
| **Project:** | Longhorn Army Ammunition Plant | | |

| | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|---|---|---|---|---|---|---|---|
| Run #1 [a] | GG020219.D | 1 | 03/03/07 | AFL | 03/01/07 | F:OP19677 | F:GGG906 |
| Run #2 [b] | GG020236.D | 1 | 03/05/07 | AFL | 03/01/07 | F:OP19677 | F:GGG907 |

| | Initial Volume | Final Volume |
|---|---|---|
| Run #1 | 1050 ml | 10.0 ml |
| Run #2 | 1050 ml | 10.0 ml |

| CAS No. | Compound | Result | RL | MDL | Units | Q |
|---|---|---|---|---|---|---|
| 2691-41-0 | HMX | 0.057 U | 0.19 | 0.057 | ug/l | |
| 121-82-4 | RDX | 0.071 U | 0.19 | 0.071 | ug/l | |
| 99-65-0 | 1,3-Dinitrobenzene | 0.067 U | 0.19 | 0.067 | ug/l | |
| 606-20-2 | 2,6-Dinitrotoluene | 0.062 U | 0.19 | 0.062 | ug/l | |
| 121-14-2 | 2,4-Dinitrotoluene | 0.16 | 0.19 | 0.071 | ug/l | J |
| 35572-78-2 | 2-amino-4,6-Dinitrotoluene | 0.067 U | 0.19 | 0.067 | ug/l | |
| 19406-51-0 | 4-amino-2,6-Dinitrotoluene | 0.17 | 0.19 | 0.076 | ug/l | J |
| 98-95-3 | Nitrobenzene | 0.057 U | 0.19 | 0.057 | ug/l | |
| 88-72-2 | o-Nitrotoluene | 0.057 U | 0.19 | 0.057 | ug/l | |
| 99-08-1 | m-Nitrotoluene | 0.071 U | 0.19 | 0.071 | ug/l | |
| 99-99-0 | p-Nitrotoluene | 0.071 U | 0.19 | 0.071 | ug/l | |
| 479-45-8 | Tetryl | 0.071 U | 0.19 | 0.071 | ug/l | |
| 99-35-4 | 1,3,5-Trinitrobenzene | 0.090 U | 0.19 | 0.090 | ug/l | |
| 118-96-7 | 2,4,6-Trinitrotoluene | 0.076 U | 0.19 | 0.076 | ug/l | |

| CAS No. | Surrogate Recoveries | Run# 1 | Run# 2 | Limits |
|---|---|---|---|---|
| 610-39-9 | 3,4-Dinitrotoluene | 103% | 90% | 70-136% |

(a) All hits confirmed by reanalysis on a dissimilar column. Analysis performed at Accutest Laboratories, Orlando, FL.
(b) Confirmation run. Analysis performed at Accutest Laboratories, Orlando, FL.

U = Not detected    MDL - Method Detection Limit    J = Indicates an estimated value
RL = Reporting Limit    B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range    N = Indicates presumptive evidence of a compound

Accutest Laboratories

# Report of Analysis



| | | | |
|---|---|---|---|
| **Client Sample ID:** | 29WW06-FEB2007 | | |
| **Lab Sample ID:** | T16445-12 | **Date Sampled:** | 02/22/07 |
| **Matrix:** | AQ - Ground Water | **Date Received:** | 02/24/07 |
| | | **Percent Solids:** | n/a |
| **Project:** | Longhorn Army Ammunition Plant | | |

## General Chemistry

| Analyte | Result | RL | MDL | Units | DF | Analyzed | By | Method |
|---|---|---|---|---|---|---|---|---|
| **Perchlorate by IC** | | | | | | | | |
| Perchlorate [a] | 20 U | 50 | 20 | ug/l | 5 | 03/07/07 18:35 | AFL | EPA 314 |
| Alkalinity, Total as CaCO3 | 856 | 25 | 0.30 | mg/l | 5 | 03/08/07 12:50 | EB | EPA 310.1 |
| Carbon Dioxide | 270 | 5.0 | | mg/l | 1 | 03/12/07 | RM | SM18 4500CO2D |
| Chloride | 298 | 20 | 0.57 | mg/l | 20 | 03/05/07 12:15 | EB | EPA 325.3 |
| Nitrogen, Nitrate [b] | 1.3 | 0.25 | 0.0050 | mg/l | 1 | 02/26/07 09:23 | LN | SM18 4500NO3E/NO2B |
| Nitrogen, Nitrate + Nitrite | 1.3 | 0.20 | 0.0050 | mg/l | 4 | 02/26/07 09:23 | LN | EPA 353.2 |
| Nitrogen, Nitrite | 0.0030 U | 0.050 | 0.0030 | mg/l | 1 | 02/24/07 14:28 | LN | EPA 353.2 |
| Specific Conductivity [c] | 2640 | 0.50 | 0.50 | umhos/cm | 1 | 03/06/07 | AFL | EPA 120.1 |
| Sulfate | 726 | 40 | 2.6 | mg/l | 4 | 03/06/07 18:00 | EB | EPA 375.3 |
| Sulfide | 0.0 B | 0.20 | | mg/l | 1 | 03/01/07 12:10 | LN | EPA 376.1 |
| Total Organic Carbon | 38.0 | 1.0 | 0.092 | mg/l | 1 | 02/28/07 09:08 | LN | EPA 415.1/9060 |
| pH | 6.8 | | | su | 1 | 03/01/07 13:00 | TW | EPA 150.1/9040 |

(a) Dilution required due to matrix interference. Analysis performed at Accutest Laboratories, Orlando, FL.
(b) Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)
(c) Analysis performed at Accutest Laboratories, Orlando, FL.

RL = Reporting Limit
MDL = Method Detection Limit

U = Indicates a result < MDL
B = Indicates a result > = MDL but < RL

Accutest Laboratories



# Report of Analysis



| | | | |
|---|---|---|---|
| **Client Sample ID:** | 17WW05-FEB2007 | | |
| **Lab Sample ID:** | T16445-13 | **Date Sampled:** | 02/23/07 |
| **Matrix:** | AQ - Ground Water | **Date Received:** | 02/24/07 |
| **Method:** | SW846 8260B | **Percent Solids:** | n/a |
| **Project:** | Longhorn Army Ammunition Plant | | |

| | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|---|---|---|---|---|---|---|---|
| Run #1 | F0079231.D | 1 | 03/08/07 | LJ | n/a | n/a | VF2318 |
| Run #2 | | | | | | | |

| | Purge Volume |
|---|---|
| Run #1 | 5.0 ml |
| Run #2 | |

**VOA TCL List**

| CAS No. | Compound | Result | RL | MDL | Units | Q |
|---|---|---|---|---|---|---|
| 67-64-1 | Acetone | 2.8 U | 50 | 2.8 | ug/l | |
| 71-43-2 | Benzene | 0.23 U | 2.0 | 0.23 | ug/l | |
| 75-27-4 | Bromodichloromethane | 0.33 U | 2.0 | 0.33 | ug/l | |
| 75-25-2 | Bromoform | 0.65 U | 2.0 | 0.65 | ug/l | |
| 108-90-7 | Chlorobenzene | 0.54 U | 2.0 | 0.54 | ug/l | |
| 75-00-3 | Chloroethane | 0.46 U | 2.0 | 0.46 | ug/l | |
| 67-66-3 | Chloroform | 0.66 U | 2.0 | 0.66 | ug/l | |
| 75-15-0 | Carbon disulfide | 0.62 U | 2.0 | 0.62 | ug/l | |
| 56-23-5 | Carbon tetrachloride | 0.52 U | 2.0 | 0.52 | ug/l | |
| 75-34-3 | 1,1-Dichloroethane | 0.52 U | 2.0 | 0.52 | ug/l | |
| 75-35-4 | 1,1-Dichloroethylene | 0.68 U | 2.0 | 0.68 | ug/l | |
| 107-06-2 | 1,2-Dichloroethane | 0.53 U | 2.0 | 0.53 | ug/l | |
| 78-87-5 | 1,2-Dichloropropane | 0.59 U | 2.0 | 0.59 | ug/l | |
| 124-48-1 | Dibromochloromethane | 0.68 U | 2.0 | 0.68 | ug/l | |
| 156-59-2 | cis-1,2-Dichloroethylene | 0.83 U | 2.0 | 0.83 | ug/l | |
| 10061-01-5 | cis-1,3-Dichloropropene | 0.59 U | 2.0 | 0.59 | ug/l | |
| 156-60-5 | trans-1,2-Dichloroethylene | 0.75 U | 2.0 | 0.75 | ug/l | |
| 10061-02-6 | trans-1,3-Dichloropropene | 0.61 U | 2.0 | 0.61 | ug/l | |
| 100-41-4 | Ethylbenzene | 0.48 U | 2.0 | 0.48 | ug/l | |
| 591-78-6 | 2-Hexanone | 1.9 U | 10 | 1.9 | ug/l | |
| 108-10-1 | 4-Methyl-2-pentanone | 7.3 U | 10 | 7.3 | ug/l | |
| 74-83-9 | Methyl bromide | 0.47 U | 2.0 | 0.47 | ug/l | |
| 74-87-3 | Methyl chloride | 0.60 U | 2.0 | 0.60 | ug/l | |
| 75-09-2 | Methylene chloride | 0.67 U | 5.0 | 0.67 | ug/l | |
| 78-93-3 | Methyl ethyl ketone | 3.0 U | 10 | 3.0 | ug/l | |
| 100-42-5 | Styrene | 0.50 U | 2.0 | 0.50 | ug/l | |
| 71-55-6 | 1,1,1-Trichloroethane | 0.37 U | 2.0 | 0.37 | ug/l | |
| 79-34-5 | 1,1,2,2-Tetrachloroethane | 0.46 U | 2.0 | 0.46 | ug/l | |
| 79-00-5 | 1,1,2-Trichloroethane | 0.66 U | 2.0 | 0.66 | ug/l | |
| 127-18-4 | Tetrachloroethylene | 0.74 U | 2.0 | 0.74 | ug/l | |
| 108-88-3 | Toluene | 0.54 U | 2.0 | 0.54 | ug/l | |
| 79-01-6 | Trichloroethylene | 0.63 U | 2.0 | 0.63 | ug/l | |

U = Not detected  MDL - Method Detection Limit  J = Indicates an estimated value
RL = Reporting Limit  B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range  N = Indicates presumptive evidence of a compound

Accutest Laboratories

# Report of Analysis






| | | | |
|---|---|---|---|
| **Client Sample ID:** | 17WW05-FEB2007 | | |
| **Lab Sample ID:** | T16445-13 | **Date Sampled:** | 02/23/07 |
| **Matrix:** | AQ - Ground Water | **Date Received:** | 02/24/07 |
| **Method:** | SW846 8260B | **Percent Solids:** | n/a |
| **Project:** | Longhorn Army Ammunition Plant | | |

**VOA TCL List**

| CAS No. | Compound | Result | RL | MDL | Units | Q |
|---|---|---|---|---|---|---|
| 75-01-4 | Vinyl chloride | 0.32 U | 2.0 | 0.32 | ug/l | |
| 1330-20-7 | Xylene (total) | 1.1 U | 6.0 | 1.1 | ug/l | |

| CAS No. | Surrogate Recoveries | Run# 1 | Run# 2 | Limits |
|---|---|---|---|---|
| 1868-53-7 | Dibromofluoromethane | 105% | | 73-139% |
| 17060-07-0 | 1,2-Dichloroethane-D4 | 100% | | 66-139% |
| 2037-26-5 | Toluene-D8 | 103% | | 77-148% |
| 460-00-4 | 4-Bromofluorobenzene | 109% | | 84-150% |

U = Not detected  MDL - Method Detection Limit  J = Indicates an estimated value
RL = Reporting Limit  B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range  N = Indicates presumptive evidence of a compound

Accutest Laboratories

# Report of Analysis



| | | | |
|---|---|---|---|
| **Client Sample ID:** | 17WW05-FEB2007 | | |
| **Lab Sample ID:** | T16445-13 | **Date Sampled:** | 02/23/07 |
| **Matrix:** | AQ - Ground Water | **Date Received:** | 02/24/07 |
| **Method:** | RSKSOP-147/175 | **Percent Solids:** | n/a |
| **Project:** | Longhorn Army Ammunition Plant | | |

| | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|---|---|---|---|---|---|---|---|
| Run #1 [a] | XY025269.D | 1 | 03/01/07 | AFL | n/a | n/a | F:GXY992 |
| Run #2 | | | | | | | |

| CAS No. | Compound | Result | RL | MDL | Units | Q |
|---|---|---|---|---|---|---|
| 74-82-8 | Methane | 349 | 0.50 | 0.30 | ug/l | |
| 74-84-0 | Ethane | 0.60 U | 1.0 | 0.60 | ug/l | |
| 74-85-1 | Ethene | 0.80 U | 1.0 | 0.80 | ug/l | |

(a) Analysis performed at Accutest Laboratories, Orlando, FL.

U = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Accutest Laboratories

# Report of Analysis



| | | | |
|---|---|---|---|
| **Client Sample ID:** | 17WW05-FEB2007 | | |
| **Lab Sample ID:** | T16445-13 | **Date Sampled:** | 02/23/07 |
| **Matrix:** | AQ - Ground Water | **Date Received:** | 02/24/07 |
| **Method:** | SW846 8330A SW846 3535A | **Percent Solids:** | n/a |
| **Project:** | Longhorn Army Ammunition Plant | | |

| | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|---|---|---|---|---|---|---|---|
| Run #1 [a] | GG020220.D | 1 | 03/03/07 | AFL | 03/01/07 | F:OP19677 | F:GGG906 |
| Run #2 | | | | | | | |

| | Initial Volume | Final Volume |
|---|---|---|
| Run #1 | 1000 ml | 10.0 ml |
| Run #2 | | |

| CAS No. | Compound | Result | RL | MDL | Units | Q |
|---|---|---|---|---|---|---|
| 2691-41-0 | HMX | 0.060 U | 0.20 | 0.060 | ug/l | |
| 121-82-4 | RDX | 0.075 U | 0.20 | 0.075 | ug/l | |
| 99-65-0 | 1,3-Dinitrobenzene | 0.070 U | 0.20 | 0.070 | ug/l | |
| 606-20-2 | 2,6-Dinitrotoluene | 0.065 U | 0.20 | 0.065 | ug/l | |
| 121-14-2 | 2,4-Dinitrotoluene | 0.075 U | 0.20 | 0.075 | ug/l | |
| 35572-78-2 | 2-amino-4,6-Dinitrotoluene | 0.070 U | 0.20 | 0.070 | ug/l | |
| 19406-51-0 | 4-amino-2,6-Dinitrotoluene | 0.080 U | 0.20 | 0.080 | ug/l | |
| 98-95-3 | Nitrobenzene | 0.060 U | 0.20 | 0.060 | ug/l | |
| 88-72-2 | o-Nitrotoluene | 0.060 U | 0.20 | 0.060 | ug/l | |
| 99-08-1 | m-Nitrotoluene | 0.075 U | 0.20 | 0.075 | ug/l | |
| 99-99-0 | p-Nitrotoluene | 0.075 U | 0.20 | 0.075 | ug/l | |
| 479-45-8 | Tetryl | 0.075 U | 0.20 | 0.075 | ug/l | |
| 99-35-4 | 1,3,5-Trinitrobenzene | 0.095 U | 0.20 | 0.095 | ug/l | |
| 118-96-7 | 2,4,6-Trinitrotoluene | 0.080 U | 0.20 | 0.080 | ug/l | |

| CAS No. | Surrogate Recoveries | Run# 1 | Run# 2 | Limits |
|---|---|---|---|---|
| 610-39-9 | 3,4-Dinitrotoluene | 107% | | 70-136% |

(a) Analysis performed at Accutest Laboratories, Orlando, FL.

U = Not detected   MDL - Method Detection Limit   J = Indicates an estimated value
RL = Reporting Limit   B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range   N = Indicates presumptive evidence of a compound

Accutest Laboratories

# Report of Analysis





| | | | |
|---|---|---|---|
| **Client Sample ID:** | 17WW05-FEB2007 | | |
| **Lab Sample ID:** | T16445-13 | **Date Sampled:** | 02/23/07 |
| **Matrix:** | AQ - Ground Water | **Date Received:** | 02/24/07 |
| | | **Percent Solids:** | n/a |
| **Project:** | Longhorn Army Ammunition Plant | | |

## General Chemistry

| Analyte | Result | RL | MDL | Units | DF | Analyzed | By | Method |
|---|---|---|---|---|---|---|---|---|
| **Perchlorate by IC** | | | | | | | | |
| Perchlorate [a] | 4.0 U | 10 | 4.0 | ug/l | 1 | 03/02/07 19:22 | AFL | EPA 314 |
| | | | | | | | | |
| Alkalinity, Total as CaCO3 | 422 | 25 | 0.30 | mg/l | 5 | 03/08/07 12:50 | EB | EPA 310.1 |
| Carbon Dioxide | 5.2 | 5.0 | | mg/l | 1 | 03/12/07 | RM | SM18 4500CO2D |
| Chloride | 174 | 20 | 0.57 | mg/l | 20 | 03/05/07 12:15 | EB | EPA 325.3 |
| Nitrogen, Nitrate [b] | < 0.10 | 0.10 | 0.0050 | mg/l | 1 | 02/26/07 09:23 | LN | SM18 4500NO3E/NO2B |
| Nitrogen, Nitrate + Nitrite | 0.0050 U | 0.050 | 0.0050 | mg/l | 1 | 02/26/07 09:23 | LN | EPA 353.2 |
| Nitrogen, Nitrite | 0.0030 U | 0.050 | 0.0030 | mg/l | 1 | 02/24/07 14:28 | LN | EPA 353.2 |
| Specific Conductivity [a] | 1170 | 0.50 | 0.50 | umhos/cm | 1 | 03/06/07 | AFL | EPA 120.1 |
| Sulfate | 34.0 | 20 | 2.6 | mg/l | 2 | 03/06/07 18:00 | EB | EPA 375.3 |
| Sulfide | 0.0 B | 0.20 | | mg/l | 1 | 03/01/07 12:10 | LN | EPA 376.1 |
| Total Organic Carbon | 3.0 | 1.0 | 0.092 | mg/l | 1 | 02/28/07 09:08 | LN | EPA 415.1/9060 |
| pH | 8.2 | | | su | 1 | 03/01/07 13:00 | TW | EPA 150.1/9040 |

(a) Analysis performed at Accutest Laboratories, Orlando, FL.
(b) Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

RL = Reporting Limit
MDL = Method Detection Limit

U = Indicates a result < MDL
B = Indicates a result > = MDL but < RL

Accutest Laboratories

# Report of Analysis



| | | | |
|---|---|---|---|
| **Client Sample ID:** | 7WW06-FEB2007 | | |
| **Lab Sample ID:** | T16445-14 | **Date Sampled:** | 02/23/07 |
| **Matrix:** | AQ - Ground Water | **Date Received:** | 02/24/07 |
| **Method:** | SW846 8260B | **Percent Solids:** | n/a |
| **Project:** | Longhorn Army Ammunition Plant | | |

| | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|---|---|---|---|---|---|---|---|
| Run #1 | F0079202.D | 1 | 03/07/07 | LJ | n/a | n/a | VF2315 |
| Run #2 | F0079238.D | 5 | 03/08/07 | LJ | n/a | n/a | VF2318 |

| | Purge Volume |
|---|---|
| Run #1 | 5.0 ml |
| Run #2 | 5.0 ml |

**VOA TCL List**

| CAS No. | Compound | Result | RL | MDL | Units | Q |
|---|---|---|---|---|---|---|
| 67-64-1 | Acetone | 2.8 U | 50 | 2.8 | ug/l | |
| 71-43-2 | Benzene | 0.23 U | 2.0 | 0.23 | ug/l | |
| 75-27-4 | Bromodichloromethane | 0.33 U | 2.0 | 0.33 | ug/l | |
| 75-25-2 | Bromoform | 0.65 U | 2.0 | 0.65 | ug/l | |
| 108-90-7 | Chlorobenzene | 0.54 U | 2.0 | 0.54 | ug/l | |
| 75-00-3 | Chloroethane | 0.46 U | 2.0 | 0.46 | ug/l | |
| 67-66-3 | Chloroform | 0.66 U | 2.0 | 0.66 | ug/l | |
| 75-15-0 | Carbon disulfide | 0.62 U | 2.0 | 0.62 | ug/l | |
| 56-23-5 | Carbon tetrachloride | 0.52 U | 2.0 | 0.52 | ug/l | |
| 75-34-3 | 1,1-Dichloroethane | 1.5 | 2.0 | 0.52 | ug/l | J |
| 75-35-4 | 1,1-Dichloroethylene | 6.9 | 2.0 | 0.68 | ug/l | |
| 107-06-2 | 1,2-Dichloroethane | 8.0 | 2.0 | 0.53 | ug/l | |
| 78-87-5 | 1,2-Dichloropropane | 0.59 U | 2.0 | 0.59 | ug/l | |
| 124-48-1 | Dibromochloromethane | 0.68 U | 2.0 | 0.68 | ug/l | |
| 156-59-2 | cis-1,2-Dichloroethylene | 9.5 | 2.0 | 0.83 | ug/l | |
| 10061-01-5 | cis-1,3-Dichloropropene | 0.59 U | 2.0 | 0.59 | ug/l | |
| 156-60-5 | trans-1,2-Dichloroethylene | 2.6 | 2.0 | 0.75 | ug/l | |
| 10061-02-6 | trans-1,3-Dichloropropene | 0.61 U | 2.0 | 0.61 | ug/l | |
| 100-41-4 | Ethylbenzene | 0.48 U | 2.0 | 0.48 | ug/l | |
| 591-78-6 | 2-Hexanone | 1.9 U | 10 | 1.9 | ug/l | |
| 108-10-1 | 4-Methyl-2-pentanone | 7.3 U | 10 | 7.3 | ug/l | |
| 74-83-9 | Methyl bromide | 0.47 U | 2.0 | 0.47 | ug/l | |
| 74-87-3 | Methyl chloride | 0.60 U | 2.0 | 0.60 | ug/l | |
| 75-09-2 | Methylene chloride | 0.67 U | 5.0 | 0.67 | ug/l | |
| 78-93-3 | Methyl ethyl ketone | 3.0 U | 10 | 3.0 | ug/l | |
| 100-42-5 | Styrene | 0.50 U | 2.0 | 0.50 | ug/l | |
| 71-55-6 | 1,1,1-Trichloroethane | 0.37 U | 2.0 | 0.37 | ug/l | |
| 79-34-5 | 1,1,2,2-Tetrachloroethane | 0.46 U | 2.0 | 0.46 | ug/l | |
| 79-00-5 | 1,1,2-Trichloroethane | 0.66 U | 2.0 | 0.66 | ug/l | |
| 127-18-4 | Tetrachloroethylene | 0.74 U | 2.0 | 0.74 | ug/l | |
| 108-88-3 | Toluene | 0.54 U | 2.0 | 0.54 | ug/l | |
| 79-01-6 | Trichloroethylene | 205 [a] | 10 | 3.2 | ug/l | |

U = Not detected  MDL - Method Detection Limit  J = Indicates an estimated value
RL = Reporting Limit  B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range  N = Indicates presumptive evidence of a compound

Accutest Laboratories

# Report of Analysis



| | | | |
|---|---|---|---|
| **Client Sample ID:** | 7WW06-FEB2007 | | |
| **Lab Sample ID:** | T16445-14 | **Date Sampled:** | 02/23/07 |
| **Matrix:** | AQ - Ground Water | **Date Received:** | 02/24/07 |
| **Method:** | SW846 8260B | **Percent Solids:** | n/a |
| **Project:** | Longhorn Army Ammunition Plant | | |

**VOA TCL List**

| CAS No. | Compound | Result | RL | MDL | Units | Q |
|---|---|---|---|---|---|---|
| 75-01-4 | Vinyl chloride | 0.32 U | 2.0 | 0.32 | ug/l | |
| 1330-20-7 | Xylene (total) | 1.1 U | 6.0 | 1.1 | ug/l | |

| CAS No. | Surrogate Recoveries | Run# 1 | Run# 2 | Limits |
|---|---|---|---|---|
| 1868-53-7 | Dibromofluoromethane | 105% | 104% | 73-139% |
| 17060-07-0 | 1,2-Dichloroethane-D4 | 105% | 97% | 66-139% |
| 2037-26-5 | Toluene-D8 | 106% | 105% | 77-148% |
| 460-00-4 | 4-Bromofluorobenzene | 117% | 123% | 84-150% |

(a) Result is from Run# 2

U = Not detected MDL - Method Detection Limit J = Indicates an estimated value
RL = Reporting Limit B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

Accutest Laboratories

# Report of Analysis



| | | | |
|---|---|---|---|
| **Client Sample ID:** | 7WW06-FEB2007 | | |
| **Lab Sample ID:** | T16445-14 | **Date Sampled:** | 02/23/07 |
| **Matrix:** | AQ - Ground Water | **Date Received:** | 02/24/07 |
| **Method:** | RSKSOP-147/175 | **Percent Solids:** | n/a |
| **Project:** | Longhorn Army Ammunition Plant | | |

| | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|---|---|---|---|---|---|---|---|
| Run #1 [a] | XY025270.D | 1 | 03/01/07 | AFL | n/a | n/a | F:GXY992 |
| Run #2 | | | | | | | |

| CAS No. | Compound | Result | RL | MDL | Units | Q |
|---|---|---|---|---|---|---|
| 74-82-8 | Methane | 1.79 | 0.50 | 0.30 | ug/l | |
| 74-84-0 | Ethane | 0.60 U | 1.0 | 0.60 | ug/l | |
| 74-85-1 | Ethene | 0.80 U | 1.0 | 0.80 | ug/l | |

(a) Analysis performed at Accutest Laboratories, Orlando, FL.

U = Not detected  MDL - Method Detection Limit  J = Indicates an estimated value
RL = Reporting Limit  B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range  N = Indicates presumptive evidence of a compound

Accutest Laboratories

# Report of Analysis



| | | | |
|---|---|---|---|
| **Client Sample ID:** | 7WW06-FEB2007 | | |
| **Lab Sample ID:** | T16445-14 | **Date Sampled:** | 02/23/07 |
| **Matrix:** | AQ - Ground Water | **Date Received:** | 02/24/07 |
| **Method:** | SW846 8330A SW846 3535A | **Percent Solids:** | n/a |
| **Project:** | Longhorn Army Ammunition Plant | | |

| | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|---|---|---|---|---|---|---|---|
| Run #1 [a] | GG020221.D | 1 | 03/03/07 | AFL | 03/01/07 | F:OP19677 | F:GGG906 |
| Run #2 | | | | | | | |

| | Initial Volume | Final Volume |
|---|---|---|
| Run #1 | 1000 ml | 10.0 ml |
| Run #2 | | |

| CAS No. | Compound | Result | RL | MDL | Units | Q |
|---|---|---|---|---|---|---|
| 2691-41-0 | HMX | 0.060 U | 0.20 | 0.060 | ug/l | |
| 121-82-4 | RDX | 0.075 U | 0.20 | 0.075 | ug/l | |
| 99-65-0 | 1,3-Dinitrobenzene | 0.070 U | 0.20 | 0.070 | ug/l | |
| 606-20-2 | 2,6-Dinitrotoluene | 0.065 U | 0.20 | 0.065 | ug/l | |
| 121-14-2 | 2,4-Dinitrotoluene | 0.075 U | 0.20 | 0.075 | ug/l | |
| 35572-78-2 | 2-amino-4,6-Dinitrotoluene | 0.070 U | 0.20 | 0.070 | ug/l | |
| 19406-51-0 | 4-amino-2,6-Dinitrotoluene | 0.080 U | 0.20 | 0.080 | ug/l | |
| 98-95-3 | Nitrobenzene | 0.060 U | 0.20 | 0.060 | ug/l | |
| 88-72-2 | o-Nitrotoluene | 0.060 U | 0.20 | 0.060 | ug/l | |
| 99-08-1 | m-Nitrotoluene | 0.075 U | 0.20 | 0.075 | ug/l | |
| 99-99-0 | p-Nitrotoluene | 0.075 U | 0.20 | 0.075 | ug/l | |
| 479-45-8 | Tetryl | 0.075 U | 0.20 | 0.075 | ug/l | |
| 99-35-4 | 1,3,5-Trinitrobenzene | 0.095 U | 0.20 | 0.095 | ug/l | |
| 118-96-7 | 2,4,6-Trinitrotoluene | 0.080 U | 0.20 | 0.080 | ug/l | |

| CAS No. | Surrogate Recoveries | Run# 1 | Run# 2 | Limits |
|---|---|---|---|---|
| 610-39-9 | 3,4-Dinitrotoluene | 102% | | 70-136% |

(a) Analysis performed at Accutest Laboratories, Orlando, FL.

U = Not detected MDL - Method Detection Limit J = Indicates an estimated value
RL = Reporting Limit B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

Accutest Laboratories

# Report of Analysis





| | | | | |
|---|---|---|---|---|
| **Client Sample ID:** | 7WW06-FEB2007 | | | |
| **Lab Sample ID:** | T16445-14 | | **Date Sampled:** | 02/23/07 |
| **Matrix:** | AQ - Ground Water | | **Date Received:** | 02/24/07 |
| | | | **Percent Solids:** | n/a |
| **Project:** | Longhorn Army Ammunition Plant | | | |

**General Chemistry**

| Analyte | Result | RL | MDL | Units | DF | Analyzed | By | Method |
|---|---|---|---|---|---|---|---|---|
| **Perchlorate by IC** | | | | | | | | |
| Perchlorate [a] | 4.0 U | 10 | 4.0 | ug/l | 1 | 03/02/07 19:36 | AFL | EPA 314 |
| Alkalinity, Total as CaCO3 | 336 | 25 | 0.30 | mg/l | 5 | 03/08/07 12:50 | EB | EPA 310.1 |
| Carbon Dioxide | 4.8 B | 5.0 | | mg/l | 1 | 03/12/07 | RM | SM18 4500CO2D |
| Chloride | 1110 | 50 | 0.57 | mg/l | 50 | 03/05/07 12:15 | EB | EPA 325.3 |
| Nitrogen, Nitrate [b] | < 0.10 | 0.10 | 0.0050 | mg/l | 1 | 02/26/07 09:23 | LN | SM18 4500NO3E/NO2B |
| Nitrogen, Nitrate + Nitrite | 0.0050 U | 0.050 | 0.0050 | mg/l | 1 | 02/26/07 09:23 | LN | EPA 353.2 |
| Nitrogen, Nitrite | 0.0030 U | 0.050 | 0.0030 | mg/l | 1 | 02/24/07 14:28 | LN | EPA 353.2 |
| Specific Conductivity [a] | 3240 | 0.50 | 0.50 | umhos/cm | 1 | 03/06/07 | AFL | EPA 120.1 |
| Sulfate | 92.0 | 40 | 2.6 | mg/l | 4 | 03/06/07 18:00 | EB | EPA 375.3 |
| Sulfide | 0.0 B | 0.20 | | mg/l | 1 | 03/01/07 12:10 | LN | EPA 376.1 |
| Total Organic Carbon | 4.0 | 1.0 | 0.092 | mg/l | 1 | 02/28/07 09:08 | LN | EPA 415.1/9060 |
| pH | 8.2 | | | su | 1 | 03/01/07 13:00 | TW | EPA 150.1/9040 |

(a) Analysis performed at Accutest Laboratories, Orlando, FL.
(b) Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

RL = Reporting Limit
MDL = Method Detection Limit

U = Indicates a result < MDL
B = Indicates a result > = MDL but < RL

Accutest Laboratories

# Report of Analysis



| | | | |
|---|---|---|---|
| **Client Sample ID:** | TRIP BLANK | | |
| **Lab Sample ID:** | T16445-15 | **Date Sampled:** | 02/22/07 |
| **Matrix:** | AQ - Trip Blank Water | **Date Received:** | 02/24/07 |
| **Method:** | SW846 8260B | **Percent Solids:** | n/a |
| **Project:** | Longhorn Army Ammunition Plant | | |

| | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|---|---|---|---|---|---|---|---|
| Run #1 | F0079185.D | 1 | 03/07/07 | LJ | n/a | n/a | VF2315 |
| Run #2 | | | | | | | |

| | Purge Volume |
|---|---|
| Run #1 | 5.0 ml |
| Run #2 | |

**VOA TCL List**

| CAS No. | Compound | Result | RL | MDL | Units | Q |
|---|---|---|---|---|---|---|
| 67-64-1 | Acetone | 2.8 U | 50 | 2.8 | ug/l | |
| 71-43-2 | Benzene | 0.23 U | 2.0 | 0.23 | ug/l | |
| 75-27-4 | Bromodichloromethane | 0.33 U | 2.0 | 0.33 | ug/l | |
| 75-25-2 | Bromoform | 0.65 U | 2.0 | 0.65 | ug/l | |
| 108-90-7 | Chlorobenzene | 0.54 U | 2.0 | 0.54 | ug/l | |
| 75-00-3 | Chloroethane | 0.46 U | 2.0 | 0.46 | ug/l | |
| 67-66-3 | Chloroform | 0.66 U | 2.0 | 0.66 | ug/l | |
| 75-15-0 | Carbon disulfide | 0.62 U | 2.0 | 0.62 | ug/l | |
| 56-23-5 | Carbon tetrachloride | 0.52 U | 2.0 | 0.52 | ug/l | |
| 75-34-3 | 1,1-Dichloroethane | 0.52 U | 2.0 | 0.52 | ug/l | |
| 75-35-4 | 1,1-Dichloroethylene | 0.68 U | 2.0 | 0.68 | ug/l | |
| 107-06-2 | 1,2-Dichloroethane | 0.53 U | 2.0 | 0.53 | ug/l | |
| 78-87-5 | 1,2-Dichloropropane | 0.59 U | 2.0 | 0.59 | ug/l | |
| 124-48-1 | Dibromochloromethane | 0.68 U | 2.0 | 0.68 | ug/l | |
| 156-59-2 | cis-1,2-Dichloroethylene | 0.83 U | 2.0 | 0.83 | ug/l | |
| 10061-01-5 | cis-1,3-Dichloropropene | 0.59 U | 2.0 | 0.59 | ug/l | |
| 156-60-5 | trans-1,2-Dichloroethylene | 0.75 U | 2.0 | 0.75 | ug/l | |
| 10061-02-6 | trans-1,3-Dichloropropene | 0.61 U | 2.0 | 0.61 | ug/l | |
| 100-41-4 | Ethylbenzene | 0.48 U | 2.0 | 0.48 | ug/l | |
| 591-78-6 | 2-Hexanone | 1.9 U | 10 | 1.9 | ug/l | |
| 108-10-1 | 4-Methyl-2-pentanone | 7.3 U | 10 | 7.3 | ug/l | |
| 74-83-9 | Methyl bromide | 0.47 U | 2.0 | 0.47 | ug/l | |
| 74-87-3 | Methyl chloride | 0.60 U | 2.0 | 0.60 | ug/l | |
| 75-09-2 | Methylene chloride | 0.67 U | 5.0 | 0.67 | ug/l | |
| 78-93-3 | Methyl ethyl ketone | 3.0 U | 10 | 3.0 | ug/l | |
| 100-42-5 | Styrene | 0.50 U | 2.0 | 0.50 | ug/l | |
| 71-55-6 | 1,1,1-Trichloroethane | 0.37 U | 2.0 | 0.37 | ug/l | |
| 79-34-5 | 1,1,2,2-Tetrachloroethane | 0.46 U | 2.0 | 0.46 | ug/l | |
| 79-00-5 | 1,1,2-Trichloroethane | 0.66 U | 2.0 | 0.66 | ug/l | |
| 127-18-4 | Tetrachloroethylene | 0.74 U | 2.0 | 0.74 | ug/l | |
| 108-88-3 | Toluene | 0.54 U | 2.0 | 0.54 | ug/l | |
| 79-01-6 | Trichloroethylene | 0.63 U | 2.0 | 0.63 | ug/l | |

U = Not detected    MDL - Method Detection Limit    J = Indicates an estimated value
RL = Reporting Limit    B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range    N = Indicates presumptive evidence of a compound

Accutest Laboratories

# Report of Analysis





| | | | |
|---|---|---|---|
| **Client Sample ID:** | TRIP BLANK | | |
| **Lab Sample ID:** | T16445-15 | **Date Sampled:** | 02/22/07 |
| **Matrix:** | AQ - Trip Blank Water | **Date Received:** | 02/24/07 |
| **Method:** | SW846 8260B | **Percent Solids:** | n/a |
| **Project:** | Longhorn Army Ammunition Plant | | |

**VOA TCL List**

| CAS No. | Compound | Result | RL | MDL | Units | Q |
|---|---|---|---|---|---|---|
| 75-01-4 | Vinyl chloride | 0.32 U | 2.0 | 0.32 | ug/l | |
| 1330-20-7 | Xylene (total) | 1.1 U | 6.0 | 1.1 | ug/l | |

| CAS No. | Surrogate Recoveries | Run# 1 | Run# 2 | Limits |
|---|---|---|---|---|
| 1868-53-7 | Dibromofluoromethane | 106% | | 73-139% |
| 17060-07-0 | 1,2-Dichloroethane-D4 | 102% | | 66-139% |
| 2037-26-5 | Toluene-D8 | 112% | | 77-148% |
| 460-00-4 | 4-Bromofluorobenzene | 131% | | 84-150% |

U = Not detected  MDL - Method Detection Limit  J = Indicates an estimated value
RL = Reporting Limit  B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range  N = Indicates presumptive evidence of a compound

Accutest Laboratories

# Report of Analysis



| | | | |
|---|---|---|---|
| **Client Sample ID:** | 17WW130-FEB2007 | | |
| **Lab Sample ID:** | T16445-18 | **Date Sampled:** | 02/23/07 |
| **Matrix:** | AQ - Ground Water | **Date Received:** | 02/24/07 |
| **Method:** | SW846 8260B | **Percent Solids:** | n/a |
| **Project:** | Longhorn Army Ammunition Plant | | |

| | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|---|---|---|---|---|---|---|---|
| Run #1 | F0079203.D | 1 | 03/08/07 | LJ | n/a | n/a | VF2315 |
| Run #2 | | | | | | | |

| | Purge Volume |
|---|---|
| Run #1 | 5.0 ml |
| Run #2 | |

**VOA TCL List**

| CAS No. | Compound | Result | RL | MDL | Units | Q |
|---|---|---|---|---|---|---|
| 67-64-1 | Acetone | 2.8 U | 50 | 2.8 | ug/l | |
| 71-43-2 | Benzene | 0.23 U | 2.0 | 0.23 | ug/l | |
| 75-27-4 | Bromodichloromethane | 0.33 U | 2.0 | 0.33 | ug/l | |
| 75-25-2 | Bromoform | 0.65 U | 2.0 | 0.65 | ug/l | |
| 108-90-7 | Chlorobenzene | 0.54 U | 2.0 | 0.54 | ug/l | |
| 75-00-3 | Chloroethane | 0.46 U | 2.0 | 0.46 | ug/l | |
| 67-66-3 | Chloroform | 0.66 U | 2.0 | 0.66 | ug/l | |
| 75-15-0 | Carbon disulfide | 0.62 U | 2.0 | 0.62 | ug/l | |
| 56-23-5 | Carbon tetrachloride | 0.52 U | 2.0 | 0.52 | ug/l | |
| 75-34-3 | 1,1-Dichloroethane | 0.52 U | 2.0 | 0.52 | ug/l | |
| 75-35-4 | 1,1-Dichloroethylene | 0.68 U | 2.0 | 0.68 | ug/l | |
| 107-06-2 | 1,2-Dichloroethane | 4.9 | 2.0 | 0.53 | ug/l | |
| 78-87-5 | 1,2-Dichloropropane | 0.59 U | 2.0 | 0.59 | ug/l | |
| 124-48-1 | Dibromochloromethane | 0.68 U | 2.0 | 0.68 | ug/l | |
| 156-59-2 | cis-1,2-Dichloroethylene | 0.83 | 2.0 | 0.83 | ug/l | J |
| 10061-01-5 | cis-1,3-Dichloropropene | 0.59 U | 2.0 | 0.59 | ug/l | |
| 156-60-5 | trans-1,2-Dichloroethylene | 0.75 U | 2.0 | 0.75 | ug/l | |
| 10061-02-6 | trans-1,3-Dichloropropene | 0.61 U | 2.0 | 0.61 | ug/l | |
| 100-41-4 | Ethylbenzene | 0.48 U | 2.0 | 0.48 | ug/l | |
| 591-78-6 | 2-Hexanone | 1.9 U | 10 | 1.9 | ug/l | |
| 108-10-1 | 4-Methyl-2-pentanone | 7.3 U | 10 | 7.3 | ug/l | |
| 74-83-9 | Methyl bromide | 0.47 U | 2.0 | 0.47 | ug/l | |
| 74-87-3 | Methyl chloride | 0.60 U | 2.0 | 0.60 | ug/l | |
| 75-09-2 | Methylene chloride | 0.67 U | 5.0 | 0.67 | ug/l | |
| 78-93-3 | Methyl ethyl ketone | 3.0 U | 10 | 3.0 | ug/l | |
| 100-42-5 | Styrene | 0.50 U | 2.0 | 0.50 | ug/l | |
| 71-55-6 | 1,1,1-Trichloroethane | 0.37 U | 2.0 | 0.37 | ug/l | |
| 79-34-5 | 1,1,2,2-Tetrachloroethane | 0.46 U | 2.0 | 0.46 | ug/l | |
| 79-00-5 | 1,1,2-Trichloroethane | 0.66 U | 2.0 | 0.66 | ug/l | |
| 127-18-4 | Tetrachloroethylene | 0.74 U | 2.0 | 0.74 | ug/l | |
| 108-88-3 | Toluene | 0.54 U | 2.0 | 0.54 | ug/l | |
| 79-01-6 | Trichloroethylene | 25.1 | 2.0 | 0.63 | ug/l | |

U = Not detected　　MDL - Method Detection Limit　　J = Indicates an estimated value
RL = Reporting Limit　　B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range　　N = Indicates presumptive evidence of a compound

Accutest Laboratories

# Report of Analysis






| | | | |
|---|---|---|---|
| **Client Sample ID:** | 17WW130-FEB2007 | | |
| **Lab Sample ID:** | T16445-18 | **Date Sampled:** | 02/23/07 |
| **Matrix:** | AQ - Ground Water | **Date Received:** | 02/24/07 |
| **Method:** | SW846 8260B | **Percent Solids:** | n/a |
| **Project:** | Longhorn Army Ammunition Plant | | |

**VOA TCL List**

| CAS No. | Compound | Result | RL | MDL | Units | Q |
|---|---|---|---|---|---|---|
| 75-01-4 | Vinyl chloride | 0.32 U | 2.0 | 0.32 | ug/l | |
| 1330-20-7 | Xylene (total) | 1.1 U | 6.0 | 1.1 | ug/l | |

| CAS No. | Surrogate Recoveries | Run# 1 | Run# 2 | Limits |
|---|---|---|---|---|
| 1868-53-7 | Dibromofluoromethane | 105% | | 73-139% |
| 17060-07-0 | 1,2-Dichloroethane-D4 | 102% | | 66-139% |
| 2037-26-5 | Toluene-D8 | 106% | | 77-148% |
| 460-00-4 | 4-Bromofluorobenzene | 116% | | 84-150% |

U = Not detected MDL - Method Detection Limit J = Indicates an estimated value
RL = Reporting Limit B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

Accutest Laboratories

# Report of Analysis





| | | | |
|---|---|---|---|
| **Client Sample ID:** | 17WW130-FEB2007 | | |
| **Lab Sample ID:** | T16445-18 | **Date Sampled:** | 02/23/07 |
| **Matrix:** | AQ - Ground Water | **Date Received:** | 02/24/07 |
| **Method:** | RSKSOP-147/175 | **Percent Solids:** | n/a |
| **Project:** | Longhorn Army Ammunition Plant | | |

| | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|---|---|---|---|---|---|---|---|
| Run #1 [a] | XY025271.D | 1 | 03/01/07 | AFL | n/a | n/a | F:GXY992 |
| Run #2 | | | | | | | |

| CAS No. | Compound | Result | RL | MDL | Units | Q |
|---|---|---|---|---|---|---|
| 74-82-8 | Methane | 0.51 | 0.50 | 0.30 | ug/l | |
| 74-84-0 | Ethane | 0.60 U | 1.0 | 0.60 | ug/l | |
| 74-85-1 | Ethene | 0.80 U | 1.0 | 0.80 | ug/l | |

(a) Analysis performed at Accutest Laboratories, Orlando, FL.

U = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Accutest Laboratories

# Report of Analysis






| | | | |
|---|---|---|---|
| **Client Sample ID:** | 17WW130-FEB2007 | | |
| **Lab Sample ID:** | T16445-18 | **Date Sampled:** | 02/23/07 |
| **Matrix:** | AQ - Ground Water | **Date Received:** | 02/24/07 |
| **Method:** | SW846 8330A SW846 3535A | **Percent Solids:** | n/a |
| **Project:** | Longhorn Army Ammunition Plant | | |

| | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|---|---|---|---|---|---|---|---|
| Run #1 [a] | GG020222.D | 1 | 03/03/07 | AFL | 03/01/07 | F:OP19677 | F:GGG906 |
| Run #2 | | | | | | | |

| | Initial Volume | Final Volume |
|---|---|---|
| Run #1 | 1030 ml | 10.0 ml |
| Run #2 | | |

| CAS No. | Compound | Result | RL | MDL | Units | Q |
|---|---|---|---|---|---|---|
| 2691-41-0 | HMX | 0.058 U | 0.19 | 0.058 | ug/l | |
| 121-82-4 | RDX | 0.073 U | 0.19 | 0.073 | ug/l | |
| 99-65-0 | 1,3-Dinitrobenzene | 0.068 U | 0.19 | 0.068 | ug/l | |
| 606-20-2 | 2,6-Dinitrotoluene | 0.063 U | 0.19 | 0.063 | ug/l | |
| 121-14-2 | 2,4-Dinitrotoluene | 0.073 U | 0.19 | 0.073 | ug/l | |
| 35572-78-2 | 2-amino-4,6-Dinitrotoluene | 0.068 U | 0.19 | 0.068 | ug/l | |
| 19406-51-0 | 4-amino-2,6-Dinitrotoluene | 0.078 U | 0.19 | 0.078 | ug/l | |
| 98-95-3 | Nitrobenzene | 0.058 U | 0.19 | 0.058 | ug/l | |
| 88-72-2 | o-Nitrotoluene | 0.058 U | 0.19 | 0.058 | ug/l | |
| 99-08-1 | m-Nitrotoluene | 0.073 U | 0.19 | 0.073 | ug/l | |
| 99-99-0 | p-Nitrotoluene | 0.073 U | 0.19 | 0.073 | ug/l | |
| 479-45-8 | Tetryl | 0.073 U | 0.19 | 0.073 | ug/l | |
| 99-35-4 | 1,3,5-Trinitrobenzene | 0.092 U | 0.19 | 0.092 | ug/l | |
| 118-96-7 | 2,4,6-Trinitrotoluene | 0.078 U | 0.19 | 0.078 | ug/l | |

| CAS No. | Surrogate Recoveries | Run# 1 | Run# 2 | Limits |
|---|---|---|---|---|
| 610-39-9 | 3,4-Dinitrotoluene | 106% | | 70-136% |

(a) Analysis performed at Accutest Laboratories, Orlando, FL.

U = Not detected MDL - Method Detection Limit J = Indicates an estimated value
RL = Reporting Limit B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

Accutest Laboratories

# Report of Analysis



| | | | |
|---|---|---|---|
| **Client Sample ID:** | 17WW130-FEB2007 | | |
| **Lab Sample ID:** | T16445-18 | **Date Sampled:** | 02/23/07 |
| **Matrix:** | AQ - Ground Water | **Date Received:** | 02/24/07 |
| | | **Percent Solids:** | n/a |
| **Project:** | Longhorn Army Ammunition Plant | | |

**General Chemistry**

| Analyte | Result | RL | MDL | Units | DF | Analyzed | By | Method |
|---|---|---|---|---|---|---|---|---|
| **Perchlorate by IC** | | | | | | | | |
| Perchlorate [a] | 4.0 U | 10 | 4.0 | ug/l | 1 | 03/02/07 19:51 | AFL | EPA 314 |
| Alkalinity, Total as CaCO3 | 567 | 25 | 0.30 | mg/l | 5 | 03/08/07 12:50 | EB | EPA 310.1 |
| Carbon Dioxide | 228 | 5.0 | | mg/l | 1 | 03/12/07 | RM | SM18 4500CO2D |
| Chloride | 1030 | 50 | 0.57 | mg/l | 50 | 03/05/07 12:15 | EB | EPA 325.3 |
| Nitrogen, Nitrate [b] | 2.7 | 0.55 | 0.0050 | mg/l | 1 | 02/26/07 14:00 | LN | SM18 4500NO3E/NO2B |
| Nitrogen, Nitrate + Nitrite | 2.7 | 0.50 | 0.0050 | mg/l | 10 | 02/26/07 13:03 | LN | EPA 353.2 |
| Nitrogen, Nitrite | 0.0030 U | 0.050 | 0.0030 | mg/l | 1 | 02/26/07 14:00 | LN | EPA 353.2 |
| Specific Conductivity [a] | 4140 | 0.50 | 0.50 | umhos/cm | 1 | 03/06/07 | AFL | EPA 120.1 |
| Sulfate | 173 | 40 | 2.6 | mg/l | 4 | 03/06/07 18:00 | EB | EPA 375.3 |
| Sulfide | 0.0 B | 0.20 | | mg/l | 1 | 03/01/07 12:10 | LN | EPA 376.1 |
| Total Organic Carbon | 6.0 | 1.0 | 0.092 | mg/l | 1 | 02/27/07 09:10 | LN | EPA 415.1/9060 |
| pH | 6.7 | | | su | 1 | 03/01/07 13:00 | TW | EPA 150.1/9040 |

(a) Analysis performed at Accutest Laboratories, Orlando, FL.
(b) Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

RL = Reporting Limit
MDL = Method Detection Limit

U = Indicates a result < MDL
B = Indicates a result > = MDL but < RL

# Misc. Forms

## Custody Documents and Other Forms

Includes the following where applicable:

- Chain of Custody
- LRC Form

T16445

Shaw® Shaw Environmental, Inc.

3010 Briarpark Drive, Suite 4N
Houston, TX 77042 (713) 996-4400

# CHAIN-OF-CUSTODY

No. 10494

Laboratory Name: Accutest
Address: 10165 Harwin Dr. #150 Houston, TX 77036
Contact: Agnes 713-271-4700

Project Name: Longhorn Army Ammunition Plant
Project Location: Karnack, TX
Project No.: 117591
Project Contact: Kay Everette
Project Telephone No.: 713-996-4421
Point of contact: Diane Meyer
Project Manager/Supervisor: Praveen Srivastav
Telephone No.: 713-996-4408

Analysis and Method Desired (Indicate separate containers)

| Item No. | Sample Number | Date | Time | Comp | Grab | Matrix | Sample Description, Location | Number of Containers | 8260B VOC | SKM 300.0 Anions | 376.2 Sulfides | 314.0 Perchlorate | SOP175 Gases, CO2 | 310.1 Alkalinity | 415.1 TOC | Explosives | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 29WW38-Feb2007 | 2-22-07 | 0930 | | ✓ | W | Site 29, GW | 3 | ✓ | | | | | | | | |
| 2 | 29WW38-Feb2007 | 2-22-07 | 0930 | | ✓ | W | Site 29, GW | 3 | | | | | ✓ | | | | |
| 3 | 29WW38-Feb2007 | 2-22-07 | 0930 | | ✓ | W | Site 29, GW | 3 | | | | | | | ✓ | | |
| 4 | 29WW38-Feb2007 | 2-22-07 | 0930 | | ✓ | W | Site 29, GW | 1 | | ✓ | | | | | | | |
| 5 | 29WW38-Feb2007 | 2-22-07 | 0930 | | ✓ | W | Site 29, GW | 1 | | | ✓ | | | | | | |
| 6 | 29WW38-Feb2007 | 2-22-07 | 0930 | | ✓ | W | Site 29, GW | 1 | | | | ✓ | | | | | |
| 7 | 29WW38-Feb2007 | 2-22-07 | 0930 | | ✓ | W | Site 29, GW | 1 | | | | | | ✓ | | | |
| 8 | 29WW38-Feb2007 | 2-22-07 | 0930 | | ✓ | W | Site 29, GW | 2 | | | | | | | | ✓ | |
| 9 | | | | | | | | | | | | | | | | | |
| 10 | | | | | | | | | | | | | | | | | |

| Transfers Relinquished By (Signature) | Date/Time | Transfers Accepted By (Signature) | Date/Time |
|---|---|---|---|
| Sherry McAdoo | 2-22-07 1700 | Scott Beesinger | 2/22/07 17:00 |
| Scott Beesinger | 2/23/07 08:30 | | |
| | | Laboratory: A. Rocha | 2/24/07 11:15 |

Special Instructions: WB

FedEx Airbill No.:

Sampler's Signature: Sherry McAdoo

TAT: ____ Standard ____ Rush Due: ____ Seals Intact? ✓ Y ____ N Received Good Condition ____ Y ____ N ____ Cold

White - Lab Copy Canary - Field Copy Pink - File Copy

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T16445: Chain of Custody
Page 1 of 10

T16445

Shaw® Shaw Environmental, Inc.

3010 Briarpark Drive, Suite 4N
Houston, TX 77042 (713) 996-4400

# CHAIN-OF-CUSTODY

No. 10928

Laboratory Name: Accutest Address: 10165 Harwin DR #150 Houston, TX, 77036 Contact: Agnes : 713-271-4700

Project Name: LONGHORN ARMY AMMUNITION PLANT Project Location: Karnack, TX

Project No.: 117591 Project Contact: RAY EVERETTE Project Telephone No.: 713-996-4421

Point of contact: DIANE Meyer Project Manager/Supervisor: PRAVEEN SRIVASTAV

Telephone No. 713-996-4408

Analysis and Method Desired (Indicate separate containers)

| | Item No. | Sample Number | Date | Time | Comp | Grab | Matrix | Sample Description, Location | Number of Containers | VOC's 8260 | ANIONS 300 | Sulfides 376.2 | 314 Perchlorate | Gases 175 | Alkalinity 310.1 | TOC 415.1 | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2 | 1 | 47WW30-FEB2007 | 2/22/07 | 0941 | | X | GW | 47WW30 | 13 | X | X | X | X | X | X | X | |
| 3 | 2 | LHS MW43-FEB2007 | 2/22/07 | 1100 | | X | GW | LHS MW43 | 13 | X | X | X | X | X | X | X | |
| 4 | 3 | SOWW06-FEB2007 | 2/22/07 | 1530 | | X | GW | SOWW06 | 13 | X | X | X | X | X | X | X | |
| | 4 | | | | | | | | | | | | | | | | |
| | 5 | | | | | | | | | | | | | | | | |
| | 6 | | | | | | | | | | | | | | | | |
| | 7 | | | | | | | | | | | | | | | | |
| | 8 | | | | | | | | | | | | | | | | |
| | 9 | | | | | | | | | | | | | | | | |
| | 10 | | | | | | | | | | | | | | | | |

| Transfers Relinquished By (Signature) | Date/Time | Transfers Accepted By (Signature) | Date/Time |
|---|---|---|---|
| J. Bah | 2/22/07 @ 1800 | Scott Beesinger | 2/22/07 18:00 |
| Scott Beesinger | 2/23/07 08:30 | | |
| | | Laboratory: A. Rodney | 2/24/07 11:15 |

Special Instructions: UPS

~~FedEx~~ Airbill No.:

Sampler's Signature: J. Bah

TAT: ____ Standard ____ Rush Due: ___ Seals Intact? ✓ Y ___ N Received Good Condition ___ Y ___ N ___ Cold

White - Lab Copy Canary - Field Copy Pink - File Copy

**T16445: Chain of Custody**
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T16445

Shaw® Shaw Environmental, Inc.

3010 Briarpark Drive, Suite 4N
Houston, TX 77042 (713) 996-4400

# CHAIN-OF-CUSTODY

No. 10918

Laboratory Name: Accu test
Address: 10165 Harwin dr, #150 Houston, TX. 77036
Contact: Agnes - 713-271-4700

Project Name: Longhorn Army Ammunition Plant
Project Location: Karnack, TX
Project No.: 117591
Project Contact: Kay Everett
Project Telephone No.: 713-996-4421
Point of contact: Diane Meyer
Telephone No. 713-996-4408
Project Manager/Supervisor: Praveen Srivastav

Analysis and Method Desired (Indicate separate containers)

| | Item No. | Sample Number | Date | Time | Comp | Grab | Matrix | Sample Description, Location | Number of Containers | Voc's 8260 | Anions 300 | Sulfides 376.2 | Perchlorate 314 | Gases 175 | Alkalinity 310.1 | TOC 415.1 | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 5 | 1 | SOWW05-FEB2007 | 2-23-07 | 1046 | | X | GW | SOWW05 | ~~13~~ 39 | X | X | X | X | X | X | X | MS/MSD Included |
| 6 | 2 | SOWW02-FEB2007 | 2-23-07 | 1453 | | X | GW | SOWW02 | 13 | X | X | X | X | X | X | X | |
| | 3 | | | | | | | | | | | | | | | | |
| | 4 | | | | | | | | | | | | | | | | |
| | 5 | | | | | | | | | | | | | | | | |
| | 6 | | | | | | | | | | | | | | | | |
| | 7 | | | | | | | | | | | | | | | | |
| | 8 | | | | | | | | | | | | | | | | |
| | 9 | | | | | | | | | | | | | | | | |
| | 10 | | | | | | | | | | | | | | | | |

| Transfers Relinquished By (Signature) | Date/Time | Transfers Accepted By (Signature) | Date/Time |
|---|---|---|---|
| J. Bilas | 2/23/07 @1800 | Scott Beesinger | 2/23/07 18:00 |
| Scott Beesinger | 2/23/07 1800 | | |
| | | Laboratory: A. Rodriguez | 2/24/07/11:15 |

Special Instructions: UPS

FedEx Airbill No.:

Sampler's Signature: J. Bilas

TAT: ____ Standard ____ Rush Due: ___ Seals Intact? ✓ Y ____ N Received Good Condition ____ Y ____ N ____ Cold

White - Lab Copy Canary - Field Copy Pink - File Copy

T16445: Chain of Custody
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T16445

Shaw® Shaw Environmental, Inc.

3010 Briarpark Drive, Suite 4N
Houston, TX 77042 (713) 996-4400

# CHAIN-OF-CUSTODY

No. 10930

Laboratory Name: Accutest
Address: 10165 Harwin #150 Houston TX 77036
Contact: Agnes (713) 271 4700

Project Name: LHAAP
Project Location: Karnack, TX
Project No.: 117591
Project Contact: K. Everette
Project Telephone No.: (713) 996 ~~4422~~ 4421
Point of contact: D. Meyers
Telephone No.: (713) 996-4408
Project Manager/Supervisor: P. Srivastav

Analysis and Method Desired (Indicate separate containers)

| | Item No. | Sample Number | Date | Time | Comp | Grab | Matrix | Sample Description, Location | Number of Containers | VOC 8260 | Anions 300 | Sulfides 376.2 | Perchlorate 314 | Gases 175 | Alkalinity 310.1 | TOC 415.1 | Explosives 8330 | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 7 | 1 | 17WW16-Feb2007 | 2-22-07 | 1030 | | ✓ | W | GW, Site 17 | 15 | 3 | 1 | 1 | 1 | 3 | 1 | 3 | 2 | |
| 8 | 2 | 17WW02-Feb2007 | 2-22-07 | 1418 ~~1030~~ | Stm. | ✓ | W | GW, Site 17 | 15 | 3 | 1 | 1 | 1 | 3 | 1 | 3 | 2 | |
| 9 | 3 | 17WW02-Feb2007 | 2-22-07 | 1418 | | ✓ | W | GW, Site 17 | 15 | 3 | 1 | 1 | 1 | 3 | 1 | 3 | 2 | FD |
| | 4 | | | | | | | | | | | | | | | | | |
| | 5 | | | | | | | | | | | | | | | | | |
| | 6 | | | | | | | | | | | | | | | | | |
| | 7 | | | | | | | | | | | | | | | | | |
| | 8 | | | | | | | | | | | | | | | | | |
| | 9 | | | | | | | | | | | | | | | | | |
| | 10 | | | | | | | | | | | | | | | | | |

| Transfers Relinquished By (Signature) | Date/Time | Transfers Accepted By (Signature) | Date/Time |
|---|---|---|---|
| [signature] | 2/23/07 8:22 | Scott Bessinger | 2/23/07 08:22 |
| Scott Bessinger | 2/23/07 8:30 | | |
| | | Laboratory: A. Rodr[illegible] | 2/24/07 11:15 |

Special Instructions: UPS

FedEx Airbill No.:

Sampler's Signature: [signature]

TAT: X Standard ____ Rush Due: ____ Seals Intact? ✓ Y ____ N Received Good Condition ____ Y ____ N ____ Cold

White - Lab Copy Canary - Field Copy Pink - File Copy

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T16445: Chain of Custody
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T16445

Shaw® Shaw Environmental, Inc.

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Houston, TX 77042 (713) 996-4400

# CHAIN-OF-CUSTODY

No. 10957

Laboratory Name: Accutest  Address: 10165 Harwin Dr #150 Houston, TX 77036  Contact: Agnes 713-271-4700

Project Name: Longhorn Army Ammunition Plant  Project Location: Karnack, TX

Project No.: 117591  Project Contact: Kay Everett  Project Telephone No.: 713-996-4421

Point of contact: Diane Meyer  Project Manager/Supervisor: Praveen Srivastav

Telephone No.: 713-996-4408

Analysis and Method Desired (Indicate separate containers)

| Item No. | Sample Number | Date | Time | Comp | Grab | Matrix | Sample Description, Location | Number of Containers | 8260B VOC | BP175 Gases-CO2 | 415.1 TOC | 300.0 Anions | 376.2 Sulfides | 314.0 Perchlorate | 310.1 Alkalinity | Explosives | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 10 | 29WW35-Feb2007 | 2-22-07 | 1245 | | ✓ | W | Site 29, GW | (15) | 3 | 3 | 3 | 1 | 1 | 1 | 1 | 2 | 15 containers |
| 11 | 29WW35-Feb2007-FD | 2-22-07 | 1245 | | ✓ | W | Site 29, GW | (15) | 3 | 3 | 3 | 1 | 1 | 1 | 1 | 2 | FDs |
| 12 | 29WW06-Feb2007 | 2-22-07 | 1500 | | ✓ | W | Site 29, GW | (15) | 3 | 3 | 3 | 1 | 1 | 1 | 1 | 2 | 15 containers |
| 4 | | | | | | | | | | | | | | | | | |
| 5 | | | | | | | | | | | | | | | | | |
| 6 | | | | | | | | | | | | | | | | | |
| 7 | | | | | | | | | | | | | | | | | |
| 8 | | | | | | | | | | | | | | | | | |
| 9 | | | | | | | | | | | | | | | | | |
| 10 | | | | | | | | | | | | | | | | | |

| Transfers Relinquished By (Signature) | Date/Time | Transfers Accepted By (Signature) | Date/Time |
|---|---|---|---|
| Sherry McFadden | 2-22-07 1700 | Scott Beasley | 2/22/07 17:00 |
| Scott Beasley | 2/23/07 08:30 | | |
| | | Laboratory: A. Rodriguez | 2/24/07 11:15 |

Special Instructions:

FedEx Airbill No.: [illegible]

Sampler's Signature: Sherry McFadden

TAT: ____ Standard ____ Rush Due: ____  Seals Intact? ✓ Y ____ N  Received/Good Condition ✓ Y ____ N  Cool

White - Lab Copy  Canary - Field Copy  Pink - File Copy

T16445: Chain of Custody
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T16445

Shaw® Shaw Environmental, Inc.

3010 Briarpark Drive, Suite 4N
Houston, TX 77042 (713) 996-4400

# CHAIN-OF-CUSTODY

No. 10956

Laboratory Name: Accutest | Address: 10165 Harwin Dr. #150 Houston, TX 77036 | Contact: Agnes 713-271-4700

Project Name: Longhorn Army Ammunition Plant | Project Location: Karnack, TX

Project No.: 117591 | Project Contact: Kay Everette | Project Telephone No.: 713-996-4421

Point of contact: Diane Meyer | Project Manager/Supervisor: Praveen Srivastav

Telephone No.: 713-996-4408

Analysis and Method Desired (Indicate separate containers)

| Item No. | Sample Number | Date | Time | Comp | Grab | Matrix | Sample Description, Location | Number of Containers | 8260B VOC | SOP 175 Gases-CO2 | 415.1 TOC | 300.0 Anions | 376.2 Sulfides | 314.0 Perchlorate | Explosives | Alkalinity | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 13 | 17WW05-FEB2007 | 2/23/07 | 1533 | | ✓ | W | GW, 17WW05 | 15 | 3 | 3 | 3 | 1 | 1 | 1 | 2 | 1 | |
| 14 | 17WW06-FEB2007 | 2/23/07 | 16:36 | | ✓ | W | GW, 17WW06 | 14 | 3 | 3 | 3 | 1 | 1 | 1 | 1 | 1 | |
| 15 3 | tb. - AR-2-24-07 | | | | | | | | | | | | | | | | |
| 16 4 | | | | | | | | | | | | | | | | | |
| 17 5 | | | | | | | | | | | | | | | | | |
| 6 | | | | | | | | | | | | | | | | | |
| 7 | | | | | | | | | | | | | | | | | |
| 18 | 17WW130-FEB2007 | 2/23 | 10:47 | AR- 2-24-07 | | | | | | | | | | | | | |
| 9 | | | | | | | | | | | | | | | | | |
| 10 | | | | | | | | | | | | | | | | | |

| Transfers Relinquished By (Signature) | Date/Time | Transfers Accepted By (Signature) | Date/Time |
|---|---|---|---|
| M. Allen | 2/23/07 17:00 | Scott Boesinger | 2/23/07 17:00 |
| Scott Boesinger | 2/23/07 1715 | | |
| | | Laboratory: A. Rodriguez | 2/24/07 11:15 |

Special Instructions:

FedEx Airbill No.: UR

Sampler's Signature: M. Allen

TAT: ____ Standard ____ Rush Due: ___

Seals Intact? Y ___ N

Received Good Condition Y ___ N ___ Cold ✓

White - Lab Copy Canary - Field Copy Pink - File Copy

4.1 4

T16445: Chain of Custody
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00079042

ACCUTEST.

**VARIANCE MEMO**
**SAMPLE LOG-IN**

SAMPLE(S) Various
PROJECT LHAAP
FILED BY AR
DATE 2/24/07
LAB NO. T16445

**VARIANCE - Check applicable items(s):**

| | |
|---|---|
| | Insufficient sample sent for proper analysis; received approx. |
| | Sample bottle received broken and/or cap not intact. |
| | Samples received without paperwork; paperwork received without samples. |
| X | Samples received without proper refrigeration, when it has been deemed necessary. Temperature at receipt: 11.0° 1 cooler |
| | Illegible sample number or label missing from bottle. |
| | Numbers on sample not the same as numbers on paper work. |
| | Incomplete instructions received with sample(s) ie.,no request for analysis, no chain of custody, incomplete billing instructions, no due date, etc. Temperature at reciept: |
| | Samples received in improper container or lacking proper preservation. |
| | Physical characteristics different than those on sampling sheets; Describe: |
| | Rush samples on hold because of incomplete paperwork. |
| | Other (specify) #11 - rec'd. w/ one Explosive container not two. |

#9. Had NO Explosive Containers.
#18-17 WW130-FEB 2007 was an extra sample rec'd. & not on the COC.
See attached list of samples received out of temp.

**CORRECTIVE ACTION TAKEN**

| | | | |
|---|---|---|---|
| Diane M. | Person Contacted | | By phone. |
| | Client informed verbally. | | Samples processed for information only and noted on report. |
| | Client informed by ~~memo/letter~~. Email | | Samples processed with higher detection limits accepted. |
| | Samples processed as is. | | Samples rejected. |
| | Samples preserved by lab. | | |
| | Client will resample and resubmit. | | |

Notes: Analyze All Samples out of Temp. -11) ok, -9) ok
18) Analyze All Short Holds. Place on Hold.
Analyze Sx18 per Diane 2/26/07 AVS

**ROUTING**

| TITLE | DATE | INITIALS | CORRECTED? |
|---|---|---|---|
| Sample Manager: | | | |
| Login: | | | |
| Project Manager: | 2/26/07 | AVS | |
| Comments: | | | |

Form: SM006

4.1
4

T16445: Chain of Custody
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Sampled out of temp.: 11.0°

#2- 47WW30- FEB 2007 - 2/22/07 @ 09:41
2 - Plastic 1000 ml's unpreserved.

#7- 17WW16 -FEB 2007- 2/22/07 @ 10:30.
1- Plastic 1000 ml unpreserved

#8- 17WW02 -FEB 2007 2/22/07 @ 14:18.
2- Plastic 1000 ml's unpreserved
1- Plastic 500 ml w/ NaOH & Zinc Acetate

#9- 17 WW02 -FEB 2007 2/22/07 @ 14:18- FD
2- Plastic 1000 ml unpreserved.

#10- 29 WW35 -FEB 2007 2/22/07 @ 12:45.
2- Plastic 1000 ml's unpreserved.
1- Plastic 500 ml unpreserved.

#11 29WW35 -FEB 2007-FD 2/22/07 @ 12:45.
2- Plastic 1000 ml's unpreserved.
1- Plastic 500 ml w/ NaOH & Zinc Acetate

#12- 29WW06 -FEB 2007 2/22/07 @ 15:00.
2- Plastic 1000 ml's unpreserved.
1- Plastic 500 ml. w/ NaOH & Zinc Acetate.

ACCUTEST

## SAMPLE RECEIPT LOG

JOB #: T16445 DATE/TIME RECEIVED: 2/24/07 / 11:15

CLIENT: Shaw INITIALS: AR

Condition/Variance (Circle "Y" for yes and "N" for no or NA. If "N" is circled, see variance for explanation):

1. Y N Sample received in undamaged condition.
2. Y N Samples received within temp. range.
3. Y N Sample received with proper pH.
4. Y N Sample received in proper containers.
5. Y N Sample volume sufficient for analysis.
6. Y N Sample received with chain of custody.
7. Y N Chain of Custody matches **sample IDs and analysis** on containers.
8. Y N Samples Headspace acceptable
9. Y N NA Custody seal received intact and tamper not evident on cooler.
10. Y N NA Custody seal received intact and tamper not evident on bottles.

| SAMPLE or FIELD ID | BOTTLE # | DATE SAMPLED | MATRIX | VOLUME | LOCATION | PRESERV. | PH |
|---|---|---|---|---|---|---|---|
| 1,2,3,4,7,8,9,10,11 14,12,13,18 | 1-3 | 2/22 | AQ | 40ml. | VREF | 1,2,3,4,5,6 | U, <2, >12, NA |
| 1 | 4-6 | | | | SUB | 1,2,3,4,5,6 | U, <2, >12, NA |
| 1 | 7-9 | | | | 2K, 2L | 1,2,3,4,5,6 | U, <2, >12, NA |
| 1 | 10-12 | | | P1000 | | 1,2,3,4,5,6 | U, <2, >12, NA |
| 1,2,3,4 Ofn | 13 | | | P500 | | 1,2,3,4,5,6 | U, <2, >12, NA |
| 1,8, 18 | 14-15 | | | A1000 | SUB | 1,2,3,4,5,6 | U, <2, >12, NA |
| 5 | 1-9 | 2/23 | | 40ml. | VREF | 1,2,3,4,5,6 | U, <2, >12, NA |
| | 10-18 | | | | SUB | 1,2,3,4,5,6 | U, <2, >12, NA |
| | 19-27 | | | | 2K, 2L | 1,2,3,4,5,6 | U, <2, >12, NA |
| | 28-32 | | | P1000 | | 1,2,3,4,5,6 | U, <2, >12, NA |
| | 33-35 | | | P500 | | 1,2,3,4,5,6 | U, <2, >12, NA |
| | 36-38 | | | | | 1,2,3,4,5,6 | U, <2, >12, NA |
| 4 | 1-3 | | | 40ml. | VREF | 1,2,3,4,5,6 | U, <2, >12, NA |
| | 4-6 | | | | SUB | 1,2,3,4,5,6 | U, <2, >12, NA |
| | 7-9 | | | | 2K, 2L | 1,2,3,4,5,6 | U, <2, >12, NA |
| | 10-11 | | | P1000 | | 1,2,3,4,5,6 | U, <2, >12, NA |

LOCATION: WI: Walk-in VR: Volatile Refrig. SUB: Subcontract EF: Encore Freezer

PRESERVATIVES: 1: None 2: HCL 3: HNO3 4: H2SO4 5: NAOH 6: Other

~~pH of waters checked excluding volatiles~~

pH of soils N/A

Comments:

Delivery method: Courier: FE

COOLER TEMP: 11.0 COOLER TEMP: 3.6

COOLER TEMP: 3.0 COOLER TEMP: 2.0

Form: SM012, Rev.07/28/06, QAO

ACCUTEST.

# SAMPLE RECEIPT LOG

JOB #: T16445 DATE/TIME RECEIVED: 2/24/07 / 11:15

CLIENT: Shaw INITIALS: AR

Condition/Variance (Circle "Y" for yes and "N" for no or NA. If "N" is circled, see variance for explanation):

1. Y N Sample received in undamaged condition.
2. Y N Samples received within temp. range.
3. Y N Sample received with proper pH.
4. Y N Sample received in proper containers.
5. Y N Sample volume sufficient for analysis.
6. Y N Sample received with chain of custody.
7. Y N Chain of Custody matches **sample IDs and analysis** on containers.
8. Y N Samples Headspace acceptable
9. Y N NA Custody seal received intact and tamper not evident on cooler.
10. Y N NA Custody seal received intact and tamper not evident on bottles.

| SAMPLE or FIELD ID | BOTTLE # | DATE SAMPLED | MATRIX | VOLUME | LOCATION | PRESERV. | PH |
|---|---|---|---|---|---|---|---|
| 6 | 12 | 2/23 | AQ | P500 | 2K, 2L | 1,2,3,4,5,6 | U, <2, >12, NA |
| 6 | 13 | | | | | 1,2,3,4,5,6 | U, <2, >12, NA |
| 7 | 10 | 2/22 | | P1000 | 2K, 2L | 1,2,3,4,5,6 | U, <2, >12, NA |
| 7 | 11 | | | P500 | | 1,2,3,4,5,6 | U, <2, >12, NA |
| 7 | 12- | | | | | 1,2,3,4,5,6 | U, <2, >12, NA |
| 7 | 13-15 | | | A1000 | SUB | 1,2,3,4,5,6 | U, <2, >12, NA |
| 10 | 10-12 | | | P1000 | 2K, 2L | 1,2,3,4,5,6 | U, <2, >12, NA |
| 10 | 13 | | | P500 | | 1,2,3,4,5,6 | U, <2, >12, NA |
| 10 | 14-15 | | | A1000 | SUB | 1,2,3,4,5,6 | U, <2, >12, NA |
| 11 | 14 | | | | | 1,2,3,4,5,6 | U, <2, >12, NA |
| 13 | 10 | | | P1000 | 2K, 2L | 1,2,3,4,5,6 | U, <2, >12, NA |
| | 11-12 | | | P500 | | 1,2,3,4,5,6 | U, <2, >12, NA |
| | 13 | | | | | 1,2,3,4,5,6 | U, <2, >12, NA |
| | 14-15 | | | A1000 | SUB | 1,2,3,4,5,6 | U, <2, >12, NA |
| 14 | 14 | | | A1000 | SUB | 1,2,3,4,5,6 | U, <2, >12, NA |
| 15-17 | 1-2 | N/A | AQ | 40ml | VREF | 1,2,3,4,5,6 | U, <2, >12, NA |

LOCATION: WI: Walk-In VR: Volatile Refrig. SUB: Subcontract EF: Encore Freezer

PRESERVATIVES: 1: None 2: HCL 3: HNO3 4: H2SO4 5: NAOH 6: Other

~~pH of waters checked excluding volatiles~~

pH of soils N/A

Comments:

Delivery method: Courier: FB

COOLER TEMP: 2.4 COOLER TEMP: 2.1

COOLER TEMP: COOLER TEMP:

Form: SM012, Rev.07/28/06, QAO

T16445: Chain of Custody

Page 10 of 10

# Appendix A    Laboratory Data Package Cover Page

This data package consists of:

- This signature page, the laboratory review checklist, and the following reportable data:
- R1 Field chain-of-custody documentation;
- R2 Sample identification cross-reference;
- R3 Test reports (analytical data sheets) for each environmental sample that includes:
  - a) Items consistent with NELAC 5.13 or ISO/IEC 17025 Section 5.10
  - b) dilution factors,
  - c) preparation methods,
  - d) cleanup methods, and
  - e) if required for the project, tentatively identified compounds (TICs).
- R4 Surrogate recovery data including:
  - a) Calculated recovery (%R), and
  - b) The laboratory's surrogate QC limits.
- R5 Test reports/summary forms for blank samples;
- R6 Test reports/summary forms for laboratory control samples (LCSs) including:
  - a) LCS spiking amounts,
  - b) Calculated %R for each analyte, and
  - c) The laboratory's LCS QC limits.
- R7 Test reports for project matrix spike/matrix spike duplicates (MS/MSDs) including:
  - a) Samples associated with the MS/MSD clearly identified,
  - b) MS/MSD spiking amounts,
  - c) Concentration of each MS/MSD analyte measured in the parent and spiked samples,
  - d) Calculated %Rs and relative percent differences (RPDs), and
  - e) The laboratory's MS/MSD QC limits
- R8 Laboratory analytical duplicate (if applicable) recovery and precision:
  - a) the amount of analyte measured in the duplicate,
  - b) the calculated RPD, and
  - c) the laboratory's QC limits for analytical duplicates.
- R9 List of method quantitation limits (MQLs) for each analyte for each method and matrix;
- R10 Other problems or anomalies.
- The Exception Report for every "No" or "Not Reviewed (NR)" item in laboratory review checklist.

**Release Statement:** I am responsible for the release of this laboratory data package. This data package has been reviewed by the laboratory and is complete and technically compliant with the requirements of the methods used, except where noted by the laboratory in the attached exception reports. By me signature below, I affirm to the best of my knowledge, all problems/anomalies, observed by the laboratory as having the potential to affect the quality of the data, have been identified by the laboratory in the Laboratory Review Checklist, and no information or data have been knowingly withheld that would affect the quality of the data.

**Check, if applicable:** [ ] This laboratory is an in-house laboratory controlled by the person responding to rule. The official signing the cover page of the rule-required report (for example, the APAR) in which these data are used is responsible for releasing this data package and is by signature affirming the above release statement is true.

| | | | |
|---|---|---|---|
| Ron Martino | Ron Martino | Lab Director | 3/19/2007 |
| Name (Printed) | Signature | Official Title (printed) | Date |

1. Items identified by the letter "R" must be included in the laboratory data package submitted in the TRRP-required report(s). Items identified by the letter "S" should be retained and made available upon request for the appropriate retention period.

## Appendix A (cont'd): Laboratory Review Checklist: Reportable Data

| | |
|---|---|
| Laboratory Name: Accutest Laboratories Gulf Coast | LRC Date: 3/19/2007 |
| Project Name: Longhorn | Laboratory Job Number: T16445 |
| Reviewer Name: Ron Martino | Prep Batch Number(s): |

| #[1] | A[2] | Description | Yes | No | NA[3] | NR[4] | ER#[5] |
|---|---|---|---|---|---|---|---|
| | | **Chain-of-custody (C-O-C)** | | | | | |
| **R1** | OI | Did samples meet the laboratory's standard conditions of sample acceptability upon receipt? | X | | | | |
| | | Were all departures from standard conditions described in an exception report? | X | | | | |
| **R2** | OI | **Sample and quality control (QC) identification** | | | | | |
| | | Are all field sample ID numbers cross-referenced to the laboratory ID numbers? | X | | | | |
| | | Are all laboratory ID numbers cross-referenced to the corresponding QC data? | X | | | | |
| **R3** | OI | **Test reports** | | | | | |
| | | Were all samples prepared and analyzed within holding times? | X | | | | |
| | | Other than those results < MQL, were all other raw values bracketed by calibration standards? | X | | | | |
| | | Were calculations checked by a peer or supervisor? | X | | | | |
| | | Were all analyte identifications checked by a peer or supervisor? | X | | | | |
| | | Were sample quantitation limits reported for all analytes not detected? | X | | | | |
| | | Were all results for soil and sediment samples reported on a dry weight basis? | | | X | | |
| | | Were % moisture (or solids) reported for all soil and sediment samples? | | | X | | |
| | | If required for the project, TICs reported? | | | X | | |
| **R4** | O | **Surrogate recovery data** | | | | | |
| | | Were surrogates added prior to extraction? | X | | | | |
| | | Were surrogate percent recoveries in all samples within the laboratory QC limits? | X | | | | |
| **R5** | OI | **Test reports/summary forms for blank samples** | | | | | |
| | | Were appropriate type(s) of blanks analyzed? | X | | | | |
| | | Were blanks analyzed at the appropriate frequency? | X | | | | |
| | | Were method blanks taken through the entire analytical process, including preparation and, if applicable, cleanup procedures? | X | | | | |
| | | Were blank concentrations < MQL? | X | | | | |
| **R6** | OI | **Laboratory control samples (LCS):** | | | | | |
| | | Were all COCs included in the LCS? | X | | | | |
| | | Was each LCS taken through the entire analytical procedure, including prep and cleanup steps? | X | | | | |
| | | Were LCSs analyzed at the required frequency? | X | | | | |
| | | Were LCS (and LCSD, if applicable) %Rs within the laboratory QC limits? | X | | | | |
| | | Does the detectability data document the laboratory's capability to detect the COCs at the MDL used to calculate the SQLs? | X | | | | |
| | | Was the LCSD RPD within QC limits? | | | X | | |
| **R7** | OI | **Matrix spike (MS) and matrix spike duplicate (MSD) data** | | | | | |
| | | Were the project/method specified analytes included in the MS and MSD? | X | | | | |
| | | Were MS/MSD analyzed at the appropriate frequency? | X | | | | |
| | | Were MS (and MSD, if applicable) %Rs within the laboratory QC limits? | | X | | | 2 |
| | | Were MS/MSD RPDs within laboratory QC limits? | X | | | | |
| **R8** | OI | **Analytical duplicate data** | | | | | |
| | | Were appropriate analytical duplicates analyzed for each matrix? | X | | | | |
| | | Were analytical duplicates analyzed at the appropriate frequency? | X | | | | |
| | | Were RPDs or relative standard deviations within the laboratory QC limits? | X | | | | |
| **R9** | OI | **Method quantitation limits (MQLs):** | | | | | |
| | | Are the MQLs for each method analyte included in the laboratory data package? | X | | | | |
| | | Do the MQLs correspond to the concentration of the lowest non-zero calibration standard? | X | | | | |
| | | Are unadjusted MQLs included in the laboratory data package? | X | | | | |
| **R10** | OI | **Other problems/anomalies** | | | | | |
| | | Are all known problems/anomalies/special conditions noted in this LRC and ER? | X | | | | |
| | | Were all necessary corrective actions performed for the reported data? | X | | | | |

2. = organic analyses; I = inorganic analyses (and general chemistry, when applicable);
3. NA = Not applicable;
4. NR = Not reviewed;
5. ER# = Exception Report identification number (an Exception Report should be completed for an item if "NR" or "No" is checked).

## Appendix A (cont'd): Laboratory Review Checklist: Reportable Data

| | |
|---|---|
| Laboratory Name: Accutest Laboratories Gulf Coast | LRC Date: 3/19/2007 |
| Project Name: Longhorn | Laboratory Job Number: T16445 |
| Reviewer Name: Ron Martino | Prep Batch Number(s): |

| #[1] | A[2] | Description | Yes | No | NA[3] | NR[4] | ER#[5] |
|---|---|---|---|---|---|---|---|
| **S1** | OI | **Initial calibration (ICAL)** | | | | | |
| | | Were response factors and/or relative response factors for each analyte within QC limits? | X | | | | |
| | | Were percent RSDs or correlation coefficient criteria met? | X | | | | |
| | | Was the number of standards recommended in the method used for all analytes? | X | | | | |
| | | Were all points generated between the lowest and highest standard used to calculate the curve? | X | | | | |
| | | Are ICAL data available for all instruments used? | X | | | | |
| | | Has the initial calibration curve been verified using an appropriate second source standard? | X | | | | |
| **S2** | OI | **Initial and continuing calibration verification (ICCV and CCV) and continuing calibration** | | | | | |
| | | Was the CCV analyzed at the method-required frequency? | X | | | | |
| | | Were percent differences for each analyte within the method-required QC limits? | X | | | | |
| | | Was the ICAL curve verified for each analyte? | X | | | | |
| | | Was the absolute value of the analyte concentration in the inorganic CCB < MDL? | X | | | | |
| **S3** | O | **Mass spectral tuning:** | | | | | |
| | | Was the appropriate compound for the method used for tuning? | X | | | | |
| | | Were ion abundance data within the method-required QC limits? | X | | | | |
| **S4** | O | **Internal standards (IS):** | | | | | |
| | | Were IS area counts and retention times within the method-required QC limits? | X | | | | |
| **S5** | OI | **Raw data (NELAC section 1 appendix A glossary, and section 5.12 or ISO/IEC 17025 section** | | | | | |
| | | Were the raw data (for example, chromatograms, spectral data) reviewed by an analyst? | X | | | | |
| | | Were data associated with manual integrations flagged on the raw data? | X | | | | |
| **S6** | O | **Dual column confirmation** | | | | | |
| | | Did dual column confirmation results meet the method-required QC? | | | X | | |
| **S7** | O | **Tentatively identified compounds (TICs):** | | | | | |
| | | If TICs were requested, were the mass spectra and TIC data subject to appropriate checks? | | | X | | |
| **S8** | I | **Interference Check Sample (ICS) results:** | | | | | |
| | | Were percent recoveries within method QC limits? | | | X | | |
| | I | **Serial dilutions, post digestion spikes, and method of standard additions** | | | | | |
| | | Were percent differences, recoveries, and the linearity within the QC limits specified in the method? | | | X | | |
| **S10** | OI | **Method detection limit (MDL) studies** | | | | | |
| | | Was a MDL study performed for each reported analyte? | X | | | | |
| | | Is the MDL either adjusted or supported by the analysis of DCSs? | X | | | | |
| **S11** | OI | **Proficiency test reports:** | | | | | |
| | | Was the laboratory's performance acceptable on the applicable proficiency tests or evaluation studies? | X | | | | |
| **S12** | OI | **Standards documentation** | | | | | |
| | | Are all standards used in the analyses NIST-traceable or obtained from other appropriate sources? | X | | | | |
| **S13** | OI | **Compound/analyte identification procedures** | | | | | |
| | | Are the procedures for compound/analyte identification documented? | X | | | | |
| **S14** | OI | **Demonstration of analyst competency (DOC)** | | | | | |
| | | Was DOC conducted consistent with NELAC Chapter 5C or ISO/IEC 4? | X | | | | |
| | | Is documentation of the analyst's competency up-to-date and on file? | X | | | | |
| **S15** | OI | **Verification/validation documentation for methods** (NELAC Chap 5 or ISO/IEC 17025 Section 5) | | | | | |
| | | Are all the methods used to generate the data documented, verified, and validated, where applicable? | X | | | | |
| **S16** | OI | **Laboratory standard operating procedures (SOPs):** | | | | | |
| | | Are laboratory SOPs current and on file for each method performed? | X | | | | |

1 Items identified by the letter "R" should be included in the laboratory data package submitted to the TCEQ in the TRRP-required report(s). Items identified by the letter "S" should be retained and made available upon request for the appropriate retention period.
2 O = organic analyses; I = inorganic analyses (and general chemistry, when applicable).
3 NA = Not applicable.
4 NR = Not Reviewed.
5 ER# = Exception Report identification number (an Exception Report should be completed for an item if "NR" or "No" is checked).

| Appendix A (cont'd): Laboratory Review Checklist: Exception Reports | |
|---|---|
| Laboratory Name: Accutest Laboratories Gulf Coast | LRC Date: 3/19/2007 |
| Project Name: Longhorn | Laboratory Job Number: T16445 |
| Reviewer Name: Ron Martino | Prep Batch Number(s): |

| ER #[1] | DESCRIPTION |
|---|---|
| 1 | For reporting purposes, the MQL is defined in the report as the RL. The unadjusted MQL/RL is reported in the method blank. The SQL/MDL is defined in the report as the MDL. |
| 2 | All anomalies are discussed in the case narrative. |

ER# = Exception Report identification number (an Exception Report should be completed for an item if "NR" or "No" is checked on the LRC)

# GC/MS Volatiles

## QC Data Summaries

Includes the following where applicable:

- Method Blank Summaries
- Blank Spike Summaries
- Matrix Spike and Duplicate Summaries
- Instrument Performance Checks (BFB)
- Internal Standard Area Summaries
- Surrogate Recovery Summaries
- Initial and Continuing Calibration Summaries

# Method Blank Summary



**Job Number:** T16445
**Account:** ITTXHO Shaw E & I, Inc.
**Project:** Longhorn Army Ammunition Plant

| Sample | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|---|---|---|---|---|---|---|---|
| VF2314-MB | F0079164.D | 1 | 03/07/07 | LJ | n/a | n/a | VF2314 |

**The QC reported here applies to the following samples:** **Method:** SW846 8260B

T16445-1, T16445-2, T16445-5

| CAS No. | Compound | Result | RL | MDL | Units | Q |
|---|---|---|---|---|---|---|
| 67-64-1 | Acetone | ND | 50 | 2.8 | ug/l | |
| 71-43-2 | Benzene | ND | 2.0 | 0.23 | ug/l | |
| 75-27-4 | Bromodichloromethane | ND | 2.0 | 0.33 | ug/l | |
| 75-25-2 | Bromoform | ND | 2.0 | 0.65 | ug/l | |
| 108-90-7 | Chlorobenzene | ND | 2.0 | 0.54 | ug/l | |
| 75-00-3 | Chloroethane | ND | 2.0 | 0.46 | ug/l | |
| 67-66-3 | Chloroform | ND | 2.0 | 0.66 | ug/l | |
| 75-15-0 | Carbon disulfide | ND | 2.0 | 0.62 | ug/l | |
| 56-23-5 | Carbon tetrachloride | ND | 2.0 | 0.52 | ug/l | |
| 75-34-3 | 1,1-Dichloroethane | ND | 2.0 | 0.52 | ug/l | |
| 75-35-4 | 1,1-Dichloroethylene | ND | 2.0 | 0.68 | ug/l | |
| 107-06-2 | 1,2-Dichloroethane | ND | 2.0 | 0.53 | ug/l | |
| 78-87-5 | 1,2-Dichloropropane | ND | 2.0 | 0.59 | ug/l | |
| 124-48-1 | Dibromochloromethane | ND | 2.0 | 0.68 | ug/l | |
| 156-59-2 | cis-1,2-Dichloroethylene | ND | 2.0 | 0.83 | ug/l | |
| 10061-01-5 | cis-1,3-Dichloropropene | ND | 2.0 | 0.59 | ug/l | |
| 156-60-5 | trans-1,2-Dichloroethylene | ND | 2.0 | 0.75 | ug/l | |
| 10061-02-6 | trans-1,3-Dichloropropene | ND | 2.0 | 0.61 | ug/l | |
| 100-41-4 | Ethylbenzene | ND | 2.0 | 0.48 | ug/l | |
| 591-78-6 | 2-Hexanone | ND | 10 | 1.9 | ug/l | |
| 108-10-1 | 4-Methyl-2-pentanone | ND | 10 | 7.3 | ug/l | |
| 74-83-9 | Methyl bromide | ND | 2.0 | 0.47 | ug/l | |
| 74-87-3 | Methyl chloride | ND | 2.0 | 0.60 | ug/l | |
| 75-09-2 | Methylene chloride | ND | 5.0 | 0.67 | ug/l | |
| 78-93-3 | Methyl ethyl ketone | ND | 10 | 3.0 | ug/l | |
| 100-42-5 | Styrene | ND | 2.0 | 0.50 | ug/l | |
| 71-55-6 | 1,1,1-Trichloroethane | ND | 2.0 | 0.37 | ug/l | |
| 79-34-5 | 1,1,2,2-Tetrachloroethane | ND | 2.0 | 0.46 | ug/l | |
| 79-00-5 | 1,1,2-Trichloroethane | ND | 2.0 | 0.66 | ug/l | |
| 127-18-4 | Tetrachloroethylene | ND | 2.0 | 0.74 | ug/l | |
| 108-88-3 | Toluene | ND | 2.0 | 0.54 | ug/l | |
| 79-01-6 | Trichloroethylene | ND | 2.0 | 0.63 | ug/l | |
| 75-01-4 | Vinyl chloride | ND | 2.0 | 0.32 | ug/l | |
| 1330-20-7 | Xylene (total) | ND | 6.0 | 1.1 | ug/l | |

# Method Blank Summary



**Job Number:** T16445
**Account:** ITTXHO Shaw E & I, Inc.
**Project:** Longhorn Army Ammunition Plant

| Sample | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|---|---|---|---|---|---|---|---|
| VF2314-MB | F0079164.D | 1 | 03/07/07 | LJ | n/a | n/a | VF2314 |



**The QC reported here applies to the following samples:** **Method:** SW846 8260B

T16445-1, T16445-2, T16445-5

| CAS No. | Surrogate Recoveries | | Limits |
|---|---|---|---|
| 1868-53-7 | Dibromofluoromethane | 104% | 73-139% |
| 17060-07-0 | 1,2-Dichloroethane-D4 | 100% | 66-139% |
| 2037-26-5 | Toluene-D8 | 106% | 77-148% |
| 460-00-4 | 4-Bromofluorobenzene | 113% | 84-150% |

# Method Blank Summary



**Job Number:** T16445
**Account:** ITTXHO Shaw E & I, Inc.
**Project:** Longhorn Army Ammunition Plant

| Sample | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|---|---|---|---|---|---|---|---|
| VF2315-MB | F0079184.D | 1 | 03/07/07 | LJ | n/a | n/a | VF2315 |

**The QC reported here applies to the following samples:** **Method:** SW846 8260B

T16445-3, T16445-6, T16445-8, T16445-9, T16445-10, T16445-11, T16445-14, T16445-15, T16445-18

| CAS No. | Compound | Result | RL | MDL | Units | Q |
|---|---|---|---|---|---|---|
| 67-64-1 | Acetone | ND | 50 | 2.8 | ug/l | |
| 71-43-2 | Benzene | ND | 2.0 | 0.23 | ug/l | |
| 75-27-4 | Bromodichloromethane | ND | 2.0 | 0.33 | ug/l | |
| 75-25-2 | Bromoform | ND | 2.0 | 0.65 | ug/l | |
| 108-90-7 | Chlorobenzene | ND | 2.0 | 0.54 | ug/l | |
| 75-00-3 | Chloroethane | ND | 2.0 | 0.46 | ug/l | |
| 67-66-3 | Chloroform | ND | 2.0 | 0.66 | ug/l | |
| 75-15-0 | Carbon disulfide | ND | 2.0 | 0.62 | ug/l | |
| 56-23-5 | Carbon tetrachloride | ND | 2.0 | 0.52 | ug/l | |
| 75-34-3 | 1,1-Dichloroethane | ND | 2.0 | 0.52 | ug/l | |
| 75-35-4 | 1,1-Dichloroethylene | ND | 2.0 | 0.68 | ug/l | |
| 107-06-2 | 1,2-Dichloroethane | ND | 2.0 | 0.53 | ug/l | |
| 78-87-5 | 1,2-Dichloropropane | ND | 2.0 | 0.59 | ug/l | |
| 124-48-1 | Dibromochloromethane | ND | 2.0 | 0.68 | ug/l | |
| 156-59-2 | cis-1,2-Dichloroethylene | ND | 2.0 | 0.83 | ug/l | |
| 10061-01-5 | cis-1,3-Dichloropropene | ND | 2.0 | 0.59 | ug/l | |
| 156-60-5 | trans-1,2-Dichloroethylene | ND | 2.0 | 0.75 | ug/l | |
| 10061-02-6 | trans-1,3-Dichloropropene | ND | 2.0 | 0.61 | ug/l | |
| 100-41-4 | Ethylbenzene | ND | 2.0 | 0.48 | ug/l | |
| 591-78-6 | 2-Hexanone | ND | 10 | 1.9 | ug/l | |
| 108-10-1 | 4-Methyl-2-pentanone | ND | 10 | 7.3 | ug/l | |
| 74-83-9 | Methyl bromide | ND | 2.0 | 0.47 | ug/l | |
| 74-87-3 | Methyl chloride | ND | 2.0 | 0.60 | ug/l | |
| 75-09-2 | Methylene chloride | ND | 5.0 | 0.67 | ug/l | |
| 78-93-3 | Methyl ethyl ketone | ND | 10 | 3.0 | ug/l | |
| 100-42-5 | Styrene | ND | 2.0 | 0.50 | ug/l | |
| 71-55-6 | 1,1,1-Trichloroethane | ND | 2.0 | 0.37 | ug/l | |
| 79-34-5 | 1,1,2,2-Tetrachloroethane | ND | 2.0 | 0.46 | ug/l | |
| 79-00-5 | 1,1,2-Trichloroethane | ND | 2.0 | 0.66 | ug/l | |
| 127-18-4 | Tetrachloroethylene | ND | 2.0 | 0.74 | ug/l | |
| 108-88-3 | Toluene | ND | 2.0 | 0.54 | ug/l | |
| 79-01-6 | Trichloroethylene | ND | 2.0 | 0.63 | ug/l | |
| 75-01-4 | Vinyl chloride | ND | 2.0 | 0.32 | ug/l | |
| 1330-20-7 | Xylene (total) | ND | 6.0 | 1.1 | ug/l | |

# Method Blank Summary



**Job Number:** T16445
**Account:** ITTXHO Shaw E & I, Inc.
**Project:** Longhorn Army Ammunition Plant

| Sample | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|---|---|---|---|---|---|---|---|
| VF2315-MB | F0079184.D | 1 | 03/07/07 | LJ | n/a | n/a | VF2315 |



**The QC reported here applies to the following samples:** **Method:** SW846 8260B

T16445-3, T16445-6, T16445-8, T16445-9, T16445-10, T16445-11, T16445-14, T16445-15, T16445-18

| CAS No. | Surrogate Recoveries | | Limits |
|---|---|---|---|
| 1868-53-7 | Dibromofluoromethane | 103% | 73-139% |
| 17060-07-0 | 1,2-Dichloroethane-D4 | 98% | 66-139% |
| 2037-26-5 | Toluene-D8 | 109% | 77-148% |
| 460-00-4 | 4-Bromofluorobenzene | 129% | 84-150% |

# Method Blank Summary



**Job Number:** T16445
**Account:** ITTXHO Shaw E & I, Inc.
**Project:** Longhorn Army Ammunition Plant

| Sample | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|---|---|---|---|---|---|---|---|
| VF2318-MB | F0079225.D | 1 | 03/08/07 | LJ | n/a | n/a | VF2318 |



**The QC reported here applies to the following samples:** **Method:** SW846 8260B

T16445-3, T16445-4, T16445-6, T16445-7, T16445-8, T16445-9, T16445-10, T16445-12, T16445-13, T16445-14

| CAS No. | Compound | Result | RL | MDL | Units | Q |
|---|---|---|---|---|---|---|
| 67-64-1 | Acetone | ND | 50 | 2.8 | ug/l | |
| 71-43-2 | Benzene | ND | 2.0 | 0.23 | ug/l | |
| 75-27-4 | Bromodichloromethane | ND | 2.0 | 0.33 | ug/l | |
| 75-25-2 | Bromoform | ND | 2.0 | 0.65 | ug/l | |
| 108-90-7 | Chlorobenzene | ND | 2.0 | 0.54 | ug/l | |
| 75-00-3 | Chloroethane | ND | 2.0 | 0.46 | ug/l | |
| 67-66-3 | Chloroform | ND | 2.0 | 0.66 | ug/l | |
| 75-15-0 | Carbon disulfide | ND | 2.0 | 0.62 | ug/l | |
| 56-23-5 | Carbon tetrachloride | ND | 2.0 | 0.52 | ug/l | |
| 75-34-3 | 1,1-Dichloroethane | ND | 2.0 | 0.52 | ug/l | |
| 75-35-4 | 1,1-Dichloroethylene | ND | 2.0 | 0.68 | ug/l | |
| 107-06-2 | 1,2-Dichloroethane | ND | 2.0 | 0.53 | ug/l | |
| 78-87-5 | 1,2-Dichloropropane | ND | 2.0 | 0.59 | ug/l | |
| 124-48-1 | Dibromochloromethane | ND | 2.0 | 0.68 | ug/l | |
| 156-59-2 | cis-1,2-Dichloroethylene | ND | 2.0 | 0.83 | ug/l | |
| 10061-01-5 | cis-1,3-Dichloropropene | ND | 2.0 | 0.59 | ug/l | |
| 156-60-5 | trans-1,2-Dichloroethylene | ND | 2.0 | 0.75 | ug/l | |
| 10061-02-6 | trans-1,3-Dichloropropene | ND | 2.0 | 0.61 | ug/l | |
| 100-41-4 | Ethylbenzene | ND | 2.0 | 0.48 | ug/l | |
| 591-78-6 | 2-Hexanone | ND | 10 | 1.9 | ug/l | |
| 108-10-1 | 4-Methyl-2-pentanone | ND | 10 | 7.3 | ug/l | |
| 74-83-9 | Methyl bromide | ND | 2.0 | 0.47 | ug/l | |
| 74-87-3 | Methyl chloride | ND | 2.0 | 0.60 | ug/l | |
| 75-09-2 | Methylene chloride | ND | 5.0 | 0.67 | ug/l | |
| 78-93-3 | Methyl ethyl ketone | ND | 10 | 3.0 | ug/l | |
| 100-42-5 | Styrene | ND | 2.0 | 0.50 | ug/l | |
| 71-55-6 | 1,1,1-Trichloroethane | ND | 2.0 | 0.37 | ug/l | |
| 79-34-5 | 1,1,2,2-Tetrachloroethane | ND | 2.0 | 0.46 | ug/l | |
| 79-00-5 | 1,1,2-Trichloroethane | ND | 2.0 | 0.66 | ug/l | |
| 127-18-4 | Tetrachloroethylene | ND | 2.0 | 0.74 | ug/l | |
| 108-88-3 | Toluene | ND | 2.0 | 0.54 | ug/l | |
| 79-01-6 | Trichloroethylene | ND | 2.0 | 0.63 | ug/l | |
| 75-01-4 | Vinyl chloride | ND | 2.0 | 0.32 | ug/l | |
| 1330-20-7 | Xylene (total) | ND | 6.0 | 1.1 | ug/l | |

# Method Blank Summary



**Job Number:** T16445
**Account:** ITTXHO Shaw E & I, Inc.
**Project:** Longhorn Army Ammunition Plant

| Sample | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|---|---|---|---|---|---|---|---|
| VF2318-MB | F0079225.D | 1 | 03/08/07 | LJ | n/a | n/a | VF2318 |

**The QC reported here applies to the following samples:** **Method:** SW846 8260B

T16445-3, T16445-4, T16445-6, T16445-7, T16445-8, T16445-9, T16445-10, T16445-12, T16445-13, T16445-14

| CAS No. | Surrogate Recoveries | | Limits |
|---|---|---|---|
| 1868-53-7 | Dibromofluoromethane | 103% | 73-139% |
| 17060-07-0 | 1,2-Dichloroethane-D4 | 97% | 66-139% |
| 2037-26-5 | Toluene-D8 | 108% | 77-148% |
| 460-00-4 | 4-Bromofluorobenzene | 121% | 84-150% |

# Blank Spike Summary



**Job Number:** T16445
**Account:** ITTXHO Shaw E & I, Inc.
**Project:** Longhorn Army Ammunition Plant

| Sample | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|---|---|---|---|---|---|---|---|
| VF2314-BS | F0079163.D | 1 | 03/07/07 | LJ | n/a | n/a | VF2314 |

**The QC reported here applies to the following samples:** **Method:** SW846 8260B

T16445-1, T16445-2, T16445-5

| CAS No. | Compound | Spike ug/l | BSP ug/l | BSP % | Limits |
|---|---|---|---|---|---|
| 67-64-1 | Acetone | 125 | 109 | 87 | 31-158 |
| 71-43-2 | Benzene | 25 | 22.8 | 91 | 67-118 |
| 75-27-4 | Bromodichloromethane | 25 | 21.5 | 86 | 66-115 |
| 75-25-2 | Bromoform | 25 | 22.4 | 90 | 57-119 |
| 108-90-7 | Chlorobenzene | 25 | 22.3 | 89 | 72-116 |
| 75-00-3 | Chloroethane | 25 | 24.7 | 99 | 61-135 |
| 67-66-3 | Chloroform | 25 | 23.2 | 93 | 66-117 |
| 75-15-0 | Carbon disulfide | 25 | 19.0 | 76 | 39-136 |
| 56-23-5 | Carbon tetrachloride | 25 | 25.0 | 100 | 67-131 |
| 75-34-3 | 1,1-Dichloroethane | 25 | 23.1 | 92 | 63-125 |
| 75-35-4 | 1,1-Dichloroethylene | 25 | 22.3 | 89 | 52-143 |
| 107-06-2 | 1,2-Dichloroethane | 25 | 23.6 | 94 | 61-120 |
| 78-87-5 | 1,2-Dichloropropane | 25 | 22.6 | 90 | 64-118 |
| 124-48-1 | Dibromochloromethane | 25 | 21.7 | 87 | 67-117 |
| 156-59-2 | cis-1,2-Dichloroethylene | 25 | 21.9 | 88 | 65-116 |
| 10061-01-5 | cis-1,3-Dichloropropene | 25 | 21.9 | 88 | 67-118 |
| 156-60-5 | trans-1,2-Dichloroethylene | 25 | 22.2 | 89 | 66-128 |
| 10061-02-6 | trans-1,3-Dichloropropene | 25 | 22.9 | 92 | 73-126 |
| 100-41-4 | Ethylbenzene | 25 | 22.1 | 88 | 71-119 |
| 591-78-6 | 2-Hexanone | 125 | 115 | 92 | 45-132 |
| 108-10-1 | 4-Methyl-2-pentanone | 125 | 121 | 97 | 46-127 |
| 74-83-9 | Methyl bromide | 25 | 21.3 | 85 | 51-126 |
| 74-87-3 | Methyl chloride | 25 | 20.7 | 83 | 47-130 |
| 75-09-2 | Methylene chloride | 25 | 20.5 | 82 | 53-130 |
| 78-93-3 | Methyl ethyl ketone | 125 | 115 | 92 | 47-128 |
| 100-42-5 | Styrene | 25 | 18.5 | 74 | 69-115 |
| 71-55-6 | 1,1,1-Trichloroethane | 25 | 24.1 | 96 | 67-128 |
| 79-34-5 | 1,1,2,2-Tetrachloroethane | 25 | 21.7 | 87 | 57-121 |
| 79-00-5 | 1,1,2-Trichloroethane | 25 | 22.9 | 92 | 62-117 |
| 127-18-4 | Tetrachloroethylene | 25 | 23.7 | 95 | 72-128 |
| 108-88-3 | Toluene | 25 | 22.4 | 90 | 70-121 |
| 79-01-6 | Trichloroethylene | 25 | 23.1 | 92 | 69-120 |
| 75-01-4 | Vinyl chloride | 25 | 23.0 | 92 | 59-145 |
| 1330-20-7 | Xylene (total) | 75 | 67.8 | 90 | 72-120 |

# Blank Spike Summary



**Job Number:** T16445
**Account:** ITTXHO Shaw E & I, Inc.
**Project:** Longhorn Army Ammunition Plant

| Sample | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|---|---|---|---|---|---|---|---|
| VF2314-BS | F0079163.D | 1 | 03/07/07 | LJ | n/a | n/a | VF2314 |



**The QC reported here applies to the following samples:** **Method:** SW846 8260B

T16445-1, T16445-2, T16445-5

| CAS No. | Surrogate Recoveries | BSP | Limits |
|---|---|---|---|
| 1868-53-7 | Dibromofluoromethane | 105% | 73-139% |
| 17060-07-0 | 1,2-Dichloroethane-D4 | 102% | 66-139% |
| 2037-26-5 | Toluene-D8 | 103% | 77-148% |
| 460-00-4 | 4-Bromofluorobenzene | 98% | 84-150% |

# Blank Spike Summary



**Job Number:** T16445
**Account:** ITTXHO Shaw E & I, Inc.
**Project:** Longhorn Army Ammunition Plant

| Sample | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|---|---|---|---|---|---|---|---|
| VF2315-BS | F0079183.D | 1 | 03/07/07 | LJ | n/a | n/a | VF2315 |



**The QC reported here applies to the following samples:** **Method:** SW846 8260B

T16445-3, T16445-6, T16445-8, T16445-9, T16445-10, T16445-11, T16445-14, T16445-15, T16445-18

| CAS No. | Compound | Spike ug/l | BSP ug/l | BSP % | Limits |
|---|---|---|---|---|---|
| 67-64-1 | Acetone | 125 | 103 | 82 | 31-158 |
| 71-43-2 | Benzene | 25 | 25.1 | 100 | 67-118 |
| 75-27-4 | Bromodichloromethane | 25 | 23.8 | 95 | 66-115 |
| 75-25-2 | Bromoform | 25 | 22.2 | 89 | 57-119 |
| 108-90-7 | Chlorobenzene | 25 | 24.3 | 97 | 72-116 |
| 75-00-3 | Chloroethane | 25 | 26.6 | 106 | 61-135 |
| 67-66-3 | Chloroform | 25 | 25.7 | 103 | 66-117 |
| 75-15-0 | Carbon disulfide | 25 | 21.7 | 87 | 39-136 |
| 56-23-5 | Carbon tetrachloride | 25 | 27.6 | 110 | 67-131 |
| 75-34-3 | 1,1-Dichloroethane | 25 | 26.2 | 105 | 63-125 |
| 75-35-4 | 1,1-Dichloroethylene | 25 | 25.4 | 102 | 52-143 |
| 107-06-2 | 1,2-Dichloroethane | 25 | 24.1 | 96 | 61-120 |
| 78-87-5 | 1,2-Dichloropropane | 25 | 25.2 | 101 | 64-118 |
| 124-48-1 | Dibromochloromethane | 25 | 22.4 | 90 | 67-117 |
| 156-59-2 | cis-1,2-Dichloroethylene | 25 | 24.3 | 97 | 65-116 |
| 10061-01-5 | cis-1,3-Dichloropropene | 25 | 25.0 | 100 | 67-118 |
| 156-60-5 | trans-1,2-Dichloroethylene | 25 | 25.2 | 101 | 66-128 |
| 10061-02-6 | trans-1,3-Dichloropropene | 25 | 24.7 | 99 | 73-126 |
| 100-41-4 | Ethylbenzene | 25 | 23.9 | 96 | 71-119 |
| 591-78-6 | 2-Hexanone | 125 | 101 | 81 | 45-132 |
| 108-10-1 | 4-Methyl-2-pentanone | 125 | 111 | 89 | 46-127 |
| 74-83-9 | Methyl bromide | 25 | 23.0 | 92 | 51-126 |
| 74-87-3 | Methyl chloride | 25 | 23.0 | 92 | 47-130 |
| 75-09-2 | Methylene chloride | 25 | 23.5 | 94 | 53-130 |
| 78-93-3 | Methyl ethyl ketone | 125 | 107 | 86 | 47-128 |
| 100-42-5 | Styrene | 25 | 20.0 | 80 | 69-115 |
| 71-55-6 | 1,1,1-Trichloroethane | 25 | 26.2 | 105 | 67-128 |
| 79-34-5 | 1,1,2,2-Tetrachloroethane | 25 | 21.4 | 86 | 57-121 |
| 79-00-5 | 1,1,2-Trichloroethane | 25 | 22.9 | 92 | 62-117 |
| 127-18-4 | Tetrachloroethylene | 25 | 26.4 | 106 | 72-128 |
| 108-88-3 | Toluene | 25 | 24.3 | 97 | 70-121 |
| 79-01-6 | Trichloroethylene | 25 | 26.1 | 104 | 69-120 |
| 75-01-4 | Vinyl chloride | 25 | 25.2 | 101 | 59-145 |
| 1330-20-7 | Xylene (total) | 75 | 74.2 | 99 | 72-120 |

# Blank Spike Summary



**Job Number:** T16445
**Account:** ITTXHO Shaw E & I, Inc.
**Project:** Longhorn Army Ammunition Plant

| Sample | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|---|---|---|---|---|---|---|---|
| VF2315-BS | F0079183.D | 1 | 03/07/07 | LJ | n/a | n/a | VF2315 |




**The QC reported here applies to the following samples:** **Method:** SW846 8260B

T16445-3, T16445-6, T16445-8, T16445-9, T16445-10, T16445-11, T16445-14, T16445-15, T16445-18

| CAS No. | Surrogate Recoveries | BSP | Limits |
|---|---|---|---|
| 1868-53-7 | Dibromofluoromethane | 104% | 73-139% |
| 17060-07-0 | 1,2-Dichloroethane-D4 | 101% | 66-139% |
| 2037-26-5 | Toluene-D8 | 102% | 77-148% |
| 460-00-4 | 4-Bromofluorobenzene | 99% | 84-150% |

# Blank Spike Summary



**Job Number:** T16445
**Account:** ITTXHO Shaw E & I, Inc.
**Project:** Longhorn Army Ammunition Plant

| Sample | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|---|---|---|---|---|---|---|---|
| VF2318-BS | F0079224.D | 1 | 03/08/07 | LJ | n/a | n/a | VF2318 |

**The QC reported here applies to the following samples:** **Method:** SW846 8260B

T16445-3, T16445-4, T16445-6, T16445-7, T16445-8, T16445-9, T16445-10, T16445-12, T16445-13, T16445-14

| CAS No. | Compound | Spike ug/l | BSP ug/l | BSP % | Limits |
|---|---|---|---|---|---|
| 67-64-1 | Acetone | 125 | 87.0 | 70 | 31-158 |
| 71-43-2 | Benzene | 25 | 24.3 | 97 | 67-118 |
| 75-27-4 | Bromodichloromethane | 25 | 22.4 | 90 | 66-115 |
| 75-25-2 | Bromoform | 25 | 20.6 | 82 | 57-119 |
| 108-90-7 | Chlorobenzene | 25 | 24.0 | 96 | 72-116 |
| 75-00-3 | Chloroethane | 25 | 24.1 | 96 | 61-135 |
| 67-66-3 | Chloroform | 25 | 24.6 | 98 | 66-117 |
| 75-15-0 | Carbon disulfide | 25 | 20.1 | 80 | 39-136 |
| 56-23-5 | Carbon tetrachloride | 25 | 27.0 | 108 | 67-131 |
| 75-34-3 | 1,1-Dichloroethane | 25 | 24.3 | 97 | 63-125 |
| 75-35-4 | 1,1-Dichloroethylene | 25 | 23.0 | 92 | 52-143 |
| 107-06-2 | 1,2-Dichloroethane | 25 | 22.7 | 91 | 61-120 |
| 78-87-5 | 1,2-Dichloropropane | 25 | 24.3 | 97 | 64-118 |
| 124-48-1 | Dibromochloromethane | 25 | 21.1 | 84 | 67-117 |
| 156-59-2 | cis-1,2-Dichloroethylene | 25 | 23.4 | 94 | 65-116 |
| 10061-01-5 | cis-1,3-Dichloropropene | 25 | 23.6 | 94 | 67-118 |
| 156-60-5 | trans-1,2-Dichloroethylene | 25 | 23.3 | 93 | 66-128 |
| 10061-02-6 | trans-1,3-Dichloropropene | 25 | 22.2 | 89 | 73-126 |
| 100-41-4 | Ethylbenzene | 25 | 23.9 | 96 | 71-119 |
| 591-78-6 | 2-Hexanone | 125 | 87.1 | 70 | 45-132 |
| 108-10-1 | 4-Methyl-2-pentanone | 125 | 95.6 | 76 | 46-127 |
| 74-83-9 | Methyl bromide | 25 | 21.3 | 85 | 51-126 |
| 74-87-3 | Methyl chloride | 25 | 22.5 | 90 | 47-130 |
| 75-09-2 | Methylene chloride | 25 | 21.8 | 87 | 53-130 |
| 78-93-3 | Methyl ethyl ketone | 125 | 87.5 | 70 | 47-128 |
| 100-42-5 | Styrene | 25 | 19.3 | 77 | 69-115 |
| 71-55-6 | 1,1,1-Trichloroethane | 25 | 26.5 | 106 | 67-128 |
| 79-34-5 | 1,1,2,2-Tetrachloroethane | 25 | 19.4 | 78 | 57-121 |
| 79-00-5 | 1,1,2-Trichloroethane | 25 | 20.9 | 84 | 62-117 |
| 127-18-4 | Tetrachloroethylene | 25 | 26.1 | 104 | 72-128 |
| 108-88-3 | Toluene | 25 | 23.9 | 96 | 70-121 |
| 79-01-6 | Trichloroethylene | 25 | 25.5 | 102 | 69-120 |
| 75-01-4 | Vinyl chloride | 25 | 22.5 | 90 | 59-145 |
| 1330-20-7 | Xylene (total) | 75 | 72.3 | 96 | 72-120 |

# Blank Spike Summary



**Job Number:** T16445
**Account:** ITTXHO Shaw E & I, Inc.
**Project:** Longhorn Army Ammunition Plant

| Sample | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|---|---|---|---|---|---|---|---|
| VF2318-BS | F0079224.D | 1 | 03/08/07 | LJ | n/a | n/a | VF2318 |



**The QC reported here applies to the following samples:** **Method:** SW846 8260B

T16445-3, T16445-4, T16445-6, T16445-7, T16445-8, T16445-9, T16445-10, T16445-12, T16445-13, T16445-14

| CAS No. | Surrogate Recoveries | BSP | Limits |
|---|---|---|---|
| 1868-53-7 | Dibromofluoromethane | 106% | 73-139% |
| 17060-07-0 | 1,2-Dichloroethane-D4 | 97% | 66-139% |
| 2037-26-5 | Toluene-D8 | 103% | 77-148% |
| 460-00-4 | 4-Bromofluorobenzene | 101% | 84-150% |

# Matrix Spike/Matrix Spike Duplicate Summary



**Job Number:** T16445
**Account:** ITTXHO Shaw E & I, Inc.
**Project:** Longhorn Army Ammunition Plant

| Sample | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|---|---|---|---|---|---|---|---|
| T16445-5MS | F0079170.D | 1 | 03/07/07 | LJ | n/a | n/a | VF2314 |
| T16445-5MSD | F0079171.D | 1 | 03/07/07 | LJ | n/a | n/a | VF2314 |
| T16445-5 | F0079169.D | 1 | 03/07/07 | LJ | n/a | n/a | VF2314 |
| T16445-5 | F0079180.D | 20 | 03/07/07 | LJ | n/a | n/a | VF2314 |

**The QC reported here applies to the following samples:** **Method:** SW846 8260B

T16445-1, T16445-2, T16445-5

| CAS No. | Compound | T16445-5 ug/l | Q | Spike ug/l | MS ug/l | MS % | MSD ug/l | MSD % | RPD | Limits Rec/RPD |
|---|---|---|---|---|---|---|---|---|---|---|
| 67-64-1 | Acetone | 50 U | | 125 | 121 | 97 | 121 | 97 | 0 | 39-130/26 |
| 71-43-2 | Benzene | 2.0 U | | 25 | 23.6 | 94 | 22.9 | 92 | 3 | 65-122/15 |
| 75-27-4 | Bromodichloromethane | 2.0 U | | 25 | 22.6 | 90 | 21.7 | 87 | 4 | 64-119/22 |
| 75-25-2 | Bromoform | 2.0 U | | 25 | 23.7 | 95 | 22.9 | 92 | 3 | 50-123/28 |
| 108-90-7 | Chlorobenzene | 2.0 U | | 25 | 22.8 | 91 | 22.4 | 90 | 2 | 72-118/20 |
| 75-00-3 | Chloroethane | 2.0 U | | 25 | 26.5 | 106 | 25.7 | 103 | 3 | 60-136/25 |
| 67-66-3 | Chloroform | 2.0 U | | 25 | 24.0 | 96 | 23.6 | 94 | 2 | 65-120/20 |
| 75-15-0 | Carbon disulfide | 2.0 U | | 25 | 19.4 | 78 | 19.7 | 79 | 2 | 37-140/24 |
| 56-23-5 | Carbon tetrachloride | 2.0 U | | 25 | 25.3 | 101 | 25.0 | 100 | 1 | 64-135/23 |
| 75-34-3 | 1,1-Dichloroethane | 1.3 | J | 25 | 25.7 | 98 | 25.0 | 95 | 3 | 65-126/21 |
| 75-35-4 | 1,1-Dichloroethylene | 12.9 | | 25 | 35.8 | 92 | 36.0 | 92 | 1 | 55-140/25 |
| 107-06-2 | 1,2-Dichloroethane | 13.5 | | 25 | 39.1 | 102 | 38.0 | 98 | 3 | 57-125/25 |
| 78-87-5 | 1,2-Dichloropropane | 2.0 U | | 25 | 23.8 | 95 | 23.2 | 93 | 3 | 63-121/22 |
| 124-48-1 | Dibromochloromethane | 2.0 U | | 25 | 21.9 | 88 | 22.0 | 88 | 0 | 60-123/23 |
| 156-59-2 | cis-1,2-Dichloroethylene | 48.2 | | 25 | 72.1 | 96 | 72.9 | 99 | 1 | 62-120/24 |
| 10061-01-5 | cis-1,3-Dichloropropene | 2.0 U | | 25 | 22.2 | 89 | 22.2 | 89 | 0 | 61-119/23 |
| 156-60-5 | trans-1,2-Dichloroethylene | 2.0 U | | 25 | 24.0 | 96 | 23.5 | 94 | 2 | 64-130/22 |
| 10061-02-6 | trans-1,3-Dichloropropene | 2.0 U | | 25 | 22.6 | 90 | 22.5 | 90 | 0 | 65-129/23 |
| 100-41-4 | Ethylbenzene | 2.0 U | | 25 | 22.4 | 90 | 22.2 | 89 | 1 | 70-123/18 |
| 591-78-6 | 2-Hexanone | 10 U | | 125 | 126 | 101 | 124 | 99 | 2 | 41-137/27 |
| 108-10-1 | 4-Methyl-2-pentanone | 10 U | | 125 | 133 | 106 | 132 | 106 | 1 | 41-133/22 |
| 74-83-9 | Methyl bromide | 2.0 U | | 25 | 23.2 | 93 | 22.1 | 88 | 5 | 47-129/27 |
| 74-87-3 | Methyl chloride | 2.0 U | | 25 | 23.7 | 95 | 22.5 | 90 | 5 | 45-133/24 |
| 75-09-2 | Methylene chloride | 5.0 U | | 25 | 22.3 | 89 | 21.5 | 86 | 4 | 49-128/21 |
| 78-93-3 | Methyl ethyl ketone | 10 U | | 125 | 126 | 101 | 125 | 100 | 1 | 43-125/29 |
| 100-42-5 | Styrene | 2.0 U | | 25 | 18.7 | 75 | 18.4 | 74 | 2 | 65-120/21 |
| 71-55-6 | 1,1,1-Trichloroethane | 2.0 U | | 25 | 24.8 | 99 | 24.5 | 98 | 1 | 68-131/21 |
| 79-34-5 | 1,1,2,2-Tetrachloroethane | 2.0 U | | 25 | 22.1 | 88 | 22.7 | 91 | 3 | 50-128/22 |
| 79-00-5 | 1,1,2-Trichloroethane | 2.0 U | | 25 | 22.9 | 92 | 23.0 | 92 | 0 | 58-120/22 |
| 127-18-4 | Tetrachloroethylene | 5.1 | | 25 | 28.7 | 94 | 29.1 | 96 | 1 | 69-132/21 |
| 108-88-3 | Toluene | 2.0 U | | 25 | 22.7 | 91 | 22.3 | 89 | 2 | 70-123/18 |
| 79-01-6 | Trichloroethylene | 1460 [b] | | 25 | 1680 | 200* [a] | 1680 | 200* [a] | 0 | 70-120/19 |
| 75-01-4 | Vinyl chloride | 2.5 | | 25 | 28.3 | 103 | 27.3 | 99 | 4 | 51-147/24 |
| 1330-20-7 | Xylene (total) | 6.0 U | | 75 | 68.6 | 91 | 67.6 | 90 | 1 | 71-122/16 |

5.3

5

# Matrix Spike/Matrix Spike Duplicate Summary



**Job Number:** T16445
**Account:** ITTXHO Shaw E & I, Inc.
**Project:** Longhorn Army Ammunition Plant

| Sample | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|---|---|---|---|---|---|---|---|
| T16445-5MS | F0079170.D | 1 | 03/07/07 | LJ | n/a | n/a | VF2314 |
| T16445-5MSD | F0079171.D | 1 | 03/07/07 | LJ | n/a | n/a | VF2314 |
| T16445-5 | F0079169.D | 1 | 03/07/07 | LJ | n/a | n/a | VF2314 |
| T16445-5 | F0079180.D | 20 | 03/07/07 | LJ | n/a | n/a | VF2314 |

**The QC reported here applies to the following samples:** **Method:** SW846 8260B

T16445-1, T16445-2, T16445-5

| CAS No. | Surrogate Recoveries | MS | MSD | T16445-5 | T16445-5 | Limits |
|---|---|---|---|---|---|---|
| 1868-53-7 | Dibromofluoromethane | 110% | 112% | 107% | 105% | 73-139% |
| 17060-07-0 | 1,2-Dichloroethane-D4 | 109% | 108% | 105% | 104% | 66-139% |
| 2037-26-5 | Toluene-D8 | 107% | 107% | 105% | 108% | 77-148% |
| 460-00-4 | 4-Bromofluorobenzene | 102% | 103% | 114% | 129% | 84-150% |

(a) Outside control limits due to high level in sample relative to spike amount.
(b) Result is from Run #2.

# Matrix Spike/Matrix Spike Duplicate Summary



**Job Number:** T16445
**Account:** ITTXHO Shaw E & I, Inc.
**Project:** Longhorn Army Ammunition Plant

| Sample | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|---|---|---|---|---|---|---|---|
| T16445-3MS | F0079191.D | 1 | 03/07/07 | LJ | n/a | n/a | VF2315 |
| T16445-3MSD | F0079192.D | 1 | 03/07/07 | LJ | n/a | n/a | VF2315 |
| T16445-3 [a] | F0079190.D | 1 | 03/07/07 | LJ | n/a | n/a | VF2315 |



**The QC reported here applies to the following samples:** **Method:** SW846 8260B

T16445-3, T16445-6, T16445-8, T16445-9, T16445-10, T16445-11, T16445-14, T16445-15, T16445-18

| CAS No. | Compound | T16445-3 ug/l | Q | Spike ug/l | MS ug/l | MS % | MSD ug/l | MSD % | RPD | Limits Rec/RPD |
|---|---|---|---|---|---|---|---|---|---|---|
| 67-64-1 | Acetone | 50 U | | 125 | 103 | 82 | 98.2 | 79 | 5 | 39-130/26 |
| 71-43-2 | Benzene | 2.0 U | | 25 | 23.6 | 94 | 24.0 | 96 | 2 | 65-122/15 |
| 75-27-4 | Bromodichloromethane | 2.0 U | | 25 | 22.5 | 90 | 22.3 | 89 | 1 | 64-119/22 |
| 75-25-2 | Bromoform | 2.0 U | | 25 | 20.5 | 82 | 20.7 | 83 | 1 | 50-123/28 |
| 108-90-7 | Chlorobenzene | 2.0 U | | 25 | 22.8 | 91 | 23.3 | 93 | 2 | 72-118/20 |
| 75-00-3 | Chloroethane | 2.0 U | | 25 | 24.6 | 98 | 23.8 | 95 | 3 | 60-136/25 |
| 67-66-3 | Chloroform | 2.0 U | | 25 | 24.9 | 100 | 25.4 | 102 | 2 | 65-120/20 |
| 75-15-0 | Carbon disulfide | 2.0 U | | 25 | 20.2 | 81 | 19.9 | 80 | 1 | 37-140/24 |
| 56-23-5 | Carbon tetrachloride | 2.0 U | | 25 | 25.6 | 102 | 25.8 | 103 | 1 | 64-135/23 |
| 75-34-3 | 1,1-Dichloroethane | 2.0 | | 25 | 27.3 | 101 | 26.7 | 99 | 2 | 65-126/21 |
| 75-35-4 | 1,1-Dichloroethylene | 10.9 | | 25 | 34.9 | 96 | 33.5 | 90 | 4 | 55-140/25 |
| 107-06-2 | 1,2-Dichloroethane | 2.0 | | 25 | 24.5 | 90 | 24.1 | 88 | 2 | 57-125/25 |
| 78-87-5 | 1,2-Dichloropropane | 2.0 U | | 25 | 23.2 | 93 | 24.2 | 97 | 4 | 63-121/22 |
| 124-48-1 | Dibromochloromethane | 2.0 U | | 25 | 21.4 | 86 | 22.0 | 88 | 3 | 60-123/23 |
| 156-59-2 | cis-1,2-Dichloroethylene | 699 | E | 25 | 685 | -56* [b] | 690 | -36* [b] | 1 | 62-120/24 |
| 10061-01-5 | cis-1,3-Dichloropropene | 2.0 U | | 25 | 23.5 | 94 | 23.8 | 95 | 1 | 61-119/23 |
| 156-60-5 | trans-1,2-Dichloroethylene | 2.1 | | 25 | 26.1 | 96 | 26.0 | 96 | 0 | 64-130/22 |
| 10061-02-6 | trans-1,3-Dichloropropene | 2.0 U | | 25 | 24.4 | 98 | 24.1 | 96 | 1 | 65-129/23 |
| 100-41-4 | Ethylbenzene | 2.0 U | | 25 | 22.8 | 91 | 23.5 | 94 | 3 | 70-123/18 |
| 591-78-6 | 2-Hexanone | 10 U | | 125 | 105 | 84 | 101 | 81 | 4 | 41-137/27 |
| 108-10-1 | 4-Methyl-2-pentanone | 10 U | | 125 | 114 | 91 | 110 | 88 | 4 | 41-133/22 |
| 74-83-9 | Methyl bromide | 2.0 U | | 25 | 21.6 | 86 | 20.8 | 83 | 4 | 47-129/27 |
| 74-87-3 | Methyl chloride | 2.0 U | | 25 | 23.2 | 93 | 22.1 | 88 | 5 | 45-133/24 |
| 75-09-2 | Methylene chloride | 5.0 U | | 25 | 22.8 | 91 | 22.5 | 90 | 1 | 49-128/21 |
| 78-93-3 | Methyl ethyl ketone | 10 U | | 125 | 108 | 86 | 105 | 84 | 3 | 43-125/29 |
| 100-42-5 | Styrene | 2.0 U | | 25 | 18.9 | 76 | 19.0 | 76 | 1 | 65-120/21 |
| 71-55-6 | 1,1,1-Trichloroethane | 2.0 U | | 25 | 25.2 | 101 | 24.8 | 99 | 2 | 68-131/21 |
| 79-34-5 | 1,1,2,2-Tetrachloroethane | 2.0 U | | 25 | 20.8 | 83 | 21.4 | 86 | 3 | 50-128/22 |
| 79-00-5 | 1,1,2-Trichloroethane | 1.7 | J | 25 | 23.7 | 88 | 24.0 | 89 | 1 | 58-120/22 |
| 127-18-4 | Tetrachloroethylene | 83.1 | | 25 | 107 | 96 | 106 | 92 | 1 | 69-132/21 |
| 108-88-3 | Toluene | 2.0 U | | 25 | 22.8 | 91 | 23.4 | 94 | 3 | 70-123/18 |
| 79-01-6 | Trichloroethylene | 6520 | E | 25 | 6200 | -1280* [b] | 6140 | -1520* [b] | 1 | 70-120/19 |
| 75-01-4 | Vinyl chloride | 3.8 | | 25 | 28.3 | 98 | 27.1 | 93 | 4 | 51-147/24 |
| 1330-20-7 | Xylene (total) | 6.0 U | | 75 | 69.8 | 93 | 70.7 | 94 | 1 | 71-122/16 |

# Matrix Spike/Matrix Spike Duplicate Summary



**Job Number:** T16445
**Account:** ITTXHO Shaw E & I, Inc.
**Project:** Longhorn Army Ammunition Plant

| Sample | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|---|---|---|---|---|---|---|---|
| T16445-3MS | F0079191.D | 1 | 03/07/07 | LJ | n/a | n/a | VF2315 |
| T16445-3MSD | F0079192.D | 1 | 03/07/07 | LJ | n/a | n/a | VF2315 |
| T16445-3 [a] | F0079190.D | 1 | 03/07/07 | LJ | n/a | n/a | VF2315 |

**The QC reported here applies to the following samples:** **Method:** SW846 8260B

T16445-3, T16445-6, T16445-8, T16445-9, T16445-10, T16445-11, T16445-14, T16445-15, T16445-18

| CAS No. | Surrogate Recoveries | MS | MSD | T16445-3 | Limits |
|---|---|---|---|---|---|
| 1868-53-7 | Dibromofluoromethane | 106% | 107% | 106% | 73-139% |
| 17060-07-0 | 1,2-Dichloroethane-D4 | 106% | 107% | 106% | 66-139% |
| 2037-26-5 | Toluene-D8 | 101% | 104% | 102% | 77-148% |
| 460-00-4 | 4-Bromofluorobenzene | 99% | 103% | 123% | 84-150% |

(a) For QC only.
(b) Outside control limits due to high level in sample relative to spike amount.

# Matrix Spike/Matrix Spike Duplicate Summary



**Job Number:** T16445
**Account:** ITTXHO Shaw E & I, Inc.
**Project:** Longhorn Army Ammunition Plant

| Sample | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|---|---|---|---|---|---|---|---|
| T16445-4MS | F0079227.D | 1 | 03/08/07 | LJ | n/a | n/a | VF2318 |
| T16445-4MSD | F0079228.D | 1 | 03/08/07 | LJ | n/a | n/a | VF2318 |
| T16445-4 | F0079226.D | 1 | 03/08/07 | LJ | n/a | n/a | VF2318 |




**The QC reported here applies to the following samples:** **Method:** SW846 8260B

T16445-3, T16445-4, T16445-6, T16445-7, T16445-8, T16445-9, T16445-10, T16445-12, T16445-13, T16445-14

| CAS No. | Compound | T16445-4 ug/l | Q | Spike ug/l | MS ug/l | MS % | MSD ug/l | MSD % | RPD | Limits Rec/RPD |
|---|---|---|---|---|---|---|---|---|---|---|
| 67-64-1 | Acetone | 50 U | | 125 | 98.5 | 79 | 107 | 86 | 8 | 39-130/26 |
| 71-43-2 | Benzene | 2.0 U | | 25 | 23.2 | 93 | 23.1 | 92 | 0 | 65-122/15 |
| 75-27-4 | Bromodichloromethane | 2.0 U | | 25 | 22.0 | 88 | 22.2 | 89 | 1 | 64-119/22 |
| 75-25-2 | Bromoform | 2.0 U | | 25 | 21.7 | 87 | 22.1 | 88 | 2 | 50-123/28 |
| 108-90-7 | Chlorobenzene | 2.0 U | | 25 | 23.0 | 92 | 22.8 | 91 | 1 | 72-118/20 |
| 75-00-3 | Chloroethane | 2.0 U | | 25 | 26.1 | 104 | 24.8 | 99 | 5 | 60-136/25 |
| 67-66-3 | Chloroform | 2.0 U | | 25 | 24.0 | 96 | 23.5 | 94 | 2 | 65-120/20 |
| 75-15-0 | Carbon disulfide | 2.0 U | | 25 | 19.5 | 78 | 18.9 | 76 | 3 | 37-140/24 |
| 56-23-5 | Carbon tetrachloride | 2.0 U | | 25 | 25.6 | 102 | 25.4 | 102 | 1 | 64-135/23 |
| 75-34-3 | 1,1-Dichloroethane | 2.0 U | | 25 | 24.3 | 97 | 23.5 | 94 | 3 | 65-126/21 |
| 75-35-4 | 1,1-Dichloroethylene | 2.0 U | | 25 | 23.0 | 92 | 22.0 | 88 | 4 | 55-140/25 |
| 107-06-2 | 1,2-Dichloroethane | 2.0 U | | 25 | 23.0 | 92 | 22.6 | 90 | 2 | 57-125/25 |
| 78-87-5 | 1,2-Dichloropropane | 2.0 U | | 25 | 23.4 | 94 | 23.3 | 93 | 0 | 63-121/22 |
| 124-48-1 | Dibromochloromethane | 2.0 U | | 25 | 21.2 | 85 | 22.2 | 89 | 5 | 60-123/23 |
| 156-59-2 | cis-1,2-Dichloroethylene | 2.0 U | | 25 | 22.3 | 89 | 22.2 | 89 | 0 | 62-120/24 |
| 10061-01-5 | cis-1,3-Dichloropropene | 2.0 U | | 25 | 23.2 | 93 | 23.0 | 92 | 1 | 61-119/23 |
| 156-60-5 | trans-1,2-Dichloroethylene | 2.0 U | | 25 | 23.1 | 92 | 22.1 | 88 | 4 | 64-130/22 |
| 10061-02-6 | trans-1,3-Dichloropropene | 2.0 U | | 25 | 22.6 | 90 | 23.5 | 94 | 4 | 65-129/23 |
| 100-41-4 | Ethylbenzene | 2.0 U | | 25 | 22.8 | 91 | 22.7 | 91 | 0 | 70-123/18 |
| 591-78-6 | 2-Hexanone | 10 U | | 125 | 101 | 81 | 112 | 90 | 10 | 41-137/27 |
| 108-10-1 | 4-Methyl-2-pentanone | 10 U | | 125 | 112 | 90 | 118 | 94 | 5 | 41-133/22 |
| 74-83-9 | Methyl bromide | 2.0 U | | 25 | 23.1 | 92 | 22.6 | 90 | 2 | 47-129/27 |
| 74-87-3 | Methyl chloride | 2.0 U | | 25 | 24.9 | 100 | 23.5 | 94 | 6 | 45-133/24 |
| 75-09-2 | Methylene chloride | 5.0 U | | 25 | 21.8 | 87 | 21.4 | 86 | 2 | 49-128/21 |
| 78-93-3 | Methyl ethyl ketone | 10 U | | 125 | 104 | 83 | 112 | 90 | 7 | 43-125/29 |
| 100-42-5 | Styrene | 2.0 U | | 25 | 19.1 | 76 | 19.1 | 76 | 0 | 65-120/21 |
| 71-55-6 | 1,1,1-Trichloroethane | 2.0 U | | 25 | 25.0 | 100 | 24.2 | 97 | 3 | 68-131/21 |
| 79-34-5 | 1,1,2,2-Tetrachloroethane | 2.0 U | | 25 | 20.8 | 83 | 21.6 | 86 | 4 | 50-128/22 |
| 79-00-5 | 1,1,2-Trichloroethane | 2.0 U | | 25 | 22.0 | 88 | 22.4 | 90 | 2 | 58-120/22 |
| 127-18-4 | Tetrachloroethylene | 2.0 U | | 25 | 25.0 | 100 | 24.9 | 100 | 0 | 69-132/21 |
| 108-88-3 | Toluene | 2.0 U | | 25 | 23.0 | 92 | 23.1 | 92 | 0 | 70-123/18 |
| 79-01-6 | Trichloroethylene | 2.0 | | 25 | 26.3 | 97 | 25.9 | 96 | 2 | 70-120/19 |
| 75-01-4 | Vinyl chloride | 2.0 U | | 25 | 25.9 | 104 | 23.5 | 94 | 10 | 51-147/24 |
| 1330-20-7 | Xylene (total) | 6.0 U | | 75 | 70.3 | 94 | 69.8 | 93 | 1 | 71-122/16 |

# Matrix Spike/Matrix Spike Duplicate Summary



**Job Number:** T16445
**Account:** ITTXHO Shaw E & I, Inc.
**Project:** Longhorn Army Ammunition Plant

| Sample | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|---|---|---|---|---|---|---|---|
| T16445-4MS | F0079227.D | 1 | 03/08/07 | LJ | n/a | n/a | VF2318 |
| T16445-4MSD | F0079228.D | 1 | 03/08/07 | LJ | n/a | n/a | VF2318 |
| T16445-4 | F0079226.D | 1 | 03/08/07 | LJ | n/a | n/a | VF2318 |



**The QC reported here applies to the following samples:** **Method:** SW846 8260B

T16445-3, T16445-4, T16445-6, T16445-7, T16445-8, T16445-9, T16445-10, T16445-12, T16445-13, T16445-14

| CAS No. | Surrogate Recoveries | MS | MSD | T16445-4 | Limits |
|---|---|---|---|---|---|
| 1868-53-7 | Dibromofluoromethane | 106% | 105% | 102% | 73-139% |
| 17060-07-0 | 1,2-Dichloroethane-D4 | 104% | 102% | 98% | 66-139% |
| 2037-26-5 | Toluene-D8 | 103% | 105% | 106% | 77-148% |
| 460-00-4 | 4-Bromofluorobenzene | 99% | 99% | 119% | 84-150% |

# Instrument Performance Check (BFB)



**Job Number:** T16445
**Account:** ITTXHO Shaw E & I, Inc.
**Project:** Longhorn Army Ammunition Plant

| | | | |
|---|---|---|---|
| **Sample:** | VF2305-BFB | **Injection Date:** | 02/28/07 |
| **Lab File ID:** | F0078963.D | **Injection Time:** | 14:36 |
| **Instrument ID:** | GCMSF | | |

| m/e | Ion Abundance Criteria | Raw Abundance | % Relative Abundance | | Pass/Fail |
|---|---|---|---|---|---|
| 50 | 15.0 - 40.0% of mass 95 | 7281 | 16.0 | | Pass |
| 75 | 30.0 - 60.0% of mass 95 | 18364 | 40.3 | | Pass |
| 95 | Base peak, 100% relative abundance | 45541 | 100.0 | | Pass |
| 96 | 5.0 - 9.0% of mass 95 | 2793 | 6.1 | | Pass |
| 173 | Less than 2.0% of mass 174 | 107 | 0.23 | (0.27) [a] | Pass |
| 174 | 50.0 - 100.0% of mass 95 | 39123 | 85.9 | | Pass |
| 175 | 5.0 - 9.0% of mass 174 | 3023 | 6.6 | (7.7) [a] | Pass |
| 176 | 95.0 - 101.0% of mass 174 | 37355 | 82.0 | (95.5) [a] | Pass |
| 177 | 5.0 - 9.0% of mass 176 | 2802 | 6.2 | (7.5) [b] | Pass |

(a) Value is % of mass 174
(b) Value is % of mass 176

**This check applies to the following Samples, MS, MSD, Blanks, and Standards:**

| Lab Sample ID | Lab File ID | Date Analyzed | Time Analyzed | Hours Lapsed | Client Sample ID |
|---|---|---|---|---|---|
| VF2305-IC2305 | F0078964.D | 02/28/07 | 15:10 | 00:34 | Initial cal 2 |
| VF2305-IC2305 | F0078965.D | 02/28/07 | 15:41 | 01:05 | Initial cal 5 |
| VF2305-IC2305 | F0078966.D | 02/28/07 | 16:12 | 01:36 | Initial cal 20 |
| VF2305-ICC2305 | F0078967.D | 02/28/07 | 16:44 | 02:08 | Initial cal 40 |
| VF2305-IC2305 | F0078968.D | 02/28/07 | 17:16 | 02:40 | Initial cal 70 |
| VF2305-IC2305 | F0078969.D | 02/28/07 | 17:46 | 03:10 | Initial cal 100 |
| VF2305-IC2305 | F0078970.D | 02/28/07 | 18:18 | 03:42 | Initial cal 200 |
| VF2305-BS | F0078972.D | 02/28/07 | 19:21 | 04:45 | Blank Spike |
| VF2305-MB | F0078974.D | 02/28/07 | 20:24 | 05:48 | Method Blank |
| ZZZZZZ | F0078975.D | 02/28/07 | 20:55 | 06:19 | (unrelated sample) |
| ZZZZZZ | F0078976.D | 02/28/07 | 21:26 | 06:50 | (unrelated sample) |
| ZZZZZZ | F0078977.D | 02/28/07 | 21:58 | 07:22 | (unrelated sample) |
| T16395-2 | F0078978.D | 02/28/07 | 22:30 | 07:54 | (used for QC only; not part of job T16445) |
| T16395-2MS | F0078979.D | 02/28/07 | 23:00 | 08:24 | Matrix Spike |
| T16395-2MSD | F0078980.D | 02/28/07 | 23:32 | 08:56 | Matrix Spike Duplicate |
| ZZZZZZ | F0078981.D | 03/01/07 | 00:03 | 09:27 | (unrelated sample) |
| ZZZZZZ | F0078982.D | 03/01/07 | 00:35 | 09:59 | (unrelated sample) |
| ZZZZZZ | F0078983.D | 03/01/07 | 01:06 | 10:30 | (unrelated sample) |
| ZZZZZZ | F0078984.D | 03/01/07 | 01:38 | 11:02 | (unrelated sample) |
| ZZZZZZ | F0078989.D | 03/01/07 | 04:15 | 13:39 | (unrelated sample) |
| ZZZZZZ | F0078990.D | 03/01/07 | 04:47 | 14:11 | (unrelated sample) |
| ZZZZZZ | F0078991.D | 03/01/07 | 05:19 | 14:43 | (unrelated sample) |
| ZZZZZZ | F0078992.D | 03/01/07 | 05:50 | 15:14 | (unrelated sample) |

# Instrument Performance Check (BFB)



**Job Number:** T16445
**Account:** ITTXHO Shaw E & I, Inc.
**Project:** Longhorn Army Ammunition Plant

| | | | |
|---|---|---|---|
| **Sample:** | VF2314-BFB | **Injection Date:** | 03/07/07 |
| **Lab File ID:** | F0079161.D | **Injection Time:** | 02:16 |
| **Instrument ID:** | GCMSF | | |

| m/e | Ion Abundance Criteria | Raw Abundance | % Relative Abundance | | Pass/Fail |
|---|---|---|---|---|---|
| 50 | 15.0 - 40.0% of mass 95 | 7377 | 17.5 | | Pass |
| 75 | 30.0 - 60.0% of mass 95 | 17646 | 41.8 | | Pass |
| 95 | Base peak, 100% relative abundance | 42171 | 100.0 | | Pass |
| 96 | 5.0 - 9.0% of mass 95 | 2522 | 6.0 | | Pass |
| 173 | Less than 2.0% of mass 174 | 89 | 0.21 | (0.25) [a] | Pass |
| 174 | 50.0 - 100.0% of mass 95 | 36285 | 86.0 | | Pass |
| 175 | 5.0 - 9.0% of mass 174 | 2662 | 6.3 | (7.3) [a] | Pass |
| 176 | 95.0 - 101.0% of mass 174 | 34632 | 82.1 | (95.4) [a] | Pass |
| 177 | 5.0 - 9.0% of mass 176 | 2164 | 5.1 | (6.2) [b] | Pass |

(a) Value is % of mass 174
(b) Value is % of mass 176

**This check applies to the following Samples, MS, MSD, Blanks, and Standards:**

| Lab Sample ID | Lab File ID | Date Analyzed | Time Analyzed | Hours Lapsed | Client Sample ID |
|---|---|---|---|---|---|
| VF2314-CC2305 | F0079162.D | 03/07/07 | 02:47 | 00:31 | Continuing cal 40 |
| VF2314-BS | F0079163.D | 03/07/07 | 03:18 | 01:02 | Blank Spike |
| VF2314-MB | F0079164.D | 03/07/07 | 03:50 | 01:34 | Method Blank |
| ZZZZZZ | F0079165.D | 03/07/07 | 04:21 | 02:05 | (unrelated sample) |
| ZZZZZZ | F0079166.D | 03/07/07 | 04:53 | 02:37 | (unrelated sample) |
| ZZZZZZ | F0079167.D | 03/07/07 | 05:24 | 03:08 | (unrelated sample) |
| T16445-5 | F0079169.D | 03/07/07 | 06:26 | 04:10 | 50WW05-FEB2007 |
| T16445-5MS | F0079170.D | 03/07/07 | 06:58 | 04:42 | Matrix Spike |
| T16445-5MSD | F0079171.D | 03/07/07 | 07:29 | 05:13 | Matrix Spike Duplicate |
| T16445-2 | F0079173.D | 03/07/07 | 08:32 | 06:16 | 47WW30-FEB2007 |
| ZZZZZZ | F0079174.D | 03/07/07 | 09:03 | 06:47 | (unrelated sample) |
| ZZZZZZ | F0079175.D | 03/07/07 | 09:35 | 07:19 | (unrelated sample) |
| ZZZZZZ | F0079176.D | 03/07/07 | 10:06 | 07:50 | (unrelated sample) |
| ZZZZZZ | F0079177.D | 03/07/07 | 10:37 | 08:21 | (unrelated sample) |
| T16445-1 | F0079178.D | 03/07/07 | 11:10 | 08:54 | 29WW38-FEB2007 |
| T16445-2 | F0079179.D | 03/07/07 | 11:41 | 09:25 | 47WW30-FEB2007 |
| T16445-5 | F0079180.D | 03/07/07 | 12:12 | 09:56 | 50WW05-FEB2007 |

# Instrument Performance Check (BFB)



**Job Number:** T16445
**Account:** ITTXHO Shaw E & I, Inc.
**Project:** Longhorn Army Ammunition Plant

| | | | |
|---|---|---|---|
| **Sample:** | VF2315-BFB | **Injection Date:** | 03/07/07 |
| **Lab File ID:** | F0079181.D | **Injection Time:** | 12:44 |
| **Instrument ID:** | GCMSF | | |

| m/e | Ion Abundance Criteria | Raw Abundance | % Relative Abundance | | Pass/Fail |
|---|---|---|---|---|---|
| 50 | 15.0 - 40.0% of mass 95 | 7668 | 19.2 | | Pass |
| 75 | 30.0 - 60.0% of mass 95 | 16756 | 42.0 | | Pass |
| 95 | Base peak, 100% relative abundance | 39853 | 100.0 | | Pass |
| 96 | 5.0 - 9.0% of mass 95 | 2768 | 6.9 | | Pass |
| 173 | Less than 2.0% of mass 174 | 96 | 0.24 | (0.28) [a] | Pass |
| 174 | 50.0 - 100.0% of mass 95 | 34109 | 85.6 | | Pass |
| 175 | 5.0 - 9.0% of mass 174 | 2473 | 6.2 | (7.3) [a] | Pass |
| 176 | 95.0 - 101.0% of mass 174 | 33421 | 83.9 | (98.0) [a] | Pass |
| 177 | 5.0 - 9.0% of mass 176 | 2339 | 5.9 | (7.0) [b] | Pass |

(a) Value is % of mass 174
(b) Value is % of mass 176

**This check applies to the following Samples, MS, MSD, Blanks, and Standards:**

| Lab Sample ID | Lab File ID | Date Analyzed | Time Analyzed | Hours Lapsed | Client Sample ID |
|---|---|---|---|---|---|
| VF2315-CC2305 | F0079182.D | 03/07/07 | 13:19 | 00:35 | Continuing cal 40 |
| VF2315-BS | F0079183.D | 03/07/07 | 13:54 | 01:10 | Blank Spike |
| VF2315-MB | F0079184.D | 03/07/07 | 14:26 | 01:42 | Method Blank |
| T16445-15 | F0079185.D | 03/07/07 | 14:58 | 02:14 | TRIP BLANK |
| ZZZZZZ | F0079186.D | 03/07/07 | 15:28 | 02:44 | (unrelated sample) |
| ZZZZZZ | F0079187.D | 03/07/07 | 15:59 | 03:15 | (unrelated sample) |
| ZZZZZZ | F0079188.D | 03/07/07 | 16:30 | 03:46 | (unrelated sample) |
| ZZZZZZ | F0079189.D | 03/07/07 | 17:01 | 04:17 | (unrelated sample) |
| T16445-3 | F0079190.D | 03/07/07 | 17:32 | 04:48 | LHSMW43-FEB2007 |
| T16445-3MS | F0079191.D | 03/07/07 | 18:04 | 05:20 | Matrix Spike |
| T16445-3MSD | F0079192.D | 03/07/07 | 18:35 | 05:51 | Matrix Spike Duplicate |
| T16445-6 | F0079194.D | 03/07/07 | 19:38 | 06:54 | 50WW02-FEB2007 |
| T16445-8 | F0079196.D | 03/07/07 | 20:41 | 07:57 | 17WW02-FEB2007 |
| T16445-9 | F0079197.D | 03/07/07 | 21:12 | 08:28 | 17WW02-FEB2007 FD |
| T16445-10 | F0079198.D | 03/07/07 | 21:44 | 09:00 | 29WW35-FEB2007 |
| T16445-11 | F0079199.D | 03/07/07 | 22:15 | 09:31 | 29WW35-FEB2007 FD |
| T16445-14 | F0079202.D | 03/07/07 | 23:49 | 11:05 | 7WW06-FEB2007 |
| T16445-18 | F0079203.D | 03/08/07 | 00:20 | 11:36 | 17WW130-FEB2007 |

# Instrument Performance Check (BFB)



**Job Number:** T16445
**Account:** ITTXHO Shaw E & I, Inc.
**Project:** Longhorn Army Ammunition Plant

| | | | |
|---|---|---|---|
| **Sample:** | VF2318-BFB | **Injection Date:** | 03/08/07 |
| **Lab File ID:** | F0079222.D | **Injection Time:** | 10:25 |
| **Instrument ID:** | GCMSF | | |



| m/e | Ion Abundance Criteria | Raw Abundance | % Relative Abundance | | Pass/Fail |
|---|---|---|---|---|---|
| 50 | 15.0 - 40.0% of mass 95 | 6198 | 16.4 | | Pass |
| 75 | 30.0 - 60.0% of mass 95 | 15579 | 41.3 | | Pass |
| 95 | Base peak, 100% relative abundance | 37709 | 100.0 | | Pass |
| 96 | 5.0 - 9.0% of mass 95 | 2320 | 6.2 | | Pass |
| 173 | Less than 2.0% of mass 174 | 83 | 0.22 | (0.26) [a] | Pass |
| 174 | 50.0 - 100.0% of mass 95 | 32211 | 85.4 | | Pass |
| 175 | 5.0 - 9.0% of mass 174 | 2369 | 6.3 | (7.4) [a] | Pass |
| 176 | 95.0 - 101.0% of mass 174 | 31824 | 84.4 | (98.8) [a] | Pass |
| 177 | 5.0 - 9.0% of mass 176 | 2216 | 5.9 | (7.0) [b] | Pass |

(a) Value is % of mass 174
(b) Value is % of mass 176

**This check applies to the following Samples, MS, MSD, Blanks, and Standards:**

| Lab Sample ID | Lab File ID | Date Analyzed | Time Analyzed | Hours Lapsed | Client Sample ID |
|---|---|---|---|---|---|
| VF2318-CC2305 | F0079223.D | 03/08/07 | 10:59 | 00:34 | Continuing cal 40 |
| VF2318-BS | F0079224.D | 03/08/07 | 11:33 | 01:08 | Blank Spike |
| VF2318-MB | F0079225.D | 03/08/07 | 12:05 | 01:40 | Method Blank |
| T16445-4 | F0079226.D | 03/08/07 | 12:37 | 02:12 | 50WW06-FEB2007 |
| T16445-4MS | F0079227.D | 03/08/07 | 13:09 | 02:44 | Matrix Spike |
| T16445-4MSD | F0079228.D | 03/08/07 | 14:05 | 03:40 | Matrix Spike Duplicate |
| T16445-7 | F0079229.D | 03/08/07 | 14:36 | 04:11 | 17WW16-FEB2007 |
| T16445-12 | F0079230.D | 03/08/07 | 15:08 | 04:43 | 29WW06-FEB2007 |
| T16445-13 | F0079231.D | 03/08/07 | 15:39 | 05:14 | 17WW05-FEB2007 |
| T16445-3 | F0079232.D | 03/08/07 | 16:11 | 05:46 | LHSMW43-FEB2007 |
| T16445-3 | F0079233.D | 03/08/07 | 16:42 | 06:17 | LHSMW43-FEB2007 |
| T16445-6 | F0079234.D | 03/08/07 | 17:14 | 06:49 | 50WW02-FEB2007 |
| T16445-8 | F0079235.D | 03/08/07 | 17:45 | 07:20 | 17WW02-FEB2007 |
| T16445-9 | F0079236.D | 03/08/07 | 18:17 | 07:52 | 17WW02-FEB2007 FD |
| T16445-10 | F0079237.D | 03/08/07 | 18:49 | 08:24 | 29WW35-FEB2007 |
| T16445-14 | F0079238.D | 03/08/07 | 19:21 | 08:56 | 7WW06-FEB2007 |
| ZZZZZZ | F0079239.D | 03/08/07 | 19:53 | 09:28 | (unrelated sample) |
| ZZZZZZ | F0079240.D | 03/08/07 | 20:24 | 09:59 | (unrelated sample) |
| ZZZZZZ | F0079241.D | 03/08/07 | 20:56 | 10:31 | (unrelated sample) |
| ZZZZZZ | F0079242.D | 03/08/07 | 21:28 | 11:03 | (unrelated sample) |
| ZZZZZZ | F0079243.D | 03/08/07 | 22:00 | 11:35 | (unrelated sample) |

# Volatile Internal Standard Area Summary



**Job Number:** T16445
**Account:** ITTXHO Shaw E & I, Inc.
**Project:** Longhorn Army Ammunition Plant

| | | | |
|---|---|---|---|
| **Check Std:** | VF2314-CC2305 | **Injection Date:** | 03/07/07 |
| **Lab File ID:** | F0079162.D | **Injection Time:** | 02:47 |
| **Instrument ID:** | GCMSF | **Method:** | SW846 8260B |

| | IS 1 AREA | RT | IS 2 AREA | RT | IS 3 AREA | RT |
|---|---|---|---|---|---|---|
| Check Std | 671218 | 11.87 | 539776 | 15.94 | 225030 | 19.21 |
| Upper Limit [a] | 1342436 | 12.37 | 1079552 | 16.44 | 450060 | 19.71 |
| Lower Limit [b] | 335609 | 11.37 | 269888 | 15.44 | 112515 | 18.71 |

| Lab Sample ID | IS 1 AREA | RT | IS 2 AREA | RT | IS 3 AREA | RT |
|---|---|---|---|---|---|---|
| VF2314-BS | 763258 | 11.87 | 585053 | 15.95 | 230789 | 19.20 |
| VF2314-MB | 761236 | 11.87 | 554989 | 15.95 | 171804 | 19.22 |
| ZZZZZZ | 715869 | 11.87 | 528018 | 15.95 | 164528 | 19.21 |
| ZZZZZZ | 713777 | 11.87 | 527108 | 15.95 | 157669 | 19.22 |
| ZZZZZZ | 714014 | 11.87 | 515957 | 15.94 | 155677 | 19.21 |
| T16445-5 | 696275 | 11.87 | 518491 | 15.94 | 157926 | 19.21 |
| T16445-5MS | 690323 | 11.87 | 531735 | 15.95 | 212449 | 19.21 |
| T16445-5MSD | 718441 | 11.88 | 554101 | 15.95 | 216829 | 19.21 |
| T16445-2 | 673074 | 11.86 | 503844 | 15.94 | 144956 | 19.20 |
| ZZZZZZ | 676854 | 11.85 | 489839 | 15.93 | 140401 | 19.20 |
| ZZZZZZ | 668299 | 11.86 | 481794 | 15.94 | 136958 | 19.20 |
| ZZZZZZ | 668450 | 11.86 | 482234 | 15.94 | 127852 | 19.20 |
| ZZZZZZ | 650403 | 11.86 | 471126 | 15.94 | 137112 | 19.20 |
| T16445-1 | 665672 | 11.86 | 484146 | 15.93 | 130143 | 19.20 |
| T16445-2 | 676833 | 11.87 | 486651 | 15.94 | 127880 | 19.21 |
| T16445-5 | 675974 | 11.87 | 487525 | 15.95 | 126817 | 19.21 |

**IS 1** = Fluorobenzene
**IS 2** = Chlorobenzene-D5
**IS 3** = 1,4-Dichlorobenzene-d4

(a) Upper Limit = + 100% of check standard area; Retention time + 0.5 minutes.
(b) Lower Limit = -50% of check standard area; Retention time -0.5 minutes.

# Volatile Internal Standard Area Summary



**Job Number:** T16445
**Account:** ITTXHO Shaw E & I, Inc.
**Project:** Longhorn Army Ammunition Plant

| | | | |
|---|---|---|---|
| **Check Std:** | VF2315-CC2305 | **Injection Date:** | 03/07/07 |
| **Lab File ID:** | F0079182.D | **Injection Time:** | 13:19 |
| **Instrument ID:** | GCMSF | **Method:** | SW846 8260B |

| | IS 1 AREA | RT | IS 2 AREA | RT | IS 3 AREA | RT |
|---|---|---|---|---|---|---|
| Check Std | 698014 | 11.87 | 549946 | 15.95 | 231402 | 19.21 |
| Upper Limit [a] | 1396028 | 12.37 | 1099892 | 16.45 | 462804 | 19.71 |
| Lower Limit [b] | 349007 | 11.37 | 274973 | 15.45 | 115701 | 18.71 |

| Lab Sample ID | IS 1 AREA | RT | IS 2 AREA | RT | IS 3 AREA | RT |
|---|---|---|---|---|---|---|
| VF2315-BS | 751267 | 11.87 | 582464 | 15.95 | 220558 | 19.22 |
| VF2315-MB | 739731 | 11.88 | 521309 | 15.96 | 135288 | 19.23 |
| T16445-15 | 709635 | 11.88 | 498169 | 15.96 | 130636 | 19.23 |
| ZZZZZZ | 713511 | 11.89 | 505249 | 15.96 | 133789 | 19.22 |
| ZZZZZZ | 670598 | 11.89 | 482656 | 15.97 | 127882 | 19.23 |
| ZZZZZZ | 692002 | 11.89 | 498481 | 15.96 | 134149 | 19.23 |
| ZZZZZZ | 694603 | 11.89 | 509623 | 15.97 | 139087 | 19.23 |
| T16445-3 [c] | 692901 | 11.89 | 523917 | 15.96 | 140544 | 19.22 |
| T16445-3MS | 703380 | 11.89 | 542581 | 15.97 | 203275 | 19.23 |
| T16445-3MSD | 721789 | 11.88 | 551007 | 15.96 | 199926 | 19.23 |
| T16445-6 | 701179 | 11.88 | 509297 | 15.96 | 124874 | 19.22 |
| T16445-8 | 672132 | 11.88 | 483654 | 15.95 | 147428 | 19.22 |
| T16445-9 | 655210 | 11.87 | 474247 | 15.95 | 142235 | 19.21 |
| T16445-10 | 658250 | 11.88 | 479882 | 15.95 | 141112 | 19.22 |
| T16445-11 | 645297 | 11.88 | 465709 | 15.95 | 134763 | 19.22 |
| T16445-14 | 633357 | 11.87 | 461754 | 15.95 | 129759 | 19.21 |
| T16445-18 | 630021 | 11.88 | 455820 | 15.95 | 129210 | 19.21 |

**IS 1** = Fluorobenzene
**IS 2** = Chlorobenzene-D5
**IS 3** = 1,4-Dichlorobenzene-d4

(a) Upper Limit = + 100% of check standard area; Retention time + 0.5 minutes.
(b) Lower Limit = -50% of check standard area; Retention time -0.5 minutes.
(c) For QC only.

# Volatile Internal Standard Area Summary



**Job Number:** T16445
**Account:** ITTXHO Shaw E & I, Inc.
**Project:** Longhorn Army Ammunition Plant

| | | | |
|---|---|---|---|
| **Check Std:** | VF2318-CC2305 | **Injection Date:** | 03/08/07 |
| **Lab File ID:** | F0079223.D | **Injection Time:** | 10:59 |
| **Instrument ID:** | GCMSF | **Method:** | SW846 8260B |




| | IS 1 AREA | RT | IS 2 AREA | RT | IS 3 AREA | RT |
|---|---|---|---|---|---|---|
| Check Std | 698975 | 11.87 | 551152 | 15.94 | 223338 | 19.21 |
| Upper Limit [a] | 1397950 | 12.37 | 1102304 | 16.44 | 446676 | 19.71 |
| Lower Limit [b] | 349488 | 11.37 | 275576 | 15.44 | 111669 | 18.71 |

| Lab Sample ID | IS 1 AREA | RT | IS 2 AREA | RT | IS 3 AREA | RT |
|---|---|---|---|---|---|---|
| VF2318-BS | 746410 | 11.87 | 580582 | 15.94 | 210100 | 19.21 |
| VF2318-MB | 745444 | 11.88 | 531800 | 15.96 | 140552 | 19.22 |
| T16445-4 | 739935 | 11.88 | 531107 | 15.96 | 143733 | 19.22 |
| T16445-4MS | 707673 | 11.88 | 540763 | 15.95 | 204404 | 19.22 |
| T16445-4MSD | 763469 | 11.88 | 578582 | 15.95 | 218177 | 19.22 |
| T16445-7 | 721619 | 11.89 | 534862 | 15.97 | 175880 | 19.23 |
| T16445-12 | 648782 | 11.89 | 490210 | 15.97 | 162557 | 19.23 |
| T16445-13 | 701074 | 11.89 | 520078 | 15.96 | 161875 | 19.23 |
| T16445-3 | 671762 | 11.90 | 510964 | 15.97 | 157114 | 19.24 |
| T16445-3 | 661266 | 11.89 | 484654 | 15.96 | 144861 | 19.24 |
| T16445-6 | 650121 | 11.89 | 473895 | 15.97 | 134032 | 19.23 |
| T16445-8 | 642529 | 11.89 | 461686 | 15.97 | 128039 | 19.23 |
| T16445-9 | 627515 | 11.89 | 448085 | 15.96 | 125224 | 19.23 |
| T16445-10 | 623811 | 11.88 | 456759 | 15.96 | 122979 | 19.22 |
| T16445-14 | 620723 | 11.89 | 447599 | 15.96 | 114685 | 19.22 |
| ZZZZZZ | 612552 | 11.89 | 445736 | 15.96 | 121452 | 19.23 |
| ZZZZZZ | 570298 | 11.88 | 412673 | 15.95 | 110551* | 19.22 |
| ZZZZZZ | 579619 | 11.87 | 421291 | 15.95 | 109077* | 19.22 |
| ZZZZZZ | 599201 | 11.87 | 424322 | 15.95 | 107464* | 19.21 |
| ZZZZZZ | 591981 | 11.87 | 425080 | 15.95 | 108784* | 19.21 |

**IS 1** = Fluorobenzene
**IS 2** = Chlorobenzene-D5
**IS 3** = 1,4-Dichlorobenzene-d4

(a) Upper Limit = + 100% of check standard area; Retention time + 0.5 minutes.
(b) Lower Limit = -50% of check standard area; Retention time -0.5 minutes.

# Volatile Surrogate Recovery Summary



**Job Number:** T16445
**Account:** ITTXHO Shaw E & I, Inc.
**Project:** Longhorn Army Ammunition Plant

**Method:** SW846 8260B **Matrix:** AQ

**Samples and QC shown here apply to the above method**

| Lab Sample ID | Lab File ID | S1 | S2 | S3 | S4 |
|---|---|---|---|---|---|
| T16445-1 | F0079178.D | 109.0 | 103.0 | 109.0 | 129.0 |
| T16445-2 | F0079179.D | 104.0 | 101.0 | 107.0 | 128.0 |
| T16445-2 | F0079173.D | 107.0 | 104.0 | 106.0 | 118.0 |
| T16445-3 | F0079232.D | 107.0 | 102.0 | 100.0 | 112.0 |
| T16445-3 | F0079233.D | 102.0 | 94.0 | 104.0 | 111.0 |
| T16445-3 | F0079190.D | 106.0 | 106.0 | 102.0 | 123.0 |
| T16445-4 | F0079226.D | 102.0 | 98.0 | 106.0 | 119.0 |
| T16445-5 | F0079180.D | 105.0 | 104.0 | 108.0 | 129.0 |
| T16445-5 | F0079169.D | 107.0 | 105.0 | 105.0 | 114.0 |
| T16445-6 | F0079234.D | 103.0 | 98.0 | 105.0 | 115.0 |
| T16445-6 | F0079194.D | 108.0 | 109.0 | 109.0 | 133.0 |
| T16445-7 | F0079229.D | 104.0 | 94.0 | 104.0 | 106.0 |
| T16445-8 | F0079235.D | 105.0 | 103.0 | 107.0 | 118.0 |
| T16445-8 | F0079196.D | 102.0 | 100.0 | 106.0 | 113.0 |
| T16445-9 | F0079236.D | 105.0 | 101.0 | 107.0 | 117.0 |
| T16445-9 | F0079197.D | 107.0 | 104.0 | 109.0 | 117.0 |
| T16445-10 | F0079237.D | 104.0 | 100.0 | 104.0 | 115.0 |
| T16445-10 | F0079198.D | 109.0 | 107.0 | 108.0 | 116.0 |
| T16445-11 | F0079199.D | 105.0 | 99.0 | 108.0 | 118.0 |
| T16445-12 | F0079230.D | 105.0 | 98.0 | 104.0 | 105.0 |
| T16445-13 | F0079231.D | 105.0 | 100.0 | 103.0 | 109.0 |
| T16445-14 | F0079238.D | 104.0 | 97.0 | 105.0 | 123.0 |
| T16445-14 | F0079202.D | 105.0 | 105.0 | 106.0 | 117.0 |
| T16445-15 | F0079185.D | 106.0 | 102.0 | 112.0 | 131.0 |
| T16445-18 | F0079203.D | 105.0 | 102.0 | 106.0 | 116.0 |
| T16445-3MS | F0079191.D | 106.0 | 106.0 | 101.0 | 99.0 |
| T16445-3MSD | F0079192.D | 107.0 | 107.0 | 104.0 | 103.0 |
| T16445-4MS | F0079227.D | 106.0 | 104.0 | 103.0 | 99.0 |
| T16445-4MSD | F0079228.D | 105.0 | 102.0 | 105.0 | 99.0 |
| T16445-5MS | F0079170.D | 110.0 | 109.0 | 107.0 | 102.0 |
| T16445-5MSD | F0079171.D | 112.0 | 108.0 | 107.0 | 103.0 |
| VF2314-BS | F0079163.D | 105.0 | 102.0 | 103.0 | 98.0 |
| VF2314-MB | F0079164.D | 104.0 | 100.0 | 106.0 | 113.0 |
| VF2315-BS | F0079183.D | 104.0 | 101.0 | 102.0 | 99.0 |
| VF2315-MB | F0079184.D | 103.0 | 98.0 | 109.0 | 129.0 |
| VF2318-BS | F0079224.D | 106.0 | 97.0 | 103.0 | 101.0 |
| VF2318-MB | F0079225.D | 103.0 | 97.0 | 108.0 | 121.0 |

# Volatile Surrogate Recovery Summary



**Job Number:** T16445
**Account:** ITTXHO Shaw E & I, Inc.
**Project:** Longhorn Army Ammunition Plant

**Method:** SW846 8260B **Matrix:** AQ

**Samples and QC shown here apply to the above method**

| Surrogate Compounds | Recovery Limits |
|---|---|

| Surrogate Compounds | | Recovery Limits |
|---|---|---|
| **S1** = | Dibromofluoromethane | 73-139% |
| **S2** = | 1,2-Dichloroethane-D4 | 66-139% |
| **S3** = | Toluene-D8 | 77-148% |
| **S4** = | 4-Bromofluorobenzene | 84-150% |

# Initial Calibration Summary



**Job Number:** T16445
**Account:** ITTXHO Shaw E & I, Inc.
**Project:** Longhorn Army Ammunition Plant
**Sample:** VF2305-ICC2305
**Lab FileID:** F0078967.D

Response Factor Report GC/MS F

Method : C:\HPCHEM\1\METHODS\VF2305C.M (RTE Integrator)
Title : SW846 8260B and EPA 624
Last Update : Thu Mar 01 07:31:12 2007
Response via : Initial Calibration

Calibration Files
1 =F0078964.D 2 =F0078965.D 3 =F0078966.D
4 =F0078967.D 5 =F0078968.D 6 =F0078969.D 7 =F0078970.D

| | Compound | 1 | 2 | 3 | 4 | 5 | 6 | 7 | Avg | %RSD |
|---|---|---|---|---|---|---|---|---|---|---|
| 1) I | Fluorobenzene | ---------------- | ISTD | -------------------- | | | | | | |
| 2) | Dichlorodifluorom | 0.157 | 0.162 | 0.153 | 0.171 | 0.181 | 0.178 | 0.196 | 0.171 | 8.89 |
| 3)P | Chloromethane | 0.353 | 0.368 | 0.326 | 0.309 | 0.319 | 0.297 | 0.331 | 0.329 | 7.50 |
| 4)C | Vinyl Chloride | 0.279 | 0.316 | 0.268 | 0.280 | 0.287 | 0.269 | 0.300 | 0.286 | 6.01 |
| 5) | Bromomethane | 0.275 | 0.253 | 0.223 | 0.215 | 0.216 | 0.204 | 0.190 | 0.225 | 12.95 |
| 6) | Chloroethane | 0.203 | 0.232 | 0.219 | 0.222 | 0.222 | 0.210 | 0.211 | 0.217 | 4.37 |
| 7) | Trichlorofluorome | 0.137 | 0.154 | 0.142 | 0.159 | 0.166 | 0.162 | 0.164 | 0.155 | 7.23 |
| 8) | Acrolein | 0.030 | 0.030 | 0.031 | 0.036 | 0.036 | 0.033 | 0.033 | 0.033 | 8.00 |
| 9)C | 1,1-Dichloroethen | 0.287 | 0.299 | 0.298 | 0.320 | 0.322 | 0.306 | 0.312 | 0.306 | 4.04 |
| 10) | Freon 113 | 0.174 | 0.190 | 0.191 | 0.225 | 0.225 | 0.213 | 0.216 | 0.205 | 9.65 |
| 11) | Acetone | 0.065 | 0.062 | 0.057 | 0.052 | 0.053 | 0.053 | 0.052 | 0.056 | 9.61 |
| 12) | Iodomethane | 0.405 | 0.432 | 0.438 | 0.436 | 0.447 | 0.434 | 0.445 | 0.434 | 3.22 |
| 13) | Methyl acetate | 0.199 | 0.203 | 0.197 | 0.179 | 0.188 | 0.186 | 0.185 | 0.191 | 4.56 |
| 14) | Carbon Disulfide | 0.833 | 0.878 | 0.869 | 0.908 | 0.930 | 0.885 | 0.918 | 0.889 | 3.74 |
| 15) | Methylene Chlorid | 0.410 | 0.424 | 0.407 | 0.404 | 0.396 | 0.378 | 0.376 | 0.399 | 4.34 |
| 16) | Tert Butyl Alcoho | 0.015 | 0.018 | 0.018 | 0.015 | 0.017 | 0.018 | 0.018 | 0.017 | 8.14 |
| 17) | trans-1,2-Dichlor | 0.328 | 0.340 | 0.340 | 0.344 | 0.351 | 0.337 | 0.344 | 0.341 | 2.11 |
| 18) | Acrylonitrile | 0.086 | 0.099 | 0.097 | 0.091 | 0.097 | 0.098 | 0.097 | 0.095 | 4.82 |
| 19) | Methyl Tert Butyl | 0.577 | 0.603 | 0.572 | 0.555 | 0.578 | 0.587 | 0.594 | 0.581 | 2.70 |
| 20) | Hexane | 0.300 | 0.281 | 0.283 | 0.341 | 0.346 | 0.320 | 0.315 | 0.312 | 8.32 |
| 21)P | 1,1-Dichloroethan | 0.428 | 0.457 | 0.436 | 0.445 | 0.450 | 0.430 | 0.435 | 0.440 | 2.44 |
| 22) | Vinyl acetate | 0.513 | 0.554 | 0.582 | 0.564 | 0.569 | 0.552 | 0.517 | 0.550 | 4.74 |
| 23) | Di-isopropyl ethe | 0.944 | 1.012 | 0.992 | 0.981 | 0.988 | 0.943 | 0.934 | 0.971 | 3.09 |
| 24) | Ethyl tert-butyl | 0.721 | 0.735 | 0.733 | 0.737 | 0.753 | 0.739 | 0.749 | 0.738 | 1.43 |
| 25) | 2,2-Dichloropropa | 0.208 | 0.200 | 0.197 | 0.210 | 0.209 | 0.202 | 0.195 | 0.203 | 2.91 |
| 26) | cis-1,2-Dichloroe | 0.282 | 0.305 | 0.302 | 0.308 | 0.307 | 0.302 | 0.307 | 0.302 | 3.03 |
| 27) | 2-Butanone | 0.113 | 0.118 | 0.120 | 0.105 | 0.111 | 0.112 | 0.109 | 0.113 | 4.48 |
| 28) | Bromochloromethan | 0.124 | 0.142 | 0.145 | 0.146 | 0.147 | 0.149 | 0.150 | 0.143 | 6.13 |
| 29)C | Chloroform | 0.343 | 0.363 | 0.358 | 0.362 | 0.364 | 0.353 | 0.362 | 0.358 | 2.09 |
| 30) | Tetrahydrofuran | 0.048 | 0.035 | 0.033 | 0.030 | 0.031 | 0.031 | 0.029 | 0.034 | 19.44 |

----- Linear regression ----- Coefficient = 0.9988
Response Ratio = 0.00148 + 0.02898 *A

| | Compound | 1 | 2 | 3 | 4 | 5 | 6 | 7 | Avg | %RSD |
|---|---|---|---|---|---|---|---|---|---|---|
| 31) | 1,1,1-Trichloroet | 0.196 | 0.201 | 0.204 | 0.213 | 0.218 | 0.210 | 0.215 | 0.208 | 3.79 |
| 32)S | Dibromofluorometh | 0.211 | 0.221 | 0.210 | 0.217 | 0.221 | 0.221 | 0.226 | 0.218 | 2.61 |
| 33) | Cyclohexane | 0.390 | 0.405 | 0.413 | 0.479 | 0.485 | 0.453 | 0.447 | 0.439 | 8.43 |
| 34) | 1,1-Dichloroprope | 0.283 | 0.279 | 0.292 | 0.313 | 0.321 | 0.312 | 0.316 | 0.302 | 5.61 |
| 35) | Carbon Tetrachlor | 0.142 | 0.161 | 0.164 | 0.176 | 0.181 | 0.177 | 0.183 | 0.169 | 8.57 |
| 36)S | 1,2-Dichloroethan | 0.159 | 0.173 | 0.166 | 0.161 | 0.165 | 0.162 | 0.166 | 0.165 | 2.76 |
| 37) | Benzene | 1.089 | 1.108 | 1.092 | 1.113 | 1.134 | 1.098 | 1.119 | 1.108 | 1.43 |
| 38) | 1,2-Dichloroethan | 0.181 | 0.193 | 0.200 | 0.205 | 0.200 | 0.204 | 0.201 | 0.198 | 4.13 |
| 39) | tert-amyl methyl | 0.712 | 0.774 | 0.759 | 0.736 | 0.767 | 0.769 | 0.782 | 0.757 | 3.26 |
| 40) | Trichloroethene | 0.212 | 0.223 | 0.218 | 0.229 | 0.233 | 0.229 | 0.236 | 0.226 | 3.78 |
| 41) | Methylcyclohexane | 0.318 | 0.332 | 0.335 | 0.391 | 0.401 | 0.384 | 0.388 | 0.364 | 9.38 |
| 42)C | 1,2-Dichloropropa | 0.320 | 0.304 | 0.310 | 0.316 | 0.320 | 0.310 | 0.318 | 0.314 | 1.90 |
| 43) | Dibromomethane | 0.129 | 0.147 | 0.169 | 0.160 | 0.166 | 0.165 | 0.170 | 0.158 | 9.61 |

# Initial Calibration Summary



**Job Number:** T16445 **Sample:** VF2305-ICC2305
**Account:** ITTXHO Shaw E & I, Inc. **Lab FileID:** F0078967.D
**Project:** Longhorn Army Ammunition Plant

```
 44)  1,4-Dioxane       0.002 0.002 0.002 0.002 0.003 0.003 0.003 0.002  17.15
            ----- Linear regression -----  Coefficient =  0.9989
              Response Ratio = -0.00341 + 0.00271 *A

 45)  Bromodichlorometh 0.287 0.300 0.298 0.307 0.311 0.306 0.317 0.304   3.19
 46)  2-Nitropropane    0.046 0.042 0.041 0.037 0.038 0.039 0.038 0.040   7.95
 47)  2-Chloroethyl vin 0.094 0.104 0.122 0.125 0.136 0.143 0.152 0.125  16.72
            ----- Linear regression -----  Coefficient =  0.9983
              Response Ratio = -0.06248 + 0.15260 *A

 48)  4-Methyl-2-pentan 0.229 0.239 0.249 0.234 0.246 0.246 0.237 0.240   3.06
 49)  cis-1,3-Dichlorop 0.369 0.397 0.420 0.427 0.443 0.439 0.454 0.421   6.95

 50) I   Chlorobenzene-d5      ----------------ISTD---------------------
 51)S Toluene-d8        1.147 1.122 1.060 1.073 1.083 1.079 1.120 1.098   2.89
 52)C Toluene           1.382 1.408 1.358 1.387 1.384 1.367 1.417 1.386   1.51
 53)  trans-1,3-Dichlor 0.340 0.364 0.391 0.402 0.406 0.409 0.428 0.391   7.65
 54)  1,1,2-Trichloroet 0.263 0.295 0.289 0.279 0.283 0.284 0.289 0.283   3.62
 55)  Tetrachloroethene 0.272 0.280 0.293 0.302 0.309 0.299 0.307 0.294   4.70
 56)  2-hexanone        0.170 0.180 0.203 0.194 0.206 0.211 0.208 0.196   8.04
 57)  1,3-Dichloropropa 0.605 0.605 0.602 0.593 0.592 0.591 0.602 0.599   1.05
 58)  Dibromochlorometh 0.254 0.312 0.303 0.296 0.299 0.304 0.315 0.298   6.92
 59)  1,2-Dibromoethane 0.283 0.310 0.305 0.302 0.314 0.320 0.331 0.309   4.87
 60)  1-Chlorohexane    0.464 0.467 0.465 0.505 0.517 0.509 0.535 0.495   5.83
 61)P Chlorobenzene     0.877 0.857 0.851 0.870 0.877 0.867 0.897 0.871   1.73
 62)  1,1,1,2-Tetrachlo 0.264 0.284 0.283 0.282 0.281 0.279 0.288 0.280   2.74
 63)C Ethylbenzene      1.475 1.458 1.433 1.493 1.499 1.470 1.518 1.478   1.90
 64)  m,p-Xylene        0.970 0.990 1.008 1.040 1.057 1.039 1.067 1.025   3.51
 65)  o-Xylene          1.021 1.033 1.058 1.084 1.107 1.077 1.111 1.070   3.23
 66)  Styrene           0.796 0.855 0.910 0.960 0.983 0.978 1.013 0.928   8.44
 67)P Bromoform         0.142 0.077 0.184 0.179 0.195 0.199 0.205 0.169  26.85
            ----- Linear regression -----  Coefficient =  0.9995
              Response Ratio = -0.01246 + 0.20679 *A


 68) I   1,4-Dichlorobenzene-d ----------------ISTD---------------------
 69)  Isopropylbenzene  3.394 3.422 2.803 2.838 2.780 2.731 2.618 2.941  11.11
 70)  Cyclohexanone     0.023 0.030 0.027 0.025 0.026 0.029 0.027 0.027   8.23
 71)S 4-Bromofluorobenz 1.169 1.004 0.864 0.853 0.853 0.860 0.845 0.921  13.32
 72)  Bromobenzene      0.997 0.963 0.842 0.837 0.823 0.822 0.788 0.867   9.15
 73)P 1,1,2,2-Tetrachlo 1.339 1.320 1.146 1.011 1.011 1.030 0.983 1.120  13.59
 74)  Trans-1,4-Dichlor 0.143 0.182 0.177 0.182 0.188 0.192 0.192 0.179   9.42
 75)  1,2,3-Trichloropr 0.257 0.296 0.253 0.232 0.230 0.236 0.225 0.247  10.10
 76)  n-Propylbenzene   4.567 4.426 4.010 4.105 4.023 3.954 3.865 4.136   6.29
 77)  2-Chlorotoluene   3.164 2.888 2.531 2.500 2.416 2.351 2.285 2.591  12.31
 78)  4-Chlorotoluene   2.569 2.376 2.183 2.187 2.133 2.116 2.076 2.234   7.90
 79)  1,3,5-Trimethylbe 2.668 2.535 2.320 2.351 2.287 2.250 2.168 2.368   7.33
 80)  sec-Butylbenzene  3.329 3.252 3.038 3.232 3.150 3.042 2.937 3.140   4.47
 81)  1,3-Dichlorobenze 1.316 1.426 1.364 1.413 1.441 1.419 1.422 1.400   3.16
 82)  4-Isopropyltoluen 2.408 2.304 2.224 2.403 2.346 2.277 2.220 2.312   3.37
 83)  1,4-Dichlorobenze 1.528 1.430 1.389 1.429 1.420 1.423 1.424 1.435   3.04
 84)  tert-Butylbenzene 0.533 0.438 0.430 0.445 0.436 0.429 0.410 0.446   8.90
 85)  n-Butylbenzene    1.465 1.572 1.892 2.173 2.149 2.132 2.214 1.942  15.91
            ----- Linear regression -----  Coefficient =  0.9997
              Response Ratio = -0.08322 + 2.22219 *A

 86)  1,2-Dichlorobenze 1.206 1.332 1.314 1.336 1.345 1.359 1.369 1.323   4.14
 87)  1,2,4-Trimethylbe 2.566 2.449 2.311 2.410 2.354 2.310 2.242 2.377   4.53
 88)  1,2-Dibromo-3-Chl 0.068 0.106 0.082 0.072 0.077 0.089 0.088 0.083  15.22
            ----- Linear regression -----  Coefficient =  0.9968
```

# Initial Calibration Summary



**Job Number:** T16445 **Sample:** VF2305-ICC2305
**Account:** ITTXHO Shaw E & I, Inc. **Lab FileID:** F0078967.D
**Project:** Longhorn Army Ammunition Plant

```
                 Response Ratio = -0.00467 + 0.08863 *A

 89)  1,2,4-Trichlorobe 0.166 0.135 0.302 0.403 0.468 0.530 0.585 0.370  47.33
               ----- Linear regression -----  Coefficient =  0.9944
                 Response Ratio = -0.09820 + 0.59565 *A

 90)  Hexachlorobutadie 0.058 0.088 0.170 0.207 0.204 0.208 0.202 0.162  38.83
               ----- Linear regression -----  Coefficient =  0.9993
                 Response Ratio = -0.00579 + 0.20548 *A

 91)  Naphthalene       0.526 0.280 0.475 0.606 0.781 0.975 1.125 0.681  43.48
            ----- Quadratic regression -----  Coefficient =  0.9974
                 Response Ratio = -0.07686 + 0.74236 *A + 0.10172 *A^2

 92)  1,2,3-Trichlorobe 0.167 0.113 0.217 0.276 0.334 0.389 0.421 0.274  41.95
               ----- Linear regression -----  Coefficient =  0.9938
                 Response Ratio = -0.07169 + 0.43007 *A

 ----------------------------------------------------------------------------
 (#) = Out of Range

           VF2305C.M         Thu Mar 01 07:44:03 2007
```

# Continuing Calibration Summary



**Job Number:** T16445
**Account:** ITTXHO Shaw E & I, Inc.
**Project:** Longhorn Army Ammunition Plant
**Sample:** VF2314-CC2305
**Lab FileID:** F0079162.D




Evaluate Continuing Calibration Report

```
Data File : C:\HPCHEM\1\DATA\VF2313\F0079162.D          Vial: 2
Acq On    :  7 Mar 2007   2:47 am                   Operator: lydiaj
Sample    : cc2305-40                               Inst    : GC/MS F
Misc      : ms3885,vf2314,,,,5,1,water              Multiplr: 1.00
MS Integration Params: RTEINT.P

Method        : C:\HPCHEM\1\METHODS\VF2305C.M (RTE Integrator)
Title         : SW846 8260B and EPA 624
Last Update   : Thu Mar 01 07:31:12 2007
Response via  : Multiple Level Calibration

Min. RRF      :   0.001  Min. Rel. Area :  50%  Max. R.T. Dev  0.50min
Max. RRF Dev :  20%     Max. Rel. Area : 200%
```

| | | Compound | AvgRF | CCRF | %Dev | Area% | Dev(min) |
|---|---|---|---|---|---|---|---|
| 1 | I | Fluorobenzene | 1.000 | 1.000 | 0.0 | 82 | -0.08 |
| 2 | | Dichlorodifluoromethane | 0.171 | 0.149 | 12.9 | 72 | -0.05 |
| 3 | P | Chloromethane | 0.329 | 0.336 | -2.1 | 90 | -0.06 |
| 4 | C | Vinyl Chloride | 0.286 | 0.303 | -5.9 | 89 | -0.06 |
| 5 | | Bromomethane | 0.225 | 0.230 | -2.2 | 88 | -0.07 |
| 6 | | Chloroethane | 0.217 | 0.235 | -8.3 | 87 | -0.07 |
| 7 | | Trichlorofluoromethane | 0.155 | 0.171 | -10.3 | 89 | -0.06 |
| 8 | | Acrolein | 0.033 | 0.030 | 9.1 | 69 | -0.08 |
| 9 | C | 1,1-Dichloroethene | 0.306 | 0.310 | -1.3 | 80 | -0.07 |
| 10 | | Freon 113 | 0.205 | 0.205 | 0.0 | 75 | -0.07 |
| 11 | | Acetone | 0.056 | 0.058 | -3.6 | 93 | -0.07 |
| 12 | | Iodomethane | 0.434 | 0.433 | 0.2 | 82 | -0.07 |
| 13 | | Methyl acetate | 0.191 | 0.220 | -15.2 | 101 | -0.07 |
| 14 | | Carbon Disulfide | 0.889 | 0.861 | 3.1 | 78 | -0.07 |
| 15 | | Methylene Chloride | 0.399 | 0.417 | -4.5 | 85 | -0.07 |
| 16 | | Tert Butyl Alcohol | 0.017 | 0.020 | -17.6 | 106 | -0.08 |
| 17 | | trans-1,2-Dichloroethene | 0.341 | 0.353 | -3.5 | 85 | -0.07 |
| 18 | | Acrylonitrile | 0.095 | 0.108 | -13.7 | 97 | -0.07 |
| 19 | | Methyl Tert Butyl Ether | 0.581 | 0.615 | -5.9 | 91 | -0.08 |
| 20 | | Hexane | 0.312 | 0.282 | 9.6 | 68 | -0.08 |
| 21 | P | 1,1-Dichloroethane | 0.440 | 0.464 | -5.5 | 86 | -0.08 |
| 22 | | Vinyl acetate | 0.550 | 0.626 | -13.8 | 92 | -0.08 |
| 23 | | Di-isopropyl ether | 0.971 | 1.067 | -9.9 | 90 | -0.07 |
| 24 | | Ethyl tert-butyl ether | 0.738 | 0.798 | -8.1 | 89 | -0.07 |
| 25 | | 2,2-Dichloropropane | 0.203 | 0.181 | 10.8 | 71 | -0.07 |
| 26 | | cis-1,2-Dichloroethene | 0.302 | 0.321 | -6.3 | 86 | -0.08 |
| 27 | | 2-Butanone | 0.113 | 0.129 | -14.2 | 101 | -0.08 |
| 28 | | Bromochloromethane | 0.143 | 0.153 | -7.0 | 87 | -0.08 |
| 29 | C | Chloroform | 0.358 | 0.376 | -5.0 | 86 | -0.08 |
| 30 | | Tetrahydrofuran | 0.034 | 0.036 | -5.9 | 99 | -0.08 |
| 31 | | 1,1,1-Trichloroethane | 0.208 | 0.219 | -5.3 | 85 | -0.08 |
| 32 | S | Dibromofluoromethane | 0.218 | 0.250 | -14.7 | 95 | -0.07 |
| 33 | | Cyclohexane | 0.439 | 0.461 | -5.0 | 79 | -0.08 |
| 34 | | 1,1-Dichloropropene | 0.302 | 0.319 | -5.6 | 84 | -0.08 |
| 35 | | Carbon Tetrachloride | 0.169 | 0.180 | -6.5 | 84 | -0.08 |
| 36 | S | 1,2-Dichloroethane-d4 | 0.165 | 0.192 | -16.4 | 98 | -0.08 |
| 37 | | Benzene | 1.108 | 1.171 | -5.7 | 87 | -0.08 |
| 38 | | 1,2-Dichloroethane | 0.198 | 0.218 | -10.1 | 88 | -0.08 |
| 39 | | tert-amyl methyl ether | 0.757 | 0.810 | -7.0 | 91 | -0.08 |
| 40 | | Trichloroethene | 0.226 | 0.238 | -5.3 | 85 | -0.08 |
| 41 | | Methylcyclohexane | 0.364 | 0.363 | 0.3 | 76 | -0.08 |
| 42 | C | 1,2-Dichloropropane | 0.314 | 0.342 | -8.9 | 89 | -0.08 |

# Continuing Calibration Summary



**Job Number:** T16445 **Sample:** VF2314-CC2305
**Account:** ITTXHO Shaw E & I, Inc. **Lab FileID:** F0079162.D
**Project:** Longhorn Army Ammunition Plant

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 43 | | Dibromomethane | 0.158 | 0.173 | -9.5 | 89 | -0.09 |
| 44 | | 1,4-Dioxane | 0.002 | 0.003 | -50.0# | 100 | -0.08 |
| 45 | | Bromodichloromethane | 0.304 | 0.328 | -7.9 | 88 | -0.08 |
| 46 | | 2-Nitropropane | 0.040 | 0.045 | -12.5 | 99 | -0.09 |
| 47 | | 2-Chloroethyl vinyl ether | 0.125 | 0.133 | -6.4 | 88 | -0.08 |
| 48 | | 4-Methyl-2-pentanone | 0.240 | 0.290 | -20.8# | 102 | -0.09 |
| 49 | | cis-1,3-Dichloropropene | 0.421 | 0.442 | -5.0 | 85 | -0.08 |
| 50 | I | Chlorobenzene-d5 | 1.000 | 1.000 | 0.0 | 89 | -0.08 |
| 51 | S | Toluene-d8 | 1.098 | 1.140 | -3.8 | 94 | -0.08 |
| 52 | C | Toluene | 1.386 | 1.356 | 2.2 | 87 | -0.08 |
| 53 | | trans-1,3-Dichloropropene | 0.391 | 0.395 | -1.0 | 87 | -0.08 |
| 54 | | 1,1,2-Trichloroethane | 0.283 | 0.288 | -1.8 | 91 | -0.08 |
| 55 | | Tetrachloroethene | 0.294 | 0.293 | 0.3 | 86 | -0.09 |
| 56 | | 2-hexanone | 0.196 | 0.223 | -13.8 | 102 | -0.08 |
| 57 | | 1,3-Dichloropropane | 0.599 | 0.605 | -1.0 | 90 | -0.08 |
| 58 | | Dibromochloromethane | 0.298 | 0.306 | -2.7 | 92 | -0.08 |
| 59 | | 1,2-Dibromoethane | 0.309 | 0.320 | -3.6 | 94 | -0.09 |
| 60 | | 1-Chlorohexane | 0.495 | 0.458 | 7.5 | 80 | -0.09 |
| 61 | P | Chlorobenzene | 0.871 | 0.866 | 0.6 | 88 | -0.09 |
| 62 | | 1,1,1,2-Tetrachloroethane | 0.280 | 0.283 | -1.1 | 89 | -0.09 |
| 63 | C | Ethylbenzene | 1.478 | 1.455 | 1.6 | 86 | -0.09 |
| 64 | | m,p-Xylene | 1.025 | 1.024 | 0.1 | 87 | -0.09 |
| 65 | | o-Xylene | 1.070 | 1.091 | -2.0 | 89 | -0.09 |
| 66 | | Styrene | 0.928 | 0.947 | -2.0 | 87 | -0.08 |
| 67 | P | Bromoform | 0.169 | 0.201 | -18.9 | 100 | -0.09 |
| 68 | I | 1,4-Dichlorobenzene-d4 | 1.000 | 1.000 | 0.0 | 90 | -0.09 |
| 69 | | Isopropylbenzene | 2.941 | 2.700 | 8.2 | 86 | -0.08 |
| 70 | | Cyclohexanone | 0.027 | 0.042 | -55.6# | 149 | -0.10 |
| 71 | S | 4-Bromofluorobenzene | 0.921 | 0.903 | 2.0 | 96 | -0.09 |
| 72 | | Bromobenzene | 0.867 | 0.837 | 3.5 | 90 | -0.10 |
| 73 | P | 1,1,2,2-Tetrachloroethane | 1.120 | 1.088 | 2.9 | 97 | -0.09 |
| 74 | | Trans-1,4-Dichloro-2-Butene | 0.179 | 0.171 | 4.5 | 85 | -0.09 |
| 75 | | 1,2,3-Trichloropropane | 0.247 | 0.252 | -2.0 | 99 | -0.10 |
| 76 | | n-Propylbenzene | 4.136 | 3.884 | 6.1 | 86 | -0.09 |
| 77 | | 2-Chlorotoluene | 2.591 | 2.414 | 6.8 | 87 | -0.09 |
| 78 | | 4-Chlorotoluene | 2.234 | 2.100 | 6.0 | 87 | -0.10 |
| 79 | | 1,3,5-Trimethylbenzene | 2.368 | 2.226 | 6.0 | 86 | -0.09 |
| 80 | | sec-Butylbenzene | 3.140 | 3.014 | 4.0 | 84 | -0.09 |
| 81 | | 1,3-Dichlorobenzene | 1.400 | 1.412 | -0.9 | 90 | -0.10 |
| 82 | | 4-Isopropyltoluene | 2.312 | 2.210 | 4.4 | 83 | -0.09 |
| 83 | | 1,4-Dichlorobenzene | 1.435 | 1.389 | 3.2 | 88 | -0.09 |
| 84 | | tert-Butylbenzene | 0.446 | 0.422 | 5.4 | 86 | -0.10 |
| 85 | | n-Butylbenzene | 1.942 | 1.915 | 1.4 | 80 | -0.10 |
| 86 | | 1,2-Dichlorobenzene | 1.323 | 1.344 | -1.6 | 91 | -0.09 |
| 87 | | 1,2,4-Trimethylbenzene | 2.377 | 2.293 | 3.5 | 86 | -0.09 |
| 88 | | 1,2-Dibromo-3-Chloropropane | 0.083 | 0.075 | 9.6 | 94 | -0.09 |
| 89 | | 1,2,4-Trichlorobenzene | 0.370 | 0.387 | -4.6 | 87 | -0.10 |
| 90 | | Hexachlorobutadiene | 0.162 | 0.189 | -16.7 | 83 | -0.11 |
| 91 | | Naphthalene | 0.681 | 0.633 | 7.0 | 94 | -0.11 |
| 92 | | 1,2,3-Trichlorobenzene | 0.274 | 0.283 | -3.3 | 93 | -0.12 |

Average % D = 7.3

(#) = Out of Range SPCC's out = 0 CCC's out = 0
F0078967.D VF2305C.M Wed Mar 07 10:06:33 2007

5.7

5

# Continuing Calibration Summary



**Job Number:** T16445 **Sample:** VF2315-CC2305
**Account:** ITTXHO Shaw E & I, Inc. **Lab FileID:** F0079182.D
**Project:** Longhorn Army Ammunition Plant

Evaluate Continuing Calibration Report

```
Data File : C:\HPCHEM\1\DATA\VF2315~1\F0079182.D          Vial: 2
Acq On    :  7 Mar 2007   1:19 pm                       Operator: lydiaj
Sample    : cc2305-40                                    Inst     : GC/MS F
Misc      : ms3885,vf2315,,,,5,1,water                   Multiplr: 1.00
MS Integration Params: RTEINT.P

Method        : C:\HPCHEM\1\METHODS\VF2305C.M (RTE Integrator)
Title         : SW846 8260B and EPA 624
Last Update   : Thu Mar 01 07:31:12 2007
Response via  : Multiple Level Calibration

Min. RRF      :   0.001  Min. Rel. Area :  50%  Max. R.T. Dev  0.50min
Max. RRF Dev :  20%     Max. Rel. Area : 200%
```

| | | Compound | AvgRF | CCRF | %Dev | Area% | Dev(min) |
|---|---|---|---|---|---|---|---|
| 1 | I | Fluorobenzene | 1.000 | 1.000 | 0.0 | 86 | -0.08 |
| 2 | | Dichlorodifluoromethane | 0.171 | 0.148 | 13.5 | 74 | -0.04 |
| 3 | P | Chloromethane | 0.329 | 0.330 | -0.3 | 92 | -0.05 |
| 4 | C | Vinyl Chloride | 0.286 | 0.292 | -2.1 | 90 | -0.06 |
| 5 | | Bromomethane | 0.225 | 0.223 | 0.9 | 89 | -0.07 |
| 6 | | Chloroethane | 0.217 | 0.226 | -4.1 | 88 | -0.06 |
| 7 | | Trichlorofluoromethane | 0.155 | 0.162 | -4.5 | 87 | -0.06 |
| 8 | | Acrolein | 0.033 | 0.034 | -3.0 | 81 | -0.08 |
| 9 | C | 1,1-Dichloroethene | 0.306 | 0.297 | 2.9 | 80 | -0.07 |
| 10 | | Freon 113 | 0.205 | 0.193 | 5.9 | 73 | -0.07 |
| 11 | | Acetone | 0.056 | 0.051 | 8.9 | 84 | -0.07 |
| 12 | | Iodomethane | 0.434 | 0.399 | 8.1 | 78 | -0.07 |
| 13 | | Methyl acetate | 0.191 | 0.208 | -8.9 | 100 | -0.07 |
| 14 | | Carbon Disulfide | 0.889 | 0.797 | 10.3 | 75 | -0.07 |
| 15 | | Methylene Chloride | 0.399 | 0.419 | -5.0 | 89 | -0.07 |
| 16 | | Tert Butyl Alcohol | 0.017 | 0.019 | -11.8 | 103 | -0.08 |
| 17 | | trans-1,2-Dichloroethene | 0.341 | 0.339 | 0.6 | 84 | -0.07 |
| 18 | | Acrylonitrile | 0.095 | 0.092 | 3.2 | 86 | -0.07 |
| 19 | | Methyl Tert Butyl Ether | 0.581 | 0.574 | 1.2 | 89 | -0.07 |
| 20 | | Hexane | 0.312 | 0.316 | -1.3 | 79 | -0.08 |
| 21 | P | 1,1-Dichloroethane | 0.440 | 0.453 | -3.0 | 87 | -0.08 |
| 22 | | Vinyl acetate | 0.550 | 0.609 | -10.7 | 93 | -0.08 |
| 23 | | Di-isopropyl ether | 0.971 | 1.066 | -9.8 | 93 | -0.07 |
| 24 | | Ethyl tert-butyl ether | 0.738 | 0.773 | -4.7 | 90 | -0.07 |
| 25 | | 2,2-Dichloropropane | 0.203 | 0.210 | -3.4 | 86 | -0.07 |
| 26 | | cis-1,2-Dichloroethene | 0.302 | 0.307 | -1.7 | 86 | -0.08 |
| 27 | | 2-Butanone | 0.113 | 0.108 | 4.4 | 88 | -0.08 |
| 28 | | Bromochloromethane | 0.143 | 0.147 | -2.8 | 86 | -0.08 |
| 29 | C | Chloroform | 0.358 | 0.370 | -3.4 | 88 | -0.08 |
| 30 | | Tetrahydrofuran | 0.034 | 0.032 | 5.9 | 91 | -0.08 |
| 31 | | 1,1,1-Trichloroethane | 0.208 | 0.210 | -1.0 | 84 | -0.08 |
| 32 | S | Dibromofluoromethane | 0.218 | 0.227 | -4.1 | 90 | -0.08 |
| 33 | | Cyclohexane | 0.439 | 0.451 | -2.7 | 81 | -0.08 |
| 34 | | 1,1-Dichloropropene | 0.302 | 0.317 | -5.0 | 87 | -0.08 |
| 35 | | Carbon Tetrachloride | 0.169 | 0.174 | -3.0 | 85 | -0.08 |
| 36 | S | 1,2-Dichloroethane-d4 | 0.165 | 0.176 | -6.7 | 94 | -0.08 |
| 37 | | Benzene | 1.108 | 1.127 | -1.7 | 87 | -0.08 |
| 38 | | 1,2-Dichloroethane | 0.198 | 0.213 | -7.6 | 89 | -0.08 |
| 39 | | tert-amyl methyl ether | 0.757 | 0.777 | -2.6 | 91 | -0.08 |
| 40 | | Trichloroethene | 0.226 | 0.232 | -2.7 | 87 | -0.08 |
| 41 | | Methylcyclohexane | 0.364 | 0.371 | -1.9 | 81 | -0.08 |
| 42 | C | 1,2-Dichloropropane | 0.314 | 0.336 | -7.0 | 91 | -0.09 |

5.7
5

# Continuing Calibration Summary



**Job Number:** T16445 **Sample:** VF2315-CC2305
**Account:** ITTXHO Shaw E & I, Inc. **Lab FileID:** F0079182.D
**Project:** Longhorn Army Ammunition Plant

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 43 | | Dibromomethane | 0.158 | 0.169 | -7.0 | 91 | -0.09 |
| 44 | | 1,4-Dioxane | 0.002 | 0.003 | -50.0# | 106 | -0.09 |
| 45 | | Bromodichloromethane | 0.304 | 0.321 | -5.6 | 90 | -0.08 |
| 46 | | 2-Nitropropane | 0.040 | 0.042 | -5.0 | 98 | -0.08 |
| 47 | | 2-Chloroethyl vinyl ether | 0.125 | 0.124 | 0.8 | 85 | -0.08 |
| 48 | | 4-Methyl-2-pentanone | 0.240 | 0.236 | 1.7 | 87 | -0.09 |
| 49 | | cis-1,3-Dichloropropene | 0.421 | 0.461 | -9.5 | 93 | -0.08 |
| 50 | I | Chlorobenzene-d5 | 1.000 | 1.000 | 0.0 | 90 | -0.08 |
| 51 | S | Toluene-d8 | 1.098 | 1.096 | 0.2 | 92 | -0.08 |
| 52 | C | Toluene | 1.386 | 1.363 | 1.7 | 89 | -0.08 |
| 53 | | trans-1,3-Dichloropropene | 0.391 | 0.405 | -3.6 | 91 | -0.07 |
| 54 | | 1,1,2-Trichloroethane | 0.283 | 0.289 | -2.1 | 93 | -0.08 |
| 55 | | Tetrachloroethene | 0.294 | 0.299 | -1.7 | 89 | -0.09 |
| 56 | | 2-hexanone | 0.196 | 0.182 | 7.1 | 85 | -0.08 |
| 57 | | 1,3-Dichloropropane | 0.599 | 0.606 | -1.2 | 92 | -0.08 |
| 58 | | Dibromochloromethane | 0.298 | 0.306 | -2.7 | 94 | -0.08 |
| 59 | | 1,2-Dibromoethane | 0.309 | 0.310 | -0.3 | 93 | -0.08 |
| 60 | | 1-Chlorohexane | 0.495 | 0.501 | -1.2 | 90 | -0.09 |
| 61 | P | Chlorobenzene | 0.871 | 0.876 | -0.6 | 91 | -0.09 |
| 62 | | 1,1,1,2-Tetrachloroethane | 0.280 | 0.286 | -2.1 | 92 | -0.08 |
| 63 | C | Ethylbenzene | 1.478 | 1.474 | 0.3 | 89 | -0.09 |
| 64 | | m,p-Xylene | 1.025 | 1.039 | -1.4 | 90 | -0.08 |
| 65 | | o-Xylene | 1.070 | 1.102 | -3.0 | 92 | -0.09 |
| 66 | | Styrene | 0.928 | 0.964 | -3.9 | 91 | -0.08 |
| 67 | P | Bromoform | 0.169 | 0.198 | -17.2 | 100 | -0.09 |
| 68 | I | 1,4-Dichlorobenzene-d4 | 1.000 | 1.000 | 0.0 | 93 | -0.09 |
| 69 | | Isopropylbenzene | 2.941 | 2.758 | 6.2 | 90 | -0.08 |
| 70 | | Cyclohexanone | 0.027 | 0.039 | -44.4# | 142 | -0.10 |
| 71 | S | 4-Bromofluorobenzene | 0.921 | 0.840 | 8.8 | 92 | -0.09 |
| 72 | | Bromobenzene | 0.867 | 0.840 | 3.1 | 93 | -0.09 |
| 73 | P | 1,1,2,2-Tetrachloroethane | 1.120 | 1.065 | 4.9 | 98 | -0.09 |
| 74 | | Trans-1,4-Dichloro-2-Butene | 0.179 | 0.176 | 1.7 | 90 | -0.09 |
| 75 | | 1,2,3-Trichloropropane | 0.247 | 0.240 | 2.8 | 96 | -0.09 |
| 76 | | n-Propylbenzene | 4.136 | 4.041 | 2.3 | 92 | -0.09 |
| 77 | | 2-Chlorotoluene | 2.591 | 2.463 | 4.9 | 92 | -0.09 |
| 78 | | 4-Chlorotoluene | 2.234 | 2.117 | 5.2 | 90 | -0.10 |
| 79 | | 1,3,5-Trimethylbenzene | 2.368 | 2.281 | 3.7 | 90 | -0.09 |
| 80 | | sec-Butylbenzene | 3.140 | 3.101 | 1.2 | 89 | -0.09 |
| 81 | | 1,3-Dichlorobenzene | 1.400 | 1.439 | -2.8 | 95 | -0.09 |
| 82 | | 4-Isopropyltoluene | 2.312 | 2.294 | 0.8 | 89 | -0.09 |
| 83 | | 1,4-Dichlorobenzene | 1.435 | 1.431 | 0.3 | 93 | -0.09 |
| 84 | | tert-Butylbenzene | 0.446 | 0.438 | 1.8 | 91 | -0.10 |
| 85 | | n-Butylbenzene | 1.942 | 2.030 | -4.5 | 87 | -0.10 |
| 86 | | 1,2-Dichlorobenzene | 1.323 | 1.352 | -2.2 | 94 | -0.09 |
| 87 | | 1,2,4-Trimethylbenzene | 2.377 | 2.379 | -0.1 | 92 | -0.09 |
| 88 | | 1,2-Dibromo-3-Chloropropane | 0.083 | 0.071 | 14.5 | 92 | -0.10 |
| 89 | | 1,2,4-Trichlorobenzene | 0.370 | 0.343 | 7.3 | 79 | -0.09 |
| 90 | | Hexachlorobutadiene | 0.162 | 0.192 | -18.5 | 86 | -0.11 |
| 91 | | Naphthalene | 0.681 | 0.550 | 19.2 | 84 | -0.12 |
| 92 | | 1,2,3-Trichlorobenzene | 0.274 | 0.247 | 9.9 | 83 | -0.12 |

Average % D = 5.5

(#) = Out of Range SPCC's out = 0 CCC's out = 0
F0078967.D VF2305C.M Thu Mar 08 11:48:42 2007

5.7

5


ACCUTEST Laboratories
T16445

# Continuing Calibration Summary



**Job Number:** T16445 **Sample:** VF2318-CC2305
**Account:** ITTXHO Shaw E & I, Inc. **Lab FileID:** F0079223.D
**Project:** Longhorn Army Ammunition Plant

Evaluate Continuing Calibration Report

```
Data File : C:\HPCHEM\1\DATA\VF2318~1\F0079223.D        Vial: 2
Acq On    :  8 Mar 2007  10:59 am                   Operator: lydiaj
Sample    : cc2305-40                               Inst    : GC/MS F
Misc      : ms3889,vf2318,,,,5,1,water              Multiplr: 1.00
MS Integration Params: RTEINT.P

Method       : C:\HPCHEM\1\METHODS\VF2305C.M (RTE Integrator)
Title        : SW846 8260B and EPA 624
Last Update  : Thu Mar 01 07:31:12 2007
Response via : Multiple Level Calibration

Min. RRF     :   0.001  Min. Rel. Area :  50%  Max. R.T. Dev  0.50min
Max. RRF Dev :  20%     Max. Rel. Area : 200%
```

| | | Compound | AvgRF | CCRF | %Dev | Area% | Dev(min) |
|---|---|---|---|---|---|---|---|
| 1 | I | Fluorobenzene | 1.000 | 1.000 | 0.0 | 86 | -0.08 |
| 2 | | Dichlorodifluoromethane | 0.171 | 0.134 | 21.6# | 68 | -0.04 |
| 3 | P | Chloromethane | 0.329 | 0.313 | 4.9 | 87 | -0.05 |
| 4 | C | Vinyl Chloride | 0.286 | 0.273 | 4.5 | 84 | -0.06 |
| 5 | | Bromomethane | 0.225 | 0.222 | 1.3 | 89 | -0.07 |
| 6 | | Chloroethane | 0.217 | 0.229 | -5.5 | 89 | -0.06 |
| 7 | | Trichlorofluoromethane | 0.155 | 0.168 | -8.4 | 91 | -0.07 |
| 8 | | Acrolein | 0.033 | 0.033 | 0.0 | 81 | -0.07 |
| 9 | C | 1,1-Dichloroethene | 0.306 | 0.303 | 1.0 | 81 | -0.07 |
| 10 | | Freon 113 | 0.205 | 0.207 | -1.0 | 79 | -0.07 |
| 11 | | Acetone | 0.056 | 0.042 | 25.0# | 70 | -0.07 |
| 12 | | Iodomethane | 0.434 | 0.423 | 2.5 | 83 | -0.07 |
| 13 | | Methyl acetate | 0.191 | 0.176 | 7.9 | 84 | -0.07 |
| 14 | | Carbon Disulfide | 0.889 | 0.841 | 5.4 | 80 | -0.08 |
| 15 | | Methylene Chloride | 0.399 | 0.413 | -3.5 | 88 | -0.07 |
| 16 | | Tert Butyl Alcohol | 0.017 | 0.017 | 0.0 | 92 | -0.07 |
| 17 | | trans-1,2-Dichloroethene | 0.341 | 0.350 | -2.6 | 87 | -0.07 |
| 18 | | Acrylonitrile | 0.095 | 0.078 | 17.9 | 73 | -0.07 |
| 19 | | Methyl Tert Butyl Ether | 0.581 | 0.562 | 3.3 | 87 | -0.07 |
| 20 | | Hexane | 0.312 | 0.315 | -1.0 | 79 | -0.08 |
| 21 | P | 1,1-Dichloroethane | 0.440 | 0.464 | -5.5 | 89 | -0.07 |
| 22 | | Vinyl acetate | 0.550 | 0.547 | 0.5 | 83 | -0.07 |
| 23 | | Di-isopropyl ether | 0.971 | 1.060 | -9.2 | 93 | -0.07 |
| 24 | | Ethyl tert-butyl ether | 0.738 | 0.774 | -4.9 | 90 | -0.07 |
| 25 | | 2,2-Dichloropropane | 0.203 | 0.232 | -14.3 | 95 | -0.07 |
| 26 | | cis-1,2-Dichloroethene | 0.302 | 0.324 | -7.3 | 90 | -0.08 |
| 27 | | 2-Butanone | 0.113 | 0.090 | 20.4# | 74 | -0.08 |
| 28 | | Bromochloromethane | 0.143 | 0.149 | -4.2 | 88 | -0.08 |
| 29 | C | Chloroform | 0.358 | 0.387 | -8.1 | 92 | -0.08 |
| 30 | | Tetrahydrofuran | 0.034 | 0.028 | 17.6 | 80 | -0.08 |
| 31 | | 1,1,1-Trichloroethane | 0.208 | 0.224 | -7.7 | 90 | -0.08 |
| 32 | S | Dibromofluoromethane | 0.218 | 0.236 | -8.3 | 93 | -0.07 |
| 33 | | Cyclohexane | 0.439 | 0.472 | -7.5 | 85 | -0.08 |
| 34 | | 1,1-Dichloropropene | 0.302 | 0.328 | -8.6 | 90 | -0.08 |
| 35 | | Carbon Tetrachloride | 0.169 | 0.187 | -10.7 | 91 | -0.07 |
| 36 | S | 1,2-Dichloroethane-d4 | 0.165 | 0.169 | -2.4 | 90 | -0.08 |
| 37 | | Benzene | 1.108 | 1.177 | -6.2 | 91 | -0.07 |
| 38 | | 1,2-Dichloroethane | 0.198 | 0.206 | -4.0 | 86 | -0.08 |
| 39 | | tert-amyl methyl ether | 0.757 | 0.767 | -1.3 | 90 | -0.08 |
| 40 | | Trichloroethene | 0.226 | 0.248 | -9.7 | 93 | -0.08 |
| 41 | | Methylcyclohexane | 0.364 | 0.394 | -8.2 | 87 | -0.08 |
| 42 | C | 1,2-Dichloropropane | 0.314 | 0.345 | -9.9 | 94 | -0.08 |

# Continuing Calibration Summary



**Job Number:** T16445 **Sample:** VF2318-CC2305
**Account:** ITTXHO Shaw E & I, Inc. **Lab FileID:** F0079223.D
**Project:** Longhorn Army Ammunition Plant

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 43 | | Dibromomethane | 0.158 | 0.163 | -3.2 | 88 | -0.08 |
| 44 | | 1,4-Dioxane | 0.002 | 0.002 | 0.0 | 89 | -0.08 |
| 45 | | Bromodichloromethane | 0.304 | 0.332 | -9.2 | 93 | -0.08 |
| 46 | | 2-Nitropropane | 0.040 | 0.036 | 10.0 | 84 | -0.08 |
| 47 | | 2-Chloroethyl vinyl ether | 0.125 | 0.110 | 12.0 | 76 | -0.08 |
| 48 | | 4-Methyl-2-pentanone | 0.240 | 0.206 | 14.2 | 76 | -0.08 |
| 49 | | cis-1,3-Dichloropropene | 0.421 | 0.471 | -11.9 | 95 | -0.08 |
| 50 | I | Chlorobenzene-d5 | 1.000 | 1.000 | 0.0 | 90 | -0.08 |
| 51 | S | Toluene-d8 | 1.098 | 1.138 | -3.6 | 96 | -0.08 |
| 52 | C | Toluene | 1.386 | 1.437 | -3.7 | 94 | -0.08 |
| 53 | | trans-1,3-Dichloropropene | 0.391 | 0.405 | -3.6 | 91 | -0.07 |
| 54 | | 1,1,2-Trichloroethane | 0.283 | 0.284 | -0.4 | 92 | -0.08 |
| 55 | | Tetrachloroethene | 0.294 | 0.324 | -10.2 | 97 | -0.09 |
| 56 | | 2-hexanone | 0.196 | 0.157 | 19.9 | 73 | -0.08 |
| 57 | | 1,3-Dichloropropane | 0.599 | 0.582 | 2.8 | 89 | -0.08 |
| 58 | | Dibromochloromethane | 0.298 | 0.305 | -2.3 | 93 | -0.08 |
| 59 | | 1,2-Dibromoethane | 0.309 | 0.301 | 2.6 | 90 | -0.08 |
| 60 | | 1-Chlorohexane | 0.495 | 0.527 | -6.5 | 94 | -0.08 |
| 61 | P | Chlorobenzene | 0.871 | 0.923 | -6.0 | 96 | -0.09 |
| 62 | | 1,1,1,2-Tetrachloroethane | 0.280 | 0.299 | -6.8 | 96 | -0.09 |
| 63 | C | Ethylbenzene | 1.478 | 1.578 | -6.8 | 96 | -0.09 |
| 64 | | m,p-Xylene | 1.025 | 1.080 | -5.4 | 94 | -0.08 |
| 65 | | o-Xylene | 1.070 | 1.152 | -7.7 | 96 | -0.08 |
| 66 | | Styrene | 0.928 | 0.989 | -6.6 | 93 | -0.08 |
| 67 | P | Bromoform | 0.169 | 0.180 | -6.5 | 91 | -0.09 |
| 68 | I | 1,4-Dichlorobenzene-d4 | 1.000 | 1.000 | 0.0 | 90 | -0.09 |
| 69 | | Isopropylbenzene | 2.941 | 3.019 | -2.7 | 95 | -0.08 |
| 70 | | Cyclohexanone | 0.027 | 0.046 | -70.4# | 163 | -0.10 |
| 71 | S | 4-Bromofluorobenzene | 0.921 | 0.912 | 1.0 | 96 | -0.09 |
| 72 | | Bromobenzene | 0.867 | 0.917 | -5.8 | 98 | -0.09 |
| 73 | P | 1,1,2,2-Tetrachloroethane | 1.120 | 1.007 | 10.1 | 89 | -0.09 |
| 74 | | Trans-1,4-Dichloro-2-Butene | 0.179 | 0.160 | 10.6 | 79 | -0.10 |
| 75 | | 1,2,3-Trichloropropane | 0.247 | 0.233 | 5.7 | 90 | -0.09 |
| 76 | | n-Propylbenzene | 4.136 | 4.335 | -4.8 | 95 | -0.09 |
| 77 | | 2-Chlorotoluene | 2.591 | 2.658 | -2.6 | 95 | -0.09 |
| 78 | | 4-Chlorotoluene | 2.234 | 2.314 | -3.6 | 95 | -0.10 |
| 79 | | 1,3,5-Trimethylbenzene | 2.368 | 2.500 | -5.6 | 95 | -0.08 |
| 80 | | sec-Butylbenzene | 3.140 | 3.327 | -6.0 | 92 | -0.09 |
| 81 | | 1,3-Dichlorobenzene | 1.400 | 1.523 | -8.8 | 97 | -0.09 |
| 82 | | 4-Isopropyltoluene | 2.312 | 2.458 | -6.3 | 92 | -0.09 |
| 83 | | 1,4-Dichlorobenzene | 1.435 | 1.494 | -4.1 | 94 | -0.09 |
| 84 | | tert-Butylbenzene | 0.446 | 0.456 | -2.2 | 92 | -0.10 |
| 85 | | n-Butylbenzene | 1.942 | 2.065 | -6.3 | 85 | -0.10 |
| 86 | | 1,2-Dichlorobenzene | 1.323 | 1.387 | -4.8 | 93 | -0.09 |
| 87 | | 1,2,4-Trimethylbenzene | 2.377 | 2.512 | -5.7 | 94 | -0.09 |
| 88 | | 1,2-Dibromo-3-Chloropropane | 0.083 | 0.069 | 16.9 | 85 | -0.09 |
| 89 | | 1,2,4-Trichlorobenzene | 0.370 | 0.322 | 13.0 | 72 | -0.09 |
| 90 | | Hexachlorobutadiene | 0.162 | 0.201 | -24.1# | 87 | -0.10 |
| 91 | | Naphthalene | 0.681 | 0.464 | 31.9# | 69 | -0.11 |
| 92 | | 1,2,3-Trichlorobenzene | 0.274 | 0.216 | 21.2# | 70 | -0.11 |

Average % D = 8.2

(#) = Out of Range SPCC's out = 0 CCC's out = 0
F0078967.D VF2305C.M Fri Mar 09 16:10:50 2007

5.7

5

# General Chemistry



## QC Data Summaries

Includes the following where applicable:

- Method Blank and Blank Spike Summaries
- Duplicate Summaries
- Matrix Spike Summaries
- Instrument Runlogs/QC

METHOD BLANK AND SPIKE RESULTS SUMMARY
GENERAL CHEMISTRY

Login Number: T16445
Account: ITTXHO - Shaw E & I, Inc.
Project: Longhorn Army Ammunition Plant

| Analyte | Batch ID | RL | MB Result | Units | Spike Amount | BSP Result | BSP %Recov | QC Limits |
|---|---|---|---|---|---|---|---|---|
| Alkalinity, Total as CaCO3 | GN11375 | 5.0 | <5.0 | mg/l | 2500 | 2500 | 100.0 | 80-120% |
| Chloride | GN11343 | 1.0 | <1.0 | mg/l | xxxxxxxx | 1020 | 102.0 | 92-107% |
| Nitrogen, Nitrate + Nitrite | GN11291 | 0.050 | <0.050 | mg/l | 0.500 | 0.51 | 102.0 | 89-112% |
| Nitrogen, Nitrate + Nitrite | GN11301 | 0.050 | <0.050 | mg/l | 0.500 | 0.51 | 102.0 | 89-112% |
| Nitrogen, Nitrite | GN11290 | 0.050 | <0.050 | mg/l | 0.500 | 0.49 | 98.0 | 89-117% |
| Nitrogen, Nitrite | GN11300 | 0.050 | <0.050 | mg/l | 0.500 | 0.49 | 98.0 | 89-117% |
| Sulfate | GN11356 | 10 | <10 | mg/l | 100 | 95.0 | 95.0 | 80-120% |
| Sulfate | GN11356 | | | mg/l | xxxxxxxx | | * | 80-120% |
| Sulfide | GN11313 | 0.20 | <0.20 | mg/l | 1600 | 1380 | 85.0 | 80-120% |
| Total Organic Carbon | GN11304 | 1.0 | <1.0 | mg/l | 25.0 | 26.0 | 104.0 | 83-110% |
| Total Organic Carbon | GN11311 | 1.0 | <1.0 | mg/l | 25.0 | 25.0 | 100.0 | 83-110% |
| Total Organic Carbon | GN11317 | 1.0 | <1.0 | mg/l | 25.0 | 25.0 | 100.0 | 83-110% |

Associated Samples:
Batch GN11290: T16445-1, T16445-10, T16445-11, T16445-12, T16445-13, T16445-14, T16445-2, T16445-3, T16445-4, T16445-5, T16445-6, T16445-7, T16445-8, T16445-9
Batch GN11291: T16445-1, T16445-10, T16445-11, T16445-12, T16445-13, T16445-14, T16445-2, T16445-3, T16445-4, T16445-5, T16445-6, T16445-7, T16445-8, T16445-9
Batch GN11300: T16445-18
Batch GN11301: T16445-18
Batch GN11304: T16445-18
Batch GN11311: T16445-1, T16445-2, T16445-3, T16445-4, T16445-5, T16445-6, T16445-7
Batch GN11313: T16445-1, T16445-10, T16445-11, T16445-12, T16445-13, T16445-14, T16445-18, T16445-2, T16445-3, T16445-4, T16445-5, T16445-6, T16445-7, T16445-8, T16445-9
Batch GN11317: T16445-10, T16445-11, T16445-12, T16445-13, T16445-14, T16445-8, T16445-9
Batch GN11343: T16445-1, T16445-10, T16445-11, T16445-12, T16445-13, T16445-14, T16445-18, T16445-2, T16445-3, T16445-4, T16445-5, T16445-6, T16445-7, T16445-8, T16445-9
Batch GN11356: T16445-1, T16445-10, T16445-11, T16445-12, T16445-13, T16445-14, T16445-18, T16445-2, T16445-3, T16445-4, T16445-5, T16445-6, T16445-7, T16445-8, T16445-9
Batch GN11375: T16445-1, T16445-10, T16445-11, T16445-12, T16445-13, T16445-14, T16445-18, T16445-2, T16445-3, T16445-4, T16445-5, T16445-6, T16445-7, T16445-8, T16445-9
(*) Outside of QC limits

DUPLICATE RESULTS SUMMARY
GENERAL CHEMISTRY

Login Number: T16445
Account: ITTXHO - Shaw E & I, Inc.
Project: Longhorn Army Ammunition Plant

| Analyte | Batch ID | QC Sample | Units | Original Result | DUP Result | RPD | QC Limits |
|---|---|---|---|---|---|---|---|
| Alkalinity, Total as CaCO3 | GN11375 | T16445-5 | mg/l | 457 | 457 | 0.0 | 0-10% |
| Chloride | GN11343 | T16445-5 | mg/l | 253 | 258 | 2.0 | 0-5% |
| Nitrogen, Nitrate + Nitrite | GN11291 | T16445-5 | mg/l | 0.0050 U | <0.050 | 0.0 | 0-10% |
| Nitrogen, Nitrate + Nitrite | GN11301 | T16445-18 | mg/l | 2.7 | 2.7 | 0.0 | 0-10% |
| Nitrogen, Nitrite | GN11290 | T16445-5 | mg/l | 0.0030 U | <0.050 | 0.0 | 0-10% |
| Nitrogen, Nitrite | GN11300 | T16445-18 | mg/l | 0.0030 U | <0.050 | 0.0 | 0-10% |
| Sulfate | GN11356 | T16445-5 | mg/l | 286 | 291 | 1.7 | 0-20% |
| Sulfide | GN11313 | T16445-5 | mg/l | 0.0 B | <0.20 | 0.0 | 0-20% |
| Total Organic Carbon | GN11304 | T16445-18 | mg/l | 6.0 | 6.0 | 0.0 | 0-11% |
| Total Organic Carbon | GN11311 | T16445-5 | mg/l | 2.0 | 2.0 | 0.0 | 0-11% |
| Total Organic Carbon | GN11317 | T16445-8 | mg/l | 3.0 | 3.0 | 0.0 | 0-11% |
| pH | GN11323 | T16445-5 | su | 7.1 | 7.1 | 0.0 | 0-6.8% |
| pH | GN11323 | T16445-7 | su | 11.2 | 11.1 | 1.8 | 0-6.8% |
| pH | GN11323 | T16445-18 | su | 6.7 | 7.0 | 3.5 | 0-6.8% |

Associated Samples:
Batch GN11290: T16445-1, T16445-10, T16445-11, T16445-12, T16445-13, T16445-14, T16445-2, T16445-3, T16445-4, T16445-5, T16445-6, T16445-7, T16445-8, T16445-9
Batch GN11291: T16445-1, T16445-10, T16445-11, T16445-12, T16445-13, T16445-14, T16445-2, T16445-3, T16445-4, T16445-5, T16445-6, T16445-7, T16445-8, T16445-9
Batch GN11300: T16445-18
Batch GN11301: T16445-18
Batch GN11304: T16445-18
Batch GN11311: T16445-1, T16445-2, T16445-3, T16445-4, T16445-5, T16445-6, T16445-7
Batch GN11313: T16445-1, T16445-10, T16445-11, T16445-12, T16445-13, T16445-14, T16445-18, T16445-2, T16445-3, T16445-4, T16445-5, T16445-6, T16445-7, T16445-8, T16445-9
Batch GN11317: T16445-10, T16445-11, T16445-12, T16445-13, T16445-14, T16445-8, T16445-9
Batch GN11323: T16445-1, T16445-10, T16445-11, T16445-12, T16445-13, T16445-14, T16445-18, T16445-2, T16445-3, T16445-4, T16445-5, T16445-6, T16445-7, T16445-8, T16445-9
Batch GN11343: T16445-1, T16445-10, T16445-11, T16445-12, T16445-13, T16445-14, T16445-18, T16445-2, T16445-3, T16445-4, T16445-5, T16445-6, T16445-7, T16445-8, T16445-9
Batch GN11356: T16445-1, T16445-10, T16445-11, T16445-12, T16445-13, T16445-14, T16445-18, T16445-2, T16445-3, T16445-4, T16445-5, T16445-6, T16445-7, T16445-8, T16445-9
Batch GN11375: T16445-1, T16445-10, T16445-11, T16445-12, T16445-13, T16445-14, T16445-18, T16445-2, T16445-3, T16445-4, T16445-5, T16445-6, T16445-7, T16445-8, T16445-9
(*) Outside of QC limits

MATRIX SPIKE RESULTS SUMMARY
GENERAL CHEMISTRY

Login Number: T16445
Account: ITTXHO - Shaw E & I, Inc.
Project: Longhorn Army Ammunition Plant

| Analyte | Batch ID | QC Sample | Units | Original Result | Spike Amount | MS Result | %Rec | QC Limits |
|---|---|---|---|---|---|---|---|---|
| Alkalinity, Total as CaCO3 | GN11375 | T16445-5 | mg/l | 457 | 125 | 590 | 106.0 | 79-122% |
| Chloride | GN11343 | T16445-5 | mg/l | 253 | xxxxxxxx | 462 | 104.0 | 81-119% |
| Nitrogen, Nitrate + Nitrite | GN11291 | T16445-5 | mg/l | 0.0050 U | 0.100 | 0.097 | 97.0 | 80-119% |
| Nitrogen, Nitrate + Nitrite | GN11291 | T16445-5 | mg/l | 0.0050 U | 0.100 | 0.10 | 100.0 | 80-119% |
| Nitrogen, Nitrate + Nitrite | GN11301 | T16445-18 | mg/l | 2.7 | 1.00 | 3.7 | 100.0 | 80-119% |
| Nitrogen, Nitrite | GN11290 | T16445-5 | mg/l | 0.0030 U | 0.100 | 0.096 | 96.0 | 75-134% |
| Nitrogen, Nitrite | GN11290 | T16445-5 | mg/l | 0.0030 U | 0.100 | 0.096 | 96.0 | 75-134% |
| Nitrogen, Nitrite | GN11300 | T16445-18 | mg/l | 0.0030 U | 0.100 | 0.094 | 94.0 | 75-134% |
| Sulfate | GN11356 | T16445-5 | mg/l | 286 | 100 | 296 | 100.0 | 75-125% |
| Sulfate | GN11356 | T16445-5 | mg/l | 286 | xxxxxxxx | | * | 75-125% |
| Total Organic Carbon | GN11304 | T16445-18 | mg/l | 6.0 | 10.0 | 16.0 | 100.0 | 74-121% |
| Total Organic Carbon | GN11311 | T16445-5 | mg/l | 2.0 | 10.0 | 13.0 | 110.0 | 74-121% |
| Total Organic Carbon | GN11311 | T16445-5 | mg/l | 2.0 | 10.0 | 12.0 | 100.0 | 74-121% |
| Total Organic Carbon | GN11317 | T16445-8 | mg/l | 3.0 | 10.0 | 14.0 | 110.0 | 74-121% |

Associated Samples:
Batch GN11290: T16445-1, T16445-10, T16445-11, T16445-12, T16445-13, T16445-14, T16445-2, T16445-3, T16445-4, T16445-5, T16445-6, T16445-7, T16445-8, T16445-9
Batch GN11291: T16445-1, T16445-10, T16445-11, T16445-12, T16445-13, T16445-14, T16445-2, T16445-3, T16445-4, T16445-5, T16445-6, T16445-7, T16445-8, T16445-9
Batch GN11300: T16445-18
Batch GN11301: T16445-18
Batch GN11304: T16445-18
Batch GN11311: T16445-1, T16445-2, T16445-3, T16445-4, T16445-5, T16445-6, T16445-7
Batch GN11317: T16445-10, T16445-11, T16445-12, T16445-13, T16445-14, T16445-8, T16445-9
Batch GN11343: T16445-1, T16445-10, T16445-11, T16445-12, T16445-13, T16445-14, T16445-18, T16445-2, T16445-3, T16445-4, T16445-5, T16445-6, T16445-7, T16445-8, T16445-9
Batch GN11356: T16445-1, T16445-10, T16445-11, T16445-12, T16445-13, T16445-14, T16445-18, T16445-2, T16445-3, T16445-4, T16445-5, T16445-6, T16445-7, T16445-8, T16445-9
Batch GN11375: T16445-1, T16445-10, T16445-11, T16445-12, T16445-13, T16445-14, T16445-18, T16445-2, T16445-3, T16445-4, T16445-5, T16445-6, T16445-7, T16445-8, T16445-9
(*) Outside of QC limits
(N) Matrix Spike Rec. outside of QC limits

6.3
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## Misc. Forms

## Custody Documents and Other Forms

(Accutest Laboratories Southeast, Inc.)

Includes the following where applicable:

- Chain of Custody

ACCUTEST Laboratories T16445

# CHAIN OF CUSTODY

10165 Harwin, Suite 150 - Houston, TX 77036 - 713-271-4700 fax: 713-271-4770

Page 1 of 2

| FED-EX Tracking # | Bottle Order Control # |
|---|---|
| Accutest Quote # | Accutest Job # T16445 |

Subcontract Information | Project Information

| | |
|---|---|
| Company Name: ALSE-ORLANDO | Send Report to: Agnesv@accutest.com |
| Project Contact | Bill to: Accutest Laboratories |
| Address | Address: 10165 Harwin Drive, Suite 150 |
| City: ORLANDO State Zip | City: Houston, TX 77036 State Zip |
| Phone No. Fax No. | Phone No.: 713-271-4700 / 713-271-4770 Fax No. |
| | Accutest Purchase Order # |

Requested Analyses: Methane, Ethane, Ethene (RSK147); Perchlorates; 8330 Explosives

Matrix Codes: DW - Drinking Water; GW - Ground Water; WW - Wastewater; SO - Soil; SL - Sludge; OI - Oil; LIQ - Other Liquid; SOL - Other Solid

| Accutest Sample ID | Collection Date | Collection Time | Matrix | # of bottles | HCl | NaOH | HNO3 | H2SO4 | ENCORE | NaHSO4 | MEOH | NONE | Methane, Ethane, Ethene (RSK147) | Perchlorates | 8330 Explosives | LAB USE ONLY |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| T16445-1 | 2/22/2007 | 930 | GW | 5 | 2 | | | | | | | 3 | X | X | X | |
| T16445-2 | 2/22/2007 | 941 | GW | 3 | 2 | | | | | | | 1 | X | X | | |
| T16445-3 | 2/22/2007 | 1536 | GW | 3 | 2 | | | | | | | 1 | X | X | | |
| T16445-5 + MS/MSD | 2/23/2007 | 1046 | GW | 9 | 6 | | | | | | | 3 | X | X | | |
| T16445-6 | 2/23/2007 | 1453 | GW | 3 | 2 | | | | | | | 1 | X | X | | |
| T16445-7 | 2/22/2007 | 1030 | GW | 5 | 2 | | | | | | | 3 | X | X | X | |
| T16445-8 | 2/22/2007 | 1418 | GW | 5 | 2 | | | | | | | 3 | X | X | X | |
| T16445-9 | 2/22/2007 | 1418 | GW | 3 | 2 | | | | | | | 1 | X | X | | |
| T16445-10 | 2/22/2007 | 1245 | GW | 5 | 2 | | | | | | | 3 | X | X | X | |
| T16445-11 | 2/22/2007 | 1245 | GW | 5 | 2 | | | | | | | 3 | X | X | X | FD. Only 1 -1L Amber |

Turnaround Time (Business days)

- [XX] 10 Day STANDARD
- [ ] 5 Day RUSH
- [ ] 4 Day RUSH
- [ ] 3 Day EMERGENCY
- [ ] 2 Day EMERGENCY
- [ ] 1 Day EMERGENCY
- [ ] Other

Approved By:/ Date:

Data Deliverable Information

- [ ] Commercial "A"
- [ ] Commercial "B"
- [XX] TRRP 13
- [XX] Reduced Tier1
- [ ] State Forms
- [ ] EDD Format
- [ ] Other

Commercial "A" = Results Only
Commercial "B" = Results & Standard QC

Comments / Remarks

SAMPLE CUSTODY MUST BE DOCUMENTED BELOW EACH TIME SAMPLES CHANGE POSSESSION, INCLUDING COURIER DELIVERY

| Relinquished by Sampler: | Date Time: | Received By: | Relinquished By: | Date Time: | Received By: |
|---|---|---|---|---|---|
| 1 | | 1 | 2 | | 2 |
| Relinquished by: 3 | Date Time: | Received By: 3 | Relinquished By: 4 [signature] | Date Time: 2/27/07/17:00 | Received By: 4 Fx |
| Relinquished by: 5 Fx | Date Time: 09:30 02-28-07 | Received By: 5 Wifred V[illegible] | Custody Seal # | Preserved where applicable ☐ | On Ice ☐ Cooler Temp. |

2.0 2.1 1.8 3.0

T16445: Chain of Custody
Page 1 of 3
Accutest Laboratories Southeast, Inc.

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ACCUTEST Laboratories

# CHAIN OF CUSTODY

T16445

10165 Harwin, Suite 150 - Houston, TX 77036 - 713-271-4700 fax: 713-271-4770

Page 2 of 2

| FED-EX Tracking # | Bottle Order Control # |
|---|---|
| Accutest Quote # | Accutest Job # T16445 |

| Subcontract Information | Project Information |
|---|---|
| Company Name: ALSE-ORLANDO | Send Report to: Agnesv@accutest.com |
| Project Contact | Bill to: Accutest Laboratories |
| Address | Address: 10165 Harwin Drive, Suite 150 |
| City: ORLANDO State Zip | City: Houston, TX 77036 State Zip |
| Phone No. Fax No. | Phone No.: 713-271-4700 / 713-271-4770 Fax No. |
| | Accutest Purchase Order # |

Matrix Codes: DW - Drinking Water; GW - Ground Water; WW - Wastewater; SO - Soil; SL - Sludge; OI - Oil; LIQ - Other Liquid; SOL - Other Solid

| Accutest Sample ID | Collection Date | Collection Time | Matrix | # of bottles | HCl | NaOH | HNO3 | H2SO4 | ENCORE | NaHSO4 | MEOH | NONE | Methane, Ethane, Ethene (RSK147) | Perchlorates | 8330 Explosives | LAB USE ONLY |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| T16445-12 | 2/22/2007 | 1500 | GW | 5 | 2 | | | | | | | 3 | X | X | X | |
| T16445-13 | 2/23/2007 | 1533 | GW | 5 | 2 | | | | | | | 3 | X | X | X | |
| T16445-14 | 2/23/2007 | 1630 | GW | 5 | 2 | | | | | | | 2 | X | X | X | Only 1-1L Amber |
| T16445-18 | 2/23/2007 | 1047 | GW | 5 | 2 | | | | | | | 3 | X | X | X | |
| T16445-4 | 2/22/2007 | 1536 | GW | 3 | 2 | | | | | | | 1 | X | X | | |

**Turnaround Time (Business days)**

- [XX] 10 Day STANDARD
- [ ] 5 Day RUSH
- [ ] 4 Day RUSH
- [ ] 3 Day EMERGENCY
- [ ] 2 Day EMERGENCY
- [ ] 1 Day EMERGENCY
- [ ] Other

Approved By:/ Date:

**Data Deliverable Information**

- [ ] Commercial "A"
- [ ] Commercial "B"
- [XX] TRRP 13
- [XX] Reduced Tier1
- [ ] State Forms
- [ ] EDD Format
- [ ] Other

Commercial "A" = Results Only
Commercial "B" = Results & Standard QC

Comments / Remarks

SAMPLE CUSTODY MUST BE DOCUMENTED BELOW EACH TIME SAMPLES CHANGE POSSESSION, INCLUDING COURIER DELIVERY

| Relinquished by Sampler: | Date Time: | Received By: | Relinquished By: | Date Time: | Received By: |
|---|---|---|---|---|---|
| 1 | | 1 | 2 | | 2 |
| Relinquished by: 3 | Date Time: | Received By: 3 | Relinquished By: 4 | Date Time: 2/27/07 17:00 | Received By: 4 FX |
| Relinquished by: 5 FX | Date Time: 14:00 02-28-07 | Received By: 5 | Custody Seal # | Preserved where applicable | On Ice / Cooler Temp. |

2.0 2.4, 1.8 2.0

T16445: Chain of Custody
Page 2 of 3



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7

# ACCUTEST LABORATORIES SAMPLE RECEIPT CONFIRMATION

ACCUTEST'S JOB NUMBER: T16445 CLIENT: AL6C PROJECT: T16445

DATE/TIME RECEIVED: 02-28-07 09:30 # OF COOLERS RECEIVED: 4 COOLER TEMPS: 2.0, 2.4, 1.8, 3.0

METHOD OF DELIVERY: FEDEX UPS ACCUTEST COURIER GREYHOUND DELIVERY OTHER

AIRBILL NUMBERS: 7986 1726 3879

## COOLER INFORMATION

- [ ] CUSTODY SEAL NOT PRESENT OR NOT INTACT
- [ ] CHAIN OF CUSTODY NOT RECEIVED (COC)
- [ ] ANALYSIS REQUESTED IS UNCLEAR OR MISSING
- [ ] SAMPLE DATES OR TIMES UNCLEAR OR MISSING
- [ ] TEMPERATURE CRITERIA NOT MET

## TRIP BLANK INFORMATION

- [ ] TRIP BLANK PROVIDED
- [x] TRIP BLANK NOT PROVIDED
- [x] TRIP BLANK NOT ON COC
- [ ] TRIP BLANK INTACT
- [ ] TRIP BLANK NOT INTACT
- [ ] RECEIVED WATER TRIP BLANK
- [ ] RECEIVED SOIL TRIP BLANK

## MISC. INFORMATION

NUMBER OF ENCORES ? Ø

NUMBER OF 5035 FIELD KITS ? Ø

NUMBER OR LAB FILTERED METALS ? Ø

## SAMPLE INFORMATION

- [ ] SAMPLE LABELS NOT PRESENT ON ALL BOTTLES
- [ ] CORRECT NUMBER OF CONTAINERS USED
- [ ] SAMPLE RECEIVED IMPROPERLY PRESERVED
- [ ] INSUFFICIENT VOLUME FOR ANALYSIS
- [ ] TIMES ON COC DOES NOT MATCH LABEL(S)
- [ ] ID'S ON COC DOES NOT MATCH LABEL(S)
- [ ] VOC VIALS HAVE HEADSPACE (MACRO BUBBLES)
- [ ] BOTTLES RECEIVED BUT ANALYSIS NOT REQUESTED
- [ ] NO BOTTLES RECEIVED FOR ANALYSIS REQUESTED
- [ ] UNCLEAR FILTERING INSTRUCTIONS
- [ ] UNCLEAR COMPOSITING INSTRUCTIONS
- [ ] SAMPLE CONTAINER(S) RECEIVED BROKEN
- [ ] % SOLIDS JAR NOT RECEIVED
- [ ] 5035 FIELD KIT NOT FROZEN WITHIN 48 HOUR'S
- [ ] RESIDUAL CHLORINE PRESENT

( APPLICABLE TO EPA 600 SERIES OR NORTH CAROLINA ORGANICS)

SUMMARY OF COMMENTS:

TECHNICIAN SIGNATURE/DATE [signature] 02-28-07 TECHNICIAN SIGNATURE/DATE [signature] 2-28-07

ASBD 10/03/06

7.1

7

T16445: Chain of Custody

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# GC Volatiles

## QC Data Summaries

(Accutest Laboratories Southeast, Inc.)

Includes the following where applicable:

- Method Blank Summaries
- Blank Spike Summaries
- Matrix Spike and Duplicate Summaries
- Surrogate Recovery Summaries
- GC Surrogate Retention Time Summaries
- Initial and Continuing Calibration Summaries

# Method Blank Summary



**Job Number:** T16445
**Account:** ALGC Accutest Laboratories Gulf Coast, Inc.
**Project:** ITTXHO: Longhorn Army Ammunition Plant

| Sample | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|---|---|---|---|---|---|---|---|
| GXY992-MB | XY025253.D | 1 | 03/01/07 | TD | n/a | n/a | GXY992 |

**The QC reported here applies to the following samples:** **Method:** RSKSOP-147/175

T16445-1, T16445-2, T16445-3, T16445-4, T16445-5, T16445-6, T16445-7, T16445-8, T16445-9, T16445-10, T16445-11, T16445-12, T16445-13, T16445-14, T16445-18

| CAS No. | Compound | Result | RL | MDL | Units | Q |
|---|---|---|---|---|---|---|
| 74-82-8 | Methane | ND | 0.50 | 0.30 | ug/l | |
| 74-84-0 | Ethane | ND | 1.0 | 0.60 | ug/l | |
| 74-85-1 | Ethene | ND | 1.0 | 0.80 | ug/l | |

# Blank Spike Summary



**Job Number:** T16445
**Account:** ALGC Accutest Laboratories Gulf Coast, Inc.
**Project:** ITTXHO: Longhorn Army Ammunition Plant

| Sample | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|---|---|---|---|---|---|---|---|
| GXY992-BS | XY025254.D | 1 | 03/01/07 | TD | n/a | n/a | GXY992 |

**The QC reported here applies to the following samples:** **Method:** RSKSOP-147/175

T16445-1, T16445-2, T16445-3, T16445-4, T16445-5, T16445-6, T16445-7, T16445-8, T16445-9, T16445-10, T16445-11, T16445-12, T16445-13, T16445-14, T16445-18

| CAS No. | Compound | Spike ug/l | BSP ug/l | BSP % | Limits |
|---|---|---|---|---|---|
| 74-82-8 | Methane | 108 | 123 | 114 | 54-149 |
| 74-84-0 | Ethane | 219 | 245 | 112 | 57-143 |
| 74-85-1 | Ethene | 290 | 319 | 110 | 57-143 |

# Matrix Spike Summary



**Job Number:** T16445
**Account:** ALGC Accutest Laboratories Gulf Coast, Inc.
**Project:** ITTXHO: Longhorn Army Ammunition Plant

| Sample | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|---|---|---|---|---|---|---|---|
| T16445-5MS | XY025273.D | 1 | 03/01/07 | TD | n/a | n/a | GXY992 |
| T16445-5 | XY025259.D | 1 | 03/01/07 | TD | n/a | n/a | GXY992 |

**The QC reported here applies to the following samples:** **Method:** RSKSOP-147/175

T16445-1, T16445-2, T16445-3, T16445-4, T16445-5, T16445-6, T16445-7, T16445-8, T16445-9, T16445-10, T16445-11, T16445-12, T16445-13, T16445-14, T16445-18

| CAS No. | Compound | T16445-5 ug/l | Q | Spike ug/l | MS ug/l | MS % | Limits |
|---|---|---|---|---|---|---|---|
| 74-82-8 | Methane | 2.93 | | 108 | 144 | 131 | 54-149 |
| 74-84-0 | Ethane | 1.0 U | | 219 | 286 | 131 | 57-143 |
| 74-85-1 | Ethene | 1.0 U | | 290 | 371 | 128 | 57-143 |

8.3

8

# Duplicate Summary



**Job Number:** T16445
**Account:** ALGC Accutest Laboratories Gulf Coast, Inc.
**Project:** ITTXHO: Longhorn Army Ammunition Plant

| Sample | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|---|---|---|---|---|---|---|---|
| T16445-5DUP | XY025272.D | 1 | 03/01/07 | TD | n/a | n/a | GXY992 |
| T16445-5 | XY025259.D | 1 | 03/01/07 | TD | n/a | n/a | GXY992 |

**The QC reported here applies to the following samples:** **Method:** RSKSOP-147/175

T16445-1, T16445-2, T16445-3, T16445-4, T16445-5, T16445-6, T16445-7, T16445-8, T16445-9, T16445-10, T16445-11, T16445-12, T16445-13, T16445-14, T16445-18

| CAS No. | Compound | T16445-5 ug/l | Q | DUP ug/l | Q | RPD | Limits |
|---|---|---|---|---|---|---|---|
| 74-82-8 | Methane | 2.93 | | 3.38 | | 14 | 24 |
| 74-84-0 | Ethane | 1.0 U | | ND | | nc | 23 |
| 74-85-1 | Ethene | 1.0 U | | ND | | nc | 10 |

# Initial Calibration Summary



**Job Number:** T16445
**Account:** ALGC Accutest Laboratories Gulf Coast, Inc.
**Project:** ITTXHO: Longhorn Army Ammunition Plant
**Sample:** GXY989-ICC989
**Lab FileID:** XY025202.D

```
                    Response Factor Report   VOA5

 Method       : C:\HPCHEM\2\METHODS\RSK147XY.M (Chemstation Integrator)
 Title        : Dissolved Gases in Water
 Last Update  : Thu Feb 22 15:36:18 2007
 Response via : Initial Calibration

 Calibration Files
 1    =XY025194.D  2    =XY025195.D  3    =XY025201.D  4    =XY025197.D
 5    =XY025202.D  6    =XY025199.D  7    =XY025200.D

    Compound             1     2     3     4     5     6     7     Avg   %RSD
 ---------------------------------------------------------------------------
 1)c Methane          1.442 0.904 1.128 1.220 0.672 0.793 0.957 1.017 E4  26.02
 2)c Ethylene         2.415 1.896 1.964 2.128 1.306 1.522 1.817 1.864 E4  19.76
 3)c Ethane           2.311 1.873 1.880 2.068 1.280 1.499 1.798 1.816 E4  18.87
----------------------------------------------------------------------------
(#) = Out of Range

         RSK147XY.M        Thu Feb 22 15:38:10 2007
```

8.5

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# Initial Calibration Verification



**Job Number:** T16445 **Sample:** GXY989-ICV989
**Account:** ALGC Accutest Laboratories Gulf Coast, Inc. **Lab FileID:** XY025203.D
**Project:** ITTXHO: Longhorn Army Ammunition Plant

```
                    Evaluate Continuing Calibration Report

Data File : C:\HPCHEM\2\DATA\022207\XY025203.D           Vial: 100
Acq On    : 22 Feb 2007   1:27 pm                    Operator: Trangd
Sample    : ICV989-1000                              Inst    : VOA5
Misc      : gc7062,gxy989,,,,,                       Multiplr: 1.00
IntFile   : EVENTS.E

Method       : C:\HPCHEM\2\METHODS\RSK147XY.M (Chemstation Integrator)
Title        : Dissolved Gases in Water
Last Update  : Thu Feb 22 15:36:18 2007
Response via : Multiple Level Calibration

Min. RRF     :   0.000  Min. Rel. Area :  50%  Max. R.T. Dev  0.50min
Max. RRF Dev :  30%     Max. Rel. Area : 150%

       Compound                Amount  Calc.    %Drift Area% Dev(min)RT Window
----------------------------------------------------------------------------
1 c   Methane                1000.000 1154.410    -15.4  175   0.20    0.88- 1.48
2 c   Ethylene               1000.000 1202.152    -20.2  172   0.31    2.54- 3.34
3 c   Ethane                 1000.000 1245.774    -24.6  177   0.32    3.14- 3.94
---------------------------------------------------------------------------
---------------------------------------------------------------------------

  (#) = Out of Range                SPCC's out = 0  CCC's out = 0
   XY025202.D RSK147XY.M       Thu Feb 22 15:37:53 2007
```

8.5

8

# Continuing Calibration Summary



**Job Number:** T16445 **Sample:** GXY992-CC989
**Account:** ALGC Accutest Laboratories Gulf Coast, Inc. **Lab FileID:** XY025251.D
**Project:** ITTXHO: Longhorn Army Ammunition Plant

```
                    Evaluate Continuing Calibration Report

  Data File : C:\HPCHEM\2\DATA\030107\XY025251.D           Vial: 100
  Acq On    :  1 Mar 2007   9:53 am                    Operator: Trangd
  Sample    : CC989-1000                               Inst    : VOA5
  Misc      : gc7109,gxy992,,,,,                       Multiplr: 1.00
  IntFile   : EVENTS.E

  Method       : C:\HPCHEM\2\METHODS\RSK147XY.M (Chemstation Integrator)
  Title        : Dissolved Gases in Water
  Last Update  : Fri Mar 02 09:28:32 2007
  Response via : Multiple Level Calibration

  Min. RRF     :   0.000  Min. Rel. Area :  50%  Max. R.T. Dev  0.50min
  Max. RRF Dev :  30%     Max. Rel. Area : 150%

         Compound                  Amount  Calc.    %Drift Area% Dev(min)RT Window
  ----------------------------------------------------------------------------
  1 c   Methane                  1000.000 1006.127     -0.6  152  -0.11    1.16- 1.76
  2 c   Ethylene                 1000.000 1069.950     -7.0  153  -0.09    2.96- 3.76
  3 c   Ethane                   1000.000 1082.186     -8.2  153  -0.08    3.58- 4.38
 ---------------------------------------------------------------------------
 ---------------------------------------------------------------------------

    (#) = Out of Range                SPCC's out = 0  CCC's out = 0
     XY025202.D RSK147XY.M       Fri Mar 02 10:53:27 2007
```

8.5

8

# Continuing Calibration Summary



**Job Number:** T16445
**Account:** ALGC Accutest Laboratories Gulf Coast, Inc.
**Project:** ITTXHO: Longhorn Army Ammunition Plant

**Sample:** GXY992-CC989
**Lab FileID:** XY025262.D

```
                    Evaluate Continuing Calibration Report

  Data File : C:\HPCHEM\2\DATA\030107\XY025262.D            Vial: 100
  Acq On    :  1 Mar 2007   1:50 pm                     Operator: Trangd
  Sample    : CC989-500                                 Inst    : VOA5
  Misc      : gc7128,gxy992,,,,,                        Multiplr: 1.00
  IntFile   : EVENTS.E

  Method       : C:\HPCHEM\2\METHODS\RSK147XY.M (Chemstation Integrator)
  Title        : Dissolved Gases in Water
  Last Update  : Fri Mar 02 09:28:32 2007
  Response via : Multiple Level Calibration

  Min. RRF     :   0.000  Min. Rel. Area :  50%  Max. R.T. Dev  0.50min
  Max. RRF Dev :  30%     Max. Rel. Area : 150%

         Compound                   Amount  Calc.    %Drift Area% Dev(min)RT Window
  ----------------------------------------------------------------------------
  1 c   Methane                   500.000 411.874     17.6    69   0.09    1.16- 1.76
  2 c   Ethylene                  500.000 450.472      9.9    79   0.14    2.96- 3.76
  3 c   Ethane                    500.000 453.565      9.3    80   0.15    3.58- 4.38
 ---------------------------------------------------------------------------
 ---------------------------------------------------------------------------

    (#) = Out of Range                 SPCC's out = 0  CCC's out = 0
     XY025197.D RSK147XY.M       Fri Mar 02 09:55:28 2007
```

# Continuing Calibration Summary



**Job Number:** T16445 **Sample:** GXY992-ECC989
**Account:** ALGC Accutest Laboratories Gulf Coast, Inc. **Lab FileID:** XY025274.D
**Project:** ITTXHO: Longhorn Army Ammunition Plant

```
                    Evaluate Continuing Calibration Report

  Data File : C:\HPCHEM\2\DATA\030107\XY025274.D          Vial: 100
  Acq On    :  1 Mar 2007   4:48 pm                   Operator: Trangd
  Sample    : ECC989-1000                             Inst    : VOA5
  Misc      : gc7128,gxy992,,,,,                      Multiplr: 1.00
  IntFile   : EVENTS.E

  Method       : C:\HPCHEM\2\METHODS\RSK147XY.M (Chemstation Integrator)
  Title        : Dissolved Gases in Water
  Last Update  : Fri Mar 02 09:28:32 2007
  Response via : Multiple Level Calibration

  Min. RRF     :   0.000  Min. Rel. Area :  50%  Max. R.T. Dev  0.50min
  Max. RRF Dev :  30%     Max. Rel. Area : 150%

         Compound                  Amount  Calc.    %Drift Area% Dev(min)RT Window
  ---------------------------------------------------------------------------
  1 c   Methane                  1000.000 1171.434    -17.1  177   0.00    1.16- 1.76
  2 c   Ethylene                 1000.000 1277.743    -27.8  182   0.00    2.96- 3.76
  3 c   Ethane                   1000.000 1297.361    -29.7  184   0.00    3.58- 4.38
 --------------------------------------------------------------------------
 --------------------------------------------------------------------------

    (#) = Out of Range               SPCC's out = 0  CCC's out = 0
     XY025202.D RSK147XY.M       Fri Mar 02 09:55:08 2007
```

8.5

8

# GC Semi-volatiles

## QC Data Summaries

(Accutest Laboratories Southeast, Inc.)

Includes the following where applicable:

- Method Blank Summaries
- Blank Spike Summaries
- Matrix Spike and Duplicate Summaries
- Surrogate Recovery Summaries
- GC Surrogate Retention Time Summaries
- Initial and Continuing Calibration Summaries

# Method Blank Summary



**Job Number:** T16445
**Account:** ALGC Accutest Laboratories Gulf Coast, Inc.
**Project:** ITTXHO: Longhorn Army Ammunition Plant

| Sample | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|---|---|---|---|---|---|---|---|
| OP19677-MB | GG020203.D | 1 | 03/02/07 | MRE | 03/01/07 | OP19677 | GGG906 |

**The QC reported here applies to the following samples:** **Method:** SW846 8330A

T16445-1, T16445-7, T16445-8, T16445-10, T16445-11, T16445-12, T16445-13, T16445-14, T16445-18

| CAS No. | Compound | Result | RL | MDL | Units | Q |
|---|---|---|---|---|---|---|
| 2691-41-0 | HMX | ND | 0.20 | 0.060 | ug/l | |
| 121-82-4 | RDX | ND | 0.20 | 0.075 | ug/l | |
| 99-65-0 | 1,3-Dinitrobenzene | ND | 0.20 | 0.070 | ug/l | |
| 606-20-2 | 2,6-Dinitrotoluene | ND | 0.20 | 0.065 | ug/l | |
| 121-14-2 | 2,4-Dinitrotoluene | ND | 0.20 | 0.075 | ug/l | |
| 35572-78-2 | 2-amino-4,6-Dinitrotoluene | ND | 0.20 | 0.070 | ug/l | |
| 19406-51-0 | 4-amino-2,6-Dinitrotoluene | ND | 0.20 | 0.080 | ug/l | |
| 98-95-3 | Nitrobenzene | ND | 0.20 | 0.060 | ug/l | |
| 88-72-2 | o-Nitrotoluene | ND | 0.20 | 0.060 | ug/l | |
| 99-08-1 | m-Nitrotoluene | ND | 0.20 | 0.075 | ug/l | |
| 99-99-0 | p-Nitrotoluene | ND | 0.20 | 0.075 | ug/l | |
| 479-45-8 | Tetryl | ND | 0.20 | 0.075 | ug/l | |
| 99-35-4 | 1,3,5-Trinitrobenzene | ND | 0.20 | 0.095 | ug/l | |
| 118-96-7 | 2,4,6-Trinitrotoluene | ND | 0.20 | 0.080 | ug/l | |

| CAS No. | Surrogate Recoveries | | Limits |
|---|---|---|---|
| 610-39-9 | 3,4-Dinitrotoluene | 102% | 70-136% |

# Method Blank Summary



**Job Number:** T16445
**Account:** ALGC Accutest Laboratories Gulf Coast, Inc.
**Project:** ITTXHO: Longhorn Army Ammunition Plant

| Sample | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|---|---|---|---|---|---|---|---|
| OP19677-MB | GG020233.D | 1 | 03/05/07 | MRE | 03/01/07 | OP19677 | GGG907 |

**The QC reported here applies to the following samples:** **Method:** SW846 8330A

T16445-1, T16445-7, T16445-8, T16445-10, T16445-11, T16445-12, T16445-13, T16445-14, T16445-18

| CAS No. | Compound | Result | RL | MDL | Units | Q |
|---|---|---|---|---|---|---|
| 2691-41-0 | HMX | ND | 0.20 | 0.060 | ug/l | |
| 121-82-4 | RDX | ND | 0.20 | 0.075 | ug/l | |
| 99-65-0 | 1,3-Dinitrobenzene | ND | 0.20 | 0.070 | ug/l | |
| 606-20-2 | 2,6-Dinitrotoluene | ND | 0.20 | 0.065 | ug/l | |
| 121-14-2 | 2,4-Dinitrotoluene | ND | 0.20 | 0.075 | ug/l | |
| 35572-78-2 | 2-amino-4,6-Dinitrotoluene | ND | 0.20 | 0.070 | ug/l | |
| 19406-51-0 | 4-amino-2,6-Dinitrotoluene | ND | 0.20 | 0.080 | ug/l | |
| 98-95-3 | Nitrobenzene | ND | 0.20 | 0.060 | ug/l | |
| 88-72-2 | o-Nitrotoluene | ND | 0.20 | 0.060 | ug/l | |
| 99-08-1 | m-Nitrotoluene | ND | 0.20 | 0.075 | ug/l | |
| 99-99-0 | p-Nitrotoluene | ND | 0.20 | 0.075 | ug/l | |
| 479-45-8 | Tetryl | ND | 0.20 | 0.075 | ug/l | |
| 99-35-4 | 1,3,5-Trinitrobenzene | ND | 0.20 | 0.095 | ug/l | |
| 118-96-7 | 2,4,6-Trinitrotoluene | ND | 0.20 | 0.080 | ug/l | |

| CAS No. | Surrogate Recoveries | | Limits |
|---|---|---|---|
| 610-39-9 | 3,4-Dinitrotoluene | 80% | 70-136% |

# Blank Spike Summary



**Job Number:** T16445
**Account:** ALGC Accutest Laboratories Gulf Coast, Inc.
**Project:** ITTXHO: Longhorn Army Ammunition Plant

| Sample | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|---|---|---|---|---|---|---|---|
| OP19677-BS | GG020202.D | 1 | 03/02/07 | MRE | 03/01/07 | OP19677 | GGG906 |

**The QC reported here applies to the following samples:** **Method:** SW846 8330A

T16445-1, T16445-7, T16445-8, T16445-10, T16445-11, T16445-12, T16445-13, T16445-14, T16445-18

| CAS No. | Compound | Spike ug/l | BSP ug/l | BSP % | Limits |
|---|---|---|---|---|---|
| 2691-41-0 | HMX | 5 | 5.3 | 106 | 74-152 |
| 121-82-4 | RDX | 5 | 5.4 | 108 | 80-124 |
| 99-65-0 | 1,3-Dinitrobenzene | 5 | 5.3 | 106 | 84-123 |
| 606-20-2 | 2,6-Dinitrotoluene | 5 | 5.3 | 106 | 84-133 |
| 121-14-2 | 2,4-Dinitrotoluene | 5 | 5.1 | 102 | 77-116 |
| 35572-78-2 | 2-amino-4,6-Dinitrotoluene | 5 | 5.2 | 104 | 78-117 |
| 19406-51-0 | 4-amino-2,6-Dinitrotoluene | 5 | 5.1 | 102 | 84-123 |
| 98-95-3 | Nitrobenzene | 5 | 5.5 | 110 | 76-128 |
| 88-72-2 | o-Nitrotoluene | 5 | 5.0 | 100 | 76-120 |
| 99-08-1 | m-Nitrotoluene | 5 | 5.2 | 104 | 74-124 |
| 99-99-0 | p-Nitrotoluene | 5 | 5.3 | 106 | 81-125 |
| 479-45-8 | Tetryl | 5 | 4.6 | 92 | 62-117 |
| 99-35-4 | 1,3,5-Trinitrobenzene | 5 | 5.3 | 106 | 85-127 |
| 118-96-7 | 2,4,6-Trinitrotoluene | 5 | 5.3 | 106 | 71-128 |

| CAS No. | Surrogate Recoveries | BSP | Limits |
|---|---|---|---|
| 610-39-9 | 3,4-Dinitrotoluene | 124% | 70-136% |

# Blank Spike Summary



**Job Number:** T16445
**Account:** ALGC Accutest Laboratories Gulf Coast, Inc.
**Project:** ITTXHO: Longhorn Army Ammunition Plant

| Sample | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|---|---|---|---|---|---|---|---|
| OP19677-BS | GG020232.D | 1 | 03/05/07 | MRE | 03/01/07 | OP19677 | GGG907 |

**The QC reported here applies to the following samples:** **Method:** SW846 8330A

T16445-1, T16445-7, T16445-8, T16445-10, T16445-11, T16445-12, T16445-13, T16445-14, T16445-18

| CAS No. | Compound | Spike ug/l | BSP ug/l | BSP % | Limits |
|---|---|---|---|---|---|
| 2691-41-0 | HMX | 5 | 5.9 | 118 | 74-152 |
| 121-82-4 | RDX | 5 | 5.5 | 110 | 80-124 |
| 99-65-0 | 1,3-Dinitrobenzene | 5 | 5.3 | 106 | 84-123 |
| 606-20-2 | 2,6-Dinitrotoluene | 5 | 5.1 | 102 | 84-133 |
| 121-14-2 | 2,4-Dinitrotoluene | 5 | 5.1 | 102 | 77-116 |
| 35572-78-2 | 2-amino-4,6-Dinitrotoluene | 5 | 5.2 | 104 | 78-117 |
| 19406-51-0 | 4-amino-2,6-Dinitrotoluene | 5 | 5.1 | 102 | 84-123 |
| 98-95-3 | Nitrobenzene | 5 | 6.4 | 128 | 76-128 |
| 88-72-2 | o-Nitrotoluene | 5 | 5.0 | 100 | 76-120 |
| 99-08-1 | m-Nitrotoluene | 5 | 5.3 | 106 | 74-124 |
| 99-99-0 | p-Nitrotoluene | 5 | 5.3 | 106 | 81-125 |
| 479-45-8 | Tetryl | 5 | 4.6 | 92 | 62-117 |
| 99-35-4 | 1,3,5-Trinitrobenzene | 5 | 5.5 | 110 | 85-127 |
| 118-96-7 | 2,4,6-Trinitrotoluene | 5 | 5.7 | 114 | 71-128 |

| CAS No. | Surrogate Recoveries | BSP | Limits |
|---|---|---|---|
| 610-39-9 | 3,4-Dinitrotoluene | 100% | 70-136% |

# Matrix Spike/Matrix Spike Duplicate Summary



**Job Number:** T16445
**Account:** ALGC Accutest Laboratories Gulf Coast, Inc.
**Project:** ITTXHO: Longhorn Army Ammunition Plant

| Sample | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|---|---|---|---|---|---|---|---|
| OP19677-MS | GG020207.D | 1 | 03/02/07 | MRE | 03/01/07 | OP19677 | GGG906 |
| OP19677-MSD | GG020208.D | 1 | 03/02/07 | MRE | 03/01/07 | OP19677 | GGG906 |
| F47539-3 | GG020206.D | 1 | 03/02/07 | MRE | 03/01/07 | OP19677 | GGG906 |

**The QC reported here applies to the following samples:** **Method:** SW846 8330A

T16445-1, T16445-7, T16445-8, T16445-10, T16445-11, T16445-12, T16445-13, T16445-14, T16445-18

| CAS No. | Compound | F47539-3 ug/l | Q | Spike ug/l | MS ug/l | MS % | MSD ug/l | MSD % | RPD | Limits Rec/RPD |
|---|---|---|---|---|---|---|---|---|---|---|
| 2691-41-0 | HMX | ND | | 10 | 11.0 | 110 | 11.8 | 118 | 7 | 74-152/21 |
| 121-82-4 | RDX | ND | | 10 | 10.3 | 103 | 10.7 | 107 | 4 | 80-124/20 |
| 99-65-0 | 1,3-Dinitrobenzene | ND | | 10 | 10.3 | 103 | 10.9 | 109 | 6 | 84-123/23 |
| 606-20-2 | 2,6-Dinitrotoluene | ND | | 10 | 9.9 | 99 | 10.6 | 106 | 7 | 84-133/23 |
| 121-14-2 | 2,4-Dinitrotoluene | ND | | 10 | 9.7 | 97 | 10.3 | 103 | 6 | 77-116/26 |
| 35572-78-2 | 2-amino-4,6-Dinitrotoluene | ND | | 10 | 9.4 | 94 | 10.5 | 105 | 11 | 78-117/28 |
| 19406-51-0 | 4-amino-2,6-Dinitrotoluene | ND | | 10 | 9.1 | 91 | 10.2 | 102 | 11 | 84-123/27 |
| 98-95-3 | Nitrobenzene | ND | | 10 | 10.5 | 105 | 11.1 | 111 | 6 | 76-128/28 |
| 88-72-2 | o-Nitrotoluene | ND | | 10 | 9.3 | 93 | 10.2 | 102 | 9 | 76-120/30 |
| 99-08-1 | m-Nitrotoluene | ND | | 10 | 9.5 | 95 | 10.6 | 106 | 11 | 74-124/32 |
| 99-99-0 | p-Nitrotoluene | ND | | 10 | 9.7 | 97 | 10.7 | 107 | 10 | 81-125/34 |
| 479-45-8 | Tetryl | ND | | 10 | 7.4 | 74 | 7.9 | 79 | 7 | 62-117/28 |
| 99-35-4 | 1,3,5-Trinitrobenzene | ND | | 10 | 9.8 | 98 | 10.4 | 104 | 6 | 85-127/21 |
| 118-96-7 | 2,4,6-Trinitrotoluene | ND | | 10 | 9.8 | 98 | 10.4 | 104 | 6 | 71-128/21 |

| CAS No. | Surrogate Recoveries | MS | MSD | F47539-3 | Limits |
|---|---|---|---|---|---|
| 610-39-9 | 3,4-Dinitrotoluene | 94% | 98% | 102% | 70-136% |

# Semivolatile Surrogate Recovery Summary



**Job Number:** T16445
**Account:** ALGC Accutest Laboratories Gulf Coast, Inc.
**Project:** ITTXHO: Longhorn Army Ammunition Plant

**Method:** SW846 8330A **Matrix:** AQ

**Samples and QC shown here apply to the above method**

| Lab Sample ID | Lab File ID | S1 [a] |
|---|---|---|
| T16445-1 | GG020214.D | 82.0 |
| T16445-7 | GG020215.D | 109.0 |
| T16445-8 | GG020216.D | 107.0 |
| T16445-10 | GG020217.D | 98.0 |
| T16445-11 | GG020218.D | 117.0 |
| T16445-12 | GG020236.D | 90.0 |
| T16445-12 | GG020219.D | 103.0 |
| T16445-13 | GG020220.D | 107.0 |
| T16445-14 | GG020221.D | 102.0 |
| T16445-18 | GG020222.D | 106.0 |
| OP19677-BS | GG020202.D | 124.0 |
| OP19677-BS | GG020232.D | 100.0 |
| OP19677-MB | GG020203.D | 102.0 |
| OP19677-MB | GG020233.D | 80.0 |
| OP19677-MS | GG020207.D | 94.0 |
| OP19677-MSD | GG020208.D | 98.0 |

| Surrogate Compounds | Recovery Limits |
|---|---|
| **S1** = 3,4-Dinitrotoluene | 70-136% |

(a) Recovery from GC signal #1

# GC Surrogate Retention Time Summary



**Job Number:** T16445
**Account:** ALGC Accutest Laboratories Gulf Coast, Inc.
**Project:** ITTXHO: Longhorn Army Ammunition Plant

| | | | |
|---|---|---|---|
| **Check Std:** | GGG906-CC825 | **Injection Date:** | 03/02/07 |
| **Lab File ID:** | GG020201.D | **Injection Time:** | 16:17 |
| **Instrument ID:** | GCGG | **Method:** | SW846 8330A |

| | S1 [a] RT |
|---|---|
| Check Std | 13.50 |

| Lab Sample ID | Lab File ID | Date Analyzed | Time Analyzed | S1 [a] RT |
|---|---|---|---|---|
| OP19677-BS | GG020202.D | 03/02/07 | 16:45 | 13.49 |
| OP19677-MB | GG020203.D | 03/02/07 | 17:12 | 13.50 |
| ZZZZZZ | GG020204.D | 03/02/07 | 17:27 | 13.50 |
| ZZZZZZ | GG020205.D | 03/02/07 | 17:54 | 13.50 |
| F47539-3 | GG020206.D | 03/02/07 | 18:22 | 13.49 |
| OP19677-MS | GG020207.D | 03/02/07 | 18:50 | 13.47 |
| OP19677-MSD | GG020208.D | 03/02/07 | 19:17 | 13.46 |
| ZZZZZZ | GG020209.D | 03/02/07 | 19:45 | 13.47 |
| ZZZZZZ | GG020210.D | 03/02/07 | 20:12 | 13.44 |
| ZZZZZZ | GG020211.D | 03/02/07 | 20:40 | 13.43 |

**Surrogate Compounds**

**S1** = 3,4-Dinitrotoluene

(a) Retention time from GC signal #1

9.5

9

# GC Surrogate Retention Time Summary



**Job Number:** T16445
**Account:** ALGC Accutest Laboratories Gulf Coast, Inc.
**Project:** ITTXHO: Longhorn Army Ammunition Plant

| | | | |
|---|---|---|---|
| **Check Std:** | GGG906-CC825 | **Injection Date:** | 03/02/07 |
| **Lab File ID:** | GG020212.D | **Injection Time:** | 21:07 |
| **Instrument ID:** | GCGG | **Method:** | SW846 8330A |

| | S1 [a] RT |
|---|---|
| Check Std | 13.45 |

| Lab Sample ID | Lab File ID | Date Analyzed | Time Analyzed | S1 [a] RT |
|---|---|---|---|---|
| T16445-1 | GG020214.D | 03/02/07 | 22:03 | 13.44 |
| T16445-7 | GG020215.D | 03/02/07 | 22:30 | 13.42 |
| T16445-8 | GG020216.D | 03/02/07 | 22:58 | 13.43 |
| T16445-10 | GG020217.D | 03/02/07 | 23:25 | 13.43 |
| T16445-11 | GG020218.D | 03/02/07 | 23:53 | 13.43 |
| T16445-12 | GG020219.D | 03/03/07 | 00:20 | 13.40 |
| T16445-13 | GG020220.D | 03/03/07 | 00:48 | 13.42 |
| T16445-14 | GG020221.D | 03/03/07 | 01:16 | 13.43 |
| T16445-18 | GG020222.D | 03/03/07 | 01:43 | 13.41 |
| ZZZZZZ | GG020223.D | 03/03/07 | 02:11 | 13.42 |

**Surrogate Compounds**

**S1** = 3,4-Dinitrotoluene

(a) Retention time from GC signal #1

# GC Surrogate Retention Time Summary



**Job Number:** T16445
**Account:** ALGC Accutest Laboratories Gulf Coast, Inc.
**Project:** ITTXHO: Longhorn Army Ammunition Plant

| | | | |
|---|---|---|---|
| **Check Std:** | GGG907-CC827 | **Injection Date:** | 03/05/07 |
| **Lab File ID:** | GG020231.D | **Injection Time:** | 13:23 |
| **Instrument ID:** | GCGG | **Method:** | SW846 8330A |

| | S1 [a] RT | S1 [b] RT |
|---|---|---|
| Check Std | 10.72 | 10.72 |

| Lab Sample ID | Lab File ID | Date Analyzed | Time Analyzed | S1 [a] RT | S1 [b] RT |
|---|---|---|---|---|---|
| OP19677-BS | GG020232.D | 03/05/07 | 13:43 | 10.72 | |
| OP19677-MB | GG020233.D | 03/05/07 | 14:02 | 10.72 | |
| ZZZZZZ | GG020234.D | 03/05/07 | 14:22 | 10.72 | |
| T16445-12 | GG020236.D | 03/05/07 | 15:01 | 10.71 | |
| GGG907-ECC827 | GG020238.D | 03/05/07 | 15:40 | 10.72 | 10.72 |

**Surrogate Compounds**

**S1** = 3,4-Dinitrotoluene

(a) Retention time from GC signal #1
(b) Retention time from GC signal #2

# Initial Calibration Summary



**Job Number:** T16445 **Sample:** GGG825-ICC825
**Account:** ALGC Accutest Laboratories Gulf Coast, Inc. **Lab FileID:** GG018282.D
**Project:** ITTXHO: Longhorn Army Ammunition Plant

Response Factor Report G1315B

```
Method       : C:\HPCHEM\1\METHODS\8330_EX.M (Chemstation Integrator)
Title        : Explosives by 8330
Last Update  : Thu Oct 19 11:32:41 2006
Response via : Initial Calibration

Calibration Files
20  =GG018279.D  100 =GG018280.D  250 =GG018281.D  500 =GG018282.D
750 =GG018283.D  1000=GG018284.D  2000=GG018285.D  ICV =GG018286.D
```

| Compound | 20 | 100 | 250 | 500 | 750 | 1000 | 2000 | ICV | Avg | %RSD |
|---|---|---|---|---|---|---|---|---|---|---|
| 1) HMX | 2.870 | 2.789 | 2.757 | 2.694 | 2.719 | 2.735 | 2.786 | | 2.764 E3 | 2.09 |
| 2) TNX | 5.916 | 6.424 | 6.486 | 6.331 | 6.453 | 6.468 | 6.587 | | 6.381 E3 | 3.43 |
| 3) DNX | 4.900 | 5.156 | 5.125 | 4.986 | 5.037 | 5.057 | 5.155 | | 5.059 E3 | 1.88 |
| 4) MNX | 4.909 | 4.991 | 4.972 | 4.807 | 4.886 | 4.901 | 4.995 | | 4.923 E3 | 1.38 |
| 5) RDX | 3.185 | 3.565 | 3.625 | 3.500 | 3.554 | 3.547 | 3.609 | | 3.512 E3 | 4.27 |
| 6) 1,3,5-Trinit | 7.763 | 7.813 | 7.689 | 7.436 | 7.595 | 7.612 | 7.763 | | 7.667 E3 | 1.70 |
| 7) 1,3-Dinitrob | 1.069 | 1.070 | 1.060 | 1.029 | 1.047 | 1.051 | 1.071 | | 1.057 E4 | 1.49 |
| 8) Tetryl | 6.130 | 6.168 | 6.180 | 6.004 | 6.091 | 6.096 | 6.221 | | 6.127 E3 | 1.17 |
| 9) Nitrobenzene | 7.057 | 7.032 | 7.019 | 6.708 | 6.915 | 6.920 | 7.082 | | 6.962 E3 | 1.85 |
| 10) 3,4-Dinitrot | 4.667 | 4.752 | 4.687 | 4.537 | 4.621 | 4.631 | 4.731 | | 4.661 E3 | 1.56 |
| 11) 2,4,6-Trinit | 7.275 | 7.409 | 7.373 | 7.143 | 7.282 | 7.301 | 7.456 | | 7.320 E3 | 1.42 |
| 12) 4-Amino-2,6- | 5.266 | 5.304 | 5.264 | 5.117 | 5.194 | 5.220 | 5.330 | | 5.242 E3 | 1.37 |
| 13) 2-Amino-4,6- | 7.249 | 7.203 | 7.187 | 7.006 | 7.130 | 7.155 | 7.311 | | 7.177 E3 | 1.35 |
| 14) 2,6-Dinitrot | 5.524 | 5.133 | 5.010 | 4.844 | 4.942 | 4.954 | 5.071 | | 5.068 E3 | 4.37 |
| 15) 2,4-Dinitrot | 1.149 | 1.009 | 0.992 | 0.958 | 0.976 | 0.978 | 0.999 | | 1.009 E4 | 6.36 |
| 16) o-Nitrotolue | 5.044 | 4.558 | 4.542 | 4.244 | 4.403 | 4.414 | 4.516 | | 4.532 E3 | 5.53 |
| 17) p-Nitrotolue | 4.102 | 3.815 | 3.790 | 3.596 | 3.734 | 3.734 | 3.831 | | 3.800 E3 | 4.06 |
| 18) m-Nitrotolue | 4.959 | 4.808 | 4.856 | 4.629 | 4.803 | 4.812 | 4.942 | | 4.830 E3 | 2.26 |

Signal #2

| Compound | 20 | 100 | 250 | 500 | 750 | 1000 | 2000 | ICV | Avg | %RSD |
|---|---|---|---|---|---|---|---|---|---|---|
| 1) HMX | 8.151 | 8.148 | 8.190 | 8.012 | 8.090 | 8.092 | 8.238 | | 8.132 E3 | 0.91 |
| 2) TNX | 0.956 | 0.980 | 0.995 | 0.969 | 0.984 | 0.985 | 1.001 | | 0.981 E4 | 1.55 |
| 3) DNX | 7.525 | 8.044 | 8.332 | 7.974 | 7.996 | 7.991 | 8.136 | | 8.000 E3 | 3.05 |
| 4) MNX | 7.756 | 7.781 | 7.940 | 7.696 | 7.742 | 7.746 | 7.895 | | 7.794 E3 | 1.14 |
| 5) RDX | 4.720 | 5.727 | 5.947 | 5.855 | 5.997 | 5.944 | 6.042 | | 5.748 E3 | 8.08 |
| 6) 1,3,5-Trinit | 1.479 | 1.619 | 1.553 | 1.513 | 1.538 | 1.540 | 1.572 | | 1.545 E4 | 2.85 |
| 7) 1,3-Dinitrob | 1.225 | 1.286 | 1.279 | 1.246 | 1.265 | 1.272 | 1.295 | | 1.267 E4 | 1.91 |
| 8) Tetryl | 1.037 | 1.106 | 1.123 | 1.092 | 1.106 | 1.105 | 1.129 | | 1.100 E4 | 2.76 |
| 9) Nitrobenzene | 3.263 | 3.394 | 3.343 | 3.176 | 3.205 | 3.190 | 3.274 | | 3.264 E3 | 2.50 |
| 10) 3,4-Dinitrot | 6.324 | 6.522 | 6.468 | 6.218 | 6.242 | 6.243 | 6.394 | | 6.344 E3 | 1.89 |
| 11) 2,4,6-Trinit | 1.070 | 1.106 | 1.085 | 1.048 | 1.060 | 1.064 | 1.089 | | 1.075 E4 | 1.85 |
| 12) 4-Amino-2,6- | 1.430 | 1.457 | 1.434 | 1.391 | 1.407 | 1.413 | 1.444 | | 1.425 E4 | 1.62 |
| 13) 2-Amino-4,6- | 1.240 | 1.240 | 1.201 | 1.171 | 1.189 | 1.194 | 1.223 | | 1.208 E4 | 2.20 |
| 14) 2,6-Dinitrot | 8.005 | 7.244 | 6.878 | 6.645 | 6.758 | 6.778 | 6.958 | | 7.038 E3 | 6.64 |
| 15) 2,4-Dinitrot | 1.102 | 0.930 | 0.906 | 0.880 | 0.888 | 0.892 | 0.911 | | 0.930 E4 | 8.36 |
| 16) o-Nitrotolue | 5.194 | 4.804 | 4.848 | 4.493 | 4.691 | 4.697 | 4.799 | | 4.789 E3 | 4.46 |
| 17) p-Nitrotolue | 7.934 | 7.544 | 7.631 | 7.143 | 7.472 | 7.477 | 7.640 | | 7.549 E3 | 3.15 |
| 18) m-Nitrotolue | 6.835 | 7.097 | 7.192 | 6.782 | 7.103 | 7.117 | 7.290 | | 7.060 E3 | 2.62 |

(#) = Out of Range ### Number of calibration levels exceeded format ###

8330_EX.M Fri Oct 20 16:25:52 2006

9.6

9

# Initial Calibration Verification



**Job Number:** T16445
**Account:** ALGC Accutest Laboratories Gulf Coast, Inc.
**Project:** ITTXHO: Longhorn Army Ammunition Plant

**Sample:** GGG825-ICV825
**Lab FileID:** GG018286.D

```
                    Evaluate Continuing Calibration Report

  Signal #1 : G:\HPCHEM\1\DATA\1018ODS\GG018286.D\dad1B.ch Vial: 10
  Signal #2 : G:\HPCHEM\1\DATA\1018ODS\GG018286.D\dad1A.ch
  Acq On    : 18-Oct-2006, 17:39:03                    Operator: MIKEE
  Sample    : ICV825-500                               Inst    : G1315B
  Misc      : OP18202,ggg825,1000,,,10,,water          Multiplr: 1.00
  IntFile Signal #1: EVENTS.E     IntFile Signal #2: EVENTS2.E

  Method       : C:\HPCHEM\1\METHODS\8330_EX.M (Chemstation Integrator)
  Title        : Explosives by 8330
  Last Update  : Thu Oct 19 11:32:41 2006
  Response via : Multiple Level Calibration

  Min. RRF     :   0.000  Min. Rel. Area :  50%  Max. R.T. Dev  0.50min
  Max. RRF Dev :  15%     Max. Rel. Area : 200%

         Compound                 Amount  Calc.    %Drift Area% Dev(min)RT Window
  ----------------------------------------------------------------------------
  1      HMX                     500.000 531.119     -6.2     0   0.00    3.83- 4.83
  2      TNX                                     -----------NA----------
  3      DNX                                     -----------NA----------
  4      MNX                                     -----------NA----------
  5      RDX                     500.000 507.091     -1.4     0   0.00    6.10- 7.10
  6      1,3,5-Trinitrobenzene   500.000 533.853     -6.8     0   0.00    8.41- 9.41
  7      1,3-Dinitrobenzene      500.000 523.924     -4.8     0   0.00   10.38-11.38
  8      Tetryl                  500.000 484.365      3.1     0   0.00   11.18-12.18
  9      Nitrobenzene            500.000 531.046     -6.2     0   0.00   11.86-12.86
 10 S    3,4-Dinitrotoluene                      -----------NA----------
 11      2,4,6-Trinitrotoluene   500.000 507.486     -1.5     0   0.00   13.56-14.56
 12      4-Amino-2,6-Dinitrotol  500.000 515.885     -3.2     0   0.00   14.25-15.25
 13      2-Amino-4,6-Dinitrotol  500.000 480.846      3.8     0   0.00   15.03-16.03
 14      2,6-Dinitrotoluene      500.000 496.634      0.7     0   0.00   16.01-17.01
 15      2,4-Dinitrotoluene      500.000 502.401     -0.5     0   0.00   16.52-17.52
 16      o-Nitrotoluene          500.000 501.204     -0.2     0   0.00   19.59-20.59
 17      p-Nitrotoluene          500.000 520.375     -4.1     0   0.00   20.92-21.92
 18      m-Nitrotoluene          500.000 509.118     -1.8     0   0.00   22.61-23.61

 *****   Signal #2   *****

  1      HMX                     500.000 537.899     -7.6     0   0.00    3.83- 4.83
  2      TNX                                     -----------NA----------
  3      DNX                                     -----------NA----------
  4      MNX                                     -----------NA----------
  5      RDX                     500.000 525.299     -5.1     0   0.00    6.10- 7.10
  6      1,3,5-Trinitrobenzene   500.000 533.889     -6.8     0   0.00    8.41- 9.41
  7      1,3-Dinitrobenzene      500.000 529.524     -5.9     0   0.00   10.38-11.38
  8      Tetryl                  500.000 489.295      2.1     0   0.00   11.18-12.18
  9      Nitrobenzene            500.000 531.782     -6.4     0   0.00   11.86-12.86
 10 S    3,4-Dinitrotoluene                      -----------NA----------
 11      2,4,6-Trinitrotoluene   500.000 505.844     -1.2     0   0.00   13.56-14.56
 12      4-Amino-2,6-Dinitrotol  500.000 516.203     -3.2     0   0.00   14.25-15.25
 13      2-Amino-4,6-Dinitrotol  500.000 480.458      3.9     0   0.00   15.03-16.03
 14      2,6-Dinitrotoluene      500.000 493.423      1.3     0   0.00   16.01-17.01
 15      2,4-Dinitrotoluene      500.000 499.987      0.0     0   0.00   16.52-17.52
 16      o-Nitrotoluene          500.000 503.639     -0.7     0   0.00   19.59-20.59
 17      p-Nitrotoluene          500.000 523.730     -4.7     0   0.00   20.92-21.92
 18      m-Nitrotoluene          500.000 512.492     -2.5     0   0.00   22.61-23.61
 ---------------------------------------------------------------------------
 ---------------------------------------------------------------------------
```

9.6
9

# Initial Calibration Verification



**Job Number:** T16445
**Account:** ALGC Accutest Laboratories Gulf Coast, Inc.
**Project:** ITTXHO: Longhorn Army Ammunition Plant
**Sample:** GGG825-ICV825
**Lab FileID:** GG018286.D

```
(#) = Out of Range                     SPCC's out = 0  CCC's out = 0
 GG018286.D 8330_EX.M        Fri Oct 20 16:26:22 2006
```

# Initial Calibration Verification



**Job Number:** T16445 **Sample:** GGG826-ICV825
**Account:** ALGC Accutest Laboratories Gulf Coast, Inc. **Lab FileID:** GG018300.D
**Project:** ITTXHO: Longhorn Army Ammunition Plant

```
                   Evaluate Continuing Calibration Report

  Signal #1 : G:\HPCHEM\1\DATA\1019ODS\GG018300.D\dad1B.ch Vial: 4
  Signal #2 : G:\HPCHEM\1\DATA\1019ODS\GG018300.D\dad1A.ch
  Acq On    : 19-Oct-2006, 13:44:13                     Operator: MIKEE
  Sample    : ICV825-500                                Inst    : G1315B
  Misc      : OP18222,ggg826,1000,,,10,,water           Multiplr: 1.00
  IntFile Signal #1: EVENTS.E    IntFile Signal #2: EVENTS2.E

  Method       : C:\HPCHEM\1\METHODS\8330_EX.M (Chemstation Integrator)
  Title        : Explosives by 8330
  Last Update  : Thu Oct 19 11:32:41 2006
  Response via : Multiple Level Calibration

  Min. RRF     :   0.000  Min. Rel. Area :  50%  Max. R.T. Dev  0.50min
  Max. RRF Dev :  15%     Max. Rel. Area : 200%

         Compound                  Amount  Calc.    %Drift Area% Dev(min)RT Window
  ----------------------------------------------------------------------------
  1      HMX                                  ----------NA----------
  2      TNX                     500.000 514.364     -2.9    0   0.00    4.15- 5.15
  3      DNX                     500.000 511.166     -2.2    0   0.00    4.58- 5.58
  4      MNX                     500.000 518.059     -3.6    0  -0.01    5.34- 6.34
  5      RDX                                  ----------NA----------
  6      1,3,5-Trinitrobenzene                ----------NA----------
  7      1,3-Dinitrobenzene                   ----------NA----------
  8      Tetryl                               ----------NA----------
  9      Nitrobenzene                         ----------NA----------
 10 S    3,4-Dinitrotoluene                   ----------NA----------
 11      2,4,6-Trinitrotoluene                ----------NA----------
 12      4-Amino-2,6-Dinitrotoluen            ----------NA----------
 13      2-Amino-4,6-Dinitrotoluen            ----------NA----------
 14      2,6-Dinitrotoluene                   ----------NA----------
 15      2,4-Dinitrotoluene                   ----------NA----------
 16      o-Nitrotoluene                       ----------NA----------
 17      p-Nitrotoluene                       ----------NA----------
 18      m-Nitrotoluene                       ----------NA----------

 *****   Signal #2   *****

  1      HMX                                  ----------NA----------
  2      TNX                     500.000 509.991     -2.0    0   0.00    4.15- 5.15
  3      DNX                     500.000 523.209     -4.6    0   0.00    4.58- 5.58
  4      MNX                     500.000 527.451     -5.5    0  -0.01    5.34- 6.34
  5      RDX                                  ----------NA----------
  6      1,3,5-Trinitrobenzene                ----------NA----------
  7      1,3-Dinitrobenzene                   ----------NA----------
  8      Tetryl                               ----------NA----------
  9      Nitrobenzene                         ----------NA----------
 10 S    3,4-Dinitrotoluene                   ----------NA----------
 11      2,4,6-Trinitrotoluene                ----------NA----------
 12      4-Amino-2,6-Dinitrotoluen            ----------NA----------
 13      2-Amino-4,6-Dinitrotoluen            ----------NA----------
 14      2,6-Dinitrotoluene                   ----------NA----------
 15      2,4-Dinitrotoluene                   ----------NA----------
 16      o-Nitrotoluene                       ----------NA----------
 17      p-Nitrotoluene                       ----------NA----------
 18      m-Nitrotoluene                       ----------NA----------
 ---------------------------------------------------------------------------
 ---------------------------------------------------------------------------
```

# Initial Calibration Verification



**Job Number:** T16445
**Account:** ALGC Accutest Laboratories Gulf Coast, Inc.
**Project:** ITTXHO: Longhorn Army Ammunition Plant
**Sample:** GGG826-ICV825
**Lab FileID:** GG018300.D

```
(#) = Out of Range                SPCC's out = 0  CCC's out = 0
 GG018286.D 8330_EX.M        Fri Oct 20 16:54:56 2006
```

# Initial Calibration Summary

Page 1 of 1

**Job Number:** T16445
**Account:** ALGC Accutest Laboratories Gulf Coast, Inc.
**Project:** ITTXHO: Longhorn Army Ammunition Plant
**Sample:** GGG827-ICC827
**Lab FileID:** GG018316.D

Response Factor Report G1315B

```
Method        : C:\HPCHEM\1\METHODS\8330_RP.M (Chemstation Integrator)
Title         : Explosives by 8330
Last Update   : Fri Oct 20 14:03:32 2006
Response via  : Initial Calibration

Calibration Files
20   =GG018313.D  100 =GG018314.D  250 =GG018315.D  500 =GG018316.D
750 =GG018317.D  1000=GG018318.D  2000=GG018319.D
```

| | Compound | 20 | 100 | 250 | 500 | 750 | 1000 | 2000 | Avg | | %RSD |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1) | TNX | 6.022 | 6.861 | 7.022 | 6.686 | 6.915 | 6.925 | 7.121 | 6.793 | E3 | 5.38 |
| 2) | HMX | 2.976 | 2.856 | 2.642 | 2.478 | 2.489 | 2.481 | 2.586 | 2.644 | E3 | 7.51 |
| 3) | DNX | 5.820 | 5.904 | 5.816 | 5.437 | 5.628 | 5.545 | 5.823 | 5.710 | E3 | 3.05 |
| 4) | MNX | 4.717 | 4.981 | 5.224 | 5.007 | 5.063 | 4.976 | 5.294 | 5.037 | E3 | 3.73 |
| 5) | 1,3,5-Trinitroben | 7.302 | 7.899 | 8.123 | 7.797 | 7.946 | 7.847 | 8.236 | 7.879 | E3 | 3.78 |
| 6) | RDX | 3.327 | 3.935 | 3.881 | 3.729 | 3.710 | 3.686 | 3.841 | 3.730 | E3 | 5.39 |
| 7) | 1,3-Dinitrobenzen | 1.122 | 1.117 | 1.144 | 1.096 | 1.117 | 1.113 | 1.146 | 1.122 | E4 | 1.56 |
| 8) | Nitrobenzene | 6.720 | 7.206 | 7.440 | 7.104 | 7.286 | 7.290 | 7.513 | 7.223 | E3 | 3.61 |
| 9) | 2,4,6-Trinitrotol | 7.126 | 7.674 | 7.812 | 7.517 | 7.651 | 7.587 | 7.941 | 7.615 | E3 | 3.39 |
| 10) | Tetryl | 5.119 | 5.755 | 6.124 | 6.105 | 6.006 | 5.862 | 6.470 | 5.920 | E3 | 7.10 |
| 11)S | 3,4-Dinitrotoluen | 4.973 | 4.941 | 4.969 | 4.829 | 4.912 | 4.883 | 5.055 | 4.938 | E3 | 1.46 |
| 12) | 2,6-Dinitrotoluen | 6.023 | 5.649 | 5.657 | 5.415 | 5.544 | 5.538 | 5.672 | 5.643 | E3 | 3.38 |
| 13) | 2,4-Dinitrotoluen | 1.200 | 1.036 | 1.034 | 0.995 | 1.012 | 1.007 | 1.038 | 1.046 | E4 | 6.68 |
| 14) | o-Nitrotoluene | 5.021 | 4.648 | 4.729 | 4.526 | 4.679 | 4.666 | 4.837 | 4.729 | E3 | 3.36 |
| 15) | p-Nitrotoluene | 4.036 | 3.890 | 3.967 | 3.762 | 3.919 | 3.914 | 4.051 | 3.934 | E3 | 2.49 |
| 16) | 4-Amino-2,6-Dinit | 5.109 | 5.368 | 5.518 | 5.300 | 5.406 | 5.380 | 5.621 | 5.386 | E3 | 3.01 |
| 17) | m-Nitrotoluene | 4.743 | 4.946 | 5.173 | 4.937 | 5.131 | 5.119 | 5.324 | 5.053 | E3 | 3.79 |
| 18) | 2-Amino-4,6-Dinit | 7.249 | 7.503 | 7.692 | 7.547 | 7.548 | 7.525 | 7.845 | 7.558 | E3 | 2.42 |

Signal #2

| | Compound | 20 | 100 | 250 | 500 | 750 | 1000 | 2000 | Avg | | %RSD |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1) | TNX | 0.828 | 1.032 | 1.066 | 1.024 | 1.037 | 1.032 | 1.073 | 1.013 | E4 | 8.25 |
| 2) | HMX | 8.967 | 9.716 | 9.270 | 8.345 | 8.192 | 8.095 | 8.326 | 8.702 | E3 | 7.15 |
| 3) | DNX | 0.786 | 1.108 | 1.019 | 0.937 | 0.919 | 0.897 | 0.935 | 0.943 | E4 | 10.65 |
| 4) | MNX | 7.457 | 8.346 | 8.580 | 8.147 | 8.087 | 7.895 | 8.399 | 8.130 | E3 | 4.58 |
| 5) | 1,3,5-Trinitroben | 1.449 | 1.617 | 1.667 | 1.594 | 1.616 | 1.593 | 1.673 | 1.601 | E4 | 4.64 |
| 6) | RDX | 6.077 | 6.386 | 6.563 | 6.283 | 6.229 | 6.181 | 6.460 | 6.311 | E3 | 2.67 |
| 7) | 1,3-Dinitrobenzen | 1.294 | 1.326 | 1.427 | 1.333 | 1.365 | 1.364 | 1.397 | 1.358 | E4 | 3.31 |
| 8) | Nitrobenzene | 3.190 | 3.096 | 3.823 | 3.281 | 3.391 | 3.385 | 3.476 | 3.378 | E3 | 6.96 |
| 9) | 2,4,6-Trinitrotol | 1.098 | 1.109 | 1.152 | 1.104 | 1.122 | 1.113 | 1.169 | 1.124 | E4 | 2.37 |
| 10) | Tetryl | 0.953 | 1.028 | 1.114 | 1.113 | 1.085 | 1.059 | 1.177 | 1.075 | E4 | 6.67 |
| 11)S | 3,4-Dinitrotoluen | 6.832 | 6.775 | 6.813 | 6.648 | 6.692 | 6.629 | 6.906 | 6.756 | E3 | 1.53 |
| 12) | 2,6-Dinitrotoluen | 8.344 | 7.760 | 7.758 | 7.423 | 7.578 | 7.556 | 7.765 | 7.740 | E3 | 3.83 |
| 13) | 2,4-Dinitrotoluen | 1.104 | 0.941 | 0.942 | 0.911 | 0.927 | 0.919 | 0.952 | 0.957 | E4 | 6.94 |
| 14) | o-Nitrotoluene | 3.189 | 2.755 | 2.867 | 2.791 | 2.895 | 2.880 | 3.025 | 2.915 | E3 | 5.09 |
| 15) | p-Nitrotoluene | 2.114 | 1.879 | 1.907 | 1.825 | 1.916 | 1.926 | 1.998 | 1.938 | E3 | 4.82 |
| 16) | 4-Amino-2,6-Dinit | 1.431 | 1.486 | 1.522 | 1.459 | 1.490 | 1.484 | 1.552 | 1.489 | E4 | 2.66 |
| 17) | m-Nitrotoluene | 2.353 | 2.391 | 2.516 | 2.444 | 2.546 | 2.567 | 2.681 | 2.500 | E3 | 4.52 |
| 18) | 2-Amino-4,6-Dinit | 1.233 | 1.258 | 1.276 | 1.258 | 1.253 | 1.255 | 1.311 | 1.263 | E4 | 1.92 |

(#) = Out of Range

8330_RP.M Mon Oct 23 13:34:29 2006

9.6

9

# Initial Calibration Verification



**Job Number:** T16445
**Account:** ALGC Accutest Laboratories Gulf Coast, Inc.
**Project:** ITTXHO: Longhorn Army Ammunition Plant

**Sample:** GGG827-ICV827
**Lab FileID:** GG018320.D

Evaluate Continuing Calibration Report

```
Signal #1 : G:\HPCHEM\1\DATA\1020RP\GG018320.D\dad1B.ch  Vial: 10
Signal #2 : G:\HPCHEM\1\DATA\1020RP\GG018320.D\dad1A.ch
Acq On    : 20-Oct-2006, 14:03:23                    Operator: MIKEE
Sample    : ICV827-250                               Inst    : G1315B
Misc      : OP18202,ggg827,1000,,,10,,water          Multiplr: 1.00
IntFile Signal #1: EVENTS.E     IntFile Signal #2: events2.e

Method        : C:\HPCHEM\1\METHODS\8330_RP.M (Chemstation Integrator)
Title         : Explosives by 8330
Last Update   : Fri Oct 20 14:03:32 2006
Response via  : Multiple Level Calibration

Min. RRF     :   0.000  Min. Rel. Area :  50%  Max. R.T. Dev  0.50min
Max. RRF Dev :  15%     Max. Rel. Area : 200%
```

| | Compound | Amount | Calc. | %Drift | Area% | Dev(min) | RT Window |
|---|---|---|---|---|---|---|---|
| 1 | TNX | 250.000 | 258.384 | -3.4 | 100 | 0.00 | 4.21- 5.21 |
| 2 | HMX | 250.000 | 260.989 | -4.4 | 104 | 0.00 | 4.69- 5.69 |
| 3 | DNX | 250.000 | 254.013 | -1.6 | 100 | 0.00 | 4.83- 5.83 |
| 4 | MNX | 250.000 | 255.142 | -2.1 | 98 | 0.00 | 5.66- 6.66 |
| 5 | 1,3,5-Trinitrobenzene | 250.000 | 264.789 | -5.9 | 103 | 0.00 | 6.12- 7.12 |
| 6 | RDX | 250.000 | 252.023 | -0.8 | 97 | 0.00 | 6.51- 7.51 |
| 7 | 1,3-Dinitrobenzene | 250.000 | 257.308 | -2.9 | 101 | 0.00 | 7.70- 8.70 |
| 8 | Nitrobenzene | 250.000 | 266.121 | -6.4 | 103 | 0.00 | 8.24- 9.24 |
| 9 | 2,4,6-Trinitrotoluene | 250.000 | 268.228 | -7.3 | 105 | 0.00 | 8.71- 9.71 |
| 10 | Tetryl | 250.000 | 205.504 | 17.8# | 79 | 0.00 | 9.41-10.41 |
| 11 S | 3,4-Dinitrotoluene | | | ----------NA---------- | | | |
| 12 | 2,6-Dinitrotoluene | 250.000 | 254.196 | -1.7 | 101 | 0.00 | 10.49-11.49 |
| 13 | 2,4-Dinitrotoluene | 250.000 | 244.946 | 2.0 | 99 | 0.00 | 10.95-11.95 |
| 14 | o-Nitrotoluene | 250.000 | 248.278 | 0.7 | 99 | 0.00 | 11.79-12.79 |
| 15 | p-Nitrotoluene | 250.000 | 258.872 | -3.5 | 103 | 0.00 | 12.45-13.45 |
| 16 | 4-Amino-2,6-Dinitrotol | 250.000 | 255.921 | -2.4 | 100 | 0.00 | 12.83-13.83 |
| 17 | m-Nitrotoluene | 250.000 | 252.478 | -1.0 | 99 | 0.00 | 13.29-14.29 |
| 18 | 2-Amino-4,6-Dinitrotol | 250.000 | 236.039 | 5.6 | 93 | 0.00 | 14.31-15.31 |

***** Signal #2 *****

| | Compound | Amount | Calc. | %Drift | Area% | Dev(min) | RT Window |
|---|---|---|---|---|---|---|---|
| 1 | TNX | 250.000 | 262.147 | -4.9 | 100 | 0.00 | 4.22- 5.22 |
| 2 | HMX | 250.000 | 276.033 | -10.4 | 104 | 0.00 | 4.69- 5.69 |
| 3 | DNX | 250.000 | 263.149 | -5.3 | 97 | 0.00 | 4.83- 5.83 |
| 4 | MNX | 250.000 | 255.967 | -2.4 | 97 | 0.00 | 5.66- 6.66 |
| 5 | 1,3,5-Trinitrobenzene | 250.000 | 265.613 | -6.2 | 102 | 0.00 | 6.12- 7.12 |
| 6 | RDX | 250.000 | 248.723 | 0.5 | 96 | 0.00 | 6.51- 7.51 |
| 7 | 1,3-Dinitrobenzene | 250.000 | 276.649 | -10.7 | 105 | 0.00 | 7.70- 8.70 |
| 8 | Nitrobenzene | 250.000 | 301.148 | -20.5# | 106 | 0.00 | 8.24- 9.24 |
| 9 | 2,4,6-Trinitrotoluene | 250.000 | 269.121 | -7.6 | 105 | 0.00 | 8.71- 9.71 |
| 10 | Tetryl | 250.000 | 203.173 | 18.7# | 78 | 0.00 | 9.41-10.41 |
| 11 S | 3,4-Dinitrotoluene | | | ----------NA---------- | | | |
| 12 | 2,6-Dinitrotoluene | 250.000 | 252.008 | -0.8 | 101 | 0.00 | 10.49-11.49 |
| 13 | 2,4-Dinitrotoluene | 250.000 | 241.694 | 3.3 | 98 | 0.00 | 10.95-11.95 |
| 14 | o-Nitrotoluene | 250.000 | 241.466 | 3.4 | 98 | 0.00 | 11.79-12.79 |
| 15 | p-Nitrotoluene | 250.000 | 250.555 | -0.2 | 102 | 0.00 | 12.46-13.46 |
| 16 | 4-Amino-2,6-Dinitrotol | 250.000 | 255.253 | -2.1 | 100 | 0.00 | 12.83-13.83 |
| 17 | m-Nitrotoluene | 250.000 | 250.572 | -0.2 | 100 | 0.00 | 13.28-14.28 |
| 18 | 2-Amino-4,6-Dinitrotol | 250.000 | 234.881 | 6.0 | 93 | 0.00 | 14.31-15.31 |

# Initial Calibration Verification



**Job Number:** T16445
**Account:** ALGC Accutest Laboratories Gulf Coast, Inc.
**Project:** ITTXHO: Longhorn Army Ammunition Plant
**Sample:** GGG827-ICV827
**Lab FileID:** GG018320.D

```
(#) = Out of Range                SPCC's out = 0  CCC's out = 0
 GG018315.D 8330_RP.M        Mon Oct 23 13:35:35 2006
```

# Continuing Calibration Summary



**Job Number:** T16445 **Sample:** GGG906-CC825
**Account:** ALGC Accutest Laboratories Gulf Coast, Inc. **Lab FileID:** GG020201.D
**Project:** ITTXHO: Longhorn Army Ammunition Plant

```
                     Evaluate Continuing Calibration Report

  Signal #1 : G:\DATA\0302ODS\GG020201.D\dad1B.ch          Vial: 2
  Signal #2 : G:\DATA\0302ODS\GG020201.D\dad1A.ch
  Acq On    : 02-Mar-2007, 16:17:48                     Operator: MIKEE
  Sample    : CC825-500                                 Inst    : G1315B
  Misc      : OP19677,ggg906,1000,,,10,,water           Multiplr: 1.00
  IntFile Signal #1: EVENTS.E     IntFile Signal #2: EVENTS2.E

  Method       : C:\HPCHEM\1\METHODS\8330_EX.M (Chemstation Integrator)
  Title        : Explosives by 8330
  Last Update  : Thu Mar 01 11:02:09 2007
  Response via : Multiple Level Calibration

  Min. RRF     :   0.000  Min. Rel. Area :  50%  Max. R.T. Dev  0.50min
  Max. RRF Dev :  15%     Max. Rel. Area : 200%
```

| | Compound | Amount | Calc. | %Drift | Area% | Dev(min) | RT Window |
|---|---|---|---|---|---|---|---|
| 1 | HMX | 500.000 | 490.559 | 1.9 | 101 | 0.00 | 3.86- 4.86 |
| 2 | TNX | 500.000 | 512.293 | -2.5 | 103 | -0.01 | 4.20- 5.20 |
| 3 | DNX | 500.000 | 511.151 | -2.2 | 104 | 0.00 | 4.60- 5.60 |
| 4 | MNX | 500.000 | 508.598 | -1.7 | 104 | 0.01 | 5.37- 6.37 |
| 5 | RDX | 500.000 | 518.998 | -3.8 | 104 | 0.00 | 6.15- 7.15 |
| 6 | 1,3,5-Trinitrobenzene | 500.000 | 498.455 | 0.3 | 103 | 0.02 | 8.43- 9.43 |
| 7 | 1,3-Dinitrobenzene | 500.000 | 498.190 | 0.4 | 102 | 0.02 | 10.43-11.43 |
| 8 | Tetryl | 500.000 | 498.475 | 0.3 | 102 | 0.03 | 11.21-12.21 |
| 9 | Nitrobenzene | 500.000 | 503.313 | -0.7 | 104 | 0.03 | 11.93-12.93 |
| 10 S | 3,4-Dinitrotoluene | 500.000 | 496.619 | 0.7 | 102 | 0.04 | 12.95-13.95 |
| 11 | 2,4,6-Trinitrotoluene | 500.000 | 503.597 | -0.7 | 103 | 0.04 | 13.60-14.60 |
| 12 | 4-Amino-2,6-Dinitrotol | 500.000 | 496.441 | 0.7 | 102 | 0.05 | 14.37-15.37 |
| 13 | 2-Amino-4,6-Dinitrotol | 500.000 | 500.727 | -0.1 | 103 | 0.05 | 15.14-16.14 |
| 14 | 2,6-Dinitrotoluene | 500.000 | 510.258 | -2.1 | 107 | 0.05 | 16.10-17.10 |
| 15 | 2,4-Dinitrotoluene | 500.000 | 480.817 | 3.8 | 101 | 0.05 | 16.60-17.60 |
| 16 | o-Nitrotoluene | 500.000 | 497.302 | 0.5 | 106 | 0.06 | 19.73-20.73 |
| 17 | p-Nitrotoluene | 500.000 | 500.449 | -0.1 | 106 | 0.06 | 21.06-22.06 |
| 18 | m-Nitrotoluene | 500.000 | 506.087 | -1.2 | 106 | 0.07 | 22.76-23.76 |

***** Signal #2 *****

| | Compound | Amount | Calc. | %Drift | Area% | Dev(min) | RT Window |
|---|---|---|---|---|---|---|---|
| 1 | HMX | 500.000 | 500.092 | -0.0 | 102 | 0.00 | 3.86- 4.86 |
| 2 | TNX | 500.000 | 509.529 | -1.9 | 103 | 0.00 | 4.18- 5.18 |
| 3 | DNX | 500.000 | 520.538 | -4.1 | 104 | 0.00 | 4.60- 5.60 |
| 4 | MNX | 500.000 | 521.239 | -4.2 | 106 | 0.01 | 5.37- 6.37 |
| 5 | RDX | 500.000 | 566.452 | -13.3 | 111 | 0.00 | 6.15- 7.15 |
| 6 | 1,3,5-Trinitrobenzene | 500.000 | 505.722 | -1.1 | 103 | 0.02 | 8.43- 9.43 |
| 7 | 1,3-Dinitrobenzene | 500.000 | 502.475 | -0.5 | 102 | 0.02 | 10.43-11.43 |
| 8 | Tetryl | 500.000 | 507.037 | -1.4 | 102 | 0.03 | 11.21-12.21 |
| 9 | Nitrobenzene | 500.000 | 499.803 | 0.0 | 103 | 0.03 | 11.93-12.93 |
| 10 S | 3,4-Dinitrotoluene | 500.000 | 495.718 | 0.9 | 101 | 0.04 | 12.95-13.95 |
| 11 | 2,4,6-Trinitrotoluene | 500.000 | 500.992 | -0.2 | 103 | 0.04 | 13.60-14.60 |
| 12 | 4-Amino-2,6-Dinitrotol | 500.000 | 497.188 | 0.6 | 102 | 0.05 | 14.37-15.37 |
| 13 | 2-Amino-4,6-Dinitrotol | 500.000 | 499.032 | 0.2 | 103 | 0.05 | 15.14-16.14 |
| 14 | 2,6-Dinitrotoluene | 500.000 | 496.978 | 0.6 | 105 | 0.05 | 16.10-17.10 |
| 15 | 2,4-Dinitrotoluene | 500.000 | 472.110 | 5.6 | 100 | 0.05 | 16.60-17.60 |
| 16 | o-Nitrotoluene | 500.000 | 489.795 | 2.0 | 104 | 0.05 | 19.73-20.73 |
| 17 | p-Nitrotoluene | 500.000 | 496.698 | 0.7 | 105 | 0.06 | 21.06-22.06 |
| 18 | m-Nitrotoluene | 500.000 | 503.963 | -0.8 | 105 | 0.07 | 22.77-23.77 |

# Continuing Calibration Summary



**Job Number:** T16445
**Account:** ALGC Accutest Laboratories Gulf Coast, Inc.
**Project:** ITTXHO: Longhorn Army Ammunition Plant
**Sample:** GGG906-CC825
**Lab FileID:** GG020201.D

```
(#) = Out of Range                 SPCC's out = 0  CCC's out = 0
 GG018282.D 8330_EX.M        Mon Mar 05 11:42:29 2007
```

# Continuing Calibration Summary



**Job Number:** T16445
**Account:** ALGC Accutest Laboratories Gulf Coast, Inc.
**Project:** ITTXHO: Longhorn Army Ammunition Plant
**Sample:** GGG906-CC825
**Lab FileID:** GG020212.D

```
                   Evaluate Continuing Calibration Report

  Signal #1 : G:\DATA\0302ODS\GG020212.D\dad1B.ch          Vial: 3
  Signal #2 : G:\DATA\0302ODS\GG020212.D\dad1A.ch
  Acq On    : 02-Mar-2007, 21:07:57                    Operator: MIKEE
  Sample    : CC825-1000                               Inst    : G1315B
  Misc      : OP19677,ggg906,1000,,,10,,water          Multiplr: 1.00
  IntFile Signal #1: EVENTS.E     IntFile Signal #2: EVENTS2.E

  Method       : C:\HPCHEM\1\METHODS\8330_EX.M (Chemstation Integrator)
  Title        : Explosives by 8330
  Last Update  : Thu Mar 01 11:02:09 2007
  Response via : Multiple Level Calibration

  Min. RRF     :   0.000  Min. Rel. Area :  50%  Max. R.T. Dev  0.50min
  Max. RRF Dev :  15%     Max. Rel. Area : 200%
```

| | Compound | Amount | Calc. | %Drift | Area% | Dev(min) | RT Window |
|---|---|---|---|---|---|---|---|
| 1 | HMX | 1000.000 | 969.184 | 3.1 | 98 | 0.00 | 3.86- 4.86 |
| 2 | TNX | 1000.000 | 1012.847 | -1.3 | 100 | -0.02 | 4.20- 5.20 |
| 3 | DNX | 1000.000 | 1011.041 | -1.1 | 101 | 0.00 | 4.60- 5.60 |
| 4 | MNX | 1000.000 | 1001.768 | -0.2 | 101 | 0.00 | 5.37- 6.37 |
| 5 | RDX | 1000.000 | 1012.522 | -1.3 | 100 | -0.01 | 6.15- 7.15 |
| 6 | 1,3,5-Trinitrobenzene | 1000.000 | 982.133 | 1.8 | 99 | 0.00 | 8.43- 9.43 |
| 7 | 1,3-Dinitrobenzene | 1000.000 | 981.873 | 1.8 | 99 | 0.00 | 10.43-11.43 |
| 8 | Tetryl | 1000.000 | 979.286 | 2.1 | 98 | 0.00 | 11.21-12.21 |
| 9 | Nitrobenzene | 1000.000 | 995.199 | 0.5 | 100 | 0.00 | 11.93-12.93 |
| 10 S | 3,4-Dinitrotoluene | 1000.000 | 971.158 | 2.9 | 98 | 0.00 | 12.95-13.95 |
| 11 | 2,4,6-Trinitrotoluene | 1000.000 | 991.752 | 0.8 | 99 | 0.00 | 13.60-14.60 |
| 12 | 4-Amino-2,6-Dinitrotol | 1000.000 | 975.490 | 2.5 | 98 | 0.00 | 14.37-15.37 |
| 13 | 2-Amino-4,6-Dinitrotol | 1000.000 | 987.191 | 1.3 | 99 | 0.00 | 15.14-16.14 |
| 14 | 2,6-Dinitrotoluene | 1000.000 | 995.657 | 0.4 | 102 | 0.00 | 16.10-17.10 |
| 15 | 2,4-Dinitrotoluene | 1000.000 | 946.550 | 5.3 | 98 | 0.00 | 16.60-17.60 |
| 16 | o-Nitrotoluene | 1000.000 | 961.637 | 3.8 | 99 | -0.01 | 19.73-20.73 |
| 17 | p-Nitrotoluene | 1000.000 | 975.200 | 2.5 | 99 | -0.01 | 21.06-22.06 |
| 18 | m-Nitrotoluene | 1000.000 | 997.451 | 0.3 | 100 | 0.00 | 22.76-23.76 |

***** Signal #2 *****

| | Compound | Amount | Calc. | %Drift | Area% | Dev(min) | RT Window |
|---|---|---|---|---|---|---|---|
| 1 | HMX | 1000.000 | 984.283 | 1.6 | 99 | 0.00 | 3.86- 4.86 |
| 2 | TNX | 1000.000 | 1002.891 | -0.3 | 100 | 0.00 | 4.18- 5.18 |
| 3 | DNX | 1000.000 | 1012.877 | -1.3 | 101 | 0.00 | 4.60- 5.60 |
| 4 | MNX | 1000.000 | 1004.320 | -0.4 | 101 | 0.00 | 5.37- 6.37 |
| 5 | RDX | 1000.000 | 1044.793 | -4.5 | 101 | -0.02 | 6.15- 7.15 |
| 6 | 1,3,5-Trinitrobenzene | 1000.000 | 984.579 | 1.5 | 99 | 0.00 | 8.43- 9.43 |
| 7 | 1,3-Dinitrobenzene | 1000.000 | 989.010 | 1.1 | 99 | 0.00 | 10.43-11.43 |
| 8 | Tetryl | 1000.000 | 997.573 | 0.2 | 99 | 0.00 | 11.21-12.21 |
| 9 | Nitrobenzene | 1000.000 | 992.439 | 0.8 | 102 | 0.00 | 11.93-12.93 |
| 10 S | 3,4-Dinitrotoluene | 1000.000 | 962.803 | 3.7 | 98 | 0.00 | 12.95-13.95 |
| 11 | 2,4,6-Trinitrotoluene | 1000.000 | 983.229 | 1.7 | 99 | 0.00 | 13.60-14.60 |
| 12 | 4-Amino-2,6-Dinitrotol | 1000.000 | 974.885 | 2.5 | 98 | 0.00 | 14.37-15.37 |
| 13 | 2-Amino-4,6-Dinitrotol | 1000.000 | 978.179 | 2.2 | 99 | 0.00 | 15.14-16.14 |
| 14 | 2,6-Dinitrotoluene | 1000.000 | 974.861 | 2.5 | 101 | 0.00 | 16.10-17.10 |
| 15 | 2,4-Dinitrotoluene | 1000.000 | 935.023 | 6.5 | 97 | 0.00 | 16.60-17.60 |
| 16 | o-Nitrotoluene | 1000.000 | 961.820 | 3.8 | 98 | -0.01 | 19.73-20.73 |
| 17 | p-Nitrotoluene | 1000.000 | 982.213 | 1.8 | 99 | 0.00 | 21.06-22.06 |
| 18 | m-Nitrotoluene | 1000.000 | 1002.440 | -0.2 | 99 | -0.01 | 22.77-23.77 |

# Continuing Calibration Summary



**Job Number:** T16445
**Account:** ALGC Accutest Laboratories Gulf Coast, Inc.
**Project:** ITTXHO: Longhorn Army Ammunition Plant
**Sample:** GGG906-CC825
**Lab FileID:** GG020212.D

```
    (#) = Out of Range                SPCC's out = 0  CCC's out = 0
     GG018284.D 8330_EX.M        Mon Mar 05 11:42:13 2007
```

# Continuing Calibration Summary



**Job Number:** T16445 **Sample:** GGG906-CC825
**Account:** ALGC Accutest Laboratories Gulf Coast, Inc. **Lab FileID:** GG020224.D
**Project:** ITTXHO: Longhorn Army Ammunition Plant

```
                  Evaluate Continuing Calibration Report

  Signal #1 : G:\DATA\0302ODS\GG020224.D\dad1B.ch          Vial: 3
  Signal #2 : G:\DATA\0302ODS\GG020224.D\dad1A.ch
  Acq On    : 03-Mar-2007, 02:38:33                    Operator: MIKEE
  Sample    : CC825-1000                               Inst    : G1315B
  Misc      : OP19677,ggg906,1000,,,10,,water          Multiplr: 1.00
  IntFile Signal #1: EVENTS.E     IntFile Signal #2: EVENTS2.E

  Method       : C:\HPCHEM\1\METHODS\8330_EX.M (Chemstation Integrator)
  Title        : Explosives by 8330
  Last Update  : Thu Mar 01 11:02:09 2007
  Response via : Multiple Level Calibration

  Min. RRF     :   0.000  Min. Rel. Area :  50%  Max. R.T. Dev  0.50min
  Max. RRF Dev :  15%     Max. Rel. Area : 200%

         Compound                   Amount  Calc.    %Drift Area% Dev(min)RT Window
  ----------------------------------------------------------------------------
  1      HMX                     1000.000 963.991      3.6   97   0.00    3.86- 4.86
  2      TNX                     1000.000 1010.267    -1.0  100  -0.02    4.20- 5.20
  3      DNX                     1000.000 1005.452    -0.5  101   0.00    4.60- 5.60
  4      MNX                     1000.000 1000.098    -0.0  100   0.00    5.37- 6.37
  5      RDX                     1000.000 1025.240    -2.5  102  -0.02    6.15- 7.15
  6      1,3,5-Trinitrobenzene   1000.000 993.055     0.7  100   0.00    8.43- 9.43
  7      1,3-Dinitrobenzene      1000.000 980.619     1.9   99  -0.01   10.43-11.43
  8      Tetryl                  1000.000 974.910     2.5   98  -0.02   11.21-12.21
  9      Nitrobenzene            1000.000 982.824     1.7   99  -0.01   11.93-12.93
 10 S    3,4-Dinitrotoluene      1000.000 957.890     4.2   96  -0.01   12.95-13.95
 11      2,4,6-Trinitrotoluene   1000.000 980.868     1.9   98  -0.01   13.60-14.60
 12      4-Amino-2,6-Dinitrotol  1000.000 962.421     3.8   97   0.00   14.37-15.37
 13      2-Amino-4,6-Dinitrotol  1000.000 1009.138    -0.9  101   0.00   15.14-16.14
 14      2,6-Dinitrotoluene      1000.000 1335.440   -33.5# 137   0.00   16.10-17.10
 15      2,4-Dinitrotoluene      1000.000 1096.840    -9.7  113  -0.01   16.60-17.60
 16      o-Nitrotoluene          1000.000 979.988     2.0  101  -0.02   19.73-20.73
 17      p-Nitrotoluene          1000.000 1001.774    -0.2  102  -0.02   21.06-22.06
 18      m-Nitrotoluene          1000.000 1009.574    -1.0  101  -0.02   22.76-23.76

 *****   Signal #2    *****

  1      HMX                     1000.000 940.821     5.9   95   0.00    3.86- 4.86
  2      TNX                     1000.000 949.976     5.0   95   0.00    4.18- 5.18
  3      DNX                     1000.000 962.122     3.8   96   0.00    4.60- 5.60
  4      MNX                     1000.000 1000.037    -0.0  101   0.00    5.37- 6.37
  5      RDX                     1000.000 1048.505    -4.9  101  -0.02    6.15- 7.15
  6      1,3,5-Trinitrobenzene   1000.000 992.257     0.8  100   0.00    8.43- 9.43
  7      1,3-Dinitrobenzene      1000.000 989.715     1.0   99  -0.01   10.43-11.43
  8      Tetryl                  1000.000 995.610     0.4   99  -0.02   11.21-12.21
  9      Nitrobenzene            1000.000 966.310     3.4   99  -0.01   11.93-12.93
 10 S    3,4-Dinitrotoluene      1000.000 952.955     4.7   97  -0.01   12.95-13.95
 11      2,4,6-Trinitrotoluene   1000.000 974.813     2.5   98  -0.01   13.60-14.60
 12      4-Amino-2,6-Dinitrotol  1000.000 968.590     3.1   98   0.00   14.37-15.37
 13      2-Amino-4,6-Dinitrotol  1000.000 981.214     1.9   99   0.00   15.14-16.14
 14      2,6-Dinitrotoluene      1000.000 1062.649    -6.3  110   0.00   16.10-17.10
 15      2,4-Dinitrotoluene      1000.000 991.035     0.9  103  -0.01   16.60-17.60
 16      o-Nitrotoluene          1000.000 973.475     2.7   99  -0.02   19.73-20.73
 17      p-Nitrotoluene          1000.000 993.006     0.7  100  -0.02   21.06-22.06
 18      m-Nitrotoluene          1000.000 1007.492    -0.7  100  -0.03   22.77-23.77
 ---------------------------------------------------------------------------
 ---------------------------------------------------------------------------
```

9.6

9

# Continuing Calibration Summary



**Job Number:** T16445
**Account:** ALGC Accutest Laboratories Gulf Coast, Inc.
**Project:** ITTXHO: Longhorn Army Ammunition Plant
**Sample:** GGG906-CC825
**Lab FileID:** GG020224.D

```
(#) = Out of Range                SPCC's out = 0  CCC's out = 0
 GG018284.D 8330_EX.M         Mon Mar 05 11:42:13 2007
```

# Continuing Calibration Summary



**Job Number:** T16445
**Account:** ALGC Accutest Laboratories Gulf Coast, Inc.
**Project:** ITTXHO: Longhorn Army Ammunition Plant

**Sample:** GGG907-CC827
**Lab FileID:** GG020231.D

Evaluate Continuing Calibration Report

```
Signal #1 : G:\DATA\0305RP\GG020231.D\dad1B.ch          Vial: 2
Signal #2 : G:\DATA\0305RP\GG020231.D\dad1A.ch
Acq On    : 05-Mar-2007, 13:23:34                    Operator: MIKEE
Sample    : CC827-500                                Inst    : G1315B
Misc      : OP19677,ggg907,1000,,,10,,water          Multiplr: 1.00
IntFile Signal #1: EVENTS.E     IntFile Signal #2: events2.e

Method       : C:\HPCHEM\1\METHODS\8330_RP.M (Chemstation Integrator)
Title        : Explosives by 8330
Last Update  : Fri Jan 26 08:35:20 2007
Response via : Multiple Level Calibration

Min. RRF     :   0.000  Min. Rel. Area :  50%  Max. R.T. Dev  0.50min
Max. RRF Dev :  15%     Max. Rel. Area : 200%
```

| | | Compound | Amount | Calc. | %Drift | Area% | Dev(min) | RT Window |
|---|---|---|---|---|---|---|---|---|
| 1 | | TNX | 500.000 | 551.245 | -10.2 | 112 | 0.02 | 4.24- 5.24 |
| 2 | | HMX | 500.000 | 527.482 | -5.5 | 113 | 0.00 | 4.75- 5.75 |
| 3 | | DNX | 500.000 | 526.884 | -5.4 | 111 | 0.01 | 4.87- 5.87 |
| 4 | | MNX | 500.000 | 525.950 | -5.2 | 106 | 0.00 | 5.72- 6.72 |
| 5 | | 1,3,5-Trinitrobenzene | 500.000 | 507.541 | -1.5 | 103 | 0.00 | 6.17- 7.17 |
| 6 | | RDX | 500.000 | 498.345 | 0.3 | 100 | 0.02 | 6.56- 7.56 |
| 7 | | 1,3-Dinitrobenzene | 500.000 | 495.147 | 1.0 | 101 | 0.00 | 7.78- 8.78 |
| 8 | | Nitrobenzene | 500.000 | 509.807 | -2.0 | 104 | 0.00 | 8.29- 9.29 |
| 9 | | 2,4,6-Trinitrotoluene | 500.000 | 506.824 | -1.4 | 103 | -0.01 | 8.80- 9.80 |
| 10 | | Tetryl | 500.000 | 535.862 | -7.2 | 104 | 0.00 | 9.52-10.52 |
| 11 | S | 3,4-Dinitrotoluene | 500.000 | 492.695 | 1.5 | 101 | 0.00 | 10.21-11.21 |
| 12 | | 2,6-Dinitrotoluene | 500.000 | 489.618 | 2.1 | 102 | -0.02 | 10.59-11.59 |
| 13 | | 2,4-Dinitrotoluene | 500.000 | 483.678 | 3.3 | 102 | -0.02 | 11.06-12.06 |
| 14 | | o-Nitrotoluene | 500.000 | 502.970 | -0.6 | 105 | -0.01 | 11.86-12.86 |
| 15 | | p-Nitrotoluene | 500.000 | 503.359 | -0.7 | 105 | -0.01 | 12.53-13.53 |
| 16 | | 4-Amino-2,6-Dinitrotol | 500.000 | 502.155 | -0.4 | 102 | -0.03 | 12.95-13.95 |
| 17 | | m-Nitrotoluene | 500.000 | 523.547 | -4.7 | 107 | -0.02 | 13.38-14.38 |
| 18 | | 2-Amino-4,6-Dinitrotol | 500.000 | 503.929 | -0.8 | 101 | -0.03 | 14.45-15.45 |

***** Signal #2 *****

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 1 | | TNX | 500.000 | 539.038 | -7.8 | 107 | 0.02 | 4.24- 5.24 |
| 2 | | HMX | 500.000 | 501.388 | -0.3 | 105 | 0.00 | 4.75- 5.75 |
| 3 | | DNX | 500.000 | 520.169 | -4.0 | 105 | 0.01 | 4.87- 5.87 |
| 4 | | MNX | 500.000 | 520.287 | -4.1 | 104 | 0.00 | 5.72- 6.72 |
| 5 | | 1,3,5-Trinitrobenzene | 500.000 | 508.259 | -1.7 | 102 | 0.00 | 6.17- 7.17 |
| 6 | | RDX | 500.000 | 496.557 | 0.7 | 100 | 0.02 | 6.56- 7.56 |
| 7 | | 1,3-Dinitrobenzene | 500.000 | 499.335 | 0.1 | 102 | 0.00 | 7.78- 8.78 |
| 8 | | Nitrobenzene | 500.000 | 521.041 | -4.2 | 107 | 0.00 | 8.29- 9.29 |
| 9 | | 2,4,6-Trinitrotoluene | 500.000 | 510.092 | -2.0 | 104 | -0.01 | 8.80- 9.80 |
| 10 | | Tetryl | 500.000 | 533.664 | -6.7 | 103 | 0.00 | 9.52-10.52 |
| 11 | S | 3,4-Dinitrotoluene | 500.000 | 488.383 | 2.3 | 99 | 0.00 | 10.21-11.21 |
| 12 | | 2,6-Dinitrotoluene | 500.000 | 487.517 | 2.5 | 102 | -0.02 | 10.59-11.59 |
| 13 | | 2,4-Dinitrotoluene | 500.000 | 483.800 | 3.2 | 102 | -0.02 | 11.06-12.06 |
| 14 | | o-Nitrotoluene | 500.000 | 519.246 | -3.8 | 108 | -0.01 | 11.86-12.86 |
| 15 | | p-Nitrotoluene | 500.000 | 515.868 | -3.2 | 110 | 0.00 | 12.54-13.54 |
| 16 | | 4-Amino-2,6-Dinitrotol | 500.000 | 499.988 | 0.0 | 102 | -0.03 | 12.95-13.95 |
| 17 | | m-Nitrotoluene | 500.000 | 538.963 | -7.8 | 110 | -0.02 | 13.37-14.37 |
| 18 | | 2-Amino-4,6-Dinitrotol | 500.000 | 499.905 | 0.0 | 100 | -0.03 | 14.45-15.45 |

9.6

9

# Continuing Calibration Summary



**Job Number:** T16445
**Account:** ALGC Accutest Laboratories Gulf Coast, Inc.
**Project:** ITTXHO: Longhorn Army Ammunition Plant
**Sample:** GGG907-CC827
**Lab FileID:** GG020231.D

```
    (#) = Out of Range                SPCC's out = 0  CCC's out = 0
     GG018316.D 8330_RP.M        Tue Mar 06 10:57:51 2007
```

# Continuing Calibration Summary



**Job Number:** T16445 **Sample:** GGG907-ECC827
**Account:** ALGC Accutest Laboratories Gulf Coast, Inc. **Lab FileID:** GG020238.D
**Project:** ITTXHO: Longhorn Army Ammunition Plant

```
                    Evaluate Continuing Calibration Report

Signal #1 : G:\DATA\0305RP\GG020238.D\dad1B.ch           Vial: 3
Signal #2 : G:\DATA\0305RP\GG020238.D\dad1A.ch
Acq On    : 05-Mar-2007, 15:40:35                    Operator: MIKEE
Sample    : ECC827-1000                              Inst    : G1315B
Misc      : OP19677,ggg907,1000,,,10,,water          Multiplr: 1.00
IntFile Signal #1: EVENTS.E     IntFile Signal #2: events2.e

Method       : C:\HPCHEM\1\METHODS\8330_RP.M (Chemstation Integrator)
Title        : Explosives by 8330
Last Update  : Fri Jan 26 08:35:20 2007
Response via : Multiple Level Calibration

Min. RRF     :   0.000  Min. Rel. Area :  50%  Max. R.T. Dev  0.50min
Max. RRF Dev :  15%     Max. Rel. Area : 200%
```

| | Compound | Amount | Calc. | %Drift | Area% | Dev(min) | RT Window |
|---|---|---|---|---|---|---|---|
| 1 | TNX | 1000.000 | 1064.078 | -6.4 | 104 | 0.02 | 4.24- 5.24 |
| 2 | HMX | 1000.000 | 1064.872 | -6.5 | 113 | 0.00 | 4.75- 5.75 |
| 3 | DNX | 1000.000 | 1029.858 | -3.0 | 106 | 0.00 | 4.87- 5.87 |
| 4 | MNX | 1000.000 | 1052.110 | -5.2 | 107 | 0.00 | 5.72- 6.72 |
| 5 | 1,3,5-Trinitrobenzene | 1000.000 | 1020.840 | -2.1 | 102 | 0.00 | 6.17- 7.17 |
| 6 | RDX | 1000.000 | 1020.894 | -2.1 | 103 | 0.02 | 6.56- 7.56 |
| 7 | 1,3-Dinitrobenzene | 1000.000 | 1005.302 | -0.5 | 101 | 0.00 | 7.78- 8.78 |
| 8 | Nitrobenzene | 1000.000 | 1031.078 | -3.1 | 102 | 0.00 | 8.29- 9.29 |
| 9 | 2,4,6-Trinitrotoluene | 1000.000 | 1033.117 | -3.3 | 104 | -0.01 | 8.80- 9.80 |
| 10 | Tetryl | 1000.000 | 1104.790 | -10.5 | 112 | 0.00 | 9.52-10.52 |
| 11 S | 3,4-Dinitrotoluene | 1000.000 | 1016.218 | -1.6 | 103 | 0.00 | 10.21-11.21 |
| 12 | 2,6-Dinitrotoluene | 1000.000 | 998.411 | 0.2 | 102 | -0.02 | 10.59-11.59 |
| 13 | 2,4-Dinitrotoluene | 1000.000 | 987.663 | 1.2 | 103 | -0.02 | 11.06-12.06 |
| 14 | o-Nitrotoluene | 1000.000 | 1040.619 | -4.1 | 105 | -0.01 | 11.86-12.86 |
| 15 | p-Nitrotoluene | 1000.000 | 1034.751 | -3.5 | 104 | -0.01 | 12.53-13.53 |
| 16 | 4-Amino-2,6-Dinitrotol | 1000.000 | 1018.262 | -1.8 | 102 | -0.02 | 12.95-13.95 |
| 17 | m-Nitrotoluene | 1000.000 | 1063.626 | -6.4 | 105 | -0.02 | 13.38-14.38 |
| 18 | 2-Amino-4,6-Dinitrotol | 1000.000 | 1018.025 | -1.8 | 102 | -0.02 | 14.45-15.45 |

***** Signal #2 *****

| | Compound | Amount | Calc. | %Drift | Area% | Dev(min) | RT Window |
|---|---|---|---|---|---|---|---|
| 1 | TNX | 1000.000 | 1065.753 | -6.6 | 105 | 0.02 | 4.24- 5.24 |
| 2 | HMX | 1000.000 | 959.987 | 4.0 | 103 | 0.00 | 4.75- 5.75 |
| 3 | DNX | 1000.000 | 1023.085 | -2.3 | 108 | 0.01 | 4.87- 5.87 |
| 4 | MNX | 1000.000 | 1036.881 | -3.7 | 107 | 0.00 | 5.72- 6.72 |
| 5 | 1,3,5-Trinitrobenzene | 1000.000 | 1018.352 | -1.8 | 102 | 0.00 | 6.17- 7.17 |
| 6 | RDX | 1000.000 | 995.036 | 0.5 | 102 | 0.02 | 6.56- 7.56 |
| 7 | 1,3-Dinitrobenzene | 1000.000 | 1003.575 | -0.4 | 100 | 0.00 | 7.78- 8.78 |
| 8 | Nitrobenzene | 1000.000 | 1035.575 | -3.6 | 103 | 0.00 | 8.29- 9.29 |
| 9 | 2,4,6-Trinitrotoluene | 1000.000 | 1043.825 | -4.4 | 105 | -0.01 | 8.80- 9.80 |
| 10 | Tetryl | 1000.000 | 1097.433 | -9.7 | 111 | 0.00 | 9.52-10.52 |
| 11 S | 3,4-Dinitrotoluene | 1000.000 | 1002.293 | -0.2 | 102 | 0.00 | 10.21-11.21 |
| 12 | 2,6-Dinitrotoluene | 1000.000 | 991.509 | 0.8 | 102 | -0.02 | 10.59-11.59 |
| 13 | 2,4-Dinitrotoluene | 1000.000 | 990.702 | 0.9 | 103 | -0.02 | 11.06-12.06 |
| 14 | o-Nitrotoluene | 1000.000 | 1071.751 | -7.2 | 108 | -0.01 | 11.86-12.86 |
| 15 | p-Nitrotoluene | 1000.000 | 1073.626 | -7.4 | 108 | 0.00 | 12.54-13.54 |
| 16 | 4-Amino-2,6-Dinitrotol | 1000.000 | 1006.760 | -0.7 | 101 | -0.02 | 12.95-13.95 |
| 17 | m-Nitrotoluene | 1000.000 | 1093.803 | -9.4 | 107 | -0.02 | 13.37-14.37 |
| 18 | 2-Amino-4,6-Dinitrotol | 1000.000 | 1006.963 | -0.7 | 101 | -0.02 | 14.45-15.45 |

# Continuing Calibration Summary



**Job Number:** T16445 **Sample:** GGG907-ECC827
**Account:** ALGC Accutest Laboratories Gulf Coast, Inc. **Lab FileID:** GG020238.D
**Project:** ITTXHO: Longhorn Army Ammunition Plant

```
(#) = Out of Range                  SPCC's out = 0  CCC's out = 0
 GG018318.D 8330_RP.M        Tue Mar 06 10:58:20 2007
```

# General Chemistry

## QC Data Summaries

(Accutest Laboratories Southeast, Inc.)

Includes the following where applicable:

- Method Blank and Blank Spike Summaries
- Duplicate Summaries
- Matrix Spike Summaries
- Instrument Runlogs/QC

METHOD BLANK AND SPIKE RESULTS SUMMARY
GENERAL CHEMISTRY

Login Number: T16445
Account: ALGC - Accutest Laboratories Gulf Coast, Inc.
Project: ITTXHO: Longhorn Army Ammunition Plant

| Analyte | Batch ID | RL | MB Result | Units | Spike Amount | BSP Result | BSP %Recov | QC Limits |
|---|---|---|---|---|---|---|---|---|
| Perchlorate | GP9044/GN24408 | 10 | <10 | ug/l | 50 | 50.1 | 100.2 | 85-115% |

Associated Samples:
Batch GP9044: T16445-1, T16445-10, T16445-11, T16445-12, T16445-13, T16445-14, T16445-18, T16445-2, T16445-3, T16445-4, T16445-5, T16445-6, T16445-7, T16445-8, T16445-9
(*) Outside of QC limits

DUPLICATE RESULTS SUMMARY
GENERAL CHEMISTRY

Login Number: T16445
Account: ALGC - Accutest Laboratories Gulf Coast, Inc.
Project: ITTXHO: Longhorn Army Ammunition Plant

| Analyte | Batch ID | QC Sample | Units | Original Result | DUP Result | RPD | QC Limits |
|---|---|---|---|---|---|---|---|
| Perchlorate | GP9044/GN24408 | T16445-5 | ug/l | 27.8 | 29.4 | 5.6 | 0-15% |
| Perchlorate | GP9044/GN24408 | T16445-6 | ug/l | 532 | 550 | 3.3 | 0-15% |

Associated Samples:
Batch GP9044: T16445-1, T16445-10, T16445-11, T16445-12, T16445-13, T16445-14, T16445-18, T16445-2, T16445-3, T16445-4, T16445-5, T16445-6, T16445-7, T16445-8, T16445-9
(*) Outside of QC limits

10.2
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MATRIX SPIKE RESULTS SUMMARY
GENERAL CHEMISTRY

Login Number: T16445
Account: ALGC - Accutest Laboratories Gulf Coast, Inc.
Project: ITTXHO: Longhorn Army Ammunition Plant

| Analyte | Batch ID | QC Sample | Units | Original Result | Spike Amount | MS Result | %Rec | QC Limits |
|---|---|---|---|---|---|---|---|---|
| Perchlorate | GP9044/GN24408 | T16445-5 | ug/l | 27.8 | 50 | 79.8 | 104.0 | 80-120% |
| Perchlorate | GP9044/GN24408 | T16445-6 | ug/l | 532 | 50 | 583 | 102.0 | 80-120% |

Associated Samples:
Batch GP9044: T16445-1, T16445-10, T16445-11, T16445-12, T16445-13, T16445-14, T16445-18, T16445-2, T16445-3, T16445-4, T16445-5, T16445-6, T16445-7, T16445-8, T16445-9
(*) Outside of QC limits
(N) Matrix Spike Rec. outside of QC limits

10.3
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Accutest Laboratories Instrument Runlog
Inorganics Analyses

Login Number: T16445
Account: ALGC - Accutest Laboratories Gulf Coast, Inc.
Project: ITTXHO: Longhorn Army Ammunition Plant

File ID: 207030201.TXT    Date Analyzed: 03/02/07    Methods: EPA 314
Analyst: MP    Run ID: GN24408
Parameters: Perchlorate

| Time | Sample Description | Dilution Factor | PS Recov | Comments |
|---|---|---|---|---|
| 14:05 | GN24408-CCV1 | 1 | | |
| 14:20 | GN24408-CCB1 | 1 | | |
| 14:34 | GP9044-MB1 | 1 | | |
| 14:49 | GP9044-B1 | 1 | | |
| 15:31 | GN24408-CRI1 | 1 | | |
| 15:46 | GN24408-IPC1 | 1 | | |
| 16:00 | T16445-1 | 1 | | |
| 16:15 | T16445-2 | 1 | | |
| 16:29 | T16445-3 | 1 | | |
| 16:43 | T16445-4 | 1 | | |
| 16:58 | T16445-5 | 1 | | |
| 17:12 | T16445-6 | 1 | | |
| 17:27 | GN24408-CCV2 | 1 | | |
| 17:41 | GN24408-CCB2 | 1 | | |
| 17:55 | T16445-7 | 1 | | |
| 18:10 | T16445-8 | 1 | | |
| 18:24 | T16445-9 | 1 | | |
| 18:39 | T16445-10 | 1 | | |
| 18:53 | T16445-11 | 1 | | |
| 19:22 | T16445-13 | 1 | | |
| 19:36 | T16445-14 | 1 | | |
| 19:51 | T16445-18 | 1 | | |
| 20:05 | ZZZZZZ | 1 | | |
| 20:19 | GN24408-CCV3 | 1 | | |
| 20:34 | GN24408-CCB3 | 1 | | |
| 20:48 | GP9044-D1 | 1 | | |
| 21:03 | GP9044-S1 | 1 | | |
| 21:17 | GP9044-D2 | 1 | | |
| 21:32 | GP9044-S2 | 1 | | |
| 21:46 | GN24408-CCV4 | 1 | | |
| 22:00 | GN24408-CCB4 | 1 | | |

Refer to raw data for calibration curve and standards.

Instrument QC Summary
Inorganics Analyses

Login Number: T16445
Account: ALGC - Accutest Laboratories Gulf Coast, Inc.
Project: ITTXHO: Longhorn Army Ammunition Plant

File ID: 207030201.TXT    Date Analyzed: 03/02/07    Methods: EPA 314
Run ID: GN24408    Units: ug/l

| Sample Number | Parameter | Result | RL | IDL/MDL | True Value | % Recov. | QC Limits |
|---|---|---|---|---|---|---|---|
| GN24408-CCV1 | Perchlorate | 52.1 | 10 | 4.0 | 50 | 104.2 | 85-115 |
| GN24408-CCB1 | Perchlorate | 4.0 U | 10 | 4.0 | | | |
| GN24408-CRI1 | Perchlorate | 4.0 U | 10 | 4.0 | 3 | 86.6 | 75-125 |
| GN24408-IPC1 | Perchlorate | 23.2 | 10 | 4.0 | 25 | 92.8 | 80-120 |
| GN24408-CCV2 | Perchlorate | 50.4 | 10 | 4.0 | 50 | 100.8 | 85-115 |
| GN24408-CCB2 | Perchlorate | 4.0 U | 10 | 4.0 | | | |
| GN24408-CCV3 | Perchlorate | 52.6 | 10 | 4.0 | 50 | 105.2 | 85-115 |
| GN24408-CCB3 | Perchlorate | 4.0 U | 10 | 4.0 | | | |
| GN24408-CCV4 | Perchlorate | 53.4 | 10 | 4.0 | 50 | 106.8 | 85-115 |
| GN24408-CCB4 | Perchlorate | 4.0 U | 10 | 4.0 | | | |

(!) Outside of QC limits

Accutest Laboratories Instrument Runlog
Inorganics Analyses

Login Number: T16445
Account: ALGC - Accutest Laboratories Gulf Coast, Inc.
Project: ITTXHO: Longhorn Army Ammunition Plant

File ID: 207030701.TXT    Date Analyzed: 03/07/07    Methods: EPA 314
Analyst: MP    Run ID: GN24437
Parameters: Perchlorate

| Time | Sample Description | Dilution Factor | PS Recov | Comments |
|---|---|---|---|---|
| 17:09 | GN24437-CCV1 | 1 | | |
| 17:23 | GN24437-CCB1 | 1 | | |
| 18:35 | T16445-12 | 5 | | |
| 18:50 | GN24437-CCV2 | 1 | | |
| 19:04 | GN24437-CCB2 | 1 | | |

Refer to raw data for calibration curve and standards.

Instrument QC Summary
Inorganics Analyses

Login Number: T16445
Account: ALGC - Accutest Laboratories Gulf Coast, Inc.
Project: ITTXHO: Longhorn Army Ammunition Plant

File ID: 207030701.TXT    Date Analyzed: 03/07/07    Methods: EPA 314
Run ID: GN24437    Units: ug/l

| Sample Number | Parameter | Result | RL | IDL/MDL | True Value | % Recov. | QC Limits |
|---|---|---|---|---|---|---|---|
| GN24437-CCV1 | Perchlorate | 52.5 | 10 | 4.0 | 50 | 105.0 | 85-115 |
| GN24437-CCB1 | Perchlorate | 4.0 U | 10 | 4.0 | | | |
| GN24437-CCV2 | Perchlorate | 46.7 | 10 | 4.0 | 50 | 93.4 | 85-115 |
| GN24437-CCB2 | Perchlorate | 4.0 U | 10 | 4.0 | | | |

(!) Outside of QC limits

10.5

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Gulf Coast ACCUTEST Laboratories

IT'S ALL IN THE CHEMISTRY

04/10/07

# Technical Report for

Shaw E & I, Inc.

Longhorn Army Ammunition Plant

PROJECT #117591

Accutest Job Number: T16448

Sampling Date: 02/24/07

Report to:

Shaw E & I, Inc.

diane.meyer@shawgrp.com

ATTN: Diane Meyer

Total number of pages in report: **124**

ACCREDITED IN ACCORDANCE WITH nelac

Test results contained within this data package meet the requirements of the National Environmental Laboratory Accreditation Conference and/or state specific certification programs as applicable.

Ron Martino
Laboratory Manager

ACCUTEST LABORATORIES 50 YEARS 1956-2006

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Accutest Laboratories

# Sample Summary

Shaw E & I, Inc.

**Job No:** T16448

Longhorn Army Ammunition Plant
Project No: PROJECT #117591

| Sample Number | Collected Date | Time | By | Received | Matrix Code | Type | Client Sample ID |
|---|---|---|---|---|---|---|---|
| T16448-1 | 02/24/07 | 10:46 | | 02/26/07 | AQ | Ground Water | 50WW03 |
| T16448-2 | 02/24/07 | 10:38 | | 02/26/07 | AQ | Ground Water | 29WW15 |
| T16448-3 | 02/24/07 | 10:00 | | 02/26/07 | AQ | Ground Water | 12WW24 |

ACCUTEST Laboratories

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# SAMPLE DELIVERY GROUP CASE NARRATIVE

**Client:** Shaw E & I, Inc. **Job No** T16448

**Site:** Longhorn Army Ammunition Plant **Report Date** 3/13/2007 5:05:01 PM

3 Samples were collected on 02/24/2007 and were received at Accutest on 02/26/2007 properly preserved, at 2.3 Deg. C and intact. These Samples received an Accutest job number of T16448. A listing of the Laboratory Sample ID, Client Sample ID and dates of collection are presented in the Results Summary Section of this report.

Except as noted below, all method specified calibrations and quality control performance criteria were met for this job. For more information, please refer to QC summary pages.

## Volatiles by GCMS By Method SW846 8260B

**Matrix** AQ **Batch ID:** VF2315

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) T16445-3MS, T16445-3MSD were used as the QC samples indicated.
- Matrix Spike Recovery(s) for cis-1,2-Dichloroethylene, Trichloroethylene are outside control limits. Outside control limits due to high level in sample relative to spike amount.

**Matrix** AQ **Batch ID:** VF2318

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) T16445-4MS, T16445-4MSD were used as the QC samples indicated.

## Volatiles by GC By Method RSKSOP-147/175

**Matrix** AQ **Batch ID:** F:GXY996

- Analysis performed at Accutest Laboratories, Orlando, FL.

## Metals By Method SW846 6010B

**Matrix** AQ **Batch ID:** MP5804

- All samples were digested within the recommended method holding time.
- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) T16414-1DUP, T16414-1MS, T16414-1MSD, T16414-1SDL were used as the QC samples for metals.

## Wet Chemistry By Method EPA 120.1

**Matrix** AQ **Batch ID:** F:R17947

- T16448-1 for Specific Conductivity: Analysis performed at Accutest Laboratories, Orlando, FL.

**Matrix** AQ **Batch ID:** GN11355

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) T16445-5DUP were used as the QC samples for Specific Conductivity.

## Wet Chemistry By Method EPA 150.1/9040

| **Matrix** AQ | **Batch ID:** GN11334 |
|---|---|

- Sample(s) T16448-1DUP were used as the QC samples for pH.
- The following samples were run outside of holding time for method EPA 150.1/9040: T16448-1

## Wet Chemistry By Method EPA 310.1

| **Matrix** AQ | **Batch ID:** GN11375 |
|---|---|

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) T16445-5DUP, T16445-5MS were used as the QC samples for Alkalinity, Total as CaCO3.

## Wet Chemistry By Method EPA 314

| **Matrix** AQ | **Batch ID:** F:GP9044 |
|---|---|

- Perchlorate Analysis performed at Accutest Laboratories, Orlando, FL.

## Wet Chemistry By Method EPA 325.3

| **Matrix** AQ | **Batch ID:** GN11343 |
|---|---|

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) T16445-5DUP, T16445-5MS were used as the QC samples for Chloride.

## Wet Chemistry By Method EPA 353.2

| **Matrix** AQ | **Batch ID:** GN11300 |
|---|---|

- All method blanks for this batch meet method specific criteria.
- Sample(s) T16445-18DUP, T16445-18MS were used as the QC samples for Nitrogen, Nitrite.

| **Matrix** AQ | **Batch ID:** GN11301 |
|---|---|

- All method blanks for this batch meet method specific criteria.
- Sample(s) T16445-18DUP, T16445-18MS were used as the QC samples for Nitrogen, Nitrate + Nitrite.

## Wet Chemistry By Method EPA 375.3

| **Matrix** AQ | **Batch ID:** GN11356 |
|---|---|

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) T16448-1DUP, T16448-1MS were used as the QC samples for Sulfate.

## Wet Chemistry By Method EPA 376.1

| **Matrix** AQ | **Batch ID:** GN11313 |
|---|---|

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) T16445-5DUP were used as the QC samples for Sulfide.

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### Wet Chemistry By Method EPA 415.1/9060

| Matrix | AQ | Batch ID: | GN11304 |
|---|---|---|---|

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) T16445-18DUP, T16445-18MS were used as the QC samples for Total Organic Carbon.

### Wet Chemistry By Method SM18 4500NO3E/NO2B

| Matrix | AQ | Batch ID: | R15469 |
|---|---|---|---|

- Nitrogen, Nitrate: Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

Accutest Laboratories Gulf Coast (ALGC) certifies that this report meets the project requirements for analytical data produced for the samples as received at ALGC and as stated on the COC. ALGC certifies that the data meets the Data QualityObjectives for precision, accuracy and completeness as specified in the ALGC Quality Manual except as noted above. This report is to be used in its entirety. ALGC is not responsible for any assumptions of data quality if partial data packages are used

# SAMPLE DELIVERY GROUP CASE NARRATIVE

**Client:** Accutest Laboratories Gulf Coast, Inc. **Job No:** T16448

**Site:** ITTXHO: Longhorn Army Ammunition Plant **Report Date:** 3/13/2007 11:35:47

2 Samples were collected on 02/24/2007 and were received at Accutest SE on 02/28/2007 properly preserved, at 1.8 Deg. C and intact. These Samples had an Accutest job number of T16448. A listing of the Laboratory Sample ID, Client Sample ID and dates of collection are presented in the Results Summary Section of this report.

Except as noted below, all method specified calibrations and quality control performance criteria were met for this job. For more information, please refer to QC summary pages.

## Volatiles by GC by Method RSKSOP-147/175

**Matrix:** AQ **Batch ID:** GXY996

All samples were analyzed within the recommended method holding time.

All method blanks for this batch meet method specific criteria.

Samples F47731-7MS, F47769-9DUP were used as the QC samples indicated.

Matrix Spike Recoverys for Ethane, Ethene are outside control limits. Probable cause: due to matrix interference.

## Extractables by GC by Method SW846 8330A

**Matrix:** AQ **Batch ID:** OP19677

All samples were extracted within the recommended method holding time.

All samples were analyzed within the recommended method holding time.

All method blanks for this batch meet method specific criteria.

Samples F47539-3MS, F47539-3MSD were used as the QC samples indicated.

## Wet Chemistry by Method EPA 314

**Matrix:** AQ **Batch ID:** GP9044

All samples were prepped within the recommended method holding time.

All samples were analyzed within the recommended method holding time.

All method blanks for this batch meet method specific criteria.

Samples T16445-5DUP, T16445-5MS were used as the QC samples for Perchlorate.

Accutest Laboratories Southeast (ALSE) certifies that this report meets the project requirements for analytical data produced for the samples as received at ALSE and as stated on the COC. ALSE certifies that the data meets the Data Quality Objectives for precision, accuracy and completeness as specified in the ALSE Quality Manual except as noted above. This report is to be used in its entirety. ALSE is not responsible for any assumptions of data quality if partial data packages are used.

Narrative prepared by:

________________________________________ Date: March 13, 2007

Ellen Pampel, Inorganic QA (signature on file)

**Tuesday, March 13, 2007**

# Sample Results

## Report of Analysis

Accutest Laboratories

# Report of Analysis





| | | | |
|---|---|---|---|
| **Client Sample ID:** | 50WW03 | | |
| **Lab Sample ID:** | T16448-1 | **Date Sampled:** | 02/24/07 |
| **Matrix:** | AQ - Ground Water | **Date Received:** | 02/26/07 |
| **Method:** | SW846 8260B | **Percent Solids:** | n/a |
| **Project:** | Longhorn Army Ammunition Plant | | |

| | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|---|---|---|---|---|---|---|---|
| Run #1 | F0079188.D | 1 | 03/07/07 | LJ | n/a | n/a | VF2315 |
| Run #2 | | | | | | | |

| | Purge Volume |
|---|---|
| Run #1 | 5.0 ml |
| Run #2 | |

**VOA TCL List**

| CAS No. | Compound | Result | RL | MDL | Units | Q |
|---|---|---|---|---|---|---|
| 67-64-1 | Acetone | 2.8 U | 50 | 2.8 | ug/l | |
| 71-43-2 | Benzene | 0.23 U | 2.0 | 0.23 | ug/l | |
| 75-27-4 | Bromodichloromethane | 0.33 U | 2.0 | 0.33 | ug/l | |
| 75-25-2 | Bromoform | 0.65 U | 2.0 | 0.65 | ug/l | |
| 108-90-7 | Chlorobenzene | 0.54 U | 2.0 | 0.54 | ug/l | |
| 75-00-3 | Chloroethane | 0.46 U | 2.0 | 0.46 | ug/l | |
| 67-66-3 | Chloroform | 0.66 U | 2.0 | 0.66 | ug/l | |
| 75-15-0 | Carbon disulfide | 0.62 U | 2.0 | 0.62 | ug/l | |
| 56-23-5 | Carbon tetrachloride | 0.52 U | 2.0 | 0.52 | ug/l | |
| 75-34-3 | 1,1-Dichloroethane | 0.52 U | 2.0 | 0.52 | ug/l | |
| 75-35-4 | 1,1-Dichloroethylene | 0.68 U | 2.0 | 0.68 | ug/l | |
| 107-06-2 | 1,2-Dichloroethane | 0.53 U | 2.0 | 0.53 | ug/l | |
| 78-87-5 | 1,2-Dichloropropane | 0.59 U | 2.0 | 0.59 | ug/l | |
| 124-48-1 | Dibromochloromethane | 0.68 U | 2.0 | 0.68 | ug/l | |
| 156-59-2 | cis-1,2-Dichloroethylene | 0.83 U | 2.0 | 0.83 | ug/l | |
| 10061-01-5 | cis-1,3-Dichloropropene | 0.59 U | 2.0 | 0.59 | ug/l | |
| 156-60-5 | trans-1,2-Dichloroethylene | 0.75 U | 2.0 | 0.75 | ug/l | |
| 10061-02-6 | trans-1,3-Dichloropropene | 0.61 U | 2.0 | 0.61 | ug/l | |
| 100-41-4 | Ethylbenzene | 0.48 U | 2.0 | 0.48 | ug/l | |
| 591-78-6 | 2-Hexanone | 1.9 U | 10 | 1.9 | ug/l | |
| 108-10-1 | 4-Methyl-2-pentanone | 7.3 U | 10 | 7.3 | ug/l | |
| 74-83-9 | Methyl bromide | 0.47 U | 2.0 | 0.47 | ug/l | |
| 74-87-3 | Methyl chloride | 0.60 U | 2.0 | 0.60 | ug/l | |
| 75-09-2 | Methylene chloride | 0.67 U | 5.0 | 0.67 | ug/l | |
| 78-93-3 | Methyl ethyl ketone | 3.0 U | 10 | 3.0 | ug/l | |
| 100-42-5 | Styrene | 0.50 U | 2.0 | 0.50 | ug/l | |
| 71-55-6 | 1,1,1-Trichloroethane | 0.37 U | 2.0 | 0.37 | ug/l | |
| 79-34-5 | 1,1,2,2-Tetrachloroethane | 0.46 U | 2.0 | 0.46 | ug/l | |
| 79-00-5 | 1,1,2-Trichloroethane | 0.66 U | 2.0 | 0.66 | ug/l | |
| 127-18-4 | Tetrachloroethylene | 0.74 U | 2.0 | 0.74 | ug/l | |
| 108-88-3 | Toluene | 0.54 U | 2.0 | 0.54 | ug/l | |
| 79-01-6 | Trichloroethylene | 0.63 U | 2.0 | 0.63 | ug/l | |

U = Not detected    MDL - Method Detection Limit    J = Indicates an estimated value
RL = Reporting Limit    B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range    N = Indicates presumptive evidence of a compound

Accutest Laboratories

# Report of Analysis





| | | | |
|---|---|---|---|
| **Client Sample ID:** | 50WW03 | | |
| **Lab Sample ID:** | T16448-1 | **Date Sampled:** | 02/24/07 |
| **Matrix:** | AQ - Ground Water | **Date Received:** | 02/26/07 |
| **Method:** | SW846 8260B | **Percent Solids:** | n/a |
| **Project:** | Longhorn Army Ammunition Plant | | |

**VOA TCL List**

| CAS No. | Compound | Result | RL | MDL | Units | Q |
|---|---|---|---|---|---|---|
| 75-01-4 | Vinyl chloride | 0.32 U | 2.0 | 0.32 | ug/l | |
| 1330-20-7 | Xylene (total) | 1.1 U | 6.0 | 1.1 | ug/l | |

| CAS No. | Surrogate Recoveries | Run# 1 | Run# 2 | Limits |
|---|---|---|---|---|
| 1868-53-7 | Dibromofluoromethane | 106% | | 73-139% |
| 17060-07-0 | 1,2-Dichloroethane-D4 | 102% | | 66-139% |
| 2037-26-5 | Toluene-D8 | 106% | | 77-148% |
| 460-00-4 | 4-Bromofluorobenzene | 121% | | 84-150% |

U = Not detected MDL - Method Detection Limit J = Indicates an estimated value
RL = Reporting Limit B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

Accutest Laboratories

# Report of Analysis





| | | | |
|---|---|---|---|
| **Client Sample ID:** | 50WW03 | | |
| **Lab Sample ID:** | T16448-1 | **Date Sampled:** | 02/24/07 |
| **Matrix:** | AQ - Ground Water | **Date Received:** | 02/26/07 |
| **Method:** | RSKSOP-147/175 | **Percent Solids:** | n/a |
| **Project:** | Longhorn Army Ammunition Plant | | |

| | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|---|---|---|---|---|---|---|---|
| Run #1 [a] | XY025336.D | 1 | 03/08/07 | AFL | n/a | n/a | F:GXY996 |
| Run #2 | | | | | | | |

| CAS No. | Compound | Result | RL | MDL | Units | Q |
|---|---|---|---|---|---|---|
| 74-82-8 | Methane | 0.56 | 0.50 | 0.30 | ug/l | |
| 74-84-0 | Ethane | 0.60 U | 1.0 | 0.60 | ug/l | |
| 74-85-1 | Ethene | 0.80 U | 1.0 | 0.80 | ug/l | |

(a) Analysis performed at Accutest Laboratories, Orlando, FL.

U = Not detected MDL - Method Detection Limit J = Indicates an estimated value
RL = Reporting Limit B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

Accutest Laboratories

# Report of Analysis





| | | | |
|---|---|---|---|
| **Client Sample ID:** | 50WW03 | | |
| **Lab Sample ID:** | T16448-1 | **Date Sampled:** | 02/24/07 |
| **Matrix:** | AQ - Ground Water | **Date Received:** | 02/26/07 |
| | | **Percent Solids:** | n/a |
| **Project:** | Longhorn Army Ammunition Plant | | |

## General Chemistry

| Analyte | Result | RL | MDL | Units | DF | Analyzed | By | Method |
|---|---|---|---|---|---|---|---|---|
| **Perchlorate by IC** | | | | | | | | |
| Perchlorate [a] | 4.0 U | 10 | 4.0 | ug/l | 1 | 03/02/07 20:05 | AFL | EPA 314 |
| | | | | | | | | |
| Alkalinity, Total as CaCO3 | 417 | 25 | 0.30 | mg/l | 5 | 03/08/07 12:50 | EB | EPA 310.1 |
| Carbon Dioxide | 416 | 5.0 | | mg/l | 1 | 03/12/07 | RM | SM18 4500CO2D |
| Chloride | 944 | 50 | 0.57 | mg/l | 50 | 03/05/07 12:15 | EB | EPA 325.3 |
| Nitrogen, Nitrate [b] | < 0.10 | 0.10 | 0.0050 | mg/l | 1 | 02/26/07 14:00 | LN | SM18 4500NO3E/NO2B |
| Nitrogen, Nitrate + Nitrite | 0.010 B | 0.050 | 0.0050 | mg/l | 1 | 02/26/07 13:03 | LN | EPA 353.2 |
| Nitrogen, Nitrite | 0.0030 U | 0.050 | 0.0030 | mg/l | 1 | 02/26/07 14:00 | LN | EPA 353.2 |
| Specific Conductivity [a] | 3340 | 0.50 | 0.50 | umhos/cm | 1 | 03/06/07 | AFL | EPA 120.1 |
| Sulfate | 403 | 100 | 2.6 | mg/l | 10 | 03/06/07 18:00 | EB | EPA 375.3 |
| Sulfide | 0.0 B | 0.20 | | mg/l | 1 | 03/01/07 12:10 | LN | EPA 376.1 |
| Total Organic Carbon | 2.0 | 1.0 | 0.092 | mg/l | 1 | 02/27/07 09:10 | LN | EPA 415.1/9060 |
| pH | 7.1 | | | su | 1 | 03/02/07 08:10 | EB | EPA 150.1/9040 |

(a) Analysis performed at Accutest Laboratories, Orlando, FL.
(b) Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

RL = Reporting Limit
MDL = Method Detection Limit

U = Indicates a result < MDL
B = Indicates a result > = MDL but < RL

Accutest Laboratories

# Report of Analysis





| | | | |
|---|---|---|---|
| **Client Sample ID:** | 29WW15 | | |
| **Lab Sample ID:** | T16448-2 | **Date Sampled:** | 02/24/07 |
| **Matrix:** | AQ - Ground Water | **Date Received:** | 02/26/07 |
| **Method:** | SW846 8260B | **Percent Solids:** | n/a |
| **Project:** | Longhorn Army Ammunition Plant | | |

| | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|---|---|---|---|---|---|---|---|
| Run #1 | F0079189.D | 1 | 03/07/07 | LJ | n/a | n/a | VF2315 |
| Run #2 | F0079239.D | 50 | 03/08/07 | LJ | n/a | n/a | VF2318 |

| | Purge Volume |
|---|---|
| Run #1 | 5.0 ml |
| Run #2 | 5.0 ml |

**VOA TCL List**

| CAS No. | Compound | Result | RL | MDL | Units | Q |
|---|---|---|---|---|---|---|
| 67-64-1 | Acetone | 2.8 U | 50 | 2.8 | ug/l | |
| 71-43-2 | Benzene | 0.47 | 2.0 | 0.23 | ug/l | J |
| 75-27-4 | Bromodichloromethane | 0.33 U | 2.0 | 0.33 | ug/l | |
| 75-25-2 | Bromoform | 0.65 U | 2.0 | 0.65 | ug/l | |
| 108-90-7 | Chlorobenzene | 0.54 U | 2.0 | 0.54 | ug/l | |
| 75-00-3 | Chloroethane | 0.46 U | 2.0 | 0.46 | ug/l | |
| 67-66-3 | Chloroform | 5.3 | 2.0 | 0.66 | ug/l | |
| 75-15-0 | Carbon disulfide | 0.62 U | 2.0 | 0.62 | ug/l | |
| 56-23-5 | Carbon tetrachloride | 0.52 U | 2.0 | 0.52 | ug/l | |
| 75-34-3 | 1,1-Dichloroethane | 3.4 | 2.0 | 0.52 | ug/l | |
| 75-35-4 | 1,1-Dichloroethylene | 7.5 | 2.0 | 0.68 | ug/l | |
| 107-06-2 | 1,2-Dichloroethane | 5520 [a] | 100 | 27 | ug/l | |
| 78-87-5 | 1,2-Dichloropropane | 0.59 U | 2.0 | 0.59 | ug/l | |
| 124-48-1 | Dibromochloromethane | 0.68 U | 2.0 | 0.68 | ug/l | |
| 156-59-2 | cis-1,2-Dichloroethylene | 1.8 | 2.0 | 0.83 | ug/l | J |
| 10061-01-5 | cis-1,3-Dichloropropene | 0.59 U | 2.0 | 0.59 | ug/l | |
| 156-60-5 | trans-1,2-Dichloroethylene | 15.6 | 2.0 | 0.75 | ug/l | |
| 10061-02-6 | trans-1,3-Dichloropropene | 0.61 U | 2.0 | 0.61 | ug/l | |
| 100-41-4 | Ethylbenzene | 0.48 U | 2.0 | 0.48 | ug/l | |
| 591-78-6 | 2-Hexanone | 1.9 U | 10 | 1.9 | ug/l | |
| 108-10-1 | 4-Methyl-2-pentanone | 7.3 U | 10 | 7.3 | ug/l | |
| 74-83-9 | Methyl bromide | 0.47 U | 2.0 | 0.47 | ug/l | |
| 74-87-3 | Methyl chloride | 0.60 U | 2.0 | 0.60 | ug/l | |
| 75-09-2 | Methylene chloride | 3.0 | 5.0 | 0.67 | ug/l | J |
| 78-93-3 | Methyl ethyl ketone | 3.0 U | 10 | 3.0 | ug/l | |
| 100-42-5 | Styrene | 0.50 U | 2.0 | 0.50 | ug/l | |
| 71-55-6 | 1,1,1-Trichloroethane | 0.37 U | 2.0 | 0.37 | ug/l | |
| 79-34-5 | 1,1,2,2-Tetrachloroethane | 0.46 U | 2.0 | 0.46 | ug/l | |
| 79-00-5 | 1,1,2-Trichloroethane | 1.9 | 2.0 | 0.66 | ug/l | J |
| 127-18-4 | Tetrachloroethylene | 0.74 U | 2.0 | 0.74 | ug/l | |
| 108-88-3 | Toluene | 0.54 U | 2.0 | 0.54 | ug/l | |
| 79-01-6 | Trichloroethylene | 344 [a] | 100 | 32 | ug/l | |

U = Not detected    MDL - Method Detection Limit    J = Indicates an estimated value
RL = Reporting Limit    B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range    N = Indicates presumptive evidence of a compound

Accutest Laboratories

# Report of Analysis





| | | | |
|---|---|---|---|
| **Client Sample ID:** | 29WW15 | | |
| **Lab Sample ID:** | T16448-2 | **Date Sampled:** | 02/24/07 |
| **Matrix:** | AQ - Ground Water | **Date Received:** | 02/26/07 |
| **Method:** | SW846 8260B | **Percent Solids:** | n/a |
| **Project:** | Longhorn Army Ammunition Plant | | |

**VOA TCL List**

| CAS No. | Compound | Result | RL | MDL | Units | Q |
|---|---|---|---|---|---|---|
| 75-01-4 | Vinyl chloride | 0.32 U | 2.0 | 0.32 | ug/l | |
| 1330-20-7 | Xylene (total) | 1.1 U | 6.0 | 1.1 | ug/l | |

| CAS No. | Surrogate Recoveries | Run# 1 | Run# 2 | Limits |
|---|---|---|---|---|
| 1868-53-7 | Dibromofluoromethane | 108% | 106% | 73-139% |
| 17060-07-0 | 1,2-Dichloroethane-D4 | 105% | 100% | 66-139% |
| 2037-26-5 | Toluene-D8 | 106% | 105% | 77-148% |
| 460-00-4 | 4-Bromofluorobenzene | 122% | 118% | 84-150% |

(a) Result is from Run# 2

U = Not detected    MDL - Method Detection Limit    J = Indicates an estimated value
RL = Reporting Limit    B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range    N = Indicates presumptive evidence of a compound

Accutest Laboratories

# Report of Analysis





| | | | |
|---|---|---|---|
| **Client Sample ID:** | 29WW15 | | |
| **Lab Sample ID:** | T16448-2 | **Date Sampled:** | 02/24/07 |
| **Matrix:** | AQ - Ground Water | **Date Received:** | 02/26/07 |
| **Method:** | RSKSOP-147/175 | **Percent Solids:** | n/a |
| **Project:** | Longhorn Army Ammunition Plant | | |

| | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|---|---|---|---|---|---|---|---|
| Run #1 [a] | XY025337.D | 1 | 03/08/07 | AFL | n/a | n/a | F:GXY996 |
| Run #2 | | | | | | | |

| CAS No. | Compound | Result | RL | MDL | Units | Q |
|---|---|---|---|---|---|---|
| 74-82-8 | Methane | 1.27 | 0.50 | 0.30 | ug/l | |
| 74-84-0 | Ethane | 0.60 U | 1.0 | 0.60 | ug/l | |
| 74-85-1 | Ethene | 0.80 U | 1.0 | 0.80 | ug/l | |

(a) Analysis performed at Accutest Laboratories, Orlando, FL.

U = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Accutest Laboratories

# Report of Analysis





| | | | |
|---|---|---|---|
| **Client Sample ID:** | 29WW15 | | |
| **Lab Sample ID:** | T16448-2 | **Date Sampled:** | 02/24/07 |
| **Matrix:** | AQ - Ground Water | **Date Received:** | 02/26/07 |
| **Method:** | SW846 8330A SW846 3535A | **Percent Solids:** | n/a |
| **Project:** | Longhorn Army Ammunition Plant | | |

| | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|---|---|---|---|---|---|---|---|
| Run #1 [a] | GG020223.D | 1 | 03/03/07 | AFL | 03/01/07 | F:OP19677 | F:GGG906 |
| Run #2 | | | | | | | |

| | Initial Volume | Final Volume |
|---|---|---|
| Run #1 | 600 ml | 10.0 ml |
| Run #2 | | |

| CAS No. | Compound | Result | RL | MDL | Units | Q |
|---|---|---|---|---|---|---|
| 2691-41-0 | HMX | 0.10 U | 0.33 | 0.10 | ug/l | |
| 121-82-4 | RDX | 0.13 U | 0.33 | 0.13 | ug/l | |
| 99-65-0 | 1,3-Dinitrobenzene | 0.12 U | 0.33 | 0.12 | ug/l | |
| 606-20-2 | 2,6-Dinitrotoluene | 0.11 U | 0.33 | 0.11 | ug/l | |
| 121-14-2 | 2,4-Dinitrotoluene | 0.13 U | 0.33 | 0.13 | ug/l | |
| 35572-78-2 | 2-amino-4,6-Dinitrotoluene | 0.12 U | 0.33 | 0.12 | ug/l | |
| 19406-51-0 | 4-amino-2,6-Dinitrotoluene | 0.13 U | 0.33 | 0.13 | ug/l | |
| 98-95-3 | Nitrobenzene | 0.10 U | 0.33 | 0.10 | ug/l | |
| 88-72-2 | o-Nitrotoluene | 0.10 U | 0.33 | 0.10 | ug/l | |
| 99-08-1 | m-Nitrotoluene | 0.13 U | 0.33 | 0.13 | ug/l | |
| 99-99-0 | p-Nitrotoluene | 0.13 U | 0.33 | 0.13 | ug/l | |
| 479-45-8 | Tetryl | 0.13 U | 0.33 | 0.13 | ug/l | |
| 99-35-4 | 1,3,5-Trinitrobenzene | 0.16 U | 0.33 | 0.16 | ug/l | |
| 118-96-7 | 2,4,6-Trinitrotoluene | 0.13 U | 0.33 | 0.13 | ug/l | |

| CAS No. | Surrogate Recoveries | Run# 1 | Run# 2 | Limits |
|---|---|---|---|---|
| 610-39-9 | 3,4-Dinitrotoluene | 95% | | 70-136% |

(a) Analysis performed at Accutest Laboratories, Orlando, FL.

U = Not detected MDL - Method Detection Limit J = Indicates an estimated value
RL = Reporting Limit B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

Accutest Laboratories

# Report of Analysis






| | | | | |
|---|---|---|---|---|
| **Client Sample ID:** | 29WW15 | | | |
| **Lab Sample ID:** | T16448-2 | | **Date Sampled:** | 02/24/07 |
| **Matrix:** | AQ - Ground Water | | **Date Received:** | 02/26/07 |
| | | | **Percent Solids:** | n/a |
| **Project:** | Longhorn Army Ammunition Plant | | | |

## General Chemistry

| Analyte | Result | RL | MDL | Units | DF | Analyzed | By | Method |
|---|---|---|---|---|---|---|---|---|
| Total Organic Carbon | 4.0 | 1.0 | 0.092 | mg/l | 1 | 02/27/07 09:10 | LN | EPA 415.1/9060 |

RL = Reporting Limit
MDL = Method Detection Limit

U = Indicates a result < MDL
B = Indicates a result > = MDL but < RL

Accutest Laboratories

# Report of Analysis





| | | | |
|---|---|---|---|
| **Client Sample ID:** | 12WW24 | | |
| **Lab Sample ID:** | T16448-3 | **Date Sampled:** | 02/24/07 |
| **Matrix:** | AQ - Ground Water | **Date Received:** | 02/26/07 |
| | | **Percent Solids:** | n/a |
| **Project:** | Longhorn Army Ammunition Plant | | |

**Metals Analysis**

| Analyte | Result | RL | MDL | Units | DF | Prep | Analyzed | By | Method | Prep Method |
|---|---|---|---|---|---|---|---|---|---|---|
| Chromium | 2.0 B | 10 | 1.8 | ug/l | 1 | 02/27/07 | 02/28/07 | NS | SW846 6010B [1] | SW846 3010A [2] |

(1) Instrument QC Batch: MA2815
(2) Prep QC Batch: MP5804

RL = Reporting Limit
MDL = Method Detection Limit

U = Indicates a result < MDL
B = Indicates a result > = MDL but < RL

# Misc. Forms

## Custody Documents and Other Forms

Includes the following where applicable:

- Chain of Custody
- LRC Form

T16448

Shaw® Shaw Environmental, Inc.

3010 Briarpark Drive, Suite 4N
Houston, TX 77042 (713) 996-4400

# CHAIN-OF-CUSTODY

No. 10921

Laboratory Name: Accutest
Address: 10165 Harwin Dr. #150 Houston, TX 77036
Contact: Agnes 713-271-4700

Project Name: Longhorn Army Ammunition Plant
Project Location: Karnack, TX
Project No.: 117591
Project Contact: Kay Everette
Project Telephone No.: 713-996-4421
Point of contact: Diane Meyer
Telephone No.: 713-996-4408
Project Manager/Supervisor: Praveen Srivastav

Analysis and Method Desired (Indicate separate containers)

| Item No. | Sample Number | Date | Time | Comp | Grab | Matrix | Sample Description, Location | Number of Containers | VOC's 8260 | Anions 300 | Sulfides 376.2 | Perchlorate 314 | Gases 175 [illegible] | Explosives | Alkalinity 310.1 | TOC 415.1 | Chromium (Total) | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 50WW03 | 2/24/07 | 10:46 | | X | GW | 50WW03 | 13 | X | X | X | X | X | X | | X | | |
| 2 | 29WW15 | 2/24/07 | 10:38 | | X | GW | 29WW15 | 10 | X | | | | X | X | | X | X | Incomplete SUITE |
| 3 | 12WW24 | 2/24/07 | 10:00 | | X | GW | 12WW24 | 2 | | | | | | | | | X | 1 Filtered 1 Unfiltered |
| 4 | | | | | | | | | | | | | | | | | | |
| 5 | | | | | | | | | | | | | | | | | | |
| 6 | | | | | | | | | | | | | | | | | | |
| 7 | | | | | | | | | | | | | | | | | | |
| 8 | | | | | | | | | | | | | | | | | | |
| 9 | | | | | | | | | | | | | | | | | | |
| 10 | | | | | | | | | | | | | | | | | | |

| Transfers Relinquished By (Signature) | Date/Time | Transfers Accepted By (Signature) | Date/Time |
|---|---|---|---|
| J. [signature] / M. Allen | 2/24/07 @ 1800 | [signature] 02.26.07 0910 | |
| | | | |
| | | | |
| | | Laboratory | |

Special Instructions: Please hold filtered sample pending further instruction. If any ?'s Please call Allen W @ 713 996-4586

FedEx Airbill No.:

Sampler's Signature: J. [signature]

TAT: ✓ Standard ____ Rush Due: ____

Seals Intact? ____ Y ____ N

Received Good Condition ✓ Y ____ N ✓ Cold 2.3°C

White - Lab Copy Canary - Field Copy Pink - File Copy

T16448: Chain of Custody
Page 1 of 3

4.1
4

00079162

ACCUTEST

**VARIANCE MEMO**
**SAMPLE LOG-IN**

SAMPLE(S) #-50WW03 - 2/24/07 @ 10:46 DATE 2/26/07
PROJECT LHAAP
FILED BY AK LAB NO. T16448

**VARIANCE - Check applicable items(s):**

____ Insufficient sample sent for proper analysis; received approx. ____
____ Sample bottle received broken and/or cap not intact.
____ Samples received without paperwork; paperwork received without samples.
____ Samples received without proper refrigeration, when it has been deemed necessary. Temperature at receipt: ____
____ Illegible sample number or label missing from bottle.
____ Numbers on sample not the same as numbers on paper work.
____ Incomplete instructions received with sample(s) ie.,no request for analysis, no chain of custody, incomplete billing instructions, no due date, etc. Temperature at reciept: ____
____ Samples received in improper container or lacking proper preservation.
____ Physical characteristics different than those on sampling sheets; Describe: ____
____ Rush samples on hold because of incomplete paperwork.
____ Other (specify) ✓

Sx. time on Containers is 08:56. Time on COC is different. Sx. 1 may be out of hold. Forward to Agnes. Sx. 1 was received without an Explosive Container. Sx. 2-The Explosive Container is only half full. May be limited Sx. volume.

**CORRECTIVE ACTION TAKEN**

| | | | |
|---|---|---|---|
| Diane M | Person Contacted | ✓ | By phone. |
| ____ | Client informed verbally. | ____ | Samples processed for information only and noted on report. |
| ____ | Client informed by memo/letter. | ____ | Samples processed with higher detection limits accepted. |
| ____ | Samples processed as is. | ____ | Samples rejected. |
| ____ | Samples preserved by lab. | | |
| ____ | Client will resample and resubmit. | | |

Notes: Sx Time is 1046 As Per CoC. No Explosives Needed
Sx#2- Limited Sx Volume.

**ROUTING**

| TITLE | DATE | INITIALS | CORRECTED? |
|---|---|---|---|
| Sample Manager: | | | |
| Login: | | | |
| Project Manager: | 2/26/07 | AKS | |
| Comments: | | | |

Form: SM006

T16448: Chain of Custody
Page 2 of 3

ACCUTEST

## SAMPLE RECEIPT LOG

JOB #: T16448 DATE/TIME RECEIVED: 2/26/07 / 09:10

CLIENT: Shaw INITIALS: AR

Condition/Variance (Circle "Y" for yes and "N" for no or NA. If "N" is circled, see variance for explanation):

1. Y N Sample received in undamaged condition.
2. Y N Samples received within temp. range.
3. Y N Sample received with proper pH.
4. Y N Sample received in proper containers.
5. Y N Sample volume sufficient for analysis.
6. Y N Sample received with chain of custody.
7. Y N Chain of Custody matches **sample IDs and analysis** on containers.
8. Y N Samples Headspace acceptable
9. Y N NA Custody seal received intact and tamper not evident on cooler.
10. Y N NA Custody seal received intact and tamper not evident on bottles.

| SAMPLE or FIELD ID | BOTTLE # | DATE SAMPLED | MATRIX | VOLUME | LOCATION | PRESERV. | PH |
|---|---|---|---|---|---|---|---|
| 1,2 | 1-3 | 2/24 | AQ | 40 ml. | VREF | 1,2,3,4,5,6 | U, <2, >12, NA |
| | 4-6 | | | | SUB | 1,2,3,4,5,6 | U, <2, >12, NA |
| | 7-9 | | | | 2L | 1,2,3,4,5,6 | U, <2, >12, NA |
| 1 | 10-11 | | | P1000 | | 1,2,3,4,5,6 | U, <2, >12, NA |
| 1 | 12 | | | P500 | | 1,2,3,4,5,6 | U, <2, >12, NA |
| 1 | 13 | | | | | 1,2,3,4,5,6 | U, <2, >12, NA |
| 2 | 10 | | | A1000 | SUB | 1,2,3,4,5,6 | U, <2, >12, NA |
| 3 | 1-2 | | | P500 | 2L | 1,2,3,4,5,6 | U, <2, >12, NA |
| | | | | | | 1,2,3,4,5,6 | U, <2, >12, NA |
| | | | | | | 1,2,3,4,5,6 | U, <2, >12, NA |
| | | | | | | 1,2,3,4,5,6 | U, <2, >12, NA |
| | | | | | | 1,2,3,4,5,6 | U, <2, >12, NA |
| | | | | | | 1,2,3,4,5,6 | U, <2, >12, NA |
| | | | | | | 1,2,3,4,5,6 | U, <2, >12, NA |
| | | | | | | 1,2,3,4,5,6 | U, <2, >12, NA |
| | | | | | | 1,2,3,4,5,6 | U, <2, >12, NA |

AR 2-26-07

LOCATION: WI: Walk-In VR: Volatile Refrig. SUB: Subcontract EF: Encore Freezer

PRESERVATIVES: 1: None 2: HCL 3: HNO3 4: H2SO4 5: NAOH 6: Other

Comments: ______

~~pH of waters checked excluding volatiles~~

pH of soils N/A

Delivery method: Courier: Client

COOLER TEMP: 2.3 COOLER TEMP: ______

COOLER TEMP: ______ COOLER TEMP: ______

Form: SM012, Rev.07/28/06, QAO

4 4.1

T16448: Chain of Custody

Page 3 of 3

# Appendix A Laboratory Data Package Cover Page

This data package consists of:

- ☐ This signature page, the laboratory review checklist, and the following reportable data:
- ☐ R1 Field chain-of-custody documentation;
- ☐ R2 Sample identification cross-reference;
- ☐ R3 Test reports (analytical data sheets) for each environmental sample that includes:
  - a) Items consistent with NELAC 5.13 or ISO/IEC 17025 Section 5.10
  - b) dilution factors,
  - c) preparation methods,
  - d) cleanup methods, and
  - e) if required for the project, tentatively identified compounds (TICs).
- ☐ R4 Surrogate recovery data including:
  - a) Calculated recovery (%R), and
  - b) The laboratory's surrogate QC limits.
- ☐ R5 Test reports/summary forms for blank samples;
- ☐ R6 Test reports/summary forms for laboratory control samples (LCSs) including:
  - a) LCS spiking amounts,
  - b) Calculated %R for each analyte, and
  - c) The laboratory's LCS QC limits.
- ☐ R7 Test reports for project matrix spike/matrix spike duplicates (MS/MSDs) including:
  - a) Samples associated with the MS/MSD clearly identified,
  - b) MS/MSD spiking amounts,
  - c) Concentration of each MS/MSD analyte measured in the parent and spiked samples,
  - d) Calculated %Rs and relative percent differences (RPDs), and
  - e) The laboratory's MS/MSD QC limits
- ☐ R8 Laboratory analytical duplicate (if applicable) recovery and precision:
  - a) the amount of analyte measured in the duplicate,
  - b) the calculated RPD, and
  - c) the laboratory's QC limits for analytical duplicates.
- ☐ R9 List of method quantitation limits (MQLs) for each analyte for each method and matrix;
- ☐ R10 Other problems or anomalies.
- ☐ The Exception Report for every "No" or "Not Reviewed (NR)" item in laboratory review checklist.

**Release Statement:** I am responsible for the release of this laboratory data package. This data package has been reviewed by the laboratory and is complete and technically compliant with the requirements of the methods used, except where noted by the laboratory in the attached exception reports. By me signature below, I affirm to the best of my knowledge, all problems/anomalies, observed by the laboratory as having the potential to affect the quality of the data, have been identified by the laboratory in the Laboratory Review Checklist, and no information or data have been knowingly withheld that would affect the quality of the data.

**Check, if applicable:** [ ] This laboratory is an in-house laboratory controlled by the person responding to rule. The official signing the cover page of the rule-required report (for example, the APAR) in which these data are used is responsible for releasing this data package and is by signature affirming the above release statement is true.

| | | | |
|---|---|---|---|
| Ron Martino | Ron Martino | Lab Director | 3/13/2007 |
| Name (Printed) | Signature | Official Title (printed) | Date |

1. Items identified by the letter “R” must be included in the laboratory data package submitted in the TRRP-required report(s). Items identified by the letter “S” should be retained and made available upon request for the appropriate retention period.

## Appendix A (cont’d): Laboratory Review Checklist: Reportable Data

| | |
|---|---|
| Laboratory Name: Accutest Laboratories Gulf Coast | LRC Date: 3/13/2007 |
| Project Name: Longhorn | Laboratory Job Number: T16448 |
| Reviewer Name: Ron Martino | Prep Batch Number(s): |

| #[1] | A[2] | Description | Yes | No | NA[3] | NR[4] | ER#[5] |
|---|---|---|---|---|---|---|---|
| | | **Chain-of-custody (C-O-C)** | | | | | |
| **R1** | OI | Did samples meet the laboratory’s standard conditions of sample acceptability upon receipt? | X | | | | |
| | | Were all departures from standard conditions described in an exception report? | X | | | | |
| **R2** | OI | **Sample and quality control (QC) identification** | | | | | |
| | | Are all field sample ID numbers cross-referenced to the laboratory ID numbers? | X | | | | |
| | | Are all laboratory ID numbers cross-referenced to the corresponding QC data? | X | | | | |
| **R3** | OI | **Test reports** | | | | | |
| | | Were all samples prepared and analyzed within holding times? | X | | | | |
| | | Other than those results < MQL, were all other raw values bracketed by calibration standards? | X | | | | |
| | | Were calculations checked by a peer or supervisor? | X | | | | |
| | | Were all analyte identifications checked by a peer or supervisor? | X | | | | |
| | | Were sample quantitation limits reported for all analytes not detected? | X | | | | |
| | | Were all results for soil and sediment samples reported on a dry weight basis? | | | X | | |
| | | Were % moisture (or solids) reported for all soil and sediment samples? | | | X | | |
| | | If required for the project, TICs reported? | | | X | | |
| **R4** | O | **Surrogate recovery data** | | | | | |
| | | Were surrogates added prior to extraction? | X | | | | |
| | | Were surrogate percent recoveries in all samples within the laboratory QC limits? | X | | | | |
| **R5** | OI | **Test reports/summary forms for blank samples** | | | | | |
| | | Were appropriate type(s) of blanks analyzed? | X | | | | |
| | | Were blanks analyzed at the appropriate frequency? | X | | | | |
| | | Were method blanks taken through the entire analytical process, including preparation and, if applicable, cleanup procedures? | X | | | | |
| | | Were blank concentrations < MQL? | X | | | | |
| **R6** | OI | **Laboratory control samples (LCS):** | | | | | |
| | | Were all COCs included in the LCS? | X | | | | |
| | | Was each LCS taken through the entire analytical procedure, including prep and cleanup steps? | X | | | | |
| | | Were LCSs analyzed at the required frequency? | X | | | | |
| | | Were LCS (and LCSD, if applicable) %Rs within the laboratory QC limits? | X | | | | |
| | | Does the detectability data document the laboratory’s capability to detect the COCs at the MDL used to calculate the SQLs? | X | | | | |
| | | Was the LCSD RPD within QC limits? | | | X | | |
| **R7** | OI | **Matrix spike (MS) and matrix spike duplicate (MSD) data** | | | | | |
| | | Were the project/method specified analytes included in the MS and MSD? | X | | | | |
| | | Were MS/MSD analyzed at the appropriate frequency? | X | | | | |
| | | Were MS (and MSD, if applicable) %Rs within the laboratory QC limits? | | X | | | 2 |
| | | Were MS/MSD RPDs within laboratory QC limits? | X | | | | |
| **R8** | OI | **Analytical duplicate data** | | | | | |
| | | Were appropriate analytical duplicates analyzed for each matrix? | X | | | | |
| | | Were analytical duplicates analyzed at the appropriate frequency? | X | | | | |
| | | Were RPDs or relative standard deviations within the laboratory QC limits? | X | | | | |
| **R9** | OI | **Method quantitation limits (MQLs):** | | | | | |
| | | Are the MQLs for each method analyte included in the laboratory data package? | **X** | | | | |
| | | Do the MQLs correspond to the concentration of the lowest non-zero calibration standard? | **X** | | | | |
| | | Are unadjusted MQLs included in the laboratory data package? | X | | | | |
| **R10** | OI | **Other problems/anomalies** | | | | | |
| | | Are all known problems/anomalies/special conditions noted in this LRC and ER? | **X** | | | | |
| | | Were all necessary corrective actions performed for the reported data? | **X** | | | | |

2. = organic analyses; I = inorganic analyses (and general chemistry, when applicable);
3. NA = Not applicable;
4. NR = Not reviewed;
5. ER# = Exception Report identification number (an Exception Report should be completed for an item if “NR” or “No” is checked).

# Appendix A (cont'd): Laboratory Review Checklist: Reportable Data

| | |
|---|---|
| Laboratory Name: Accutest Laboratories Gulf Coast | LRC Date: 3/13/2007 |
| Project Name: Longhorn | Laboratory Job Number: T16448 |
| Reviewer Name: Ron Martino | Prep Batch Number(s): |

| #[1] | A[2] | Description | Yes | No | NA[3] | NR[4] | ER#[5] |
|---|---|---|---|---|---|---|---|
| **S1** | OI | **Initial calibration (ICAL)** | | | | | |
| | | Were response factors and/or relative response factors for each analyte within QC limits? | **X** | | | | |
| | | Were percent RSDs or correlation coefficient criteria met? | **X** | | | | |
| | | Was the number of standards recommended in the method used for all analytes? | **X** | | | | |
| | | Were all points generated between the lowest and highest standard used to calculate the curve? | **X** | | | | |
| | | Are ICAL data available for all instruments used? | **X** | | | | |
| | | Has the initial calibration curve been verified using an appropriate second source standard? | **X** | | | | |
| **S2** | OI | **Initial and continuing calibration verification (ICCV and CCV) and continuing calibration** | | | | | |
| | | Was the CCV analyzed at the method-required frequency? | **X** | | | | |
| | | Were percent differences for each analyte within the method-required QC limits? | **X** | | | | |
| | | Was the ICAL curve verified for each analyte? | **X** | | | | |
| | | Was the absolute value of the analyte concentration in the inorganic CCB < MDL? | **X** | | | | |
| **S3** | O | **Mass spectral tuning:** | | | | | |
| | | Was the appropriate compound for the method used for tuning? | **X** | | | | |
| | | Were ion abundance data within the method-required QC limits? | **X** | | | | |
| **S4** | O | **Internal standards (IS):** | | | | | |
| | | Were IS area counts and retention times within the method-required QC limits? | **X** | | | | |
| **S5** | OI | **Raw data (NELAC section 1 appendix A glossary, and section 5.12 or ISO/IEC 17025 section** | | | | | |
| | | Were the raw data (for example, chromatograms, spectral data) reviewed by an analyst? | **X** | | | | |
| | | Were data associated with manual integrations flagged on the raw data? | **X** | | | | |
| **S6** | O | **Dual column confirmation** | | | | | |
| | | Did dual column confirmation results meet the method-required QC? | | | **X** | | |
| **S7** | O | **Tentatively identified compounds (TICs):** | | | | | |
| | | If TICs were requested, were the mass spectra and TIC data subject to appropriate checks? | | | **X** | | |
| **S8** | I | **Interference Check Sample (ICS) results:** | | | | | |
| | | Were percent recoveries within method QC limits? | | | **X** | | |
| | I | **Serial dilutions, post digestion spikes, and method of standard additions** | | | | | |
| | | Were percent differences, recoveries, and the linearity within the QC limits specified in the method? | | | **X** | | |
| **S10** | OI | **Method detection limit (MDL) studies** | | | | | |
| | | Was a MDL study performed for each reported analyte? | **X** | | | | |
| | | Is the MDL either adjusted or supported by the analysis of DCSs? | **X** | | | | |
| **S11** | OI | **Proficiency test reports:** | | | | | |
| | | Was the laboratory's performance acceptable on the applicable proficiency tests or evaluation studies? | **X** | | | | |
| **S12** | OI | **Standards documentation** | | | | | |
| | | Are all standards used in the analyses NIST-traceable or obtained from other appropriate sources? | **X** | | | | |
| **S13** | OI | **Compound/analyte identification procedures** | | | | | |
| | | Are the procedures for compound/analyte identification documented? | **X** | | | | |
| **S14** | OI | **Demonstration of analyst competency (DOC)** | | | | | |
| | | Was DOC conducted consistent with NELAC Chapter 5C or ISO/IEC 4? | **X** | | | | |
| | | Is documentation of the analyst's competency up-to-date and on file? | **X** | | | | |
| **S15** | OI | **Verification/validation documentation for methods** (NELAC Chap 5 or ISO/IEC 17025 Section 5) | | | | | |
| | | Are all the methods used to generate the data documented, verified, and validated, where applicable? | **X** | | | | |
| **S16** | OI | **Laboratory standard operating procedures (SOPs):** | | | | | |
| | | Are laboratory SOPs current and on file for each method performed? | **X** | | | | |

1 Items identified by the letter "R" should be included in the laboratory data package submitted to the TCEQ in the TRRP-required report(s). Items identified by the letter "S" should be retained and made available upon request for the appropriate retention period.
2 O = organic analyses; I = inorganic analyses (and general chemistry, when applicable).
3 NA = Not applicable.
4 NR = Not Reviewed.
5 ER# = Exception Report identification number (an Exception Report should be completed for an item if "NR" or "No" is checked).

| Appendix A (cont'd): Laboratory Review Checklist: Exception Reports | |
|---|---|
| Laboratory Name: Accutest Laboratories Gulf Coast | LRC Date: 3/13/2007 |
| Project Name: Longhorn | Laboratory Job Number: T16448 |
| Reviewer Name: Ron Martino | Prep Batch Number(s): |

| ER #[1] | DESCRIPTION |
|---|---|
| 1 | For reporting purposes, the MQL is defined in the report as the RL. The unadjusted MQL/RL is reported in the method blank. The SQL/MDL is defined in the report as the MDL. |
| 2 | All anomalies are discussed in the case narrative. |

ER# = Exception Report identification number (an Exception Report should be completed for an item if "NR" or "No" is checked on the LRC)

# GC/MS Volatiles

## QC Data Summaries

Includes the following where applicable:

- Method Blank Summaries
- Blank Spike Summaries
- Matrix Spike and Duplicate Summaries
- Instrument Performance Checks (BFB)
- Internal Standard Area Summaries
- Surrogate Recovery Summaries
- Initial and Continuing Calibration Summaries

# Method Blank Summary



**Job Number:** T16448
**Account:** ITTXHO Shaw E & I, Inc.
**Project:** Longhorn Army Ammunition Plant

| Sample | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|---|---|---|---|---|---|---|---|
| VF2315-MB | F0079184.D | 1 | 03/07/07 | LJ | n/a | n/a | VF2315 |



**The QC reported here applies to the following samples:** **Method:** SW846 8260B

T16448-1, T16448-2

| CAS No. | Compound | Result | RL | MDL | Units | Q |
|---|---|---|---|---|---|---|
| 67-64-1 | Acetone | ND | 50 | 2.8 | ug/l | |
| 71-43-2 | Benzene | ND | 2.0 | 0.23 | ug/l | |
| 75-27-4 | Bromodichloromethane | ND | 2.0 | 0.33 | ug/l | |
| 75-25-2 | Bromoform | ND | 2.0 | 0.65 | ug/l | |
| 108-90-7 | Chlorobenzene | ND | 2.0 | 0.54 | ug/l | |
| 75-00-3 | Chloroethane | ND | 2.0 | 0.46 | ug/l | |
| 67-66-3 | Chloroform | ND | 2.0 | 0.66 | ug/l | |
| 75-15-0 | Carbon disulfide | ND | 2.0 | 0.62 | ug/l | |
| 56-23-5 | Carbon tetrachloride | ND | 2.0 | 0.52 | ug/l | |
| 75-34-3 | 1,1-Dichloroethane | ND | 2.0 | 0.52 | ug/l | |
| 75-35-4 | 1,1-Dichloroethylene | ND | 2.0 | 0.68 | ug/l | |
| 107-06-2 | 1,2-Dichloroethane | ND | 2.0 | 0.53 | ug/l | |
| 78-87-5 | 1,2-Dichloropropane | ND | 2.0 | 0.59 | ug/l | |
| 124-48-1 | Dibromochloromethane | ND | 2.0 | 0.68 | ug/l | |
| 156-59-2 | cis-1,2-Dichloroethylene | ND | 2.0 | 0.83 | ug/l | |
| 10061-01-5 | cis-1,3-Dichloropropene | ND | 2.0 | 0.59 | ug/l | |
| 156-60-5 | trans-1,2-Dichloroethylene | ND | 2.0 | 0.75 | ug/l | |
| 10061-02-6 | trans-1,3-Dichloropropene | ND | 2.0 | 0.61 | ug/l | |
| 100-41-4 | Ethylbenzene | ND | 2.0 | 0.48 | ug/l | |
| 591-78-6 | 2-Hexanone | ND | 10 | 1.9 | ug/l | |
| 108-10-1 | 4-Methyl-2-pentanone | ND | 10 | 7.3 | ug/l | |
| 74-83-9 | Methyl bromide | ND | 2.0 | 0.47 | ug/l | |
| 74-87-3 | Methyl chloride | ND | 2.0 | 0.60 | ug/l | |
| 75-09-2 | Methylene chloride | ND | 5.0 | 0.67 | ug/l | |
| 78-93-3 | Methyl ethyl ketone | ND | 10 | 3.0 | ug/l | |
| 100-42-5 | Styrene | ND | 2.0 | 0.50 | ug/l | |
| 71-55-6 | 1,1,1-Trichloroethane | ND | 2.0 | 0.37 | ug/l | |
| 79-34-5 | 1,1,2,2-Tetrachloroethane | ND | 2.0 | 0.46 | ug/l | |
| 79-00-5 | 1,1,2-Trichloroethane | ND | 2.0 | 0.66 | ug/l | |
| 127-18-4 | Tetrachloroethylene | ND | 2.0 | 0.74 | ug/l | |
| 108-88-3 | Toluene | ND | 2.0 | 0.54 | ug/l | |
| 79-01-6 | Trichloroethylene | ND | 2.0 | 0.63 | ug/l | |
| 75-01-4 | Vinyl chloride | ND | 2.0 | 0.32 | ug/l | |
| 1330-20-7 | Xylene (total) | ND | 6.0 | 1.1 | ug/l | |

# Method Blank Summary



**Job Number:** T16448
**Account:** ITTXHO Shaw E & I, Inc.
**Project:** Longhorn Army Ammunition Plant

| Sample | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|---|---|---|---|---|---|---|---|
| VF2315-MB | F0079184.D | 1 | 03/07/07 | LJ | n/a | n/a | VF2315 |



**The QC reported here applies to the following samples:** **Method:** SW846 8260B

T16448-1, T16448-2

| CAS No. | Surrogate Recoveries | | Limits |
|---|---|---|---|
| 1868-53-7 | Dibromofluoromethane | 103% | 73-139% |
| 17060-07-0 | 1,2-Dichloroethane-D4 | 98% | 66-139% |
| 2037-26-5 | Toluene-D8 | 109% | 77-148% |
| 460-00-4 | 4-Bromofluorobenzene | 129% | 84-150% |

# Method Blank Summary



**Job Number:** T16448
**Account:** ITTXHO Shaw E & I, Inc.
**Project:** Longhorn Army Ammunition Plant

| Sample | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|---|---|---|---|---|---|---|---|
| VF2318-MB | F0079225.D | 1 | 03/08/07 | LJ | n/a | n/a | VF2318 |




**The QC reported here applies to the following samples:** **Method:** SW846 8260B

T16448-2

| CAS No. | Compound | Result | RL | MDL | Units | Q |
|---|---|---|---|---|---|---|
| 107-06-2 | 1,2-Dichloroethane | ND | 2.0 | 0.53 | ug/l | |
| 79-01-6 | Trichloroethylene | ND | 2.0 | 0.63 | ug/l | |

| CAS No. | Surrogate Recoveries | | Limits |
|---|---|---|---|
| 1868-53-7 | Dibromofluoromethane | 103% | 73-139% |
| 17060-07-0 | 1,2-Dichloroethane-D4 | 97% | 66-139% |
| 2037-26-5 | Toluene-D8 | 108% | 77-148% |
| 460-00-4 | 4-Bromofluorobenzene | 121% | 84-150% |

# Blank Spike Summary



**Job Number:** T16448
**Account:** ITTXHO Shaw E & I, Inc.
**Project:** Longhorn Army Ammunition Plant

| Sample | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|---|---|---|---|---|---|---|---|
| VF2315-BS | F0079183.D | 1 | 03/07/07 | LJ | n/a | n/a | VF2315 |



**The QC reported here applies to the following samples:** **Method:** SW846 8260B

T16448-1, T16448-2

| CAS No. | Compound | Spike ug/l | BSP ug/l | BSP % | Limits |
|---|---|---|---|---|---|
| 67-64-1 | Acetone | 125 | 103 | 82 | 31-158 |
| 71-43-2 | Benzene | 25 | 25.1 | 100 | 67-118 |
| 75-27-4 | Bromodichloromethane | 25 | 23.8 | 95 | 66-115 |
| 75-25-2 | Bromoform | 25 | 22.2 | 89 | 57-119 |
| 108-90-7 | Chlorobenzene | 25 | 24.3 | 97 | 72-116 |
| 75-00-3 | Chloroethane | 25 | 26.6 | 106 | 61-135 |
| 67-66-3 | Chloroform | 25 | 25.7 | 103 | 66-117 |
| 75-15-0 | Carbon disulfide | 25 | 21.7 | 87 | 39-136 |
| 56-23-5 | Carbon tetrachloride | 25 | 27.6 | 110 | 67-131 |
| 75-34-3 | 1,1-Dichloroethane | 25 | 26.2 | 105 | 63-125 |
| 75-35-4 | 1,1-Dichloroethylene | 25 | 25.4 | 102 | 52-143 |
| 107-06-2 | 1,2-Dichloroethane | 25 | 24.1 | 96 | 61-120 |
| 78-87-5 | 1,2-Dichloropropane | 25 | 25.2 | 101 | 64-118 |
| 124-48-1 | Dibromochloromethane | 25 | 22.4 | 90 | 67-117 |
| 156-59-2 | cis-1,2-Dichloroethylene | 25 | 24.3 | 97 | 65-116 |
| 10061-01-5 | cis-1,3-Dichloropropene | 25 | 25.0 | 100 | 67-118 |
| 156-60-5 | trans-1,2-Dichloroethylene | 25 | 25.2 | 101 | 66-128 |
| 10061-02-6 | trans-1,3-Dichloropropene | 25 | 24.7 | 99 | 73-126 |
| 100-41-4 | Ethylbenzene | 25 | 23.9 | 96 | 71-119 |
| 591-78-6 | 2-Hexanone | 125 | 101 | 81 | 45-132 |
| 108-10-1 | 4-Methyl-2-pentanone | 125 | 111 | 89 | 46-127 |
| 74-83-9 | Methyl bromide | 25 | 23.0 | 92 | 51-126 |
| 74-87-3 | Methyl chloride | 25 | 23.0 | 92 | 47-130 |
| 75-09-2 | Methylene chloride | 25 | 23.5 | 94 | 53-130 |
| 78-93-3 | Methyl ethyl ketone | 125 | 107 | 86 | 47-128 |
| 100-42-5 | Styrene | 25 | 20.0 | 80 | 69-115 |
| 71-55-6 | 1,1,1-Trichloroethane | 25 | 26.2 | 105 | 67-128 |
| 79-34-5 | 1,1,2,2-Tetrachloroethane | 25 | 21.4 | 86 | 57-121 |
| 79-00-5 | 1,1,2-Trichloroethane | 25 | 22.9 | 92 | 62-117 |
| 127-18-4 | Tetrachloroethylene | 25 | 26.4 | 106 | 72-128 |
| 108-88-3 | Toluene | 25 | 24.3 | 97 | 70-121 |
| 79-01-6 | Trichloroethylene | 25 | 26.1 | 104 | 69-120 |
| 75-01-4 | Vinyl chloride | 25 | 25.2 | 101 | 59-145 |
| 1330-20-7 | Xylene (total) | 75 | 74.2 | 99 | 72-120 |

# Blank Spike Summary



**Job Number:** T16448
**Account:** ITTXHO Shaw E & I, Inc.
**Project:** Longhorn Army Ammunition Plant

| Sample | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|---|---|---|---|---|---|---|---|
| VF2315-BS | F0079183.D | 1 | 03/07/07 | LJ | n/a | n/a | VF2315 |

**The QC reported here applies to the following samples:** **Method:** SW846 8260B

T16448-1, T16448-2

| CAS No. | Surrogate Recoveries | BSP | Limits |
|---|---|---|---|
| 1868-53-7 | Dibromofluoromethane | 104% | 73-139% |
| 17060-07-0 | 1,2-Dichloroethane-D4 | 101% | 66-139% |
| 2037-26-5 | Toluene-D8 | 102% | 77-148% |
| 460-00-4 | 4-Bromofluorobenzene | 99% | 84-150% |

# Blank Spike Summary



**Job Number:** T16448
**Account:** ITTXHO Shaw E & I, Inc.
**Project:** Longhorn Army Ammunition Plant

| Sample | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|---|---|---|---|---|---|---|---|
| VF2318-BS | F0079224.D | 1 | 03/08/07 | LJ | n/a | n/a | VF2318 |

**The QC reported here applies to the following samples:** **Method:** SW846 8260B

T16448-2

| CAS No. | Compound | Spike ug/l | BSP ug/l | BSP % | Limits |
|---|---|---|---|---|---|
| 107-06-2 | 1,2-Dichloroethane | 25 | 22.7 | 91 | 61-120 |
| 79-01-6 | Trichloroethylene | 25 | 25.5 | 102 | 69-120 |

| CAS No. | Surrogate Recoveries | BSP | Limits |
|---|---|---|---|
| 1868-53-7 | Dibromofluoromethane | 106% | 73-139% |
| 17060-07-0 | 1,2-Dichloroethane-D4 | 97% | 66-139% |
| 2037-26-5 | Toluene-D8 | 103% | 77-148% |
| 460-00-4 | 4-Bromofluorobenzene | 101% | 84-150% |

# Matrix Spike/Matrix Spike Duplicate Summary



**Job Number:** T16448
**Account:** ITTXHO Shaw E & I, Inc.
**Project:** Longhorn Army Ammunition Plant

| Sample | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|---|---|---|---|---|---|---|---|
| T16445-3MS | F0079191.D | 1 | 03/07/07 | LJ | n/a | n/a | VF2315 |
| T16445-3MSD | F0079192.D | 1 | 03/07/07 | LJ | n/a | n/a | VF2315 |
| T16445-3 [a] | F0079190.D | 1 | 03/07/07 | LJ | n/a | n/a | VF2315 |



**The QC reported here applies to the following samples:** **Method:** SW846 8260B

T16448-1, T16448-2

| CAS No. | Compound | T16445-3 ug/l | Q | Spike ug/l | MS ug/l | MS % | MSD ug/l | MSD % | RPD | Limits Rec/RPD |
|---|---|---|---|---|---|---|---|---|---|---|
| 67-64-1 | Acetone | 50 U | | 125 | 103 | 82 | 98.2 | 79 | 5 | 39-130/26 |
| 71-43-2 | Benzene | 2.0 U | | 25 | 23.6 | 94 | 24.0 | 96 | 2 | 65-122/15 |
| 75-27-4 | Bromodichloromethane | 2.0 U | | 25 | 22.5 | 90 | 22.3 | 89 | 1 | 64-119/22 |
| 75-25-2 | Bromoform | 2.0 U | | 25 | 20.5 | 82 | 20.7 | 83 | 1 | 50-123/28 |
| 108-90-7 | Chlorobenzene | 2.0 U | | 25 | 22.8 | 91 | 23.3 | 93 | 2 | 72-118/20 |
| 75-00-3 | Chloroethane | 2.0 U | | 25 | 24.6 | 98 | 23.8 | 95 | 3 | 60-136/25 |
| 67-66-3 | Chloroform | 2.0 U | | 25 | 24.9 | 100 | 25.4 | 102 | 2 | 65-120/20 |
| 75-15-0 | Carbon disulfide | 2.0 U | | 25 | 20.2 | 81 | 19.9 | 80 | 1 | 37-140/24 |
| 56-23-5 | Carbon tetrachloride | 2.0 U | | 25 | 25.6 | 102 | 25.8 | 103 | 1 | 64-135/23 |
| 75-34-3 | 1,1-Dichloroethane | 2.0 | | 25 | 27.3 | 101 | 26.7 | 99 | 2 | 65-126/21 |
| 75-35-4 | 1,1-Dichloroethylene | 10.9 | | 25 | 34.9 | 96 | 33.5 | 90 | 4 | 55-140/25 |
| 107-06-2 | 1,2-Dichloroethane | 2.0 | | 25 | 24.5 | 90 | 24.1 | 88 | 2 | 57-125/25 |
| 78-87-5 | 1,2-Dichloropropane | 2.0 U | | 25 | 23.2 | 93 | 24.2 | 97 | 4 | 63-121/22 |
| 124-48-1 | Dibromochloromethane | 2.0 U | | 25 | 21.4 | 86 | 22.0 | 88 | 3 | 60-123/23 |
| 156-59-2 | cis-1,2-Dichloroethylene | 699 | E | 25 | 685 | -56* [b] | 690 | -36* [b] | 1 | 62-120/24 |
| 10061-01-5 | cis-1,3-Dichloropropene | 2.0 U | | 25 | 23.5 | 94 | 23.8 | 95 | 1 | 61-119/23 |
| 156-60-5 | trans-1,2-Dichloroethylene | 2.1 | | 25 | 26.1 | 96 | 26.0 | 96 | 0 | 64-130/22 |
| 10061-02-6 | trans-1,3-Dichloropropene | 2.0 U | | 25 | 24.4 | 98 | 24.1 | 96 | 1 | 65-129/23 |
| 100-41-4 | Ethylbenzene | 2.0 U | | 25 | 22.8 | 91 | 23.5 | 94 | 3 | 70-123/18 |
| 591-78-6 | 2-Hexanone | 10 U | | 125 | 105 | 84 | 101 | 81 | 4 | 41-137/27 |
| 108-10-1 | 4-Methyl-2-pentanone | 10 U | | 125 | 114 | 91 | 110 | 88 | 4 | 41-133/22 |
| 74-83-9 | Methyl bromide | 2.0 U | | 25 | 21.6 | 86 | 20.8 | 83 | 4 | 47-129/27 |
| 74-87-3 | Methyl chloride | 2.0 U | | 25 | 23.2 | 93 | 22.1 | 88 | 5 | 45-133/24 |
| 75-09-2 | Methylene chloride | 5.0 U | | 25 | 22.8 | 91 | 22.5 | 90 | 1 | 49-128/21 |
| 78-93-3 | Methyl ethyl ketone | 10 U | | 125 | 108 | 86 | 105 | 84 | 3 | 43-125/29 |
| 100-42-5 | Styrene | 2.0 U | | 25 | 18.9 | 76 | 19.0 | 76 | 1 | 65-120/21 |
| 71-55-6 | 1,1,1-Trichloroethane | 2.0 U | | 25 | 25.2 | 101 | 24.8 | 99 | 2 | 68-131/21 |
| 79-34-5 | 1,1,2,2-Tetrachloroethane | 2.0 U | | 25 | 20.8 | 83 | 21.4 | 86 | 3 | 50-128/22 |
| 79-00-5 | 1,1,2-Trichloroethane | 1.7 | J | 25 | 23.7 | 88 | 24.0 | 89 | 1 | 58-120/22 |
| 127-18-4 | Tetrachloroethylene | 83.1 | | 25 | 107 | 96 | 106 | 92 | 1 | 69-132/21 |
| 108-88-3 | Toluene | 2.0 U | | 25 | 22.8 | 91 | 23.4 | 94 | 3 | 70-123/18 |
| 79-01-6 | Trichloroethylene | 6520 | E | 25 | 6200 | -1280* [b] | 6140 | -1520* [b] | 1 | 70-120/19 |
| 75-01-4 | Vinyl chloride | 3.8 | | 25 | 28.3 | 98 | 27.1 | 93 | 4 | 51-147/24 |
| 1330-20-7 | Xylene (total) | 6.0 U | | 75 | 69.8 | 93 | 70.7 | 94 | 1 | 71-122/16 |

# Matrix Spike/Matrix Spike Duplicate Summary



**Job Number:** T16448
**Account:** ITTXHO Shaw E & I, Inc.
**Project:** Longhorn Army Ammunition Plant

| Sample | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|---|---|---|---|---|---|---|---|
| T16445-3MS | F0079191.D | 1 | 03/07/07 | LJ | n/a | n/a | VF2315 |
| T16445-3MSD | F0079192.D | 1 | 03/07/07 | LJ | n/a | n/a | VF2315 |
| T16445-3 [a] | F0079190.D | 1 | 03/07/07 | LJ | n/a | n/a | VF2315 |

**The QC reported here applies to the following samples:** **Method:** SW846 8260B

T16448-1, T16448-2

| CAS No. | Surrogate Recoveries | MS | MSD | T16445-3 | Limits |
|---|---|---|---|---|---|
| 1868-53-7 | Dibromofluoromethane | 106% | 107% | 106% | 73-139% |
| 17060-07-0 | 1,2-Dichloroethane-D4 | 106% | 107% | 106% | 66-139% |
| 2037-26-5 | Toluene-D8 | 101% | 104% | 102% | 77-148% |
| 460-00-4 | 4-Bromofluorobenzene | 99% | 103% | 123% | 84-150% |

(a) For QC only.
(b) Outside control limits due to high level in sample relative to spike amount.

# Matrix Spike/Matrix Spike Duplicate Summary



**Job Number:** T16448
**Account:** ITTXHO Shaw E & I, Inc.
**Project:** Longhorn Army Ammunition Plant

| Sample | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|---|---|---|---|---|---|---|---|
| T16445-4MS | F0079227.D | 1 | 03/08/07 | LJ | n/a | n/a | VF2318 |
| T16445-4MSD | F0079228.D | 1 | 03/08/07 | LJ | n/a | n/a | VF2318 |
| T16445-4 | F0079226.D | 1 | 03/08/07 | LJ | n/a | n/a | VF2318 |

**The QC reported here applies to the following samples:** **Method:** SW846 8260B

T16448-2

| CAS No. | Compound | T16445-4 ug/l | Q | Spike ug/l | MS ug/l | MS % | MSD ug/l | MSD % | RPD | Limits Rec/RPD |
|---|---|---|---|---|---|---|---|---|---|---|
| 107-06-2 | 1,2-Dichloroethane | 2.0 U | | 25 | 23.0 | 92 | 22.6 | 90 | 2 | 57-125/25 |
| 79-01-6 | Trichloroethylene | 2.0 | | 25 | 26.3 | 97 | 25.9 | 96 | 2 | 70-120/19 |

| CAS No. | Surrogate Recoveries | MS | MSD | T16445-4 | Limits |
|---|---|---|---|---|---|
| 1868-53-7 | Dibromofluoromethane | 106% | 105% | 102% | 73-139% |
| 17060-07-0 | 1,2-Dichloroethane-D4 | 104% | 102% | 98% | 66-139% |
| 2037-26-5 | Toluene-D8 | 103% | 105% | 106% | 77-148% |
| 460-00-4 | 4-Bromofluorobenzene | 99% | 99% | 119% | 84-150% |

# Instrument Performance Check (BFB)



**Job Number:** T16448
**Account:** ITTXHO Shaw E & I, Inc.
**Project:** Longhorn Army Ammunition Plant

| | | | |
|---|---|---|---|
| **Sample:** | VF2305-BFB | **Injection Date:** | 02/28/07 |
| **Lab File ID:** | F0078963.D | **Injection Time:** | 14:36 |
| **Instrument ID:** | GCMSF | | |

| m/e | Ion Abundance Criteria | Raw Abundance | % Relative Abundance | | Pass/Fail |
|---|---|---|---|---|---|
| 50 | 15.0 - 40.0% of mass 95 | 7281 | 16.0 | | Pass |
| 75 | 30.0 - 60.0% of mass 95 | 18364 | 40.3 | | Pass |
| 95 | Base peak, 100% relative abundance | 45541 | 100.0 | | Pass |
| 96 | 5.0 - 9.0% of mass 95 | 2793 | 6.1 | | Pass |
| 173 | Less than 2.0% of mass 174 | 107 | 0.23 | (0.27) [a] | Pass |
| 174 | 50.0 - 100.0% of mass 95 | 39123 | 85.9 | | Pass |
| 175 | 5.0 - 9.0% of mass 174 | 3023 | 6.6 | (7.7) [a] | Pass |
| 176 | 95.0 - 101.0% of mass 174 | 37355 | 82.0 | (95.5) [a] | Pass |
| 177 | 5.0 - 9.0% of mass 176 | 2802 | 6.2 | (7.5) [b] | Pass |

(a) Value is % of mass 174
(b) Value is % of mass 176

**This check applies to the following Samples, MS, MSD, Blanks, and Standards:**

| Lab Sample ID | Lab File ID | Date Analyzed | Time Analyzed | Hours Lapsed | Client Sample ID |
|---|---|---|---|---|---|
| VF2305-IC2305 | F0078964.D | 02/28/07 | 15:10 | 00:34 | Initial cal 2 |
| VF2305-IC2305 | F0078965.D | 02/28/07 | 15:41 | 01:05 | Initial cal 5 |
| VF2305-IC2305 | F0078966.D | 02/28/07 | 16:12 | 01:36 | Initial cal 20 |
| VF2305-ICC2305 | F0078967.D | 02/28/07 | 16:44 | 02:08 | Initial cal 40 |
| VF2305-IC2305 | F0078968.D | 02/28/07 | 17:16 | 02:40 | Initial cal 70 |
| VF2305-IC2305 | F0078969.D | 02/28/07 | 17:46 | 03:10 | Initial cal 100 |
| VF2305-IC2305 | F0078970.D | 02/28/07 | 18:18 | 03:42 | Initial cal 200 |
| VF2305-BS | F0078972.D | 02/28/07 | 19:21 | 04:45 | Blank Spike |
| VF2305-MB | F0078974.D | 02/28/07 | 20:24 | 05:48 | Method Blank |
| ZZZZZZ | F0078975.D | 02/28/07 | 20:55 | 06:19 | (unrelated sample) |
| ZZZZZZ | F0078976.D | 02/28/07 | 21:26 | 06:50 | (unrelated sample) |
| ZZZZZZ | F0078977.D | 02/28/07 | 21:58 | 07:22 | (unrelated sample) |
| T16395-2 | F0078978.D | 02/28/07 | 22:30 | 07:54 | (used for QC only; not part of job T16448) |
| T16395-2MS | F0078979.D | 02/28/07 | 23:00 | 08:24 | Matrix Spike |
| T16395-2MSD | F0078980.D | 02/28/07 | 23:32 | 08:56 | Matrix Spike Duplicate |
| ZZZZZZ | F0078981.D | 03/01/07 | 00:03 | 09:27 | (unrelated sample) |
| ZZZZZZ | F0078982.D | 03/01/07 | 00:35 | 09:59 | (unrelated sample) |
| ZZZZZZ | F0078983.D | 03/01/07 | 01:06 | 10:30 | (unrelated sample) |
| ZZZZZZ | F0078984.D | 03/01/07 | 01:38 | 11:02 | (unrelated sample) |
| ZZZZZZ | F0078989.D | 03/01/07 | 04:15 | 13:39 | (unrelated sample) |
| ZZZZZZ | F0078990.D | 03/01/07 | 04:47 | 14:11 | (unrelated sample) |
| ZZZZZZ | F0078991.D | 03/01/07 | 05:19 | 14:43 | (unrelated sample) |
| ZZZZZZ | F0078992.D | 03/01/07 | 05:50 | 15:14 | (unrelated sample) |

# Instrument Performance Check (BFB)



**Job Number:** T16448
**Account:** ITTXHO Shaw E & I, Inc.
**Project:** Longhorn Army Ammunition Plant

| | | | |
|---|---|---|---|
| **Sample:** | VF2315-BFB | **Injection Date:** | 03/07/07 |
| **Lab File ID:** | F0079181.D | **Injection Time:** | 12:44 |
| **Instrument ID:** | GCMSF | | |



| m/e | Ion Abundance Criteria | Raw Abundance | % Relative Abundance | | Pass/Fail |
|---|---|---|---|---|---|
| 50 | 15.0 - 40.0% of mass 95 | 7668 | 19.2 | | Pass |
| 75 | 30.0 - 60.0% of mass 95 | 16756 | 42.0 | | Pass |
| 95 | Base peak, 100% relative abundance | 39853 | 100.0 | | Pass |
| 96 | 5.0 - 9.0% of mass 95 | 2768 | 6.9 | | Pass |
| 173 | Less than 2.0% of mass 174 | 96 | 0.24 | (0.28) [a] | Pass |
| 174 | 50.0 - 100.0% of mass 95 | 34109 | 85.6 | | Pass |
| 175 | 5.0 - 9.0% of mass 174 | 2473 | 6.2 | (7.3) [a] | Pass |
| 176 | 95.0 - 101.0% of mass 174 | 33421 | 83.9 | (98.0) [a] | Pass |
| 177 | 5.0 - 9.0% of mass 176 | 2339 | 5.9 | (7.0) [b] | Pass |

(a) Value is % of mass 174
(b) Value is % of mass 176

**This check applies to the following Samples, MS, MSD, Blanks, and Standards:**

| Lab Sample ID | Lab File ID | Date Analyzed | Time Analyzed | Hours Lapsed | Client Sample ID |
|---|---|---|---|---|---|
| VF2315-CC2305 | F0079182.D | 03/07/07 | 13:19 | 00:35 | Continuing cal 40 |
| VF2315-BS | F0079183.D | 03/07/07 | 13:54 | 01:10 | Blank Spike |
| VF2315-MB | F0079184.D | 03/07/07 | 14:26 | 01:42 | Method Blank |
| ZZZZZZ | F0079185.D | 03/07/07 | 14:58 | 02:14 | (unrelated sample) |
| ZZZZZZ | F0079186.D | 03/07/07 | 15:28 | 02:44 | (unrelated sample) |
| ZZZZZZ | F0079187.D | 03/07/07 | 15:59 | 03:15 | (unrelated sample) |
| T16448-1 | F0079188.D | 03/07/07 | 16:30 | 03:46 | 50WW03 |
| T16448-2 | F0079189.D | 03/07/07 | 17:01 | 04:17 | 29WW15 |
| T16445-3 | F0079190.D | 03/07/07 | 17:32 | 04:48 | (used for QC only; not part of job T16448) |
| T16445-3MS | F0079191.D | 03/07/07 | 18:04 | 05:20 | Matrix Spike |
| T16445-3MSD | F0079192.D | 03/07/07 | 18:35 | 05:51 | Matrix Spike Duplicate |
| ZZZZZZ | F0079194.D | 03/07/07 | 19:38 | 06:54 | (unrelated sample) |
| ZZZZZZ | F0079196.D | 03/07/07 | 20:41 | 07:57 | (unrelated sample) |
| ZZZZZZ | F0079197.D | 03/07/07 | 21:12 | 08:28 | (unrelated sample) |
| ZZZZZZ | F0079198.D | 03/07/07 | 21:44 | 09:00 | (unrelated sample) |
| ZZZZZZ | F0079199.D | 03/07/07 | 22:15 | 09:31 | (unrelated sample) |
| ZZZZZZ | F0079202.D | 03/07/07 | 23:49 | 11:05 | (unrelated sample) |
| ZZZZZZ | F0079203.D | 03/08/07 | 00:20 | 11:36 | (unrelated sample) |

# Instrument Performance Check (BFB)



**Job Number:** T16448
**Account:** ITTXHO Shaw E & I, Inc.
**Project:** Longhorn Army Ammunition Plant

| | | | |
|---|---|---|---|
| **Sample:** | VF2318-BFB | **Injection Date:** | 03/08/07 |
| **Lab File ID:** | F0079222.D | **Injection Time:** | 10:25 |
| **Instrument ID:** | GCMSF | | |

| m/e | Ion Abundance Criteria | Raw Abundance | % Relative Abundance | | Pass/Fail |
|---|---|---|---|---|---|
| 50 | 15.0 - 40.0% of mass 95 | 6198 | 16.4 | | Pass |
| 75 | 30.0 - 60.0% of mass 95 | 15579 | 41.3 | | Pass |
| 95 | Base peak, 100% relative abundance | 37709 | 100.0 | | Pass |
| 96 | 5.0 - 9.0% of mass 95 | 2320 | 6.2 | | Pass |
| 173 | Less than 2.0% of mass 174 | 83 | 0.22 | (0.26) [a] | Pass |
| 174 | 50.0 - 100.0% of mass 95 | 32211 | 85.4 | | Pass |
| 175 | 5.0 - 9.0% of mass 174 | 2369 | 6.3 | (7.4) [a] | Pass |
| 176 | 95.0 - 101.0% of mass 174 | 31824 | 84.4 | (98.8) [a] | Pass |
| 177 | 5.0 - 9.0% of mass 176 | 2216 | 5.9 | (7.0) [b] | Pass |

(a) Value is % of mass 174
(b) Value is % of mass 176

**This check applies to the following Samples, MS, MSD, Blanks, and Standards:**

| Lab Sample ID | Lab File ID | Date Analyzed | Time Analyzed | Hours Lapsed | Client Sample ID |
|---|---|---|---|---|---|
| VF2318-CC2305 | F0079223.D | 03/08/07 | 10:59 | 00:34 | Continuing cal 40 |
| VF2318-BS | F0079224.D | 03/08/07 | 11:33 | 01:08 | Blank Spike |
| VF2318-MB | F0079225.D | 03/08/07 | 12:05 | 01:40 | Method Blank |
| T16445-4 | F0079226.D | 03/08/07 | 12:37 | 02:12 | (used for QC only; not part of job T16448) |
| T16445-4MS | F0079227.D | 03/08/07 | 13:09 | 02:44 | Matrix Spike |
| T16445-4MSD | F0079228.D | 03/08/07 | 14:05 | 03:40 | Matrix Spike Duplicate |
| ZZZZZZ | F0079229.D | 03/08/07 | 14:36 | 04:11 | (unrelated sample) |
| ZZZZZZ | F0079230.D | 03/08/07 | 15:08 | 04:43 | (unrelated sample) |
| ZZZZZZ | F0079231.D | 03/08/07 | 15:39 | 05:14 | (unrelated sample) |
| ZZZZZZ | F0079232.D | 03/08/07 | 16:11 | 05:46 | (unrelated sample) |
| ZZZZZZ | F0079233.D | 03/08/07 | 16:42 | 06:17 | (unrelated sample) |
| ZZZZZZ | F0079234.D | 03/08/07 | 17:14 | 06:49 | (unrelated sample) |
| ZZZZZZ | F0079235.D | 03/08/07 | 17:45 | 07:20 | (unrelated sample) |
| ZZZZZZ | F0079236.D | 03/08/07 | 18:17 | 07:52 | (unrelated sample) |
| ZZZZZZ | F0079237.D | 03/08/07 | 18:49 | 08:24 | (unrelated sample) |
| ZZZZZZ | F0079238.D | 03/08/07 | 19:21 | 08:56 | (unrelated sample) |
| T16448-2 | F0079239.D | 03/08/07 | 19:53 | 09:28 | 29WW15 |
| ZZZZZZ | F0079240.D | 03/08/07 | 20:24 | 09:59 | (unrelated sample) |
| ZZZZZZ | F0079241.D | 03/08/07 | 20:56 | 10:31 | (unrelated sample) |
| ZZZZZZ | F0079242.D | 03/08/07 | 21:28 | 11:03 | (unrelated sample) |
| ZZZZZZ | F0079243.D | 03/08/07 | 22:00 | 11:35 | (unrelated sample) |

# Volatile Internal Standard Area Summary



**Job Number:** T16448
**Account:** ITTXHO Shaw E & I, Inc.
**Project:** Longhorn Army Ammunition Plant

**Check Std:** VF2315-CC2305
**Lab File ID:** F0079182.D
**Instrument ID:** GCMSF
**Injection Date:** 03/07/07
**Injection Time:** 13:19
**Method:** SW846 8260B

| | IS 1 AREA | RT | IS 2 AREA | RT | IS 3 AREA | RT |
|---|---|---|---|---|---|---|
| Check Std | 698014 | 11.87 | 549946 | 15.95 | 231402 | 19.21 |
| Upper Limit [a] | 1396028 | 12.37 | 1099892 | 16.45 | 462804 | 19.71 |
| Lower Limit [b] | 349007 | 11.37 | 274973 | 15.45 | 115701 | 18.71 |

| Lab Sample ID | IS 1 AREA | RT | IS 2 AREA | RT | IS 3 AREA | RT |
|---|---|---|---|---|---|---|
| VF2315-BS | 751267 | 11.87 | 582464 | 15.95 | 220558 | 19.22 |
| VF2315-MB | 739731 | 11.88 | 521309 | 15.96 | 135288 | 19.23 |
| ZZZZZZ | 709635 | 11.88 | 498169 | 15.96 | 130636 | 19.23 |
| ZZZZZZ | 713511 | 11.89 | 505249 | 15.96 | 133789 | 19.22 |
| ZZZZZZ | 670598 | 11.89 | 482656 | 15.97 | 127882 | 19.23 |
| T16448-1 | 692002 | 11.89 | 498481 | 15.96 | 134149 | 19.23 |
| T16448-2 | 694603 | 11.89 | 509623 | 15.97 | 139087 | 19.23 |
| T16445-3 | 692901 | 11.89 | 523917 | 15.96 | 140544 | 19.22 |
| T16445-3MS | 703380 | 11.89 | 542581 | 15.97 | 203275 | 19.23 |
| T16445-3MSD | 721789 | 11.88 | 551007 | 15.96 | 199926 | 19.23 |
| ZZZZZZ | 701179 | 11.88 | 509297 | 15.96 | 124874 | 19.22 |
| ZZZZZZ | 672132 | 11.88 | 483654 | 15.95 | 147428 | 19.22 |
| ZZZZZZ | 655210 | 11.87 | 474247 | 15.95 | 142235 | 19.21 |
| ZZZZZZ | 658250 | 11.88 | 479882 | 15.95 | 141112 | 19.22 |
| ZZZZZZ | 645297 | 11.88 | 465709 | 15.95 | 134763 | 19.22 |
| ZZZZZZ | 633357 | 11.87 | 461754 | 15.95 | 129759 | 19.21 |
| ZZZZZZ | 630021 | 11.88 | 455820 | 15.95 | 129210 | 19.21 |

**IS 1** = Fluorobenzene
**IS 2** = Chlorobenzene-D5
**IS 3** = 1,4-Dichlorobenzene-d4

(a) Upper Limit = + 100% of check standard area; Retention time + 0.5 minutes.
(b) Lower Limit = -50% of check standard area; Retention time -0.5 minutes.

# Volatile Internal Standard Area Summary



**Job Number:** T16448
**Account:** ITTXHO Shaw E & I, Inc.
**Project:** Longhorn Army Ammunition Plant

| | | | |
|---|---|---|---|
| **Check Std:** | VF2318-CC2305 | **Injection Date:** | 03/08/07 |
| **Lab File ID:** | F0079223.D | **Injection Time:** | 10:59 |
| **Instrument ID:** | GCMSF | **Method:** | SW846 8260B |



| | IS 1 AREA | RT | IS 2 AREA | RT | IS 3 AREA | RT |
|---|---|---|---|---|---|---|
| Check Std | 698975 | 11.87 | 551152 | 15.94 | 223338 | 19.21 |
| Upper Limit [a] | 1397950 | 12.37 | 1102304 | 16.44 | 446676 | 19.71 |
| Lower Limit [b] | 349488 | 11.37 | 275576 | 15.44 | 111669 | 18.71 |

| Lab Sample ID | IS 1 AREA | RT | IS 2 AREA | RT | IS 3 AREA | RT |
|---|---|---|---|---|---|---|
| VF2318-BS | 746410 | 11.87 | 580582 | 15.94 | 210100 | 19.21 |
| VF2318-MB | 745444 | 11.88 | 531800 | 15.96 | 140552 | 19.22 |
| T16445-4 | 739935 | 11.88 | 531107 | 15.96 | 143733 | 19.22 |
| T16445-4MS | 707673 | 11.88 | 540763 | 15.95 | 204404 | 19.22 |
| T16445-4MSD | 763469 | 11.88 | 578582 | 15.95 | 218177 | 19.22 |
| ZZZZZZ | 721619 | 11.89 | 534862 | 15.97 | 175880 | 19.23 |
| ZZZZZZ | 648782 | 11.89 | 490210 | 15.97 | 162557 | 19.23 |
| ZZZZZZ | 701074 | 11.89 | 520078 | 15.96 | 161875 | 19.23 |
| ZZZZZZ | 671762 | 11.90 | 510964 | 15.97 | 157114 | 19.24 |
| ZZZZZZ | 661266 | 11.89 | 484654 | 15.96 | 144861 | 19.24 |
| ZZZZZZ | 650121 | 11.89 | 473895 | 15.97 | 134032 | 19.23 |
| ZZZZZZ | 642529 | 11.89 | 461686 | 15.97 | 128039 | 19.23 |
| ZZZZZZ | 627515 | 11.89 | 448085 | 15.96 | 125224 | 19.23 |
| ZZZZZZ | 623811 | 11.88 | 456759 | 15.96 | 122979 | 19.22 |
| ZZZZZZ | 620723 | 11.89 | 447599 | 15.96 | 114685 | 19.22 |
| T16448-2 | 612552 | 11.89 | 445736 | 15.96 | 121452 | 19.23 |
| ZZZZZZ | 570298 | 11.88 | 412673 | 15.95 | 110551* | 19.22 |
| ZZZZZZ | 579619 | 11.87 | 421291 | 15.95 | 109077* | 19.22 |
| ZZZZZZ | 599201 | 11.87 | 424322 | 15.95 | 107464* | 19.21 |
| ZZZZZZ | 591981 | 11.87 | 425080 | 15.95 | 108784* | 19.21 |

**IS 1** = Fluorobenzene
**IS 2** = Chlorobenzene-D5
**IS 3** = 1,4-Dichlorobenzene-d4

(a) Upper Limit = + 100% of check standard area; Retention time + 0.5 minutes.
(b) Lower Limit = -50% of check standard area; Retention time -0.5 minutes.

# Volatile Surrogate Recovery Summary



**Job Number:** T16448
**Account:** ITTXHO Shaw E & I, Inc.
**Project:** Longhorn Army Ammunition Plant

**Method:** SW846 8260B **Matrix:** AQ

**Samples and QC shown here apply to the above method**

| Lab Sample ID | Lab File ID | S1 | S2 | S3 | S4 |
|---|---|---|---|---|---|
| T16448-1 | F0079188.D | 106.0 | 102.0 | 106.0 | 121.0 |
| T16448-2 | F0079239.D | 106.0 | 100.0 | 105.0 | 118.0 |
| T16448-2 | F0079189.D | 108.0 | 105.0 | 106.0 | 122.0 |
| T16445-3MS | F0079191.D | 106.0 | 106.0 | 101.0 | 99.0 |
| T16445-3MSD | F0079192.D | 107.0 | 107.0 | 104.0 | 103.0 |
| T16445-4MS | F0079227.D | 106.0 | 104.0 | 103.0 | 99.0 |
| T16445-4MSD | F0079228.D | 105.0 | 102.0 | 105.0 | 99.0 |
| VF2315-BS | F0079183.D | 104.0 | 101.0 | 102.0 | 99.0 |
| VF2315-MB | F0079184.D | 103.0 | 98.0 | 109.0 | 129.0 |
| VF2318-BS | F0079224.D | 106.0 | 97.0 | 103.0 | 101.0 |
| VF2318-MB | F0079225.D | 103.0 | 97.0 | 108.0 | 121.0 |

| Surrogate Compounds | Recovery Limits |
|---|---|
| **S1** = Dibromofluoromethane | 73-139% |
| **S2** = 1,2-Dichloroethane-D4 | 66-139% |
| **S3** = Toluene-D8 | 77-148% |
| **S4** = 4-Bromofluorobenzene | 84-150% |

# Initial Calibration Summary



**Job Number:** T16448
**Account:** ITTXHO Shaw E & I, Inc.
**Project:** Longhorn Army Ammunition Plant

**Sample:** VF2305-ICC2305
**Lab FileID:** F0078967.D



Response Factor Report GC/MS F

Method : C:\HPCHEM\1\METHODS\VF2305C.M (RTE Integrator)
Title : SW846 8260B and EPA 624
Last Update : Thu Mar 01 07:31:12 2007
Response via : Initial Calibration

Calibration Files
1 =F0078964.D 2 =F0078965.D 3 =F0078966.D
4 =F0078967.D 5 =F0078968.D 6 =F0078969.D 7 =F0078970.D

| | Compound | 1 | 2 | 3 | 4 | 5 | 6 | 7 | Avg | %RSD |
|---|---|---|---|---|---|---|---|---|---|---|
| 1) I | Fluorobenzene | | | | ---ISTD--- | | | | | |
| 2) | Dichlorodifluorom | 0.157 | 0.162 | 0.153 | 0.171 | 0.181 | 0.178 | 0.196 | 0.171 | 8.89 |
| 3)P | Chloromethane | 0.353 | 0.368 | 0.326 | 0.309 | 0.319 | 0.297 | 0.331 | 0.329 | 7.50 |
| 4)C | Vinyl Chloride | 0.279 | 0.316 | 0.268 | 0.280 | 0.287 | 0.269 | 0.300 | 0.286 | 6.01 |
| 5) | Bromomethane | 0.275 | 0.253 | 0.223 | 0.215 | 0.216 | 0.204 | 0.190 | 0.225 | 12.95 |
| 6) | Chloroethane | 0.203 | 0.232 | 0.219 | 0.222 | 0.222 | 0.210 | 0.211 | 0.217 | 4.37 |
| 7) | Trichlorofluorome | 0.137 | 0.154 | 0.142 | 0.159 | 0.166 | 0.162 | 0.164 | 0.155 | 7.23 |
| 8) | Acrolein | 0.030 | 0.030 | 0.031 | 0.036 | 0.036 | 0.033 | 0.033 | 0.033 | 8.00 |
| 9)C | 1,1-Dichloroethen | 0.287 | 0.299 | 0.298 | 0.320 | 0.322 | 0.306 | 0.312 | 0.306 | 4.04 |
| 10) | Freon 113 | 0.174 | 0.190 | 0.191 | 0.225 | 0.225 | 0.213 | 0.216 | 0.205 | 9.65 |
| 11) | Acetone | 0.065 | 0.062 | 0.057 | 0.052 | 0.053 | 0.053 | 0.052 | 0.056 | 9.61 |
| 12) | Iodomethane | 0.405 | 0.432 | 0.438 | 0.436 | 0.447 | 0.434 | 0.445 | 0.434 | 3.22 |
| 13) | Methyl acetate | 0.199 | 0.203 | 0.197 | 0.179 | 0.188 | 0.186 | 0.185 | 0.191 | 4.56 |
| 14) | Carbon Disulfide | 0.833 | 0.878 | 0.869 | 0.908 | 0.930 | 0.885 | 0.918 | 0.889 | 3.74 |
| 15) | Methylene Chlorid | 0.410 | 0.424 | 0.407 | 0.404 | 0.396 | 0.378 | 0.376 | 0.399 | 4.34 |
| 16) | Tert Butyl Alcoho | 0.015 | 0.018 | 0.018 | 0.015 | 0.017 | 0.018 | 0.018 | 0.017 | 8.14 |
| 17) | trans-1,2-Dichlor | 0.328 | 0.340 | 0.340 | 0.344 | 0.351 | 0.337 | 0.344 | 0.341 | 2.11 |
| 18) | Acrylonitrile | 0.086 | 0.099 | 0.097 | 0.091 | 0.097 | 0.098 | 0.097 | 0.095 | 4.82 |
| 19) | Methyl Tert Butyl | 0.577 | 0.603 | 0.572 | 0.555 | 0.578 | 0.587 | 0.594 | 0.581 | 2.70 |
| 20) | Hexane | 0.300 | 0.281 | 0.283 | 0.341 | 0.346 | 0.320 | 0.315 | 0.312 | 8.32 |
| 21)P | 1,1-Dichloroethan | 0.428 | 0.457 | 0.436 | 0.445 | 0.450 | 0.430 | 0.435 | 0.440 | 2.44 |
| 22) | Vinyl acetate | 0.513 | 0.554 | 0.582 | 0.564 | 0.569 | 0.552 | 0.517 | 0.550 | 4.74 |
| 23) | Di-isopropyl ethe | 0.944 | 1.012 | 0.992 | 0.981 | 0.988 | 0.943 | 0.934 | 0.971 | 3.09 |
| 24) | Ethyl tert-butyl | 0.721 | 0.735 | 0.733 | 0.737 | 0.753 | 0.739 | 0.749 | 0.738 | 1.43 |
| 25) | 2,2-Dichloropropa | 0.208 | 0.200 | 0.197 | 0.210 | 0.209 | 0.202 | 0.195 | 0.203 | 2.91 |
| 26) | cis-1,2-Dichloroe | 0.282 | 0.305 | 0.302 | 0.308 | 0.307 | 0.302 | 0.307 | 0.302 | 3.03 |
| 27) | 2-Butanone | 0.113 | 0.118 | 0.120 | 0.105 | 0.111 | 0.112 | 0.109 | 0.113 | 4.48 |
| 28) | Bromochloromethan | 0.124 | 0.142 | 0.145 | 0.146 | 0.147 | 0.149 | 0.150 | 0.143 | 6.13 |
| 29)C | Chloroform | 0.343 | 0.363 | 0.358 | 0.362 | 0.364 | 0.353 | 0.362 | 0.358 | 2.09 |
| 30) | Tetrahydrofuran | 0.048 | 0.035 | 0.033 | 0.030 | 0.031 | 0.031 | 0.029 | 0.034 | 19.44 |

----- Linear regression ----- Coefficient = 0.9988
Response Ratio = 0.00148 + 0.02898 *A

| | Compound | 1 | 2 | 3 | 4 | 5 | 6 | 7 | Avg | %RSD |
|---|---|---|---|---|---|---|---|---|---|---|
| 31) | 1,1,1-Trichloroet | 0.196 | 0.201 | 0.204 | 0.213 | 0.218 | 0.210 | 0.215 | 0.208 | 3.79 |
| 32)S | Dibromofluorometh | 0.211 | 0.221 | 0.210 | 0.217 | 0.221 | 0.221 | 0.226 | 0.218 | 2.61 |
| 33) | Cyclohexane | 0.390 | 0.405 | 0.413 | 0.479 | 0.485 | 0.453 | 0.447 | 0.439 | 8.43 |
| 34) | 1,1-Dichloroprope | 0.283 | 0.279 | 0.292 | 0.313 | 0.321 | 0.312 | 0.316 | 0.302 | 5.61 |
| 35) | Carbon Tetrachlor | 0.142 | 0.161 | 0.164 | 0.176 | 0.181 | 0.177 | 0.183 | 0.169 | 8.57 |
| 36)S | 1,2-Dichloroethan | 0.159 | 0.173 | 0.166 | 0.161 | 0.165 | 0.162 | 0.166 | 0.165 | 2.76 |
| 37) | Benzene | 1.089 | 1.108 | 1.092 | 1.113 | 1.134 | 1.098 | 1.119 | 1.108 | 1.43 |
| 38) | 1,2-Dichloroethan | 0.181 | 0.193 | 0.200 | 0.205 | 0.200 | 0.204 | 0.201 | 0.198 | 4.13 |
| 39) | tert-amyl methyl | 0.712 | 0.774 | 0.759 | 0.736 | 0.767 | 0.769 | 0.782 | 0.757 | 3.26 |
| 40) | Trichloroethene | 0.212 | 0.223 | 0.218 | 0.229 | 0.233 | 0.229 | 0.236 | 0.226 | 3.78 |
| 41) | Methylcyclohexane | 0.318 | 0.332 | 0.335 | 0.391 | 0.401 | 0.384 | 0.388 | 0.364 | 9.38 |
| 42)C | 1,2-Dichloropropa | 0.320 | 0.304 | 0.310 | 0.316 | 0.320 | 0.310 | 0.318 | 0.314 | 1.90 |
| 43) | Dibromomethane | 0.129 | 0.147 | 0.169 | 0.160 | 0.166 | 0.165 | 0.170 | 0.158 | 9.61 |

# Initial Calibration Summary



**Job Number:** T16448 **Sample:** VF2305-ICC2305
**Account:** ITTXHO Shaw E & I, Inc. **Lab FileID:** F0078967.D
**Project:** Longhorn Army Ammunition Plant

```
 44)  1,4-Dioxane       0.002 0.002 0.002 0.002 0.003 0.003 0.003 0.002  17.15
            ----- Linear regression -----  Coefficient =  0.9989
              Response Ratio = -0.00341 + 0.00271 *A

 45)  Bromodichlorometh 0.287 0.300 0.298 0.307 0.311 0.306 0.317 0.304   3.19
 46)  2-Nitropropane    0.046 0.042 0.041 0.037 0.038 0.039 0.038 0.040   7.95
 47)  2-Chloroethyl vin 0.094 0.104 0.122 0.125 0.136 0.143 0.152 0.125  16.72
            ----- Linear regression -----  Coefficient =  0.9983
              Response Ratio = -0.06248 + 0.15260 *A

 48)  4-Methyl-2-pentan 0.229 0.239 0.249 0.234 0.246 0.246 0.237 0.240   3.06
 49)  cis-1,3-Dichlorop 0.369 0.397 0.420 0.427 0.443 0.439 0.454 0.421   6.95

 50) I   Chlorobenzene-d5      ----------------ISTD---------------------
 51)S Toluene-d8        1.147 1.122 1.060 1.073 1.083 1.079 1.120 1.098   2.89
 52)C Toluene           1.382 1.408 1.358 1.387 1.384 1.367 1.417 1.386   1.51
 53)  trans-1,3-Dichlor 0.340 0.364 0.391 0.402 0.406 0.409 0.428 0.391   7.65
 54)  1,1,2-Trichloroet 0.263 0.295 0.289 0.279 0.283 0.284 0.289 0.283   3.62
 55)  Tetrachloroethene 0.272 0.280 0.293 0.302 0.309 0.299 0.307 0.294   4.70
 56)  2-hexanone        0.170 0.180 0.203 0.194 0.206 0.211 0.208 0.196   8.04
 57)  1,3-Dichloropropa 0.605 0.605 0.602 0.593 0.592 0.591 0.602 0.599   1.05
 58)  Dibromochlorometh 0.254 0.312 0.303 0.296 0.299 0.304 0.315 0.298   6.92
 59)  1,2-Dibromoethane 0.283 0.310 0.305 0.302 0.314 0.320 0.331 0.309   4.87
 60)  1-Chlorohexane    0.464 0.467 0.465 0.505 0.517 0.509 0.535 0.495   5.83
 61)P Chlorobenzene     0.877 0.857 0.851 0.870 0.877 0.867 0.897 0.871   1.73
 62)  1,1,1,2-Tetrachlo 0.264 0.284 0.283 0.282 0.281 0.279 0.288 0.280   2.74
 63)C Ethylbenzene      1.475 1.458 1.433 1.493 1.499 1.470 1.518 1.478   1.90
 64)  m,p-Xylene        0.970 0.990 1.008 1.040 1.057 1.039 1.067 1.025   3.51
 65)  o-Xylene          1.021 1.033 1.058 1.084 1.107 1.077 1.111 1.070   3.23
 66)  Styrene           0.796 0.855 0.910 0.960 0.983 0.978 1.013 0.928   8.44
 67)P Bromoform         0.142 0.077 0.184 0.179 0.195 0.199 0.205 0.169  26.85
            ----- Linear regression -----  Coefficient =  0.9995
              Response Ratio = -0.01246 + 0.20679 *A


 68) I   1,4-Dichlorobenzene-d ----------------ISTD---------------------
 69)  Isopropylbenzene  3.394 3.422 2.803 2.838 2.780 2.731 2.618 2.941  11.11
 70)  Cyclohexanone     0.023 0.030 0.027 0.025 0.026 0.029 0.027 0.027   8.23
 71)S 4-Bromofluorobenz 1.169 1.004 0.864 0.853 0.853 0.860 0.845 0.921  13.32
 72)  Bromobenzene      0.997 0.963 0.842 0.837 0.823 0.822 0.788 0.867   9.15
 73)P 1,1,2,2-Tetrachlo 1.339 1.320 1.146 1.011 1.011 1.030 0.983 1.120  13.59
 74)  Trans-1,4-Dichlor 0.143 0.182 0.177 0.182 0.188 0.192 0.192 0.179   9.42
 75)  1,2,3-Trichloropr 0.257 0.296 0.253 0.232 0.230 0.236 0.225 0.247  10.10
 76)  n-Propylbenzene   4.567 4.426 4.010 4.105 4.023 3.954 3.865 4.136   6.29
 77)  2-Chlorotoluene   3.164 2.888 2.531 2.500 2.416 2.351 2.285 2.591  12.31
 78)  4-Chlorotoluene   2.569 2.376 2.183 2.187 2.133 2.116 2.076 2.234   7.90
 79)  1,3,5-Trimethylbe 2.668 2.535 2.320 2.351 2.287 2.250 2.168 2.368   7.33
 80)  sec-Butylbenzene  3.329 3.252 3.038 3.232 3.150 3.042 2.937 3.140   4.47
 81)  1,3-Dichlorobenze 1.316 1.426 1.364 1.413 1.441 1.419 1.422 1.400   3.16
 82)  4-Isopropyltoluen 2.408 2.304 2.224 2.403 2.346 2.277 2.220 2.312   3.37
 83)  1,4-Dichlorobenze 1.528 1.430 1.389 1.429 1.420 1.423 1.424 1.435   3.04
 84)  tert-Butylbenzene 0.533 0.438 0.430 0.445 0.436 0.429 0.410 0.446   8.90
 85)  n-Butylbenzene    1.465 1.572 1.892 2.173 2.149 2.132 2.214 1.942  15.91
            ----- Linear regression -----  Coefficient =  0.9997
              Response Ratio = -0.08322 + 2.22219 *A

 86)  1,2-Dichlorobenze 1.206 1.332 1.314 1.336 1.345 1.359 1.369 1.323   4.14
 87)  1,2,4-Trimethylbe 2.566 2.449 2.311 2.410 2.354 2.310 2.242 2.377   4.53
 88)  1,2-Dibromo-3-Chl 0.068 0.106 0.082 0.072 0.077 0.089 0.088 0.083  15.22
            ----- Linear regression -----  Coefficient =  0.9968
```

5.7

5

# Initial Calibration Summary



**Job Number:** T16448 **Sample:** VF2305-ICC2305
**Account:** ITTXHO Shaw E & I, Inc. **Lab FileID:** F0078967.D
**Project:** Longhorn Army Ammunition Plant

```
                Response Ratio = -0.00467 + 0.08863 *A

89)  1,2,4-Trichlorobe 0.166 0.135 0.302 0.403 0.468 0.530 0.585 0.370  47.33
              ----- Linear regression -----  Coefficient =  0.9944
                Response Ratio = -0.09820 + 0.59565 *A

90)  Hexachlorobutadie 0.058 0.088 0.170 0.207 0.204 0.208 0.202 0.162  38.83
              ----- Linear regression -----  Coefficient =  0.9993
                Response Ratio = -0.00579 + 0.20548 *A

91)  Naphthalene       0.526 0.280 0.475 0.606 0.781 0.975 1.125 0.681  43.48
           ----- Quadratic regression -----  Coefficient =  0.9974
                Response Ratio = -0.07686 + 0.74236 *A + 0.10172 *A^2

92)  1,2,3-Trichlorobe 0.167 0.113 0.217 0.276 0.334 0.389 0.421 0.274  41.95
              ----- Linear regression -----  Coefficient =  0.9938
                Response Ratio = -0.07169 + 0.43007 *A

----------------------------------------------------------------------------
(#) = Out of Range

          VF2305C.M         Thu Mar 01 07:44:03 2007
```

# Continuing Calibration Summary



**Job Number:** T16448 **Sample:** VF2315-CC2305
**Account:** ITTXHO Shaw E & I, Inc. **Lab FileID:** F0079182.D
**Project:** Longhorn Army Ammunition Plant

Evaluate Continuing Calibration Report

```
Data File : C:\HPCHEM\1\DATA\VF2315~1\F0079182.D        Vial: 2
Acq On    :  7 Mar 2007   1:19 pm                   Operator: lydiaj
Sample    : cc2305-40                               Inst    : GC/MS F
Misc      : ms3885,vf2315,,,,5,1,water              Multiplr: 1.00
MS Integration Params: RTEINT.P

Method       : C:\HPCHEM\1\METHODS\VF2305C.M (RTE Integrator)
Title        : SW846 8260B and EPA 624
Last Update  : Thu Mar 01 07:31:12 2007
Response via : Multiple Level Calibration

Min. RRF     :   0.001  Min. Rel. Area :  50%  Max. R.T. Dev  0.50min
Max. RRF Dev :  20%     Max. Rel. Area : 200%
```

| | | Compound | AvgRF | CCRF | %Dev | Area% | Dev(min) |
|---|---|---|---|---|---|---|---|
| 1 | I | Fluorobenzene | 1.000 | 1.000 | 0.0 | 86 | -0.08 |
| 2 | | Dichlorodifluoromethane | 0.171 | 0.148 | 13.5 | 74 | -0.04 |
| 3 | P | Chloromethane | 0.329 | 0.330 | -0.3 | 92 | -0.05 |
| 4 | C | Vinyl Chloride | 0.286 | 0.292 | -2.1 | 90 | -0.06 |
| 5 | | Bromomethane | 0.225 | 0.223 | 0.9 | 89 | -0.07 |
| 6 | | Chloroethane | 0.217 | 0.226 | -4.1 | 88 | -0.06 |
| 7 | | Trichlorofluoromethane | 0.155 | 0.162 | -4.5 | 87 | -0.06 |
| 8 | | Acrolein | 0.033 | 0.034 | -3.0 | 81 | -0.08 |
| 9 | C | 1,1-Dichloroethene | 0.306 | 0.297 | 2.9 | 80 | -0.07 |
| 10 | | Freon 113 | 0.205 | 0.193 | 5.9 | 73 | -0.07 |
| 11 | | Acetone | 0.056 | 0.051 | 8.9 | 84 | -0.07 |
| 12 | | Iodomethane | 0.434 | 0.399 | 8.1 | 78 | -0.07 |
| 13 | | Methyl acetate | 0.191 | 0.208 | -8.9 | 100 | -0.07 |
| 14 | | Carbon Disulfide | 0.889 | 0.797 | 10.3 | 75 | -0.07 |
| 15 | | Methylene Chloride | 0.399 | 0.419 | -5.0 | 89 | -0.07 |
| 16 | | Tert Butyl Alcohol | 0.017 | 0.019 | -11.8 | 103 | -0.08 |
| 17 | | trans-1,2-Dichloroethene | 0.341 | 0.339 | 0.6 | 84 | -0.07 |
| 18 | | Acrylonitrile | 0.095 | 0.092 | 3.2 | 86 | -0.07 |
| 19 | | Methyl Tert Butyl Ether | 0.581 | 0.574 | 1.2 | 89 | -0.07 |
| 20 | | Hexane | 0.312 | 0.316 | -1.3 | 79 | -0.08 |
| 21 | P | 1,1-Dichloroethane | 0.440 | 0.453 | -3.0 | 87 | -0.08 |
| 22 | | Vinyl acetate | 0.550 | 0.609 | -10.7 | 93 | -0.08 |
| 23 | | Di-isopropyl ether | 0.971 | 1.066 | -9.8 | 93 | -0.07 |
| 24 | | Ethyl tert-butyl ether | 0.738 | 0.773 | -4.7 | 90 | -0.07 |
| 25 | | 2,2-Dichloropropane | 0.203 | 0.210 | -3.4 | 86 | -0.07 |
| 26 | | cis-1,2-Dichloroethene | 0.302 | 0.307 | -1.7 | 86 | -0.08 |
| 27 | | 2-Butanone | 0.113 | 0.108 | 4.4 | 88 | -0.08 |
| 28 | | Bromochloromethane | 0.143 | 0.147 | -2.8 | 86 | -0.08 |
| 29 | C | Chloroform | 0.358 | 0.370 | -3.4 | 88 | -0.08 |
| 30 | | Tetrahydrofuran | 0.034 | 0.032 | 5.9 | 91 | -0.08 |
| 31 | | 1,1,1-Trichloroethane | 0.208 | 0.210 | -1.0 | 84 | -0.08 |
| 32 | S | Dibromofluoromethane | 0.218 | 0.227 | -4.1 | 90 | -0.08 |
| 33 | | Cyclohexane | 0.439 | 0.451 | -2.7 | 81 | -0.08 |
| 34 | | 1,1-Dichloropropene | 0.302 | 0.317 | -5.0 | 87 | -0.08 |
| 35 | | Carbon Tetrachloride | 0.169 | 0.174 | -3.0 | 85 | -0.08 |
| 36 | S | 1,2-Dichloroethane-d4 | 0.165 | 0.176 | -6.7 | 94 | -0.08 |
| 37 | | Benzene | 1.108 | 1.127 | -1.7 | 87 | -0.08 |
| 38 | | 1,2-Dichloroethane | 0.198 | 0.213 | -7.6 | 89 | -0.08 |
| 39 | | tert-amyl methyl ether | 0.757 | 0.777 | -2.6 | 91 | -0.08 |
| 40 | | Trichloroethene | 0.226 | 0.232 | -2.7 | 87 | -0.08 |
| 41 | | Methylcyclohexane | 0.364 | 0.371 | -1.9 | 81 | -0.08 |
| 42 | C | 1,2-Dichloropropane | 0.314 | 0.336 | -7.0 | 91 | -0.09 |

# Continuing Calibration Summary



**Job Number:** T16448 **Sample:** VF2315-CC2305
**Account:** ITTXHO Shaw E & I, Inc. **Lab FileID:** F0079182.D
**Project:** Longhorn Army Ammunition Plant

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 43 | | Dibromomethane | 0.158 | 0.169 | -7.0 | 91 | -0.09 |
| 44 | | 1,4-Dioxane | 0.002 | 0.003 | -50.0# | 106 | -0.09 |
| 45 | | Bromodichloromethane | 0.304 | 0.321 | -5.6 | 90 | -0.08 |
| 46 | | 2-Nitropropane | 0.040 | 0.042 | -5.0 | 98 | -0.08 |
| 47 | | 2-Chloroethyl vinyl ether | 0.125 | 0.124 | 0.8 | 85 | -0.08 |
| 48 | | 4-Methyl-2-pentanone | 0.240 | 0.236 | 1.7 | 87 | -0.09 |
| 49 | | cis-1,3-Dichloropropene | 0.421 | 0.461 | -9.5 | 93 | -0.08 |
| 50 | I | Chlorobenzene-d5 | 1.000 | 1.000 | 0.0 | 90 | -0.08 |
| 51 | S | Toluene-d8 | 1.098 | 1.096 | 0.2 | 92 | -0.08 |
| 52 | C | Toluene | 1.386 | 1.363 | 1.7 | 89 | -0.08 |
| 53 | | trans-1,3-Dichloropropene | 0.391 | 0.405 | -3.6 | 91 | -0.07 |
| 54 | | 1,1,2-Trichloroethane | 0.283 | 0.289 | -2.1 | 93 | -0.08 |
| 55 | | Tetrachloroethene | 0.294 | 0.299 | -1.7 | 89 | -0.09 |
| 56 | | 2-hexanone | 0.196 | 0.182 | 7.1 | 85 | -0.08 |
| 57 | | 1,3-Dichloropropane | 0.599 | 0.606 | -1.2 | 92 | -0.08 |
| 58 | | Dibromochloromethane | 0.298 | 0.306 | -2.7 | 94 | -0.08 |
| 59 | | 1,2-Dibromoethane | 0.309 | 0.310 | -0.3 | 93 | -0.08 |
| 60 | | 1-Chlorohexane | 0.495 | 0.501 | -1.2 | 90 | -0.09 |
| 61 | P | Chlorobenzene | 0.871 | 0.876 | -0.6 | 91 | -0.09 |
| 62 | | 1,1,1,2-Tetrachloroethane | 0.280 | 0.286 | -2.1 | 92 | -0.08 |
| 63 | C | Ethylbenzene | 1.478 | 1.474 | 0.3 | 89 | -0.09 |
| 64 | | m,p-Xylene | 1.025 | 1.039 | -1.4 | 90 | -0.08 |
| 65 | | o-Xylene | 1.070 | 1.102 | -3.0 | 92 | -0.09 |
| 66 | | Styrene | 0.928 | 0.964 | -3.9 | 91 | -0.08 |
| 67 | P | Bromoform | 0.169 | 0.198 | -17.2 | 100 | -0.09 |
| 68 | I | 1,4-Dichlorobenzene-d4 | 1.000 | 1.000 | 0.0 | 93 | -0.09 |
| 69 | | Isopropylbenzene | 2.941 | 2.758 | 6.2 | 90 | -0.08 |
| 70 | | Cyclohexanone | 0.027 | 0.039 | -44.4# | 142 | -0.10 |
| 71 | S | 4-Bromofluorobenzene | 0.921 | 0.840 | 8.8 | 92 | -0.09 |
| 72 | | Bromobenzene | 0.867 | 0.840 | 3.1 | 93 | -0.09 |
| 73 | P | 1,1,2,2-Tetrachloroethane | 1.120 | 1.065 | 4.9 | 98 | -0.09 |
| 74 | | Trans-1,4-Dichloro-2-Butene | 0.179 | 0.176 | 1.7 | 90 | -0.09 |
| 75 | | 1,2,3-Trichloropropane | 0.247 | 0.240 | 2.8 | 96 | -0.09 |
| 76 | | n-Propylbenzene | 4.136 | 4.041 | 2.3 | 92 | -0.09 |
| 77 | | 2-Chlorotoluene | 2.591 | 2.463 | 4.9 | 92 | -0.09 |
| 78 | | 4-Chlorotoluene | 2.234 | 2.117 | 5.2 | 90 | -0.10 |
| 79 | | 1,3,5-Trimethylbenzene | 2.368 | 2.281 | 3.7 | 90 | -0.09 |
| 80 | | sec-Butylbenzene | 3.140 | 3.101 | 1.2 | 89 | -0.09 |
| 81 | | 1,3-Dichlorobenzene | 1.400 | 1.439 | -2.8 | 95 | -0.09 |
| 82 | | 4-Isopropyltoluene | 2.312 | 2.294 | 0.8 | 89 | -0.09 |
| 83 | | 1,4-Dichlorobenzene | 1.435 | 1.431 | 0.3 | 93 | -0.09 |
| 84 | | tert-Butylbenzene | 0.446 | 0.438 | 1.8 | 91 | -0.10 |
| 85 | | n-Butylbenzene | 1.942 | 2.030 | -4.5 | 87 | -0.10 |
| 86 | | 1,2-Dichlorobenzene | 1.323 | 1.352 | -2.2 | 94 | -0.09 |
| 87 | | 1,2,4-Trimethylbenzene | 2.377 | 2.379 | -0.1 | 92 | -0.09 |
| 88 | | 1,2-Dibromo-3-Chloropropane | 0.083 | 0.071 | 14.5 | 92 | -0.10 |
| 89 | | 1,2,4-Trichlorobenzene | 0.370 | 0.343 | 7.3 | 79 | -0.09 |
| 90 | | Hexachlorobutadiene | 0.162 | 0.192 | -18.5 | 86 | -0.11 |
| 91 | | Naphthalene | 0.681 | 0.550 | 19.2 | 84 | -0.12 |
| 92 | | 1,2,3-Trichlorobenzene | 0.274 | 0.247 | 9.9 | 83 | -0.12 |

Average % D = 5.5

(#) = Out of Range SPCC's out = 0 CCC's out = 0
F0078967.D VF2305C.M Thu Mar 08 11:48:42 2007

# Continuing Calibration Summary



**Job Number:** T16448
**Account:** ITTXHO Shaw E & I, Inc.
**Project:** Longhorn Army Ammunition Plant
**Sample:** VF2318-CC2305
**Lab FileID:** F0079223.D

Evaluate Continuing Calibration Report

```
Data File : C:\HPCHEM\1\DATA\VF2318~1\F0079223.D        Vial: 2
Acq On    :  8 Mar 2007  10:59 am                    Operator: lydiaj
Sample    : cc2305-40                                Inst    : GC/MS F
Misc      : ms3889,vf2318,,,,5,1,water               Multiplr: 1.00
MS Integration Params: RTEINT.P

Method         : C:\HPCHEM\1\METHODS\VF2305C.M (RTE Integrator)
Title          : SW846 8260B and EPA 624
Last Update    : Thu Mar 01 07:31:12 2007
Response via   : Multiple Level Calibration

Min. RRF       :   0.001  Min. Rel. Area :  50%  Max. R.T. Dev  0.50min
Max. RRF Dev   :  20%     Max. Rel. Area : 200%
```

| | | Compound | AvgRF | CCRF | %Dev | Area% | Dev(min) |
|---|---|---|---|---|---|---|---|
| 1 | I | Fluorobenzene | 1.000 | 1.000 | 0.0 | 86 | -0.08 |
| 2 | | Dichlorodifluoromethane | 0.171 | 0.134 | 21.6# | 68 | -0.04 |
| 3 | P | Chloromethane | 0.329 | 0.313 | 4.9 | 87 | -0.05 |
| 4 | C | Vinyl Chloride | 0.286 | 0.273 | 4.5 | 84 | -0.06 |
| 5 | | Bromomethane | 0.225 | 0.222 | 1.3 | 89 | -0.07 |
| 6 | | Chloroethane | 0.217 | 0.229 | -5.5 | 89 | -0.06 |
| 7 | | Trichlorofluoromethane | 0.155 | 0.168 | -8.4 | 91 | -0.07 |
| 8 | | Acrolein | 0.033 | 0.033 | 0.0 | 81 | -0.07 |
| 9 | C | 1,1-Dichloroethene | 0.306 | 0.303 | 1.0 | 81 | -0.07 |
| 10 | | Freon 113 | 0.205 | 0.207 | -1.0 | 79 | -0.07 |
| 11 | | Acetone | 0.056 | 0.042 | 25.0# | 70 | -0.07 |
| 12 | | Iodomethane | 0.434 | 0.423 | 2.5 | 83 | -0.07 |
| 13 | | Methyl acetate | 0.191 | 0.176 | 7.9 | 84 | -0.07 |
| 14 | | Carbon Disulfide | 0.889 | 0.841 | 5.4 | 80 | -0.08 |
| 15 | | Methylene Chloride | 0.399 | 0.413 | -3.5 | 88 | -0.07 |
| 16 | | Tert Butyl Alcohol | 0.017 | 0.017 | 0.0 | 92 | -0.07 |
| 17 | | trans-1,2-Dichloroethene | 0.341 | 0.350 | -2.6 | 87 | -0.07 |
| 18 | | Acrylonitrile | 0.095 | 0.078 | 17.9 | 73 | -0.07 |
| 19 | | Methyl Tert Butyl Ether | 0.581 | 0.562 | 3.3 | 87 | -0.07 |
| 20 | | Hexane | 0.312 | 0.315 | -1.0 | 79 | -0.08 |
| 21 | P | 1,1-Dichloroethane | 0.440 | 0.464 | -5.5 | 89 | -0.07 |
| 22 | | Vinyl acetate | 0.550 | 0.547 | 0.5 | 83 | -0.07 |
| 23 | | Di-isopropyl ether | 0.971 | 1.060 | -9.2 | 93 | -0.07 |
| 24 | | Ethyl tert-butyl ether | 0.738 | 0.774 | -4.9 | 90 | -0.07 |
| 25 | | 2,2-Dichloropropane | 0.203 | 0.232 | -14.3 | 95 | -0.07 |
| 26 | | cis-1,2-Dichloroethene | 0.302 | 0.324 | -7.3 | 90 | -0.08 |
| 27 | | 2-Butanone | 0.113 | 0.090 | 20.4# | 74 | -0.08 |
| 28 | | Bromochloromethane | 0.143 | 0.149 | -4.2 | 88 | -0.08 |
| 29 | C | Chloroform | 0.358 | 0.387 | -8.1 | 92 | -0.08 |
| 30 | | Tetrahydrofuran | 0.034 | 0.028 | 17.6 | 80 | -0.08 |
| 31 | | 1,1,1-Trichloroethane | 0.208 | 0.224 | -7.7 | 90 | -0.08 |
| 32 | S | Dibromofluoromethane | 0.218 | 0.236 | -8.3 | 93 | -0.07 |
| 33 | | Cyclohexane | 0.439 | 0.472 | -7.5 | 85 | -0.08 |
| 34 | | 1,1-Dichloropropene | 0.302 | 0.328 | -8.6 | 90 | -0.08 |
| 35 | | Carbon Tetrachloride | 0.169 | 0.187 | -10.7 | 91 | -0.07 |
| 36 | S | 1,2-Dichloroethane-d4 | 0.165 | 0.169 | -2.4 | 90 | -0.08 |
| 37 | | Benzene | 1.108 | 1.177 | -6.2 | 91 | -0.07 |
| 38 | | 1,2-Dichloroethane | 0.198 | 0.206 | -4.0 | 86 | -0.08 |
| 39 | | tert-amyl methyl ether | 0.757 | 0.767 | -1.3 | 90 | -0.08 |
| 40 | | Trichloroethene | 0.226 | 0.248 | -9.7 | 93 | -0.08 |
| 41 | | Methylcyclohexane | 0.364 | 0.394 | -8.2 | 87 | -0.08 |
| 42 | C | 1,2-Dichloropropane | 0.314 | 0.345 | -9.9 | 94 | -0.08 |

# Continuing Calibration Summary



**Job Number:** T16448 **Sample:** VF2318-CC2305
**Account:** ITTXHO Shaw E & I, Inc. **Lab FileID:** F0079223.D
**Project:** Longhorn Army Ammunition Plant

| | | | | | | |
|---|---|---|---|---|---|---|
| 43 | | Dibromomethane | 0.158 | 0.163 | -3.2 | 88 | -0.08 |
| 44 | | 1,4-Dioxane | 0.002 | 0.002 | 0.0 | 89 | -0.08 |
| 45 | | Bromodichloromethane | 0.304 | 0.332 | -9.2 | 93 | -0.08 |
| 46 | | 2-Nitropropane | 0.040 | 0.036 | 10.0 | 84 | -0.08 |
| 47 | | 2-Chloroethyl vinyl ether | 0.125 | 0.110 | 12.0 | 76 | -0.08 |
| 48 | | 4-Methyl-2-pentanone | 0.240 | 0.206 | 14.2 | 76 | -0.08 |
| 49 | | cis-1,3-Dichloropropene | 0.421 | 0.471 | -11.9 | 95 | -0.08 |
| 50 | I | Chlorobenzene-d5 | 1.000 | 1.000 | 0.0 | 90 | -0.08 |
| 51 | S | Toluene-d8 | 1.098 | 1.138 | -3.6 | 96 | -0.08 |
| 52 | C | Toluene | 1.386 | 1.437 | -3.7 | 94 | -0.08 |
| 53 | | trans-1,3-Dichloropropene | 0.391 | 0.405 | -3.6 | 91 | -0.07 |
| 54 | | 1,1,2-Trichloroethane | 0.283 | 0.284 | -0.4 | 92 | -0.08 |
| 55 | | Tetrachloroethene | 0.294 | 0.324 | -10.2 | 97 | -0.09 |
| 56 | | 2-hexanone | 0.196 | 0.157 | 19.9 | 73 | -0.08 |
| 57 | | 1,3-Dichloropropane | 0.599 | 0.582 | 2.8 | 89 | -0.08 |
| 58 | | Dibromochloromethane | 0.298 | 0.305 | -2.3 | 93 | -0.08 |
| 59 | | 1,2-Dibromoethane | 0.309 | 0.301 | 2.6 | 90 | -0.08 |
| 60 | | 1-Chlorohexane | 0.495 | 0.527 | -6.5 | 94 | -0.08 |
| 61 | P | Chlorobenzene | 0.871 | 0.923 | -6.0 | 96 | -0.09 |
| 62 | | 1,1,1,2-Tetrachloroethane | 0.280 | 0.299 | -6.8 | 96 | -0.09 |
| 63 | C | Ethylbenzene | 1.478 | 1.578 | -6.8 | 96 | -0.09 |
| 64 | | m,p-Xylene | 1.025 | 1.080 | -5.4 | 94 | -0.08 |
| 65 | | o-Xylene | 1.070 | 1.152 | -7.7 | 96 | -0.08 |
| 66 | | Styrene | 0.928 | 0.989 | -6.6 | 93 | -0.08 |
| 67 | P | Bromoform | 0.169 | 0.180 | -6.5 | 91 | -0.09 |
| 68 | I | 1,4-Dichlorobenzene-d4 | 1.000 | 1.000 | 0.0 | 90 | -0.09 |
| 69 | | Isopropylbenzene | 2.941 | 3.019 | -2.7 | 95 | -0.08 |
| 70 | | Cyclohexanone | 0.027 | 0.046 | -70.4# | 163 | -0.10 |
| 71 | S | 4-Bromofluorobenzene | 0.921 | 0.912 | 1.0 | 96 | -0.09 |
| 72 | | Bromobenzene | 0.867 | 0.917 | -5.8 | 98 | -0.09 |
| 73 | P | 1,1,2,2-Tetrachloroethane | 1.120 | 1.007 | 10.1 | 89 | -0.09 |
| 74 | | Trans-1,4-Dichloro-2-Butene | 0.179 | 0.160 | 10.6 | 79 | -0.10 |
| 75 | | 1,2,3-Trichloropropane | 0.247 | 0.233 | 5.7 | 90 | -0.09 |
| 76 | | n-Propylbenzene | 4.136 | 4.335 | -4.8 | 95 | -0.09 |
| 77 | | 2-Chlorotoluene | 2.591 | 2.658 | -2.6 | 95 | -0.09 |
| 78 | | 4-Chlorotoluene | 2.234 | 2.314 | -3.6 | 95 | -0.10 |
| 79 | | 1,3,5-Trimethylbenzene | 2.368 | 2.500 | -5.6 | 95 | -0.08 |
| 80 | | sec-Butylbenzene | 3.140 | 3.327 | -6.0 | 92 | -0.09 |
| 81 | | 1,3-Dichlorobenzene | 1.400 | 1.523 | -8.8 | 97 | -0.09 |
| 82 | | 4-Isopropyltoluene | 2.312 | 2.458 | -6.3 | 92 | -0.09 |
| 83 | | 1,4-Dichlorobenzene | 1.435 | 1.494 | -4.1 | 94 | -0.09 |
| 84 | | tert-Butylbenzene | 0.446 | 0.456 | -2.2 | 92 | -0.10 |
| 85 | | n-Butylbenzene | 1.942 | 2.065 | -6.3 | 85 | -0.10 |
| 86 | | 1,2-Dichlorobenzene | 1.323 | 1.387 | -4.8 | 93 | -0.09 |
| 87 | | 1,2,4-Trimethylbenzene | 2.377 | 2.512 | -5.7 | 94 | -0.09 |
| 88 | | 1,2-Dibromo-3-Chloropropane | 0.083 | 0.069 | 16.9 | 85 | -0.09 |
| 89 | | 1,2,4-Trichlorobenzene | 0.370 | 0.322 | 13.0 | 72 | -0.09 |
| 90 | | Hexachlorobutadiene | 0.162 | 0.201 | -24.1# | 87 | -0.10 |
| 91 | | Naphthalene | 0.681 | 0.464 | 31.9# | 69 | -0.11 |
| 92 | | 1,2,3-Trichlorobenzene | 0.274 | 0.216 | 21.2# | 70 | -0.11 |

Average % D = 8.2

(#) = Out of Range SPCC's out = 0 CCC's out = 0
F0078967.D VF2305C.M Fri Mar 09 16:10:50 2007

# Metals Analysis

## QC Data Summaries

Includes the following where applicable:

- Instrument Runlogs
- Initial and Continuing Calibration Blanks
- Initial and Continuing Calibration Checks
- High and Low Check Standards
- Interfering Element Check Standards
- Method Blank Summaries
- Matrix Spike and Duplicate Summaries
- Blank Spike and Lab Control Sample Summaries
- Serial Dilution Summaries

Accutest Laboratories Instrument Runlog
Inorganics Analyses

Login Number: T16448
Account: ITTXHO - Shaw E & I, Inc.
Project: Longhorn Army Ammunition Plant

File ID: IR022807.ASC    Date Analyzed: 02/28/07    Methods: SW846 6010B
Analyst: NS    Run ID: MA2815
Parameters: Cr

| Time | Sample Description | Dilution Factor | PS Recov | Comments |
|---|---|---|---|---|
| 10:29 | MA2815-STD1 | 1 | | STDA |
| 10:36 | MA2815-STD2 | 1 | | STDC |
| 10:42 | MA2815-STD3 | 1 | | STDE |
| 10:47 | MA2815-STD4 | 1 | | STDB |
| 10:53 | MA2815-STD5 | 1 | | STDD |
| 11:53 | MA2815-HSTD1 | 1 | | |
| 12:00 | MA2815-ICV1 | 1 | | |
| 12:06 | MA2815-ICB1 | 1 | | |
| 12:13 | MA2815-CRIB1 | 1 | | |
| 12:29 | MA2815-ICSA1 | 1 | | |
| 12:36 | MA2815-ICSAB1 | 1 | | |
| 12:44 | MA2815-CCV1 | 1 | | |
| 12:51 | MA2815-CCB1 | 1 | | |
| 12:57 | MP5805-MB1 | 1 | | |
| 13:04 | MP5805-LC1 | 1 | | |
| 13:11 | T16368-10 | 1 | | (sample used for QC only; not part of login T16448) |
| 13:17 | MP5805-D1 | 1 | | |
| 13:24 | MP5805-SD1 | 5 | | |
| 13:30 | MP5805-S1 | 1 | | |
| 13:37 | MP5805-S2 | 1 | | |
| 13:44 | ZZZZZZ | 1 | | |
| 13:50 | ZZZZZZ | 1 | | |
| 13:57 | ZZZZZZ | 1 | | |
| 14:04 | MA2815-CCV2 | 1 | | |
| 14:10 | MA2815-CCB2 | 1 | | |
| 14:26 | ZZZZZZ | 1 | | |
| 14:33 | ZZZZZZ | 1 | | |
| 14:39 | ZZZZZZ | 1 | | |
| 14:46 | ZZZZZZ | 1 | | |
| 14:52 | ZZZZZZ | 1 | | |
| 14:59 | ZZZZZZ | 1 | | |
| 15:06 | ZZZZZZ | 1 | | |
| 15:12 | ZZZZZZ | 1 | | |



6.1
6

Accutest Laboratories Instrument Runlog
Inorganics Analyses

Login Number: T16448
Account: ITTXHO - Shaw E & I, Inc.
Project: Longhorn Army Ammunition Plant

File ID: IR022807.ASC    Date Analyzed: 02/28/07    Methods: SW846 6010B
Analyst: NS    Run ID: MA2815
Parameters: Cr

| Time | Sample Description | Dilution Factor | PS Recov | Comments |
|---|---|---|---|---|
| 15:19 | ZZZZZZ | 1 | | |
| 15:26 | ZZZZZZ | 1 | | |
| 15:34 | MA2815-CCV3 | 1 | | |
| 15:42 | MA2815-CCB3 | 1 | | |
| 15:49 | ZZZZZZ | 1 | | |
| 15:56 | ZZZZZZ | 1 | | |
| 16:02 | ZZZZZZ | 1 | | |
| 16:09 | ZZZZZZ | 1 | | |
| 16:16 | ZZZZZZ | 1 | | |
| 16:22 | ZZZZZZ | 1 | | |
| 16:31 | MA2815-CCV4 | 1 | | |
| 16:39 | MA2815-CCB4 | 1 | | |
| 16:46 | MP5797-MB1 | 1 | | |
| 16:52 | MP5797-B1 | 1 | | |
| 16:59 | T16390-1 | 1 | | (sample used for QC only; not part of login T16448) |
| 17:05 | MP5797-D1 | 1 | | |
| 17:12 | MP5797-SD1 | 5 | | |
| 17:19 | MP5797-S1 | 1 | | |
| 17:25 | MP5797-S2 | 1 | | |
| 17:39 | ZZZZZZ | 1 | | |
| 17:45 | ZZZZZZ | 1 | | |
| 17:54 | MA2815-CCV5 | 1 | | |
| 18:02 | MA2815-CCB5 | 1 | | |
| 18:17 | MA2815-CCV6 | 1 | | |
| 18:25 | MA2815-CCB6 | 1 | | |
| 18:32 | MP5798-MB1 | 1 | | |
| 18:39 | MP5798-B1 | 1 | | |
| 18:45 | T16386-1 | 1 | | (sample used for QC only; not part of login T16448) |
| 18:52 | MP5798-D1 | 1 | | |
| 18:59 | MP5798-SD1 | 5 | | |
| 19:05 | MP5798-S1 | 1 | | |
| 19:12 | MP5798-S2 | 1 | | |
| 19:20 | MA2815-CCV7 | 1 | | |

Accutest Laboratories Instrument Runlog
Inorganics Analyses

Login Number: T16448
Account: ITTXHO - Shaw E & I, Inc.
Project: Longhorn Army Ammunition Plant

File ID: IR022807.ASC    Date Analyzed: 02/28/07    Methods: SW846 6010B
Analyst: NS    Run ID: MA2815
Parameters: Cr

| Time | Sample Description | Dilution Factor | PS Recov | Comments |
|---|---|---|---|---|
| 19:29 | MA2815-CCB7 | 1 | | |
| 19:35 | ZZZZZZ | 5 | | |
| 19:42 | ZZZZZZ | 5 | | |
| 19:50 | MA2815-CCV8 | 1 | | |
| 19:59 | MA2815-CCB8 | 1 | | |
| 20:05 | MP5804-MB1 | 1 | | |
| 20:12 | MP5804-B1 | 1 | | |
| 20:19 | T16414-1 | 1 | | (sample used for QC only; not part of login T16448) |
| 20:25 | MP5804-D1 | 1 | | |
| 20:32 | MP5804-SD1 | 5 | | |
| 20:38 | MP5804-S1 | 1 | | |
| 20:45 | MP5804-S2 | 1 | | |
| 20:52 | T16448-3 | 1 | | |
| -----------> | Last reportable sample/prep for job T16448 | | | |
| 20:58 | ZZZZZZ | 1 | | |
| 21:05 | ZZZZZZ | 1 | | |
| 21:13 | MA2815-CCV9 | 1 | | |
| 21:22 | MA2815-CCB9 | 1 | | |
| -----------> | Last reportable CCB for job T16448 | | | |
| 21:28 | ZZZZZZ | 1 | | |
| 21:37 | MA2815-CCV10 | 1 | | |
| 21:45 | MA2815-CCB10 | 1 | | |

Refer to raw data for calibration curve and standards.

INTERNAL STANDARD SUMMARY

Login Number: T16448
Account: ITTXHO - Shaw E & I, Inc.
Project: Longhorn Army Ammunition Plant

File ID: IR022807.ASC Date Analyzed: 02/28/07 Methods: SW846 6010B
Analyst: NS Run ID: MA2815
Parameters: Cr

| Time | Sample Description | Istd#1 |
|---|---|---|
| 10:29 | MA2815-STD1 | 35191 R |
| 10:36 | MA2815-STD2 | 35110 |
| 10:42 | MA2815-STD3 | 34622 |
| 10:47 | MA2815-STD4 | 35248 |
| 10:53 | MA2815-STD5 | 35473 |
| 11:53 | MA2815-HSTD1 | 34726 |
| 12:00 | MA2815-ICV1 | 35160 |
| 12:06 | MA2815-ICB1 | 35577 |
| 12:13 | MA2815-CRIB1 | 35176 |
| 12:29 | MA2815-ICSA1 | 33297 |
| 12:36 | MA2815-ICSAB1 | 32873 |
| 12:44 | MA2815-CCV1 | 33774 |
| 12:51 | MA2815-CCB1 | 33955 |
| 12:57 | MP5805-MB1 | 34090 |
| 13:04 | MP5805-LC1 | 38051 |
| 13:11 | T16368-10 | 36813 |
| 13:17 | MP5805-D1 | 36865 |
| 13:24 | MP5805-SD1 | 34542 |
| 13:30 | MP5805-S1 | 36557 |
| 13:37 | MP5805-S2 | 36279 |
| 13:44 | ZZZZZZ | 36543 |
| 13:50 | ZZZZZZ | 36660 |
| 13:57 | ZZZZZZ | 36149 |
| 14:04 | MA2815-CCV2 | 33600 |
| 14:10 | MA2815-CCB2 | 33939 |
| 14:26 | ZZZZZZ | 36687 |
| 14:33 | ZZZZZZ | 36158 |
| 14:39 | ZZZZZZ | 36313 |
| 14:46 | ZZZZZZ | 36401 |
| 14:52 | ZZZZZZ | 37023 |
| 14:59 | ZZZZZZ | 36200 |
| 15:06 | ZZZZZZ | 35974 |
| 15:12 | ZZZZZZ | 36687 |

INTERNAL STANDARD SUMMARY

Login Number: T16448
Account: ITTXHO - Shaw E & I, Inc.
Project: Longhorn Army Ammunition Plant

File ID: IR022807.ASC Date Analyzed: 02/28/07 Methods: SW846 6010B
Analyst: NS Run ID: MA2815
Parameters: Cr

| Time | Sample Description | Istd#1 |
|---|---|---|
| 15:19 | ZZZZZZ | 36421 |
| 15:26 | ZZZZZZ | 33854 |
| 15:34 | MA2815-CCV3 | 33805 |
| 15:42 | MA2815-CCB3 | 34060 |
| 15:49 | ZZZZZZ | 34845 |
| 15:56 | ZZZZZZ | 35690 |
| 16:02 | ZZZZZZ | 36145 |
| 16:09 | ZZZZZZ | 35959 |
| 16:16 | ZZZZZZ | 35680 |
| 16:22 | ZZZZZZ | 34030 |
| 16:31 | MA2815-CCV4 | 33871 |
| 16:39 | MA2815-CCB4 | 34086 |
| 16:46 | MP5797-MB1 | 34090 |
| 16:52 | MP5797-B1 | 33470 |
| 16:59 | T16390-1 | 33848 |
| 17:05 | MP5797-D1 | 33681 |
| 17:12 | MP5797-SD1 | 33959 |
| 17:19 | MP5797-S1 | 33487 |
| 17:25 | MP5797-S2 | 33229 |
| 17:39 | ZZZZZZ | 42590 |
| 17:45 | ZZZZZZ | 51777 ! |
| 17:54 | MA2815-CCV5 | 33659 |
| 18:02 | MA2815-CCB5 | 33977 |
| 18:17 | MA2815-CCV6 | 33458 |
| 18:25 | MA2815-CCB6 | 33868 |
| 18:32 | MP5798-MB1 | 33829 |
| 18:39 | MP5798-B1 | 33568 |
| 18:45 | T16386-1 | 33446 |
| 18:52 | MP5798-D1 | 33730 |
| 18:59 | MP5798-SD1 | 33887 |
| 19:05 | MP5798-S1 | 33609 |
| 19:12 | MP5798-S2 | 33372 |
| 19:20 | MA2815-CCV7 | 33902 |

INTERNAL STANDARD SUMMARY

Login Number: T16448
Account: ITTXHO - Shaw E & I, Inc.
Project: Longhorn Army Ammunition Plant

File ID: IR022807.ASC    Date Analyzed: 02/28/07    Methods: SW846 6010B
Analyst: NS    Run ID: MA2815
Parameters: Cr

| Time | Sample Description | Istd#1 |
|---|---|---|
| 19:29 | MA2815-CCB7 | 34221 |
| 19:35 | ZZZZZZ | 34116 |
| 19:42 | ZZZZZZ | 33707 |
| 19:50 | MA2815-CCV8 | 33395 |
| 19:59 | MA2815-CCB8 | 33978 |
| 20:05 | MP5804-MB1 | 33772 |
| 20:12 | MP5804-B1 | 33325 |
| 20:19 | T16414-1 | 34128 |
| 20:25 | MP5804-D1 | 34110 |
| 20:32 | MP5804-SD1 | 34179 |
| 20:38 | MP5804-S1 | 33498 |
| 20:45 | MP5804-S2 | 33745 |
| 20:52 | T16448-3 | 33928 |
| 20:58 | ZZZZZZ | 33803 |
| 21:05 | ZZZZZZ | 33697 |
| 21:13 | MA2815-CCV9 | 33632 |
| 21:22 | MA2815-CCB9 | 33875 |
| 21:28 | ZZZZZZ | 33538 |
| 21:37 | MA2815-CCV10 | 33698 |
| 21:45 | MA2815-CCB10 | 33813 |

R = Reference for ISTD limits.   ! = Outside limits.

LEGEND:

| Istd# | Parameter | Limits |
|---|---|---|
| Istd#1 | Yttrium | 60-125 % |

BLANK RESULTS SUMMARY
Part 1 - Initial and Continuing Calibration Blanks

Login Number: T16448
Account: ITTXHO - Shaw E & I, Inc.
Project: Longhorn Army Ammunition Plant

File ID: IR022807.ASC Date Analyzed: 02/28/07 Methods: SW846 6010B
QC Limits: result < RL Run ID: MA2815 Units: ug/l

| Time: | | | 12:06 | | 12:51 | | 14:10 | | 15:42 | |
|---|---|---|---|---|---|---|---|---|---|---|
| Sample ID: | | | ICB1 | | CCB1 | | CCB2 | | CCB3 | |
| Metal | RL | IDL | raw | final | raw | final | raw | final | raw | final |
| Aluminum | 200 | 51 | | | | | | | | |
| Antimony | 5.0 | 1.8 | | | | | | | | |
| Arsenic | 5.0 | 1.4 | anr | | | | | | | |
| Barium | 200 | .1 | anr | | | | | | | |
| Beryllium | 5.0 | .06 | | | | | | | | |
| Boron | 100 | 1.4 | | | | | | | | |
| Cadmium | 4.0 | .5 | anr | | | | | | | |
| Calcium | 5000 | 8 | | | | | | | | |
| Chromium | 10 | .9 | 0.52 | <10 | -0.080 | <10 | -0.30 | <10 | -0.25 | <10 |
| Cobalt | 50 | .99 | | | | | | | | |
| Copper | 25 | 1.4 | anr | | | | | | | |
| Iron | 100 | 16 | | | | | | | | |
| Lead | 3.0 | .7 | anr | | | | | | | |
| Magnesium | 5000 | 8 | | | | | | | | |
| Manganese | 15 | .2 | anr | | | | | | | |
| Molybdenum | 10 | .45 | | | | | | | | |
| Nickel | 40 | 1 | anr | | | | | | | |
| Potassium | 5000 | 80 | anr | | | | | | | |
| Selenium | 5.0 | 1.7 | anr | | | | | | | |
| Silver | 10 | .5 | anr | | | | | | | |
| Sodium | 5000 | 160 | | | | | | | | |
| Strontium | 20 | .5 | | | | | | | | |
| Thallium | 10 | 1.5 | | | | | | | | |
| Tin | 20 | 1.5 | | | | | | | | |
| Titanium | 20 | .5 | | | | | | | | |
| Vanadium | 50 | .4 | anr | | | | | | | |
| Zinc | 20 | .8 | anr | | | | | | | |

(*) Outside of QC limits
(anr) Analyte not requested

BLANK RESULTS SUMMARY
Part 1 - Initial and Continuing Calibration Blanks

Login Number: T16448
Account: ITTXHO - Shaw E & I, Inc.
Project: Longhorn Army Ammunition Plant

File ID: IR022807.ASC    Date Analyzed: 02/28/07    Methods: SW846 6010B
QC Limits: result < RL    Run ID: MA2815    Units: ug/l

| Time: / Sample ID: / Metal | RL | IDL | 16:39 CCB4 raw | final | 18:02 CCB5 raw | final | 18:25 CCB6 raw | final | 19:29 CCB7 raw | final |
|---|---|---|---|---|---|---|---|---|---|---|
| Aluminum | 200 | 51 | | | | | | | | |
| Antimony | 5.0 | 1.8 | | | | | | | | |
| Arsenic | 5.0 | 1.4 | anr | | | | | | | |
| Barium | 200 | .1 | anr | | | | | | | |
| Beryllium | 5.0 | .06 | | | | | | | | |
| Boron | 100 | 1.4 | | | | | | | | |
| Cadmium | 4.0 | .5 | anr | | | | | | | |
| Calcium | 5000 | 8 | | | | | | | | |
| Chromium | 10 | .9 | -0.11 | <10 | -0.79 | <10 | -0.67 | <10 | -0.090 | <10 |
| Cobalt | 50 | .99 | | | | | | | | |
| Copper | 25 | 1.4 | anr | | | | | | | |
| Iron | 100 | 16 | | | | | | | | |
| Lead | 3.0 | .7 | anr | | | | | | | |
| Magnesium | 5000 | 8 | | | | | | | | |
| Manganese | 15 | .2 | anr | | | | | | | |
| Molybdenum | 10 | .45 | | | | | | | | |
| Nickel | 40 | 1 | anr | | | | | | | |
| Potassium | 5000 | 80 | anr | | | | | | | |
| Selenium | 5.0 | 1.7 | anr | | | | | | | |
| Silver | 10 | .5 | anr | | | | | | | |
| Sodium | 5000 | 160 | | | | | | | | |
| Strontium | 20 | .5 | | | | | | | | |
| Thallium | 10 | 1.5 | | | | | | | | |
| Tin | 20 | 1.5 | | | | | | | | |
| Titanium | 20 | .5 | | | | | | | | |
| Vanadium | 50 | .4 | anr | | | | | | | |
| Zinc | 20 | .8 | anr | | | | | | | |

(*) Outside of QC limits
(anr) Analyte not requested

BLANK RESULTS SUMMARY
Part 1 - Initial and Continuing Calibration Blanks

Login Number: T16448
Account: ITTXHO - Shaw E & I, Inc.
Project: Longhorn Army Ammunition Plant

File ID: IR022807.ASC  Date Analyzed: 02/28/07  Methods: SW846 6010B
QC Limits: result < RL  Run ID: MA2815  Units: ug/l

| Time: | | | 19:59 | | 21:22 | |
|---|---|---|---|---|---|---|
| Sample ID: | | | CCB8 | | CCB9 | |
| Metal | RL | IDL | raw | final | raw | final |
| Aluminum | 200 | 51 | | | | |
| Antimony | 5.0 | 1.8 | | | | |
| Arsenic | 5.0 | 1.4 | anr | | | |
| Barium | 200 | .1 | anr | | | |
| Beryllium | 5.0 | .06 | | | | |
| Boron | 100 | 1.4 | | | | |
| Cadmium | 4.0 | .5 | anr | | | |
| Calcium | 5000 | 8 | | | | |
| Chromium | 10 | .9 | 0.080 | <10 | -0.42 | <10 |
| Cobalt | 50 | .99 | | | | |
| Copper | 25 | 1.4 | anr | | | |
| Iron | 100 | 16 | | | | |
| Lead | 3.0 | .7 | anr | | | |
| Magnesium | 5000 | 8 | | | | |
| Manganese | 15 | .2 | anr | | | |
| Molybdenum | 10 | .45 | | | | |
| Nickel | 40 | 1 | anr | | | |
| Potassium | 5000 | 80 | anr | | | |
| Selenium | 5.0 | 1.7 | anr | | | |
| Silver | 10 | .5 | anr | | | |
| Sodium | 5000 | 160 | | | | |
| Strontium | 20 | .5 | | | | |
| Thallium | 10 | 1.5 | | | | |
| Tin | 20 | 1.5 | | | | |
| Titanium | 20 | .5 | | | | |
| Vanadium | 50 | .4 | anr | | | |
| Zinc | 20 | .8 | anr | | | |

(*) Outside of QC limits
(anr) Analyte not requested

CALIBRATION CHECK STANDARDS SUMMARY
Initial and Continuing Calibration Checks

Login Number: T16448
Account: ITTXHO - Shaw E & I, Inc.
Project: Longhorn Army Ammunition Plant

File ID: IR022807.ASC　Date Analyzed: 02/28/07　Methods: SW846 6010B
QC Limits: 90 to 110 % Recovery　Run ID: MA2815　Units: ug/l

| Time: | | 12:00 | | | 12:44 | | | 14:04 | |
|---|---|---|---|---|---|---|---|---|---|
| Sample ID: | ICV | ICV1 | | CCV | CCV1 | | CCV | CCV2 | |
| Metal | True | Results | % Rec | True | Results | % Rec | True | Results | % Rec |
| Aluminum | | | | | | | | | |
| Antimony | | | | | | | | | |
| Arsenic | anr | | | | | | | | |
| Barium | anr | | | | | | | | |
| Beryllium | | | | | | | | | |
| Boron | | | | | | | | | |
| Cadmium | anr | | | | | | | | |
| Calcium | | | | | | | | | |
| Chromium | 1000 | 997 | 99.7 | 2000 | 1980 | 99.0 | 2000 | 1980 | 99.0 |
| Cobalt | | | | | | | | | |
| Copper | anr | | | | | | | | |
| Iron | | | | | | | | | |
| Lead | anr | | | | | | | | |
| Magnesium | | | | | | | | | |
| Manganese | anr | | | | | | | | |
| Molybdenum | | | | | | | | | |
| Nickel | anr | | | | | | | | |
| Potassium | anr | | | | | | | | |
| Selenium | anr | | | | | | | | |
| Silver | anr | | | | | | | | |
| Sodium | | | | | | | | | |
| Strontium | | | | | | | | | |
| Thallium | | | | | | | | | |
| Tin | | | | | | | | | |
| Titanium | | | | | | | | | |
| Vanadium | anr | | | | | | | | |
| Zinc | anr | | | | | | | | |

(*) Outside of QC limits
(anr) Analyte not requested

CALIBRATION CHECK STANDARDS SUMMARY
Initial and Continuing Calibration Checks

Login Number: T16448
Account: ITTXHO - Shaw E & I, Inc.
Project: Longhorn Army Ammunition Plant

File ID: IR022807.ASC Date Analyzed: 02/28/07 Methods: SW846 6010B
QC Limits: 90 to 110 % Recovery Run ID: MA2815 Units: ug/l

| Time: / Sample ID: / Metal | CCV True | 15:34 CCV3 Results | % Rec | CCV True | 16:31 CCV4 Results | % Rec | CCV True | 17:54 CCV5 Results | % Rec |
|---|---|---|---|---|---|---|---|---|---|
| Aluminum | | | | | | | | | |
| Antimony | | | | | | | | | |
| Arsenic | anr | | | | | | | | |
| Barium | anr | | | | | | | | |
| Beryllium | | | | | | | | | |
| Boron | | | | | | | | | |
| Cadmium | anr | | | | | | | | |
| Calcium | | | | | | | | | |
| Chromium | 2000 | 1970 | 98.5 | 2000 | 1970 | 98.5 | 2000 | 1980 | 99.0 |
| Cobalt | | | | | | | | | |
| Copper | anr | | | | | | | | |
| Iron | | | | | | | | | |
| Lead | anr | | | | | | | | |
| Magnesium | | | | | | | | | |
| Manganese | anr | | | | | | | | |
| Molybdenum | | | | | | | | | |
| Nickel | anr | | | | | | | | |
| Potassium | anr | | | | | | | | |
| Selenium | anr | | | | | | | | |
| Silver | anr | | | | | | | | |
| Sodium | | | | | | | | | |
| Strontium | | | | | | | | | |
| Thallium | | | | | | | | | |
| Tin | | | | | | | | | |
| Titanium | | | | | | | | | |
| Vanadium | anr | | | | | | | | |
| Zinc | anr | | | | | | | | |

(*) Outside of QC limits
(anr) Analyte not requested

CALIBRATION CHECK STANDARDS SUMMARY
Initial and Continuing Calibration Checks

Login Number: T16448
Account: ITTXHO - Shaw E & I, Inc.
Project: Longhorn Army Ammunition Plant

File ID: IR022807.ASC Date Analyzed: 02/28/07 Methods: SW846 6010B
QC Limits: 90 to 110 % Recovery Run ID: MA2815 Units: ug/l

| Time: / Sample ID: / Metal | CCV True | 18:17 CCV6 Results | % Rec | CCV True | 19:20 CCV7 Results | % Rec | CCV True | 19:50 CCV8 Results | % Rec |
|---|---|---|---|---|---|---|---|---|---|
| Aluminum | | | | | | | | | |
| Antimony | | | | | | | | | |
| Arsenic | anr | | | | | | | | |
| Barium | anr | | | | | | | | |
| Beryllium | | | | | | | | | |
| Boron | | | | | | | | | |
| Cadmium | anr | | | | | | | | |
| Calcium | | | | | | | | | |
| Chromium | 2000 | 1980 | 99.0 | 2000 | 1980 | 99.0 | 2000 | 1980 | 99.0 |
| Cobalt | | | | | | | | | |
| Copper | anr | | | | | | | | |
| Iron | | | | | | | | | |
| Lead | anr | | | | | | | | |
| Magnesium | | | | | | | | | |
| Manganese | anr | | | | | | | | |
| Molybdenum | | | | | | | | | |
| Nickel | anr | | | | | | | | |
| Potassium | anr | | | | | | | | |
| Selenium | anr | | | | | | | | |
| Silver | anr | | | | | | | | |
| Sodium | | | | | | | | | |
| Strontium | | | | | | | | | |
| Thallium | | | | | | | | | |
| Tin | | | | | | | | | |
| Titanium | | | | | | | | | |
| Vanadium | anr | | | | | | | | |
| Zinc | anr | | | | | | | | |

(*) Outside of QC limits
(anr) Analyte not requested

CALIBRATION CHECK STANDARDS SUMMARY
Initial and Continuing Calibration Checks

Login Number: T16448
Account: ITTXHO - Shaw E & I, Inc.
Project: Longhorn Army Ammunition Plant

File ID: IR022807.ASC    Date Analyzed: 02/28/07    Methods: SW846 6010B
QC Limits: 90 to 110 % Recovery    Run ID: MA2815    Units: ug/l

| Time: | | 21:13 | |
|---|---|---|---|
| Sample ID: | CCV | CCV9 | |
| Metal | True | Results | % Rec |
| Aluminum | | | |
| Antimony | | | |
| Arsenic | anr | | |
| Barium | anr | | |
| Beryllium | | | |
| Boron | | | |
| Cadmium | anr | | |
| Calcium | | | |
| Chromium | 2000 | 1990 | 99.5 |
| Cobalt | | | |
| Copper | anr | | |
| Iron | | | |
| Lead | anr | | |
| Magnesium | | | |
| Manganese | anr | | |
| Molybdenum | | | |
| Nickel | anr | | |
| Potassium | anr | | |
| Selenium | anr | | |
| Silver | anr | | |
| Sodium | | | |
| Strontium | | | |
| Thallium | | | |
| Tin | | | |
| Titanium | | | |
| Vanadium | anr | | |
| Zinc | anr | | |

(*) Outside of QC limits
(anr) Analyte not requested

HIGH STANDARD CHECK SUMMARY

Login Number: T16448
Account: ITTXHO - Shaw E & I, Inc.
Project: Longhorn Army Ammunition Plant

File ID: IR022807.ASC
QC Limits: 95 to 105 % Recovery

Date Analyzed: 02/28/07
Run ID: MA2815

Methods: SW846 6010B
Units: ug/l

| Time: |  | 11:53 |  |
|---|---|---|---|
| Sample ID: | HSTD | HSTD1 |  |
| Metal | True | Results | % Rec |
| Aluminum |  |  |  |
| Antimony |  |  |  |
| Arsenic | anr |  |  |
| Barium | anr |  |  |
| Beryllium |  |  |  |
| Boron |  |  |  |
| Cadmium | anr |  |  |
| Calcium |  |  |  |
| Chromium | 4000 | 4000 | 100.0 |
| Cobalt |  |  |  |
| Copper | anr |  |  |
| Iron |  |  |  |
| Lead | anr |  |  |
| Magnesium |  |  |  |
| Manganese | anr |  |  |
| Molybdenum |  |  |  |
| Nickel | anr |  |  |
| Potassium | anr |  |  |
| Selenium | anr |  |  |
| Silver | anr |  |  |
| Sodium |  |  |  |
| Strontium |  |  |  |
| Thallium |  |  |  |
| Tin |  |  |  |
| Titanium |  |  |  |
| Vanadium | anr |  |  |
| Zinc | anr |  |  |

(*) Outside of QC limits
(anr) Analyte not requested

# INITIAL LOW CALIBRATION CHECK STANDARD SUMMARY

Login Number: T16448
Account: ITTXHO - Shaw E & I, Inc.
Project: Longhorn Army Ammunition Plant

File ID: IR022807.ASC    Date Analyzed: 02/28/07    Methods: SW846 6010B
QC Limits: 80 to 120 % Recovery    Run ID: MA2815    Units: ug/l

| Time: | | 12:13 | |
|---|---|---|---|
| Sample ID: | CRIB | CRIB1 | |
| Metal | True | Results | % Rec |
| Aluminum | 400 | | |
| Antimony | 10 | | |
| Arsenic | 10 | | |
| Barium | 400 | | |
| Beryllium | 10 | | |
| Boron | 200 | | |
| Cadmium | 8.0 | | |
| Calcium | 5000 | | |
| Chromium | 20 | 20.3 | 101.5 |
| Cobalt | 100 | | |
| Copper | 50 | | |
| Iron | 200 | | |
| Lead | 6.0 | | |
| Magnesium | 5000 | | |
| Manganese | 30 | | |
| Molybdenum | 10 | | |
| Nickel | 80 | | |
| Potassium | 5000 | | |
| Selenium | 10 | | |
| Silver | 20 | | |
| Sodium | 5000 | | |
| Strontium | 20 | | |
| Thallium | 20 | | |
| Tin | 20 | | |
| Titanium | 20 | | |
| Vanadium | 100 | | |
| Zinc | 40 | | |

(*) Outside of QC limits
(anr) Analyte not requested

INTERFERING ELEMENT CHECK STANDARDS SUMMARY
Part 1 - ICSA and ICSAB Standards

Login Number: T16448
Account: ITTXHO - Shaw E & I, Inc.
Project: Longhorn Army Ammunition Plant

File ID: IR022807.ASC    Date Analyzed: 02/28/07    Methods: SW846 6010B
QC Limits: 80 to 120 % Recovery    Run ID: MA2815    Units: ug/l

| Time: / Sample ID: / Metal | ICSA True | ICSAB True | 12:29 ICSA1 Results | % Rec | 12:36 ICSAB1 Results | % Rec |
|---|---|---|---|---|---|---|
| Aluminum | 500000 | 500000 | 455000 | 91.0 | 455000 | 91.0 |
| Antimony | | 1000 | 0.31 | | 1030 | 103.0 |
| Arsenic | | 500 | 1.3 | | 526 | 105.2 |
| Barium | | 500 | 4.2 | | 555 | 111.0 |
| Beryllium | | 500 | -0.34 | | 510 | 102.0 |
| Boron | | | -41 | | -40 | |
| Cadmium | | 1000 | -1.2 | | 959 | 95.9 |
| Calcium | 500000 | 500000 | 482000 | 96.4 | 475000 | 95.0 |
| Chromium | | 500 | 1.3 | | 520 | 104.0 |
| Cobalt | | 500 | -0.86 | | 504 | 100.8 |
| Copper | | 500 | 1.4 | | 574 | 114.8 |
| Iron | 200000 | 200000 | 189000 | 94.5 | 186000 | 93.0 |
| Lead | | 500 | 2.7 | | 515 | 103.0 |
| Magnesium | 500000 | 500000 | 459000 | 91.8 | 456000 | 91.2 |
| Manganese | | 500 | -7.1 | | 517 | 103.4 |
| Molybdenum | | 500 | 0.36 | | 496 | 99.2 |
| Nickel | | 1000 | 1.7 | | 966 | 96.6 |
| Potassium | | | 511 | | 492 | |
| Selenium | | 500 | -3.0 | | 505 | 101.0 |
| Silver | | 1000 | 0.16 | | 1100 | 110.0 |
| Sodium | | | -340 | | -350 | |
| Strontium | | | 0.53 | | 0.44 | |
| Thallium | | 500 | -1.3 | | 500 | 100.0 |
| Tin | | | -8.9 | | -9.3 | |
| Titanium | | | 0.020 | | -0.11 | |
| Vanadium | | 500 | 3.8 | | 519 | 103.8 |
| Zinc | | 1000 | -3.3 | | 1060 | 106.0 |

(*) Outside of QC limits
(anr) Analyte not requested



6.1.6
6

BLANK RESULTS SUMMARY
Part 2 - Method Blanks

Login Number: T16448
Account: ITTXHO - Shaw E & I, Inc.
Project: Longhorn Army Ammunition Plant

QC Batch ID: MP5804
Matrix Type: AQUEOUS

Methods: SW846 6010B
Units: ug/l

Prep Date: 02/27/07

| Metal | RL | IDL | MB raw | final |
|---|---|---|---|---|
| Aluminum | 200 | 51 | | |
| Antimony | 5.0 | 1.8 | | |
| Arsenic | 5.0 | 1.4 | anr | |
| Barium | 200 | .1 | anr | |
| Beryllium | 5.0 | .06 | | |
| Boron | 100 | 1.4 | | |
| Cadmium | 4.0 | .5 | anr | |
| Calcium | 5000 | 8 | | |
| Chromium | 10 | .9 | -0.12 | <10 |
| Cobalt | 50 | .99 | | |
| Copper | 25 | 1.4 | anr | |
| Iron | 100 | 16 | | |
| Lead | 3.0 | .7 | anr | |
| Magnesium | 5000 | 8 | | |
| Manganese | 15 | .2 | anr | |
| Molybdenum | 10 | .45 | | |
| Nickel | 40 | 1 | anr | |
| Potassium | 5000 | 80 | | |
| Selenium | 5.0 | 1.7 | anr | |
| Silver | 10 | .5 | anr | |
| Sodium | 5000 | 160 | | |
| Strontium | 20 | .5 | | |
| Thallium | 10 | 1.5 | | |
| Tin | 20 | 1.5 | | |
| Titanium | 20 | .5 | | |
| Vanadium | 50 | .4 | anr | |
| Zinc | 20 | .8 | anr | |

Associated samples MP5804: T16448-3

Results < IDL are shown as zero for calculation purposes
(*) Outside of QC limits
(anr) Analyte not requested

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: T16448
Account: ITTXHO - Shaw E & I, Inc.
Project: Longhorn Army Ammunition Plant

QC Batch ID: MP5804
Matrix Type: AQUEOUS

Methods: SW846 6010B
Units: ug/l

Prep Date: 02/27/07 02/27/07

| Metal | T16414-1 Original | DUP | RPD | QC Limits | T16414-1 Original | MS | Spikelot MPTW3 | % Rec | QC Limits |
|---|---|---|---|---|---|---|---|---|---|
| Aluminum | | | | | | | | | |
| Antimony | | | | | | | | | |
| Arsenic | anr | | | | | | | | |
| Barium | anr | | | | | | | | |
| Beryllium | | | | | | | | | |
| Boron | | | | | | | | | |
| Cadmium | anr | | | | | | | | |
| Calcium | | | | | | | | | |
| Chromium | 0.0 | 0.0 | NC | 0-20 | 0.0 | 397 | 400 | 99.3 | 75-125 |
| Cobalt | | | | | | | | | |
| Copper | anr | | | | | | | | |
| Iron | | | | | | | | | |
| Lead | anr | | | | | | | | |
| Magnesium | | | | | | | | | |
| Manganese | anr | | | | | | | | |
| Molybdenum | | | | | | | | | |
| Nickel | anr | | | | | | | | |
| Potassium | | | | | | | | | |
| Selenium | anr | | | | | | | | |
| Silver | anr | | | | | | | | |
| Sodium | | | | | | | | | |
| Strontium | | | | | | | | | |
| Thallium | | | | | | | | | |
| Tin | | | | | | | | | |
| Titanium | | | | | | | | | |
| Vanadium | anr | | | | | | | | |
| Zinc | anr | | | | | | | | |

Associated samples MP5804: T16448-3

Results < IDL are shown as zero for calculation purposes
(*) Outside of QC limits
(N) Matrix Spike Rec. outside of QC limits
(anr) Analyte not requested

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: T16448
Account: ITTXHO - Shaw E & I, Inc.
Project: Longhorn Army Ammunition Plant

QC Batch ID: MP5804
Matrix Type: AQUEOUS

Methods: SW846 6010B
Units: ug/l

Prep Date: 02/27/07

| Metal | T16414-1 Original | MSD | Spikelot MPTW3 | % Rec | MSD RPD | QC Limit |
|---|---|---|---|---|---|---|
| Aluminum | | | | | | |
| Antimony | | | | | | |
| Arsenic | anr | | | | | |
| Barium | anr | | | | | |
| Beryllium | | | | | | |
| Boron | | | | | | |
| Cadmium | anr | | | | | |
| Calcium | | | | | | |
| Chromium | 0.0 | 352 | 400 | 88.0 | 12.0 | |
| Cobalt | | | | | | |
| Copper | anr | | | | | |
| Iron | | | | | | |
| Lead | anr | | | | | |
| Magnesium | | | | | | |
| Manganese | anr | | | | | |
| Molybdenum | | | | | | |
| Nickel | anr | | | | | |
| Potassium | | | | | | |
| Selenium | anr | | | | | |
| Silver | anr | | | | | |
| Sodium | | | | | | |
| Strontium | | | | | | |
| Thallium | | | | | | |
| Tin | | | | | | |
| Titanium | | | | | | |
| Vanadium | anr | | | | | |
| Zinc | anr | | | | | |

Associated samples MP5804: T16448-3

Results < IDL are shown as zero for calculation purposes
(*) Outside of QC limits
(N) Matrix Spike Rec. outside of QC limits
(anr) Analyte not requested

SPIKE BLANK AND LAB CONTROL SAMPLE SUMMARY

Login Number: T16448
Account: ITTXHO - Shaw E & I, Inc.
Project: Longhorn Army Ammunition Plant

QC Batch ID: MP5804
Matrix Type: AQUEOUS

Methods: SW846 6010B
Units: ug/l

Prep Date: 02/27/07

| Metal | BSP Result | Spikelot MPTW3 | % Rec | QC Limits |
|---|---|---|---|---|
| Aluminum | | | | |
| Antimony | | | | |
| Arsenic | anr | | | |
| Barium | anr | | | |
| Beryllium | | | | |
| Boron | | | | |
| Cadmium | anr | | | |
| Calcium | | | | |
| Chromium | 407 | 400 | 101.8 | 80-120 |
| Cobalt | | | | |
| Copper | anr | | | |
| Iron | | | | |
| Lead | anr | | | |
| Magnesium | | | | |
| Manganese | anr | | | |
| Molybdenum | | | | |
| Nickel | anr | | | |
| Potassium | | | | |
| Selenium | anr | | | |
| Silver | anr | | | |
| Sodium | | | | |
| Strontium | | | | |
| Thallium | | | | |
| Tin | | | | |
| Titanium | | | | |
| Vanadium | anr | | | |
| Zinc | anr | | | |

Associated samples MP5804: T16448-3

Results < IDL are shown as zero for calculation purposes
(*) Outside of QC limits
(anr) Analyte not requested

SERIAL DILUTION RESULTS SUMMARY

Login Number: T16448
Account: ITTXHO - Shaw E & I, Inc.
Project: Longhorn Army Ammunition Plant

QC Batch ID: MP5804
Matrix Type: AQUEOUS

Methods: SW846 6010B
Units: ug/l

Prep Date: 02/27/07

| Metal | T16414-1 Original | SDL 1:5 | RPD | QC Limits |
|---|---|---|---|---|
| Aluminum | | | | |
| Antimony | | | | |
| Arsenic | anr | | | |
| Barium | anr | | | |
| Beryllium | | | | |
| Boron | | | | |
| Cadmium | anr | | | |
| Calcium | | | | |
| Chromium | 0.00 | 0.00 | NC | 0-10 |
| Cobalt | | | | |
| Copper | anr | | | |
| Iron | | | | |
| Lead | anr | | | |
| Magnesium | | | | |
| Manganese | anr | | | |
| Molybdenum | | | | |
| Nickel | anr | | | |
| Potassium | | | | |
| Selenium | anr | | | |
| Silver | anr | | | |
| Sodium | | | | |
| Strontium | | | | |
| Thallium | | | | |
| Tin | | | | |
| Titanium | | | | |
| Vanadium | anr | | | |
| Zinc | anr | | | |

Associated samples MP5804: T16448-3

Results < IDL are shown as zero for calculation purposes
(*) Outside of QC limits
(anr) Analyte not requested

## General Chemistry

## QC Data Summaries

Includes the following where applicable:

- Method Blank and Blank Spike Summaries
- Duplicate Summaries
- Matrix Spike Summaries
- Instrument Runlogs/QC

METHOD BLANK AND SPIKE RESULTS SUMMARY
GENERAL CHEMISTRY

Login Number: T16448
Account: ITTXHO - Shaw E & I, Inc.
Project: Longhorn Army Ammunition Plant

| Analyte | Batch ID | RL | MB Result | Units | Spike Amount | BSP Result | BSP %Recov | QC Limits |
|---|---|---|---|---|---|---|---|---|
| Alkalinity, Total as CaCO3 | GN11375 | 5.0 | <5.0 | mg/l | 2500 | 2500 | 100.0 | 80-120% |
| Chloride | GN11343 | 1.0 | <1.0 | mg/l | xxxxxxxx | 1020 | 102.0 | 92-107% |
| Nitrogen, Nitrate + Nitrite | GN11301 | 0.050 | <0.050 | mg/l | 0.500 | 0.51 | 102.0 | 89-112% |
| Nitrogen, Nitrite | GN11300 | 0.050 | <0.050 | mg/l | 0.500 | 0.49 | 98.0 | 89-117% |
| Sulfate | GN11356 | 10 | <10 | mg/l | 100 | 95.0 | 95.0 | 80-120% |
| Sulfate | GN11356 | | | mg/l | xxxxxxxx | | * | 80-120% |
| Sulfide | GN11313 | 0.20 | <0.20 | mg/l | 1600 | 1380 | 85.0 | 80-120% |
| Total Organic Carbon | GN11304 | 1.0 | <1.0 | mg/l | 25.0 | 26.0 | 104.0 | 83-110% |

Associated Samples:
Batch GN11300: T16448-1
Batch GN11301: T16448-1
Batch GN11304: T16448-1, T16448-2
Batch GN11313: T16448-1
Batch GN11343: T16448-1
Batch GN11356: T16448-1
Batch GN11375: T16448-1
(*) Outside of QC limits

DUPLICATE RESULTS SUMMARY
GENERAL CHEMISTRY

Login Number: T16448
Account: ITTXHO - Shaw E & I, Inc.
Project: Longhorn Army Ammunition Plant

| Analyte | Batch ID | QC Sample | Units | Original Result | DUP Result | RPD | QC Limits |
|---|---|---|---|---|---|---|---|
| Alkalinity, Total as CaCO3 | GN11375 | T16445-5 | mg/l | 457 | 457 | 0.0 | 0-10% |
| Chloride | GN11343 | T16445-5 | mg/l | 253 | 258 | 2.0 | 0-5% |
| Nitrogen, Nitrate + Nitrite | GN11301 | T16445-18 | mg/l | 2.7 | 2.7 | 0.0 | 0-10% |
| Nitrogen, Nitrite | GN11300 | T16445-18 | mg/l | 0.0030 U | <0.050 | 0.0 | 0-10% |
| Sulfate | GN11356 | T16448-1 | mg/l | 403 | 436 | 7.8 | 0-20% |
| Sulfide | GN11313 | T16445-5 | mg/l | 0.0 B | <0.20 | 0.0 | 0-20% |
| Total Organic Carbon | GN11304 | T16445-18 | mg/l | 6.0 | 6.0 | 0.0 | 0-11% |
| pH | GN11334 | T16448-1 | su | 7.1 | 7.1 | 0.0 | 0-6.8% |
| pH | GN11334 | T16448-1 | su | 7.1 | 7.1 | 0.0 | 0-20% |

Associated Samples:
Batch GN11300: T16448-1
Batch GN11301: T16448-1
Batch GN11304: T16448-1, T16448-2
Batch GN11313: T16448-1
Batch GN11334: T16448-1
Batch GN11343: T16448-1
Batch GN11356: T16448-1
Batch GN11375: T16448-1
(*) Outside of QC limits

7.2

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MATRIX SPIKE RESULTS SUMMARY
GENERAL CHEMISTRY

Login Number: T16448
Account: ITTXHO - Shaw E & I, Inc.
Project: Longhorn Army Ammunition Plant

| Analyte | Batch ID | QC Sample | Units | Original Result | Spike Amount | MS Result | %Rec | QC Limits |
|---|---|---|---|---|---|---|---|---|
| Alkalinity, Total as CaCO3 | GN11375 | T16445-5 | mg/l | 457 | 125 | 590 | 106.0 | 79-122% |
| Chloride | GN11343 | T16445-5 | mg/l | 253 | xxxxxxxx | 462 | 104.0 | 81-119% |
| Nitrogen, Nitrate + Nitrite | GN11301 | T16445-18 | mg/l | 2.7 | 1.00 | 3.7 | 100.0 | 80-119% |
| Nitrogen, Nitrite | GN11300 | T16445-18 | mg/l | 0.0030 U | 0.100 | 0.094 | 94.0 | 75-134% |
| Sulfate | GN11356 | T16448-1 | mg/l | 403 | 250 | 641 | 96.0 | 75-125% |
| Sulfate | GN11356 | T16448-1 | mg/l | 403 | xxxxxxxx | | * | 75-125% |
| Total Organic Carbon | GN11304 | T16445-18 | mg/l | 6.0 | 10.0 | 16.0 | 100.0 | 74-121% |

Associated Samples:
Batch GN11300: T16448-1
Batch GN11301: T16448-1
Batch GN11304: T16448-1, T16448-2
Batch GN11343: T16448-1
Batch GN11356: T16448-1
Batch GN11375: T16448-1
(*) Outside of QC limits
(N) Matrix Spike Rec. outside of QC limits

# Misc. Forms

## Custody Documents and Other Forms

(Accutest Laboratories Southeast, Inc.)

Includes the following where applicable:

- Chain of Custody

ACCUTEST Laboratories T16448

# CHAIN OF CUSTODY

10165 Harwin, Suite 150 - Houston, TX 77036 - 713-271-4700 fax: 713-271-4770

Page 1 of 1

| FED-EX Tracking # | Bottle Order Control # |
|---|---|
| Accutest Quote # | Accutest Job # T16448 |

**Subcontract Information**

| | |
|---|---|
| Company Name: ALSE-ORLANDO | |
| Project Contact | |
| Address | |
| City: ORLANDO | State / Zip |
| Phone No. | Fax No. |

**Project Information**

| | |
|---|---|
| Send Report to: Agnesv@accutest.com | |
| Bill to: Accutest Laboratories | |
| Address: 10165 Harwin Drive, Suite 150 | |
| City: Houston, TX 77036 | State / Zip |
| Phone No.: 713-271-4700 / 713-271-4770 | Fax No. |
| Accutest Purchase Order # | |

**Requested Analyses**

**Matrix Codes:** DW - Drinking Water; GW - Ground Water; WW - Wastewater; SO - Soil; SL - Sludge; OI - Oil; LIQ - Other Liquid; SOL - Other Solid

| Accutest Sample ID | Collection Date | Collection Time | Matrix | # of bottles | HCl | NaOH | HNO3 | H2SO4 | ENCORE | NaHSO4 | MEOH | NONE | Methane, Ethane, Ethene (RSK147) | Perchlorates | 8330 Explosives | LAB USE ONLY |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| T16448-1 | 2/24/2007 | 1046 | GW | 3 | 2 | | | | | | | 1 | X | X | | |
| T16448-2 | 2/24/2007 | 1038 | GW | 3 | 2 | | | | | | | 1 | X | | X | Only 1/2 Liter Rcv'd |

**Turnaround Time ( Business days)**

- [XX] 10 Day STANDARD
- [ ] 5 Day RUSH
- [ ] 4 Day RUSH
- [ ] 3 Day EMERGENCY
- [ ] 2 Day EMERGENCY
- [ ] 1 Day EMERGENCY
- [ ] Other

Approved By:/ Date:

**Data Deliverable Information**

- [ ] Commercial "A"
- [ ] Commercial "B"
- [XX] TRRP 13
- [XX] Reduced Tier1
- [ ] State Forms
- [ ] EDD Format
- [ ] Other

Commercial "A" = Results Only

Commercial "B" = Results & Standard QC

**Comments / Remarks**

SAMPLE CUSTODY MUST BE DOCUMENTED BELOW EACH TIME SAMPLES CHANGE POSSESSION, INCLUDING COURIER DELIVERY

| Relinquished by | Date Time | Received By | Relinquished By | Date Time | Received By |
|---|---|---|---|---|---|
| 1 | | 1 | 2 | | 2 |
| 3 | | 3 | 4 [illegible signature] | 2/27/07 1700 | 4 FX |
| 5 FX | 02-28-07 0930 | 5 [illegible signature] | Custody Seal # | Preserved where applicable ☐ | On Ice ☐ Cooler Temp. 1.8 |

8.1

8

T16448: Chain of Custody

Page 1 of 2

Accutest Laboratories Southeast, Inc.

# ACCUTEST LABORATORIES SAMPLE RECEIPT CONFIRMATION

ACCUTEST'S JOB NUMBER: T16448 CLIENT: ALGC PROJECT: T16448

DATE/TIME RECEIVED: 02-28-07 09:30 # OF COOLERS RECEIVED: 1 COOLER TEMPS: 1.8

METHOD OF DELIVERY: FEDEX UPS ACCUTEST COURIER GREYHOUND DELIVERY OTHER

AIRBILL NUMBERS: 7986 1726 3905

## COOLER INFORMATION

- [ ] CUSTODY SEAL NOT PRESENT OR NOT INTACT
- [ ] CHAIN OF CUSTODY NOT RECEIVED (COC)
- [ ] ANALYSIS REQUESTED IS UNCLEAR OR MISSING
- [ ] SAMPLE DATES OR TIMES UNCLEAR OR MISSING
- [ ] TEMPERATURE CRITERIA NOT MET

## TRIP BLANK INFORMATION

- [ ] TRIP BLANK PROVIDED
- [x] TRIP BLANK NOT PROVIDED
- [x] TRIP BLANK NOT ON COC
- [ ] TRIP BLANK INTACT
- [ ] TRIP BLANK NOT INTACT
- [ ] RECEIVED WATER TRIP BLANK
- [ ] RECEIVED SOIL TRIP BLANK

## MISC. INFORMATION

NUMBER OF ENCORES ? 0
NUMBER OF 5035 FIELD KITS ? 0
NUMBER OR LAB FILTERED METALS ? 0

## SAMPLE INFORMATION

- [ ] SAMPLE LABELS NOT PRESENT ON ALL BOTTLES
- [ ] CORRECT NUMBER OF CONTAINERS USED
- [ ] SAMPLE RECEIVED IMPROPERLY PRESERVED
- [ ] INSUFFICIENT VOLUME FOR ANALYSIS
- [ ] TIMES ON COC DOES NOT MATCH LABEL(S)
- [ ] ID'S ON COC DOES NOT MATCH LABEL(S)
- [ ] VOC VIALS HAVE HEADSPACE (MACRO BUBBLES)
- [ ] BOTTLES RECEIVED BUT ANALYSIS NOT REQUESTED
- [ ] NO BOTTLES RECEIVED FOR ANALYSIS REQUESTED
- [ ] UNCLEAR FILTERING INSTRUCTIONS
- [ ] UNCLEAR COMPOSITING INSTRUCTIONS
- [ ] SAMPLE CONTAINER(S) RECEIVED BROKEN
- [ ] % SOLIDS JAR NOT RECEIVED
- [ ] 5035 FIELD KIT NOT FROZEN WITHIN 48 HOUR'S
- [ ] RESIDUAL CHLORINE PRESENT

( APPLICABLE TO EPA 600 SERIES OR NORTH CAROLINA ORGANICS)

SUMMARY OF COMMENTS: ~~For~~ SAMPLE # 2 FOR 8330 ANALYSIS BOTTLE RECEIVED ONLY 500ML

TECHNICIAN SIGNATURE/DATE [signature] 02-28-07 TECHNICIAN SIGNATURE/DATE [signature] 2-28-07 ASBD 10/03/06

8.1

8

T16448: Chain of Custody
Page 2 of 2

# GC Volatiles

## QC Data Summaries

(Accutest Laboratories Southeast, Inc.)

Includes the following where applicable:

- Method Blank Summaries
- Blank Spike Summaries
- Matrix Spike and Duplicate Summaries
- Surrogate Recovery Summaries
- GC Surrogate Retention Time Summaries
- Initial and Continuing Calibration Summaries

# Method Blank Summary



**Job Number:** T16448
**Account:** ALGC Accutest Laboratories Gulf Coast, Inc.
**Project:** ITTXHO: Longhorn Army Ammunition Plant

| Sample | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|---|---|---|---|---|---|---|---|
| GXY996-MB | XY025325.D | 1 | 03/08/07 | TD | n/a | n/a | GXY996 |

**The QC reported here applies to the following samples:**

**Method:** RSKSOP-147/175

T16448-1, T16448-2

| CAS No. | Compound | Result | RL | MDL | Units | Q |
|---|---|---|---|---|---|---|
| 74-82-8 | Methane | ND | 0.50 | 0.30 | ug/l | |
| 74-84-0 | Ethane | ND | 1.0 | 0.60 | ug/l | |
| 74-85-1 | Ethene | ND | 1.0 | 0.80 | ug/l | |

# Blank Spike Summary



**Job Number:** T16448
**Account:** ALGC Accutest Laboratories Gulf Coast, Inc.
**Project:** ITTXHO: Longhorn Army Ammunition Plant

| Sample | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|---|---|---|---|---|---|---|---|
| GXY996-BS | XY025326.D | 1 | 03/08/07 | TD | n/a | n/a | GXY996 |

**The QC reported here applies to the following samples:** **Method:** RSKSOP-147/175

T16448-1, T16448-2

| CAS No. | Compound | Spike ug/l | BSP ug/l | BSP % | Limits |
|---|---|---|---|---|---|
| 74-82-8 | Methane | 108 | 137 | 127 | 54-149 |
| 74-84-0 | Ethane | 219 | 273 | 125 | 57-143 |
| 74-85-1 | Ethene | 290 | 353 | 122 | 57-143 |

# Matrix Spike Summary



**Job Number:** T16448
**Account:** ALGC Accutest Laboratories Gulf Coast, Inc.
**Project:** ITTXHO: Longhorn Army Ammunition Plant

| Sample | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|---|---|---|---|---|---|---|---|
| F47731-7MS | XY025345.D | 1 | 03/08/07 | TD | n/a | n/a | GXY996 |
| F47731-7 [a] | XY025344.D | 1 | 03/08/07 | TD | n/a | n/a | GXY996 |

**The QC reported here applies to the following samples:** **Method:** RSKSOP-147/175

T16448-1, T16448-2

| CAS No. | Compound | F47731-7 ug/l | Q | Spike ug/l | MS ug/l | MS % | Limits |
|---|---|---|---|---|---|---|---|
| 74-82-8 | Methane | 9.31 | | 108 | 166 | 145 | 54-149 |
| 74-84-0 | Ethane | ND | | 219 | 334 | 153* | 57-143 |
| 74-85-1 | Ethene | ND | | 290 | 435 | 150* | 57-143 |

(a) Confirmation run.

9.3

9

# Duplicate Summary



**Job Number:** T16448
**Account:** ALGC Accutest Laboratories Gulf Coast, Inc.
**Project:** ITTXHO: Longhorn Army Ammunition Plant

| Sample | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|---|---|---|---|---|---|---|---|
| F47769-9DUP | XY025351.D | 1 | 03/08/07 | TD | n/a | n/a | GXY996 |
| F47769-9 | XY025350.D | 1 | 03/08/07 | TD | n/a | n/a | GXY996 |

**The QC reported here applies to the following samples:** **Method:** RSKSOP-147/175

T16448-1, T16448-2

| CAS No. | Compound | F47769-9 ug/l | Q | DUP ug/l | Q | RPD | Limits |
|---|---|---|---|---|---|---|---|
| 74-82-8 | Methane | ND | | ND | | nc | 24 |
| 74-84-0 | Ethane | ND | | ND | | nc | 23 |
| 74-85-1 | Ethene | ND | | ND | | nc | 10 |

# Initial Calibration Summary



**Job Number:** T16448
**Account:** ALGC Accutest Laboratories Gulf Coast, Inc.
**Project:** ITTXHO: Longhorn Army Ammunition Plant
**Sample:** GXY995-ICC995
**Lab FileID:** XY025305.D

```
                         Response Factor Report  VOA5

  Method       : C:\HPCHEM\2\METHODS\RSK147XY.M (Chemstation Integrator)
  Title        : Dissolved Gases in Water
  Last Update  : Thu Mar 08 08:31:33 2007
  Response via : Initial Calibration

  Calibration Files
  1   =XY025301.D  2   =XY025302.D  3   =XY025304.D  4   =XY025303.D
  5   =XY025305.D  6   =XY025306.D  7   =XY025307.D

     Compound            1     2     3     4     5     6     7     Avg   %RSD
  ---------------------------------------------------------------------------
  1)c Methane          1.256 2.507 1.576 0.832 1.293 0.961 1.016 1.349 E4  42.09#
             ---- Linear regr., Force(0,0) ----  Coefficient =  0.9983
               Response Ratio = 0.00000 + 10071.12721 *A

  2)c Ethylene         2.402 4.239 2.629 1.419 2.516 1.854 1.947 2.429 E4  37.22#
             ---- Linear regr., Force(0,0) ----  Coefficient =  0.9982
               Response Ratio = 0.00000 + 19323.23175 *A

  3)c Ethane           2.241 3.960 2.584 1.355 2.483 1.825 1.918 2.338 E4  35.47#
             ---- Linear regr., Force(0,0) ----  Coefficient =  0.9981
               Response Ratio = 0.00000 + 19028.53933 *A

 ----------------------------------------------------------------------------
 (#) = Out of Range

          RSK147XY.M        Thu Mar 08 08:36:38 2007
```

9.5

9

# Initial Calibration Verification



**Job Number:** T16448
**Account:** ALGC Accutest Laboratories Gulf Coast, Inc.
**Project:** ITTXHO: Longhorn Army Ammunition Plant
**Sample:** GXY995-ICV995
**Lab FileID:** XY025308.D

```
                    Evaluate Continuing Calibration Report

  Data File : C:\HPCHEM\2\DATA\030707\XY025308.D           Vial: 100
  Acq On    :  7 Mar 2007   2:55 pm                    Operator: Trangd
  Sample    : ICV995-1000                              Inst    : VOA5
  Misc      : gc7128,gxy995,,,,,                       Multiplr: 1.00
  IntFile   : EVENTS.E

  Method        : C:\HPCHEM\2\METHODS\RSK147XY.M (Chemstation Integrator)
  Title         : Dissolved Gases in Water
  Last Update   : Thu Mar 08 08:31:33 2007
  Response via  : Multiple Level Calibration

  Min. RRF      :   0.000  Min. Rel. Area :  50%  Max. R.T. Dev  0.50min
  Max. RRF Dev  :  30%     Max. Rel. Area : 150%

         Compound                  Amount  Calc.    %Drift Area% Dev(min)RT Window
  ----------------------------------------------------------------------------

            -------------------- Amount  Calc.    %Drift  --------------
  1 c   Methane                  1000.000 950.295     5.0    74  -0.06    1.13- 1.73
  2 c   Ethylene                 1000.000 962.910     3.7    74  -0.03    2.85- 3.65
  3 c   Ethane                   1000.000 991.839     0.8    76  -0.03    3.48- 4.28
 ---------------------------------------------------------------------------
 ---------------------------------------------------------------------------

    (#) = Out of Range                SPCC's out = 0  CCC's out = 0
     XY025305.D RSK147XY.M       Thu Mar 08 08:35:31 2007
```

9.5

9

# Continuing Calibration Summary



**Job Number:** T16448 **Sample:** GXY996-CC995
**Account:** ALGC Accutest Laboratories Gulf Coast, Inc. **Lab FileID:** XY025323.D
**Project:** ITTXHO: Longhorn Army Ammunition Plant

```
                    Evaluate Continuing Calibration Report

Data File : C:\HPCHEM\2\DATA\030807\XY025323.D          Vial: 100
Acq On    :  8 Mar 2007   8:42 am                   Operator: Trangd
Sample    : CC995-1000                              Inst    : VOA5
Misc      : gc7128,gxy996,,,,,                      Multiplr: 1.00
IntFile   : EVENTS.E

Method       : C:\HPCHEM\2\METHODS\RSK147XY.M (Chemstation Integrator)
Title        : Dissolved Gases in Water
Last Update  : Fri Mar 09 08:55:16 2007
Response via : Multiple Level Calibration

Min. RRF     :   0.000  Min. Rel. Area :  50%  Max. R.T. Dev  0.50min
Max. RRF Dev :  30%     Max. Rel. Area : 150%

       Compound                Amount  Calc.    %Drift Area% Dev(min)RT Window
----------------------------------------------------------------------------

          -------------------- Amount  Calc.    %Drift  --------------
1 c   Methane                1000.000 957.766      4.2   75   0.04    1.09- 1.69
2 c   Ethylene               1000.000 988.131      1.2   76   0.07    2.80- 3.60
3 c   Ethane                 1000.000 983.846      1.6   75   0.08    3.43- 4.23
---------------------------------------------------------------------------
---------------------------------------------------------------------------

  (#) = Out of Range                SPCC's out = 0  CCC's out = 0
   XY025305.D RSK147XY.M       Fri Mar 09 09:33:39 2007
```

9.5

9

# Continuing Calibration Summary



**Job Number:** T16448
**Account:** ALGC Accutest Laboratories Gulf Coast, Inc.
**Project:** ITTXHO: Longhorn Army Ammunition Plant
**Sample:** GXY996-CC995
**Lab FileID:** XY025334.D

```
                    Evaluate Continuing Calibration Report

Data File : C:\HPCHEM\2\DATA\030807\XY025334.D          Vial: 100
Acq On    :  8 Mar 2007  11:32 am                    Operator: Trangd
Sample    : CC995-500                                Inst    : VOA5
Misc      : gc7128,gxy996,,,,,                       Multiplr: 1.00
IntFile   : EVENTS.E

Method       : C:\HPCHEM\2\METHODS\RSK147XY.M (Chemstation Integrator)
Title        : Dissolved Gases in Water
Last Update  : Fri Mar 09 08:55:16 2007
Response via : Multiple Level Calibration

Min. RRF     :   0.000  Min. Rel. Area :  50%  Max. R.T. Dev  0.50min
Max. RRF Dev :  30%     Max. Rel. Area : 150%

       Compound                Amount  Calc.    %Drift Area% Dev(min)RT Window
----------------------------------------------------------------------------

          -------------------- Amount  Calc.    %Drift  --------------
1 c   Methane                500.000 435.207     13.0  105   0.00    1.09- 1.69
2 c   Ethylene               500.000 443.798     11.2  121   0.00    2.80- 3.60
3 c   Ethane                 500.000 437.136     12.6  123   0.00    3.43- 4.23
--------------------------------------------------------------------------
--------------------------------------------------------------------------

  (#) = Out of Range                SPCC's out = 0  CCC's out = 0
   XY025303.D RSK147XY.M       Fri Mar 09 09:34:49 2007
```

9.5

9

# Continuing Calibration Summary



**Job Number:** T16448 **Sample:** GXY996-CC995
**Account:** ALGC Accutest Laboratories Gulf Coast, Inc. **Lab FileID:** XY025346.D
**Project:** ITTXHO: Longhorn Army Ammunition Plant

```
                    Evaluate Continuing Calibration Report

  Data File : C:\HPCHEM\2\DATA\030807\XY025346.D            Vial: 100
  Acq On    :  8 Mar 2007   4:17 pm                     Operator: Trangd
  Sample    : CC995-1000                                Inst    : VOA5
  Misc      : gc7142,gxy996,,,,,                        Multiplr: 1.00
  IntFile   : EVENTS.E

  Method       : C:\HPCHEM\2\METHODS\RSK147XY.M (Chemstation Integrator)
  Title        : Dissolved Gases in Water
  Last Update  : Fri Mar 09 08:55:16 2007
  Response via : Multiple Level Calibration

  Min. RRF     :   0.000  Min. Rel. Area :  50%  Max. R.T. Dev  0.50min
  Max. RRF Dev :  30%     Max. Rel. Area : 150%

         Compound                Amount  Calc.    %Drift Area% Dev(min)RT Window
  ----------------------------------------------------------------------------

            -------------------- Amount  Calc.    %Drift  --------------
  1 c   Methane                1000.000 1110.796    -11.1    87    0.00    1.09- 1.69
  2 c   Ethylene               1000.000 1155.448    -15.5    89    0.00    2.80- 3.60
  3 c   Ethane                 1000.000 1156.356    -15.6    89    0.00    3.43- 4.23
 ---------------------------------------------------------------------------
 ---------------------------------------------------------------------------

    (#) = Out of Range              SPCC's out = 0  CCC's out = 0
     XY025305.D RSK147XY.M       Fri Mar 09 09:33:39 2007
```

9.5

9

# Continuing Calibration Summary



**Job Number:** T16448 **Sample:** GXY996-ECC995
**Account:** ALGC Accutest Laboratories Gulf Coast, Inc. **Lab FileID:** XY025352.D
**Project:** ITTXHO: Longhorn Army Ammunition Plant

```
                    Evaluate Continuing Calibration Report

  Data File : C:\HPCHEM\2\DATA\030807\XY025352.D          Vial: 100
  Acq On    :  8 Mar 2007   5:34 pm                   Operator: Trangd
  Sample    : ECC995-1000                             Inst    : VOA5
  Misc      : gc7142,gxy996,,,,,                      Multiplr: 1.00
  IntFile   : EVENTS.E

  Method       : C:\HPCHEM\2\METHODS\RSK147XY.M (Chemstation Integrator)
  Title        : Dissolved Gases in Water
  Last Update  : Fri Mar 09 08:55:16 2007
  Response via : Multiple Level Calibration

  Min. RRF     :   0.000  Min. Rel. Area :  50%  Max. R.T. Dev  0.50min
  Max. RRF Dev :  30%     Max. Rel. Area : 150%

         Compound                Amount  Calc.    %Drift Area% Dev(min)RT Window
  ----------------------------------------------------------------------------

            -------------------- Amount  Calc.    %Drift  --------------
  1 c   Methane                1000.000 1104.999   -10.5    86    0.00    1.09- 1.69
  2 c   Ethylene               1000.000 1148.251   -14.8    88    0.01    2.80- 3.60
  3 c   Ethane                 1000.000 1151.972   -15.2    88    0.01    3.43- 4.23
 ---------------------------------------------------------------------------
 ---------------------------------------------------------------------------

    (#) = Out of Range               SPCC's out = 0  CCC's out = 0
     XY025305.D RSK147XY.M       Fri Mar 09 09:33:40 2007
```

9.5

9

# GC Semi-volatiles

## QC Data Summaries

(Accutest Laboratories Southeast, Inc.)

Includes the following where applicable:

- Method Blank Summaries
- Blank Spike Summaries
- Matrix Spike and Duplicate Summaries
- Surrogate Recovery Summaries
- GC Surrogate Retention Time Summaries
- Initial and Continuing Calibration Summaries

# Method Blank Summary



**Job Number:** T16448
**Account:** ALGC Accutest Laboratories Gulf Coast, Inc.
**Project:** ITTXHO: Longhorn Army Ammunition Plant

| Sample | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|---|---|---|---|---|---|---|---|
| OP19677-MB | GG020203.D | 1 | 03/02/07 | MRE | 03/01/07 | OP19677 | GGG906 |

**The QC reported here applies to the following samples:** **Method:** SW846 8330A

T16448-2

| CAS No. | Compound | Result | RL | MDL | Units | Q |
|---|---|---|---|---|---|---|
| 2691-41-0 | HMX | ND | 0.20 | 0.060 | ug/l | |
| 121-82-4 | RDX | ND | 0.20 | 0.075 | ug/l | |
| 99-65-0 | 1,3-Dinitrobenzene | ND | 0.20 | 0.070 | ug/l | |
| 606-20-2 | 2,6-Dinitrotoluene | ND | 0.20 | 0.065 | ug/l | |
| 121-14-2 | 2,4-Dinitrotoluene | ND | 0.20 | 0.075 | ug/l | |
| 35572-78-2 | 2-amino-4,6-Dinitrotoluene | ND | 0.20 | 0.070 | ug/l | |
| 19406-51-0 | 4-amino-2,6-Dinitrotoluene | ND | 0.20 | 0.080 | ug/l | |
| 98-95-3 | Nitrobenzene | ND | 0.20 | 0.060 | ug/l | |
| 88-72-2 | o-Nitrotoluene | ND | 0.20 | 0.060 | ug/l | |
| 99-08-1 | m-Nitrotoluene | ND | 0.20 | 0.075 | ug/l | |
| 99-99-0 | p-Nitrotoluene | ND | 0.20 | 0.075 | ug/l | |
| 479-45-8 | Tetryl | ND | 0.20 | 0.075 | ug/l | |
| 99-35-4 | 1,3,5-Trinitrobenzene | ND | 0.20 | 0.095 | ug/l | |
| 118-96-7 | 2,4,6-Trinitrotoluene | ND | 0.20 | 0.080 | ug/l | |

| CAS No. | Surrogate Recoveries | | Limits |
|---|---|---|---|
| 610-39-9 | 3,4-Dinitrotoluene | 102% | 70-136% |

# Method Blank Summary



**Job Number:** T16448
**Account:** ALGC Accutest Laboratories Gulf Coast, Inc.
**Project:** ITTXHO: Longhorn Army Ammunition Plant

| Sample | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|---|---|---|---|---|---|---|---|
| OP19677-MB | GG020233.D | 1 | 03/05/07 | MRE | 03/01/07 | OP19677 | GGG907 |

**The QC reported here applies to the following samples:** **Method:** SW846 8330A

T16448-2

| CAS No. | Compound | Result | RL | MDL | Units | Q |
|---|---|---|---|---|---|---|
| 2691-41-0 | HMX | ND | 0.20 | 0.060 | ug/l | |
| 121-82-4 | RDX | ND | 0.20 | 0.075 | ug/l | |
| 99-65-0 | 1,3-Dinitrobenzene | ND | 0.20 | 0.070 | ug/l | |
| 606-20-2 | 2,6-Dinitrotoluene | ND | 0.20 | 0.065 | ug/l | |
| 121-14-2 | 2,4-Dinitrotoluene | ND | 0.20 | 0.075 | ug/l | |
| 35572-78-2 | 2-amino-4,6-Dinitrotoluene | ND | 0.20 | 0.070 | ug/l | |
| 19406-51-0 | 4-amino-2,6-Dinitrotoluene | ND | 0.20 | 0.080 | ug/l | |
| 98-95-3 | Nitrobenzene | ND | 0.20 | 0.060 | ug/l | |
| 88-72-2 | o-Nitrotoluene | ND | 0.20 | 0.060 | ug/l | |
| 99-08-1 | m-Nitrotoluene | ND | 0.20 | 0.075 | ug/l | |
| 99-99-0 | p-Nitrotoluene | ND | 0.20 | 0.075 | ug/l | |
| 479-45-8 | Tetryl | ND | 0.20 | 0.075 | ug/l | |
| 99-35-4 | 1,3,5-Trinitrobenzene | ND | 0.20 | 0.095 | ug/l | |
| 118-96-7 | 2,4,6-Trinitrotoluene | ND | 0.20 | 0.080 | ug/l | |

| CAS No. | Surrogate Recoveries | | Limits |
|---|---|---|---|
| 610-39-9 | 3,4-Dinitrotoluene | 80% | 70-136% |

# Blank Spike Summary



**Job Number:** T16448
**Account:** ALGC Accutest Laboratories Gulf Coast, Inc.
**Project:** ITTXHO: Longhorn Army Ammunition Plant

| Sample | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|---|---|---|---|---|---|---|---|
| OP19677-BS | GG020202.D | 1 | 03/02/07 | MRE | 03/01/07 | OP19677 | GGG906 |

**The QC reported here applies to the following samples:** **Method:** SW846 8330A

T16448-2

| CAS No. | Compound | Spike ug/l | BSP ug/l | BSP % | Limits |
|---|---|---|---|---|---|
| 2691-41-0 | HMX | 5 | 5.3 | 106 | 74-152 |
| 121-82-4 | RDX | 5 | 5.4 | 108 | 80-124 |
| 99-65-0 | 1,3-Dinitrobenzene | 5 | 5.3 | 106 | 84-123 |
| 606-20-2 | 2,6-Dinitrotoluene | 5 | 5.3 | 106 | 84-133 |
| 121-14-2 | 2,4-Dinitrotoluene | 5 | 5.1 | 102 | 77-116 |
| 35572-78-2 | 2-amino-4,6-Dinitrotoluene | 5 | 5.2 | 104 | 78-117 |
| 19406-51-0 | 4-amino-2,6-Dinitrotoluene | 5 | 5.1 | 102 | 84-123 |
| 98-95-3 | Nitrobenzene | 5 | 5.5 | 110 | 76-128 |
| 88-72-2 | o-Nitrotoluene | 5 | 5.0 | 100 | 76-120 |
| 99-08-1 | m-Nitrotoluene | 5 | 5.2 | 104 | 74-124 |
| 99-99-0 | p-Nitrotoluene | 5 | 5.3 | 106 | 81-125 |
| 479-45-8 | Tetryl | 5 | 4.6 | 92 | 62-117 |
| 99-35-4 | 1,3,5-Trinitrobenzene | 5 | 5.3 | 106 | 85-127 |
| 118-96-7 | 2,4,6-Trinitrotoluene | 5 | 5.3 | 106 | 71-128 |

| CAS No. | Surrogate Recoveries | BSP | Limits |
|---|---|---|---|
| 610-39-9 | 3,4-Dinitrotoluene | 124% | 70-136% |

# Blank Spike Summary



**Job Number:** T16448
**Account:** ALGC Accutest Laboratories Gulf Coast, Inc.
**Project:** ITTXHO: Longhorn Army Ammunition Plant

| Sample | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|---|---|---|---|---|---|---|---|
| OP19677-BS | GG020232.D | 1 | 03/05/07 | MRE | 03/01/07 | OP19677 | GGG907 |

**The QC reported here applies to the following samples:** **Method:** SW846 8330A

T16448-2

| CAS No. | Compound | Spike ug/l | BSP ug/l | BSP % | Limits |
|---|---|---|---|---|---|
| 2691-41-0 | HMX | 5 | 5.9 | 118 | 74-152 |
| 121-82-4 | RDX | 5 | 5.5 | 110 | 80-124 |
| 99-65-0 | 1,3-Dinitrobenzene | 5 | 5.3 | 106 | 84-123 |
| 606-20-2 | 2,6-Dinitrotoluene | 5 | 5.1 | 102 | 84-133 |
| 121-14-2 | 2,4-Dinitrotoluene | 5 | 5.1 | 102 | 77-116 |
| 35572-78-2 | 2-amino-4,6-Dinitrotoluene | 5 | 5.2 | 104 | 78-117 |
| 19406-51-0 | 4-amino-2,6-Dinitrotoluene | 5 | 5.1 | 102 | 84-123 |
| 98-95-3 | Nitrobenzene | 5 | 6.4 | 128 | 76-128 |
| 88-72-2 | o-Nitrotoluene | 5 | 5.0 | 100 | 76-120 |
| 99-08-1 | m-Nitrotoluene | 5 | 5.3 | 106 | 74-124 |
| 99-99-0 | p-Nitrotoluene | 5 | 5.3 | 106 | 81-125 |
| 479-45-8 | Tetryl | 5 | 4.6 | 92 | 62-117 |
| 99-35-4 | 1,3,5-Trinitrobenzene | 5 | 5.5 | 110 | 85-127 |
| 118-96-7 | 2,4,6-Trinitrotoluene | 5 | 5.7 | 114 | 71-128 |

| CAS No. | Surrogate Recoveries | BSP | Limits |
|---|---|---|---|
| 610-39-9 | 3,4-Dinitrotoluene | 100% | 70-136% |

# Matrix Spike/Matrix Spike Duplicate Summary



**Job Number:** T16448
**Account:** ALGC Accutest Laboratories Gulf Coast, Inc.
**Project:** ITTXHO: Longhorn Army Ammunition Plant

| Sample | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|---|---|---|---|---|---|---|---|
| OP19677-MS | GG020207.D | 1 | 03/02/07 | MRE | 03/01/07 | OP19677 | GGG906 |
| OP19677-MSD | GG020208.D | 1 | 03/02/07 | MRE | 03/01/07 | OP19677 | GGG906 |
| F47539-3 | GG020206.D | 1 | 03/02/07 | MRE | 03/01/07 | OP19677 | GGG906 |

**The QC reported here applies to the following samples:** **Method:** SW846 8330A

T16448-2

| CAS No. | Compound | F47539-3 ug/l | Q | Spike ug/l | MS ug/l | MS % | MSD ug/l | MSD % | RPD | Limits Rec/RPD |
|---|---|---|---|---|---|---|---|---|---|---|
| 2691-41-0 | HMX | ND | | 10 | 11.0 | 110 | 11.8 | 118 | 7 | 74-152/21 |
| 121-82-4 | RDX | ND | | 10 | 10.3 | 103 | 10.7 | 107 | 4 | 80-124/20 |
| 99-65-0 | 1,3-Dinitrobenzene | ND | | 10 | 10.3 | 103 | 10.9 | 109 | 6 | 84-123/23 |
| 606-20-2 | 2,6-Dinitrotoluene | ND | | 10 | 9.9 | 99 | 10.6 | 106 | 7 | 84-133/23 |
| 121-14-2 | 2,4-Dinitrotoluene | ND | | 10 | 9.7 | 97 | 10.3 | 103 | 6 | 77-116/26 |
| 35572-78-2 | 2-amino-4,6-Dinitrotoluene | ND | | 10 | 9.4 | 94 | 10.5 | 105 | 11 | 78-117/28 |
| 19406-51-0 | 4-amino-2,6-Dinitrotoluene | ND | | 10 | 9.1 | 91 | 10.2 | 102 | 11 | 84-123/27 |
| 98-95-3 | Nitrobenzene | ND | | 10 | 10.5 | 105 | 11.1 | 111 | 6 | 76-128/28 |
| 88-72-2 | o-Nitrotoluene | ND | | 10 | 9.3 | 93 | 10.2 | 102 | 9 | 76-120/30 |
| 99-08-1 | m-Nitrotoluene | ND | | 10 | 9.5 | 95 | 10.6 | 106 | 11 | 74-124/32 |
| 99-99-0 | p-Nitrotoluene | ND | | 10 | 9.7 | 97 | 10.7 | 107 | 10 | 81-125/34 |
| 479-45-8 | Tetryl | ND | | 10 | 7.4 | 74 | 7.9 | 79 | 7 | 62-117/28 |
| 99-35-4 | 1,3,5-Trinitrobenzene | ND | | 10 | 9.8 | 98 | 10.4 | 104 | 6 | 85-127/21 |
| 118-96-7 | 2,4,6-Trinitrotoluene | ND | | 10 | 9.8 | 98 | 10.4 | 104 | 6 | 71-128/21 |

| CAS No. | Surrogate Recoveries | MS | MSD | F47539-3 | Limits |
|---|---|---|---|---|---|
| 610-39-9 | 3,4-Dinitrotoluene | 94% | 98% | 102% | 70-136% |

# Semivolatile Surrogate Recovery Summary



**Job Number:** T16448
**Account:** ALGC Accutest Laboratories Gulf Coast, Inc.
**Project:** ITTXHO: Longhorn Army Ammunition Plant

**Method:** SW846 8330A **Matrix:** AQ

**Samples and QC shown here apply to the above method**

| Lab Sample ID | Lab File ID | S1 [a] |
|---|---|---|
| T16448-2 | GG020223.D | 95.0 |
| OP19677-BS | GG020202.D | 124.0 |
| OP19677-BS | GG020232.D | 100.0 |
| OP19677-MB | GG020203.D | 102.0 |
| OP19677-MB | GG020233.D | 80.0 |
| OP19677-MS | GG020207.D | 94.0 |
| OP19677-MSD | GG020208.D | 98.0 |

| Surrogate Compounds | Recovery Limits |
|---|---|
| **S1** = 3,4-Dinitrotoluene | 70-136% |

(a) Recovery from GC signal #1

# GC Surrogate Retention Time Summary



**Job Number:** T16448
**Account:** ALGC Accutest Laboratories Gulf Coast, Inc.
**Project:** ITTXHO: Longhorn Army Ammunition Plant

| | | | |
|---|---|---|---|
| **Check Std:** | GGG906-CC825 | **Injection Date:** | 03/02/07 |
| **Lab File ID:** | GG020201.D | **Injection Time:** | 16:17 |
| **Instrument ID:** | GCGG | **Method:** | SW846 8330A |

| | S1 [a] RT |
|---|---|
| Check Std | 13.50 |

| Lab Sample ID | Lab File ID | Date Analyzed | Time Analyzed | S1 [a] RT |
|---|---|---|---|---|
| OP19677-BS | GG020202.D | 03/02/07 | 16:45 | 13.49 |
| OP19677-MB | GG020203.D | 03/02/07 | 17:12 | 13.50 |
| ZZZZZZ | GG020204.D | 03/02/07 | 17:27 | 13.50 |
| ZZZZZZ | GG020205.D | 03/02/07 | 17:54 | 13.50 |
| F47539-3 | GG020206.D | 03/02/07 | 18:22 | 13.49 |
| OP19677-MS | GG020207.D | 03/02/07 | 18:50 | 13.47 |
| OP19677-MSD | GG020208.D | 03/02/07 | 19:17 | 13.46 |
| ZZZZZZ | GG020209.D | 03/02/07 | 19:45 | 13.47 |
| ZZZZZZ | GG020210.D | 03/02/07 | 20:12 | 13.44 |
| ZZZZZZ | GG020211.D | 03/02/07 | 20:40 | 13.43 |

**Surrogate Compounds**

**S1** = 3,4-Dinitrotoluene

(a) Retention time from GC signal #1

10.5
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# GC Surrogate Retention Time Summary



**Job Number:** T16448
**Account:** ALGC Accutest Laboratories Gulf Coast, Inc.
**Project:** ITTXHO: Longhorn Army Ammunition Plant

| | | | |
|---|---|---|---|
| **Check Std:** | GGG906-CC825 | **Injection Date:** | 03/02/07 |
| **Lab File ID:** | GG020212.D | **Injection Time:** | 21:07 |
| **Instrument ID:** | GCGG | **Method:** | SW846 8330A |

| | S1 [a] RT |
|---|---|
| Check Std | 13.45 |

| Lab Sample ID | Lab File ID | Date Analyzed | Time Analyzed | S1 [a] RT |
|---|---|---|---|---|
| ZZZZZZ | GG020214.D | 03/02/07 | 22:03 | 13.44 |
| ZZZZZZ | GG020215.D | 03/02/07 | 22:30 | 13.42 |
| ZZZZZZ | GG020216.D | 03/02/07 | 22:58 | 13.43 |
| ZZZZZZ | GG020217.D | 03/02/07 | 23:25 | 13.43 |
| ZZZZZZ | GG020218.D | 03/02/07 | 23:53 | 13.43 |
| ZZZZZZ | GG020219.D | 03/03/07 | 00:20 | 13.40 |
| ZZZZZZ | GG020220.D | 03/03/07 | 00:48 | 13.42 |
| ZZZZZZ | GG020221.D | 03/03/07 | 01:16 | 13.43 |
| ZZZZZZ | GG020222.D | 03/03/07 | 01:43 | 13.41 |
| T16448-2 | GG020223.D | 03/03/07 | 02:11 | 13.42 |

**Surrogate Compounds**

**S1** = 3,4-Dinitrotoluene

(a) Retention time from GC signal #1

# GC Surrogate Retention Time Summary



**Job Number:** T16448
**Account:** ALGC Accutest Laboratories Gulf Coast, Inc.
**Project:** ITTXHO: Longhorn Army Ammunition Plant

| | | | |
|---|---|---|---|
| **Check Std:** | GGG907-CC827 | **Injection Date:** | 03/05/07 |
| **Lab File ID:** | GG020231.D | **Injection Time:** | 13:23 |
| **Instrument ID:** | GCGG | **Method:** | SW846 8330A |

| | S1 [a] RT | S1 [b] RT |
|---|---|---|
| Check Std | 10.72 | 10.72 |

| Lab Sample ID | Lab File ID | Date Analyzed | Time Analyzed | S1 [a] RT | S1 [b] RT |
|---|---|---|---|---|---|
| OP19677-BS | GG020232.D | 03/05/07 | 13:43 | 10.72 | |
| OP19677-MB | GG020233.D | 03/05/07 | 14:02 | 10.72 | |
| ZZZZZZ | GG020234.D | 03/05/07 | 14:22 | 10.72 | |
| ZZZZZZ | GG020236.D | 03/05/07 | 15:01 | 10.71 | |
| GGG907-ECC827 | GG020238.D | 03/05/07 | 15:40 | 10.72 | 10.72 |

**Surrogate Compounds**

**S1** = 3,4-Dinitrotoluene

(a) Retention time from GC signal #1
(b) Retention time from GC signal #2

# Initial Calibration Summary



**Job Number:** T16448 **Sample:** GGG825-ICC825
**Account:** ALGC Accutest Laboratories Gulf Coast, Inc. **Lab FileID:** GG018282.D
**Project:** ITTXHO: Longhorn Army Ammunition Plant

Response Factor Report G1315B

Method : C:\HPCHEM\1\METHODS\8330_EX.M (Chemstation Integrator)
Title : Explosives by 8330
Last Update : Thu Oct 19 11:32:41 2006
Response via : Initial Calibration

Calibration Files
20 =GG018279.D 100 =GG018280.D 250 =GG018281.D 500 =GG018282.D
750 =GG018283.D 1000=GG018284.D 2000=GG018285.D ICV =GG018286.D

| Compound | 20 | 100 | 250 | 500 | 750 | 1000 | 2000 | ICV | Avg | %RSD |
|---|---|---|---|---|---|---|---|---|---|---|
| 1) HMX | 2.870 | 2.789 | 2.757 | 2.694 | 2.719 | 2.735 | 2.786 | | 2.764 E3 | 2.09 |
| 2) TNX | 5.916 | 6.424 | 6.486 | 6.331 | 6.453 | 6.468 | 6.587 | | 6.381 E3 | 3.43 |
| 3) DNX | 4.900 | 5.156 | 5.125 | 4.986 | 5.037 | 5.057 | 5.155 | | 5.059 E3 | 1.88 |
| 4) MNX | 4.909 | 4.991 | 4.972 | 4.807 | 4.886 | 4.901 | 4.995 | | 4.923 E3 | 1.38 |
| 5) RDX | 3.185 | 3.565 | 3.625 | 3.500 | 3.554 | 3.547 | 3.609 | | 3.512 E3 | 4.27 |
| 6) 1,3,5-Trinit | 7.763 | 7.813 | 7.689 | 7.436 | 7.595 | 7.612 | 7.763 | | 7.667 E3 | 1.70 |
| 7) 1,3-Dinitrob | 1.069 | 1.070 | 1.060 | 1.029 | 1.047 | 1.051 | 1.071 | | 1.057 E4 | 1.49 |
| 8) Tetryl | 6.130 | 6.168 | 6.180 | 6.004 | 6.091 | 6.096 | 6.221 | | 6.127 E3 | 1.17 |
| 9) Nitrobenzene | 7.057 | 7.032 | 7.019 | 6.708 | 6.915 | 6.920 | 7.082 | | 6.962 E3 | 1.85 |
| 10) 3,4-Dinitrot | 4.667 | 4.752 | 4.687 | 4.537 | 4.621 | 4.631 | 4.731 | | 4.661 E3 | 1.56 |
| 11) 2,4,6-Trinit | 7.275 | 7.409 | 7.373 | 7.143 | 7.282 | 7.301 | 7.456 | | 7.320 E3 | 1.42 |
| 12) 4-Amino-2,6- | 5.266 | 5.304 | 5.264 | 5.117 | 5.194 | 5.220 | 5.330 | | 5.242 E3 | 1.37 |
| 13) 2-Amino-4,6- | 7.249 | 7.203 | 7.187 | 7.006 | 7.130 | 7.155 | 7.311 | | 7.177 E3 | 1.35 |
| 14) 2,6-Dinitrot | 5.524 | 5.133 | 5.010 | 4.844 | 4.942 | 4.954 | 5.071 | | 5.068 E3 | 4.37 |
| 15) 2,4-Dinitrot | 1.149 | 1.009 | 0.992 | 0.958 | 0.976 | 0.978 | 0.999 | | 1.009 E4 | 6.36 |
| 16) o-Nitrotolue | 5.044 | 4.558 | 4.542 | 4.244 | 4.403 | 4.414 | 4.516 | | 4.532 E3 | 5.53 |
| 17) p-Nitrotolue | 4.102 | 3.815 | 3.790 | 3.596 | 3.734 | 3.734 | 3.831 | | 3.800 E3 | 4.06 |
| 18) m-Nitrotolue | 4.959 | 4.808 | 4.856 | 4.629 | 4.803 | 4.812 | 4.942 | | 4.830 E3 | 2.26 |

Signal #2

| Compound | 20 | 100 | 250 | 500 | 750 | 1000 | 2000 | ICV | Avg | %RSD |
|---|---|---|---|---|---|---|---|---|---|---|
| 1) HMX | 8.151 | 8.148 | 8.190 | 8.012 | 8.090 | 8.092 | 8.238 | | 8.132 E3 | 0.91 |
| 2) TNX | 0.956 | 0.980 | 0.995 | 0.969 | 0.984 | 0.985 | 1.001 | | 0.981 E4 | 1.55 |
| 3) DNX | 7.525 | 8.044 | 8.332 | 7.974 | 7.996 | 7.991 | 8.136 | | 8.000 E3 | 3.05 |
| 4) MNX | 7.756 | 7.781 | 7.940 | 7.696 | 7.742 | 7.746 | 7.895 | | 7.794 E3 | 1.14 |
| 5) RDX | 4.720 | 5.727 | 5.947 | 5.855 | 5.997 | 5.944 | 6.042 | | 5.748 E3 | 8.08 |
| 6) 1,3,5-Trinit | 1.479 | 1.619 | 1.553 | 1.513 | 1.538 | 1.540 | 1.572 | | 1.545 E4 | 2.85 |
| 7) 1,3-Dinitrob | 1.225 | 1.286 | 1.279 | 1.246 | 1.265 | 1.272 | 1.295 | | 1.267 E4 | 1.91 |
| 8) Tetryl | 1.037 | 1.106 | 1.123 | 1.092 | 1.106 | 1.105 | 1.129 | | 1.100 E4 | 2.76 |
| 9) Nitrobenzene | 3.263 | 3.394 | 3.343 | 3.176 | 3.205 | 3.190 | 3.274 | | 3.264 E3 | 2.50 |
| 10) 3,4-Dinitrot | 6.324 | 6.522 | 6.468 | 6.218 | 6.242 | 6.243 | 6.394 | | 6.344 E3 | 1.89 |
| 11) 2,4,6-Trinit | 1.070 | 1.106 | 1.085 | 1.048 | 1.060 | 1.064 | 1.089 | | 1.075 E4 | 1.85 |
| 12) 4-Amino-2,6- | 1.430 | 1.457 | 1.434 | 1.391 | 1.407 | 1.413 | 1.444 | | 1.425 E4 | 1.62 |
| 13) 2-Amino-4,6- | 1.240 | 1.240 | 1.201 | 1.171 | 1.189 | 1.194 | 1.223 | | 1.208 E4 | 2.20 |
| 14) 2,6-Dinitrot | 8.005 | 7.244 | 6.878 | 6.645 | 6.758 | 6.778 | 6.958 | | 7.038 E3 | 6.64 |
| 15) 2,4-Dinitrot | 1.102 | 0.930 | 0.906 | 0.880 | 0.888 | 0.892 | 0.911 | | 0.930 E4 | 8.36 |
| 16) o-Nitrotolue | 5.194 | 4.804 | 4.848 | 4.493 | 4.691 | 4.697 | 4.799 | | 4.789 E3 | 4.46 |
| 17) p-Nitrotolue | 7.934 | 7.544 | 7.631 | 7.143 | 7.472 | 7.477 | 7.640 | | 7.549 E3 | 3.15 |
| 18) m-Nitrotolue | 6.835 | 7.097 | 7.192 | 6.782 | 7.103 | 7.117 | 7.290 | | 7.060 E3 | 2.62 |

(#) = Out of Range ### Number of calibration levels exceeded format ###

8330_EX.M Fri Oct 20 16:25:52 2006

10.6
10

# Initial Calibration Verification



**Job Number:** T16448 **Sample:** GGG825-ICV825
**Account:** ALGC Accutest Laboratories Gulf Coast, Inc. **Lab FileID:** GG018286.D
**Project:** ITTXHO: Longhorn Army Ammunition Plant

```
                    Evaluate Continuing Calibration Report

  Signal #1 : G:\HPCHEM\1\DATA\1018ODS\GG018286.D\dad1B.ch Vial: 10
  Signal #2 : G:\HPCHEM\1\DATA\1018ODS\GG018286.D\dad1A.ch
  Acq On    : 18-Oct-2006, 17:39:03                    Operator: MIKEE
  Sample    : ICV825-500                               Inst    : G1315B
  Misc      : OP18202,ggg825,1000,,,10,,water          Multiplr: 1.00
  IntFile Signal #1: EVENTS.E     IntFile Signal #2: EVENTS2.E

  Method       : C:\HPCHEM\1\METHODS\8330_EX.M (Chemstation Integrator)
  Title        : Explosives by 8330
  Last Update  : Thu Oct 19 11:32:41 2006
  Response via : Multiple Level Calibration

  Min. RRF     :   0.000  Min. Rel. Area :  50%  Max. R.T. Dev  0.50min
  Max. RRF Dev :  15%     Min. Rel. Area : 200%
```

| # | Compound | Amount | Calc. | %Drift | Area% | Dev(min) | RT Window |
|---|---|---|---|---|---|---|---|
| 1 | HMX | 500.000 | 531.119 | -6.2 | 0 | 0.00 | 3.83- 4.83 |
| 2 | TNX | | | -----------NA---------- | | | |
| 3 | DNX | | | -----------NA---------- | | | |
| 4 | MNX | | | -----------NA---------- | | | |
| 5 | RDX | 500.000 | 507.091 | -1.4 | 0 | 0.00 | 6.10- 7.10 |
| 6 | 1,3,5-Trinitrobenzene | 500.000 | 533.853 | -6.8 | 0 | 0.00 | 8.41- 9.41 |
| 7 | 1,3-Dinitrobenzene | 500.000 | 523.924 | -4.8 | 0 | 0.00 | 10.38-11.38 |
| 8 | Tetryl | 500.000 | 484.365 | 3.1 | 0 | 0.00 | 11.18-12.18 |
| 9 | Nitrobenzene | 500.000 | 531.046 | -6.2 | 0 | 0.00 | 11.86-12.86 |
| 10 S | 3,4-Dinitrotoluene | | | -----------NA---------- | | | |
| 11 | 2,4,6-Trinitrotoluene | 500.000 | 507.486 | -1.5 | 0 | 0.00 | 13.56-14.56 |
| 12 | 4-Amino-2,6-Dinitrotol | 500.000 | 515.885 | -3.2 | 0 | 0.00 | 14.25-15.25 |
| 13 | 2-Amino-4,6-Dinitrotol | 500.000 | 480.846 | 3.8 | 0 | 0.00 | 15.03-16.03 |
| 14 | 2,6-Dinitrotoluene | 500.000 | 496.634 | 0.7 | 0 | 0.00 | 16.01-17.01 |
| 15 | 2,4-Dinitrotoluene | 500.000 | 502.401 | -0.5 | 0 | 0.00 | 16.52-17.52 |
| 16 | o-Nitrotoluene | 500.000 | 501.204 | -0.2 | 0 | 0.00 | 19.59-20.59 |
| 17 | p-Nitrotoluene | 500.000 | 520.375 | -4.1 | 0 | 0.00 | 20.92-21.92 |
| 18 | m-Nitrotoluene | 500.000 | 509.118 | -1.8 | 0 | 0.00 | 22.61-23.61 |

***** Signal #2 *****

| # | Compound | Amount | Calc. | %Drift | Area% | Dev(min) | RT Window |
|---|---|---|---|---|---|---|---|
| 1 | HMX | 500.000 | 537.899 | -7.6 | 0 | 0.00 | 3.83- 4.83 |
| 2 | TNX | | | -----------NA---------- | | | |
| 3 | DNX | | | -----------NA---------- | | | |
| 4 | MNX | | | -----------NA---------- | | | |
| 5 | RDX | 500.000 | 525.299 | -5.1 | 0 | 0.00 | 6.10- 7.10 |
| 6 | 1,3,5-Trinitrobenzene | 500.000 | 533.889 | -6.8 | 0 | 0.00 | 8.41- 9.41 |
| 7 | 1,3-Dinitrobenzene | 500.000 | 529.524 | -5.9 | 0 | 0.00 | 10.38-11.38 |
| 8 | Tetryl | 500.000 | 489.295 | 2.1 | 0 | 0.00 | 11.18-12.18 |
| 9 | Nitrobenzene | 500.000 | 531.782 | -6.4 | 0 | 0.00 | 11.86-12.86 |
| 10 S | 3,4-Dinitrotoluene | | | -----------NA---------- | | | |
| 11 | 2,4,6-Trinitrotoluene | 500.000 | 505.844 | -1.2 | 0 | 0.00 | 13.56-14.56 |
| 12 | 4-Amino-2,6-Dinitrotol | 500.000 | 516.203 | -3.2 | 0 | 0.00 | 14.25-15.25 |
| 13 | 2-Amino-4,6-Dinitrotol | 500.000 | 480.458 | 3.9 | 0 | 0.00 | 15.03-16.03 |
| 14 | 2,6-Dinitrotoluene | 500.000 | 493.423 | 1.3 | 0 | 0.00 | 16.01-17.01 |
| 15 | 2,4-Dinitrotoluene | 500.000 | 499.987 | 0.0 | 0 | 0.00 | 16.52-17.52 |
| 16 | o-Nitrotoluene | 500.000 | 503.639 | -0.7 | 0 | 0.00 | 19.59-20.59 |
| 17 | p-Nitrotoluene | 500.000 | 523.730 | -4.7 | 0 | 0.00 | 20.92-21.92 |
| 18 | m-Nitrotoluene | 500.000 | 512.492 | -2.5 | 0 | 0.00 | 22.61-23.61 |

# Initial Calibration Verification



**Job Number:** T16448
**Account:** ALGC Accutest Laboratories Gulf Coast, Inc.
**Project:** ITTXHO: Longhorn Army Ammunition Plant
**Sample:** GGG825-ICV825
**Lab FileID:** GG018286.D

```
    (#) = Out of Range                SPCC's out = 0  CCC's out = 0
     GG018286.D 8330_EX.M        Fri Oct 20 16:26:22 2006
```

# Initial Calibration Verification



**Job Number:** T16448
**Account:** ALGC Accutest Laboratories Gulf Coast, Inc.
**Project:** ITTXHO: Longhorn Army Ammunition Plant
**Sample:** GGG826-ICV825
**Lab FileID:** GG018300.D

```
                    Evaluate Continuing Calibration Report

  Signal #1 : G:\HPCHEM\1\DATA\1019ODS\GG018300.D\dad1B.ch Vial: 4
  Signal #2 : G:\HPCHEM\1\DATA\1019ODS\GG018300.D\dad1A.ch
  Acq On    : 19-Oct-2006, 13:44:13                    Operator: MIKEE
  Sample    : ICV825-500                               Inst    : G1315B
  Misc      : OP18222,ggg826,1000,,,10,,water          Multiplr: 1.00
  IntFile Signal #1: EVENTS.E     IntFile Signal #2: EVENTS2.E

  Method       : C:\HPCHEM\1\METHODS\8330_EX.M (Chemstation Integrator)
  Title        : Explosives by 8330
  Last Update  : Thu Oct 19 11:32:41 2006
  Response via : Multiple Level Calibration

  Min. RRF     :   0.000  Min. Rel. Area :  50%  Max. R.T. Dev  0.50min
  Max. RRF Dev :  15%     Max. Rel. Area : 200%

         Compound                  Amount  Calc.    %Drift Area% Dev(min)RT Window
  ----------------------------------------------------------------------------
  1      HMX                                 ----------NA----------
  2      TNX                     500.000 514.364     -2.9    0   0.00    4.15- 5.15
  3      DNX                     500.000 511.166     -2.2    0   0.00    4.58- 5.58
  4      MNX                     500.000 518.059     -3.6    0  -0.01    5.34- 6.34
  5      RDX                                 ----------NA----------
  6      1,3,5-Trinitrobenzene               ----------NA----------
  7      1,3-Dinitrobenzene                  ----------NA----------
  8      Tetryl                              ----------NA----------
  9      Nitrobenzene                        ----------NA----------
 10 S    3,4-Dinitrotoluene                  ----------NA----------
 11      2,4,6-Trinitrotoluene               ----------NA----------
 12      4-Amino-2,6-Dinitrotoluen           ----------NA----------
 13      2-Amino-4,6-Dinitrotoluen           ----------NA----------
 14      2,6-Dinitrotoluene                  ----------NA----------
 15      2,4-Dinitrotoluene                  ----------NA----------
 16      o-Nitrotoluene                      ----------NA----------
 17      p-Nitrotoluene                      ----------NA----------
 18      m-Nitrotoluene                      ----------NA----------

 *****   Signal #2   *****

  1      HMX                                 ----------NA----------
  2      TNX                     500.000 509.991     -2.0    0   0.00    4.15- 5.15
  3      DNX                     500.000 523.209     -4.6    0   0.00    4.58- 5.58
  4      MNX                     500.000 527.451     -5.5    0  -0.01    5.34- 6.34
  5      RDX                                 ----------NA----------
  6      1,3,5-Trinitrobenzene               ----------NA----------
  7      1,3-Dinitrobenzene                  ----------NA----------
  8      Tetryl                              ----------NA----------
  9      Nitrobenzene                        ----------NA----------
 10 S    3,4-Dinitrotoluene                  ----------NA----------
 11      2,4,6-Trinitrotoluene               ----------NA----------
 12      4-Amino-2,6-Dinitrotoluen           ----------NA----------
 13      2-Amino-4,6-Dinitrotoluen           ----------NA----------
 14      2,6-Dinitrotoluene                  ----------NA----------
 15      2,4-Dinitrotoluene                  ----------NA----------
 16      o-Nitrotoluene                      ----------NA----------
 17      p-Nitrotoluene                      ----------NA----------
 18      m-Nitrotoluene                      ----------NA----------
 ---------------------------------------------------------------------------
 ---------------------------------------------------------------------------
```

# Initial Calibration Verification



**Job Number:** T16448
**Account:** ALGC Accutest Laboratories Gulf Coast, Inc.
**Project:** ITTXHO: Longhorn Army Ammunition Plant
**Sample:** GGG826-ICV825
**Lab FileID:** GG018300.D

```
   (#) = Out of Range                SPCC's out = 0  CCC's out = 0
    GG018286.D 8330_EX.M        Fri Oct 20 16:54:56 2006
```

# Initial Calibration Summary



**Job Number:** T16448
**Account:** ALGC Accutest Laboratories Gulf Coast, Inc.
**Project:** ITTXHO: Longhorn Army Ammunition Plant
**Sample:** GGG827-ICC827
**Lab FileID:** GG018316.D

Response Factor Report G1315B

```
Method       : C:\HPCHEM\1\METHODS\8330_RP.M (Chemstation Integrator)
Title        : Explosives by 8330
Last Update  : Fri Oct 20 14:03:32 2006
Response via : Initial Calibration

Calibration Files
20   =GG018313.D  100 =GG018314.D  250 =GG018315.D  500 =GG018316.D
750 =GG018317.D  1000=GG018318.D  2000=GG018319.D
```

| | Compound | 20 | 100 | 250 | 500 | 750 | 1000 | 2000 | Avg | | %RSD |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1) | TNX | 6.022 | 6.861 | 7.022 | 6.686 | 6.915 | 6.925 | 7.121 | 6.793 | E3 | 5.38 |
| 2) | HMX | 2.976 | 2.856 | 2.642 | 2.478 | 2.489 | 2.481 | 2.586 | 2.644 | E3 | 7.51 |
| 3) | DNX | 5.820 | 5.904 | 5.816 | 5.437 | 5.628 | 5.545 | 5.823 | 5.710 | E3 | 3.05 |
| 4) | MNX | 4.717 | 4.981 | 5.224 | 5.007 | 5.063 | 4.976 | 5.294 | 5.037 | E3 | 3.73 |
| 5) | 1,3,5-Trinitroben | 7.302 | 7.899 | 8.123 | 7.797 | 7.946 | 7.847 | 8.236 | 7.879 | E3 | 3.78 |
| 6) | RDX | 3.327 | 3.935 | 3.881 | 3.729 | 3.710 | 3.686 | 3.841 | 3.730 | E3 | 5.39 |
| 7) | 1,3-Dinitrobenzen | 1.122 | 1.117 | 1.144 | 1.096 | 1.117 | 1.113 | 1.146 | 1.122 | E4 | 1.56 |
| 8) | Nitrobenzene | 6.720 | 7.206 | 7.440 | 7.104 | 7.286 | 7.290 | 7.513 | 7.223 | E3 | 3.61 |
| 9) | 2,4,6-Trinitrotol | 7.126 | 7.674 | 7.812 | 7.517 | 7.651 | 7.587 | 7.941 | 7.615 | E3 | 3.39 |
| 10) | Tetryl | 5.119 | 5.755 | 6.124 | 6.105 | 6.006 | 5.862 | 6.470 | 5.920 | E3 | 7.10 |
| 11)S | 3,4-Dinitrotoluen | 4.973 | 4.941 | 4.969 | 4.829 | 4.912 | 4.883 | 5.055 | 4.938 | E3 | 1.46 |
| 12) | 2,6-Dinitrotoluen | 6.023 | 5.649 | 5.657 | 5.415 | 5.544 | 5.538 | 5.672 | 5.643 | E3 | 3.38 |
| 13) | 2,4-Dinitrotoluen | 1.200 | 1.036 | 1.034 | 0.995 | 1.012 | 1.007 | 1.038 | 1.046 | E4 | 6.68 |
| 14) | o-Nitrotoluene | 5.021 | 4.648 | 4.729 | 4.526 | 4.679 | 4.666 | 4.837 | 4.729 | E3 | 3.36 |
| 15) | p-Nitrotoluene | 4.036 | 3.890 | 3.967 | 3.762 | 3.919 | 3.914 | 4.051 | 3.934 | E3 | 2.49 |
| 16) | 4-Amino-2,6-Dinit | 5.109 | 5.368 | 5.518 | 5.300 | 5.406 | 5.380 | 5.621 | 5.386 | E3 | 3.01 |
| 17) | m-Nitrotoluene | 4.743 | 4.946 | 5.173 | 4.937 | 5.131 | 5.119 | 5.324 | 5.053 | E3 | 3.79 |
| 18) | 2-Amino-4,6-Dinit | 7.249 | 7.503 | 7.692 | 7.547 | 7.548 | 7.525 | 7.845 | 7.558 | E3 | 2.42 |

Signal #2

| | Compound | 20 | 100 | 250 | 500 | 750 | 1000 | 2000 | Avg | | %RSD |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1) | TNX | 0.828 | 1.032 | 1.066 | 1.024 | 1.037 | 1.032 | 1.073 | 1.013 | E4 | 8.25 |
| 2) | HMX | 8.967 | 9.716 | 9.270 | 8.345 | 8.192 | 8.095 | 8.326 | 8.702 | E3 | 7.15 |
| 3) | DNX | 0.786 | 1.108 | 1.019 | 0.937 | 0.919 | 0.897 | 0.935 | 0.943 | E4 | 10.65 |
| 4) | MNX | 7.457 | 8.346 | 8.580 | 8.147 | 8.087 | 7.895 | 8.399 | 8.130 | E3 | 4.58 |
| 5) | 1,3,5-Trinitroben | 1.449 | 1.617 | 1.667 | 1.594 | 1.616 | 1.593 | 1.673 | 1.601 | E4 | 4.64 |
| 6) | RDX | 6.077 | 6.386 | 6.563 | 6.283 | 6.229 | 6.181 | 6.460 | 6.311 | E3 | 2.67 |
| 7) | 1,3-Dinitrobenzen | 1.294 | 1.326 | 1.427 | 1.333 | 1.365 | 1.364 | 1.397 | 1.358 | E4 | 3.31 |
| 8) | Nitrobenzene | 3.190 | 3.096 | 3.823 | 3.281 | 3.391 | 3.385 | 3.476 | 3.378 | E3 | 6.96 |
| 9) | 2,4,6-Trinitrotol | 1.098 | 1.109 | 1.152 | 1.104 | 1.122 | 1.113 | 1.169 | 1.124 | E4 | 2.37 |
| 10) | Tetryl | 0.953 | 1.028 | 1.114 | 1.113 | 1.085 | 1.059 | 1.177 | 1.075 | E4 | 6.67 |
| 11)S | 3,4-Dinitrotoluen | 6.832 | 6.775 | 6.813 | 6.648 | 6.692 | 6.629 | 6.906 | 6.756 | E3 | 1.53 |
| 12) | 2,6-Dinitrotoluen | 8.344 | 7.760 | 7.758 | 7.423 | 7.578 | 7.556 | 7.765 | 7.740 | E3 | 3.83 |
| 13) | 2,4-Dinitrotoluen | 1.104 | 0.941 | 0.942 | 0.911 | 0.927 | 0.919 | 0.952 | 0.957 | E4 | 6.94 |
| 14) | o-Nitrotoluene | 3.189 | 2.755 | 2.867 | 2.791 | 2.895 | 2.880 | 3.025 | 2.915 | E3 | 5.09 |
| 15) | p-Nitrotoluene | 2.114 | 1.879 | 1.907 | 1.825 | 1.916 | 1.926 | 1.998 | 1.938 | E3 | 4.82 |
| 16) | 4-Amino-2,6-Dinit | 1.431 | 1.486 | 1.522 | 1.459 | 1.490 | 1.484 | 1.552 | 1.489 | E4 | 2.66 |
| 17) | m-Nitrotoluene | 2.353 | 2.391 | 2.516 | 2.444 | 2.546 | 2.567 | 2.681 | 2.500 | E3 | 4.52 |
| 18) | 2-Amino-4,6-Dinit | 1.233 | 1.258 | 1.276 | 1.258 | 1.253 | 1.255 | 1.311 | 1.263 | E4 | 1.92 |

(#) = Out of Range

8330_RP.M Mon Oct 23 13:34:29 2006

10.6

10

# Initial Calibration Verification



**Job Number:** T16448 **Sample:** GGG827-ICV827
**Account:** ALGC Accutest Laboratories Gulf Coast, Inc. **Lab FileID:** GG018320.D
**Project:** ITTXHO: Longhorn Army Ammunition Plant

```
                    Evaluate Continuing Calibration Report

  Signal #1 : G:\HPCHEM\1\DATA\1020RP\GG018320.D\dad1B.ch  Vial: 10
  Signal #2 : G:\HPCHEM\1\DATA\1020RP\GG018320.D\dad1A.ch
  Acq On    : 20-Oct-2006, 14:03:23                       Operator: MIKEE
  Sample    : ICV827-250                                  Inst    : G1315B
  Misc      : OP18202,ggg827,1000,,,10,,water             Multiplr: 1.00
  IntFile Signal #1: EVENTS.E     IntFile Signal #2: events2.e

  Method       : C:\HPCHEM\1\METHODS\8330_RP.M (Chemstation Integrator)
  Title        : Explosives by 8330
  Last Update  : Fri Oct 20 14:03:32 2006
  Response via : Multiple Level Calibration

  Min. RRF     :   0.000  Min. Rel. Area :  50%  Max. R.T. Dev  0.50min
  Max. RRF Dev :  15%     Max. Rel. Area : 200%
```

| | | Compound | Amount | Calc. | %Drift | Area% | Dev(min) | RT Window |
|---|---|---|---|---|---|---|---|---|
| 1 | | TNX | 250.000 | 258.384 | -3.4 | 100 | 0.00 | 4.21- 5.21 |
| 2 | | HMX | 250.000 | 260.989 | -4.4 | 104 | 0.00 | 4.69- 5.69 |
| 3 | | DNX | 250.000 | 254.013 | -1.6 | 100 | 0.00 | 4.83- 5.83 |
| 4 | | MNX | 250.000 | 255.142 | -2.1 | 98 | 0.00 | 5.66- 6.66 |
| 5 | | 1,3,5-Trinitrobenzene | 250.000 | 264.789 | -5.9 | 103 | 0.00 | 6.12- 7.12 |
| 6 | | RDX | 250.000 | 252.023 | -0.8 | 97 | 0.00 | 6.51- 7.51 |
| 7 | | 1,3-Dinitrobenzene | 250.000 | 257.308 | -2.9 | 101 | 0.00 | 7.70- 8.70 |
| 8 | | Nitrobenzene | 250.000 | 266.121 | -6.4 | 103 | 0.00 | 8.24- 9.24 |
| 9 | | 2,4,6-Trinitrotoluene | 250.000 | 268.228 | -7.3 | 105 | 0.00 | 8.71- 9.71 |
| 10 | | Tetryl | 250.000 | 205.504 | 17.8# | 79 | 0.00 | 9.41-10.41 |
| 11 | S | 3,4-Dinitrotoluene | | | ----------NA---------- | | | |
| 12 | | 2,6-Dinitrotoluene | 250.000 | 254.196 | -1.7 | 101 | 0.00 | 10.49-11.49 |
| 13 | | 2,4-Dinitrotoluene | 250.000 | 244.946 | 2.0 | 99 | 0.00 | 10.95-11.95 |
| 14 | | o-Nitrotoluene | 250.000 | 248.278 | 0.7 | 99 | 0.00 | 11.79-12.79 |
| 15 | | p-Nitrotoluene | 250.000 | 258.872 | -3.5 | 103 | 0.00 | 12.45-13.45 |
| 16 | | 4-Amino-2,6-Dinitrotol | 250.000 | 255.921 | -2.4 | 100 | 0.00 | 12.83-13.83 |
| 17 | | m-Nitrotoluene | 250.000 | 252.478 | -1.0 | 99 | 0.00 | 13.29-14.29 |
| 18 | | 2-Amino-4,6-Dinitrotol | 250.000 | 236.039 | 5.6 | 93 | 0.00 | 14.31-15.31 |

***** Signal #2 *****

| | | Compound | Amount | Calc. | %Drift | Area% | Dev(min) | RT Window |
|---|---|---|---|---|---|---|---|---|
| 1 | | TNX | 250.000 | 262.147 | -4.9 | 100 | 0.00 | 4.22- 5.22 |
| 2 | | HMX | 250.000 | 276.033 | -10.4 | 104 | 0.00 | 4.69- 5.69 |
| 3 | | DNX | 250.000 | 263.149 | -5.3 | 97 | 0.00 | 4.83- 5.83 |
| 4 | | MNX | 250.000 | 255.967 | -2.4 | 97 | 0.00 | 5.66- 6.66 |
| 5 | | 1,3,5-Trinitrobenzene | 250.000 | 265.613 | -6.2 | 102 | 0.00 | 6.12- 7.12 |
| 6 | | RDX | 250.000 | 248.723 | 0.5 | 96 | 0.00 | 6.51- 7.51 |
| 7 | | 1,3-Dinitrobenzene | 250.000 | 276.649 | -10.7 | 105 | 0.00 | 7.70- 8.70 |
| 8 | | Nitrobenzene | 250.000 | 301.148 | -20.5# | 106 | 0.00 | 8.24- 9.24 |
| 9 | | 2,4,6-Trinitrotoluene | 250.000 | 269.121 | -7.6 | 105 | 0.00 | 8.71- 9.71 |
| 10 | | Tetryl | 250.000 | 203.173 | 18.7# | 78 | 0.00 | 9.41-10.41 |
| 11 | S | 3,4-Dinitrotoluene | | | ----------NA---------- | | | |
| 12 | | 2,6-Dinitrotoluene | 250.000 | 252.008 | -0.8 | 101 | 0.00 | 10.49-11.49 |
| 13 | | 2,4-Dinitrotoluene | 250.000 | 241.694 | 3.3 | 98 | 0.00 | 10.95-11.95 |
| 14 | | o-Nitrotoluene | 250.000 | 241.466 | 3.4 | 98 | 0.00 | 11.79-12.79 |
| 15 | | p-Nitrotoluene | 250.000 | 250.555 | -0.2 | 102 | 0.00 | 12.46-13.46 |
| 16 | | 4-Amino-2,6-Dinitrotol | 250.000 | 255.253 | -2.1 | 100 | 0.00 | 12.83-13.83 |
| 17 | | m-Nitrotoluene | 250.000 | 250.572 | -0.2 | 100 | 0.00 | 13.28-14.28 |
| 18 | | 2-Amino-4,6-Dinitrotol | 250.000 | 234.881 | 6.0 | 93 | 0.00 | 14.31-15.31 |

# Initial Calibration Verification



**Job Number:** T16448
**Account:** ALGC Accutest Laboratories Gulf Coast, Inc.
**Project:** ITTXHO: Longhorn Army Ammunition Plant
**Sample:** GGG827-ICV827
**Lab FileID:** GG018320.D

```
(#) = Out of Range                  SPCC's out = 0  CCC's out = 0
 GG018315.D 8330_RP.M           Mon Oct 23 13:35:35 2006
```

# Continuing Calibration Summary



**Job Number:** T16448 **Sample:** GGG906-CC825
**Account:** ALGC Accutest Laboratories Gulf Coast, Inc. **Lab FileID:** GG020201.D
**Project:** ITTXHO: Longhorn Army Ammunition Plant

```
                    Evaluate Continuing Calibration Report

  Signal #1 : G:\DATA\0302ODS\GG020201.D\dad1B.ch         Vial: 2
  Signal #2 : G:\DATA\0302ODS\GG020201.D\dad1A.ch
  Acq On    : 02-Mar-2007, 16:17:48                   Operator: MIKEE
  Sample    : CC825-500                               Inst    : G1315B
  Misc      : OP19677,ggg906,1000,,,10,,water         Multiplr: 1.00
  IntFile Signal #1: EVENTS.E     IntFile Signal #2: EVENTS2.E

  Method       : C:\HPCHEM\1\METHODS\8330_EX.M (Chemstation Integrator)
  Title        : Explosives by 8330
  Last Update  : Thu Mar 01 11:02:09 2007
  Response via : Multiple Level Calibration

  Min. RRF     :   0.000  Min. Rel. Area :  50%  Max. R.T. Dev  0.50min
  Max. RRF Dev :  15%     Max. Rel. Area : 200%
```

| | | Compound | Amount | Calc. | %Drift | Area% | Dev(min) | RT Window |
|---|---|---|---|---|---|---|---|---|
| 1 | | HMX | 500.000 | 490.559 | 1.9 | 101 | 0.00 | 3.86- 4.86 |
| 2 | | TNX | 500.000 | 512.293 | -2.5 | 103 | -0.01 | 4.20- 5.20 |
| 3 | | DNX | 500.000 | 511.151 | -2.2 | 104 | 0.00 | 4.60- 5.60 |
| 4 | | MNX | 500.000 | 508.598 | -1.7 | 104 | 0.01 | 5.37- 6.37 |
| 5 | | RDX | 500.000 | 518.998 | -3.8 | 104 | 0.00 | 6.15- 7.15 |
| 6 | | 1,3,5-Trinitrobenzene | 500.000 | 498.455 | 0.3 | 103 | 0.02 | 8.43- 9.43 |
| 7 | | 1,3-Dinitrobenzene | 500.000 | 498.190 | 0.4 | 102 | 0.02 | 10.43-11.43 |
| 8 | | Tetryl | 500.000 | 498.475 | 0.3 | 102 | 0.03 | 11.21-12.21 |
| 9 | | Nitrobenzene | 500.000 | 503.313 | -0.7 | 104 | 0.03 | 11.93-12.93 |
| 10 | S | 3,4-Dinitrotoluene | 500.000 | 496.619 | 0.7 | 102 | 0.04 | 12.95-13.95 |
| 11 | | 2,4,6-Trinitrotoluene | 500.000 | 503.597 | -0.7 | 103 | 0.04 | 13.60-14.60 |
| 12 | | 4-Amino-2,6-Dinitrotol | 500.000 | 496.441 | 0.7 | 102 | 0.05 | 14.37-15.37 |
| 13 | | 2-Amino-4,6-Dinitrotol | 500.000 | 500.727 | -0.1 | 103 | 0.05 | 15.14-16.14 |
| 14 | | 2,6-Dinitrotoluene | 500.000 | 510.258 | -2.1 | 107 | 0.05 | 16.10-17.10 |
| 15 | | 2,4-Dinitrotoluene | 500.000 | 480.817 | 3.8 | 101 | 0.05 | 16.60-17.60 |
| 16 | | o-Nitrotoluene | 500.000 | 497.302 | 0.5 | 106 | 0.06 | 19.73-20.73 |
| 17 | | p-Nitrotoluene | 500.000 | 500.449 | -0.1 | 106 | 0.06 | 21.06-22.06 |
| 18 | | m-Nitrotoluene | 500.000 | 506.087 | -1.2 | 106 | 0.07 | 22.76-23.76 |

***** Signal #2 *****

| | | Compound | Amount | Calc. | %Drift | Area% | Dev(min) | RT Window |
|---|---|---|---|---|---|---|---|---|
| 1 | | HMX | 500.000 | 500.092 | -0.0 | 102 | 0.00 | 3.86- 4.86 |
| 2 | | TNX | 500.000 | 509.529 | -1.9 | 103 | 0.00 | 4.18- 5.18 |
| 3 | | DNX | 500.000 | 520.538 | -4.1 | 104 | 0.00 | 4.60- 5.60 |
| 4 | | MNX | 500.000 | 521.239 | -4.2 | 106 | 0.01 | 5.37- 6.37 |
| 5 | | RDX | 500.000 | 566.452 | -13.3 | 111 | 0.00 | 6.15- 7.15 |
| 6 | | 1,3,5-Trinitrobenzene | 500.000 | 505.722 | -1.1 | 103 | 0.02 | 8.43- 9.43 |
| 7 | | 1,3-Dinitrobenzene | 500.000 | 502.475 | -0.5 | 102 | 0.02 | 10.43-11.43 |
| 8 | | Tetryl | 500.000 | 507.037 | -1.4 | 102 | 0.03 | 11.21-12.21 |
| 9 | | Nitrobenzene | 500.000 | 499.803 | 0.0 | 103 | 0.03 | 11.93-12.93 |
| 10 | S | 3,4-Dinitrotoluene | 500.000 | 495.718 | 0.9 | 101 | 0.04 | 12.95-13.95 |
| 11 | | 2,4,6-Trinitrotoluene | 500.000 | 500.992 | -0.2 | 103 | 0.04 | 13.60-14.60 |
| 12 | | 4-Amino-2,6-Dinitrotol | 500.000 | 497.188 | 0.6 | 102 | 0.05 | 14.37-15.37 |
| 13 | | 2-Amino-4,6-Dinitrotol | 500.000 | 499.032 | 0.2 | 103 | 0.05 | 15.14-16.14 |
| 14 | | 2,6-Dinitrotoluene | 500.000 | 496.978 | 0.6 | 105 | 0.05 | 16.10-17.10 |
| 15 | | 2,4-Dinitrotoluene | 500.000 | 472.110 | 5.6 | 100 | 0.05 | 16.60-17.60 |
| 16 | | o-Nitrotoluene | 500.000 | 489.795 | 2.0 | 104 | 0.05 | 19.73-20.73 |
| 17 | | p-Nitrotoluene | 500.000 | 496.698 | 0.7 | 105 | 0.06 | 21.06-22.06 |
| 18 | | m-Nitrotoluene | 500.000 | 503.963 | -0.8 | 105 | 0.07 | 22.77-23.77 |

# Continuing Calibration Summary



**Job Number:** T16448
**Account:** ALGC Accutest Laboratories Gulf Coast, Inc.
**Project:** ITTXHO: Longhorn Army Ammunition Plant

**Sample:** GGG906-CC825
**Lab FileID:** GG020201.D

```
(#) = Out of Range                SPCC's out = 0  CCC's out = 0
 GG018282.D 8330_EX.M        Mon Mar 05 11:42:29 2007
```

# Continuing Calibration Summary



**Job Number:** T16448
**Account:** ALGC Accutest Laboratories Gulf Coast, Inc.
**Project:** ITTXHO: Longhorn Army Ammunition Plant
**Sample:** GGG906-CC825
**Lab FileID:** GG020212.D

Evaluate Continuing Calibration Report

```
Signal #1 : G:\DATA\0302ODS\GG020212.D\dad1B.ch         Vial: 3
Signal #2 : G:\DATA\0302ODS\GG020212.D\dad1A.ch
Acq On    : 02-Mar-2007, 21:07:57                   Operator: MIKEE
Sample    : CC825-1000                              Inst    : G1315B
Misc      : OP19677,ggg906,1000,,,10,,water         Multiplr: 1.00
IntFile Signal #1: EVENTS.E     IntFile Signal #2: EVENTS2.E

Method       : C:\HPCHEM\1\METHODS\8330_EX.M (Chemstation Integrator)
Title        : Explosives by 8330
Last Update  : Thu Mar 01 11:02:09 2007
Response via : Multiple Level Calibration

Min. RRF     :   0.000  Min. Rel. Area :  50%  Max. R.T. Dev  0.50min
Max. RRF Dev :  15%     Max. Rel. Area : 200%
```

| | Compound | Amount | Calc. | %Drift | Area% | Dev(min) | RT Window |
|---|---|---|---|---|---|---|---|
| 1 | HMX | 1000.000 | 969.184 | 3.1 | 98 | 0.00 | 3.86- 4.86 |
| 2 | TNX | 1000.000 | 1012.847 | -1.3 | 100 | -0.02 | 4.20- 5.20 |
| 3 | DNX | 1000.000 | 1011.041 | -1.1 | 101 | 0.00 | 4.60- 5.60 |
| 4 | MNX | 1000.000 | 1001.768 | -0.2 | 101 | 0.00 | 5.37- 6.37 |
| 5 | RDX | 1000.000 | 1012.522 | -1.3 | 100 | -0.01 | 6.15- 7.15 |
| 6 | 1,3,5-Trinitrobenzene | 1000.000 | 982.133 | 1.8 | 99 | 0.00 | 8.43- 9.43 |
| 7 | 1,3-Dinitrobenzene | 1000.000 | 981.873 | 1.8 | 99 | 0.00 | 10.43-11.43 |
| 8 | Tetryl | 1000.000 | 979.286 | 2.1 | 98 | 0.00 | 11.21-12.21 |
| 9 | Nitrobenzene | 1000.000 | 995.199 | 0.5 | 100 | 0.00 | 11.93-12.93 |
| 10 S | 3,4-Dinitrotoluene | 1000.000 | 971.158 | 2.9 | 98 | 0.00 | 12.95-13.95 |
| 11 | 2,4,6-Trinitrotoluene | 1000.000 | 991.752 | 0.8 | 99 | 0.00 | 13.60-14.60 |
| 12 | 4-Amino-2,6-Dinitrotol | 1000.000 | 975.490 | 2.5 | 98 | 0.00 | 14.37-15.37 |
| 13 | 2-Amino-4,6-Dinitrotol | 1000.000 | 987.191 | 1.3 | 99 | 0.00 | 15.14-16.14 |
| 14 | 2,6-Dinitrotoluene | 1000.000 | 995.657 | 0.4 | 102 | 0.00 | 16.10-17.10 |
| 15 | 2,4-Dinitrotoluene | 1000.000 | 946.550 | 5.3 | 98 | 0.00 | 16.60-17.60 |
| 16 | o-Nitrotoluene | 1000.000 | 961.637 | 3.8 | 99 | -0.01 | 19.73-20.73 |
| 17 | p-Nitrotoluene | 1000.000 | 975.200 | 2.5 | 99 | -0.01 | 21.06-22.06 |
| 18 | m-Nitrotoluene | 1000.000 | 997.451 | 0.3 | 100 | 0.00 | 22.76-23.76 |

***** Signal #2 *****

| | Compound | Amount | Calc. | %Drift | Area% | Dev(min) | RT Window |
|---|---|---|---|---|---|---|---|
| 1 | HMX | 1000.000 | 984.283 | 1.6 | 99 | 0.00 | 3.86- 4.86 |
| 2 | TNX | 1000.000 | 1002.891 | -0.3 | 100 | 0.00 | 4.18- 5.18 |
| 3 | DNX | 1000.000 | 1012.877 | -1.3 | 101 | 0.00 | 4.60- 5.60 |
| 4 | MNX | 1000.000 | 1004.320 | -0.4 | 101 | 0.00 | 5.37- 6.37 |
| 5 | RDX | 1000.000 | 1044.793 | -4.5 | 101 | -0.02 | 6.15- 7.15 |
| 6 | 1,3,5-Trinitrobenzene | 1000.000 | 984.579 | 1.5 | 99 | 0.00 | 8.43- 9.43 |
| 7 | 1,3-Dinitrobenzene | 1000.000 | 989.010 | 1.1 | 99 | 0.00 | 10.43-11.43 |
| 8 | Tetryl | 1000.000 | 997.573 | 0.2 | 99 | 0.00 | 11.21-12.21 |
| 9 | Nitrobenzene | 1000.000 | 992.439 | 0.8 | 102 | 0.00 | 11.93-12.93 |
| 10 S | 3,4-Dinitrotoluene | 1000.000 | 962.803 | 3.7 | 98 | 0.00 | 12.95-13.95 |
| 11 | 2,4,6-Trinitrotoluene | 1000.000 | 983.229 | 1.7 | 99 | 0.00 | 13.60-14.60 |
| 12 | 4-Amino-2,6-Dinitrotol | 1000.000 | 974.885 | 2.5 | 98 | 0.00 | 14.37-15.37 |
| 13 | 2-Amino-4,6-Dinitrotol | 1000.000 | 978.179 | 2.2 | 99 | 0.00 | 15.14-16.14 |
| 14 | 2,6-Dinitrotoluene | 1000.000 | 974.861 | 2.5 | 101 | 0.00 | 16.10-17.10 |
| 15 | 2,4-Dinitrotoluene | 1000.000 | 935.023 | 6.5 | 97 | 0.00 | 16.60-17.60 |
| 16 | o-Nitrotoluene | 1000.000 | 961.820 | 3.8 | 98 | -0.01 | 19.73-20.73 |
| 17 | p-Nitrotoluene | 1000.000 | 982.213 | 1.8 | 99 | 0.00 | 21.06-22.06 |
| 18 | m-Nitrotoluene | 1000.000 | 1002.440 | -0.2 | 99 | -0.01 | 22.77-23.77 |

10.6 10

# Continuing Calibration Summary



**Job Number:** T16448 **Sample:** GGG906-CC825
**Account:** ALGC Accutest Laboratories Gulf Coast, Inc. **Lab FileID:** GG020212.D
**Project:** ITTXHO: Longhorn Army Ammunition Plant

```
(#) = Out of Range                SPCC's out = 0  CCC's out = 0
 GG018284.D 8330_EX.M        Mon Mar 05 11:42:13 2007
```

# Continuing Calibration Summary



**Job Number:** T16448
**Account:** ALGC Accutest Laboratories Gulf Coast, Inc.
**Project:** ITTXHO: Longhorn Army Ammunition Plant
**Sample:** GGG906-CC825
**Lab FileID:** GG020224.D

```
                    Evaluate Continuing Calibration Report

  Signal #1 : G:\DATA\0302ODS\GG020224.D\dad1B.ch          Vial: 3
  Signal #2 : G:\DATA\0302ODS\GG020224.D\dad1A.ch
  Acq On    : 03-Mar-2007, 02:38:33                    Operator: MIKEE
  Sample    : CC825-1000                               Inst    : G1315B
  Misc      : OP19677,ggg906,1000,,,10,,water          Multiplr: 1.00
  IntFile Signal #1: EVENTS.E     IntFile Signal #2: EVENTS2.E

  Method       : C:\HPCHEM\1\METHODS\8330_EX.M (Chemstation Integrator)
  Title        : Explosives by 8330
  Last Update  : Thu Mar 01 11:02:09 2007
  Response via : Multiple Level Calibration

  Min. RRF     :   0.000  Min. Rel. Area :  50%  Max. R.T. Dev  0.50min
  Max. RRF Dev :  15%     Max. Rel. Area : 200%

         Compound                   Amount  Calc.    %Drift Area% Dev(min)RT Window
  ----------------------------------------------------------------------------
  1      HMX                     1000.000 963.991      3.6   97   0.00    3.86- 4.86
  2      TNX                     1000.000 1010.267    -1.0  100  -0.02    4.20- 5.20
  3      DNX                     1000.000 1005.452    -0.5  101   0.00    4.60- 5.60
  4      MNX                     1000.000 1000.098    -0.0  100   0.00    5.37- 6.37
  5      RDX                     1000.000 1025.240    -2.5  102  -0.02    6.15- 7.15
  6      1,3,5-Trinitrobenzene   1000.000 993.055     0.7  100   0.00    8.43- 9.43
  7      1,3-Dinitrobenzene      1000.000 980.619     1.9   99  -0.01   10.43-11.43
  8      Tetryl                  1000.000 974.910     2.5   98  -0.02   11.21-12.21
  9      Nitrobenzene            1000.000 982.824     1.7   99  -0.01   11.93-12.93
 10 S    3,4-Dinitrotoluene      1000.000 957.890     4.2   96  -0.01   12.95-13.95
 11      2,4,6-Trinitrotoluene   1000.000 980.868     1.9   98  -0.01   13.60-14.60
 12      4-Amino-2,6-Dinitrotol  1000.000 962.421     3.8   97   0.00   14.37-15.37
 13      2-Amino-4,6-Dinitrotol  1000.000 1009.138    -0.9  101   0.00   15.14-16.14
 14      2,6-Dinitrotoluene      1000.000 1335.440  -33.5# 137   0.00   16.10-17.10
 15      2,4-Dinitrotoluene      1000.000 1096.840    -9.7  113  -0.01   16.60-17.60
 16      o-Nitrotoluene          1000.000 979.988     2.0  101  -0.02   19.73-20.73
 17      p-Nitrotoluene          1000.000 1001.774    -0.2  102  -0.02   21.06-22.06
 18      m-Nitrotoluene          1000.000 1009.574    -1.0  101  -0.02   22.76-23.76

 *****   Signal #2    *****

  1      HMX                     1000.000 940.821     5.9   95   0.00    3.86- 4.86
  2      TNX                     1000.000 949.976     5.0   95   0.00    4.18- 5.18
  3      DNX                     1000.000 962.122     3.8   96   0.00    4.60- 5.60
  4      MNX                     1000.000 1000.037    -0.0  101   0.00    5.37- 6.37
  5      RDX                     1000.000 1048.505    -4.9  101  -0.02    6.15- 7.15
  6      1,3,5-Trinitrobenzene   1000.000 992.257     0.8  100   0.00    8.43- 9.43
  7      1,3-Dinitrobenzene      1000.000 989.715     1.0   99  -0.01   10.43-11.43
  8      Tetryl                  1000.000 995.610     0.4   99  -0.02   11.21-12.21
  9      Nitrobenzene            1000.000 966.310     3.4   99  -0.01   11.93-12.93
 10 S    3,4-Dinitrotoluene      1000.000 952.955     4.7   97  -0.01   12.95-13.95
 11      2,4,6-Trinitrotoluene   1000.000 974.813     2.5   98  -0.01   13.60-14.60
 12      4-Amino-2,6-Dinitrotol  1000.000 968.590     3.1   98   0.00   14.37-15.37
 13      2-Amino-4,6-Dinitrotol  1000.000 981.214     1.9   99   0.00   15.14-16.14
 14      2,6-Dinitrotoluene      1000.000 1062.649    -6.3  110   0.00   16.10-17.10
 15      2,4-Dinitrotoluene      1000.000 991.035     0.9  103  -0.01   16.60-17.60
 16      o-Nitrotoluene          1000.000 973.475     2.7   99  -0.02   19.73-20.73
 17      p-Nitrotoluene          1000.000 993.006     0.7  100  -0.02   21.06-22.06
 18      m-Nitrotoluene          1000.000 1007.492    -0.7  100  -0.03   22.77-23.77
 ---------------------------------------------------------------------------
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```

10.6 10

# Continuing Calibration Summary



**Job Number:** T16448 **Sample:** GGG906-CC825
**Account:** ALGC Accutest Laboratories Gulf Coast, Inc. **Lab FileID:** GG020224.D
**Project:** ITTXHO: Longhorn Army Ammunition Plant

```
(#) = Out of Range                SPCC's out = 0  CCC's out = 0
 GG018284.D 8330_EX.M        Mon Mar 05 11:42:13 2007
```

# Continuing Calibration Summary



**Job Number:** T16448
**Account:** ALGC Accutest Laboratories Gulf Coast, Inc.
**Project:** ITTXHO: Longhorn Army Ammunition Plant
**Sample:** GGG907-CC827
**Lab FileID:** GG020231.D

```
                        Evaluate Continuing Calibration Report

  Signal #1 : G:\DATA\0305RP\GG020231.D\dad1B.ch          Vial: 2
  Signal #2 : G:\DATA\0305RP\GG020231.D\dad1A.ch
  Acq On    : 05-Mar-2007, 13:23:34                   Operator: MIKEE
  Sample    : CC827-500                               Inst    : G1315B
  Misc      : OP19677,ggg907,1000,,,10,,water         Multiplr: 1.00
  IntFile Signal #1: EVENTS.E     IntFile Signal #2: events2.e

  Method       : C:\HPCHEM\1\METHODS\8330_RP.M (Chemstation Integrator)
  Title        : Explosives by 8330
  Last Update  : Fri Jan 26 08:35:20 2007
  Response via : Multiple Level Calibration

  Min. RRF     :   0.000  Min. Rel. Area :  50%  Max. R.T. Dev  0.50min
  Max. RRF Dev :  15%     Max. Rel. Area : 200%

         Compound                   Amount  Calc.    %Drift Area% Dev(min)RT Window
  ----------------------------------------------------------------------------
  1      TNX                      500.000 551.245    -10.2  112   0.02    4.24- 5.24
  2      HMX                      500.000 527.482     -5.5  113   0.00    4.75- 5.75
  3      DNX                      500.000 526.884     -5.4  111   0.01    4.87- 5.87
  4      MNX                      500.000 525.950     -5.2  106   0.00    5.72- 6.72
  5      1,3,5-Trinitrobenzene    500.000 507.541     -1.5  103   0.00    6.17- 7.17
  6      RDX                      500.000 498.345      0.3  100   0.02    6.56- 7.56
  7      1,3-Dinitrobenzene       500.000 495.147      1.0  101   0.00    7.78- 8.78
  8      Nitrobenzene             500.000 509.807     -2.0  104   0.00    8.29- 9.29
  9      2,4,6-Trinitrotoluene    500.000 506.824     -1.4  103  -0.01    8.80- 9.80
 10      Tetryl                   500.000 535.862     -7.2  104   0.00    9.52-10.52
 11 S    3,4-Dinitrotoluene       500.000 492.695      1.5  101   0.00   10.21-11.21
 12      2,6-Dinitrotoluene       500.000 489.618      2.1  102  -0.02   10.59-11.59
 13      2,4-Dinitrotoluene       500.000 483.678      3.3  102  -0.02   11.06-12.06
 14      o-Nitrotoluene           500.000 502.970     -0.6  105  -0.01   11.86-12.86
 15      p-Nitrotoluene           500.000 503.359     -0.7  105  -0.01   12.53-13.53
 16      4-Amino-2,6-Dinitrotol   500.000 502.155     -0.4  102  -0.03   12.95-13.95
 17      m-Nitrotoluene           500.000 523.547     -4.7  107  -0.02   13.38-14.38
 18      2-Amino-4,6-Dinitrotol   500.000 503.929     -0.8  101  -0.03   14.45-15.45

 *****   Signal #2   *****

  1      TNX                      500.000 539.038     -7.8  107   0.02    4.24- 5.24
  2      HMX                      500.000 501.388     -0.3  105   0.00    4.75- 5.75
  3      DNX                      500.000 520.169     -4.0  105   0.01    4.87- 5.87
  4      MNX                      500.000 520.287     -4.1  104   0.00    5.72- 6.72
  5      1,3,5-Trinitrobenzene    500.000 508.259     -1.7  102   0.00    6.17- 7.17
  6      RDX                      500.000 496.557      0.7  100   0.02    6.56- 7.56
  7      1,3-Dinitrobenzene       500.000 499.335      0.1  102   0.00    7.78- 8.78
  8      Nitrobenzene             500.000 521.041     -4.2  107   0.00    8.29- 9.29
  9      2,4,6-Trinitrotoluene    500.000 510.092     -2.0  104  -0.01    8.80- 9.80
 10      Tetryl                   500.000 533.664     -6.7  103   0.00    9.52-10.52
 11 S    3,4-Dinitrotoluene       500.000 488.383      2.3   99   0.00   10.21-11.21
 12      2,6-Dinitrotoluene       500.000 487.517      2.5  102  -0.02   10.59-11.59
 13      2,4-Dinitrotoluene       500.000 483.800      3.2  102  -0.02   11.06-12.06
 14      o-Nitrotoluene           500.000 519.246     -3.8  108  -0.01   11.86-12.86
 15      p-Nitrotoluene           500.000 515.868     -3.2  110   0.00   12.54-13.54
 16      4-Amino-2,6-Dinitrotol   500.000 499.988      0.0  102  -0.03   12.95-13.95
 17      m-Nitrotoluene           500.000 538.963     -7.8  110  -0.02   13.37-14.37
 18      2-Amino-4,6-Dinitrotol   500.000 499.905      0.0  100  -0.03   14.45-15.45
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```

# Continuing Calibration Summary



**Job Number:** T16448
**Account:** ALGC Accutest Laboratories Gulf Coast, Inc.
**Project:** ITTXHO: Longhorn Army Ammunition Plant

**Sample:** GGG907-CC827
**Lab FileID:** GG020231.D

```
(#) = Out of Range                SPCC's out = 0  CCC's out = 0
 GG018316.D 8330_RP.M        Tue Mar 06 10:57:51 2007
```

# Continuing Calibration Summary



**Job Number:** T16448 **Sample:** GGG907-ECC827
**Account:** ALGC Accutest Laboratories Gulf Coast, Inc. **Lab FileID:** GG020238.D
**Project:** ITTXHO: Longhorn Army Ammunition Plant

```
                    Evaluate Continuing Calibration Report

  Signal #1 : G:\DATA\0305RP\GG020238.D\dad1B.ch          Vial: 3
  Signal #2 : G:\DATA\0305RP\GG020238.D\dad1A.ch
  Acq On    : 05-Mar-2007, 15:40:35                   Operator: MIKEE
  Sample    : ECC827-1000                             Inst    : G1315B
  Misc      : OP19677,ggg907,1000,,,10,,water         Multiplr: 1.00
  IntFile Signal #1: EVENTS.E     IntFile Signal #2: events2.e

  Method       : C:\HPCHEM\1\METHODS\8330_RP.M (Chemstation Integrator)
  Title        : Explosives by 8330
  Last Update  : Fri Jan 26 08:35:20 2007
  Response via : Multiple Level Calibration

  Min. RRF     :   0.000  Min. Rel. Area :  50%  Max. R.T. Dev  0.50min
  Max. RRF Dev :  15%     Max. Rel. Area : 200%
```

| # | Compound | Amount | Calc. | %Drift | Area% | Dev(min) | RT Window |
|---|---|---|---|---|---|---|---|
| 1 | TNX | 1000.000 | 1064.078 | -6.4 | 104 | 0.02 | 4.24- 5.24 |
| 2 | HMX | 1000.000 | 1064.872 | -6.5 | 113 | 0.00 | 4.75- 5.75 |
| 3 | DNX | 1000.000 | 1029.858 | -3.0 | 106 | 0.00 | 4.87- 5.87 |
| 4 | MNX | 1000.000 | 1052.110 | -5.2 | 107 | 0.00 | 5.72- 6.72 |
| 5 | 1,3,5-Trinitrobenzene | 1000.000 | 1020.840 | -2.1 | 102 | 0.00 | 6.17- 7.17 |
| 6 | RDX | 1000.000 | 1020.894 | -2.1 | 103 | 0.02 | 6.56- 7.56 |
| 7 | 1,3-Dinitrobenzene | 1000.000 | 1005.302 | -0.5 | 101 | 0.00 | 7.78- 8.78 |
| 8 | Nitrobenzene | 1000.000 | 1031.078 | -3.1 | 102 | 0.00 | 8.29- 9.29 |
| 9 | 2,4,6-Trinitrotoluene | 1000.000 | 1033.117 | -3.3 | 104 | -0.01 | 8.80- 9.80 |
| 10 | Tetryl | 1000.000 | 1104.790 | -10.5 | 112 | 0.00 | 9.52-10.52 |
| 11 S | 3,4-Dinitrotoluene | 1000.000 | 1016.218 | -1.6 | 103 | 0.00 | 10.21-11.21 |
| 12 | 2,6-Dinitrotoluene | 1000.000 | 998.411 | 0.2 | 102 | -0.02 | 10.59-11.59 |
| 13 | 2,4-Dinitrotoluene | 1000.000 | 987.663 | 1.2 | 103 | -0.02 | 11.06-12.06 |
| 14 | o-Nitrotoluene | 1000.000 | 1040.619 | -4.1 | 105 | -0.01 | 11.86-12.86 |
| 15 | p-Nitrotoluene | 1000.000 | 1034.751 | -3.5 | 104 | -0.01 | 12.53-13.53 |
| 16 | 4-Amino-2,6-Dinitrotol | 1000.000 | 1018.262 | -1.8 | 102 | -0.02 | 12.95-13.95 |
| 17 | m-Nitrotoluene | 1000.000 | 1063.626 | -6.4 | 105 | -0.02 | 13.38-14.38 |
| 18 | 2-Amino-4,6-Dinitrotol | 1000.000 | 1018.025 | -1.8 | 102 | -0.02 | 14.45-15.45 |

***** Signal #2 *****

| # | Compound | Amount | Calc. | %Drift | Area% | Dev(min) | RT Window |
|---|---|---|---|---|---|---|---|
| 1 | TNX | 1000.000 | 1065.753 | -6.6 | 105 | 0.02 | 4.24- 5.24 |
| 2 | HMX | 1000.000 | 959.987 | 4.0 | 103 | 0.00 | 4.75- 5.75 |
| 3 | DNX | 1000.000 | 1023.085 | -2.3 | 108 | 0.01 | 4.87- 5.87 |
| 4 | MNX | 1000.000 | 1036.881 | -3.7 | 107 | 0.00 | 5.72- 6.72 |
| 5 | 1,3,5-Trinitrobenzene | 1000.000 | 1018.352 | -1.8 | 102 | 0.00 | 6.17- 7.17 |
| 6 | RDX | 1000.000 | 995.036 | 0.5 | 102 | 0.02 | 6.56- 7.56 |
| 7 | 1,3-Dinitrobenzene | 1000.000 | 1003.575 | -0.4 | 100 | 0.00 | 7.78- 8.78 |
| 8 | Nitrobenzene | 1000.000 | 1035.575 | -3.6 | 103 | 0.00 | 8.29- 9.29 |
| 9 | 2,4,6-Trinitrotoluene | 1000.000 | 1043.825 | -4.4 | 105 | -0.01 | 8.80- 9.80 |
| 10 | Tetryl | 1000.000 | 1097.433 | -9.7 | 111 | 0.00 | 9.52-10.52 |
| 11 S | 3,4-Dinitrotoluene | 1000.000 | 1002.293 | -0.2 | 102 | 0.00 | 10.21-11.21 |
| 12 | 2,6-Dinitrotoluene | 1000.000 | 991.509 | 0.8 | 102 | -0.02 | 10.59-11.59 |
| 13 | 2,4-Dinitrotoluene | 1000.000 | 990.702 | 0.9 | 103 | -0.02 | 11.06-12.06 |
| 14 | o-Nitrotoluene | 1000.000 | 1071.751 | -7.2 | 108 | -0.01 | 11.86-12.86 |
| 15 | p-Nitrotoluene | 1000.000 | 1073.626 | -7.4 | 108 | 0.00 | 12.54-13.54 |
| 16 | 4-Amino-2,6-Dinitrotol | 1000.000 | 1006.760 | -0.7 | 101 | -0.02 | 12.95-13.95 |
| 17 | m-Nitrotoluene | 1000.000 | 1093.803 | -9.4 | 107 | -0.02 | 13.37-14.37 |
| 18 | 2-Amino-4,6-Dinitrotol | 1000.000 | 1006.963 | -0.7 | 101 | -0.02 | 14.45-15.45 |

# Continuing Calibration Summary



**Job Number:** T16448
**Account:** ALGC Accutest Laboratories Gulf Coast, Inc.
**Project:** ITTXHO: Longhorn Army Ammunition Plant
**Sample:** GGG907-ECC827
**Lab FileID:** GG020238.D

```
    (#) = Out of Range                SPCC's out = 0  CCC's out = 0
     GG018318.D 8330_RP.M        Tue Mar 06 10:58:20 2007
```

# General Chemistry

## QC Data Summaries

(Accutest Laboratories Southeast, Inc.)

Includes the following where applicable:

- Method Blank and Blank Spike Summaries
- Duplicate Summaries
- Matrix Spike Summaries
- Instrument Runlogs/QC

METHOD BLANK AND SPIKE RESULTS SUMMARY
GENERAL CHEMISTRY

Login Number: T16448
Account: ALGC - Accutest Laboratories Gulf Coast, Inc.
Project: ITTXHO: Longhorn Army Ammunition Plant

| Analyte | Batch ID | RL | MB Result | Units | Spike Amount | BSP Result | BSP %Recov | QC Limits |
|---|---|---|---|---|---|---|---|---|
| Perchlorate | GP9044/GN24408 | 10 | <10 | ug/l | 50 | 50.1 | 100.2 | 85-115% |

Associated Samples:
Batch GP9044: T16448-1
(*) Outside of QC limits

DUPLICATE RESULTS SUMMARY
GENERAL CHEMISTRY

Login Number: T16448
Account: ALGC - Accutest Laboratories Gulf Coast, Inc.
Project: ITTXHO: Longhorn Army Ammunition Plant

| Analyte | Batch ID | QC Sample | Units | Original Result | DUP Result | RPD | QC Limits |
|---|---|---|---|---|---|---|---|
| Perchlorate | GP9044/GN24408 | T16445-5 | ug/l | 27.8 | 29.4 | 5.6 | 0-15% |

Associated Samples:
Batch GP9044: T16448-1
(*) Outside of QC limits

MATRIX SPIKE RESULTS SUMMARY
GENERAL CHEMISTRY

Login Number: T16448
Account: ALGC - Accutest Laboratories Gulf Coast, Inc.
Project: ITTXHO: Longhorn Army Ammunition Plant

| Analyte | Batch ID | QC Sample | Units | Original Result | Spike Amount | MS Result | %Rec | QC Limits |
|---|---|---|---|---|---|---|---|---|
| Perchlorate | GP9044/GN24408 | T16445-5 | ug/l | 27.8 | 50 | 79.8 | 104.0 | 80-120% |

Associated Samples:
Batch GP9044: T16448-1
(*) Outside of QC limits
(N) Matrix Spike Rec. outside of QC limits

Accutest Laboratories Instrument Runlog
Inorganics Analyses

Login Number: T16448
Account: ALGC - Accutest Laboratories Gulf Coast, Inc.
Project: ITTXHO: Longhorn Army Ammunition Plant

File ID: 207030201.TXT    Date Analyzed: 03/02/07    Methods: EPA 314
Analyst: MP    Run ID: GN24408
Parameters: Perchlorate

| Time | Sample Description | Dilution Factor | PS Recov | Comments |
|---|---|---|---|---|
| 14:05 | GN24408-CCV1 | 1 | | |
| 14:20 | GN24408-CCB1 | 1 | | |
| 14:34 | GP9044-MB1 | 1 | | |
| 14:49 | GP9044-B1 | 1 | | |
| 15:31 | GN24408-CRI1 | 1 | | |
| 15:46 | GN24408-IPC1 | 1 | | |
| 16:00 | ZZZZZZ | 1 | | |
| 16:15 | ZZZZZZ | 1 | | |
| 16:29 | ZZZZZZ | 1 | | |
| 16:43 | ZZZZZZ | 1 | | |
| 16:58 | T16445-5 | 1 | | (sample used for QC only; not part of login T16448) |
| 17:12 | T16445-6 | 1 | | (sample used for QC only; not part of login T16448) |
| 17:27 | GN24408-CCV2 | 1 | | |
| 17:41 | GN24408-CCB2 | 1 | | |
| 17:55 | ZZZZZZ | 1 | | |
| 18:10 | ZZZZZZ | 1 | | |
| 18:24 | ZZZZZZ | 1 | | |
| 18:39 | ZZZZZZ | 1 | | |
| 18:53 | ZZZZZZ | 1 | | |
| 19:22 | ZZZZZZ | 1 | | |
| 19:36 | ZZZZZZ | 1 | | |
| 19:51 | ZZZZZZ | 1 | | |
| 20:05 | T16448-1 | 1 | | |
| 20:19 | GN24408-CCV3 | 1 | | |
| 20:34 | GN24408-CCB3 | 1 | | |
| 20:48 | GP9044-D1 | 1 | | |
| 21:03 | GP9044-S1 | 1 | | |
| 21:17 | GP9044-D2 | 1 | | |
| 21:32 | GP9044-S2 | 1 | | |
| 21:46 | GN24408-CCV4 | 1 | | |
| 22:00 | GN24408-CCB4 | 1 | | |

Refer to raw data for calibration curve and standards.

Instrument QC Summary
Inorganics Analyses

Login Number: T16448
Account: ALGC - Accutest Laboratories Gulf Coast, Inc.
Project: ITTXHO: Longhorn Army Ammunition Plant

File ID: 207030201.TXT Date Analyzed: 03/02/07 Methods: EPA 314
Run ID: GN24408 Units: ug/l

| Sample Number | Parameter | Result | RL | IDL/MDL | True Value | % Recov. | QC Limits |
|---|---|---|---|---|---|---|---|
| GN24408-CCV1 | Perchlorate | 52.1 | 10 | 4.0 | 50 | 104.2 | 85-115 |
| GN24408-CCB1 | Perchlorate | 4.0 U | 10 | 4.0 | | | |
| GN24408-CRI1 | Perchlorate | 4.0 U | 10 | 4.0 | 3 | 86.6 | 75-125 |
| GN24408-IPC1 | Perchlorate | 23.2 | 10 | 4.0 | 25 | 92.8 | 80-120 |
| GN24408-CCV2 | Perchlorate | 50.4 | 10 | 4.0 | 50 | 100.8 | 85-115 |
| GN24408-CCB2 | Perchlorate | 4.0 U | 10 | 4.0 | | | |
| GN24408-CCV3 | Perchlorate | 52.6 | 10 | 4.0 | 50 | 105.2 | 85-115 |
| GN24408-CCB3 | Perchlorate | 4.0 U | 10 | 4.0 | | | |
| GN24408-CCV4 | Perchlorate | 53.4 | 10 | 4.0 | 50 | 106.8 | 85-115 |
| GN24408-CCB4 | Perchlorate | 4.0 U | 10 | 4.0 | | | |

(!) Outside of QC limits

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# Sample Collection Log



## 117591 - Longhorn Army Ammunition Plant

**Manager:** Praveen Srivastav

**RFA / COC Number:** 10919 | 10920

*Location Code:* 50WW02
*Sample Number:* 50WW02-FEB2007
*Sample Name:* 50WW02-GW-50WW02- -REG
*Sampling Method:* SP
*Sample Type:* GW *Sample Purpose:* REG
*Sampling Equip:* QED BLADDER PUMP

*Task:* MNA_EVENT_FEB07
*Collection Date:* 2/23/07
*Collection Time:*
*Start Depth:* 19.21
*End Depth:* 20.33
*Sample Matrix:* WATER
*Sample Team:* Joe Belcourt | Mike Martinez

**QC Partners:**
(TB) 2-23-07 (ER) (FB)

**ERPIMS Values:**
*Sacode:*
*Lot Control#:*

**Containers**

| Analytical Suite | Flt | Frtn | Qty | Size | Units | Type |
|---|---|---|---|---|---|---|
| VOC-FULL | N | A | 3 | 40 | mL | VOA VIAL |
| ANIONS | N | B | 1 | 1000 | mL | HDPE |
| PERC | N | C | 1 | 500 | mL | HDPE |
| GASES | N | D | 3 | 40 | mL | VOA Vial |
| ALKALINITY | N | E | 1 | 1000 | mL | HDPE |
| TOC_415 | N | F | 3 | ~~100~~ 40 | mL | HDPE |
| DHC | N | G | 1 | 1 | L | Amb. Glass |
| Sulfides | N | H | 1 | 1000 | mL | HDPE |

**Groundwater Information:**

**Measured Well Depth:** 22.18 **Depth To Water:** 19.21

**Comments:** Ferrous Iron 0.00 mg/L
Salinity 0.82

**Sketch Location:**

*Logged BY / Date:* J. Belcourt 2/23/07 *Reviewed BY / Date:*

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# *Sample Collection Log*



**117591 - Longhorn Army Ammunition Plant**
**Manager:** **Praveen Srivastav**

*Location Code:* **50WW02**
*Sample Number:* **50WW02-**FEB 2007

***PURGE RECORD:***

| Initial | Time(24hr) | DepthtoWater (ft) | Eh (mV) | pH (SU) | Conductivity (mS/cm) | Turbidity (NTU) | DissOxygen (ppm) | Temperature (C) | Purge Volume (gal) |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | |
| **Sample:** | 1532 | 20.33 | 306.4 | 6.30 | 1.622 | -0- | 6.25 | 19.63 | 2.8 |

MSY 02/23/07

*Logged BY / Date:* J. Palus 2/23/07 *Reviewed BY / Date:* ______

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# GROUNDWATER SAMPLING FORM

Sheet 1 of 2

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| | |
|---|---|
| Operable Unit/Site ID: Area 50 | Sampling location ID: 50 GW02 |
| Project Name/#: Longhorn AAP 117591 | Sample ID: 50GW02-FEB2007 |
| Weather: Sunny ~ 65°- 70° F | Collection Time/Date: 02-23-07/ |

## Pump Installation

| | |
|---|---|
| Pump installation crew: M. Martinez / J. Belcourt | Installation date/beginning time: 2/23/07 @ 1346 |
| PID/FID reading (well head/background): 50.0 / 0.0 | Installation date/completion time: 2/23/07 |
| Casing diameter (inches): 4" Steel | Screen Interval (ft. BTOC): 12 to 22 |
| Total well Depth (ft. BTOC): 22.18 | Pump intake depth (ft BTOC): 21' |
| Initial (pre-installation) DTW/time: 19.71 | Post-installation DTW/time: 19.14 @ 1349 |
| Final (after pump priming) DTW/time: 19.14 | Max. sustainable pump rate (mL/min): 100 |
| Free product (circle): LNAPL / DNAPL | Appearance of product: None |
| Volume of water removed during priming (mL): 1000 | Discharge tube diameter (3/8" or 1/4"): 1/4" |
| Discharge tube length (ft.): 30' | Inlet reducer used (Y/N): N |

**Pneumatic Controller Tuning:**

Initial air pressure = H (ft.) X 0.43 = 18 psi

| | Initial | 2 | 3 | 4 | 5 | 6 | 7 | 8 | Final |
|---|---|---|---|---|---|---|---|---|---|
| Pressure (psi) | 18 | 18 | | | | | | | 18 |
| Refill Setting | 10 | 10 | | | | | | | 10 |
| Discharge Setting | 3.4 | 4.4 | | | | | | | 4.4 |
| Flow rate (mL/min) | 80 | 100 | | | | | | | 100 |

## Purging

| | |
|---|---|
| Purging/sampling crew: Mike Martinez / Joe Belcourt | PID/FID reading (well head/background): 50.0 PPM |
| Purge date/beginning time: 2/23/07 @ 1350 | Purge date/completion time: 2/23/07 @ 1532 |
| Initial (pre-purging) DTW (ft. BTOC): 19.14 | Final (post-purging) DTW (ft. BTOC): 20.33 |
| Calculated tubing + pump volume: NA | No. of tubing + pump volumes purged: 11.2 |

**Pneumatic Controller Tuning:**

Initial air pressure = H (ft.) X 0.43 = 18 psi

| | Initial | 2 | 3 | 4 | 5 | 6 | 7 | 8 | Final |
|---|---|---|---|---|---|---|---|---|---|
| Pressure (psi) | 18 | 18 | | | | | | | 18 |
| Refill Setting | 10 | 10 | | | | | | | 10 |
| Discharge Setting | 3.4 | 4.4 | | | | | | | 4.4 |
| Flow rate (mL/min) | 80 | 100 | | | | | | | 100 |

### Water Quality Parameter Measurements

| Time | DTW (ft. BTOC) | Purge Rate (mL/min) | Cumulative Volume Purged (L) | Temp. (degree C) | Electrical Conductivity (uMhos/cm) | pH | Eh (mv) | DO (mg/L) | Turbidity (NTU) |
|---|---|---|---|---|---|---|---|---|---|
| 1402 | 19.42 | 80 | ~0 ~ | 20.41 | 1.631 | 6.69 | 234.7 | 7.57 | 27.4 |
| 1412 | 19.55 | 100 | 1.3 | 18.88 | 1.611 | 6.46 | 272.0 | 7.46 | 8.8 |
| 1417 | 19.64 | 100 | 1.8 | 18.97 | 1.606 | 6.44 | 285.3 | 7.51 | 6.8 |
| 1422 | 19.70 | 100 | 2.3 | 18.93 | 1.607 | 6.45 | 293.1 | 7.48 | 6.0 |
| 1427 | 19.78 | 100 | 2.8 | 18.85 | 1.608 | 6.44 | 300.3 | 7.42 | 5.3 |
| 1432 | 19.83 | 100 | 3.3 | 18.67 | 1.608 | 6.43 | 310.4 | 7.37 | 5.6 |
| 1437 | 19.90 | 100 | 4.8 | 18.60 | 1.605 | 6.41 | 322.6 | 7.30 | 3.7 |
| 1442 | 19.95 | 100 | 5.3 | 18.54 | 1.603 | 6.40 | 337.6 | 7.17 | 2.7 |

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# GROUNDWATER SAMPLING FORM

Sheet 2 of 2

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**Water Quality Parameter Measurements (continued)**

| Time | DTW (ft. BTOC) | Purge Rate (mL/min) | Cumulative Volume Purged (L) | Temp. (degree C) | Electrical Conductivity (uMhos/cm) | pH | Eh (mv) | DO (mg/L) | Turbidity (NTU) |
|---|---|---|---|---|---|---|---|---|---|
| 1447 | 19.97 | 100 | 5.8 | 18.55 | 1.602 | 6.38 | 329.4 | 7.02 | 5.1 |
| 1452 | 20.02 | 100 | 6.3 | 18.57 | 1.601 | 6.33 | 330.6 | 6.98 | 5.0 |
| 1453 | Pump off | | | | | | | | |

2/23/07 JCB

## Sampling

Sampling beginning time: 1453

Sampling completion time: 1532

**Water Quality Parameter Measurements**

| Time | DTW (ft. BTOC) | Purge Rate (mL/min) | Cumulative Volume Purged (L) | Temp. (degree C) | Electrical Conductivity (uMhos/cm) | pH | Eh (mv) | DO (mg/L) | Turbidity (NTU) |
|---|---|---|---|---|---|---|---|---|---|
| 1532 | 20.33 | 100 | | 19.63 | 1.622 | 6.30 | 306.4 | 6.25 | -0- |

2/23/07 JCB

## Sample Information

Sample ID: 50WW02

Sample collection date/time: 2/23/07 @ 1453

Duplicate sample collected (Y/N): N

Duplicate sample ID: N

Split sample collected (Y/N): N

Split sample ID: N

COC No(s): 10919 / 10920

| Requested Analysis | Method | Containers | Requested Analysis | Method | Containers |
|---|---|---|---|---|---|
| VOC's-Full | 8260B | 3 VOA's | Sulfides | 376.2 | 1-500 mL HDPE |
| Gases | 175 | 3 VOA's | Anions | 300.0 | 1-1000 mL HDPE |
| TOC | 415.1 | 3 VOA's | DHC | – | 2 1L Amber |
| Perchlorate | 314.0 | 1-500 mL HDPE | | | |
| Alkalinity | 310.1 | 1-1000 mL HDPE | | | |

**Comments:** Ferrous Iron = 0.00

Salinity = 0.82

Abbreviations: BTOC - Below top of casing; DTW - Depth to water; H - head above pump intake; mL - milliliter; L - Liter

39
6.3
\

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# Sample Collection Log



## 117591 - Longhorn Army Ammunition Plant

Manager: Praveen Srivastav

RFA / COC Number: 10920 / 10921

*Location Code:* 50WW03

*Sample Number:* 50WW03- FEB 2007

*Sample Name:* 50WW03-GW-50WW03- -REG

*Sampling Method:* SP

*Sample Type:* GW *Sample Purpose:* REG

*Sampling Equip:* QED Bladder Pump

*Task:* MNA_EVENT_FEB07

*Collection Date:* 02-24-07

*Collection Time:* 0856

*Start Depth:* 20.30

*End Depth:* 20.88

*Sample Matrix:* WATER

*Sample Team:* M. Martinez / J. Belcart

QC Partners:
(TB) 02-24-07 (ER) n/A (FB) n/A

**ERPIMS Values:**
*Sacode:*
*Lot Control#:*

| Analytical Suite | Flt | Frtn | Qty | Size | Units | Type |
|---|---|---|---|---|---|---|
| VOC-FULL | N | A | 3 | 40 | mL | VOA VIAL |
| ANIONS | N | B | 1 | ~~500~~ 1000 | mL | HDPE |
| PERC | N | C | 1 | 500 | mL | HDPE |
| GASES | N | D | ~~2~~ 3 | 40 | mL | VOA Vial |
| ALKALINITY | N | E | 1 | 1000 | mL | HDPE |
| TOC_415 | N | F | ~~2~~ 3 | ~~100~~ 40 | mL | ~~HDPE~~ voa vials |
| DHC | N | G | ~~1~~ 2 | 1 | L | Amb. Glass |
| Sulfides | N | H | 1 | 500 | ml | HDPE |

**Groundwater Information:**

**Measured Well Depth:** 22.98' **Depth To Water:** 20.44

**Comments:** Ferrous Iron 0.06 mg/L
Salinity 3.78

**Sketch Location:**

*Logged BY / Date:* [signature] / 02-24-07 *Reviewed BY / Date:*

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# *Sample Collection Log*



## 117591 - Longhorn Army Ammunition Plant

**Manager:** Praveen Srivastav

*Location Code:* **50WW03**
*Sample Number:* **50WW03-** FEB 2007

***PURGE RECORD:***

| Initial | Time(24hr) | DepthtoWater (ft) | Eh (mV) | pH (SU) | Conductivity (mS/cm) | Turbidity (NTU) | DissOxygen (ppm) | Temperature (C) | Purge Volume (gal) |
|---|---|---|---|---|---|---|---|---|---|
| **Sample:** | 0955 | 20.88 | 200.0 | 7.05 | 6.867 | 4.5 | 3.08 | 18.75 | 11.475 |

*Logged BY / Date:* [signature] / 02-24-07 *Reviewed BY / Date:* ____________

# GROUNDWATER SAMPLING FORM

Shaw®

Sheet 1 of 2

Operable Unit/Site ID: AREA 50
Project Name/#: Longhorn AAP 117591
Weather: Cloudy 76°

Sampling location ID: 50WW03
Sample ID: 50WW03-FEB2007
Collection Time/Date: 02-24-07 /

## Pump Installation

Pump installation crew: J. Beleour / M. Martinez
PID/FID reading (well head/background): 0.0 PPM
Casing diameter (inches): 4"
Total well Depth (ft. BTOC): 22.98
Initial (pre-installation) DTW/time: 20.44 @1622
Final (after pump priming) DTW/time: 20.
Free product (circle): LNAPL / DNAPL
Volume of water removed during priming (mL): 1000
Discharge tube length (ft.): 30'

Installation date/beginning time: 2/23/07 @ 1625
Installation date/completion time: 2/23/07 @ 1630
Screen Interval (ft. BTOC): 13' to 23'
Pump intake depth (ft BTOC): 21'
Post-installation DTW/time: 20.38 @1629
Max. sustainable pump rate (mL/min):
Appearance of product: NONE
Discharge tube diameter (3/8" or 1/4"): 1/4"
Inlet reducer used (Y/N): N

**Pneumatic Controller Tuning:**
Initial air pressure = H (ft.) X 0.43 = 18 psi

| | Initial | 2 | 3 | 4 | 5 | 6 | 7 | 8 | Final |
|---|---|---|---|---|---|---|---|---|---|
| Pressure (psi) | 18 | | | | | | | | 18 |
| Refill Setting | 10 | | | | | | | | 10 |
| Discharge Setting | 5 | | | | | | | | 5 |
| Flow rate (mL/min) | 133 | | | | | | | | 135 |

## Purging

Purging/sampling crew: J. Beleour / M. Martinez
Purge date/beginning time: ~~2/23/07 @ 1630~~ 0830/02-24-07
Initial (pre-purging) DTW (ft. BTOC): ~~20.38~~ 20.30-02-24-07
Calculated tubing + pump volume: NA

PID/FID reading (well head/background): 0.0 / 0.0
Purge date/completion time: 02-24-07 / 0855
Final (post-purging) DTW (ft. BTOC): 20.88
No. of tubing + pump volumes purged: 12.475

**Pneumatic Controller Tuning:**
Initial air pressure = H (ft.) X 0.43 = 18 psi

| | Initial | 2 | 3 | 4 | 5 | 6 | 7 | 8 | Final |
|---|---|---|---|---|---|---|---|---|---|
| Pressure (psi) | 18 | | | | | | | | 18 |
| Refill Setting | 10 | | | | | | | | 10 |
| Discharge Setting | 5 | | | | | | | | 5 |
| Flow rate (mL/min) | 135 | | | | | | | | 135 |

### Water Quality Parameter Measurements

| Time | DTW (ft. BTOC) | Purge Rate (mL/min) | Cumulative Volume Purged (L) | Temp. (degree C) | Electrical Conductivity (uMhos/cm) | pH | Eh (mv) | DO (mg/L) | Turbidity (NTU) |
|---|---|---|---|---|---|---|---|---|---|
| 0830 | 20.02 | 135 | 0 | 18.08 | 0.888 | 6.93 | 292.2 | 3.90 | 28.7 |
| 0840 | 20.65 | 135 | 1.35 | 18.13 | 0.900 | 6.94 | 290.1 | 3.87 | 27.1 |
| 0845 | 20.70 | 135 | 2.02 | 18.15 | 0.907 | 6.94 | 287.2 | 3.85 | 26.2 |
| 0850 | 20.78 | 135 | 2.7 | 18.19 | 0.907 | 6.94 | 285.7 | 3.66 | 24.7 |
| 0855 | 20.78 | 135 | 3.375 | 18.21 | 0.911 | 6.95 | 283.6 | 3.72 | 20.9 |
| 0856 | Sample | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |

MS 02-24-07

00079272

# GROUNDWATER SAMPLING FORM

Sheet 2 of 2

Shaw®

**Water Quality Parameter Measurements (continued)**

| Time | DTW (ft. BTOC) | Purge Rate (mL/min) | Cumulative Volume Purged (L) | Temp. (degree C) | Electrical Conductivity (uMhos/cm) | pH | Eh (mv) | DO (mg/L) | Turbidity (NTU) |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | |

MB 02-24-07

## Sampling

Sampling beginning time: 0856  Sampling completion time: 0950

**Water Quality Parameter Measurements**

| Time | DTW (ft. BTOC) | Purge Rate (mL/min) | Cumulative Volume Purged (L) | Temp. (degree C) | Electrical Conductivity (uMhos/cm) | pH | Eh (mv) | DO (mg/L) | Turbidity (NTU) |
|---|---|---|---|---|---|---|---|---|---|
| 0955 | 20.88 | ~~11.475~~ 135 | 11.475 | 18.95 | 6.867 | 7.05 | 200.0 | 3.08 | 4.5 |

MB 02-24-07

## Sample Information

Sample ID: SOCW03-FEB2007  Sample collection date/time: 02-24-07/

Duplicate sample collected (Y/N): N  Duplicate sample ID: N

Split sample collected (Y/N): N  Split sample ID: N

COC No(s): 10920/10921

| Requested Analysis | Method | Containers | Requested Analysis | Method | Containers |
|---|---|---|---|---|---|
| VOC's - Full | 8260B | 3 VOA's | Sulfides | ~~300~~ | 1-500 mL HDPE |
| Gases | 175 | 3 VOA's | ANIONS | 300 | 1-1000 mL HDPE |
| TOC | 415.1 | 3 VOA's | DHC | | 2 1 L Amber |
| Perchlorate | 314.0 | 1-500 mL HDPE | | | |
| Alkalinity | 310.1 | 1-1000 mL HDPE | | | |

MB 02-24-07

Comments: Ferrous Iron: 0.00 mg/L
Salinity: 3.78

Abbreviations: BTOC - Below top of casing; DTW - Depth to water; H - head above pump intake; mL - milliliter; L - Liter

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# Sample Collection Log



## 117591 - Longhorn Army Ammunition Plant

**Manager:** Praveen Srivastav

**RFA / COC Number:** 10918 / 10919

*Location Code:* **50WW05**
*Sample Number:* **50WW05-** FEB 2007-MS/MSD
*Sample Name:* **50WW05-GW-50WW05- -REG**
*Sampling Method:* **SP**
*Sample Type:* **GW** *Sample Purpose:* **REG**
*Sampling Equip:* QED Bladder Pump

**QC Partners:**
**(TB)** 2-23-07 **(ER)** **(FB)**

*Task:* **MNA_EVENT_FEB07**
*Collection Date:* 02-23-07
*Collection Time:* 02-23-07 / 1046
*Start Depth:* 16.54
*End Depth:* 16.80
*Sample Matrix:* **WATER**
*Sample Team:* M. Martinez / J. Belcourt

**ERPIMS Values:**
*Sacode:*
*Lot Control#:*

**Containers**

| Analytical Suite | Flt | Frtn | Qty | Size | Units | Type |
|---|---|---|---|---|---|---|
| VOC-FULL | N | A | 3 | 40 | mL | VOA VIAL |
| ANIONS | N | B | 1 | ~~500~~ 1000 | mL | HDPE |
| PERC | N | C | 1 | 500 | mL | HDPE |
| GASES | N | D | ~~2~~ 3 | ~~40~~ 40 | mL | VOA Vial |
| ALKALINITY | N | E | 1 | 1000 | mL | HDPE |
| TOC_415 | N | F | ~~1~~ 3 | ~~100~~ 40 | mL | ~~HDPE~~ VOA Vial |
| DHC | N | G | ~~1~~ 2 | 1 | L | Amb. Glass |
| Sulfides | N | H | 1 | 500 | mL | HDPE |

**Groundwater Information:**
**Measured Well Depth:** 24.90' **Depth To Water:** 16.54'

**Comments:** Ferrous Iron 0.4 mg/L
Salinity 1.26
MS/MSD taken from this location

**Sketch Location:**

*Logged BY / Date:* M. Martinez / 02/23/07 *Reviewed BY / Date:*

00079274

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# *Sample Collection Log*



**117591 - Longhorn Army Ammunition Plant**
**Manager: Praveen Srivastav**

*Location Code:* **50WW05**
*Sample Number:* **50WW05-** FEB 2007

***PURGE RECORD:***

| Initial | Time(24hr) | DepthtoWater (ft) | Eh (mV) | pH (SU) | Conductivity (mS/cm) | Turbidity (NTU) | DissOxygen (ppm) | Temperature (C) | Purge Volume (gal) |
|---|---|---|---|---|---|---|---|---|---|
| **Sample:** | 1157 | 16.80 | 62.1 | 7.10 | 2.411 | -0- | 1.53 | 20.55 | 7.04 |

MSM 02/23/07

*Logged BY / Date:* [signature] / 02/23/07 *Reviewed BY / Date:* ______________

Shaw

# GROUNDWATER SAMPLING FORM

Sheet 1 of 2

Operable Unit/Site ID: Area 50
Project Name/#: Lonestar AAP
Weather: P/C ≈ 60-65°F

Sampling location ID: 50GW05
Sample ID: 50GW05-FEB2007
Collection Time/Date: 02-23-07 / 1046

## Pump Installation

Pump installation crew: M.Martinez/Joe Belcourt
PID/FID reading (well head/background): 3.7/0.0
Casing diameter (inches): 4" Stainless Steel
Total well Depth (ft. BTOC): 24.90
Initial (pre-installation) DTW/time: 16.54 / 0930
Final (after pump priming) DTW/time: 16.70/0950
Free product (circle): LNAPL / DNAPL
Volume of water removed during priming (mL): 1000
Discharge tube length (ft.): 30'

Installation date/beginning time: 02-23-07 /0940
Installation date/completion time: 02-23-07 /0943
Screen Interval (ft. BTOC): 14.90 to 24.90
Pump intake depth (ft BTOC): ~~19.90~~ 21.90
Post-installation DTW/time: 16.48 / 0944
Max. sustainable pump rate (mL/min): 220
Appearance of product: none
Discharge tube diameter (3/8" or 1/4"): 1/4"
Inlet reducer used (Y/N): NO

**Pneumatic Controller Tuning:**
Initial air pressure = H (ft.) X 0.43 = 20 psi

| | Initial | 2 | 3 | 4 | 5 | 6 | 7 | 8 | Final |
|---|---|---|---|---|---|---|---|---|---|
| Pressure (psi) | 20 | | | | | | | | 20 |
| Refill Setting | 10 | | | | | | | | 10 |
| Discharge Setting | 5 | | | | | | | | 5 |
| Flow rate (mL/min) | 220 | | | | | | | | 220 |

## Purging

Purging/sampling crew: M.Martinez/J. Belcourt
Purge date/beginning time: 02-23-07 / 0945
Initial (pre-purging) DTW (ft. BTOC): 16.48/ 0944
Calculated tubing + pump volume: NA

PID/FID reading (well head/background): 1.5 /0.0
Purge date/completion time: 2/23/07 @ 1157
Final (post-purging) DTW (ft. BTOC): 16.80
No. of tubing + pump volumes purged: 28.6

**Pneumatic Controller Tuning:**
Initial air pressure = H (ft.) X 0.43 = 20 psi

| | Initial | 2 | 3 | 4 | 5 | 6 | 7 | 8 | Final |
|---|---|---|---|---|---|---|---|---|---|
| Pressure (psi) | 20 | | | | | | | | 20 |
| Refill Setting | 10 | | | | | | | | 10 |
| Discharge Setting | 5 | | | | | | | | 5 |
| Flow rate (mL/min) | 220 | | | | | | | | 220 |

### Water Quality Parameter Measurements

| Time | DTW (ft. BTOC) | Purge Rate (mL/min) | Cumulative Volume Purged (L) | Temp. (degree C) | Electrical Conductivity (uMhos/cm) | pH | Eh (mv) | DO (mg/L) | Turbidity (NTU) |
|---|---|---|---|---|---|---|---|---|---|
| 0950 | 16.70 | 220 | -0- | 18.56 | 2.408 | 6.82 | 275.1 | 1.42 | 32.9 |
| 1000 | 16.78 | 220 | 3.3 | 18.66 | 2.408 | 6.85 | 200.0 | 1.10 | 14.7 |
| 1005 | 16.82 | 220 | 4.4 | 18.65 | 2.422 | 6.86 | 150.0 | 1.07 | 15.4 |
| 1010 | 16.82 | 220 | 5.5 | 18.65 | 2.425 | 6.87 | 122.6 | 1.03 | 14.2 |
| 1015 | 16.83 | 220 | 6.6 | 18.54 | 2.426 | 6.86 | 94.4 | 0.98 | 13.6 |
| 1020 | 16.83 | 220 | 7.7 | 18.61 | 2.424 | 6.88 | 74.7 | 0.96 | 13.7 |
| 1025 | 16.82 | 220 | 8.8 | 18.64 | 2.423 | 6.88 | 67.2 | 0.94 | 18.3 |
| 1030 | 16.82 | 220 | 9.9 | 18.63 | 2.415 | 6.86 | 62.1 | 0.92 | 15.8 |

22

Shaw

# GROUNDWATER SAMPLING FORM

Sheet 2 of 2

## Water Quality Parameter Measurements (continued)

| Time | DTW (ft. BTOC) | Purge Rate (mL/min) | Cumulative Volume Purged (L) | Temp. (degree C) ±10% | ±3% Electrical Conductivity (uMhos/cm) | pH ±0.1 | Eh (mv) ±10 | DO (mg/L) ±10% | Turbidity (NTU) ±10% |
|---|---|---|---|---|---|---|---|---|---|
| 1035 | 16.82 | 220 | 11.0 | 18.65 | 2.406 | 6.87 | 53.0 | 0.87 | 12.4 |
| 1040 | 16.82 | 220 | 12.1 | 18.65 | 2.409 | 6.86 | 47.7 | 0.87 | 11.0 |
| 1045 | 16.82 | 220 | 12.2 | 18.65 | 2.406 | 6.86 | 45.0 | 0.85 | 8.9 |
| 1046 | Sample | | — | — | — | | | | |

10-esp nd
20

02-23-07

## Sampling

Sampling beginning time: 1046

Sampling completion time: 1155

### Water Quality Parameter Measurements

| Time | DTW (ft. BTOC) | Purge Rate (mL/min) | Cumulative Volume Purged (L) | Temp. (degree C) | Electrical Conductivity (uMhos/cm) | pH | Eh (mv) | DO (mg/L) | Turbidity (NTU) |
|---|---|---|---|---|---|---|---|---|---|
| 1157 | 16.80 | 220 | 28.6 | 20.55 | 2.411 | 7.10 | 62.1 | 1.53 | -0- |

02-23-07

## Sample Information

Sample ID: 50WW05-FEB2007

Sample collection date/time: 02-23-07

Duplicate sample collected (Y/N): No

Duplicate sample ID: NA

Split sample collected (Y/N): NO

Split sample ID: NA

COC No(s): 10918 / 10919

MS/MSD - yes

| Requested Analysis | Method | Containers | MS/MSD | Requested Analysis | Method | Containers | MS/MSD |
|---|---|---|---|---|---|---|---|
| VOC-Full | 8260B | 3 VOA's | 6 | Sulfides | 376.2 | 1-500mL HDPE | 2 |
| Gasses | 175 | 3 VOA's | 6 | Anions | 300.0 | 1-1000mL HDPE | 2 |
| TOC | 415.1 | 3 VOA's | 6 | DHC | | 2-1Liter Ambers | 4 |
| Perchlorate | 314.0 | 1-500mL HDPE | 2 | | | | |
| Alkalinity | 310.1 | 1-1000mL HDPE | 2 | | | | |

**Comments:** Ferrous Iron - 0.14

Salinity - 1.26

(50WW05-FEB2007 MS/MSD)

Abbreviations: BTOC - Below top of casing; DTW - Depth to water; H - head above pump intake; mL - milliliter; L - Liter

12.2
1
14.94

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# Sample Collection Log



## 117591 - Longhorn Army Ammunition Plant

**Manager:** Praveen Srivastav

**RFA / COC Number:** 10928/10929

*Location Code:* 50WW06
*Sample Number:* 50WW06-FEB2007
*Sample Name:* 50WW06-GW-50WW06-FEB 2007-REG
*Sampling Method:* SP
*Sample Type:* GW *Sample Purpose:* REG
*Sampling Equip:* QED BLADDER PUMP

*Task:* MNA_EVENT_FEB07
*Collection Date:* 2/22/07
*Collection Time:* 1536
*Start Depth:* 14.41
*End Depth:* 14.71
*Sample Matrix:* WATER

**QC Partners:**
(TB) 2-22-07 (ER) N/A (FB) N/A

*Sample Team:* Joe Belcourt, Mike Martinez

**ERPIMS Values:**
*Sacode:*
*Lot Control#:*

| Analytical Suite | Flt | Frtn | Qty | Size | Units | Type |
|---|---|---|---|---|---|---|
| VOC-FULL | N | A | 3 | 40 | mL | VOA VIAL |
| ANIONS | N | B | 1 | ~~500~~ 1000 | mL | HDPE |
| PERC | N | C | 1 | 500 | mL | HDPE |
| GASES | N | D | 3 | 40 | mL | VOA Vial |
| ALKALINITY | N | E | 1 | 1000 | mL | HDPE |
| TOC_415 | N | F | 3 | ~~400~~ 40 | mL | HDPE |
| DHC | N | G | 1 | 1 | L | Amb. Glass |
| Sulfides | N | H | 1 | 500 | mL | HDPE |

**Groundwater Information:**
**Measured Well Depth:** 58.44 **Depth To Water:** 14.41

**Comments:** Ferrous Iron 0.44 mg/L
Salinity 3.01

**Sketch Location:**

*Logged BY / Date:* J.Bel 2/22/07 *Reviewed BY / Date:*

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# *Sample Collection Log*



## 117591 - Longhorn Army Ammunition Plant

**Manager:** **Praveen Srivastav**

*Location Code:* **50WW06**

*Sample Number:* **50WW06-** FEB 2007

***PURGE RECORD:***

| Initial | Time(24hr) | DepthtoWater (ft) | Eh (mV) | pH (SU) | Conductivity (mS/cm) | Turbidity (NTU) | DissOxygen (ppm) | Temperature (C) | Purge Volume (gal) |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | |
| Sample: | 1610 | 14.71 | 59.6 | 6.91 | 1.583 | -0- | 2.09 | 19.25 | 12.6 |

JB 2/22/07

*Logged BY / Date:* JB 2/22/07 *Reviewed BY / Date:*

00079279

# GROUNDWATER SAMPLING FORM

Shaw®

Sheet 1 of 2

Operable Unit/Site ID: AREA 50
Project Name/#: Longhorn AAP 117591
Weather: Cl/Skies Sunny ≈ 80-85°F

Sampling location ID: 50WW06
Sample ID: 50WW06-FEB2007
Collection Time/Date: 02-22-07 / 1536

## Pump Installation

Pump installation crew: M. Martinez / J. Selcout
PID/FID reading (well head/background): 0.0 / 0.0
Casing diameter (inches): 4" / PVC
Total well Depth (ft. BTOC): 58.44
Initial (pre-installation) DTW/time: 14.41 / 1345
Final (after pump priming) DTW/time: 14.51 @ 1405
Free product (circle): LNAPL / DNAPL
Volume of water removed during priming (mL): 1000
Discharge tube length (ft.): 60'

Installation date/beginning time: 02-22-07 / 1348
Installation date/completion time: 02-22-07 / 1353
Screen Interval (ft. BTOC): 48 to 58
Pump intake depth (ft BTOC): 53'
Post-installation DTW/time: 14.10 / 1354
Max. sustainable pump rate (mL/min): 120
Appearance of product: none
Discharge tube diameter (3/8" or 1/4"): 1/4
Inlet reducer used (Y/N): N

**Pneumatic Controller Tuning:**
Initial air pressure = H (ft.) X 0.43 = 38 psi

| | Initial | 2 | 3 | 4 | 5 | 6 | 7 | 8 | Final |
|---|---|---|---|---|---|---|---|---|---|
| Pressure (psi) | 38 | 38 | | | | | | | 38 |
| Refill Setting | 10 | 10 | | | | | | | 10 |
| Discharge Setting | 5 | 5 | | | | | | | 5 |
| Flow rate (mL/min) | 100 | 120 | | | | | | | 120 |

## Purging

Purging/sampling crew: M. Martinez / J. Selcout
Purge date/beginning time: 02-22-07 / 1400
Initial (pre-purging) DTW (ft. BTOC): 14.22 / 1359
Calculated tubing + pump volume: NA

PID/FID reading (well head/background): 0.0 / 0.0
Purge date/completion time: 02-22-07 / 1611
Final (post-purging) DTW (ft. BTOC): 14.71
No. of tubing + pump volumes purged: 16.6

**Pneumatic Controller Tuning:**
Initial air pressure = H (ft.) X 0.43 = 38 psi

| | Initial | 2 | 3 | 4 | 5 | 6 | 7 | 8 | Final |
|---|---|---|---|---|---|---|---|---|---|
| Pressure (psi) | 38 | 38 | | | | | | | 38 |
| Refill Setting | 10 | 10 | | | | | | | 10 |
| Discharge Setting | 5 | 5 | | | | | | | 5 |
| Flow rate (mL/min) | 100 | 120 | | | | | | | 120 |

### Water Quality Parameter Measurements

| Time | DTW (ft. BTOC) | Purge Rate (mL/min) | Cumulative Volume Purged (L) | Temp. (degree C) | Electrical Conductivity (uMhos/cm) | pH | Eh (mv) | DO (mg/L) | Turbidity (NTU) |
|---|---|---|---|---|---|---|---|---|---|
| 1405 | 14.51 | 120 | -0- | 20.47 | 0.891 | 7.21 | 246.7 | 3.26 | 27.4 |
| 1415 | 14.69 | 120 | 1.8 | 19.53 | 0.984 | 7.05 | 248.7 | 2.46 | 25.3 |
| 1420 | 14.72 | 120 | 2.4 | 19.36 | 1.011 | 7.05 | 245.8 | 2.29 | 25.7 |
| 1425 | 14.70 | 120 | 3.0 | 19.21 | 1.027 | 7.05 | 243.3 | 2.26 | 17.0 |
| 1430 | 14.73 | 120 | 3.6 | 19.17 | 1.052 | 7.02 | 239.0 | 2.14 | 11.8 |
| 1435 | 14.73 | 120 | 4.2 | 19.18 | 1.078 | 7.04 | 229.8 | 2.09 | 14.9 |
| 1440 | 14.73 | 120 | 4.8 | 19.19 | 1.122 | 6.98 | 222.6 | 2.09 | 9.3 |
| 1445 | 14.73 | 120 | 5.4 | 19.16 | 1.160 | 6.92 | 208.1 | 1.97 | 6.1 |

12

00079280

# GROUNDWATER SAMPLING FORM

Sheet 2 of 2

Water Quality Parameter Measurements (continued)

| Time | DTW (ft. BTOC) | Purge Rate (mL/min) | Cumulative Volume Purged (L) | Temp. (degree C) ±10% | ±3% Electrical Conductivity (uMhos/cm) | pH ±0.1 | Eh (mv) ±10 | DO (mg/L) ±10% | Turbidity (NTU) ±10% |
|---|---|---|---|---|---|---|---|---|---|
| 1450 | 14.73 | 120 | 6.0 | 19.09 | 1.195 | 6.90 | 182.4 | 1.89 | 4.2 |
| 1455 | 14.73 | 120 | 6.6 | 18.92 | 1.229 | 6.87 | 152.1 | 1.80 | 2.9 |
| 1500 | 14.72 | 120 | 7.2 | 18.97 | 1.246 | 6.87 | 138.6 | 1.72 | 3.1 |
| 1505 | 14.72 | 120 | 7.8 | 19.07 | 1.262 | 6.88 | 123.6 | 1.66 | 1.9 |
| 1510 | 14.72 | 120 | 8.4 | 19.02 | 1.296 | 6.87 | 112.1 | 1.59 | 0.5 |
| 1515 | 14.71 | 120 | 9.0 | 19.01 | 1.318 | 6.84 | 86.0 | 1.52 | 0.2 |
| 1520 | 14.71 | 120 | 9.6 | 18.92 | 1.356 | 6.83 | 71.9 | 1.47 | -0- |
| 1525 | 14.72 | 120 | 10.2 | 18.92 | 1.379 | 6.79 | 61.9 | 1.42 | 2.2 |
| 1530 | 14.72 | 120 | 10.8 | 18.94 | 1.401 | 6.79 | 57.4 | 1.36 | 0.6 |
| 1535 | 14.71 | 120 | 11.4 | 18.98 | 1.415 | 6.80 | 52.1 | 1.31 | -0- |

10 - exp. 20

2/22/07 ACB

## Sampling

Sampling beginning time: 1536 Sampling completion time: 1606

Water Quality Parameter Measurements

| Time | DTW (ft. BTOC) | Purge Rate (mL/min) | Cumulative Volume Purged (L) | Temp. (degree C) | Electrical Conductivity (uMhos/cm) | pH | Eh (mv) | DO (mg/L) | Turbidity (NTU) |
|---|---|---|---|---|---|---|---|---|---|
| 1610 | 14.71 | 120 | 4.2 | 19.25 | 1.583 | 6.91 | 59.6 | 2.09 | -0- |

2/22/07 ACB

## Sample Information

Sample ID: 50WW06-FEB 2007
Duplicate sample collected (Y/N): N
Split sample collected (Y/N): N
COC No(s): 10928 / 10929

Sample collection date/time: 1536 / 2/22/07
Duplicate sample ID: N/A
Split sample ID: N/A

| Requested Analysis | Method | Containers | Requested Analysis | Method | Containers |
|---|---|---|---|---|---|
| VOC-Full | 8260B | 3 VOAs | Sulfides | 376.2 | 1-500mL HDPE |
| Gasses | 175 | 3 VOAs | Anions | 300.0 | 1-1000mL HDPE |
| TOC | 415.1 | 3 VOAs | OHC | | 2-1 Liter Ambers |
| Perchlorate | 314.0 | 1-1000mL HDPE | | | |
| Alkalinity | 310.1 | 1-1000mL HDPE | | | |

Comments: Ferrous Iron 0.44 mg/L
Salinity 3.01

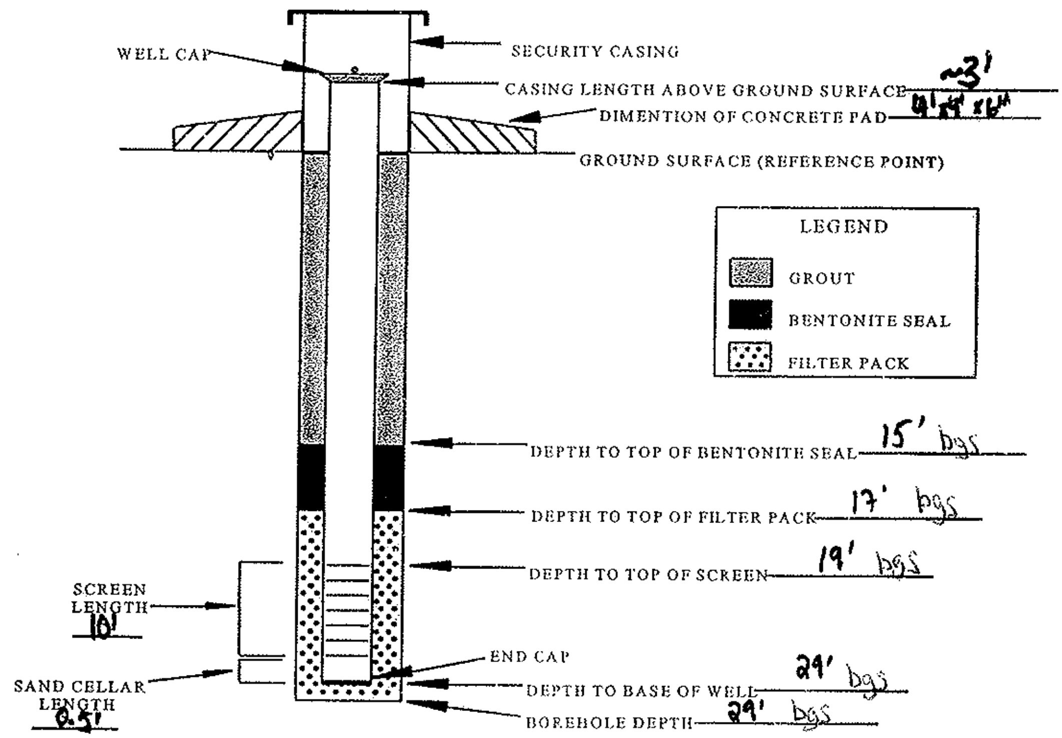
Abbreviations: BTOC - Below top of casing; DTW - Depth to water; H - head above pump intake; mL - milliliter; L - Liter

# WELL COMPLETION FORM (Stickup or Above Grade Completion Well)

FIELD REPRESENTATIVE: Allen Willmore
DRILLING CONTRACTOR: Jedi
DRILLING TECHNIQUE: Hollow Stem
AUGER SIZE AND TYPE:
BOREHOLE IDENTIFICATION: 50WW07
BOREHOLE DIAMETER: 8"
WELL IDENTIFICATION: 50WW07
WELL CONSTRUCTION START DATE: 2/11/08
WELL CONSTRUCTION COMPLETE DATE: 2/11/08
SCREEN MATERIAL: SCH 40 PVC
SCREEN DIAMETER: 4"
STRATUM-SCREENED INTERVAL (FT):
CASING MATERIAL: SCH 40 PVC
CASING DIAMETER: 4"

TYPE OF FILTER PACK: Silica Sand
GRADIATION: 20/40
AMOUNT OF FILTER PACK USED: 7 - 50 lb bags
TYPE OF BENTONITE: Bentonite chips
AMOUNT BENTONITE USED: 4 - 50 lb bucket
TYPE OF CEMENT: Portland - Cement
AMOUNT CEMENT USED: 8 - 96 lb bags
GROUT MATERIALS USED: bentonite slurry
DIMENSIONS OF SECURITY CASING: 8" x 8"
TYPE OF WELL CAP: plugging cap
TYPE OF END CAP: PVC 4" cap
COMMENTS:

SPECIAL CONDITIONS
(describe and draw)




NOT TO SCALE

INSTALLED BY: Oscar Garcia (Jedi) INSTALLATION OBSERVED BY: Allen Willmore (Shaw)

DISCREPANCIES: None

00079282

HOLE NO. 50WW07

| DRILLING LOG | DIVISION FEDERAL | INSTALLATION LHAAP | SHEET 1 OF 2 SHEETS |
|---|---|---|---|
| 1. PROJECT LHAAP | | 10. SIZE AND TYPE OF BIT 8" | |
| 2. LOCATION (Coordinates or Station) LHAAP-50 | | 11. DATUM FOR ELEVATION SHOWN (TBM or MSL) MSL | |
| 3. DRILLING AGENCY JEDI | | 12. MANUFACTURER'S DESIGNATION OF DRILL CME 75 | |
| 4. HOLE NO. (As shown on drawing title and file number) 50WW07 | — | 13. OVERBURDEN SAMPLES | DISTURBED YES / UNDISTURBED |
| 5. NAME OF DRILLER Oscar Garcia | | 14. TOTAL NUMBER CORE BOXES NA | |
| 6. DIRECTION OF HOLE ☑ VERTICAL ☐ INCLINED 0° DEG. FROM VERT. | | 15. ELEVATION GROUND WATER NR | |
| | | 16. DATE HOLE | STARTED 2/11/08 / COMPLETED 2/11/08 |
| 7. THICKNESS OF OVERBURDEN NA | | 17. ELEVATION TOP OF HOLE NR | |
| 8. DEPTH DRILLED INTO ROCK NA | | 18. TOTAL CORE RECOVERY FOR BORING NA % | |
| 9. TOTAL DEPTH OF HOLE 29' | | Allen Willmore INSPECTOR | |

| ~~ELEVATION~~ PID (a) | DEPTH (b) | LEGEND (c) | CLASSIFICATION OF MATERIALS (Description) (d) | % CORE RECOVERY (e) | BOX OR SAMPLE NO. (f) | REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) (g) |
|---|---|---|---|---|---|---|
| | | CL | CLAY, SOFT, LOW PLASTICITY, sandy, moist no odor, grayish brown w/ orange-red mottling - becomes dry hard | 100% | | Used 4' split spoon to sample (2"Ø) 10:45 - Began drilling Well set @ 29' bgs w/ 10' of screen. |
| | 5 | | | 100% | | |
| | | SC | Sand, clayey, dense, well-sorted, gray iron staining, dry to sl. moist, no odor | 100% | | -2' long 2" split spoon from 8' bgs to 10' bgs |
| | 10 | CL | CLAY, SILTY, STIFF TO HARD, NO PLASTICITY, DRY, MOTTLING, GRAY, NO ODOR. | | | |
| | | | SAND, clayey, dense, well-sorted, gray iron staining, slightly moist to moist, no odor | 100% | | |

| DRILLING LOG (Cont Sheet) | ELEVATION TOP OF HOLE NR | Hole No. 50WW07 |
|---|---|---|
| PROJECT LONGHORN AAP | INSTALLATION LHAAP | SHEET 2 OF 2 SHEETS |

| PID ~~ELEVATION~~ a | DEPTH b | LEGEND c | CLASSIFICATION OF MATERIALS (Description) d | % CORE RECOVERY e | BOX OR SAMPLE NO. f | REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g |
|---|---|---|---|---|---|---|
| | | CL | CLAY, SANDY, STIFF TO HARD, NO PLAST. non staining, dry, no odor. - Becomes silty | 100% | | |
| | 15 | | | | | |
| | | SC | SAND, CLAYEY, DENSE, WELL SORTED, REDDISH ORANGE MOTTLING (IRON STAINING), MOIST, NO ODOR | 100% | | |
| | | | - LESS IRON STAINING | | | |
| | 20 | | | 100% | | |
| | | | | 100% | | |
| | 25 | | | 100% | | |
| | | CL | CLAY, SANDY, DENSE, HARD, GRAY, DAMP TO DRY, NO ODOR | 100% | | |

ENG FORM 1836—A PREVIOUS EDITIONS ARE OBSOLETE. MAR 71

END OF BORING @ 29'

PROJECT LONGHORN | HOLE NO. 50WW07

00079284

# WELL DEVELOPMENT RECORD

WELL/PIEZOMETER ID 50WW07
SHEET 1 of 1

PROJECT NAME: LHAAP PROJECT NO.: 117591 DATE: 2/18/08

LOCATION: Karnack, TX DATE INSTALLED: 2/11/08

TOTAL DEPTH (FTOC) 31.58 CASING DIAMETER 4"

METHODS OF DEVELOPMENT

☐ Swabbing ☐ Bailing ☑ Pumping ☐ Describe Air lift

Equipment decontaminated prior to development ☐ Yes ☐ NO

Describe ~~YSI 650 MDS~~ (AW)

EQUIPMENT NUMBERS:

pH Meter YSI 650 MDS 36919 EC Meter YSI 650 MDS 36919 Turbidity Meter YSI 650 MDS 36919 Thermometer YSI 650 MDS 36919

CASING VOLUME INFORMATION:

| Casing ID (inch) | 1.0 | 1.5 | 2.0 | 2.2 | 3.0 | 4.0 | 4.3 | 5.0 | 6.0 | 7.0 | 8.0 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Unit Casing Volume (A) (gal/ft) | 0.04 | 0.09 | 0.16 | 0.2 | 0.37 | 0.65 | 0.75 | 1.0 | 1.5 | 2.0 | 2.6 |

PURGING INFORMATION:

Measured Well Depth (B) ~29 (used for calculations) 3158 (actual) ft.

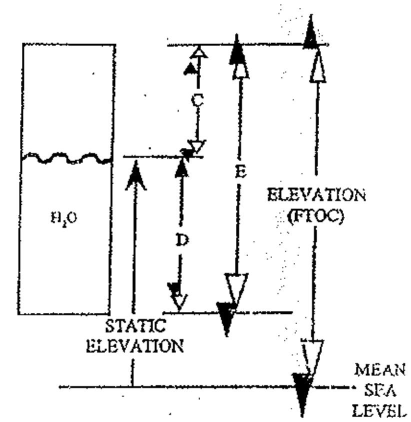
Measured Water Level Depth (C) ~19 ft.

Length of Static Water Column (D) 29 (B) - 19 (C) = 10 ft.

Casing Water Volume (E) = 0.64 (A) x 10 (D) = 6.4 gal

5 x 6.4 = 32 gallons

Total Purge Volume = 40 (gal)




| Date | Time | Water Level (FTOC) | Volume Removed (gal) | pH | EC | Temperature F or C | Turbidity/ Sand (ppm) | Comments |
|---|---|---|---|---|---|---|---|---|
| 2/18/08 | 15:05 | NR | 18 | 8.03 | 1.469 | 18.17 | 48.4 | grayish |
| 2/18/08 | 15:15 | NR | 25 | 8.28 | 1.583 | 17.86 | 17.3 | clear |
| 2/18/08 | 15:20 | NR | 32 | 8.33 | 1.586 | 17.76 | 10.5 | clear |
| 2/18/08 | 15:28 | NR | 38 | 8.39 | 1.641 | 17.63 | 7.1 | clear |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |

FIGURE 5

First 2 hours not recorded

00079285 50WW07

# GROUNDWATER SAMPLING FORM

Sheet 1 of 2

Shaw®

Operable Unit/Site ID: 50
Project Name/#: Longhorn
Weather: Ptly cloudy 50's

Sampling location ID: 50WW07
Sample ID: 50WW07-021908
Collection Time/Date: 11:15 / 02-19-08

## Pump Installation

Pump installation crew: A. Willmore
PID/FID reading (well head/background): 0.0
Casing diameter (inches): 4"
Total well Depth (ft. BTOC): 31.58
Initial (pre-installation) DTW/time: 23.00
Final (after pump priming) DTW/time: NA
Free product (circle): LNAPL / DNAPL
Volume of water removed during priming (mL): NR
Discharge tube length (ft.): ~28

Installation date/beginning time: 2-19-08 10:42
Installation date/completion time: 2-19-08 10:45
Screen Interval (ft. BTOC): 22 to 32
Pump intake depth (ft BTOC): ~~28~~ 37
Post-installation DTW/time: 23.09
Max. sustainable pump rate (mL/min): 100
Appearance of product: Non
Discharge tube diameter (3/8" or 1/4"): 1/4
Inlet reducer used (Y/N): N

**Pneumatic Controller Tuning:**
Initial air pressure = H (ft.) X 0.43 = NR psi

| | Initial | 2 | 3 | 4 | 5 | 6 | 7 | 8 | Final |
|---|---|---|---|---|---|---|---|---|---|
| Pressure (psi) | | | | | | | | | |
| Refill Setting | | | | | | | | | |
| Discharge Setting | | | | | | | | | |
| Flow rate (mL/min) | | | | | | | | | |

2/19/08

## Purging

Purging/sampling crew: A. Willmore
Purge date/beginning time: 2-19-08
Initial (pre-purging) DTW (ft. BTOC): 23.09
Calculated tubing + pump volume: NA

PID/FID reading (well head/background): 0.0
Purge date/completion time: 2-19-08
Final (post-purging) DTW (ft. BTOC): 23.06
No. of tubing + pump volumes purged: NA

**Pneumatic Controller Tuning:**
Initial air pressure = H (ft.) X 0.43 = NR psi

| | Initial | 2 | 3 | 4 | 5 | 6 | 7 | 8 | Final |
|---|---|---|---|---|---|---|---|---|---|
| Pressure (psi) | 25 | | | | | | | | 25 |
| Refill Setting | 10 | | | | | | | | 10 |
| Discharge Setting | 5 | | | | | | | | 5 |
| Flow rate (mL/min) | 100 | | | | | | | | 100 |

### Water Quality Parameter Measurements

| Time | DTW (ft. BTOC) | Purge Rate (mL/min) | Cumulative Volume Purged (L) | Temp. (degree C) | Electrical Conductivity (uMhos/cm) | pH | Eh (mv) | DO (mg/L) | Turbidity (NTU) |
|---|---|---|---|---|---|---|---|---|---|
| 10:55 | 23.06 | 100 | 0.5 | 21.07 | 1,721 | 7.00 | 71.3 | 4.17 | 6.1 |
| 11:00 | 23.06 | 100 | 1.0 | 21.08 | 1,722 | 7.01 | 72.9 | 4.21 | 4.1 |
| 11:05 | 23.06 | 100 | 1.5 | 21.02 | 1719 | 7.01 | 73.6 | 4.22 | 3.2 |
| 11:10 | 23.06 | 100 | 2.0 | 21.01 | 1718 | 7.02 | 73.4 | 4.20 | 3.0 |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |

2/19/08

00079286 5OWW07

# GROUNDWATER SAMPLING FORM

Shaw



Water Quality Parameter Measurements (continued)

| Time | DTW (ft. BTOC) | Purge Rate (mL/min) | Cumulative Volume Purged (L) | Temp. (degree C) ±10% | Electrical Conductivity (uMhos/cm) ±3% | pH ±0.1 | Eh (mv) ±10 | DO (mg/L) ±10% | Turbidity (NTU) ±10% |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | |

10% / 20

2/19/08

## Sampling

Sampling beginning time: 11:15

Sampling completion time: 11:20

Water Quality Parameter Measurements

| Time | DTW (ft. BTOC) | Purge Rate (mL/min) | Cumulative Volume Purged (L) | Temp. (degree C) | Electrical Conductivity (uMhos/cm) | pH | Eh (mv) | DO (mg/L) | Turbidity (NTU) |
|---|---|---|---|---|---|---|---|---|---|
| 11:30 | 23.06 | 100 | 3.5 | 21.02 | 1.717 | 7.03 | 73.2 | 4.20 | 3.4 |

## Sample Information

Sample ID: 50WW07-021908

Sample collection date/time: 2-19-08 11:20

Duplicate sample collected (Y/N): N

Duplicate sample ID: NA

Split sample collected (Y/N): N

Split sample ID: NA

COC No(s): NR

| Requested Analysis | Method | Containers | Requested Analysis | Method | Containers |
|---|---|---|---|---|---|
| VOCs | 8260 | 3 - 40 mL Voa vials | | | |

Comments: Stailess - steel cased bladder pump used for purging and sampling

Abbreviations: BTOC - Below top of casing; DTW - Depth to water; H - head above pump intake; mL - milliliter; L - Liter

# *Appendix C*

# *Basis of Estimate for LHAAP-50 Remediation*

# Alternative 2, Excavation, MNA, LUCs
# Present Value

**COMPANY NAME: SHAW E&I**
**PROJECT LOCATION: KARNACK, TEXAS** **KARNACK, TEXAS** **DATE: December 2009**

| Year | FY | Capital Costs | | O & M Costs | | | | Present Value (NPV) | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | Discount Rate | Capital | O & M |
| | | MNA | Excavation | MNA | LTM | | Total | 2.8% | | |
| 1 | 2007 | 81,755 | 133,362 | 47,416 | | | 47,416 | NPV | $ 215,117 | $ 423,631 |
| 2 | 2008 | | | 47,416 | | | 47,416 | | | |
| 3 | 2009 | | | | 24,064 | | 24,064 | Total Capital and O&M | | $ 638,748 |
| 4 | 2010 | | | | 24,064 | | 24,064 | | | |
| 5 | 2011 | | | | 66,589 | | 66,589 | | | |
| 6 | 2011 | | | | 15,302 | | 15,302 | | | |
| 7 | 2012 | | | | 15,302 | | 15,302 | | | |
| 8 | 2013 | | | | 15,302 | | 15,302 | | | |
| 9 | 2014 | | | | 15,302 | | 15,302 | | | |
| 10 | 2015 | | | | 57,827 | | 57,827 | | | |
| 11 | 2016 | | | | | | 0 | | | |
| 12 | 2017 | | | | | | 0 | | | |
| 13 | 2018 | | | | | | 0 | | | |
| 14 | 2019 | | | | | | 0 | | | |
| 15 | 2020 | | | | 57,827 | | 57,827 | | | |
| 16 | 2021 | | | | | | 0 | | | |
| 17 | 2022 | | | | | | 0 | | | |
| 18 | 2023 | | | | | | 0 | | | |
| 19 | 2024 | | | | | | 0 | | | |
| 20 | 2025 | | | | 57,827 | | 57,827 | | | |
| 21 | 2026 | | | | | | 0 | | | |
| 22 | 2027 | | | | | | 0 | | | |
| 23 | 2028 | | | | | | 0 | | | |
| 24 | 2029 | | | | | | 0 | | | |
| 25 | 2030 | | | | 57,827 | | 57,827 | | | |
| 26 | 2031 | | | | | | 0 | | | |
| 27 | 2032 | | | | | | 0 | | | |
| 28 | 2033 | | | | | | 0 | | | |
| 29 | 2034 | | | | | | 0 | | | |
| 30 | 2035 | | | | 57,827 | | 57,827 | | | |
| | | | 215,117 | 94,832 | 465,055 | | 559,887 | | | |

Note:

Discount rate of 2.8% is based on the Office of Management and Budget Circular No. A-94, January 2008.

# Alternative 2, Excavation Activities

**COMPANY NAME:** SHAW E&I
**PROJECT LOCATION:** KARNACK, TEXAS
**DATE:** December 2009

| Item | | | | LABOR | | | | | MATERIAL | | EQUIPMENT | | SUBCONTRACT | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| NO | DESCRIPTION | QTY | UNIT | UNIT MH | TOTAL MH | CRAFT | $/MH | $ VALUE | $/UNIT | $ VALUE | $/UNIT | $ VALUE | $/UNIT | $ VALUE | TOTAL ($) |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | **Year 1** | | | | | | | | | | | | | | |
| | **Capital costs** | | | | | | | | | | | | | | |
| 1 | Develop Work Plans/Design | 1 | ea | 300 | 300 | eng | 81.60 | 24,480 | 500 | 500 | | | | | 24,980 |
| 2 | Waste Characterization | 1 | ea | 8 | 8 | chem | 71.20 | 570 | 50 | 50 | | | | | 620 |
| | Waste Characterization | 2 | ea | 16 | 32 | tech | 34.30 | 1,098 | 400 | 800 | 200 | 400 | 1,500 | 3,000 | 5,298 |
| 3 | Mobilization/Demobilization | 2 | ea | 16 | 32 | spr/tech/hs | 89.90 | 2,877 | 327 | 654 | 500 | 1,000 | 4,500 | 9,000 | 13,531 |
| 4 | Clear and Grub | 1 | ea | | | | | | | | | | 1,500 | 1,500 | 1,500 |
| 5 | Soil Excavation Activities | 3 | dy | 20 | 60 | spr/tech/hs | 89.90 | 5,394 | 652 | 1,956 | 500 | 1,500 | 700 | 2,100 | 10,950 |
| 6 | Transport and Disposal | 13 | load | | | | | | 100 | 1,300 | | | 600 | 7,800 | 9,100 |
| 7 | Confirmation Sampling (VOCs, perchlorate) | 7 | ea | | | | | | 50 | 350 | | | 500 | 3,500 | 3,850 |
| 8 | Site Restoration | 195 | cy | | | | | | 100 | 19,500 | | | 10 | 1,950 | 21,450 |
| 9 | Closeout Report | 1 | ea | 200 | 200 | eng | 81.60 | 16,320 | 500 | 500 | | | | | 16,820 |
| | | | | | | | | | | | | | | | |
| | **Capital Costs Subtotal** | | | | | | | **50,738** | | **25,610** | | **2,900** | | **28,850** | **108,098** |
| | Taxes @ 6.5 % | | | | | | | | | 1,665 | | | | | 1,665 |
| | **Subtotal** | | | | | | | | | | | | | | **109,763** |
| | Indirects @ 21.5% | | | | | | | | | | | | | | 23,599 |
| | **Year 1 total Capitol costs** | | | | | | | | | | | | | | **$ 133,362** |
| | | | | | | | | | | | | | | | |

# Alternative 2, MNA/LUCs

**COMPANY NAME:** SHAW E&I **DATE:** December 2009
**PROJECT LOCATION:** KARNACK, TEXAS

| Item NO | DESCRIPTION | QTY | UNIT | UNIT MH | TOTAL MH | LABOR CRAFT | LABOR $/MH | LABOR $ VALUE | MATERIAL $/UNIT | MATERIAL $ VALUE | EQUIPMENT $/UNIT | EQUIPMENT $ VALUE | SUBCONTRACT $/UNIT | SUBCONTRACT $ VALUE | TOTAL ($) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Assumes monitoring of 3 existing and 2 new wells | | | | | | | | | | | | | | |
| | **Year 1** | | | | | | | | | | | | | | |
| | **Capital costs** | | | | | | | | | | | | | | |
| 1 | Allowance for Legal Fees, Administration Controls, and Documentation | 1 | lot | | | | | | | | | | 15,000 | 15,000 | 15,000 |
| 2 | Establish initial database, licenses, work plans | 1 | ea | 300 | 300 | eng | 81.60 | 21,000 | 5,000 | 5,000 | | | 5000 | 5,000 | 31,000 |
| 3 | Geoprobe install additional monitoring wells | 2 | ea | 40 | 80 | geol | 71.20 | 5,696 | 1,500 | 3,000 | 36 | 72 | 6000 | 12,000 | 20,768 |
| | **Capital Costs Subtotal** | | | | | | | **26,696** | | **8,000** | | **72** | | **32,000** | **66,768** |
| | Taxes @ 6.5 % | | | | | | | | | 520 | | | | | 520 |
| | **Subtotal** | | | | | | | | | | | | | | **67,288** |
| | Indirects @ 21.5% | | | | | | | | | | | | | | 14,467 |
| | **Year 1 total Capital costs** | | | | | | | | | | | | | | $ **81,755** |
| | **Years 1 and 2 Monitoring (under O&M costs)** | | | | | | | | | | | | | | |
| 1 | Collect and prepare samples quarterly (GW) | 48 | ea | 16 | 768 | tech | 34.30 | 26,340 | 110 | 5,280 | 36 | 1,728 | | | 33,348 |
| 2 | Sample analysis (VOCs, perchlorate, MNA) | 48 | ea | | | | | | | | | | 700 | 33,600 | 33,600 |
| 3 | Annual report | 2 | ea | 64 | 128 | eng | 81.60 | 10,440 | 150 | 300 | | | | | 10,740 |
| | **Subtotal** | | | | | | | **36,780** | | **5,580** | | **1,728** | | **33,600** | **77,688** |
| | Taxes @ 6.5 % | | | | | | | | | 363 | | | | | 363 |
| | **Subtotal** | | | | | | | | | | | | | | **78,051** |
| | Indirects @ 21.5% | | | | | | | | | | | | | | 16,781 |
| | **Years 1 and 2 Total Cost** | | | | | | | | | | | | | | **94,832** |
| | **Annual Cost** | | | | | | | | | | | | | | $ **47,416** |
| | **Years 3 and 4 LTM** | | | | | | | | | | | | | | |
| 1 | Collect and prepare samples semiannually | 24 | ea | 16 | 384 | tech | 34.30 | 13,171 | 110 | 2,640 | 36 | 864 | | | 16,675 |
| 2 | Sample analysis (VOCs and perchlorate) | 24 | ea | | | | | | | | | | 500 | 12,000 | 12,000 |
| 3 | Annual report | 2 | ea | 64 | 128 | eng | 81.60 | 10,445 | 150 | 300 | | | | | 10,745 |
| | **Subtotal** | | | | | | | **23,616** | | **2,940** | | **864** | | **12,000** | **39,420** |
| | Taxes @ 6.5 % | | | | | | | | | 191 | | | | | 191 |
| | **Subtotal** | | | | | | | | | | | | | | **39,611** |
| | Indirects @ 21.5% | | | | | | | | | | | | | | 8,516 |
| | **Years 3 and 4 Total Cost** | | | | | | | | | | | | | | **48,127** |
| | **Annual Cost** | | | | | | | | | | | | | | $ **24,064** |

# Alternative 2, MNA/LUCs

**COMPANY NAME:** SHAW E&I **DATE:** December 2009
**PROJECT LOCATION:** KARNACK, TEXAS

| Item | | | | LABOR | | | | | MATERIAL | | EQUIPMENT | | SUBCONTRACT | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| NO | DESCRIPTION | QTY | UNIT | UNIT MH | TOTAL MH | CRAFT | $/MH | $ VALUE | $/UNIT | $ VALUE | $/UNIT | $ VALUE | $/UNIT | $ VALUE | TOTAL ($) |
| | **Year 5 LTM** | | | | | | | | | | | | | | |
| 1 | Collect and prepare samples semiannually | 12 | ea | 16 | 192 | tech | 34.30 | 6,586 | 110 | 1,320 | 36 | 432 | | | 8,338 |
| 2 | Sample analysis (VOCs and perchlorate) | 12 | ea | | | | | | | | | | 500 | 6,000 | 6,000 |
| 3 | Annual report | 1 | ea | 64 | 64 | eng | 81.60 | 5,222 | 150 | 150 | | | | | 5,372 |
| 4 | Five Year report/inspection | 1 | ea | | | | | | | | | | 35,000 | 35,000 | 35,000 |
| | **Subtotal** | | | | | | | **11,808** | | **1,470** | | **432** | | **41,000** | **54,710** |
| | Taxes @ 6.5 % | | | | | | | | | 96 | | | | | 96 |
| | **Subtotal** | | | | | | | | | | | | | | **54,806** |
| | Indirects @ 21.5% | | | | | | | | | | | | | | 11,783 |
| | **Year 5 Total Cost** | | | | | | | | | | | | | | **$ 66,589** |
| | **Years 6 through 9 LTM** | | | | | | | | | | | | | | |
| 1 | Collect and prepare samples Annually | 24 | ea | 16 | 384 | tech | 34.30 | 13,171 | 110 | 2,640 | 36 | 864 | | | 16,675 |
| 2 | Sample analysis (VOCs and perchlorate) | 24 | ea | | | | | | | | | | 500 | 12,000 | 12,000 |
| 3 | Annual report | 4 | ea | 64 | 256 | eng | 81.60 | 20,890 | 150 | 600 | | | | | 21,490 |
| | **Subtotal** | | | | | | | **34,061** | | **3,240** | | **864** | | **12,000** | **50,165** |
| | Taxes @ 6.5 % | | | | | | | | | 211 | | | | | 211 |
| | **Subtotal** | | | | | | | | | | | | | | **50,375** |
| | Indirects @ 21.5% | | | | | | | | | | | | | | 10,831 |
| | **Years 6 through 9 Total Cost** | | | | | | | | | | | | | | **61,206** |
| | **Annual Cost** | | | | | | | | | | | | | | **$ 15,302** |
| | **Year 10 LTM** | | | | | | | | | | | | | | |
| 1 | Collect and prepare samples Annually | 6 | ea | 16 | 96 | tech | 34.30 | 3,293 | 110 | 660 | 36 | 216 | | | 4,169 |
| 2 | Sample analysis (VOCs and perchlorate) | 6 | ea | | | | | | | | | | 500 | 3,000 | 3,000 |
| 3 | Annual report | 1 | ea | 64 | 64 | eng | 81.60 | 5,222 | 150 | 150 | | | | | 5,372 |
| 4 | Five Year report/inspection | 1 | ea | | | | | | | | | | 35,000 | 35,000 | 35,000 |
| | **Subtotal** | | | | | | | **8,515** | | **810** | | **216** | | **38,000** | **47,541** |
| | Taxes @ 6.5 % | | | | | | | | | 53 | | | | | 53 |
| | **Subtotal** | | | | | | | | | | | | | | **47,594** |
| | Indirects @ 21.5% | | | | | | | | | | | | | | 10,233 |
| | **Year 10 Total Cost** | | | | | | | | | | | | | | **$ 57,827** |

# Alternative 2, MNA/LUCs

**COMPANY NAME:** **SHAW E&I** **DATE:** December 2009
**PROJECT LOCATION:** **KARNACK, TEXAS**

| Item | | | | LABOR | | | | | MATERIAL | | EQUIPMENT | | SUBCONTRACT | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| NO | DESCRIPTION | QTY | UNIT | UNIT MH | TOTAL MH | CRAFT | $/MH | $ VALUE | $/UNIT | $ VALUE | $/UNIT | $ VALUE | $/UNIT | $ VALUE | TOTAL ($) |
| | **Years 15, 20, 25, and 30 LTM** | | | | | | | | | | | | | | |
| | **Cost for one event** | | | | | | | | | | | | | | |
| 1 | Collect and prepare samples once every 5 yrs | 6 | ea | 16 | 96 | tech | 34.30 | 3,293 | 110 | 660 | 36 | 216 | | | 4,169 |
| 2 | Sample analysis (VOCs and perchlorate) | 6 | ea | | | | | | | | | | 500 | 3,000 | 3,000 |
| 3 | Event report | 1 | ea | 64 | 64 | eng | 81.60 | 5,222 | 150 | 150 | | | | | 5,372 |
| 4 | Five Year report/inspection | 1 | ea | | | | | | | | | | 35,000 | 35,000 | 35,000 |
| | **Subtotal** | | | | | | | **8,515** | | **810** | | **216** | | **103,000** | **47,541** |
| | Taxes @ 6.5 % | | | | | | | | | 53 | | | | | 53 |
| | **Subtotal** | | | | | | | | | | | | | | **47,594** |
| | Indirects @ 21.5% | | | | | | | | | | | | | | 10,233 |
| | **Total for 1 Event** | | | | | | | | | | | | | | **$ 57,827** |
| | **Years 15, 20, 25, and 30 Total Cost** | | | | | | | | | | | | | | **231,306** |

# Alternative 3, Excavation, In Situ Bioremediation, LUCs
# Present Value

**COMPANY NAME:** SHAW E&I
**PROJECT LOCATION:** KARNACK, TEXAS **DATE:** DECEMBER 2009

| Year | FY | Capital Costs | | | O & M Costs | | | | Present Value (NPV) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Bioremediation | Work Plans and New Wells | Excavation | Monitoring | Bioremed | | Total | Discount Rate | Capital | O & M |
| 1 | 2008 | 182,569 | 85,983 | 133,362 | 41,584 | | | 41,584 | 2.8% | | |
| 2 | 2009 | | | | 41,584 | 102,368 | | 143,952 | **NPV** | **401,914** | **511,706** |
| 3 | 2010 | | | | 24,064 | | | 24,064 | | | |
| 4 | 2011 | | | | 24,064 | | | 24,064 | | | |
| 5 | 2012 | | | | 66,589 | | | 66,589 | **Total Capital and O&M** | | **$913,620** |
| 6 | 2013 | | | | 15,302 | | | 15,302 | | | |
| 7 | 2014 | | | | 15,302 | | | 15,302 | | | |
| 8 | 2015 | | | | 15,302 | | | 15,302 | | | |
| 9 | 2016 | | | | 15,302 | | | 15,302 | | | |
| 10 | 2017 | | | | 57,827 | | | 57,827 | | | |
| 11 | 2018 | | | | | | | 0 | | | |
| 12 | 2019 | | | | | | | 0 | | | |
| 13 | 2020 | | | | | | | 0 | | | |
| 14 | 2021 | | | | | | | 0 | | | |
| 15 | 2022 | | | | 57,827 | | | 57,827 | | | |
| 16 | 2023 | | | | | | | 0 | | | |
| 17 | 2024 | | | | | | | 0 | | | |
| 18 | 2025 | | | | | | | 0 | | | |
| 19 | 2026 | | | | | | | 0 | | | |
| 20 | 2027 | | | | 57,827 | | | 57,827 | | | |
| 21 | 2028 | | | | | | | 0 | | | |
| 22 | 2029 | | | | | | | 0 | | | |
| 23 | 2030 | | | | | | | 0 | | | |
| 24 | 2031 | | | | | | | 0 | | | |
| 25 | 2032 | | | | 57,827 | | | 57,827 | | | |
| 26 | 2033 | | | | | | | 0 | | | |
| 27 | 2034 | | | | | | | 0 | | | |
| 28 | 2035 | | | | | | | 0 | | | |
| 29 | 2036 | | | | | | | 0 | | | |
| 30 | 2037 | | | | 57,827 | | | 57,827 | | | |
| | | | | 401,914 | 548,223 | 102,368 | | 650,591 | | | |

Note:

Discount rate of 2.8% is based on the Office of Management and Budget Circular No. A-94, January 2008.

# Alternative 3, Excavation Activities

**COMPANY NAME:** **SHAW E&I**
**PROJECT LOCATION:** **KARNACK, TEXAS** **DATE:** **DECEMBER 2009**

| Item | | | | | | LABOR | | | MATERIAL | | EQUIPMENT | | SUBCONTRACT | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **NO** | **DESCRIPTION** | **QTY** | **UNIT** | **UNIT MH** | **TOTAL MH** | **CRAFT** | **$/MH** | **$ VALUE** | **$/UNIT** | **$ VALUE** | **$/UNIT** | **$ VALUE** | **$/UNIT** | **$ VALUE** | **TOTAL ($)** |
| | **Year 1 - Excavation Capital Costs** | | | | | | | | | | | | | | |
| 1 | Develop Work Plans/Design | 1 | ea | 300 | 300 | eng | 81.60 | 24,480 | 500 | 500 | | | | | 24,980 |
| 2 | Waste Characterization | 1 | ea | 8 | 8 | chem | 71.20 | 570 | 50 | 50 | | | | | 620 |
| | | 2 | ea | 16 | 32 | tech | 34.30 | 1,098 | 400 | 800 | 200 | 400 | 1,500 | 3,000 | 5,298 |
| 3 | Mobilization/Demobilization | 2 | ea | 16 | 32 | spr/tech/hs | 89.90 | 2,877 | 327 | 654 | 500 | 1,000 | 4,500 | 9,000 | 13,531 |
| 4 | Clear and Grub | 1 | ea | | | | | | | | | | 1,500 | 1,500 | 1,500 |
| 5 | Soil Excavation Activities | 3 | dy | 20 | 60 | spr/tech/hs | 89.90 | 5,394 | 652 | 1,956 | 500 | 1,500 | 700 | 2,100 | 10,950 |
| 6 | Transport and Disposal | 13 | load | | | | | | 100 | 1,300 | | | 600 | 7,800 | 9,100 |
| 7 | Confirmation Sampling | 7 | ea | | | | | | 50 | 350 | | | 500 | 3,500 | 3,850 |
| 8 | Site Restoration | 195 | cy | | | | | | 100 | 19,500 | | | 10 | 1,950 | 21,450 |
| 9 | Closeout Report | 1 | ea | 200 | 200 | eng | 81.60 | 16,320 | 500 | 500 | | | | | 16,820 |
| | **Capital Costs Subtotal** | | | | | | | **50,738** | | **25,610** | | **2,900** | | **28,850** | **108,098** |
| | Taxes @ 6.5 % | | | | | | | | | 1,665 | | | | | 1,665 |
| | **Subtotal** | | | | | | | | | | | | | | **109,763** |
| | Indirects @ 21.5% | | | | | | | | | | | | | | 23,599 |
| | **Year 1 total Capitol Excavation Costs** | | | | | | | | | | | | | **$** | **133,362** |

# Alternative 3, In Situ Bioaugmentation

**COMPANY NAME:** SHAW E&I
**PROJECT LOCATION:** KARNACK, TEXAS
**DATE:** DECEMBER 2009

| Item | | | | LABOR | | | | | MATERIAL | | EQUIPMENT | | SUBCONTRACT | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| NO | DESCRIPTION | QTY | UNIT | UNIT MH | TOTAL MH | CRAFT | $/MH | $ VALUE | $/UNIT | $ VALUE | $/UNIT | $ VALUE | $/UNIT | $ VALUE | TOTAL ($) |
| | **Field Work in Year 1 - Capital Costs** | | | | | | | | | | | | | | |
| 1 | Work plans, safety plans | 1 | ea | 240 | 240 | eng | 81.60 | 19,584 | 200 | 200 | | | | | 19,784 |
| 2 | UIC Permit and Design | 1 | ea | 160 | 160 | eng/geol | 91.50 | 14,640 | 200 | 200 | | | | | 14,840 |
| 3 | Treatability/Pilot Study | 1 | ea | 120 | 120 | eng | 81.60 | 9,792 | 200 | 200 | | | | | 9,992 |
| | Treatability/Pilot Sample Collection | 1 | hr | 50 | 50 | eng/geol | 91.50 | 4,575 | | | | | | | 4,575 |
| | Driller for Treatability/Pilot Sampling | 3 | wells | | | | | | | | | | 3150 | 9,450 | 9,450 |
| | Per Diem and Travel Costs | 5 | days | | | | | | 159 | 795 | 80.00 | 400 | | | 1,195 |
| | Mob / Demob | 1 | ea | 40 | 40 | eng | 81.60 | 3,264 | 1,200 | 1,200 | 1,000 | 1,000 | | | 5,464 |
| 4 | Field H&S | 1 | hr | 80 | 80 | h/s | 55.70 | 4,456 | 50 | 50 | 160 | 160 | | | 4,666 |
| 5 | Field Super/Geolog | 1 | hr | 60 | 60 | geol | 71.20 | 4,272 | | | 2,825 | 2,825 | | | 7,097 |
| 6 | Vehicles | 14 | day | | | | | | 10 | 140 | 80 | 1,120 | | | 1,260 |
| 7 | Per Diem | 37 | day | | | | | | | | | | 109 | 4,033 | 4,033 |
| 8 | Driller Mob/Demob | 2 | ea | | | | | | | | | | 2400 | 4,800 | 4,800 |
| 9 | Install injection wells, 30' dpt, 2" dia. | 5 | ea | | | | | | | | | | 3,150 | 15,750 | 15,750 |
| 10 | Well survey | 1 | ea | | | | | | | | | | 3,000 | 3,000 | 3,000 |
| 11 | Well drill waste disposal | 3 | drum | | | | | | | | | | 250 | 750 | 750 |
| 12 | Collect & prepare well waste drum samples | 3 | ea | 12 | 36 | tech | 34.30 | 1,235 | 60 | 180 | 36 | 108 | | | 1,523 |
| 13 | Sample analysis (waste char) | 2 | ea | | | | | | | | | | 1,500 | 3,000 | 3,000 |
| 14 | Bioaugmentation materials | 1 | ea | 40 | 40 | eng tech | 65.70 | 2,628 | 30,360 | 30,360 | 1500 | 1,500 | | | 34,488 |
| 15 | Collect and prepare samples (2 times) | 2 | ea | 16 | 32 | tech | 34.30 | 1,098 | 122 | 244 | 36 | 72 | | | 1,414 |
| 16 | Sample analysis (VOCs and perchlorate) | 2 | ea | | | | | | | | | | 500 | 1,000 | 1,000 |
| | **Subtotal** | | | | | | | **65,543** | | **33,569** | | **7,185** | | **41,783** | **148,080** |
| | Taxes @ 6.5 % | | | | | | | | | 2,182 | | | | | 2,182 |
| | **Subtotal** | | | | | | | | | | | | | | **150,262** |
| | Indirects @ 21.5% | | | | | | | | | | | | | | 32,306 |
| | **Year 1 Total Capital Costs** | | | | | | | | | | | | | | **$ 182,569** |

# Alternative 3, Bioaugmentation Operations and Maintenance

**COMPANY NAME:** **SHAW E&I**
**PROJECT LOCATION:** **KARNACK, TEXAS** **DATE:** **DECEMBER 2009**

| Item NO | DESCRIPTION | QTY | UNIT | UNIT MH | TOTAL MH | LABOR CRAFT | LABOR $/MH | LABOR $ VALUE | MATERIAL $/UNIT | MATERIAL $ VALUE | EQUIPMENT $/UNIT | EQUIPMENT $ VALUE | SUBCONTRACT $/UNIT | SUBCONTRACT $ VALUE | TOTAL ($) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | **Bioremediation O&M Annual costs Year 2** | | | | | | | | | | | | | | |
| 1 | Update safety, training ,waste, and health , plans, etc. | 1 | ea | 80 | 80 | eng | 81.60 | 6,528 | 80 | 80 | | | | | 6,608 |
| 2 | H&S | 1 | hr | 80 | 80 | h/s | 55.70 | 4,456 | 50 | 50 | 160 | 160 | | | 4,666 |
| 3 | Field Engineer | 1 | hr | 60 | 60 | eng/geol | 91.50 | 5,490 | | | 2,825 | 2,825 | | | 8,315 |
| 4 | Inject additional nutrients into each well | 1 | ea | 40 | 40 | eng tech | 65.70 | 2,628 | 30,360 | 30,360 | 1500 | 1,500 | | | 34,488 |
| 5 | Abandon wells | 5 | ea | 5 | 25 | eng tech | 65.70 | 1,643 | 80 | 400 | 80 | 400 | 1600 | 8,000 | 10,443 |
| 6 | Mob / Demob | 2 | ea | 24 | 48 | spr/tech/hs | 89.90 | 4,315 | 1,200 | 2,400 | 1,000 | 2,000 | 2400 | 4,800 | 13,515 |
| 7 | Vehicles | 14 | day | | | | | | 10 | 140 | 80 | 1,120 | | | 1,260 |
| 8 | Per Diem | 24 | day | | | | | | 109 | 2,616 | | | | | 2,616 |
| | **Subtotal** | | | | | | | **25,060** | | **36,046** | | **8,005** | | **12,800** | **81,911** |
| | Taxes @ 6.5 % | | | | | | | | | 2,343 | | | | | 2,343 |
| | **Subtotal** | | | | | | | | | | | | | | **84,254** |
| | Indirects @ 21.5% | | | | | | | | | | | | | | 18,115 |
| | **Year 2 Total O&M Cost** | | | | | | | | | | | | | | **$ 102,368** |

# Alternative 3, Monitoring/LUCs

**COMPANY NAME:** SHAW E&I
**PROJECT LOCATION:** KARNACK, TEXAS
**DATE:** DECEMBER 2009

| Item NO | DESCRIPTION | QTY | UNIT | LABOR UNIT MH | LABOR TOTAL MH | LABOR CRAFT | LABOR $/MH | LABOR $ VALUE | MATERIAL $/UNIT | MATERIAL $ VALUE | EQUIPMENT $/UNIT | EQUIPMENT $ VALUE | SUBCONTRACT $/UNIT | SUBCONTRACT $ VALUE | TOTAL ($) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | **Monitoring of 3 existing wells and 2 new wells** | | | | | | | | | | | | | | |
| | **Year 1 - Startup, New Wells, MNA** | | | | | | | | | | | | | | |
| 1 | Allowance for Legal Fees, Administration | 1 | lot | | | | | | | | | | 15,000 | 15,000 | 15,000 |
| 2 | Establish initial database, licenses, coordinate well characterization & other well info, develop work plans, etc | 1 | ea | 300 | 300 | eng | 81.60 | 24,480 | 5,000 | 5,000 | | | 5,000 | 5,000 | 34,480 |
| 3 | Geoprobe install additional monitoring wells | 2 | ea | 40 | 80 | geol | 71.20 | 5,696 | 1,500 | 3,000 | 36 | 72 | 6000 | 12,000 | 20,768 |
| | **Subtotal** | | | | | | | **30,176** | | **8,000** | | **72** | | **32,000** | **70,248** |
| | Taxes @ 6.5 % | | | | | | | | | 520 | | | | | 520 |
| | **Subtotal** | | | | | | | | | | | | | | **70,768** |
| | Indirects @ 21.5% | | | | | | | | | | | | | | 15,215 |
| | **Year 1 Total Capital Costs** | | | | | | | | | | | | | | **$ 85,983** |
| | **Years 1 and 2 Monitoring O&M costs** | | | | | | | | | | | | | | |
| 1 | Collect and prepare samples quarterly (GW) | 48 | ea | 16 | 768 | tech | 34.30 | 26,340 | 110 | 5,280 | 36 | 1,728 | | | 33,348 |
| 2 | Sample analysis (VOCs, perchlorate, MNA) | 48 | ea | | | | | | | | | | 500 | 24,000 | 24,000 |
| 3 | Annual report | 2 | ea | 64 | 128 | eng | 81.60 | 10,440 | 150 | 300 | | | | | 10,740 |
| | **Subtotal** | | | | | | | **36,780** | | **5,580** | | **1,728** | | **24,000** | **68,088** |
| | Taxes @ 6.5 % | | | | | | | | | 363 | | | | | 363 |
| | **Subtotal** | | | | | | | | | | | | | | **68,451** |
| | Indirects @ 21.5% | | | | | | | | | | | | | | 14,717 |
| | **Years 1 and 2 Total Cost** | | | | | | | | | | | | | | **83,168** |
| | **Annual Cost** | | | | | | | | | | | | | | **$ 41,584** |
| | **Years 3 and 4 Monitoring** | | | | | | | | | | | | | | |
| 1 | Collect and prepare samples semiannually | 24 | ea | 16 | 384 | tech | 34.30 | 13,171 | 110 | 2,640 | 36 | 864 | | | 16,675 |
| 2 | Sample analysis (VOCs, perchlorate) | 24 | ea | | | | | | | | | | 500 | 12,000 | 12,000 |
| 3 | Annual report | 2 | ea | 64 | 128 | eng | 81.60 | 10,445 | 150 | 300 | | | | | 10,745 |
| | **Subtotal** | | | | | | | **23,616** | | **2,940** | | **864** | | **12,000** | **39,420** |
| | Taxes @ 6.5 % | | | | | | | | | 191 | | | | | 191 |
| | **Subtotal** | | | | | | | | | | | | | | **39,611** |
| | Indirects @ 21.5% | | | | | | | | | | | | | | 8,516 |
| | **Years 3 and 4 Total Cost** | | | | | | | | | | | | | | **48,127** |
| | **Annual Cost** | | | | | | | | | | | | | | **$ 24,064** |

# Alternative 3, Monitoring/LUCs

COMPANY NAME: SHAW E&I
PROJECT LOCATION: KARNACK, TEXAS
DATE: DECEMBER 2009

| Item | | | | | | LABOR | | | | MATERIAL | | EQUIPMENT | | SUBCONTRACT | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| NO | DESCRIPTION | QTY | UNIT | UNIT MH | TOTAL MH | CRAFT | $/MH | $ VALUE | $/UNIT | $ VALUE | $/UNIT | $ VALUE | $/UNIT | $ VALUE | | TOTAL ($) |
| | **Year 5 Monitoring** | | | | | | | | | | | | | | | |
| 1 | Collect and prepare samples semiannually | 12 | ea | 16 | 192 | tech | 34.30 | 6,586 | 110 | 1,320 | 36 | 432 | | | | 8,338 |
| 2 | Sample analysis (Suite 2) | 12 | ea | | | | | | | | | | 500 | 6,000 | | 6,000 |
| 3 | Annual report | 1 | ea | 64 | 64 | eng | 81.60 | 5,222 | 150 | 150 | | | | | | 5,372 |
| 4 | Five-Year Inspection and Review | 1 | ea | | | | | | | | | | 35,000 | 35,000 | | 35,000 |
| | **Subtotal** | | | | | | | **11,808** | | **1,470** | | **432** | | **41,000** | | **54,710** |
| | Taxes @ 6.5 % | | | | | | | | | 96 | | | | | | 96 |
| | **Subtotal** | | | | | | | | | | | | | | | **54,806** |
| | Indirects @ 21.5% | | | | | | | | | | | | | | | 11,783 |
| | **Year 5 Total Cost** | | | | | | | | | | | | | | **$** | **66,589** |
| | **Years 6 through 9 Monitoring** | | | | | | | | | | | | | | | |
| 1 | Collect and prepare samples Annually | 24 | ea | 16 | 384 | tech | 34.30 | 13,171 | 110 | 2,640 | 36 | 864 | | | | 16,675 |
| 2 | Sample analysis (Suite 2) | 24 | ea | | | | | | | | | | 500 | 12,000 | | 12,000 |
| 3 | Annual report | 4 | ea | 64 | 256 | eng | 81.60 | 20,890 | 150 | 600 | | | | | | 21,490 |
| | **Subtotal** | | | | | | | **34,061** | | **3,240** | | **864** | | **12,000** | | **50,165** |
| | Taxes @ 6.5 % | | | | | | | | | 211 | | | | | | 211 |
| | **Subtotal** | | | | | | | | | | | | | | | **50,375** |
| | Indirects @ 21.5% | | | | | | | | | | | | | | | 10,831 |
| | **Years 6 through 9 Total Cost** | | | | | | | | | | | | | | | **61,206** |
| | **Annual Cost** | | | | | | | | | | | | | | **$** | **15,302** |
| | **Year 10 Monitoring** | | | | | | | | | | | | | | | |
| 1 | Collect and prepare samples Annually | 6 | ea | 16 | 96 | tech | 34.30 | 3,293 | 110 | 660 | 36 | 216 | | | | 4,169 |
| 2 | Sample analysis (Suite 2) | 6 | ea | | | | | | | | | | 500 | 3,000 | | 3,000 |
| 3 | Annual report | 1 | ea | 64 | 64 | eng | 81.60 | 5,222 | 150 | 150 | | | | | | 5,372 |
| 4 | Five-Year Inspection and Review | 1 | ea | | | | | | | | | | 35,000 | 35,000 | | 35,000 |
| | **Subtotal** | | | | | | | **8,515** | | **810** | | **216** | | **38,000** | | **47,541** |
| | Taxes @ 6.5 % | | | | | | | | | 53 | | | | | | 53 |
| | **Subtotal** | | | | | | | | | | | | | | | **47,594** |
| | Indirects @ 21.5% | | | | | | | | | | | | | | | 10,233 |
| | **Year 10 Total Cost** | | | | | | | | | | | | | | **$** | **57,827** |

# Alternative 3, Monitoring/LUCs

**COMPANY NAME:** SHAW E&I
**PROJECT LOCATION:** KARNACK, TEXAS
**DATE:** DECEMBER 2009

| Item NO | DESCRIPTION | QTY | UNIT | LABOR UNIT MH | LABOR TOTAL MH | LABOR CRAFT | LABOR $/MH | LABOR $ VALUE | MATERIAL $/UNIT | MATERIAL $ VALUE | EQUIPMENT $/UNIT | EQUIPMENT $ VALUE | SUBCONTRACT $/UNIT | SUBCONTRACT $ VALUE | TOTAL ($) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | **Years 15, 20, 25, and 30 Monitoring** | | | | | | | | | | | | | | |
| 1 | Collect and prepare samples every 5 years | 24 | ea | 16 | 384 | tech | 34.30 | 13,171 | 110 | 2,640 | 36 | 864 | | | 16,675 |
| 2 | Sample analysis (Suite 2) | 24 | ea | | | | | | | | | | 500 | 12,000 | 12,000 |
| 3 | Event report | 4 | ea | 64 | 256 | eng | 81.60 | 20,890 | 150 | 600 | | | | | 21,490 |
| 4 | Five-Year Inspection and Review | 4 | ea | | | | | | | | | | 35,000 | 140,000 | 140,000 |
| | **Subtotal** | | | | | | | **34,061** | | **3,240** | | **864** | | **12,000** | **190,165** |
| | Taxes @ 6.5 % | | | | | | | | | 211 | | | | | 211 |
| | **Subtotal** | | | | | | | | | | | | | | **190,375** |
| | Indirects @ 21.5% | | | | | | | | | | | | | | 40,931 |
| | **Years 15, 20, 25, and 30 Total Cost** | | | | | | | | | | | | | | **231,306** |
| | **Event Cost** | | | | | | | | | | | | | | **$ 57,827** |