LONGHORN ARMY AMMUNITION PLANT KARNACK, TEXAS

ADMINISTRATIVE RECORD

Volume 3 of 16

2011

Bate Stamp Numbers

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Prepared for

Department of the Army
Longhorn Army Ammunition Plant

1976 – 2011

LONGHORN ARMY AMMUNITION PLANT
KARNACK, TEXAS
<u>ADMINISTRATIVE RECORD – CHRONOLOGICAL INDEX</u>

VOLUME 3 of 16

2011

A. Title: Report–Final Feasibility Study LHAAP-47, Plant 3 Area, Group 4, Longhorn Army Ammunition Plant, Karnack, Texas
Author(s): Shaw Environmental, Inc., Houston, Texas
Recipient: All Stakeholders
Date: July 27, 2011
Bate Stamp: 00100423 - 00101492

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FINAL
FEASIBILITY STUDY
LHAAP-47, PLANT 3 AREA, GROUP 4
LONGHORN ARMY AMMUNITION PLANT
KARNACK, TEXAS

ON THE LINE

Shaw®

JULY 2011

00100424

Shaw® Shaw Environmental, Inc.

Date: ***July 27, 2011***

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 for LHAAP-47, Plant 3 Area, Group 4
Longhorn Army Ammunition Plant, July 2011

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

For: Review____ As Requested ____ Approval____ Corrections____ Submittal **X** Other____

Item No:	*No. of Copies*	*Date:*	*Document Title*
1	2	July 2011	**Final Feasibility Study for LHAAP-47, Plant 3 Area, Group 4, Longhorn Army Ammunition Plant, Karnack, Texas**

Aaron,
Enclosed are two copies of the above-named document. Copies have been distributed as indicated below. Please call with any questions or comments.

Sincerely:

Praveen Srivastav
Project Manager

CC: **Distribution List:**
Mr. J. Lambert – USACE, Tulsa (sent to A. Williams for distribution)
Ms. M. Plitnik – USAEC
Ms. Rose Zeiler – BRAC-LHAAP
Mr. S. Tzhone – EPA Region 6 (2)
Ms. F. Duke– TCEQ, Austin (2)
Mr. D. Vodak– TCEQ, Tyler
Mr. P. Bruckwicki– U.S. Fish and Wildlife Service

00100425

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

July 27, 2011

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-47, Plant 3 Area, Group 4, Longhorn Army Ammunition Plant, Karnack, Texas, July 2011

Dear Mr. Tzhone,

The above-referenced document is being transmitted to you for your records. 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, USACE, Tulsa District, OK
A. Williams, USACE, Tulsa District, OK
M. Plitnik, USAEC, San Antonio, TX
P. Srivastav, Shaw – Houston, TX (for project files)

00100426

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

July 27, 2011

DAIM-ODB-LO

Ms. Fay Duke (MC-136)
SSDAT/Superfund Section
Remediation Division
Texas Commission on Environmental Quality
12100 Park 35 Circle, Bldg D
Austin, TX 78753

Re: Final Feasibility Study LHAAP-47, Plant 3 Area, Group 4, Longhorn Army Ammunition Plant, Karnack, Texas, July 2011
SUP 126

Dear Ms. Duke,

The above-referenced document is being transmitted to you for your records. 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

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D. Vodak, TCEQ, Tyler, TX
P. Bruckwicki, Caddo Lake NWR, TX
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Comments on Revised Draft Final Feasibility Study LHAAP-47, Plant 3 Area, Group 4, Revision 2 (published March 2011)
Longhorn Army Ammunition Plant, Karnack, Texas

May 2011

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

1. Respondent Concurs (C), Does Not Concur (D), Takes Exception (E), or Delete (X).
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1		General	We were disappointed that the remedial alternatives presented do not represent a wide range of treatment options for the entire groundwater plume. We noted that except for the No Action alternative, all three alternatives proposed for the LHAAP-47 groundwater include MNA as the remedy for a large portion of the contaminated plume. As we commented previously, we believe there is inconclusive evidence to suggest that natural attenuation is a feasible remedy for portions of the plume not being actively remediated. We did not find additional supporting documentation in this revised report to alter our opinion. We note that most wells evaluated show “limited evidence of anaerobic biodegradation.” However, acknowledging the committed time line for the completion the FS and ROD this fiscal year by the Army, the TCEQ would be amenable with a remedy selected from the three alternatives if the “active treatment” technology of each proposed alternative (whichever is chosen) are included as the contingent remedy to enhance natural attenuation if, after the initial monitoring period, the condition is not favorable for natural attenuation.	C	In the event that the MNA evaluation determines conditions are not favorable for natural attenuation in the areas outside of the active treatments, a contingency remedy may be implemented to enhance MNA. See response to comments 17 and 19.	A
2	Page ES-3; Page 3-1	Executive Summary; Section 3.1	Remedial Action Objective: We believe there's a disconnect between the RAO and the action for the soil. However, we noted that change in RAO will likely not result in the change of the remedial alternatives since they all include soil excavation. We note that the remedial action objective does not include the mitigation or prevention of contaminants in soil from migrating into surface water bodies. However, it is our understanding that the interim cover at Building 25C was placed to mitigate this pathway. We acknowledge that the proposed remedial alternatives include discussions that the result of the LHAAP-50 surface water monitoring will be used to evaluate this pathway to determine whether additional action is needed. We recommend that RAO be included for this pathway.	D	In the Executive Summary and Section 3.1, the second RAO already addresses the pathway of soil to surface water for protection of human health as follows (note bold italics added): “Protection of human health by preventing further potential degradation of groundwater ***and surface water*** from contaminated soil;”	A

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3	Page 2-4 and others	Section 2.3.2, Section 2.3.2.13, Section 2.3.2.14 & Table 2-2:	It states that 2,4-DNT and 2,6-DNT indicate risk above $1X10^{-6}$, the combined indicated risk is below $1X10^{-4}$ for all chemical without MCLs, placing 2,4-DNT and 2,6-DNT in the acceptable risk range, and they are not identified as COCs. We disagree. The levels of 2,-4 DNT and 2-6-DNT exceed the TCEQ MSC standards and must be retained as COCs.	C	While TCEQ uses the word “must”, it is unclear whether 2,4-DNT and 2,6-DNT pose any significant threat to human health. The historical record for these compounds indicates most results below the detection limit (319 of 323) and most data more than 10 years old. The detection limits were mostly below the GW-Ind TCEQ MSC. Detected results exceeded the GW-Ind MSC value at only two wells (47WW11 and LHSMW53) and were only detected in two other wells (LHSMW39 and LHSMW54). Thus, it is unconfirmed if 2,4-DNT and 2,6-DNT have current concentrations that pose risk, and they will be retained as COCs with the GW-Ind as the proposed cleanup level for groundwater (Table 3-5) and the GW-Res for surface water (Table 3-6). These explosives would be monitored during the first two years to determine if a wide spread plume exists that requires an active treatment.	A
4	Page 2-11	Section 2.4	It states that modeling calculations concluded that contaminants present in the shallow groundwater will not adversely impact the surface water body. However, it fails to indicate that due to lack of calibration and the use of literature based degradation rates, there are inestimable uncertainties associated with this modeling effort. Surface water monitoring must be included as part of the long term monitoring.	C	Long-term monitoring of surface water to evaluate groundwater to surface water pathway will be added to each of the alternatives. *Sentences were added in Sections 5.2.2, 5.2.3 and 5.2.4, and new subsections will be added discussing the surface water monitoring.*	A
5	Page 3-1	Section 3.1	We recommend that the last sentence of the first paragraph and the first three bullets in this section be deleted or the second bullet be rewritten to clarify the intent of using the residential MSCs due to the potential discharge of groundwater to the Caddo Lake. Since the development of the cleanup levels are discussed in detail in later sections of this report, we recommend just deleting the referenced text.	D	A new fourth bullet will be added in Section 3.1 as follows: • Soil to surface water and groundwater to surface water has the potential to impact human health.	A
6	Page 4-1	Section 4.1	We noted in this section, as well as other sections, the evaluation of remedial alternatives seem to only address the chlorinated ethenes and perchlorate. Other COCs that exceeds groundwater standards are not being addressed by the groundwater remedial alternative. We acknowledge that chlorinated ethenes and perchlorate are the primary risk	C	Bullets will be added to Section 4.1 to address explosives, semivolatiles, and metals: • Explosives (2,4,6-TNT) in groundwater are isolated and do not indicate a plume of contamination and account for only 0.09% of the carcinogenic risk and only 0.01%	A

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6 *(cont.)*			drivers for the contaminated groundwater. However, we believe that all COCs exceeding groundwater standards should be addressed and discussed. Additionally, the management of the potential of increase in metal concentration, as a result of the remedial alternatives which rely on reductive dechlorination as treatment, must also be discussed.		of the non-carcinogenic hazard in the BHHRA. Thus, no significant risk is associated with explosives concentrations in the groundwater. No explicit treatment is directed at reducing explosives concentrations, because of the lack of significant risk associated with them. Monitoring will be performed to track explosives concentrations for future potential treatment or elimination as COCs. • SVOCs, pentachlorophenol and bis(2-ethylhexyl)phthalate, in groundwater do not indicate a plume of contamination, just isolated exceedances of MCLs. SVOCs accounted for only 0.19% of the carcinogenic risk in the BHHRA. The SVOCs detected in past groundwater samples may not be found in the future. No explicit treatment is directed at reducing SVOC concentrations, because of the small percentage of risk associated with them. Monitoring will be performed to track SVOC concentrations for future potential treatment or elimination as COCs. • Metals in groundwater accounted for only 2.5% of the non-carcinogenic hazard in the BHHRA. It is expected that many of the metals exceedances are associated with the presence of VOCs in the groundwater combined with oxidizing conditions. The wells with exceedances generally are within the VOC plume, which supports this expectation. The chromium, nickel, and vanadium exceedances are associated with wells with stainless steel screens and are possibly associated with well materials. No explicit treatment is directed at reducing metals concentrations, because of the small percentage of hazard associated with them. Metals concentrations may potentially rise with implementation of in situ enhanced bioremediation treatment but typically attenuate without additional treatment. Monitoring will be performed to track metals concentrations for future potential treatment or elimination as COCs.	

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7	Page 5-4	Section 5.2.2.2, second bullet	It states that material to enhance bioremediation would be injected once at the 47WW25 location in the first year and may be repeated in year 3 where treatment has not succeeded. We have a few concern with these statements. First, why wait until year 3 for repeated treatment if it is determined that treatment has not succeeded? What are the criteria for determining whether treatment is successful or if additional amendment is needed? With the high concentrations of TCE in this well, isn't it a bit optimistic to assume that two treatments at two years apart would be sufficient to treat the contaminants down to cleanup levels? We recommend that statement be revised to state that injection would be re-administer as necessary to ensure the conditions of the aquifer are conducive for the complete reductive dechlorination of TCE and its daughter compounds.	C	The second bullet will be revised (indicated by green text) as follows: "…at approximately 30 feet bgs. Near 47WW25 to support continued remediation in the target area or at additional locations, it is anticipated a second injection will be needed. For cost estimating purposes, it is estimated injection will take place at one target area in the first year (47WW25), and a second injection will be applied for one target area in year 3. The actual timing of the second injection may differ from this estimate to ensure the conditions in the aquifer are conducive for continued dechlorination of TCE."	A
8 8	Page 5-4	Section 5.2.2.2, third bullet	Similar to the above comment, what is the objective to determine success? What is the basis for the estimation that the biobarriers are to be renewed at ten-year intervals? We recommend that statement be revised to state that follow-up injection would be administered as necessary to ensure that the conditions conducive of reductive dechlorination are maintained.	C	Also see comment 14. The third bullet will be revised (indicated by green text) as follows: "**Biobarriers.** Biobarriers will be used to prevent further migration and treat target areas with greater amounts of groundwater (47WW09, 47WW30, 47WW34, LHSMW43, LHSMW56, and LHSMW60). For the biobarrier, the carbon source chosen will have persistence, such as ESO, wood chips, or a proprietary mix, such as HRC by Regenesis. For cost estimating purposes, these biobarriers are assumed to be installed by direct injection of a carbon source and a microbial culture. The carbon source is assumed to be ESO, and the microbial culture is assumed to be SDC-9. The biobarriers are assumed to be of variable lengths, and will be installed as noted on **Figure 5-2** to address areas within the 1,000 μg/L contour lines (shown in **Figures 2-5** and **2-6**). Injection points are assumed to have a 20-foot spacing to ensure overlap of injected material. The biobarriers are assumed to be installed in the first year, then follow-up injections would be administered as necessary to ensure that the	A

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(cont.)					conditions conducive to reductive dechlorination are maintained. For cost estimating purposes, it is assumed biobarriers may be renewed at ten-year intervals."	
9	Page 5-5	Section 5.2.2.2, fourth bullet	Please revise second sentence to read: the effectiveness of the treatment would be monitoring using the monitoring wells at the target areas and appropriate peripheral locations to be determined in the Remedial Design phase.	C	The text will be revised in the fourth bullet, Monitoring Wells, as suggested by adding, ". . . to be determined in the Remedial Design phase" at the end of the second sentence.	A
10	Page 5-5	Section 5.2.2.2, fifth bullet	We recommend the deletion of this bullet. Section 5.2.2.4 appears to be addressing the same topic but with more clarity.	C	The fifth bullet will be revised by retaining only the first, next to last, and last sentences.	A
11	Page 5-5	Section 5.2.2.3	Shouldn't the monitoring program include monitoring constituents that maybe a byproduct of the ISB such as metals caused by reductive dissolution?	C	Monitoring COCs would cover the metals without any special consideration. The text listing of analytes in the second sentence will be revised to note the dual purpose of metals monitoring for COC tracking and potential products of in situ enhanced bioremediation as follows: ". . . and several metals (both COCs and metals that may be mobilized by in situ enhanced bioremediation treatment)."	A
12	Page 5-6	Section 5.2.2.4	We recommend that performance criteria be specified for MNA evaluation. We recommend revising the second paragraph with the following: "An evaluation of MNA performance and potential will be made after completion of quarterly sampling for eight events. The following criteria are among those which will be considered to determine whether MNA is the appropriate remedy to address groundwater contamination • Demonstrate that the existing site conditions support the use of MNA; • Verify that the plume is not expanding; • Verify there are no changes in environmental conditions that may reduce the effectiveness of the natural attenuation processes; and • Identify any potentially toxic and/or mobile transformation	C	Language from the final LHAAP-58 FS will be used. The second paragraph will be replaced with the following: "An evaluation of MNA performance and potential will be made after completion of quarterly sampling for eight events. The following criteria are among those which will be considered to determine whether MNA is the appropriate remedy to address groundwater contamination: • Demonstrate that MNA is occurring according to the expectations • Verify there is no unacceptable impact to downgradient receptors • Verify the plume is not expanding	A

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12 *(cont.)*			products and verify that it will not adversely affect the protectiveness of the MNA remedy. This evaluation will provide the rationale for MNA as a remedial method, and whether additional in-situ bioremediation is needed. For the purpose of estimating cost, it is assumed the evaluation will be favorable."		• Demonstrate the effectiveness of LUCs to protect the hypothetical future maintenance worker, and • Verify attainment of RAOs. This evaluation will provide the rationale for MNA as a remedial method, and whether additional in-situ bioremediation is needed. For the purpose of estimating cost, it is assumed the evaluation will be favorable."	
13	Page 5-7	Section 5.2.3	We have the similar concerns as those listed above for Alternative 2.	C	Similar responses will be made in Section 5.2.3. Changes equivalent to those in the RTC for Comment 7 will be made to the third bullet of Section 5.2.3.2, as indicated by the green text below: **"Direct injection bioremediation at hot spots.** For this FS, it is assumed that direct injection bioremediation would be used at the site. This form of bioremediation combines the injection of SDC-9 with a carbon source ESO to provide adequate conditions for the proliferation of the dechlorinating organisms. Injection points would be placed at each area using direct push technology and a spacing of 20 feet between points. It is anticipated that the material would be injected once, and that the injection would occur in the contaminated interval, at approximately 30 feet bgs. Additional injections would be applied as necessary to support continued remediation in the target areas or at additional locations. For cost estimating purposes, it is estimated injection will take place at two target areas in the first year (47WW25 and LHSMW56), and additional injections may be applied for two target areas in year 3 to treat additional areas or re-administer treatment where it has not succeeded." To address the similar concerns for Alternative 3, the following sections will be revised in the Draft Final FS: Changes equivalent to those in the RTC for Comment 9 will be made to the fourth bullet of Section 5.2.3.2.	A

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13 *(cont.)*					Changes equivalent to those in the RTC for Comment 10 will be made to the fifth bullet of Section 5.2.3.2. Changes equivalent to those in the RTC for Comment 11 will be made to Section 5.2.3.3. Changes equivalent to those in the RTC for Comment 12 will be made to Section 5.2.3.4.	
14	Page 5-8	Section 5.2.3.2	Why is the treatment target area define as wells with VOCs>1000 µg/L in this alternative and 500 µg/L in Alternative 2? Based on figures 5-2 and 5-3, the areas targeted for treatment are the same. While there is insufficient data to suggest with certainty that treating VOC to certain levels would ensure the remaining concentration to naturally attenuate, we believe that treating contaminated groundwater greater than 500 µg/L of VOC should be the starting point. Groundwater monitoring and evaluation following treatment would determine whether additional treatment is necessary.	D	This is a typo in the biobarriers bullet of Section 5.2.2.2. The number there should be 1,000 µg/L, not 500 µg/L. See RTC to comment 8. The bullet for defining the target area indicated VOCs >1,000 µg/L and perchlorate >20,000 µg/L are the target areas for both Alternatives.	A
15	Page 5-11	Section 5.2.3.4	This section needs to be updated to reflect the long-term operation for this alternative (re-circulation vs. bio-barrier).	C	The first sentence will be revised as follows (revised language in green) to note recirculating in situ enhanced bioremediation areas and delete the reference to biobarriers. "Long-term operations would include operating the recirculating in situ enhanced bioremediation areas during the first 5 years, monitoring of groundwater at LHAAP-47 for a fixed period of time (assumed to be 30 years in the estimate). " A paragraph break will be made after the first sentence, and a new paragraph will be added as follows: "Operation and maintenance of the recirculating in situ enhanced bioremediation areas will include periodic inspections of the system for leaks from pipelines, tanks, pumps, or equipment. Only limited maintenance is expected to be necessary for the recirculation equipment as the operational phase is expected to last fewer than five years. The recirculating in situ enhanced bioremediation	A

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15 *(cont.)*					systems will need to be decommissioned at the end of treatment, which, for cost estimating purposes, is expected sometime in the fifth year after beginning of remediation. Long-term groundwater sampling . . ."	
		Section 5.2.4	Additional changes not specifically requested.		Revisions to text for TCEQ Comment 13 RTC indirect response as Alternative 4 was not mentioned: Changes equivalent to those in the RTC for Comment 7 will be made to the second bullet of Section 5.2.4.2 (indicated by green text) as follows: ". . . For this FS, it is assumed that bioaugmentation would be used at the site. This form of bioremediation combines the injection of SDC-9 with a carbon source ESO to provide adequate conditions for the proliferation of the dechlorinating organisms. Injection points would be placed at each area using direct push technology and a spacing of 20 feet between points. It is anticipated that the material would be injected once, and that the injection would occur in the contaminated interval, at approximately 30 feet bgs. Additional injections would be applied as necessary to support continued remediation in the target areas or at additional locations. For cost estimating purposes, it is estimated injection will take place at three target areas in the first year (47WW25, LHSMW43, and LHSMW56), and additional injections may be applied for two target areas in year 3 to treat additional areas or re-administer treatment where it has not succeeded." To address the similar concern for Alternative 4 as were noted for Alternatives 2 and 3, the following sections will be revised in the Draft Final FS: Changes equivalent to those in the RTC for Comment 9 will be made to the fifth bullet of Section 5.2.4.2. Changes equivalent to those in the RTC for Comment 10	A

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15 *(cont.)*					will be made to the sixth bullet of Section 5.2.4.2. Changes equivalent to those in the RTC for Comment 11 will be made to Section 5.2.4.3. Changes equivalent to those in the RTC for Comment 12 will be made to Section 5.2.4.4.	
16	Page 5-12	Section 5.2.4	Title should be revised to include ISB.	C	The title of Section 5.2.4 will be revised to "Excavation, Pump and Treat, In Situ Bioremediation, MNA and LUC".	A
17	Page 6-7	Section 6.3.2.1.1	This section lacks specifics in how, on the whole, the groundwater remedial alternative protects and maintains human health. For clarity, we recommend that Section 6.3.2 summarize the components of the remedial alternative and the protectiveness statement be specified in Section 6.3.2.1.1 such as the following: o "The groundwater remedial action proposed for this alternative would eventually achieve the destruction of the COCs present in groundwater above cleanup levels established for LHAAP-47. The groundwater remedial action combines ISB to treat the highly contaminated groundwater plume and MNA to contain and restore the remaining plume. MNA processes will be confirmed though long-term groundwater monitoring. ISB to enhance biodegradation would be implemented in areas where MNA is demonstrated to be ineffective. This alternative also includes LUC to prevent human health exposure while MNA slowly reduces COC concentrations. Therefore, the residual site risk after completion of these action would be within the target risk range for a hypothetical future maintenance worker."	C	The suggested text revision will be made to Section 6.3.2.1.1. The text in Section 6.3.2 will be revised to include a summary of components and will be replaced with the following: "This alternative reduces soil contamination by excavation of soil with high concentrations of perchlorate near Building 25C. The highest concentrations in the groundwater plume will be remediated by in situ bioremediation using bioaugmentation in target areas and biobarriers. Groundwater monitoring and long-term LUC will be maintained until COC cleanup levels are attained. It is estimated that cleanup levels in the groundwater would be achieved in 30 years in the treatment areas; however, it will take approximately 100 additional years for the balance of the plume to attain cleanup levels. This is purely an estimate since the hydrogeologic conditions and bioremediation effectiveness have not been fully defined. These actions would reduce COC concentrations in the groundwater to the cleanup levels throughout the site, provided bioremediation results are favorable. Areas with lower concentrations will be addressed through MNA. If MNA is not found to be effective in these areas, a contingency remedy may be implemented. The components of the contingency remedy will be determined based on the aquifer condition at that time and will be comprised of the process options retained as appropriate	A

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Comment #	Page	Section/ Paragraph	Comment	C, D[1], E or X	Response	A or D[2]
					to satisfy the RAOs."	
18	Page 6-7	Section 6.3.2.2.1	It states that the alternative would comply with chemical specific ARAR for the groundwater because cleanup levels would be attained. It is not clear how the remedial alternative supports this statement. As previously commented, the FS lacks discussions regarding how COCs, other than chlorinated solvent and perchlorate, would attain cleanup standards under each of the alternatives proposed.	C	Section 6.3.2.2.1 will be revised to add the following at the end: " VOCs and perchlorate would be actively addressed by treatment. The SVOCs and explosives can also degrade under anaerobic conditions. Metals levels may remain above cleanup levels while VOCs and perchlorate still exceed the cleanup levels, then dissipate to acceptable levels as the conditions revert to natural in the aquifer after VOCs and perchlorate have been exhausted."	A
19	Pages 6-11 and 6-16	Sections 6.3.3 and 6.3.4 -	We have the similar concerns as those listed above for Alternative 2.	C	Section 6.3.3 will be replaced with the following: "This alternative reduces soil contamination by excavation of soil with high concentrations of perchlorate near Building 25C. The highest concentrations in the groundwater plume will be remediated by bioaugmentation in target areas and recirculating bioremediation. Groundwater monitoring and long-term LUC will be maintained until COC cleanup levels are attained. It is estimated that cleanup levels in the groundwater would be achieved in 30 years in the treatment areas; however, it will take approximately 100 additional years for the balance of the plume to attain cleanup levels. This is purely an estimate since the hydrogeologic conditions and bioremediation effectiveness have not been fully defined. These actions would reduce COC concentrations in the groundwater to the cleanup levels throughout the site, provided bioremediation results are favorable. Areas with lower concentrations will be addressed through MNA. If MNA is not found to be effective in these areas, a contingency remedy may be implemented. The components of the contingency remedy will be determined based on the aquifer condition at that time and will be comprised of the process options retained as appropriate to satisfy the RAOs."	A

Comments on Revised Draft Final Feasibility Study LHAAP-47, Plant 3 Area, Group 4, Revision 2 (published March 2011)
Longhorn Army Ammunition Plant, Karnack, Texas

May 2011

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

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

Comment #	Page	Section/ Paragraph	Comment	C, D[1], E or X	Response	A or D[2]
19 *(cont.)*					Additionally, Section 6.3.3.2.1 and Section 6.3.4.2.1 will be revised to match Section 6.3.2.2.1 after revisions for Comment 18 are applied. Section 6.3.4.1.1 will be replaced with the following: "The groundwater remedial action proposed for this alternative would eventually achieve the destruction of the COCs present in groundwater above cleanup levels established for LHAAP-47. The groundwater remedial action combines in situ enhanced bioremediation to treat highly contaminated groundwater near unproductive wells with pumping and treatment for parts of the plume with plentifully available groundwater, and MNA to contain and restore the remaining plume. MNA processes will be confirmed through long-term groundwater monitoring. In situ enhanced bioremediation to enhance biodegradation or additional groundwater extraction wells would be implemented in areas where MNA is demonstrated to be ineffective. This alternative also includes LUC to prevent human health exposure while MNA slowly reduces COC concentrations. Therefore, the residual site risk after completion of these actions would be within the target risk range for a hypothetical future maintenance worker. " Section 6.3.4 will be replaced with the following: "This alternative reduces soil contamination by excavation of soil with high concentrations of perchlorate near Building 25C. The highest concentrations in the groundwater plume will be remediated by in situ bioremediation and by pumping and treating groundwater. In situ bioremediation will be used around wells with high COC concentrations but insufficient water for pumping. Pumping and treating will be used in areas with high COC concentrations and sufficient groundwater to pump effectively. Groundwater monitoring and long-term LUC will be maintained until COC cleanup levels are attained. It is estimated that cleanup levels in the groundwater would be achieved in 30 years in the treatment areas; however, it will take	

Comments on Revised Draft Final Feasibility Study LHAAP-47, Plant 3 Area, Group 4, Revision 2 (published March 2011)
Longhorn Army Ammunition Plant, Karnack, Texas

May 2011

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

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

Comment #	Page	Section/ Paragraph	Comment	C, D[1], E or X	Response	A or D[2]
19 *(cont.)*					approximately 100 additional years for the balance of the plume to attain cleanup levels. This is purely an estimate since the hydrogeologic conditions and bioremediation effectiveness have not been fully defined. These actions would reduce COC concentrations in the groundwater to the cleanup levels throughout the site, provided bioremediation results and progress in pumping and treating are favorable. Areas with lower concentrations will be addressed through MNA. If MNA is not found to be effective in these areas, a contingency remedy may be implemented. The components of the contingency remedy will be determined based on the aquifer condition at that time and will be comprised of the process options retained as appropriate to satisfy RAOs."	

Comments on Revised Draft Final Feasibility Study LHAAP-47, Plant 3 Area, Group 4, Revision 2 (published March 2011)
Longhorn Army Ammunition Plant, Karnack, Texas

May 2011

Reviewer: Stephen Tzhone, USEPA
Respondents: Shaw Environmental, Inc.

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

Comment #	Page	Section/ Paragraph	Comment	C, D[1], E or X	Response	A or D[2]
1		General	For each discussed alternative involving an MNA component, an active treatment contingency (as well as the trigger for the contingency) needs to be integrated.	C	For other LHAAP sites, the FS does not mention the contingency remedy, and it is introduced in the Proposed Plan. However, since requested, for Alternatives 2, 3, and 4, discussion of contingency remedy if MNA is ineffective will be integrated into the text as suggested. The discussion of specific triggers will be left to the Remedial Design consistent with other LHAAP sites. See response to TCEQ comments 17 and 19.	A
2	Page 1-3	Section 1.2.1, Site Description, Last paragraph-	Text discusses a vertical head difference of 10 feet between 47WW13 and 47WW14. Figure 1-4 shows only 5 feet of difference.	C	The head difference in the text will be changed to 5 feet.	A
3	Page 2-2	Appendix B	EPA agrees with this first sentence in the first paragraph: "If the concentrations of trace elements in unfiltered samples are positively correlated with aluminum (Al) or Fe, then they are most likely adsorbed to the surfaces of suspended particulates." However, EPA does not agree with the next sentence: "If all of the samples fall on a common trend with a positive slope, then the elevated concentrations are most likely natural." EPA does not agree because showing that metals sorb to clay particles is not proof of natural metals background and should not be considered as such. Instead, what is required for determination of natural background is that the metal contaminant has been found to be ubiquitous.	D	This distinction is noted. The use of the phrase, ". . . most likely natural" at the end of the sentence indicates the Shaw analysts also consider other mechanisms to be possible, and the sentence does not claim it as proof of natural metals background. Background metals concentrations for LHAAP are derived from the separate document *Final Evaluation of Perimeter Well Data for Use as Groundwater Background, Longhorn Army Ammunition Plant, Karnack, Texas*, Shaw, June 2007. The information presented in Appendix B does not serve to include or exclude any metals as COCs. No changes are planned for the text.	A

00100440

FINAL
FEASIBILITY STUDY
LHAAP-47, PLANT 3 AREA, GROUP 4
LONGHORN ARMY AMMUNITION PLANT
KARNACK, TEXAS

Prepared for

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

Prepared by

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

July 2011

Table of Contents

Table of Contents (continued)

Table of Contents (continued)

Table of Contents (continued)

Table of Contents (continued)

Table of Contents (continued)

List of Tables

List of Figures

List of Appendices

Acronyms and Abbreviations

°F	degrees Fahrenheit
µg/L	micrograms per liter
ARARs	applicable or relevant and appropriate requirements
Army	U.S. Department of the Army
BCM	BCM Engineers, Inc.
BERA	baseline ecological risk assessment
bgs	below ground surface
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act of 1980
CFR	Code of Federal Regulations
COC	chemical of concern
CWA	Clean Water Act of 1972
cy	cubic yards
DCA	dichloroethane
DCE	dichloroethene
DNT	dinitrotoluene
DPT	direct-push technology
ECP	Environmental Condition of Property
ELCR	excess lifetime cancer risk
EPC	exposure point concentration
EPS	Environmental Protection Systems, Inc.
ESO	emulsified soybean oil
FFA	Federal Facility Agreement
FR	Federal Register
FS	Feasibility Study
ft^2	square feet
GAC	granulated activated carbon
GRA	general response action
GW-Ind	groundwater MSC for industrial use
GWP-Ind	soil MSC for industrial use based on groundwater protection standard
GW-Res	groundwater MSC for residential use
GWTP	groundwater treatment plant
HI	hazard index
HQ	hazard quotient
Jacobs	Jacobs Engineering Group, Inc.
LHAAP	Longhorn Army Ammunition Plant
LHAAP-47	Plant 3 Area
LUC	land use control
MARC	Multiple Award Remediation Contract
MCL	maximum contaminant level
mg/kg	milligrams per kilogram

Acronyms and Abbreviations (continued)

MNA	monitored natural attenuation
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
PBX	plastic blended explosive
PCB	polychlorinated biphenyl
PCE	tetrachloroethene
Plexus	Plexus Scientific Corporation
PP	Proposed Plan
PPE	personal protective equipment
RAO	remedial action objective
RCRA	Resource Conservation and Recovery Act
RI	Remedial Investigation
RI/FS	Remedial Investigation/Feasibility Study
ROD	Record of Decision
Shaw	Shaw Environmental, Inc.
STEP	Solutions to Environmental Problems, Inc.
SVOC	semivolatile organic compound
TAC	Texas Administrative Code
TBC	to-be-considered
TCA	trichloroethane
TCDD	tetrachlorodibenzo-p-dioxin
TCE	trichloroethene
TCEQ	Texas Commission on Environmental Quality
TNRCC	Texas Natural Resources Conservation Commission
TNT	trinitrotoluene
TOC	total organic carbon
TSD	treatment, storage, disposal
USACE	U.S. Army Corps of Engineers
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 former Longhorn Army Ammunition Plant (LHAAP) in Karnack, Texas. This FS presents the analysis of remedial alternatives for the Plant 3 Area, designated as LHAAP-47, in accordance with the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA), and provides a basis for the groundwater and soil remedy selection consistent with the intended future use of the 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-47, Plant 3 Area, covers approximately 275 acres and is located in the north-central portion of LHAAP. In July 1953, construction began on Plant 3. From 1954 to the early 1980s, rocket motors were produced at Plant 3. Some of the rocket motor production facilities converted to produce pyrotechnic and illumination devices, and continued this operation until 1997.

LHAAP was placed on the National Priorities List (NPL) on August 9, 1990. A Federal Facility Agreement 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-47 was not one of the originally listed NPL sites; however, it is considered an NPL caliber site 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 Army until May 5, 2004, when approximately two-thirds of the property was transferred to the U.S. Fish and Wildlife Service (USFWS). Property transfer continues as response actions are completed at smaller parcels of land. The U.S. Army Environmental Command provides funding for the environmental remedial activities. The Base Realignment and Closure Division is responsible for all aspects of LHAAP including the environmental program, operations, and land transfer.

Goose Prairie Creek watershed is the nearest significant surface water body to LHAAP-47. Runoff from the site drains into Goose Prairie Creek, which eventually flows into Caddo Lake (a drinking water source for multiple communities).

Sampling conducted specific to LHAAP-47 media occurred during Phase I through Phase III Remedial Investigations (RIs) by Jacobs Engineering Group, Inc. (Jacobs), and during additional investigations performed by Solutions to Environmental Problems, Inc. (STEP), Plexus Scientific Corporation (Plexus), and Shaw through 2010. The baseline human health risk assessment for the Group 4 Sites, including LHAAP-47 (Jacobs, 2003), was based on data from the RIs and additional investigations performed through 2001. Fifty waste process sumps and three waste rack sumps located within LHAAP-47 are also included in LHAAP-35/36 along with sumps from other sites. Shaw collected soil data around these sumps and reported the data in the Final Data Evaluation Report for LHAAP-35/36 (Shaw, 2008).

The Installation-Wide Baseline Ecological Risk Assessment (BERA) identified no potential risk to ecological receptors at the industrial sub-area (Shaw, 2007a), which includes LHAAP-47. The future use for LHAAP-47 is as a wildlife refuge as a part of the Caddo Lake Wildlife Refuge. The anticipated human health exposure case for LHAAP-47 is the hypothetical future maintenance worker. Groundwater at LHAAP-47 presented a cancer risk of 7.1×10^{-3}, which is above the acceptable cancer risk range of 1×10^{-6} to 1×10^{-4}. The total hazard index (HI) from groundwater was 1,100, which is above the acceptable HI of 1.

Cleanup levels were established for the chemicals of concern (COCs). Maximum contaminant levels (MCLs), if available, are considered cleanup levels. Chemicals with no MCL had site-specific cleanup levels calculated based on risk.

The groundwater COCs are: perchlorate, trichloroethene (TCE), cis-1,2-dichloroethene (DCE), vinyl chloride (VC), 1,1-DCE, tetrachloroethene (PCE), 1,2-dichloroethane (DCA), acetone, chloroform, trans-1,2-DCE, 2,4,6-trinitrotoluene (TNT), bis(2-ethylhexyl)phthalate, pentachlorophenol, aluminum, antimony, arsenic, cadmium, chromium, cobalt, manganese, nickel, silver, strontium, thallium, tin, and vanadium. The COCs have been detected in monitoring wells designated as shallow, shallow/intermediate, and intermediate groundwater zones.

The soil at LHAAP-47 presented a cancer risk of 1.8×10^{-5}, within the acceptable cancer risk range of 1×10^{-6} to 1×10^{-4}, and a total HI of 0.46, below the acceptable HI of 1. Even though the risk assessment identified no risk from soil, an emerging contaminant, perchlorate, was detected in the groundwater at elevated levels. To prevent future migration of perchlorate from soil to the groundwater, it will be addressed by removing the potential source area in the soil.

The remedial action objectives (RAOs) established within this FS address potential human health risks for future industrial use of LHAAP-47. The future use of the entire LHAAP facility is as a national wildlife refuge. A hypothetical future maintenance worker has been proposed as a conservative human receptor scenario for this land use. As documented in the BERA (Shaw, 2007a), ecological risk is not a concern at LHAAP-47. Based on these considerations, the RAOs for LHAAP-47 are as follows:

- Protection of human health by preventing human exposure to the contaminated groundwater;
- Protection of human health by preventing further potential degradation of groundwater and surface water from contaminated soil;
- Protection of human health by preventing degradation of surface water from groundwater contaminated with COCs; and
- Return of groundwater to its potential beneficial uses as drinking water, wherever practicable.

The above RAO recognizes USEPA's policy to return all groundwater to beneficial uses, based on the non-binding programmatic expectation in the National Oil and Hazardous Substances Pollution Contingency Plan (NCP).

This FS identifies and screens groundwater remedial technologies and associated process options that may be appropriate for satisfying the RAOs for LHAAP-47. Selected remedial technologies and process options were carried forward after the initial screening and were combined to develop the following remedial alternatives for LHAAP-47:

- **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, In Situ Bioremediation, MNA, and LUC.** The goals of this alternative are to prevent exposure of the hypothetical future maintenance worker to contaminated soil and groundwater at LHAAP-47. Soil that has the potential to impact groundwater would be removed. The shallow zone and shallow/intermediate and intermediate zone groundwater have contaminants above cleanup levels that would be reduced over time via in situ bioremediation of the highest groundwater concentrations and monitored natural attenuation (MNA) until contaminant concentrations are reduced over time to meet the cleanup levels. Biobarriers will prevent migration of contaminants and protect surface water in Goose Prairie Creek. The land use control (LUC) will prevent use of groundwater except for environmental monitoring and testing until contaminant concentrations in the groundwater attain the cleanup levels.
- **Alternative 3 – Excavation, Recirculating Bioremediation, In Situ Bioremediation, MNA, and LUC.** The goals of this alternative are to prevent exposure of the hypothetical future maintenance worker to contaminated groundwater at LHAAP-47. Soil that has the potential to impact groundwater would be removed. The shallow zone, shallow/intermediate, and intermediate zone groundwater have contaminants above cleanup levels that would be reduced over time via recirculating bioremediation or direct injection bioremediation of the highest groundwater concentrations and MNA for the entire plumes until contaminant concentrations are

reduced over time to meet the cleanup levels. The recirculation areas will prevent migration of contaminants and protect surface water in Goose Prairie Creek. LUC will prevent use of groundwater, except for environmental monitoring and testing, until contaminant concentrations in the groundwater attain the cleanup levels.

- **Alternative 4 – Excavation, Pump and Treat, In Situ Bioremediation, MNA, and LUC.** The goals of this alternative are to prevent exposure of the hypothetical future maintenance worker to contaminated soil and groundwater at LHAAP-47. Soil that has the potential to impact groundwater would be removed. The shallow zone and shallow/intermediate and intermediate zone groundwater have contaminants above cleanup levels that would be reduced over time via a pump and treat system. Areas around wells with high COC concentrations, but insufficient water for pumping will be treated by in situ bioremediation. The highest groundwater concentrations will be treated, and MNA will be conducted until contaminant concentrations are reduced over time to meet the cleanup levels. LUC will prevent use of groundwater except for environmental monitoring and testing until contaminant concentrations in the groundwater attain the cleanup levels.

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

Table ES-1
Comparative Analysis of Alternatives

Comparative Analysis of Alternatives Criteria	Alternative 1 No Action	Alternative 2 Excavation, In Situ Bioremediation, MNA, and LUC	Alternative 3 Excavation, Recirculating Bioremediation, MNA, and LUC	Alternative 4 Excavation, Pump and Treat, In Situ Bioremediation, MNA, and LUC
Overall protection of human health and the environment	No protection. Does not achieve RAOs.	Achieves RAOs. Protection of human health and environment provided by remediation of groundwater COCs in areas of highest contamination. Groundwater monitoring and LUC in place until cleanup levels are attained. Removal of perchlorate contaminated source soils protect the groundwater from future perchlorate migration from soil to groundwater.	Achieves RAOs. Protection of human health and environment provided by remediation of groundwater COCs in areas of highest contamination by recirculating bioremediation and in situ bioremediation. Groundwater monitoring and LUC in place until cleanup levels are attained. Removal of perchlorate contaminated source soils protect the groundwater from future perchlorate migration from soil to groundwater.	Achieves RAOs. Protection of human health and environment provided by groundwater extraction and ex situ treatment for areas with available water, and by in situ bioremediation for areas without sufficient water to pump. Groundwater monitoring and LUC in place until cleanup levels are attained. Removal of perchlorate contaminated source soils protect the groundwater from future perchlorate migration from soil to groundwater.
Compliance with ARARs	No compliance with chemical-specific ARARs.	Complies with ARARs.	Complies with ARARs.	Complies with ARARs.
Long-term effectiveness and permanence	Not effective.	Should be effective and permanent; however, uncertainty exists concerning the effectiveness and time needed for in situ biological treatment and degradation to cleanup levels. Treatability study may be required. Long-term groundwater monitoring will follow treatment. LUC would be effective and reliable so long as they are maintained until cleanup levels are attained. Removal of perchlorate soil eliminates a potential future source of groundwater contamination via infiltration.	Should be effective and permanent; however, uncertainty exists concerning the effectiveness and time needed for in situ biological treatment and degradation to cleanup levels. Treatability study may be required. Long-term groundwater monitoring will follow treatment. Operation & maintenance of recirculation systems will be required. LUC would be effective and reliable so long as they are maintained until cleanup levels are attained. Removal of perchlorate soil eliminates a potential future source of groundwater contamination via infiltration.	Should be effective and permanent. Uncertainty exists concerning time needed for extraction and attenuation to cleanup levels. Pilot study may be required. Construction, operation, and maintenance of the extraction system will be required. LUC would be effective and reliable so long as they are maintained until cleanup levels are attained. Removal of perchlorate soil eliminates a potential future source of groundwater contamination via infiltration.

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

Comparative Analysis of Alternatives Criteria	Alternative 1 No Action	Alternative 2 Excavation, In Situ Bioremediation, MNA, and LUC	Alternative 3 Excavation, Recirculating Bioremediation, MNA, and LUC	Alternative 4 Excavation, Pump and Treat, In Situ Bioremediation, MNA, and LUC
Reduction of toxicity, mobility, or volume through treatment	No reduction.	Provides permanent reduction in groundwater through in situ bioremediation in the areas of highest contamination provided conditions are favorable. Provides permanent reduction of perchlorate contaminated soil by removal.	Provides permanent reduction in groundwater through in situ bioremediation and recirculation in the areas of highest contamination provided treatment is successful at improving conditions. Provides permanent reduction of perchlorate contaminated soil by removal.	Provides permanent reduction in groundwater through extraction from areas of highest contamination and ex situ treatment, and from in situ bioremediation. Provides permanent reduction of perchlorate contaminated soil by removal.
Short-term effectiveness	No short-term impacts.	Minimal impacts to the community, workers, or the environment from short-term activities. Provides almost immediate protection. Some potential impacts to workers and minimal impact to community during excavation and transportation activities.	Minimal impacts to the community, workers, or the environment from short-term activities. Provides almost immediate protection. Some potential impacts to workers and minimal impact to community during excavation and transportation activities. Some potential impacts to workers from exposure to contaminated groundwater in recirculation system.	Minimal impacts to the community, workers, or the environment from short-term activities. Provides almost immediate protection. Some potential impacts to workers and minimal impact to community during excavation and transportation activities. Some potential impacts to workers from exposure to contaminated groundwater in extraction system and transport pipeline.
Implementability	Inherently implementable.	Implementable, but uncertainty exists in the effectiveness and time required to reduce contaminants in groundwater to cleanup levels. Specialized knowledge required for implementation.	Implementable, but uncertainty exists in the effectiveness and time required to reduce contaminants in groundwater to cleanup levels. Specialized knowledge required for implementation.	Implementable, but uncertainty exists in the effectiveness and time required to reduce contaminants in groundwater to cleanup levels. Specialized knowledge required for implementation.
• Capital Cost	$0	$2,980,000	$5,510,000	$3,040,000
• Operation and Maintenance Cost	$0	$2,110,000	$2,110,000	$4,860,000
• Present Worth	$0	$5,090,000	$7,620,000	$7,900,000

<u>Abbreviations</u>:

ARARs applicable or relevant and appropriate requirements
LUC land use controls
MCLs maximum contaminant levels
RAOs remedial action objectives

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 at the Longhorn Army Ammunition Plant (LHAAP) in Karnack, Texas. This FS presents the analysis of remediation alternatives for the Plant 3 area designated as LHAAP-47 in accordance with the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA) and provides a basis for remedy selection consistent with the intended future use of the LHAAP as a wildlife refuge.

The U.S. Army Environmental Command provides funding for the environmental remedial activities. The Base Realignment and Closure Division is responsible for all aspects of Longhorn 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. 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 report (Jacobs, 2003), the environmental site assessment (Plexus Scientific Corporation [Plexus], 2005), the data gaps investigation (Shaw, 2007b), modeling report (Shaw, 2007c), monitored natural attenuation (MNA) evaluation (**Appendix A**), geochemical evaluation (**Appendix B**), and evaluation of sumps (Shaw, 2008). Shaw conducted additional groundwater sampling in 2008, 2009, and 2010, and the data are included in **Appendix C**. No human health risk or hazard to a hypothetical future maintenance worker was identified from the soil at LHAAP-47, but a non-carcinogenic hazard and a carcinogenic risk was identified from the groundwater at LHAAP-47. 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 further evaluated in the Installation-Wide Baseline Ecological Risk Assessment (BERA) (Shaw, 2007a). The industrial subarea included LHAAP-47, and no potential risk to ecological receptors was identified in the industrial subarea. Thus, no potential risk to ecological receptors from LHAAP-47 was identified.

This FS takes the next step of identifying and evaluating remedial solutions to address impacted media. Environmental problems identified for LHAAP-47 are contamination in the shallow,

shallow/intermediate, and intermediate groundwater zones, and perchlorate contaminated soil. Even though perchlorate is not a Resource Conservation and Recovery Act (RCRA) or CERCLA waste, it is an emerging contaminant and is evaluated in this FS. The formulation of viable alternatives involves defining remedial action objectives (RAOs), general response actions (GRAs), volumes or areas 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 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. Alternatives developed in this FS address the media and chemicals of concern (COCs) at LHAAP-47 through combinations of source control and groundwater actions.

The preferred alternative for LHAAP-47 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 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-47 (Plant 3 Area) is located in the north-central portion of LHAAP and covers an area of approximately 275 acres. LHAAP-47 is bounded by LHAAP-46 to the north, Karnack

Avenue to the east, Marshall Avenue to the south, and Avenue "P" to the west. LHAAP-6 and LHAAP-7 are within the LHAAP-47 boundary. LHAAP-35B(37) is to the southwest of LHAAP-47, and LHAAP-50 and LHAAP-8 are to its south. **Figure 1-2** shows the current site boundary.

The surface features at LHAAP-47 are a mixture of asphalt-paved roads, parking areas, building foundation remnants, old buildings, and overgrown wooded and grassy vegetation-covered areas. The topography in this area is relatively flat with the surface drainage flowing into tributaries of Goose Prairie Creek. Runoff from the site enters Caddo Lake via Goose Prairie Creek.

Forty-eight monitoring wells have been installed at LHAAP-47 in the shallow zone at depths ranging from 12.5 to 35.5 feet below ground surface (bgs). Another ten wells have been installed in a zone designated as shallow/intermediate at depths ranging from 25 to 51.7 feet bgs. Eight wells have been installed in the intermediate zone at depths ranging from 42 to 64.5 feet bgs. Three wells have been installed in the deep zone at depths ranging from 83 to 95 feet bgs. The monitoring well locations at LHAAP-47 are shown on **Figure 1-3** along with some adjacent wells from surrounding sites. Based on the November-December 2007 groundwater elevations, the groundwater flow direction in the shallow saturated zone below LHAAP-47 is to the northeast as shown on **Figure 1-4**. Based on the April 2008 groundwater elevations, the groundwater flow direction in the intermediate zone is to the northeast as shown on **Figure 1-5**. The groundwater flow direction in the deep zone based on November-December 2007 groundwater elevations is estimated to be to the north-northeast as shown on **Figure 1-6**.

Additional potentiometric surfaces have been plotted for December 1998 (Jacobs, 2002), March and September 2002 (Solutions to Environmental Problems, Inc. [STEP], 2005), and August 2004 (Shaw, 2007b) and also indicate that groundwater flow is to the east/northeast. The maps are in previously approved documents and are in the administrative record.

Near the center of the site, the groundwater elevation difference between wells 47WW13 (shallow) and 47WW14 (shallow/intermediate) is approximately 5 feet, indicating a strong downward vertical gradient. The vertical gradient, however, is not observed in other areas of the site and it is suspected that surface infiltration is the cause of the higher groundwater elevation at 47WW13. Of the 10 wells at LHAAP-47 that were redesignated as shallow/intermediate – six were formerly designated shallow, and four were formerly designated intermediate. The overlapping depth range of the wells, the minimal difference between groundwater elevations in the shallow and intermediate zones, and the redesignations of wells to shallow/intermediate zone, indicate that the shallow and intermediate zones at LHAAP-47 are interconnected. The interconnectedness of the shallow and intermediate zones is also noticeable on the cross-sections in **Figures 1-7** through and **1-11**. All wells and their zone classification are shown on **Figure 1-3**.

Vertical gradients between the zones vary across the site. The three deep wells, 47WW07, 47WW15, and 47WW20 are clustered with shallow and intermediate wells. At the 47WW07 cluster, the difference in groundwater elevation from intermediate to deep was 1.26 feet downward, while the difference between shallow and intermediate was essentially flat. At the 47WW15 cluster, the difference in groundwater elevation from intermediate to deep was 2.63 feet downward, and the shallow to intermediate comparison was not made because of the anomalously high groundwater at the shallow well 47WW13. At the 47WW20 cluster, the difference in groundwater elevation from intermediate to deep was 0.01 feet upward, essentially flat, while the difference between the shallow and intermediate was 0.21 feet downward. Groundwater elevations at these clusters are shown on **Figures 1-7** through **1-11**.

Rising head slug tests were performed on some wells at LHAAP-47 to calculate hydraulic conductivity values using the Bouwer-Rice method. The hydraulic conductivities in the various zones varied from 5×10^{-6} to 2×10^{-3} centimeters per second (Jacobs, 2002). General soil and geologic maps indicate that the site is situated in the outcrop of the Wilcox Group. The Wilcox Group at the site generally consists of a few feet of residually derived soil overlying silts and clays. The soil at LHAAP-47 consists of layers of silty clay, underlain by silty sand to clayey sands.

Under current conditions, the groundwater elevations are several feet below the base of the creek bed, and the only expected interaction between surface water and groundwater is that surface water will infiltrate through the vadose zone into the groundwater when water is present in Goose Prairie Creek. However, in December 1998 and March 2002, groundwater elevations were higher than the creek bed. Therefore, the possibility exists that groundwater elevations may be high again in the future, and groundwater could then discharge into Goose Prairie Creek.

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 (TNRCC), 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. Approximately 2,000 acres have been transferred to the USFWS since the initial transfer and the process will continue as response actions are completed at individual sites. The remaining land is under the Army's control and includes the Group 2 and 4 sites currently undergoing Remedial Investigation/Feasibility Study (RI/FS) evaluation. The Army intends to transfer this land to the USFWS after the environmental response is completed.

LHAAP-47 was identified through historical records as Plant 3, producing rocket motors and later pyrotechnic and illumination devices. Construction of Plant 3 began in July 1953 and production of rocket motors began in December 1954. Rocket motor production continued until the early 1980s. Some of the rocket motor production facilities were converted to produce pyrotechnic and illumination devices and were active until approximately 1997. Industrial solid wastes and possibly hazardous wastes, such as parts cleaners and spent solvents, may have been generated by these activities. Fifty waste process sumps and three waste rack sumps were located within LHAAP-47 that are included in LHAAP-35/36 along with sumps from other sites.

1.3 Sampling Investigations at LHAAP-47

The environmental media (soil, groundwater, surface water, sediment, and sump contents) at LHAAP-47 have been the subject of numerous investigations to identify potential contamination and are summarized in **Table 1-1**. These include the Pre-RI investigations by Environmental Protection Systems, Inc. (EPS) in 1984, by BCM Engineers, Inc. (BCM) in 1992, and by the USACE in 1993. Jacobs conducted Phase I, Phase II, and Phase III RIs in 1993, 1995, and 1998, respectively, and additional RI related investigations in 1996, 1999, 2000, and 2001. The site-wide perchlorate investigation conducted by STEP in 2002 and the Environmental Site Assessment activities were performed by Plexus in 2003. Reports associated with the investigations mentioned above are included in the Administrative Record for the LHAAP.

Several follow-up investigations at LHAAP-47 were performed by Shaw and USACE to further delineate the extent of contamination identified during the previous sample events. These sample events include the data gaps investigation by Shaw in the spring and summer of 2004

(Shaw, 2007b); 2006 soil samples for the final evaluation of sumps (Shaw, 2008). Sampling from 2007 and later has not been previously documented.

In 2007, Shaw collected groundwater samples from five wells in February for natural attenuation evaluation (**Appendix A**). In September, Shaw installed one monitoring well (47WW32) and collected groundwater samples from two wells for metals analysis. In October and November, groundwater samples were collected from 25 wells and analyzed for metals, perchlorate, or volatile organic compounds (VOCs). Metals results were used for the geochemical evaluation (**Appendix B**). Analytical results for these samples are presented in **Appendix C**.

In 2008, Shaw installed four new monitoring wells in the area east of LHAAP-47 (47WW33, 47WW34, 47WW35 and 47WW36). Groundwater samples collected in February, March and October were analyzed for VOCs. Analytical results for these samples are presented in **Appendix C**.

In 2009, Shaw collected groundwater samples from 11 monitoring wells in February and from 4 monitoring wells in April. Samples were analyzed for VOCs, natural attenuation parameters, and perchlorate. Analytical results for these samples are presented in **Appendix C**.

In 2010, the USEPA collected a groundwater sample from LHSMW60 and analyzed it for perchlorate. Shaw installed two new wells in the intermediate zone (47WW37 and 47WW38) near existing monitoring wells 47WW25 and LHSMW60, respectively. As part of a sampling event spanning multiple sites during August and September, Shaw collected 80 soil samples and 38 groundwater samples at LHAAP-47. The soil samples were collected from 28 locations around Building 25C and Building 25D and tested for perchlorate. The groundwater samples were collected from 26 wells and tested for VOCs, perchlorate, and other parameters. Groundwater sampling was attempted at 17 other wells, but they were dry. Analytical results for these samples are presented in **Appendix C**.

Sampling locations for investigations performed at LHAAP-47 are presented on **Figure 1-3** for groundwater monitoring wells, and on **Figure 1-12** for all the other sample locations.

1.4 Additional Evaluations at LHAAP-47

In November 1999, plastic liner material was placed around Building 25C by the Army over areas known to contain perchlorate in the soil to prevent migration of perchlorate to Goose Prairie Creek. The extent of the liner was noted in the site-wide perchlorate investigation report (STEP, 2005).

In September 2001, Lynntech collected soil samples at Building 25C and analyzed them for perchlorate. A total of 20 samples were collected from 5 locations over a distance spanning 35 feet.

The BERA was completed in February 2007 (Shaw, 2007a). The BERA concluded there is no ecological impact in the industrial sub area, which includes LHAAP-47.

In February 2007, Shaw issued a modeling report that concluded the VOC contaminants in the shallow zone will not reach Goose Prairie Creek. The model indicates that even though perchlorate reaches the creek, the concentration in surface water will be below the surface water action level (Shaw, 2007c). Thus, there is no expected impact of surface water from the shallow groundwater at LHAAP-47.

Table 1-1
Summary of Investigations at LHAAP-47

Pre-Phase I (Jacobs, 2002)
EPS, 1984 • EPS installed 1 monitoring well and collected a groundwater sample.
BCM, 1992 • Inventory of the waste process sumps at this site
USACE, 1993 • Inventory of the waste process sumps and waste rack sumps at this site
Phases I-III (Jacobs, 2002)
USACE, Phase I 1993 • Collected sump content sample for laboratory analysis • Completed borings at sump locations and collected soil samples
USACE, Phase II 1994 • Collected soil samples from monitoring well locations and from ditch and drainage ways • Installed monitoring wells and collected groundwater samples from each well
USACE, Pre-Phase III 1996 • Determined locations for Phase III monitoring wells by delineating plume using site characterization and analysis penetrometer system (8 locations)
Jacobs, Phase III 1998 • Collected soil samples at waste process sump locations • Collected surface water and sediment samples • Collected soil samples from locations • Installed monitoring wells and collected groundwater samples from each of the new wells and existing wells
Remedial Investigation (Jacobs, 2002)
• USACE collected 2 rounds of groundwater samples in 1996 (Jacobs, 2002) • In 1999 and 2000, collected soil samples for perchlorate and total petroleum hydrocarbons (Jacobs, 2002) • In 2000, installed and sampled 4 new monitoring wells and collected groundwater samples from existing wells (Jacobs, 2002) • In 2001, collected groundwater samples for perchlorate (Jacobs, 2002)
Additional Investigations • In 2001, collected soil samples for perchlorate investigation (Lynntech, 2001) • In 2002, collected soil samples as part of the perchlorate investigation (STEP, 2005) • In 2003, collected groundwater and soil samples at two locations as part of the Phase II Environmental Site Assessment (Plexus, 2005) • In 2004, installed 4 monitoring wells and collected groundwater samples for VOC analysis (Shaw, 2007b) • In 2006, collected additional soil samples from select sumps (Shaw, 2007a and 2008) • In 2007, installed 1 monitoring well and collected samples for natural attenuation evaluation (Appendix A) and for geochemistry evaluation (Appendix B) • In 2008, installed 4 monitoring wells and collected groundwater samples for VOC analysis (Appendix C) • In 2009, collected additional groundwater samples for VOC analysis (Appendix C) • In 2010, installed 2 monitoring wells and 18 temporary monitoring wells, collected additional groundwater samples for VOC, perchlorate, metals, SVOC, and MNA analysis, and collected additional soil samples for perchlorate analysis (Appendix C).

00100465

PLOT DATE: 11/03/08
FORMAT REVISION 5/13/02

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TYLER(250_000)	---	Houston, Texas	L. JONES	11/03/08	R. DUFFIELD	11/03/08	P. SRIVASTAV	12/22/08	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

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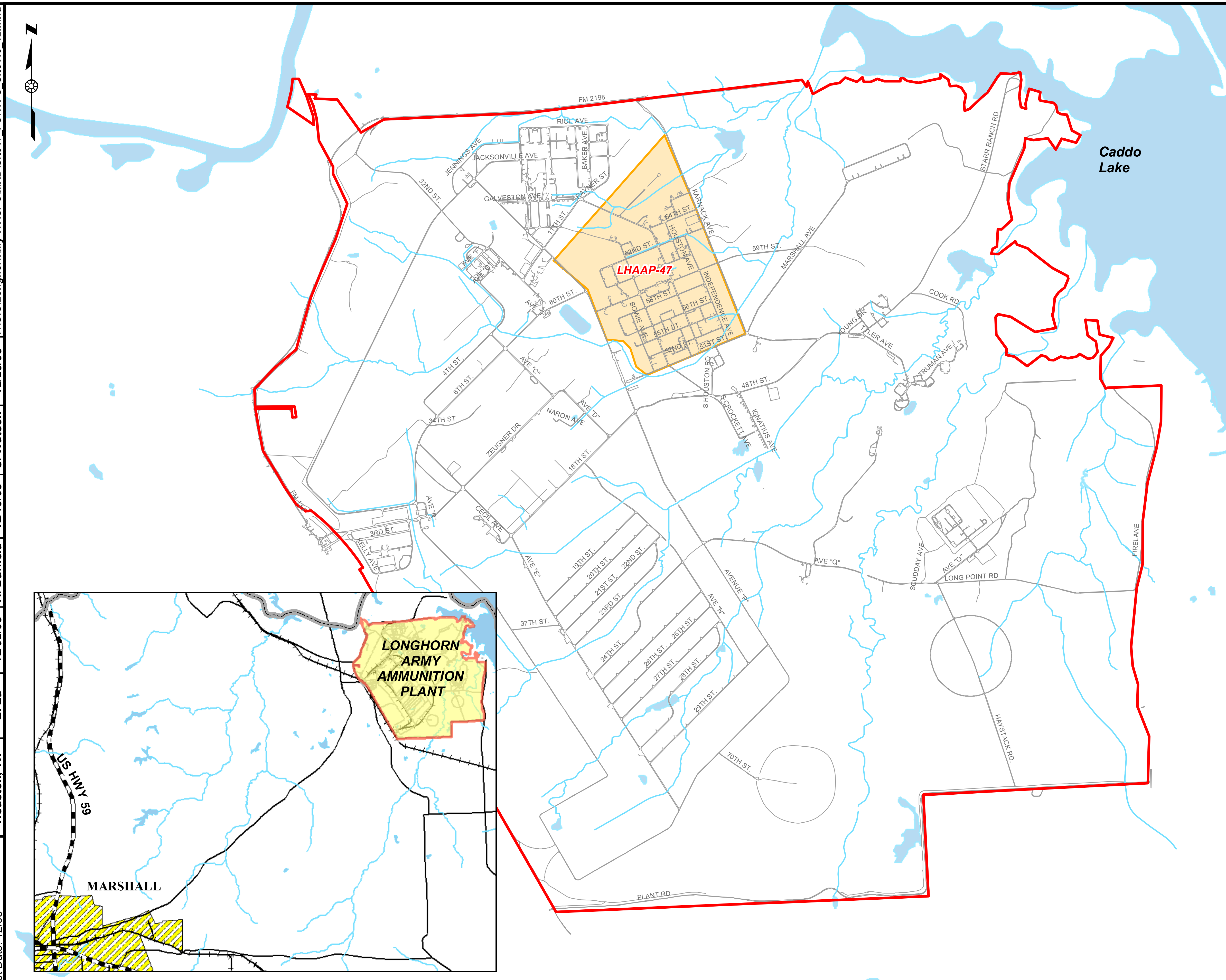
TULSA DISTRICT
TULSA, OKLAHOMA

FIGURE 1-1

LHAAP LOCATION MAP
LHAAP-47 FEASIBILITY STUDY
LONGHORN ARMY AMMUNITION PLANT
KARNACK, TEXAS



LEGEND

- Stream
- Road
- Site
- Lake/Pond
- LHAAP Boundary

0 1,250 2,500 5,000 Feet

OFFICE	DRAWN BY	CHECKED BY	APPROVED BY	FILE PATH
Houston, TX	B. Lu 12/02/08	R. Duffield 12/19/08	S. Watson 12/23/08	T:\GIS\Longhorn\My WKSPC\MXD\Site47 FS\47FS SiteVic 12.mxd

Plot Date: 12/08

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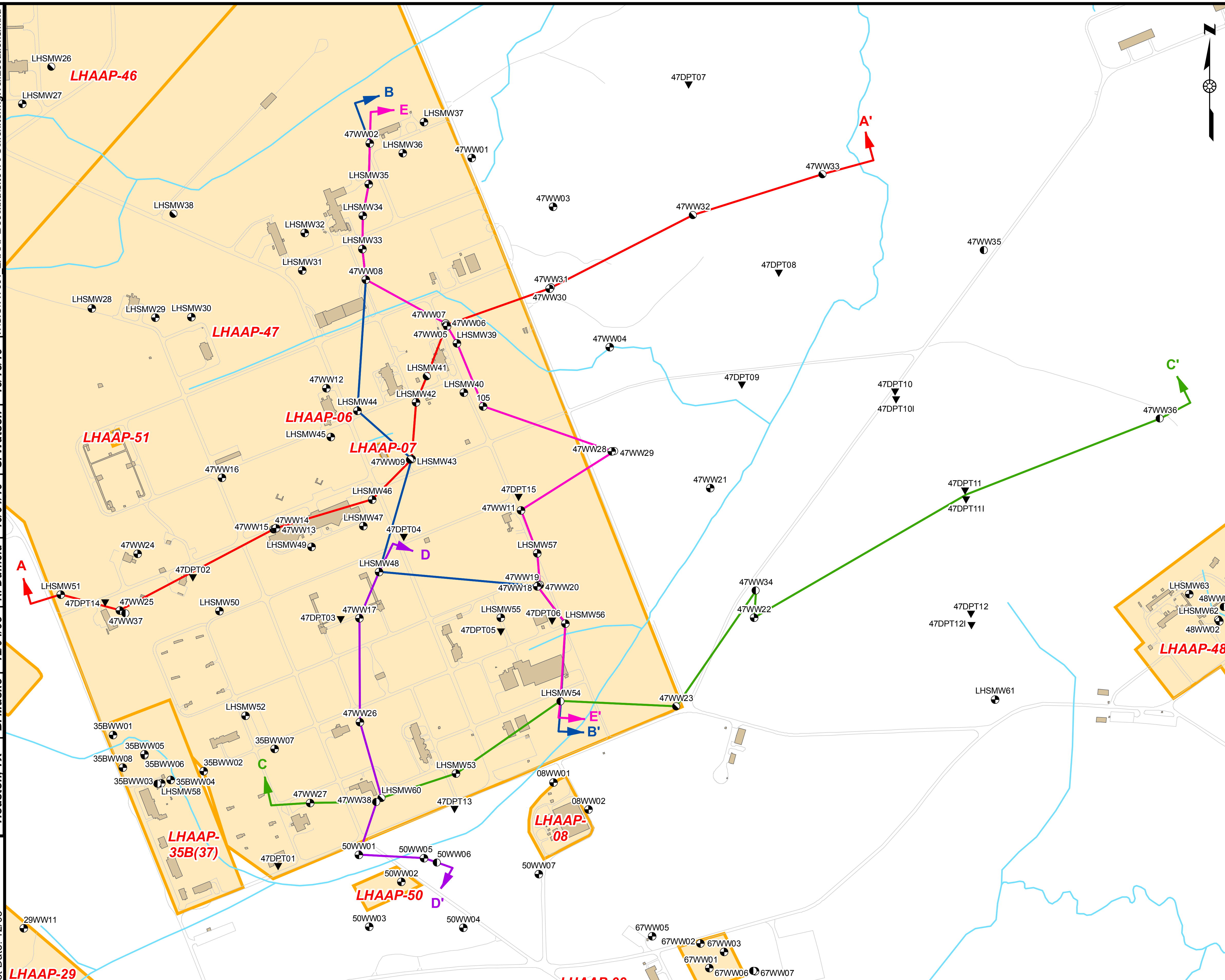
TULSA, OKLAHOMA

FIGURE 1-2

LHAAP-47 SITE VICINITY MAP
LHAAP-47 FEASIBILITY STUDY

LONGHORN ARMY AMMUNITION PLANT
KARNACK, TEXAS

00100467



OFFICE Houston, TX

DRAWN BY B. Muske 12/04/08

CHECKED BY R. Duffield 10/01/10

APPROVED BY S. Watson 10/15/10

FILE PATH T:\GIS\117591 LHAAP\Doc\Mxd\Site47\FS\MonitoringWellLocations.mxd

Plot Date: 12/08

LEGEND

- ▼ DPT Sample 2010
- Shallow Monitoring Well
- Shallow/Intermediate Monitoring Well
- Intermediate Monitoring Well
- Deep Monitoring Well
- Stream
- Road
- Former Building or Concrete Slab
- Site

NOTES:

1. 47WW23, 47WW32, 47WW33, LHSMW38, LHSMW41, and LHSMW60 were redesignated from shallow to shallow/intermediate.
2. 47WW06, 47WW09, 47WW14, and 47WW31 were redesignated from intermediate to shallow/intermediate.
3. The 2010 well and DPT locations and elevations shown are approximate, and will be revised once the survey data is received.

0 300 600 1,200 Feet

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FIGURE 1-3

MONITORING WELL LOCATIONS
LHAAP-47 FEASIBILITY STUDY

LONGHORN ARMY AMMUNITION PLANT
KARNACK, TEXAS

00100468

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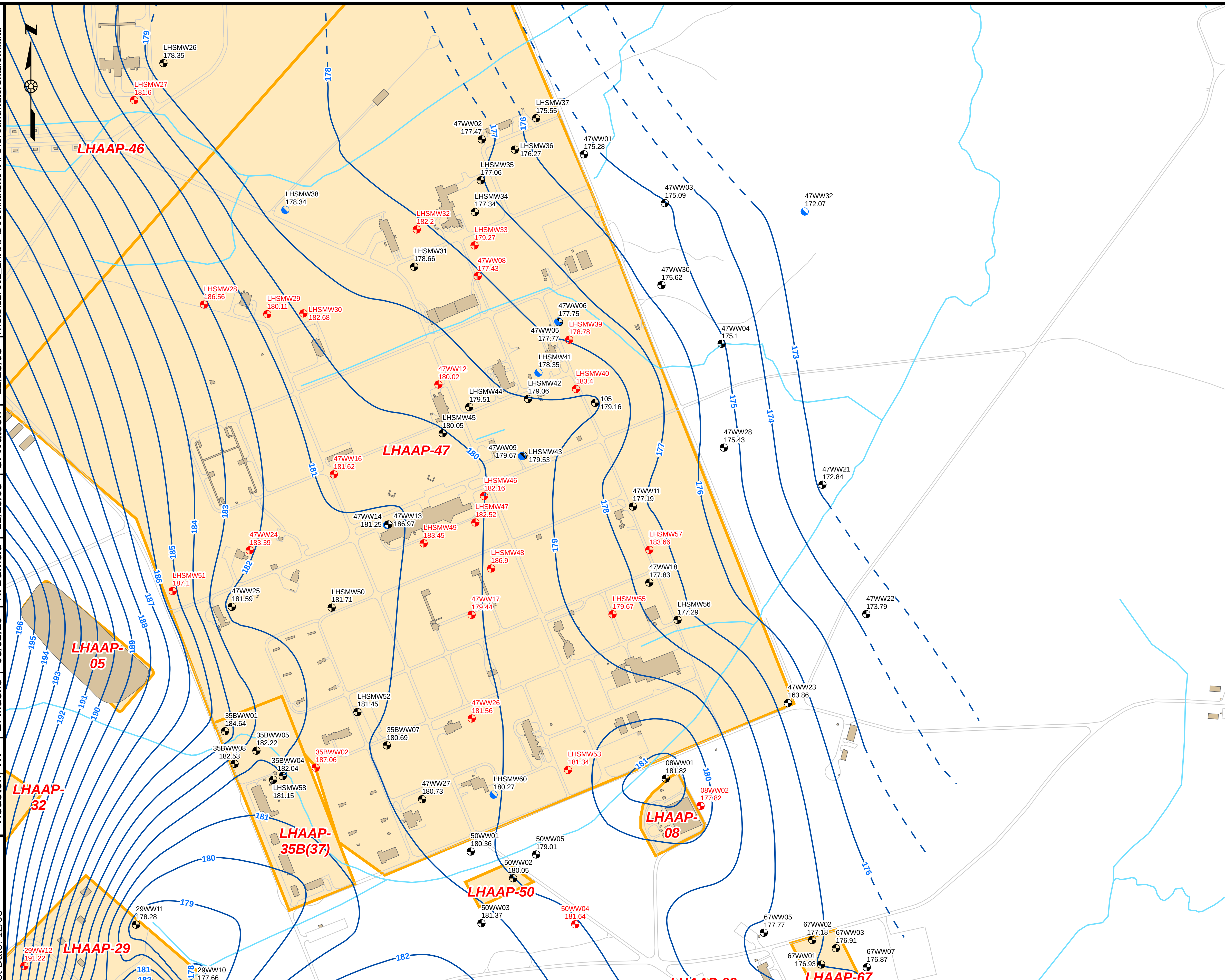
APPROVED BY	S. Watson 12/23/08
CHECKED BY	R. Duffield 12/19/08
DRAWN BY	B. Muske 08/02/10
OFFICE	Houston, TX



Plot Date: 12/08

LEGEND

- Dry Shallow Monitoring Well (with Bottom of Well Elevation)
- Shallow Monitoring Well (with Groundwater Elevation)
- Shallow/Intermediate Monitoring Well
- Groundwater Elevation Contour
- Inferred Groundwater Elevation Contour
- Stream
- Road
- Former Building or Concrete Slab
- Site

Notes:

1. Groundwater contours are based on data collected November 29, 2007 through December 3, 2007.
2. Groundwater elevations at 47WW13 and 47WW23 were anomalous and not used to plot contours.
3. Wells with elevations shown are used to generate contours.

0 300 600 1,200 Feet

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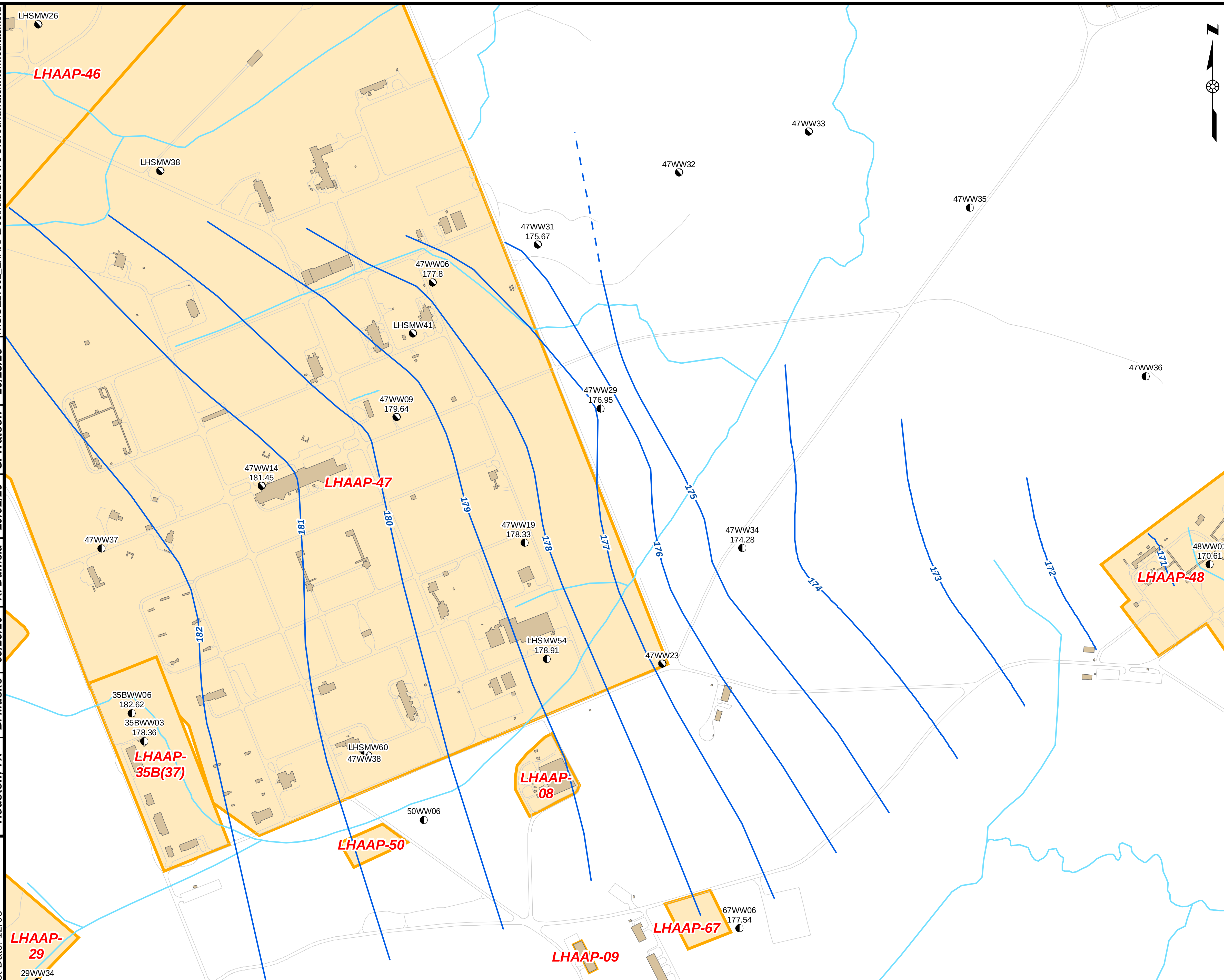
FIGURE 1-4

SHALLOW ZONE
GROUNDWATER ELEVATIONS
LHAAP-47 FEASIBILITY STUDY

LONGHORN ARMY AMMUNITION PLANT
KARNACK, TEXAS

00100469



LEGEND

Shallow/Intermediate Monitoring Well

Intermediate Monitoring Well

Groundwater Elevation Contour

Groundwater Elevation Contour (Inferred)

Stream

Road

Former Building or Concrete Slab

Site

NOTE:

1. Groundwater elevations reported in feet above mean sea level based on data collected April 3, 2008.
2. Wells with elevations shown are used to generate contours.
3. 35BWW03 elevation was anamalous and not used.
4. The 2010 well and DPT locations and elevations shown are approximate, and will be revised once the survey data is received.

0 300 600 1,200 Feet

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FIGURE 1-5

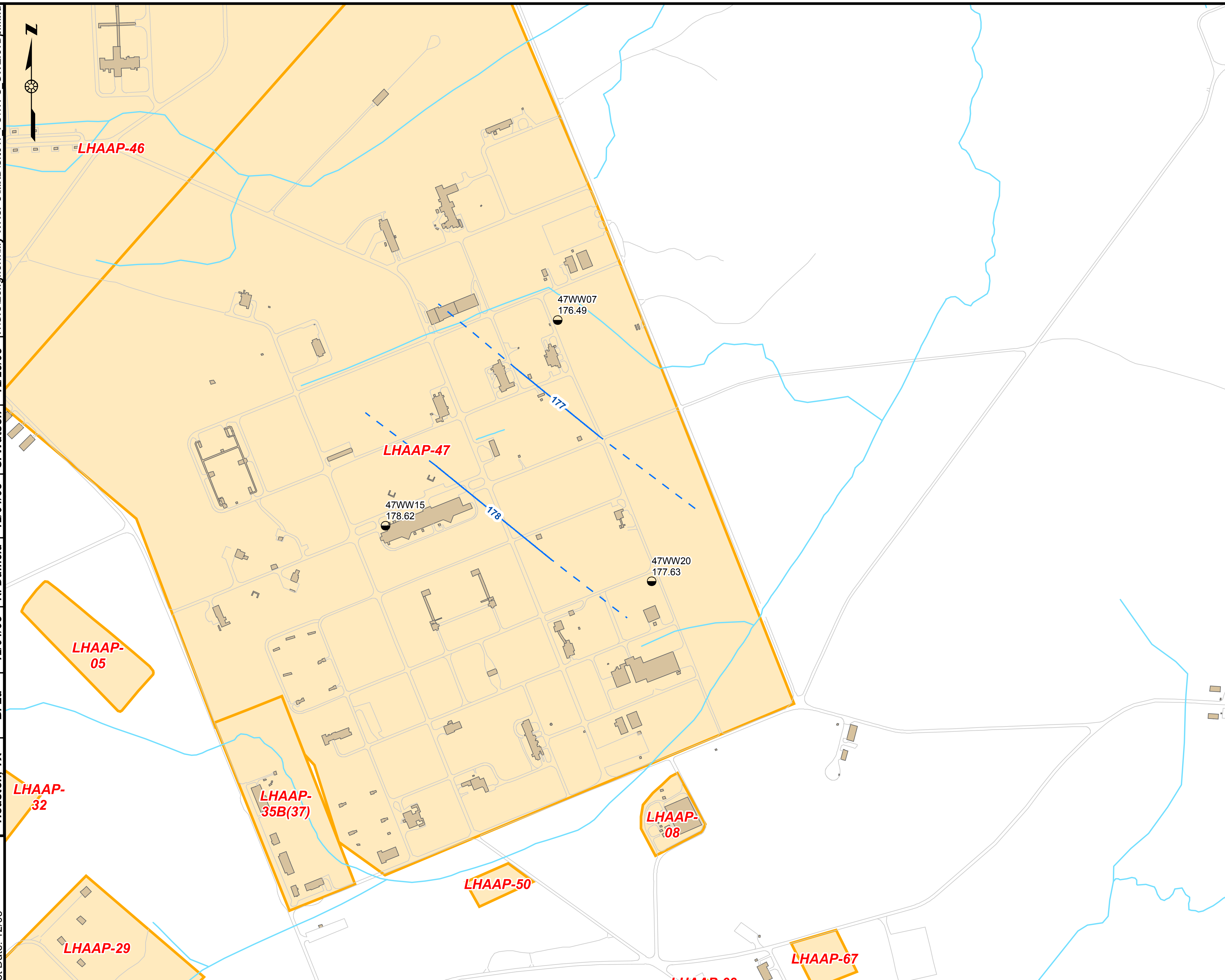
INTERMEDIATE ZONE
GROUNDWATER ELEVATIONS
LHAAP-47 FEASIBILITY STUDY

LONGHORN ARMY AMMUNITION PLANT
KARNACK, TEXAS

OFFICE	DRAWN BY	CHECKED BY	APPROVED BY	FILE PATH
Houston, TX	B. Muske 09/29/10	R. Duffield 10/01/10	S. Watson 10/15/10	T:\GIS\117591_LHAAP\Doc\Mxd\Site47\FS\GroundwaterIntermediate.mxd

Plot Date: 12/08

00100470



LEGEND

- Deep Monitoring Well
- Groundwater Elevation Contour
- Inferred Groundwater Elevation Contour
- Stream
- Road
- Former Building or Concrete Slab
- Site

NOTE:

Groundwater elevations reported in feet above mean sea level as measured between November 30 and December 1, 2007.

0 300 600 1,200 Feet

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FIGURE 1-6

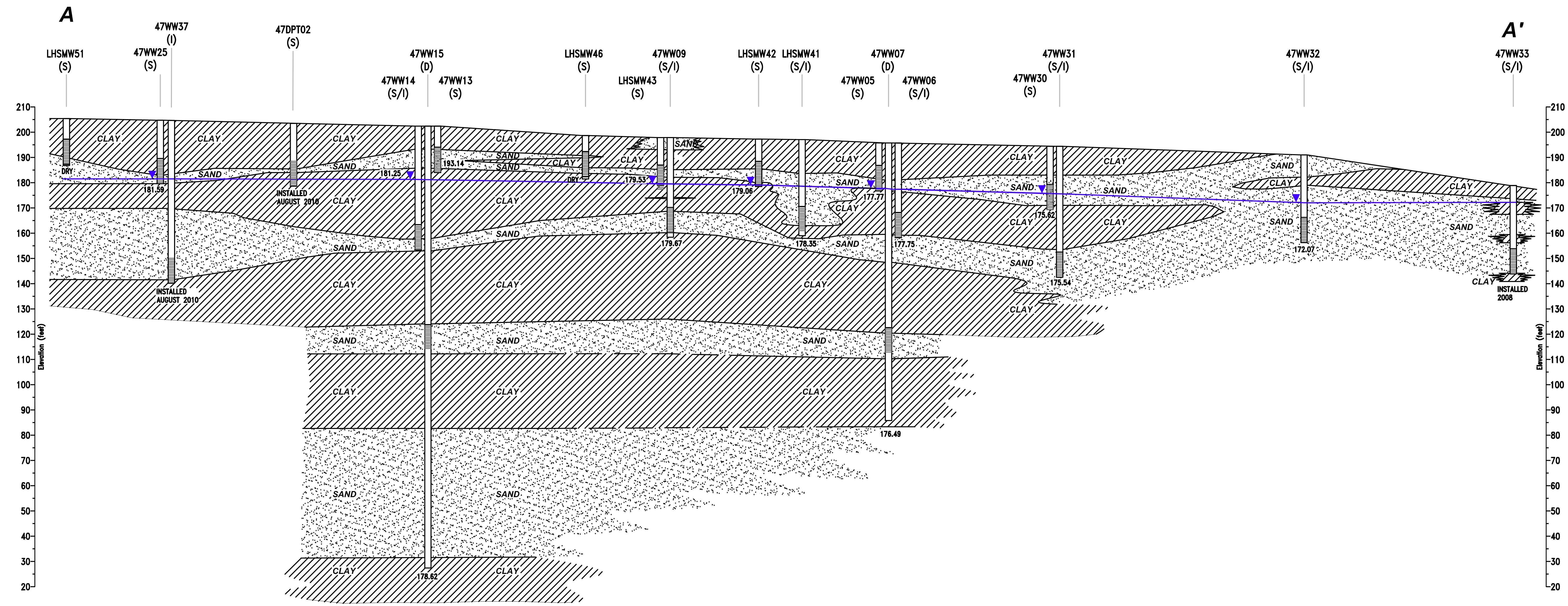
DEEP ZONE
GROUNDWATER ELEVATIONS
LHAAP-47 FEASIBILITY STUDY

LONGHORN ARMY AMMUNITION PLANT
KARNACK, TEXAS

OFFICE	DRAWN BY	CHECKED BY	APPROVED BY	FILE PATH
Houston, TX	B. Lu 12/04/08	R. Duffield 12/04/08	S. Watson 12/23/08	T:\GIS\Longhorn\My WKSPC\MXD\Site47 FS\47FS GWElevDp.mxd

Plot Date: 12/08

00100471



CROSS–SECTION A–A'

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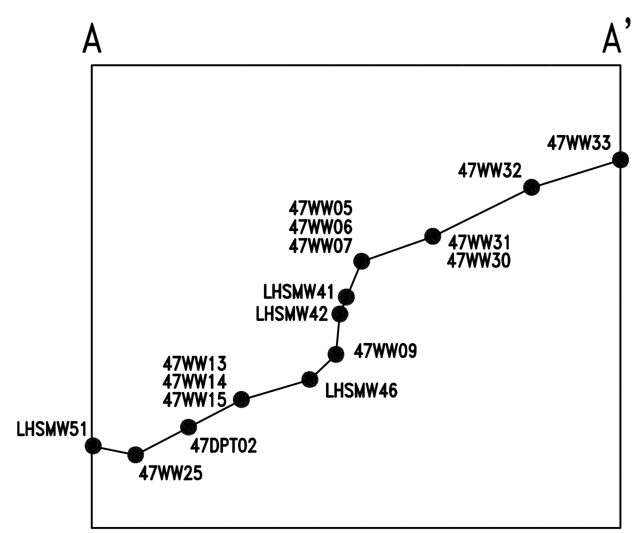
VERTICAL AS SHOWN



LEGEND:

CLAY (DASHED WHERE INFERRED)

SAND (DASHED WHERE INFERRED)

SCREEN

GROUNDWATER ELEVATION NOVEMBER–DECEMBER 2007

NOTE:

1. BOREHOLES AT 47WW07 AND 47WW15 EXTENDED BELOW THE BOTTOM OF THE WELL INSTALLATION DEPTH.

(S) SHALLOW GROUNDWATER ZONE

(S/I) SHALLOW/INTERMEDIATE GROUNDWATER ZONE

(I) INTERMEDIATE GROUNDWATER ZONE

(D) DEEP GROUNDWATER ZONE

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FIGURE 1–7
GEOLOGICAL CROSS SECTION A–A'
LHAAP–47 FEASIBILITY STUDY
LONGHORN ARMY AMMUNITION PLANT
KARNACK, TEXAS

DRAWING NUMBER 117591–B11
APPROVED BY S. WATSON 10/08/10
CHECKED BY K. EVERETT 10/08/10
DRAWN BY S. MCCAWLEY 10/08/10
OFFICE Houston, Texas
X–REF ---
IMAGE ---
PLOT DATE: 12/05/08
FORMAT REVISION 3/25/99

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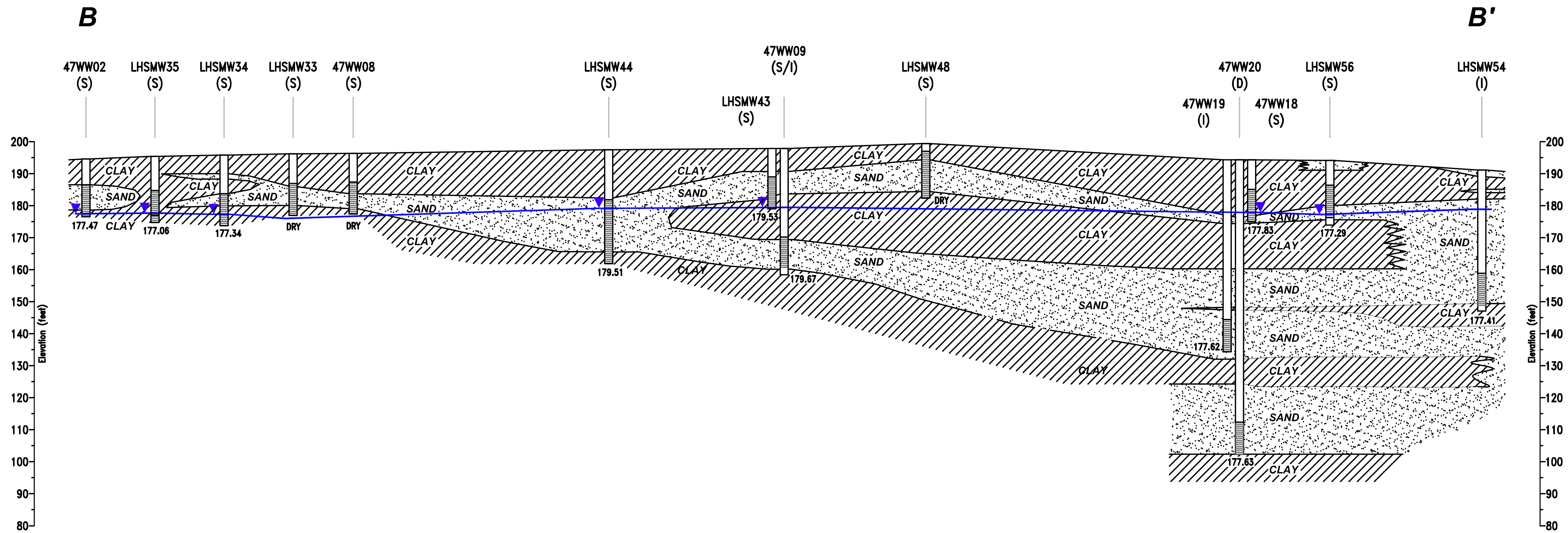
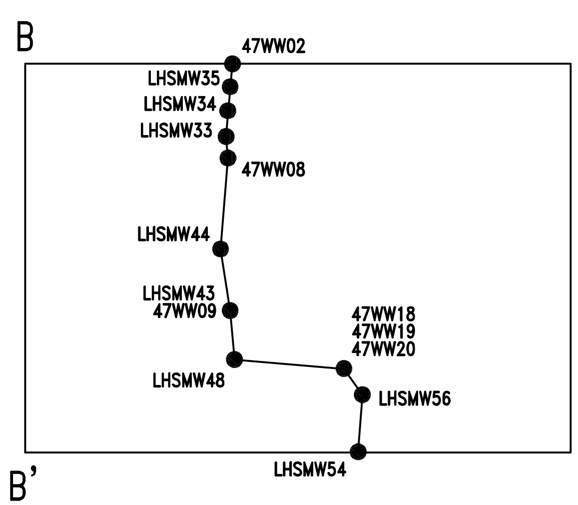


SECTION B–B'

SCALE: HORIZONTAL 1" = 400'
VERTICAL AS SHOWN



LEGEND:

CLAY (DASHED WHERE INFERRED)

SAND (DASHED WHERE INFERRED)

SCREEN

GROUNDWATER ELEVATION NOVEMBER–DECEMBER 2007

NOTE:

1. BOREHOLE AT 47WW20 EXTENDED BELOW THE BOTTOM OF THE WELL INSTALLATION DEPTH.

(S) SHALLOW GROUNDWATER ZONE

(S/I) SHALLOW/INTERMEDIATE GROUNDWATER ZONE

(I) INTERMEDIATE GROUNDWATER ZONE

(D) DEEP GROUNDWATER ZONE

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FIGURE 1–8
GEOLOGICAL CROSS SECTION B–B'
LHAAP–47 FEASIBILITY STUDY
LONGHORN ARMY AMMUNITION PLANT
KARNACK, TEXAS

DRAWING NUMBER	117591–B11
APPROVED BY	S. WATSON 10/08/10
CHECKED BY	K. EVERETT 10/08/10
DRAWN BY	S. MCCAWLEY 10/08/10
OFFICE	Houston, Texas
X–REF	---
IMAGE	---

PLOT DATE: 12/05/08
FORMAT REVISION 3/25/99

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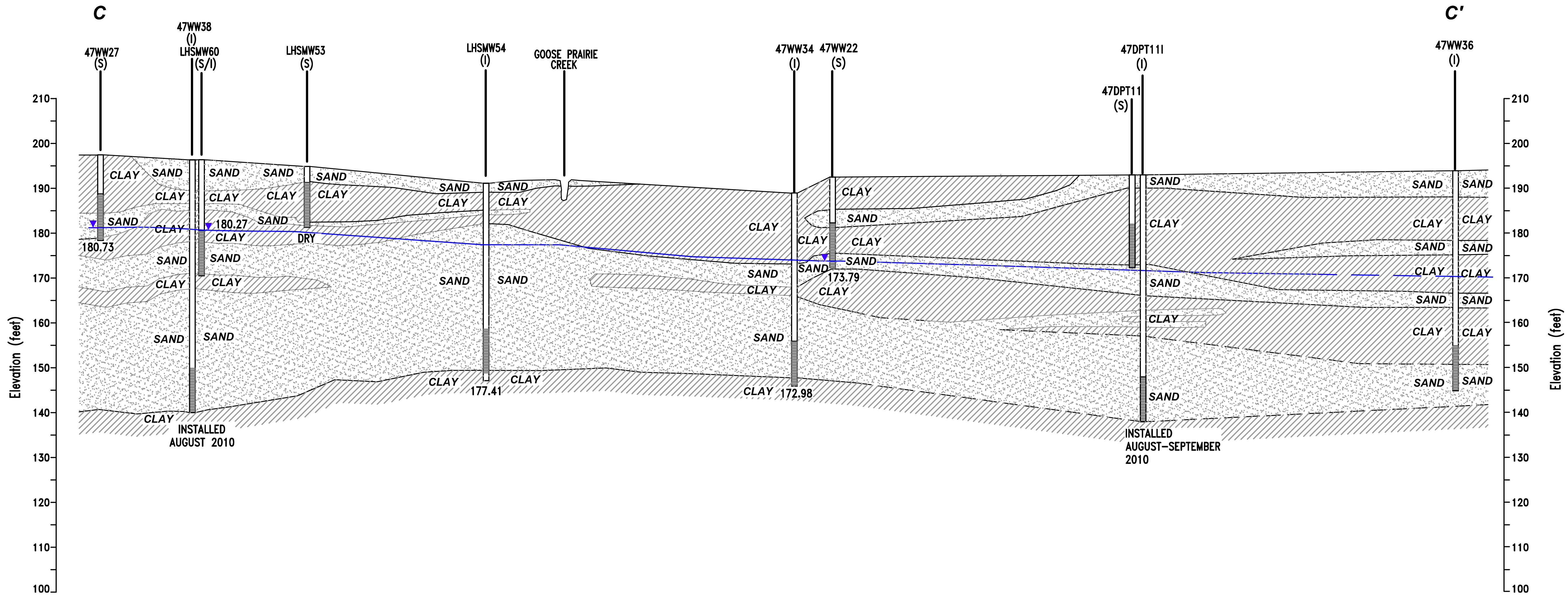
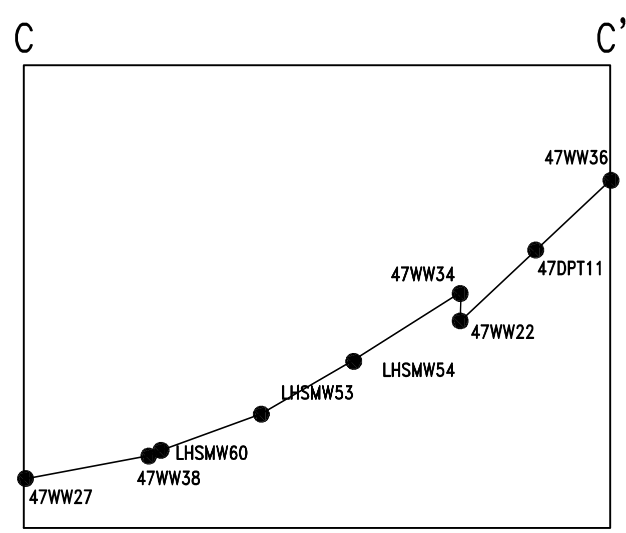


CROSS–SECTION C–C'

SCALE: HORIZONTAL 1" = 500'
VERTICAL AS SHOWN



LEGEND:

CLAY (DASHED WHERE INFERRED)

SAND (DASHED WHERE INFERRED)

SCREEN

GROUNDWATER ELEVATION NOVEMBER–DECEMBER 2007

NOTE:

(S) SHALLOW GROUNDWATER ZONE

(S/I) SHALLOW/INTERMEDIATE GROUNDWATER ZONE

(I) INTERMEDIATE GROUNDWATER ZONE

(D) DEEP GROUNDWATER ZONE

Shaw

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TULSA, OKLAHOMA

FIGURE 1–9
GEOLOGICAL CROSS SECTION C–C'
LHAAP–47 FEASIBILITY STUDY
LONGHORN ARMY AMMUNITION PLANT
KARNACK, TEXAS

DRAWING NUMBER	117591–B11
APPROVED BY	S. WATSON 10/08/10
CHECKED BY	K. EVERETT 10/08/10
DRAWN BY	S. MCCAWLEY 10/08/10
OFFICE	Houston, Texas
X–REF	---
IMAGE	---

PLOT DATE: 12/05/08
FORMAT REVISION 3/25/99

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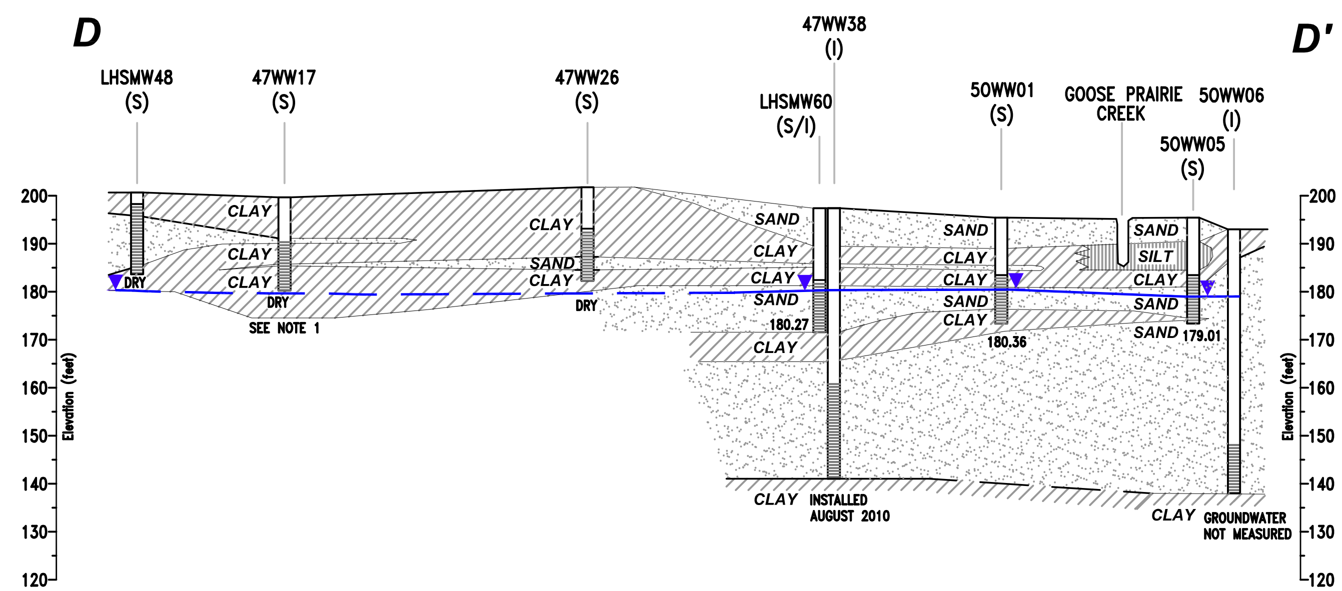

SECTION D–D'

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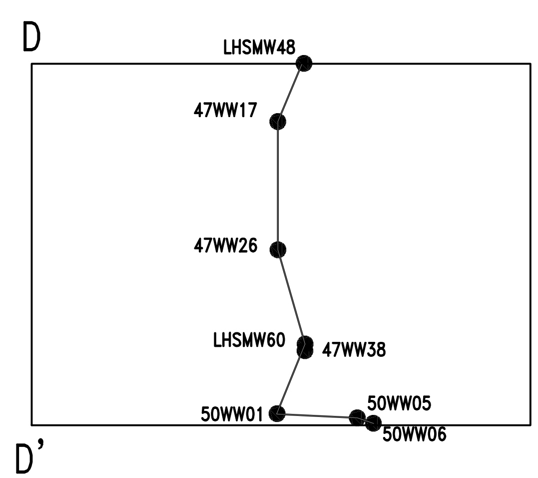
VERTICAL AS SHOWN



LEGEND:

- CLAY (DASHED WHERE INFERRED)
- SAND (DASHED WHERE INFERRED)
- SILT
- SCREEN
- GROUNDWATER ELEVATION NOVEMBER–DECEMBER 2007

NOTE:

1. INFORMATION FROM 47DPT03 WAS USED TO EXTEND LITHOLOGY AT 47WW17.

(S) SHALLOW GROUNDWATER ZONE

(S/I) SHALLOW/INTERMEDIATE GROUNDWATER ZONE

(I) INTERMEDIATE GROUNDWATER ZONE

(D) DEEP GROUNDWATER ZONE

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FIGURE 1–10
GEOLOGICAL CROSS SECTION D–D'
LHAAP–47 FEASIBILITY STUDY
LONGHORN ARMY AMMUNITION PLANT
KARNACK, TEXAS

DRAWING NUMBER	APPROVED BY	CHECKED BY	DRAWN BY	OFFICE	X-REF	IMAGE
117591–B11	S. WATSON 10/08/10	K. EVERETT 10/08/10	S. MCCAWLEY 10/08/10	Houston, Texas	---	---

PLOT DATE: 0713/10
FORMAT REVISION 3/25/99

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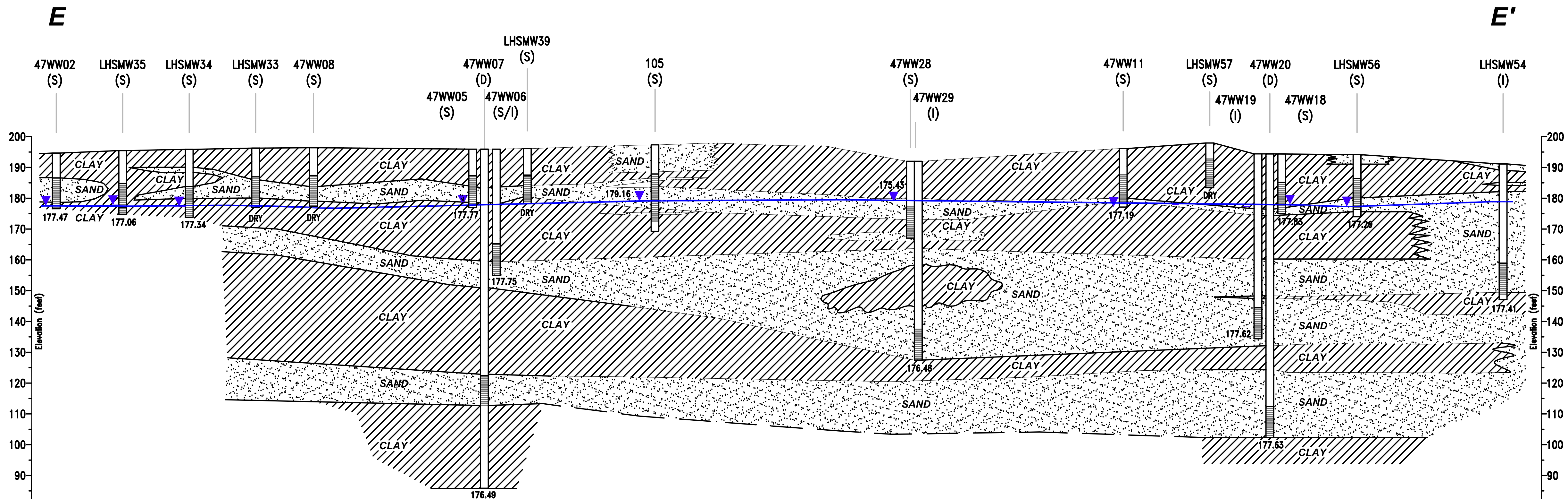
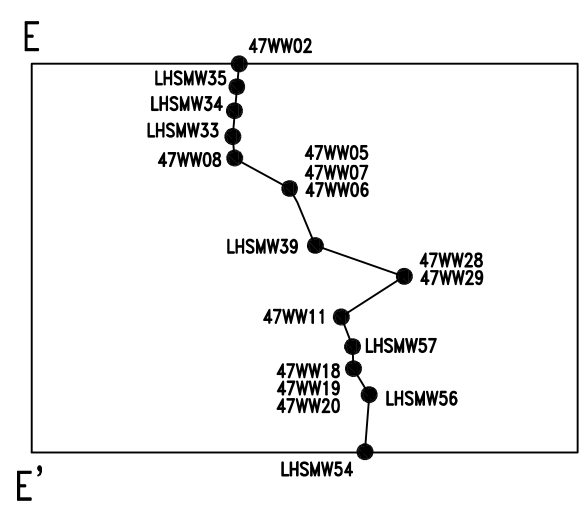


SECTION E–E'

SCALE: HORIZONTAL 1" = 400'
VERTICAL AS SHOWN



LEGEND:

CLAY (DASHED WHERE INFERRED)

SAND (DASHED WHERE INFERRED)

SCREEN

GROUNDWATER ELEVATION NOVEMBER–DECEMBER 2007

NOTE:

1. BOREHOLES AT 47WW07 AND 47WW20 EXTENDED BELOW THE BOTTOM OF THE WELL INSTALLATION DEPTH.

(S) SHALLOW GROUNDWATER ZONE

(S/I) SHALLOW/INTERMEDIATE GROUNDWATER ZONE

(I) INTERMEDIATE GROUNDWATER ZONE

(D) DEEP GROUNDWATER ZONE

Shaw

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

FIGURE 1–11
GEOLOGICAL CROSS SECTION E–E'
LHAAP–47 FEASIBILITY STUDY
LONGHORN ARMY AMMUNITION PLANT
KARNACK, TEXAS

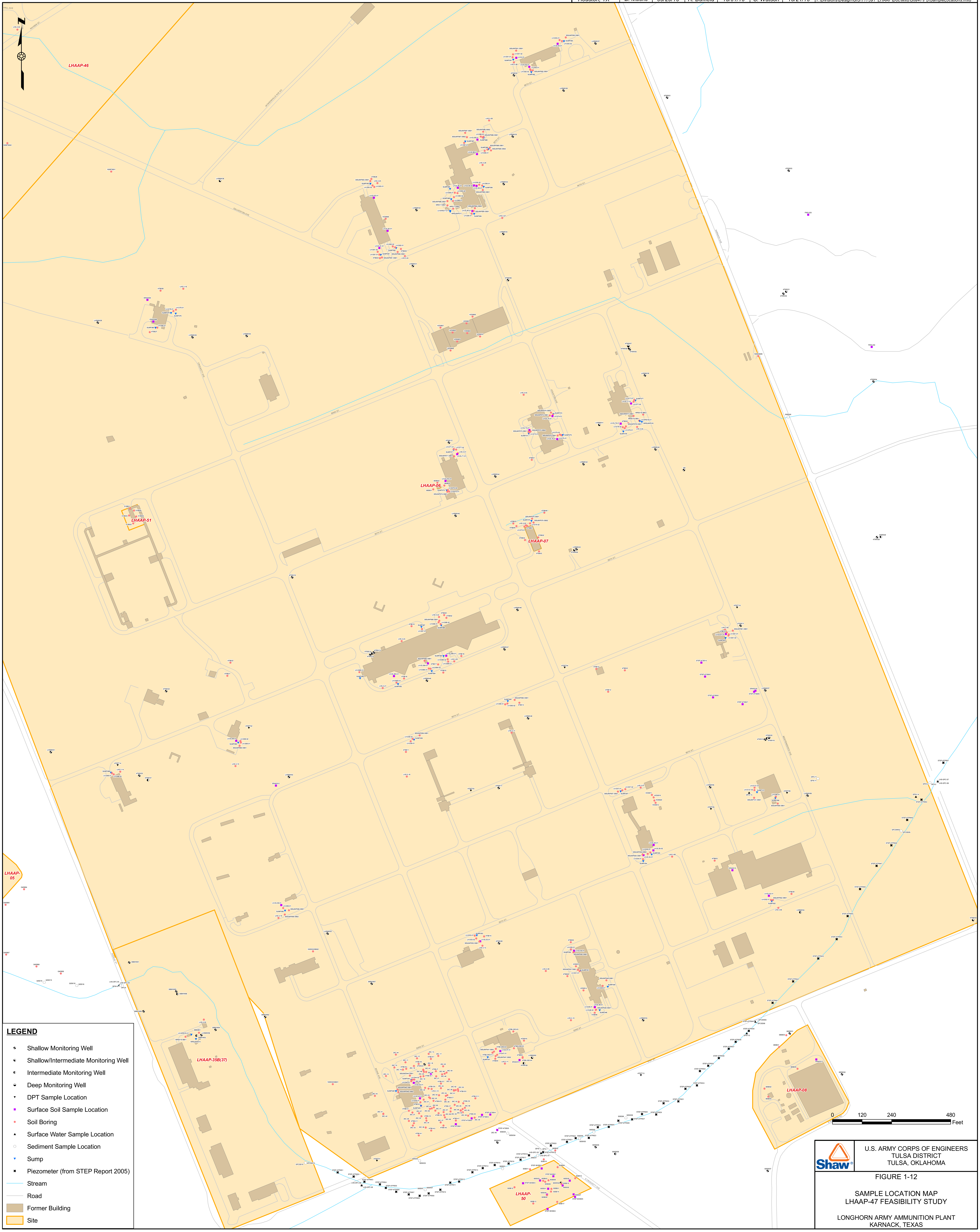
DRAWING NUMBER	117591–B11
APPROVED BY	S. WATSON 10/08/10
CHECKED BY	K. EVERETT 10/08/10
DRAWN BY	S. MCCAWLEY 10/08/10
OFFICE	Houston, Texas
X–REF	---
IMAGE	---

PLOT DATE: 12/05/08
FORMAT REVISION 3/25/99

00100476

Plot Date: 12/08

OFFICE	DRAWN BY		CHECKED BY		APPROVED BY		FILE PATH
Houston, TX	B. Muske	09/29/10	R. Duffield	10/01/10	S. Watson	10/21/10	T:\Divisions\Design\GIS\117591_LHAAP\Doc\Mxd\Site47\FS\SampleLocations.mxd



2.0 Risk and Site Assessment

This section summarizes the risk assessment approach, risk conclusions, and the conceptual site model for LHAAP-47. 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, 2007b)
- Installation-Wide Baseline Ecological Risk Assessment (Shaw, 2007a)
- Environmental Site Assessment (Plexus, 2005)
- Final Modeling Report (Shaw, 2007c)
- Final Sump Report (Shaw, 2008)

2.1 Risk Assessment Summary for LHAAP-47

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. For the 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 1×10^{-6} to 1×10^{-4} for the excess lifetime cancer risk (ELCR) and a hazard index (HI) of 1.

2.1.1 Soil

For the hypothetical future maintenance worker exposure to soil at LHAAP-47, the carcinogenic risk and non-carcinogenic hazard are acceptable. The ELCR calculated is 1.8×10^{-5}, which is within the acceptable range of 1×10^{-6} to 1×10^{-4}. The non-carcinogenic HI is 0.46, which is less than the acceptable value of 1. Thus, the risk assessment concludes that the soil does not pose a carcinogenic risk or non-carcinogenic hazard.

2.1.2 Groundwater

Although groundwater is not a present or anticipated source of drinking water, risk for a hypothetical future maintenance worker was evaluated. Risks from exposure to groundwater at LHAAP-47, the carcinogenic risk and non-carcinogenic hazard, exceed the acceptable limits. Groundwater data with unacceptable risk or hazard were also compared to maximum contaminant levels (MCLs). The total ELCR from groundwater for a hypothetical future maintenance worker is 7.1×10^{-3}. The total HI is 1,100. All chemicals in groundwater identified as presenting carcinogenic risk greater than 1×10^{-6}or non-carcinogenic hazards with a hazard quotient (HQ) greater than 0.1 are listed in **Table 2-1** and **Table 2-2**, respectively.

2.2 Evaluation of Data Collected Since the Risk Assessment

The risk assessment was completed using data from the groundwater samples through February 2001 and the soil samples through December 2000. Since that time, additional groundwater and soil samples have been collected and analyzed.

2.2.1 Soil

Additional soil samples were collected in September 2001 (Lynntech, 2001), during the perchlorate investigation in 2002 (STEP, 2005), during the sumps investigation in September 2006 (Shaw, 2008), during the baseline ecological risk assessment in November 2006 (Shaw, 2007a), and during soil sampling in 2010. Most of the results were less than the concentrations evaluated in the risk assessment, but perchlorate and arsenic results were higher. The maximum perchlorate detected was in a soil sample collected in 2001 with a concentration of 350 milligrams per kilogram (mg/kg). The exposure point concentration (EPC) for perchlorate used in the risk assessment was 180 mg/kg, with an associated HQ of 0.21 (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 of 0.41. Thus, the HQ will still be below 1, and does not change the outcome of the risk assessment for perchlorate in soil. The maximum arsenic detected was in a soil sample collected in 2006 as part of the sumps investigation with a concentration of 14.6 mg/kg. The EPC for arsenic used in the risk assessment was 4.7 mg/kg, with an associated carcinogenic risk of 3.0×10^{-6} (Jacobs, 2003). Using ratios of the risk to the arsenic concentrations, the risk for the maximum concentration of arsenic detected since the risk assessment would yield a risk of 9.3×10^{-6}. Thus, the risk will still be in the acceptable range of 10^{-6} to 10^{-4}, and does not change the outcome of the risk assessment for arsenic in soil. 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, metals, VOCs, and attenuation parameters. The impact of the metals in groundwater was further evaluated (geochemical evaluation – **Appendix B**). No new VOCs were detected that would change the listed chemicals in **Table 2-1** or **Table 2-2**. More recent data indicated that concentrations of perchlorate, TCE, cis-1,2-dichloroethene (DCE), 2,4,6-TNT, vinyl chloride (VC), 1,1-DCE, tetrachloroethene (PCE), 1,2-dichloroethane (DCA), 1,1,2-trichloroethane (TCA) in the groundwater decreased. Other chemicals showed higher or lower concentrations in more recent groundwater samples, but the wells with the EPC concentrations evaluated in the risk assessment were not resampled.

In response to concerns by the Army about high TCE concentrations at monitoring wells 47WW25 and LHSMW56, and wells with most recent results more than eight years old, Shaw conducted additional groundwater sampling in February, April 2009, and August 2010. In February 2009, ten monitoring wells (105, 47WW09, 47WW13, 47WW14, 47WW19, LHSMW41, LHSMW43, LHSMW45, LHSMW50, and LHSMW57) were sampled and tested for VOCs and microbes. Three other monitoring wells (47WW16, 47WW25, and LHSMW56) were dry. In April 2009, four monitoring wells (47WW12, 47WW16, 47WW25, and LHSMW56) were sampled and tested for VOCs. In August 2010, 20 monitoring wells and 18 direct-push technology (DPT) locations were sampled and tested for VOCs, perchlorate, metals, semivolatile organic compounds (SVOCs), and MNA parameters. In addition, 17 other monitoring wells were dry. Soil samples were collected around Buildings 25C and 25D to better characterize perchlorate in soil. The sample collection logs and results in tabular form are included in **Appendix C**.

The results obtained from these post risk assessment groundwater samples do not alter the conclusion of the risk assessment that groundwater poses unacceptable risk or hazard.

2.2.3 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 (max of 27 micrograms per liter [µg/L] in March 2008) but have remained below the TCEQ surface water contact recreational level (395 µg/L), and the groundwater medium-specific concentration (MSC) for residential use (GW-Res) (26 µg/L) in quarterly 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 Goose Prairie Creek is below the GW-Res and is not contaminating Caddo Lake.

2.3 Media Contamination Assessment

The human health risk assessment determined that chemicals in the groundwater at LHAAP-47 pose an unacceptable risk to the hypothetical future maintenance worker. Evaluation of groundwater data generated after the risk assessment identified no additional COCs with risks exceeding the USEPA target risk level of 1×10^{-4} or an HQ greater than 0.1 as shown in **Table 2-1** and **Table 2-2**. Chemicals in the soil do not pose unacceptable risk or hazard to human health.

2.3.1 Soil Contamination

Soil was not found to contribute to a significant human health risk or hazard and is not addressed further under this FS except for perchlorate. Perchlorate was detected in soil at LHAAP-47 near Building 25C. Even though data in the human health risk assessment indicates that chemicals in soil pose no unacceptable risk or hazard 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 350 mg/kg in the soil (Lynntech, 2001). The TCEQ soil MSC for industrial use based on groundwater protection (GWP-Ind) for perchlorate is 7.2 mg/kg. Based on the concentrations in the groundwater, the maximum concentrations detected in soil, and the GWP-Ind, perchlorate in the soil could be acting as a residual source. Therefore, assessment of alternatives will include removal of soil in the areas where perchlorate concentrations exceed the GWP-Ind because it may act as a residual source to the groundwater contamination. The area of perchlorate soil contamination to be addressed at Building 25C is shown on **Figure 2-1**. The extent of the plastic liner laid down in November 1999 is also shown on **Figure 2-1**.

Soil sampling to assess potential perchlorate contamination at Building 25D was conducted in 2010. Perchlorate was detected, but at concentrations below the GWP-Ind. **Figure 2-2** shows the perchlorate sample locations at Building 25D.

2.3.2 Groundwater Contamination

Based on the human health risk assessment, groundwater at LHAAP-47 poses an unacceptable carcinogenic risk and non-carcinogenic hazard to a hypothetical future maintenance worker at LHAAP under an industrial scenario.

Groundwater contaminants with a HQ greater than 0.1 are listed in **Table 2-1**. Many of the contaminants have MCLs, which are the proposed cleanup levels. For chemicals that do not have an MCL, the TCEQ groundwater MSC for industrial use (GW-Ind) was used for evaluation. The COCs listed in **Table 2-1** for the LHAAP-47 groundwater are perchlorate,4 VOCs (TCE, chloroform, acetone, and cis-1,2-DCE), 12 metals (thallium, cadmium, nickel, silver, tin, antimony, manganese, aluminum, strontium, chromium, vanadium, and cobalt), and 1 explosive (2,4,6-TNT). A geochemical evaluation was conducted to evaluate if any of the inorganic compounds were naturally occurring or could be present due to site activities. Several metals are suspected to be naturally occurring or associated with stainless steel wells, but the metals were retained as COCs for further sampling and evaluation (**Appendix B**).

Groundwater contaminants with an ELCR greater than 1×10^{-6} are listed in **Table 2-2**. As above, MCLs were used for the evaluation. The COCs considered in **Table 2-2** for the LHAAP-47 groundwater are seven VOCs (TCE, VC, 1,1-DCE, chloroform, PCE, 1,2-DCA, and 1,2-TCA), 2,3,7,8-tetrachlorodibenzo-p-dioxin (TCDD), two SVOCs (pentachlorophenol and bis[2-ethylhexyl] phthalate) and two explosives (2,4-dinitrotoluene [DNT] and 2,6-DNT) due to their contribution to risk and exceedance of the MCL. Even though 2,3,7,8-TCDD, and 1,1,2-TCA indicate risk above 1×10^{-6}, the maximum concentrations are below the MCL, and they are not identified as COCs. Explosives 2,4-DNT and 2,6-DNT indicate risk above 1×10^{-6}, but the combined indicated risk is below 1×10^{-4} for all chemicals without MCLs, placing 2,4-DNT and 2,6-DNT in the acceptable risk range. However, 2,4-DNT and 2,6-DNT were retained as COCs for further sampling and evaluation.

Perchlorate and VOCs contributed the majority (97.5%) of the non-carcinogenic hazard and VOCs contributed the majority (99.8%) of the carcinogenic risk. The most recent perchlorate concentrations in shallow groundwater are shown in **Figures 2-3** and **2-4** and the most recent VOC concentrations in groundwater are shown in **Figure 2-5** through **Figure 2-8**. The perchlorate and VOC plumes do not overlap, and the VOC plume is primarily of TCE, with minor occurrences of PCE, 1,1-DCE, cis-1,2-DCE, and VC. The MCL (TCE) and GW-Ind (perchlorate) were used as the criteria for defining plume boundaries.

2.3.2.1 Perchlorate

Perchlorate concentrations in groundwater are compared to the GW-Ind (72 µg/L). As shown on **Figure 2-3**, perchlorate exceeds the GW-Ind at shallow monitoring wells 47WW11, 47WW26, 47WW27, and LHSMW60. The highest perchlorate concentration is found in monitoring well LHSMW60 near two buildings (25C and 25D) where ammonium perchlorate was received and processed. The trend of perchlorate concentrations at 47WW11, 47WW26, and 47WW27 has been generally downward. The trend of perchlorate concentrations at LHSMW60 has been mixed. The most recent results are approximately ¾ of the maximum concentration in that well. More detailed analysis of perchlorate trends is included in **Appendix A**.

Perchlorate concentrations in groundwater exceed the GW-Ind at intermediate zone well 47WW38 near LHSMW60. Perchlorate was also detected at intermediate zone well 47WW37 at a concentration below the GW-Ind. Mixing and casting of plastic blended explosive (PBX) propellant took place at Building 46A and PBX contains perchlorates (Plexus, 2005). The area upgradient of monitoring well 47WW37 is LHAAP-5, a surface impoundment which received boiler plant brine backwash, but no identified perchlorate wastes (Plexus, 2005). **Figure 2-4** shows the projected intermediate zone perchlorate plume based on perchlorate concentrations and the overall hydraulic gradient.

2.3.2.2 Trichloroethene

Concentrations of TCE in groundwater are compared to the MCL (5 µg/L). The most recent TCE results exceed the MCL at 20 monitoring wells, 14 shallow, 3 shallow/intermediate, and 3 intermediate wells. Some interpretation is needed to define TCE plumes as being in the shallow or intermediate groundwater zone. The low groundwater levels since 2002 and resulting dry wells add additional complications.

Figure 2-5 shows an interpretation for TCE plumes in the shallow zone. For this interpretation, monitoring wells 47WW23, 47WW32 and 47WW33 designated as shallow/intermediate were used as shallow wells for delineation. The northern plume stretches from monitoring well 47WW25 through 47WW13 and LHSMW43 to 105, and additionally from monitoring well 47WW45 through 47WW05 and 47WW30 to 47WW32. The southern plume centers around monitoring well LHSMW56, includes 47WW18, and trends off toward the east. The plumes are bounded by results less than the MCL in adjacent shallow monitoring wells or DPT points. A large swath of dry wells across the center was excluded from either plume since the more recent DPTs indicate that TCE is not above detection limits in this area. Several areas have higher TCE concentrations within the plume, including 13,300 μg/L at monitoring well 47WW25 and 6,210 μg/L at monitoring well LHSMW43, both near buildings where solvents were used.

Figure 2-6 shows an interpretation for TCE plumes in the intermediate zone. For this interpretation, monitoring wells 47WW06, 47WW09, 47WW14, 47WW23, 47WW31, and LHSMW41 designated as shallow/intermediate were used as intermediate wells for delineation. The plume stretches from 47WW37 through 47WW14 to 47WW09 in the middle of the site. A separate plume is drawn from LHSMW54 east-northeast to 47WW34. The plume is bounded by results less than the MCL in adjacent intermediate monitoring wells, and temporary monitoring points.

Figure 2-7 displays both the shallow and intermediate TCE plumes together. For the monitoring wells where trends in TCE concentration can be evaluated, three of the seven wells with the highest concentrations showed decreasing trends while only one showed an increasing trend. The other three showed mixed results. More detailed analysis of TCE concentration trends can be found in **Appendix A**.

2.3.2.3 Tetrachloroethene

Concentrations of PCE in groundwater are compared to the MCL (5 μg/L). The most recent PCE results exceed the MCL at two monitoring wells, LHSMW43 and 47WW09. These monitoring wells are collocated and the plume is bounded by results less than the MCL in adjacent monitoring wells. This PCE plume is depicted on **Figure 2-7** and is entirely within the limits of the TCE plume. The trend in PCE concentrations has been mixed with no strong increasing or decreasing pattern.

2.3.2.4 1,1-Dichloroethene

Concentrations of 1,1-DCE in groundwater are compared to the MCL (7 µg/L). It is a daughter product of TCE degradation. The most recent 1,1-DCE results exceed the MCL at two monitoring wells, LHSMW39 and LHSMW56. The plume is bounded by results less than the MCL in adjacent monitoring wells. This 1,1-DCE plume is depicted on **Figure 2-8** and is within the limits of the TCE plume except for monitoring well LHSMW39, which overlaps its edge. The trends of 1,1-DCE concentrations have been mixed, with some decreasing and some increasing.

2.3.2.5 cis-1,2-Dichloroethene

Concentrations of cis-1,2-DCE in groundwater are compared to the MCL (70 µg/L). It is a daughter product of TCE degradation. The most recent cis-1,2-DCE results exceed the MCL at eight monitoring wells, 47WW09, 47WW13, 47WW14, 47WW25, 47WW34, LHSMW43, LHSMW45, and LHSMW56. The plumes are bounded by results less than the MCL in adjacent monitoring wells. This cis-1,2-DCE plume is depicted on **Figure 2-8** and is entirely within the limits of the TCE plume. The trends for cis-1,2-DCE concentrations have been mixed, with some decreasing and some increasing.

2.3.2.6 Vinyl Chloride

Concentrations of VC in groundwater are compared to the MCL (2 µg/L). It is a daughter product of TCE degradation. The most recent VC results exceed the MCL at three monitoring wells, 47WW13, 47WW14, and LHSMW56. The plume is bounded by results less than the MCL in adjacent monitoring wells. This VC plume is depicted on **Figure 2-8** and is entirely within the limits of the TCE plume. The trends for VC concentrations have been mixed, with some decreasing and some increasing.

2.3.2.7 1,2-Dichloroethane

Concentrations of 1,2-DCA in groundwater are compared to the MCL (5 µg/L). The most recent 1,2-DCA results do not exceed the MCL at any monitoring well. The chemical 1,2-DCA is considered a COC because one sample from 1996 at monitoring well LHSMW48 exceeded the MCL. It is expected that the 1,2-DCA detected was a trace contaminant in the TCE solvent or a minor daughter product of TCE degradation.

2.3.2.8 Chloroform

Concentrations of chloroform in groundwater are compared to the MCL for total trihalomethanes (80 µg/L). The most recent chloroform results exceed the MCL at one monitoring well, 47WW20. The chemical chloroform is considered a COC because one sample from 1998 at monitoring well 47WW20 exceeded the MCL. It is expected that the chloroform from 1998 was a laboratory contaminant and is not likely to be found in the future.

2.3.2.9 Acetone

Concentrations of acetone in groundwater are compared to the GW-Ind (92,000 μg/L). The most recent acetone results show a maximum of 21,000 μg/L in monitoring well LHSMW35 from 1998. The chemical acetone is considered a COC because the Baseline Risk Assessment used more conservative assumptions for assessing acetone risk and calculated an HQ of 8.1. It is expected that the acetone detected in past groundwater samples was a laboratory contaminant and is not likely to be found in the future.

2.3.2.10 1,1,2-Trichloroethane

Concentrations of 1,1,2-TCA in groundwater are compared to the MCL (5 μg/L). The most recent 1,1,2-TCA results are all less than the MCL. The chemical 1,1,2-TCA is not considered a COC because the maximum concentration detected (4.9 μg/L at LHSMW43) is less than the MCL.

2.3.2.11 2,3,7,8-TCDD

Concentrations of 2,3,7,8-TCDD in groundwater are compared to the MCL (3.0×10^{-5} μg/L). The most recent 2,3,7,8-TCDD results are all less than the MCL. The chemical 2,3,7,8-TCDD is not considered a COC because the maximum concentration detected (2.88×10^{-6} μg/L at 47WW01) is less than the MCL.

2.3.2.12 2,4,6-TNT

Concentrations of 2,4,6-TNT in groundwater are compared to the GW-Ind (51 μg/L). The most recent 2,4,6-TNT results show no detectable TNT. The chemical 2,4,6-TNT is considered a COC because a 1996 sample from monitoring well LHSMW56 showed a 6.8 μg/L 2,4,6-TNT concentration, leading to an HQ of 0.13. It is expected that the 2,4,6-TNT detected in past groundwater samples was transient and is not likely to be found in the future.

2.3.2.13 2,4-Dinitrotoluene

Concentrations of 2,4-DNT in groundwater are compared to the GW-Ind (0.42 μg/L). The most recent 2,4-DNT results exceed the GW-Ind at one monitoring well, 47WW11. This well was dry in August 2010. The cumulative risk of all cancer risks for chemicals with no MCL is less than 10^{-4}, but the chemical 2,4-DNT is retained as a COC for further sampling and evaluation.

2.3.2.14 2,6-Dinitrotoluene

Concentrations of 2,6-DNT in groundwater are compared to the GW-Ind (0.42 μg/L). The most recent 2,6-DNT results exceed the GW-Ind at one monitoring well, 47WW11. This well was dry in August 2010. The cumulative risk of all cancer risks for chemicals with no MCL is less than 10^{-4}, but the chemical 2,6-DNT is retained as a COC for further sampling and evaluation.

2.3.2.15 bis(2-Ethylhexyl)phthalate

Concentrations of bis(2-ethylhexyl)phthalate in groundwater are compared to the MCL (6 µg/L). The most recent bis(2-ethylhexyl)phthalate results exceed the MCL at four monitoring wells, 47WW13, 47WW14, LHSMW37, and 47WW09. The chemical bis(2-ethylhexyl)phthalate is considered a COC because concentrations exceed the MCL. It is expected that the bis(2-ethylhexyl)phthalate detected in groundwater samples may be a sampling contaminant as it has also been detected in associated equipment blanks.

2.3.2.16 Pentachlorophenol

Concentrations of pentachlorophenol in groundwater are compared to the MCL (1 µg/L). The most recent pentachlorophenol results exceed the MCL at one monitoring well, LHSMW47. The chemical pentachlorophenol is considered a COC because concentrations exceed the MCL. It is expected that the pentachlorophenol detected in past groundwater samples was transient and are not likely to be found in the future.

2.3.2.17 Aluminum

Concentrations of aluminum in groundwater are compared to the GW-Ind (100,000 µg/L). The most recent aluminum results exceed the GW-Ind at one monitoring well, 47WW13. The chemical aluminum is considered a COC because aluminum concentrations in groundwater led to an HQ of 0.84. It is expected that the aluminum detected in past groundwater samples is related to clay minerals and future sampling with low flow methods will show lower concentrations.

2.3.2.18 Antimony

Concentrations of antimony in groundwater are compared to the MCL (6 µg/L). The most recent antimony results exceed the MCL at six monitoring wells, 47WW04, 47WW16, 47WW21, 47WW22, LHSMW54 and LHSMW57. The chemical antimony is considered a COC because concentrations exceed the MCL. It is expected that the antimony detected in past groundwater samples has a natural source.

2.3.2.19 Cadmium

Concentrations of cadmium in groundwater are compared to the MCL (5 µg/L). The most recent cadmium results exceed the MCL at one monitoring well, LHSMW57. The chemical cadmium is considered a COC because one sample result from 1998 exceeded the MCL. It is expected that the cadmium detected in past groundwater samples was an isolated occurrence and future sampling with low flow methods will show lower concentrations.

2.3.2.20 Chromium

Concentrations of chromium in groundwater are compared to the MCL (100 µg/L). The most recent chromium results exceed the MCL at 21 monitoring wells. Most of these monitoring wells are shallow, and all are constructed with stainless steel well screens. The chemical chromium is considered a COC because concentrations exceed the MCL. It is expected that the chromium detected in past groundwater samples is related to stainless steel well construction material.

2.3.2.21 Cobalt

Concentrations of cobalt in groundwater are compared to the GW-Ind (31 µg/L). The most recent cobalt results show no concentrations above the GW-Ind. The chemical cobalt is considered a COC because cobalt concentrations in groundwater led to an HQ of 0.15. It is expected that future sampling with low flow methods will show lower concentrations.

2.3.2.22 Manganese

Concentrations of manganese in groundwater are compared to the GW-Ind (14,000 µg/L). The most recent manganese results, and all past results, show no concentrations above the GW-Ind. The chemical manganese is considered a COC because the Baseline Risk Assessment used more conservative assumptions for assessing manganese risk and calculated an HQ of 1.6. It is expected that the manganese detected in past groundwater samples has a natural source and future sampling with low flow methods will show lower concentrations.

2.3.2.23 Nickel

Concentrations of nickel in groundwater are compared to the GW-Ind (2,000 µg/L). The most recent nickel results exceed the GW-Ind at four monitoring wells, 47WW08, 47WW22, LHSMW51 and LHSMW55. All of these monitoring wells are shallow, and all are constructed with stainless steel well screens. The chemical nickel is considered a COC because concentrations exceed the GW-Ind. It is expected that the nickel detected in past groundwater samples is related to stainless steel well construction material.

2.3.2.24 Silver

Concentrations of silver in groundwater are compared to the GW-Ind (510 µg/L). The most recent silver results exceed the GW-Ind at one monitoring well, LHSMW51. The chemical silver is considered a COC because concentrations exceed the GW-Ind. It is expected that the silver detected in past groundwater samples is anomalous and future sampling with low flow methods will show lower concentrations.

2.3.2.25 Strontium

Concentrations of strontium in groundwater are compared to the GW-Ind (61,000 µg/L). The most recent strontium results, and all past results, show no concentrations above the GW-Ind. The chemical strontium is considered a COC because strontium concentrations in groundwater led to an HQ of 0.31. It is expected that future sampling with low flow methods will show lower concentrations.

2.3.2.26 Thallium

Concentrations of thallium in groundwater are compared to the MCL (2 µg/L). The most recent thallium results exceed the MCL at two wells, 47WW05 and 47WW06. The chemical thallium is considered a COC because concentrations exceed the MCL. It is expected that the thallium detected in past groundwater samples is related to sampling technique and that future sampling with low flow methods will show lower concentrations.

2.3.2.27 Tin

Concentrations of tin in groundwater are compared to the GW-Ind (61,000 µg/L). The most recent tin results exceed the GW-Ind at one well, 47WW02. The chemical tin is considered a COC because the tin concentration in one sample exceeds the GW-Ind. It is expected that the tin detected in past groundwater samples is anomalous and that future sampling with low flow methods will show lower concentrations.

2.3.2.28 Vanadium

Concentrations of vanadium in groundwater are compared to the GW-Ind (7.2 µg/L). The most recent vanadium results exceed the GW-Ind at one monitoring well, 47WW22. The chemical vanadium is considered a COC because concentrations exceed the GW-Ind. It is expected that the vanadium detected in past groundwater samples is related to stainless steel well construction material.

2.4 Conceptual Site Model

Figure 2-9 illustrates the overall conceptual site model for LHAAP-47. The model presents those pathways that may lead to the exposure of a hypothetical future maintenance worker and are hence being considered for remediation. Pathways that have no potential for exposure or have negligible impact are not being considered for remediation.

There are areas of highly contaminated groundwater at the site which may have resulted from releases from the former sumps or spills during site operations. The migration pathway of leaching of soil contaminants to groundwater is a potential pathway. Perchlorate concentrations in the soil near Building 25C exceed the groundwater protection standard, and soil leaching may have contributed to the perchlorate contamination in the groundwater. Metals, SVOCs, and VOCs have been detected in the groundwater at concentrations exceeding respective MCLs. However, available data do not indicate the presence of associated soil contamination that may leach to the groundwater. All sumps at LHAAP-47 have been either removed or taken out of service and can no longer be a potential source of groundwater contamination. Residual groundwater contamination from former sources and the perchlorate-contaminated soil near Building 25C will be addressed as part of the remedial action.

Risks from exposure to soil were found to be acceptable and direct soil exposure is not a potential pathway. Overland flow does not currently appear to be contributing to a migration of contaminants, as the ditch surface water did not contain any VOCs, SVOCs, explosives, pesticides, or polychlorinated biphenyls (PCBs). Likewise, the sediment data show no detections of VOCs, SVOCs, explosives, or pesticides. Some metals were detected in the surface water and sediment at low concentrations that occur naturally.

The migration pathway, groundwater to surface water, is not a likely pathway under current conditions. This pathway is not complete because the groundwater elevations lie below the base of the creek bed. Should groundwater elevations rise in the future, this pathway could potentially become complete. Modeling calculations were completed to assess the potential for the COCs present in shallow groundwater at LHAAP-47 to migrate toward and discharge to Goose Prairie Creek. The modeling concluded that contaminants present in the shallow groundwater at LHAAP-47 will not adversely impact Goose Prairie Creek surface water (Shaw, 2007c).

The migration pathway, soil to surface water, is not a likely pathway. Goose Prairie Creek runs on the south side of LHAAP-47, and the perchlorate contaminated soil may be contributing to detections of perchlorate in surface water. However, perchlorate results for the surface water are below the contact recreational value of 395 µg/L (TCEQ, 2007) and the GW-Res (26 µg/L). Thus, the only soil pathway considered for remediation is the potential migration to groundwater.

There is no present use of the groundwater and there is no projected use of the groundwater at LHAAP-47. The reasonably anticipated future use of the site is a wildlife refuge (or industrial use). The hypothetical pathway considered for remediation in this FS is potential ingestion by the hypothetical future maintenance worker. Remediation of this pathway will ensure that future groundwater use does not occur.

Table 2-1
Chemicals with Hazard Quotient Greater than 0.1 in Groundwater

Chemical	Baseline Risk Assessment			Recent Maximum Result			Comparison Level		Retained as COC ?
	EPC (µg/L)	Well	Groundwater Hazard Quotient	Recent Maximum (µg/L)	Date	Well [a]	MCL (µg/L)	GW-Ind (µg/L)	
Perchlorate	82,900	LHSMW60	900	56,600	08/30/10	LHSMW60		72	Yes, 1
Trichloroethene	29,400	LHSMW43	110	13,300 6,240	04/03/09 02/19/09	47WW25 LHSMW43	5		Yes, 2
Chloroform	120	47WW20	69	1.61 JB -	10/09/09 -	47WW35 47WW20	80 [b]		Yes, 2
Thallium	93	LHSMW47	11	4.62 ND	09/13/07 05/18/98	47WW07 LHSMW47	2		Yes, 2
Acetone	21,000	LHSMW35	8.1	12.5 -	10/09/08 -	47WW36 LHSMW35		92000	Yes, 1
Cadmium	200	LHSMW57	3.9	5.07 -	11/29/07 -	47WW22 LHSMW57	5		Yes, 2
Nickel	8,000	LHSMW51	3.9	17,500 -	11/29/07 -	47WW22 LHSMW51		2000	Yes, 1
cis-1,2-Dichloroethene	2,090	LHSMW43	2.5	1,440 325	08/04/10 02/19/09	47WW13 LHSMW43	70		Yes, 2
Silver	1,000	LHSMW51	2	ND -	08/04/10 -	47WW13 LHSMW51		510	Yes, 1
Tin	120,000	47WW02	2	Not Tested After Risk Assessment				61000	Yes, 1
Antimony	76	LHSMW60	1.9	7.5 1.62 J	11/29/07 08/30/10	47WW22 LHSMW60	6		Yes, 2
Manganese	7,750	47WW16	1.6	3,280 -	11/29/07 -	47WW22 47WW16		14000	Yes, 1
Aluminum	86,000	LHSMW48	0.84	63,000 -	11/29/07 -	47WW22 LHSMW48		100000	Yes, 1
Strontium	19,000	47WW17	0.31	Not Tested After Risk Assessment				61000	Yes, 1

Table 2-1
Chemicals with Hazard Quotient Greater than 0.1 in Groundwater

Chemical	Baseline Risk Assessment			Recent Maximum Result			Comparison Level		Retained as COC ?
	EPC (µg/L)	Well	Groundwater Hazard Quotient	Recent Maximum (µg/L)	Date	Well [a]	MCL (µg/L)	GW-Ind (µg/L)	
Chromium	43,000	LHSMW51	0.28	356,000 -	11/29/07 -	47WW22 LHSMW51	100		Yes, 2
Vanadium	130	LHSMW48	0.18	1,820 -	11/29/07 -	47WW22 LHSMW48		72	Yes, 1
Cobalt	311	LHSMW53	0.15	171 80	11/29/07 05/20/98	47WW22 LHSMW53		31	Yes, 1
2,4,6-Trinitrotoluene	6.8	LHSMW56	0.13	Not Tested After Risk Assessment				51	Yes, 1

Notes and Abbreviations:

Lists chemicals with hazard quotient greater than 0.1.

1. Retained as a COC because hazard quotient is greater than 0.1.
2. Retained as a COC because at least 1 result is greater than the MCL.

[a] When 2 wells are listed, the recent maximum was from a different well.

[b] MCL for Total Trihalomethanes used as a surrogate.

µg/L - micrograms per liter

COC - chemical of concern

EPC - exposure point concentration

GW-Ind - TCEQ groundwater MSC for industrial use.

MCL - maximum contaminant level

MSC - medium-specific concentration

TCEQ - Texas Commission on Environmental Quality

Table 2-2
Chemicals Contributing to Carcinogenic Risk in Groundwater

Chemical	Baseline Risk Assessment			Recent Maximum Result			Comparison Level		Retained as COC ?
	EPC (µg/L)	Well	Cancer Risk Groundwater	Recent Maximum (µg/L)	Date	Well [a]	MCL (µg/L)	GW-Ind (µg/L)	
Trichloroethene	29,400	LHSMW43	5.70E-03	13,300 6,240	04/03/09 02/19/09	47WW25 LHSMW43	5		Yes, 1
Vinyl Chloride	127	LHSMW56	7.30E-04	249 14.3	08/04/10 04/03/09	47WW13 LHSMW56	2		Yes, 1
1,1-Dichloroethene	32.2	LHSMW48	2.60E-04	108 2.9	04/03/09 05/19/98	LHSMW56 LHSMW48	7		Yes, 1
Chloroform	120	47WW20	1.80E-04	1.61 JB -	10/09/09 -	47WW35 47WW20	80 [b]		Yes, 1
Tetrachloroethene	168	LHSMW43	1.50E-04	38.4	02/19/09	LHSMW43	5		Yes, 1
2,3,7,8-TCDD	2.88E-06	47WW01	1.40E-05	2.31E-06	11/07/98	47WW01	3.00E-05		No, 2
Pentachlorophenol	7.9	LHSMW47	1.20E-05	Not Tested After Risk Assessment			1		Yes, 1
1,2-Dichloroethane	5.7	LHSMW48	1.20E-05	0.746 ND	02/23/09 05/19/98	47WW34 LHSMW48	5		Yes, 1
2,4-Dinitrotoluene	1.4	47WW11	3.30E-06	Not Tested After Risk Assessment				0.42	Yes, 3
2,6-Dinitrotoluene	1.4	47WW11	3.30E-06	Not Tested After Risk Assessment				0.42	Yes, 3
1,1,2-Trichloroethane	4.9	LHSMW43	1.90E-06	1.8	02/22/09	LHSMW43	5		No, 2
bis(2-Ethylhexyl)phthalate	21	LHSMW45	1.70E-06	Not Tested After Risk Assessment			6		Yes, 1

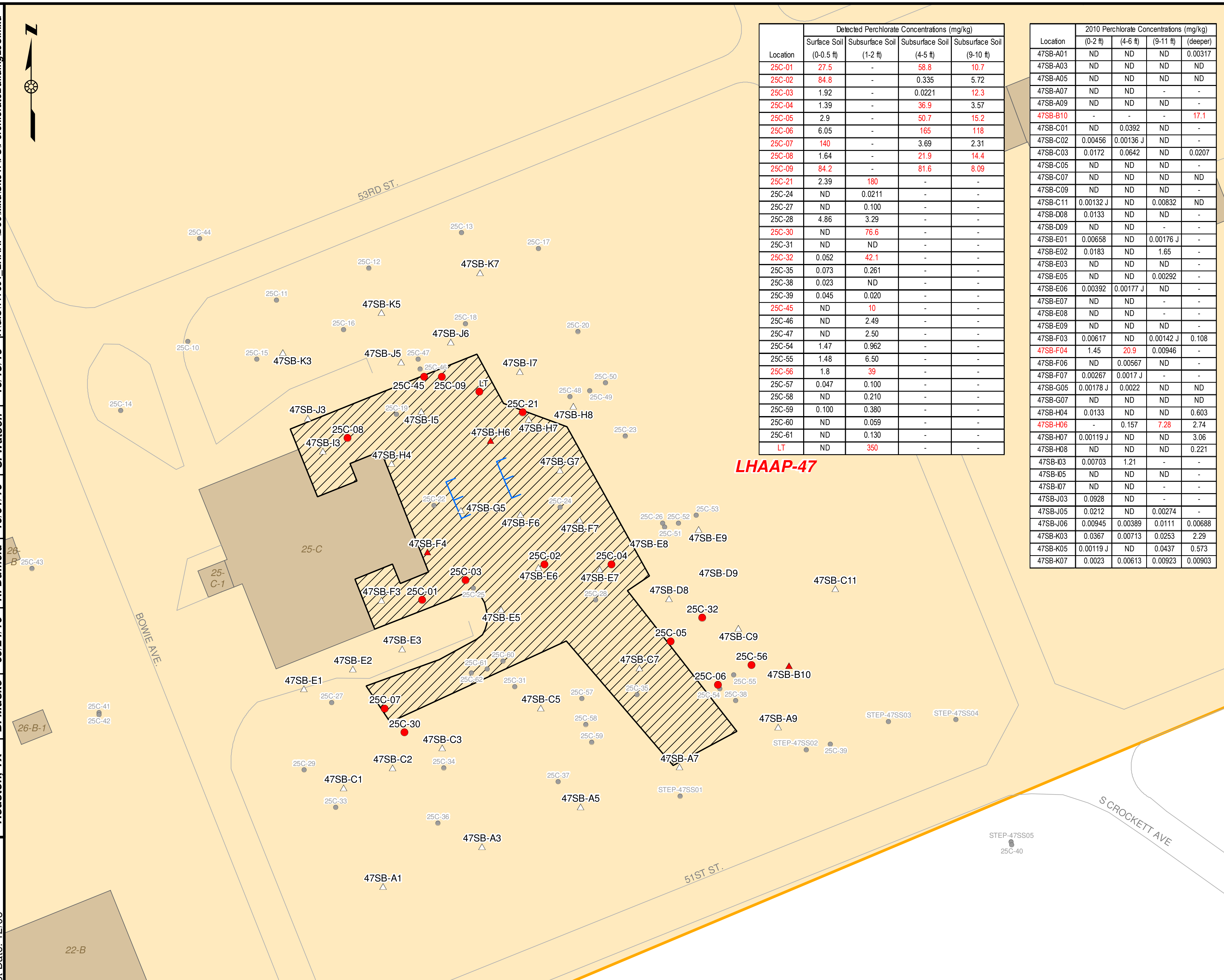
Notes and Abbreviations:

1. Retained as a COC because at least 1 result exceeded the MCL
2. Excluded as a COC because all results are less than the MCL
3. Retained as a COC because cumulative cancer risk is greater than 1.0×10^{-6}

[a] When 2 wells are listed, the recent maximum was from a different well

[b] MCL for Total Trihalomethanes used as a surrogate

µg/L - micrograms per liter
COC - chemical of concern
EPC - exposure point concentration
GW-Ind - TCEQ groundwater MSC for industrial use
MCL - maximum contaminant level
MSC - medium-specific concentration



Location	Detected Perchlorate Concentrations (mg/kg)			
	Surface Soil (0-0.5 ft)	Subsurface Soil (1-2 ft)	Subsurface Soil (4-5 ft)	Subsurface Soil (9-10 ft)
25C-01	27.5	-	58.8	10.7
25C-02	84.8	-	0.335	5.72
25C-03	1.92	-	0.0221	12.3
25C-04	1.39	-	36.9	3.57
25C-05	2.9	-	50.7	15.2
25C-06	6.05	-	165	118
25C-07	140	-	3.69	2.31
25C-08	1.64	-	21.9	14.4
25C-09	84.2	-	81.6	8.09
25C-21	2.39	180	-	-
25C-24	ND	0.0211	-	-
25C-27	ND	0.100	-	-
25C-28	4.86	3.29	-	-
25C-30	ND	76.6	-	-
25C-31	ND	ND	-	-
25C-32	0.052	42.1	-	-
25C-35	0.073	0.261	-	-
25C-38	0.023	ND	-	-
25C-39	0.045	0.020	-	-
25C-45	ND	10	-	-
25C-46	ND	2.49	-	-
25C-47	ND	2.50	-	-
25C-54	1.47	0.962	-	-
25C-55	1.48	6.50	-	-
25C-56	1.8	39	-	-
25C-57	0.047	0.100	-	-
25C-58	ND	0.210	-	-
25C-59	0.100	0.380	-	-
25C-60	ND	0.059	-	-
25C-61	ND	0.130	-	-
LT	ND	350	-	-

Location	2010 Perchlorate Concentrations (mg/kg)			
	(0-2 ft)	(4-6 ft)	(9-11 ft)	(deeper)
47SB-A01	ND	ND	ND	0.00317
47SB-A03	ND	ND	ND	ND
47SB-A05	ND	ND	ND	ND
47SB-A07	ND	ND	-	-
47SB-A09	ND	ND	ND	-
47SB-B10	-	-	-	17.1
47SB-C01	ND	0.0392	ND	-
47SB-C02	0.00456	0.00136 J	ND	-
47SB-C03	0.0172	0.0642	ND	0.0207
47SB-C05	ND	ND	ND	-
47SB-C07	ND	ND	ND	ND
47SB-C09	ND	ND	ND	-
47SB-C11	0.00132 J	ND	0.00832	ND
47SB-D08	0.0133	ND	ND	-
47SB-D09	ND	ND	-	-
47SB-E01	0.00658	ND	0.00176 J	-
47SB-E02	0.0183	ND	1.65	-
47SB-E03	ND	ND	ND	-
47SB-E05	ND	ND	0.00292	-
47SB-E06	0.00392	0.00177 J	ND	-
47SB-E07	ND	ND	-	-
47SB-E08	ND	ND	-	-
47SB-E09	ND	ND	ND	-
47SB-F03	0.00617	ND	0.00142 J	0.108
47SB-F04	1.45	20.9	0.00946	-
47SB-F06	ND	0.00567	ND	-
47SB-F07	0.00267	0.0017 J	-	-
47SB-G05	0.00178 J	0.0022	ND	ND
47SB-G07	ND	ND	ND	ND
47SB-H04	0.0133	ND	ND	0.603
47SB-H06	-	0.157	7.28	2.74
47SB-H07	0.00119 J	ND	ND	3.06
47SB-H08	ND	ND	ND	0.221
47SB-I03	0.00703	1.21	-	-
47SB-I05	ND	ND	ND	-
47SB-I07	ND	ND	-	-
47SB-J03	0.0928	ND	-	-
47SB-J05	0.0212	ND	0.00274	-
47SB-J06	0.00945	0.00389	0.0111	0.00688
47SB-K03	0.0367	0.00713	0.0253	2.29
47SB-K05	0.00119 J	ND	0.0437	0.573
47SB-K07	0.0023	0.00613	0.00923	0.00903

LEGEND

Previous Perchlorate Sample Location

- < 7.2 mg/kg
- > 7.2 mg/kg

2010 Perchlorate Sample Location

- < 7.2 mg/kg
- > 7.2 mg/kg

Road

Approximate Extent of Liner

Building or Concrete Slab

Site

Notes:

1. ND: not detected
2. - : not sampled
3. LT: Lyntech sampled 5 individual samples within a span of 35 feet. Maximum and minimum shown.
4. Red numbers in table and on figure are >7.2 mg/kg.
5. Concentrations are in milligrams per kilogram (mg/kg).
6. Samples that did not detect perchlorate at any depth are not shown on the table.
7. 25C series soil boring locations were placed at locations provided by Cliff Murray.
8. The soil sample locations from 2010 are approximate, and will be revised once the survey data is received.

0 25 50 100 Feet

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TULSA DISTRICT
TULSA, OKLAHOMA

Shaw

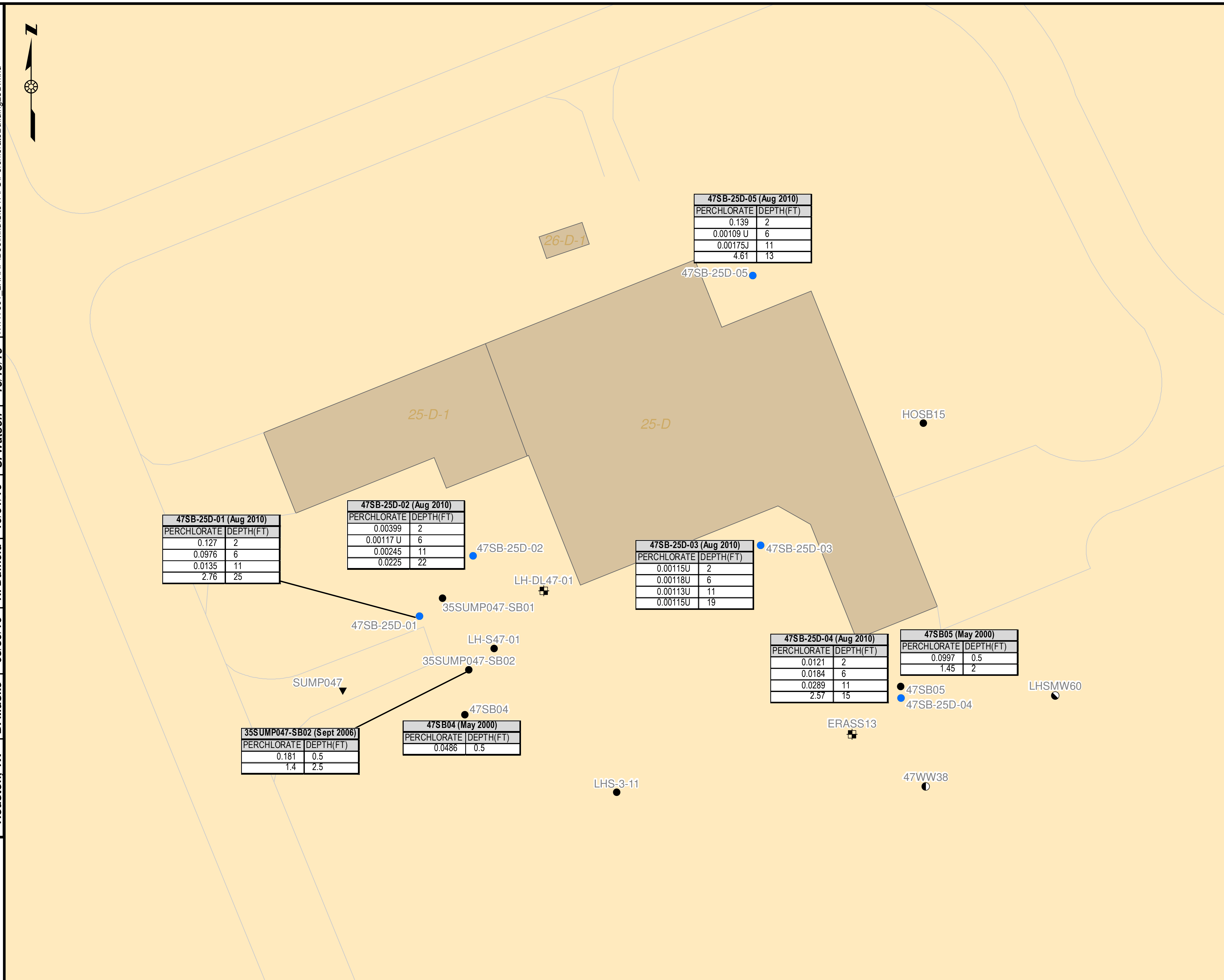
FIGURE 2-1

PERCHLORATE IN SOIL AT BLDG 25C
LHAAP-47 FEASIBILITY STUDY

LONGHORN ARMY AMMUNITION PLANT
KARNACK, TEXAS

OFFICE	DRAWN BY	CHECKED BY	APPROVED BY	FILE PATH
Houston, TX	B. Muske 09/24/10	R. Duffield 10/01/10	S. Watson 10/15/10	T:\GIS\117591_LHAAP\Doc\Mxd\Site47\FS\PerchlorateBuilding25C.mxd

Plot Date: 12/08



47SB-25D-05 (Aug 2010)	
PERCHLORATE	DEPTH(FT)
0.139	2
0.00109 U	6
0.00175J	11
4.61	13

47SB-25D-01 (Aug 2010)	
PERCHLORATE	DEPTH(FT)
0.127	2
0.0976	6
0.0135	11
2.76	25

47SB-25D-02 (Aug 2010)	
PERCHLORATE	DEPTH(FT)
0.00399	2
0.00117 U	6
0.00245	11
0.0225	22

47SB-25D-03 (Aug 2010)	
PERCHLORATE	DEPTH(FT)
0.00115U	2
0.00118U	6
0.00113U	11
0.00115U	19

47SB-25D-04 (Aug 2010)	
PERCHLORATE	DEPTH(FT)
0.0121	2
0.0184	6
0.0289	11
2.57	15

47SB05 (May 2000)	
PERCHLORATE	DEPTH(FT)
0.0997	0.5
1.45	2

35SUMP047-SB02 (Sept 2006)	
PERCHLORATE	DEPTH(FT)
0.181	0.5
1.4	2.5

47SB04 (May 2000)	
PERCHLORATE	DEPTH(FT)
0.0486	0.5

LEGEND

- New Soil Borings
- Shallow/Intermediate Monitoring Well
- Intermediate Monitoring Well
- Soil Boring
- Surface Soil Sample Location
- Sump
- Road
- Former Building or Concrete Slab
- Site

Notes:

1. Perchlorate results are in mg/kg.
2. Results from August 2010 are shaded in blue.
3. The 2010 well and DPT locations and elevations shown are approximate, and will be revised once the survey data is received.

0 25 50 Feet

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TULSA, OKLAHOMA

FIGURE 2-2

PERCHLORATE IN SOIL AT BUILDING 25D
LHAAP-47 FEASIBILITY STUDY

LONGHORN ARMY AMMUNITION PLANT
KARNACK, TEXAS

OFFICE	DRAWN BY	CHECKED BY	APPROVED BY	FILE PATH
Houston, TX	B. Muske 08/30/10	R. Duffield 10/01/10	S. Watson 10/15/10	T:\117591_LHAAP\DocMxd\Site47\FS\PerchlorateBuilding25D.mxd

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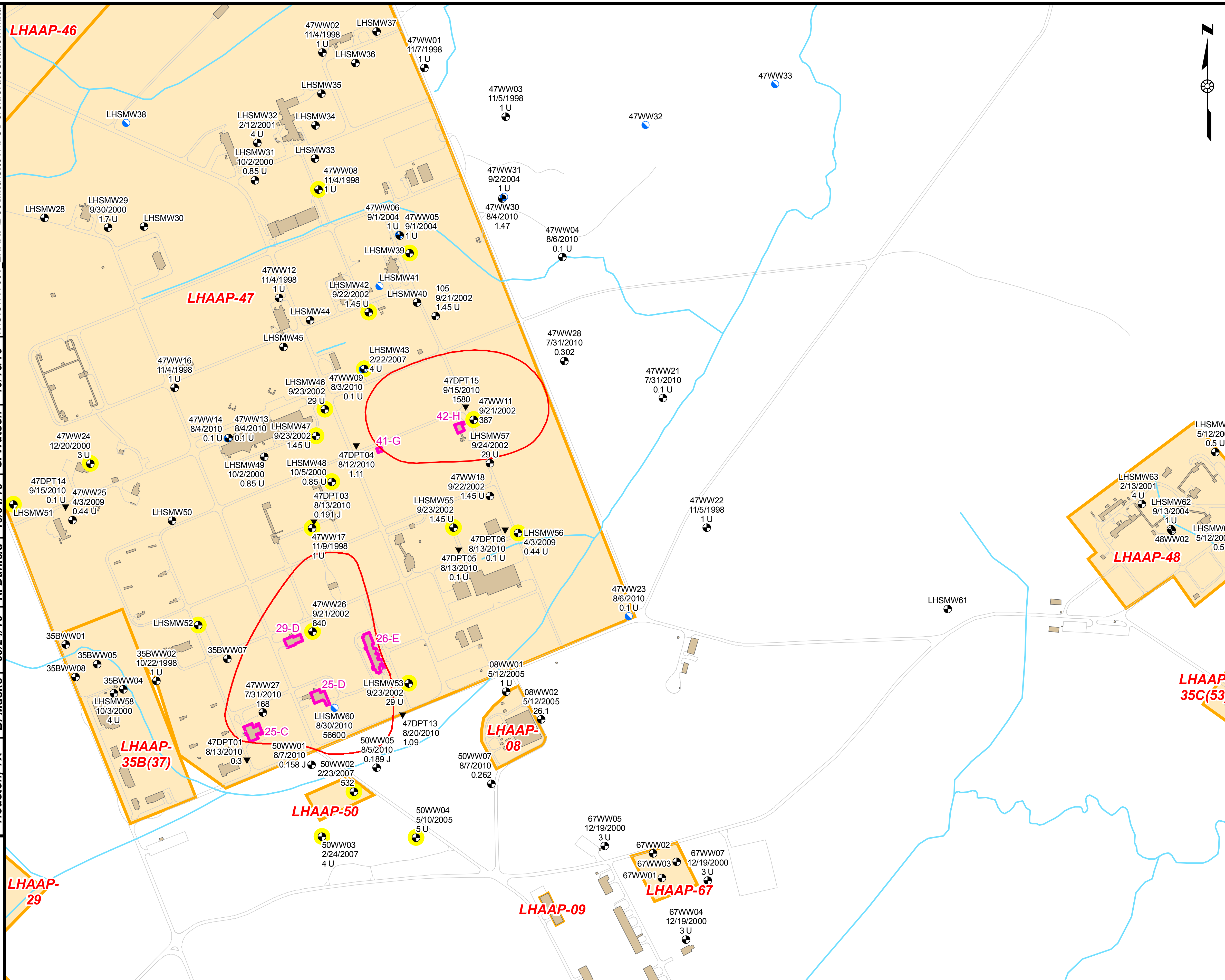

LEGEND

- Shallow Monitoring Well
- Shallow/Intermediate Monitoring Well
- DPT Sample 2010
- Well Dry in 2010
- Perchlorate Exceeding GW-Ind (72 µg/L)
- Stream
- Road
- Potential Perchlorate Source Building
- Former Building or Concrete Slab
- Site

NOTES:

1. Results reported in micrograms per liter (µg/L)
2. Most recent results are shown (1998-2010).
3. The 2010 well and DPT locations and elevations shown are approximate, and will be revised once the survey data is received.

0 300 600 1,200 Feet

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TULSA DISTRICT
TULSA, OKLAHOMA

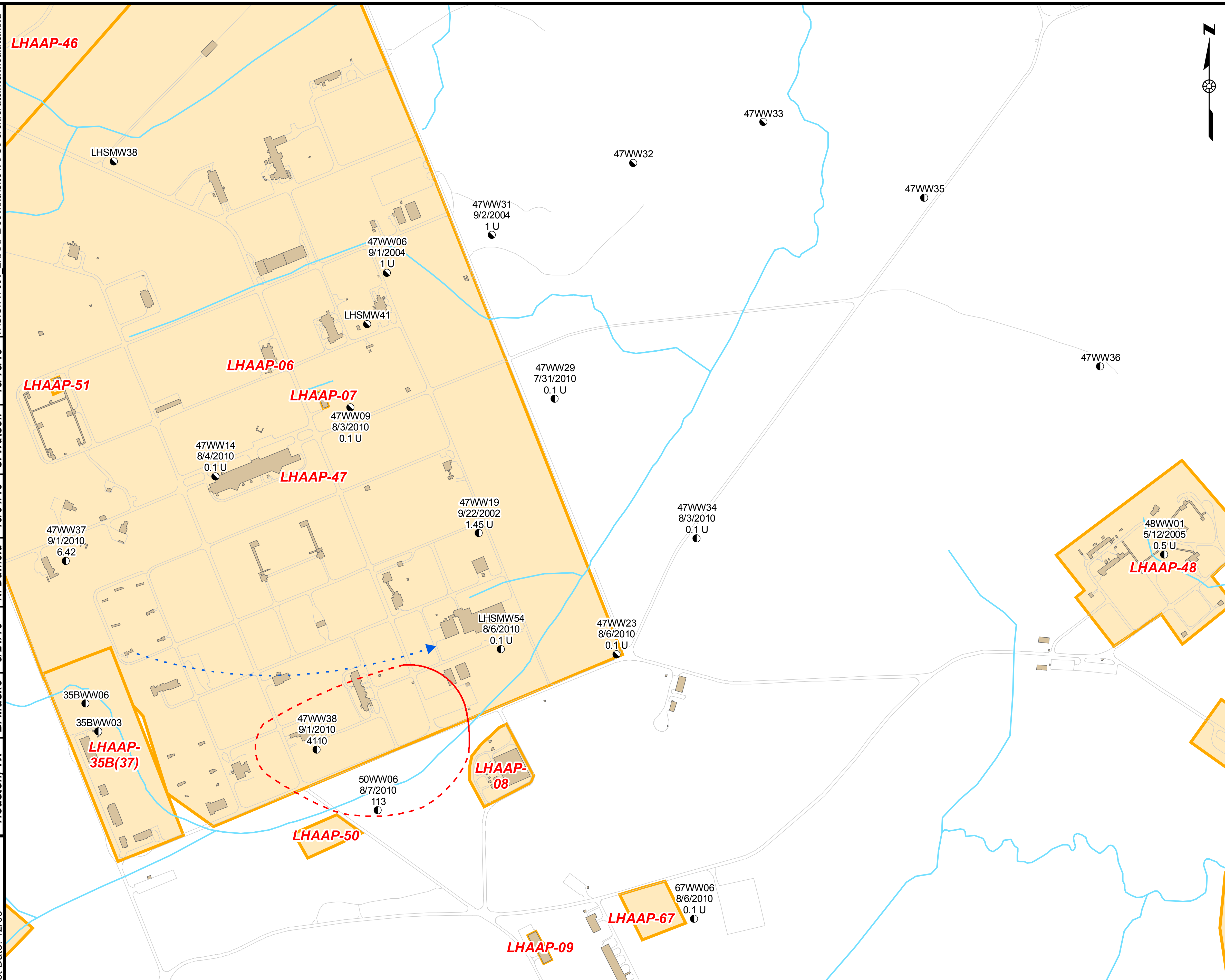
FIGURE 2-3

PERCHLORATE IN SHALLOW GROUNDWATER
LHAAP-47 FEASIBILITY STUDY

LONGHORN ARMY AMMUNITION PLANT
KARNACK, TEXAS

FILE PATH T:\GIS\117591 LHAAP\Doc\Mxd\Site47\FS\PerchlorateShallow.mxd
APPROVED BY S. Watson 10/15/10
CHECKED BY R. Duffield 10/01/10
DRAWN BY B. Muske 09/24/10
OFFICE Houston, TX

00100495



LEGEND

- Shallow/Intermediate Monitoring Well
- Intermediate Monitoring Well
- Perchlorate Exceeding GW-Ind (72 µg/L)
- Groundwater Flow Direction
- Stream
- Road
- Former Building or Concrete Slab
- Site

NOTES:

1. 47WW23, 47WW32, 47WW33, LHSMW38, LHSMW41, and LHSMW60 were redesignated from shallow to shallow/intermediate.
2. 47WW06, 47WW09, 47WW14, and 47WW31 were redesignated from intermediate to shallow/intermediate.
3. The 2010 well and DPT locations and elevations shown are approximate, and will be revised once the survey data is received.

0 300 600 1,200 Feet

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TULSA DISTRICT
TULSA, OKLAHOMA

FIGURE 2-4

PERCHLORATE
IN INTERMEDIATE GROUNDWATER
LHAAP-47 FEASIBILITY STUDY

LONGHORN ARMY AMMUNITION PLANT
KARNACK, TEXAS

OFFICE	DRAWN BY	CHECKED BY	APPROVED BY	FILE PATH
Houston, TX	B. Muske 9/24/10	R. Duffield 10/01/10	S. Watson 10/15/10	T:\GIS\117591 LHAAP\Doc\Mxd\Site47\FS\PerchlorateIntermediate.mxd

Plot Date: 12/08

FILE PATH	APPROVED BY	CHECKED BY	DRAWN BY	OFFICE
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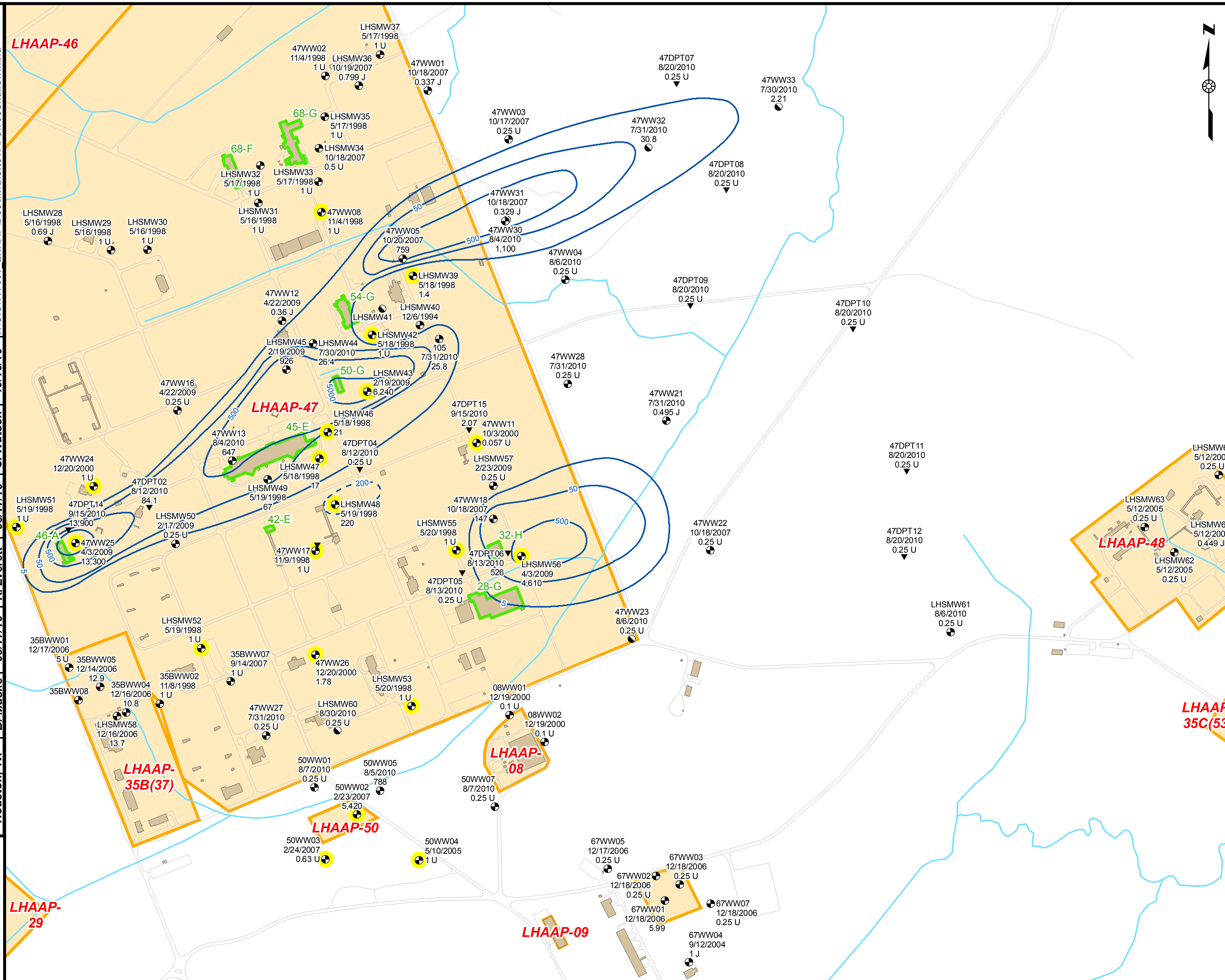

LEGEND

- Shallow Monitoring Well
- Shallow/Intermediate Monitoring Well
- DPT Sample 2010
- Well Dry in 2010
- TCE Isoconcentration Contour *Dashed where inferred*
- Stream
- Road
- Potential Chlorinated Solvent Source Building
- Former Building or Concrete Slab
- Site

NOTES:

1. TCE - trichloroethene
2. MCL - maximum contaminant level
3. Results reported in micrograms per liter (µg/L).
4. Most recent results are shown (1998 - 2010).
5. Wells designated as shallow/intermediate were included (47WW23, 47WW32, and 47WW33).
6. The 2010 well and DPT locations and elevations shown are approximate, and will be revised once the survey data is received.

0 300 600 1,200 Feet

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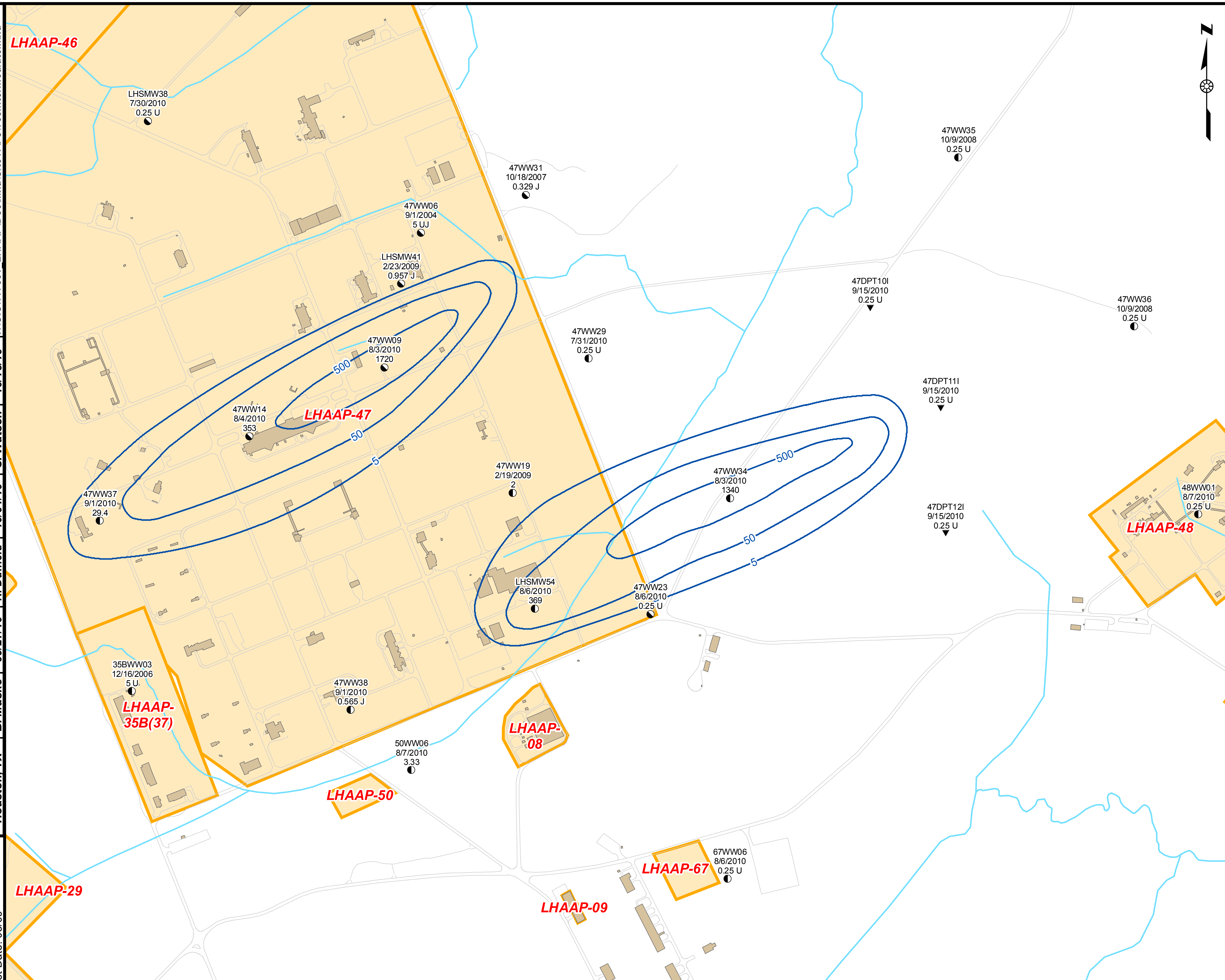
FIGURE 2-5

TCE IN SHALLOW GROUNDWATER
LHAAP-47 FEASIBILITY STUDY

LONGHORN ARMY AMMUNITION PLANT
KARNACK, TEXAS

FILE PATH	APPROVED BY		CHECKED BY		DRAWN BY		OFFICE
T:\GIS\117591_LHAAP\Doc\Mxd\Site47\Fs\TceIntermediate.mxd	S. Watson	10/15/10	R. Duffield	10/01/10	B. Muske	09/27/10	Houston, TX

Plot Date: 03/09



LEGEND

- Shallow/Intermediate Monitoring Well
- Intermediate Monitoring Well
- DPT Sample 2010
- TCE Isoconcentration Contour
- Stream
- Road
- Former Building or Concrete Slab
- Site

NOTES:

1. TCE - trichloroethene
2. MCL - maximum contaminant level
3. Results reported in micrograms per liter (µg/L)
4. Most recent results are shown (1998 - 2010).
5. Wells designated as shallow/intermediate were included (47WW06, 47WW09, 47WW14, 47WW23, 47WW31, LHSMW38, LHSMW41, LHSMW60).
6. The 2010 well and DPT locations and elevations shown are approximate, and will be revised once the survey data is received.

0 300 600 1,200 Feet

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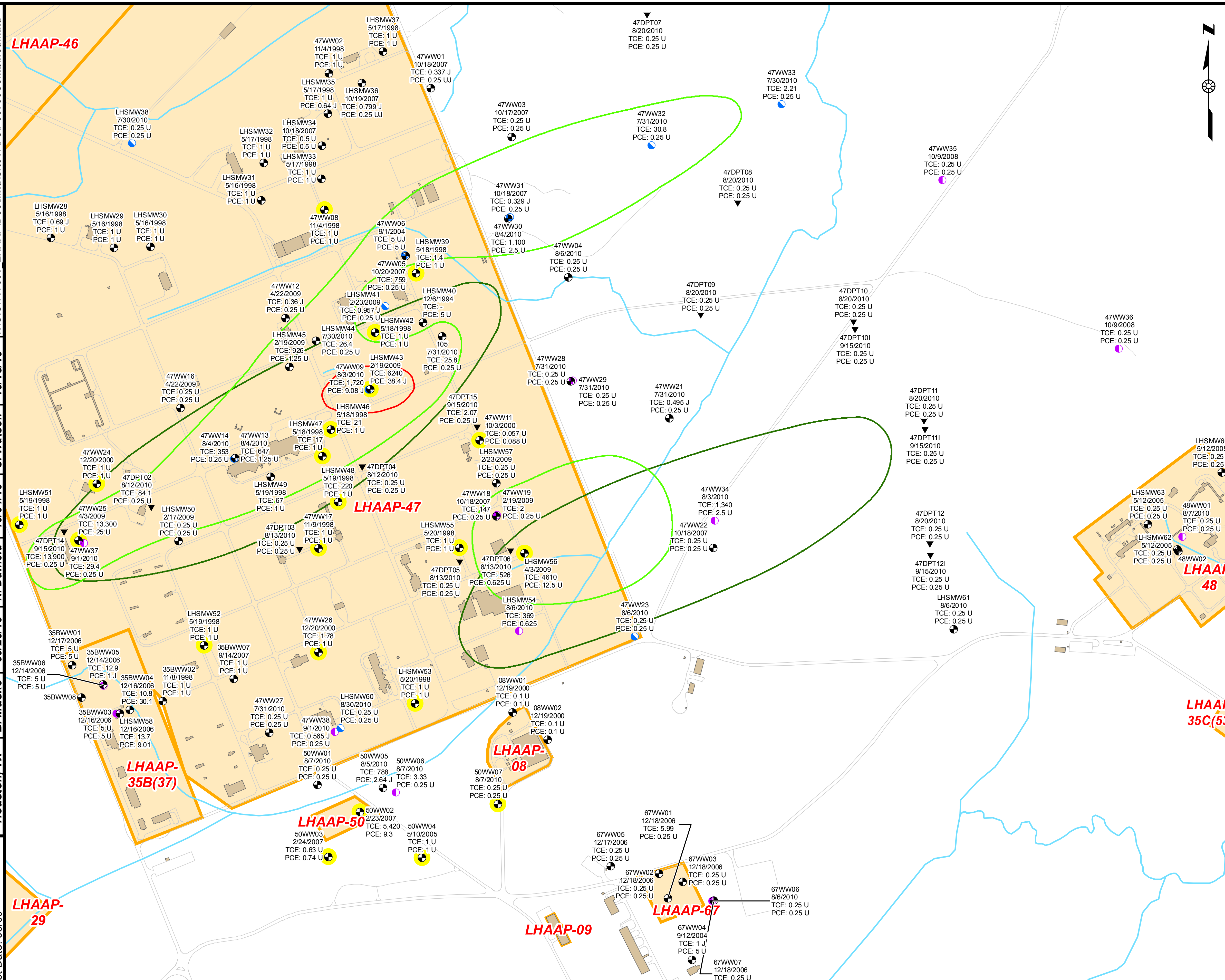
TULSA, OKLAHOMA

FIGURE 2-6

TCE IN INTERMEDIATE GROUNDWATER
LHAAP-47 FEASIBILITY STUDY

LONGHORN ARMY AMMUNITION PLANT
KARNACK, TEXAS

00100498



FILE PATH T:\GIS\117591 LHAAP\Doc\Mxd\Site47\Fs\PceTceCombined.mxd

APPROVED BY S. Watson 10/15/10

CHECKED BY R. Duffield 10/01/10

DRAWN BY B. Muske 09/28/10

OFFICE Houston, TX

Plot Date: 03/09

LEGEND

- Shallow Monitoring Well
- Shallow/Intermediate Monitoring Well
- Intermediate Monitoring Well
- DPT Sample 2010
- Well Dry in 2010
- PCE Exceeding MCL (5 µg/L)

TCE Exceeding MCL (5 µg/L)

- Shallow Zone
- Intermediate Zone
- Stream
- Road
- Former Building or Concrete Slab
- Site

NOTES:

1. TCE - trichloroethene
2. PCE - tetrachloroethene
3. MCL - maximum contaminant level
4. Results reported in micrograms per liter (µg/L).
5. Most recent results are shown (1998 - 2010).
6. All PCE results that exceed MCL, are within the TCE area.
7. Plumes shown are in the interconnected shallow/ intermediate zones and use the combined well data of both zones.
8. The 2010 well and DPT locations and elevations shown are approximate, and will be revised once the survey data is received.

0 300 600 1,200 Feet

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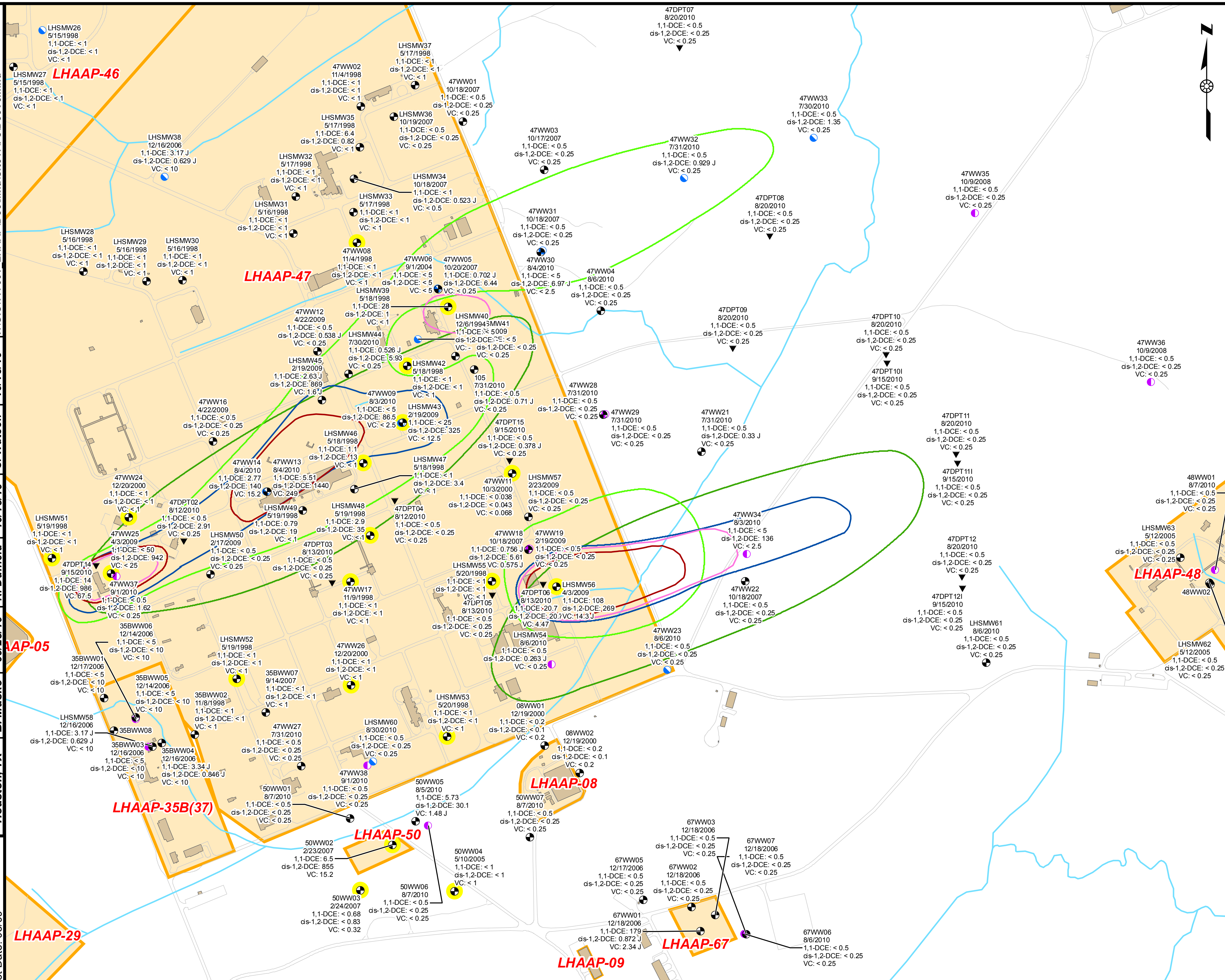
TULSA, OKLAHOMA

FIGURE 2-7

TCE AND PCE IN GROUNDWATER (SHALLOW/INTERMEDIATE)
LHAAP-47 FEASIBILITY STUDY

LONGHORN ARMY AMMUNITION PLANT
KARNACK, TEXAS

00100499



LEGEND

- Shallow Monitoring Well
- Shallow/Intermediate Monitoring Well
- Intermediate Monitoring Well
- DPT Sample 2010
- Well Dry in 2010

Shallow Zone

- 1,1-DCE Exceeding MCL (7 µg/L)
- cis-1,2-DCE Exceeding MCL (70 µg/L)
- VC Exceeding MCL (2 µg/L)
- TCE Exceeding MCL (5 µg/L)

Intermediate Zone

- TCE Exceeding MCL (5 µg/L)
- Stream
- Road
- Former Building or Concrete Slab
- Site

NOTES:

1. 1,1-DCE - 1,1-dichloroethene
2. cis-1,2-DCE - cis-1,2-dichloroethene
3. TCE - trichloroethene
4. VC - vinyl chloride
5. MCL - maximum contaminant level
6. Results reported in micrograms per liter (µg/L).
7. Most recent results are shown (1998 - 2010).
8. 1,1-DCE, cis-1,2-DCE, and VC results that exceed MCLs, are approximately within the TCE area.
9. Plumes shown are in the interconnected shallow/intermediate zones and use the combined well data of both zones.
10. The 2010 well and DPT locations and elevations shown are approximate, and will be revised once the survey data is received.

0 300 600 1,200 Feet

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FIGURE 2-8

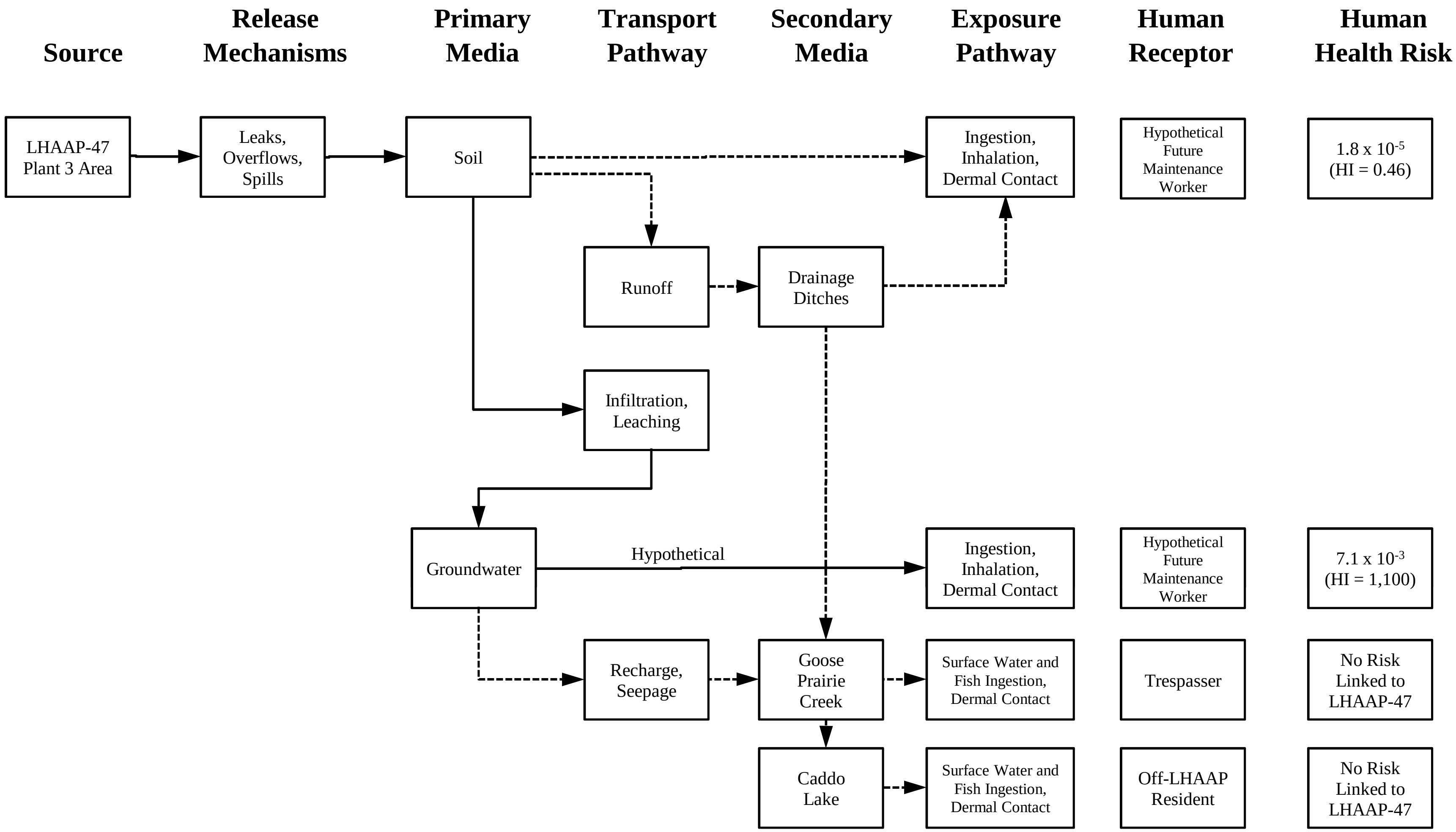
1,1-DCE, CIS-1,2-DCE, AND VC IN GROUNDWATER (SHALLOW/INTERMEDIATE)
LHAAP-47 FEASIBILITY STUDY

LONGHORN ARMY AMMUNITION PLANT
KARNACK, TEXAS

OFFICE	DRAWN BY	CHECKED BY	APPROVED BY	FILE PATH
Houston, TX	B. Muske 09/28/10	R. Duffield 10/15/10	S. Watson 10/15/10	T:\GIS\117591 LHAAP\Doc\Mxd\Site47\Fs\DceVc.mxd

Plot Date: 03/09

PLOT DATE: 09/16/2010	IMAGE	X-REF	OFFICE	DRAWN BY		CHECKED BY		APPROVED BY		Drawing Number	117591-A64
FORMAT REVISION: 09/16/2010	- - -	- - -	HOUSTON, TX	R. DUFFIELD	09/2010	R. DUFFIELD	09/2010	S. WATSON	09/2010		



Pathway considered for remedial measure

Pathway *not* considered for remedial measure

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FIGURE 2-9
CONCEPTUAL SITE MODEL
LHAAP-47 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 cleanup levels **(Section 3.3)**. The RAOs identify the general goals or endpoints that the remediation will accomplish, while the cleanup levels identify specific cleanup standards for each medium of concern based on risk or ARARs. The cleanup 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. The conceptual site model (**Section 2.4**) identifies the primary environmental issues at LHAAP-47:

- Groundwater that exceeds MCLs for VOCs (TCE, cis-1,2-DCE, VC, 1,1-DCE and PCE) 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 near Building 25C that has concentrations of perchlorate in excess of the GWP-Ind concentration and has the potential to continue to be a source of groundwater contamination.
- Soil to surface water and groundwater to surface water has the potential to impact human health.

The future use of the entire LHAAP facility is as a national 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, 2007b), ecological risk is not a concern at LHAAP-47. Based on these considerations, the RAOs for LHAAP-47 are as follows:

- Protection of human health by preventing human exposure to the contaminated groundwater;
- Protection of human health by preventing further potential degradation of groundwater and surface water from contaminated soil;
- Protection of human health by preventing degradation of surface water from groundwater contaminated with COCs; and
- Return of groundwater to its potential beneficial uses as drinking water, wherever practicable.

The above RAO recognizes USEPA's policy to return all groundwater to beneficial uses, based on the non-binding programmatic expectation in the National Oil and Hazardous Substances Pollution Contingency Plan (NCP).

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-47 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, 1989a, 1989b), 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 number 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 ARAR 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 cleanup levels 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-47. Location-specific ARARs/TBCs for the sensitive resources potentially identified at LHAAP are discussed in **Section 3.2.3** and listed in **Table 3-2**. Action-specific ARARs/TBCs are listed in **Table 3-3** 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, air, surface water, and groundwater at LHAAP-47. These ARARs are summarized in **Table 3-1**.

3.2.2.1 Potential 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 GWP-Ind of 7.2 mg/kg will prevent contamination of the groundwater at the site.

3.2.2.2 Potential 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 Potential 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 Potential Chemical-Specific ARARs for Groundwater

The human health risk assessment (Jacobs, 2003) indicated that the contaminated groundwater at LHAAP-47 presented an unacceptable hazard and risk to a hypothetical future maintenance worker. For the groundwater COCs at LHAAP-47, Safe Drinking Water Act MCLs are available and are considered relevant and appropriate because LHAAP-47 is an NPL site. Thus, MCLs are proposed as the preliminary cleanup levels in this FS for the groundwater at LHAAP-47. If

MCLs are not available for certain COCs, MSCs provided under Texas Risk Reduction Rules (Title 30 Texas Administrative Code [TAC] 335.551 through 335.569) will be used.

3.2.3 Potential Location-Specific ARARs

This section identifies the potential location-specific ARARs that may apply to LHAAP-47. These ARARs are summarized in **Table 3-2**.

3.2.3.1 Floodplains

LHAAP-47 includes areas classified as part of a 100-year floodplain. These areas are along the banks of Goose Prairie Creek, on the south side of LHAAP-47. The set of requirements for hazardous waste facilities in floodplains in 40 CFR 264.18(b) is a potential location-specific ARAR. Requirements include preventing the washout of hazardous waste by a 100-year flood.

3.2.3.2 Wetlands

The USFWS database has identified some wetlands to be present on the northeast side of LHAAP-47; therefore protection of wetlands is considered a potential location-specific ARAR for this site. LHAAP-47 is not considered to be part of the Caddo Lake Ramsar wetlands. Adverse impacts to any identified wetlands located at LHAAP or to the Caddo Lake wetland system from remedial actions at LHAAP-47 must be avoided to the extent practicable. In particular, no discharge of dredged or fill material shall be permitted if there is a practicable alternative that would have less adverse impact, and unless appropriate and practical steps have been taken which will minimize potential impacts of the discharge on the aquatic ecosystem, in accordance with Section 404 of the CWA and 40 CFR 230.

3.2.4 Potential Action-Specific ARARs

Potential 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-47.

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-47 are discussed in the sections below. All action-specific ARARs are listed in **Table 3-3** and are grouped by component action.

Each of the proposed remedial action alternatives will involve several of the following activities: waste generation, characterization, management, storage, and disposal activities; land use controls (LUC) and long-term monitoring; and water treatment. Action-specific ARARs are discussed here for the activities common to the remedial activities to be proposed for LHAAP-47.

3.2.4.1 Site Preparation, Construction, and Excavation Activities

Certain on-site preparation, construction, and/or excavation activities will be necessary under all remediation actions to prepare the site for remediation, including the soil-moving or site-grading activities. Control of fugitive emissions and storm water runoff during implementation of these activities will be required.

Airborne particulate matter resulting from construction or excavation activities is subject to the fugitive dust and opacity limits listed in 30 TAC 111, Subchapter A. No person may cause, suffer, allow, or permit visible emissions from any source to exceed an opacity of 30 percent for any 6-minute-period [30 TAC 111.111(a)]. Reasonable precautions must also be taken to achieve maximum control of dust to the extent practicable, including the application of water or suitable chemicals or the complete covering of materials (30 TAC 111.145).

Texas has also promulgated general nuisance rules for air contaminants mandating that no person shall discharge from any source whatsoever one or more air contaminants, or combinations thereof, in such concentration and of such duration as are or may tend to be injurious to or to adversely affect human health or welfare, animal life, vegetation, or property, or as to interfere with the normal use and enjoyment of animal life, vegetation, or property (30 TAC 101.4).

Storm water discharges from construction activities that disturb equal to or greater than one acre of land must comply with the substantive requirements of a USEPA National Pollutant Discharge Elimination System (NPDES) general permit (40 CFR 122.26; 30 TAC 205, Subchapter A; and 30 TAC 308.121), depending on the amount of acreage disturbed. Substantive requirements include implementation of good construction management techniques; phasing of large construction projects; minimal clearing; and sediment, erosion, structural, and vegetative controls to mitigate runoff and ensure that discharges meet required parameters.

3.2.4.2 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 [PPE], 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 of in accordance with the ARARs for waste management listed in **Table 3-3** for the particular type of waste stream or contaminants in the waste.

3.2.4.3 Well Construction

The remedial action 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 long-term monitoring of the groundwater. Available standards for well construction and plugging/abandonment would provide ARARs for such actions and include 30 TAC 331, Subchapters A, C, and H.

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-47 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.

3.2.4.4 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 Federal Register [FR] 34079, September 2, 1988).

3.3 Preliminary Cleanup Levels

Cleanup levels are the concentrations for individual chemicals in soil and groundwater above which some response action (e.g., treatment, LUC) would be required. The cleanup levels for soil and groundwater at LHAAP-47 are determined with consideration of the risk to human health and the ARARs identified for the site in **Section 3.2.2**.

3.3.1 Soil

Perchlorate was not identified as a COC for soil in the risk assessment; however, it has been carried forward as a COC in this document because perchlorate is present in groundwater at LHAAP-47 at concentrations that have an HI greater than 1 and poses a non-carcinogenic human health hazard in the groundwater. The perchlorate in on-site soil is considered the primary source for the groundwater contamination. Perchlorate will be remediated to the GWP-Ind MSC for protection of the groundwater. **Table 3-4** presents the applicable cleanup level for the target contaminant in soil.

3.3.2 Groundwater

The cleanup levels for the COCs are established to protect the hypothetical future maintenance worker at LHAAP-47. The cleanup levels will be used to identify the areas of contamination to be considered for remediation in this FS to allow development of alternatives that will prevent exposure to the hypothetical future maintenance worker.

The cleanup levels for groundwater at LHAAP-47 are the MCLs (when available. Groundwater at LHAAP-47 has unacceptable risk or hazard primarily due to TCE, cis-1,2-DCE, VC, 1,1-DCE, PCE, and perchlorate. Some of the chemicals (e.g., TCE) have degradation products with MCLs, and those degradation products have also been identified as COCs. The HI for LHAAP-47 was high. The chemicals that contribute to the HI are numerous and the sum of the HQs exceed an HI of 1 when the GW-Ind was used as cleanup level. Thus, cleanup levels were developed for the non-carcinogenic chemicals so the total HI of 1 would not be exceeded. **Table 3-5** presents the results of this calculation. **Table 3-5** summarizes the COCs and the proposed cleanup levels for groundwater.

3.3.3 Surface Water

The cleanup levels for COCs in the surface water are established to protect Caddo Lake as a water supply reservoir. The cleanup levels will be used to verify that surface water in Goose Prairie Creek remains unaffected by migration of COCs from groundwater to surface water. Under current conditions, this pathway is not complete. Comparisons of surface water test results to these cleanup levels will be evaluated in conjunction with observed groundwater levels and COC concentrations to determine whether exceedances of the surface water cleanup levels are related to groundwater migration.

The cleanup levels for surface water in Goose Prairie Creek at LHAAP-47 are the MCLs (when available) and the GW-Res (TCEQ, 2006) for chemicals without MCLs. The list of COCs for surface water is the same as the list of COCs for groundwater, reflecting the concern about potential migration from groundwater to surface water. **Table 3-6** summarizes the COCs and the proposed cleanup levels for surface water.

Table 3-1
Potential Chemical-Specific ARARs

Citation	Activity or Prerequisite/Status	Requirement
Surface/Subsurface Soil		
TCEQ Texas Risk Reduction Rules 30 TAC 335.558 and 335.559(d)(2)	Ensures adequate protection of human health and the environment from potential exposure to contaminants associated with releases – relevant and appropriate for remediation of contaminated soil for cross-media contamination pathways such as soil to groundwater and for hypothetical future maintenance workers.	The concentration of contamination in soil shall not exceed the non-residential soil-to-groundwater cross media (GWP-Ind). See Table 3-4 for specific numeric criteria.
Groundwater		
Federal Safe Drinking Water Act MCLs/Non-Zero MCLGs 40 CFR 141	Applicable to drinking water at the tap—relevant and appropriate for water that could potentially be used for human consumption.	Must not exceed MCLs/non-zero MCLGs for water designated as a current or potential source of drinking water. See Table 3-5 for specific numeric criteria.
TCEQ Texas Risk Reduction Rules 30 TAC 335	Applicable to industrial groundwater—relevant and appropriate for hypothetical future maintenance worker exposure to groundwater	If no maximum contaminant level has been promulgated, groundwater must not exceed the industrial medium-specific concentration. See Table 3-5 for specific numeric criteria.

Abbreviations:

ARAR applicable or relevant and appropriate requirement
GWP-Ind soil MSC for industrial use based on groundwater protection
MCL maximum contaminant level
MCLG maximum contaminant level goal
TAC Texas Administrative Code
TCEQ Texas Commission on Environmental Quality

Table 3-2
Potential Location-Specific ARARs

Resource/Citation	Activity or Prerequisite Status	Requirement
Requirements for Hazardous Waste Facilities in Floodplains Resource Conservation and Recovery Act (RCRA) 40 CFR 264.18(b)	If excavated soil is found to constitute RCRA hazardous waste, these requirements are **relevant and appropriate** since part of LHAAP-47 is located within a 100-year floodplain. However, it is not anticipated that the excavated soil will be classified as hazardous.	A hazardous waste treatment, storage, or disposal facility used for remediation waste and located in the 100-year floodplain must be designed, constructed operated, and maintained to prevent washout of such waste by a 100-year flood unless owner/operator show that procedures are in effect to remove waste safely before flood water can reach the facility.
Protection of Wetlands Section 404 of the Clean Water Act (33 USC 1344); 40 CFR 230.10(a) and (d)	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. The U.S. Fish and Wildlife Service database has identified some wetlands to be present at LHAAP-47.	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. 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*
LHAAP *Longhorn Army Ammunition Plant*
USC *United States Code*

Table 3-3
Potential Action-Specific ARARs

Citation	Activity or Prerequisite/Status	Requirement
General Site Preparation, Construction, and Excavation Activities		
Air Contaminants – General Nuisance Rules 30 TAC 101.4	Emissions of air contaminants—applicable.	No person shall discharge from any source whatsoever one or more air contaminants or combinations thereof, in such concentration and of such duration as are or may tend to be injurious to or to adversely affect human health or welfare, animal life, vegetation, or property, or as to interfere with the normal use and enjoyment of animal life, vegetation, or property.
Opacity Standard 30 TAC 111.111(a)(8)(A)	Fugitive emissions from land-disturbing activities (e.g., excavation, construction)—applicable.	Visible emissions shall not be permitted to exceed opacity of 30% for any 6-minute period from any source.
Fugitive Particulate Matter Standard 30 TAC 111.145	Fugitive emissions from land-disturbing activities (e.g., excavation, construction)—applicable.	No person may cause, suffer, allow, or permit a structure, road, street, alley or parking area to be constructed, altered, repaired, or demolished, or land to be cleared without taking at least the following precautions to achieve control of dust emissions: • Use of water or of suitable oil or chemicals for control of dust in the demolition of structures, in construction operations, in work performed on a road, street, alley, or parking area, or in the clearing of land; and • Use of adequate methods to prevent airborne particulate matter during sandblasting of structures or similar operations.
Storm Water Runoff Controls 40 CFR 122.26; 30 TAC 205, Subchapter A; 30 TAC 308.121	Storm water discharges associated with construction activities—applicable to disturbances of equal to or greater than 1 acre of land.	Good construction management techniques, phasing of construction projects, minimal clearing, and sediment, erosion, structural, and vegetative controls shall be implemented to mitigate storm water run-on/runoff.
Waste Generation, Management, and Storage		
Characterization of Solid Waste 40 CFR 262.11 30 TAC 335.62 30 TAC 335.504 30 TAC 335.503(a)(4)	Generation of solid waste, as defined in 30 TAC 335.1—applicable.	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. 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 40 CFR 264.13(a)(1); 40 CFR 268.7 30 TAC 335.504(3) 30 TAC 335.509 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. 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.

Table 3-3 *(continued)*
Potential Action-Specific ARARs

Citation	Activity or Prerequisite/Status	Requirement
Management of RCRA Hazardous Waters—Wastewater Treatment Unit Exclusion 40 CFR 264.1(g)(6) 40 CFR 270.1(c)(2) 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 40 CFR 262.34(a) and (c)(1) 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 • Waste is placed in containers that comply with 40 CFR 264.171 to 264.173 (Subpart I); and • Container is marked with the words "hazardous waste"; or • Container may be marked with other words that identify the contents.
Requirements for the Use and Management of Containers 40 CFR 264.171–264.173 30 TAC 335.69(e) 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 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.
Class V Injection Wells 30 TAC 331, Subchapter H	Installation, operation, and closure of injection wells fall in the category of Class V Injection Wells – **relevant and appropriate**.	Injection wells shall be constructed to the required specifications for isolation casing, surface completion, prevention of commingling, and confinement of undesirable groundwater to its zone of origin. Closure shall be accomplished by removing all of the removable casing and the entire well shall be pressure filled via a tremie pipe with cement from bottom to the land surface, or closure shall be performed by the alternative method for Class V Wells completed in zones of undesirable groundwater. Groundwater concentrations at time of well closure will determine the appropriate method of abandonment.
Well Construction Standards—Extraction Wells 16 TAC 76.1000(a) and (c) through (h) 16 TAC 76.1002(a) through (c) 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. Water wells completed to produce undesirable water shall be cased to prevent the mixing of water or constituent zones. 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. 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. 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.

Table 3-3 *(continued)*
Potential Action-Specific ARARs

Citation	Activity or Prerequisite/Status	Requirement
Treatment/Disposal		
Disposal of Wastewater (e.g., contaminated groundwater, dewatering fluids, decontamination liquids) 40 CFR 268.1(c)(4)(i) 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		
Standards for Plugging Wells that Penetrate Undesirable Water or Constituent Zones 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.

Abbreviations:

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

Table 3-4
Cleanup Levels for Target COCs in Soil

COCs Targeted for Remediation	Cleanup Level [a] (mg/kg)
Perchlorate	7.2

Notes and Abbreviations:

[a] Unless otherwise noted, cleanup level applies to soil from surface to groundwater interface

mg/kg milligrams per kilogram

COC contaminant of concern

GWP-Ind soil medium specific concentration for industrial use based on groundwater protection

Table 3-5
Cleanup Levels for Target COCs in Groundwater

COCs Targeted for Remediation	MCL (µg/L)	TCEQ MSC GW-Ind (µg/L)	Background (µg/L)	Proposed Cleanup Level (µg/L)	Basis
Anions					
Perchlorate	--	72	--	26	Risk
Volatile Organic Compounds					
1,1-Dichloroethene	7	--	--	7	MCL
1,2-Dichloroethane	5	--	--	5	MCL
Acetone	--	92,000	--	500	Risk
Chloroform	80	--	--	80	MCL
cis-1,2-Dichloroethene (cis-1,2-DCE)	70	--	--	70	MCL
Tetrachloroethene (PCE)	5	--	--	5	MCL
trans-1,2-Dichloroethene (trans-1,2-DCE) (daughter product)	100	--	--	100	MCL
Trichloroethene (TCE)	5	--	--	5	MCL
Vinyl Chloride (VC)	2	--	--	2	MCL
Explosives					
2,4,6-Trinitrotoluene	--	51	--	1	Risk
2,4-Dinitrotoluene	--	0.42	--	0.42	GW-Ind
2,6-Dinitrotoluene	--	0.42	--	0.42	GW-Ind
Semivolatile Organic Compounds					
bis(2-Ethylhexyl)phthalate	6	--	--	6	MCL
Pentachlorophenol	1	--	--	1	MCL

Table 3-5 *(continued)*
Cleanup Levels for Target COCs in Groundwater

COCs Targeted for Remediation	MCL (µg/L)	TCEQ MSC GW-Ind (µg/L)	Background (µg/L)	Proposed Cleanup Level (µg/L)	Basis
Metals					
Aluminum*	--	100,000	2,680	30,000	Risk
Antimony	6	--	12.2	12.2	Background
Arsenic	10	--	34.2	10	MCL
Cadmium	5	--	5.1	5	MCL
Chromium	100	--	15.8	100	MCL
Cobalt*	--	31	187	187	Background
Manganese	--	14,000	7,820	7,820	Background
Nickel	--	2,000	229	425	Risk
Silver	--	510	1.92	46	Risk
Strontium	--	61,000	7,330	7,330	Background
Thallium	2	--	--	2	MCL
Tin	--	61,000	--	600	Risk
Vanadium*	--	7.2	3.99	3.99	Background

Notes and Abbreviations:

* MSC was revised for changes to RfDo since 2006.

Background concentration from Final Evaluation of Perimeter Well Data for Use as Groundwater Background (Shaw, 2007).

µg/L micrograms per liter
GW-Ind Groundwater MSC for industrial use
MCL Safe Drinking Water Act maximum contaminant level
MSC medium specific concentration
Risk See Table 3-7 for calculation of risk-based cleanup levels.
TCEQ Texas Commission on Environmental Quality

Table 3-6
Cleanup Levels for Target COCs in Surface Water

COCs Targeted for Remediation	MCL (µg/L)	TCEQ MSC GW-Res (µg/L)
Anions		
Perchlorate	--	26
Volatile Organic Compounds		
1,1-Dichloroethene	7	--
1,2-Dichloroethane	5	--
Acetone	--	33,000
Chloroform	80	--
cis-1,2-Dichloroethene (cis-1,2-DCE)	70	--
Tetrachloroethene (PCE)	5	--
trans-1,2-Dichloroethene (trans-1,2-DCE) (daughter product)	100	--
Trichloroethene (TCE)	5	--
Vinyl Chloride (VC)	2	--
Explosives		
2,4-Dinitrotoluene	--	0.13
2,6-Dinitrotoluene	--	0.13
2,4,6-Trinitrotoluene	--	18
Semivolatile Organic Compounds		
bis(2-Ethylhexyl)phthalate	6	--
Pentachlorophenol	1	--
Metals		
Aluminum [b]	--	37,000
Antimony	6	--
Arsenic	10	--
Cadmium	5	--
Chromium	100	--
Cobalt [b]	--	11
Manganese	--	2,200 [a]
Nickel	--	730
Silver	--	180
Strontium	--	22,000
Thallium	2	--
Tin	--	22,000
Vanadium [b]	--	2.6

Notes and Abbreviations:

[a] Manganese surface water background concentration is 2,200 µg/L. Thus, any concentration equal to or below the background value will be acceptable.
[b] MSC was revised for changes to RfDo since 2006.

Background concentration from Final Background Surface Water and Sediment Study Report (Shaw, 2006).

µg/L micrograms per liter
GW-Res groundwater MSC for residential use
MCL Safe Drinking Water Act maximum contaminant level
MSC medium specific concentration
TCEQ Texas Commission on Environmental Quality

Table 3-7
Site-Specific Cleanup Levels for COCs with no MCL

Chemical	Adjustment 1		Adjustment 2		Adjustment 3		Adjustment 4		Proposed Cleanup Level
	GW-Ind MSC (µg/L)	Associated HQ	Cleanup Level (µg/L)	Associated HQ	Cleanup Level (µg/L)	Associated HQ	Cleanup Level (µg/L)	Associated HQ	
Perchlorate	72	1.0	6.5	0.09	12	0.17	26	0.36	26
Acetone	92,000	1.0	8,364	0.09	15,333	0.17	500	0.01	500
2,4,6-Trinitrotoluene	51	1.0	4.6	0.09	8.5	0.17	1.0	0.02	1.00
Aluminum *	100,000	1.0	9,091	0.09	16,667	0.17	30,000	0.30	30,000
Cobalt *	31	1.0	2.8	0.09	Background 187	--	Background 187	--	187
Manganese	14,000	1.0	1,273	0.09	Background 7,820	--	Background 7,820	--	7,820
Nickel	2,000	1.0	182	0.09	Background 229	--	425	0.21	425
Silver	510	1.0	46	0.09	85	0.17	46	0.09	46
Strontium	61,000	1.0	5,545	0.09	Background 7,330	--	Background 7,330	--	7,330
Tin	61,000	1.0	5,545	0.09	10,167	0.17	600	0.01	600
Vanadium *	7.2	1.0	0.65	0.09	Background 3.99	--	Background 3.99	--	3.99
Cumulative HI		11.0 HI > 1		1.00 OK		1.00 OK		1.00 OK	

Notes and Abbreviations:

* Toxicity numbers revised since March 2006, MSC was recalculated.

Background concentrations from Final Evaluation of Perimeter Well Data for Use as Groundwater Background (Shaw, 2007).

Adjustment 1 used the GW-Ind. Individually these are fine, but cumulatively (HI=sum of HQs) they are not.
Adjustment 2 divided the risk equally among the chemicals. This yields an acceptable HI of 1. Some cleanup levels exceed background.
Adjustment 3 uses background as the cleanup level for cobalt, manganese, nickel, strontium, and vanadium, then divides the risk equally. This yields an acceptable HI of 1.
Adjustment 4 uses background for cobalt, manganese, strontium, and vanadium, and adjusts proposed cleanup levels in light of past sample results. This yields an acceptable HI of 1.

µg/L micrograms per liter
GW-Ind groundwater medium-specific concentration for industrial use
HI hazard index
HQ hazard quotient
MSC medium specific concentration

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-47 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 the associated COCs (**Section 4.1**)
- Identify 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 Volumes of Concern

Section 2.0 presents detailed site conditions at LHAAP-47. Based on available sampling data, soil and groundwater at LHAAP-47 have been identified as media of concern because these media pose an unacceptable carcinogenic risk and non-carcinogenic hazard to a hypothetical future maintenance worker. These contaminated media include:

- Perchlorate in soil at locations near the former Building 25C at the south end of LHAAP-47 exceeds the GWP-Ind value (7.2 mg/kg) and thus acts as a potential source for perchlorate contamination of the groundwater. Contamination in this area extends to depths of 10 feet with an estimated volume of 9,000 cubic yards (cy) (**Figure 2-1**).

- Two separate plumes of perchlorate contamination exists in shallow groundwater at LHAAP-47 where chemical concentrations exceed cleanup levels (LHSMW60 and 47WW11). The extent of the contamination has been determined (1,520,000 square feet [ft^2]). The estimated volume of the perchlorate plume is approximately 12 million gallons (**Figure 2-3**) based on an average thickness of 4.2 feet and porosity of 25%.

- A dissolved plume of perchlorate contamination exists in intermediate groundwater around 47WW38. The extent of the contamination has been determined (880,000 ft^2). The estimated volume of the intermediate perchlorate plume is approximately 43 million gallons (**Figure 2-4**) based on an average thickness of 26 feet and porosity of 25%.

- Two separate plumes of dissolved VOC contamination exist in shallow groundwater at LHAAP-47 that exceed the cleanup levels. The extent of the contamination has been determined (3,8000,000 ft^2). Due to overlapping extents for individual VOCs, the total volume of contaminated groundwater in the shallow zone is approximately

50 million gallons (**Figure 2-5**) based on an average thickness of 7.0 feet and porosity of 25%.

- Two separate plumes of dissolved VOC contamination exist in intermediate groundwater at LHAAP-47 that exceed cleanup levels. The extent of contamination has been determined (4,230,000 ft^2). Due to overlapping extents for individual VOCs, the total volume of contaminated groundwater in the intermediate zone is approximately 154 million gallons (**Figure 2-6**) based on an average thickness of 19.5 feet and porosity of 25%.

- Explosives (2,4,6-TNT) in groundwater are isolated and do not indicate a plume of contamination and account for only 0.09% of the carcinogenic risk and only 0.01% of the non-carcinogenic hazard in the BHHRA. Thus, no significant risk is associated with explosives concentrations in the groundwater. No explicit treatment is directed at reducing explosives concentrations, because of the lack of significant risk associated with them. Monitoring will be performed to track explosives concentrations for future potential treatment or elimination as COCs.

- SVOCs, pentachlorophenol and bis(2-ethylhexyl)phthalate, in groundwater do not indicate a plume of contamination, just isolated exceedances of MCLs. SVOCs accounted for only 0.19% of the carcinogenic risk in the BHHRA. The SVOCs detected in past groundwater samples may not be found in the future. No explicit treatment is directed at reducing SVOC concentrations, because of the small percentage of risk associated with them. Monitoring will be performed to track SVOC concentrations for future potential treatment or elimination as COCs.

- Metals in groundwater accounted for only 2.5% of the non-carcinogenic hazard in the BHHRA. It is expected that many of the metals exceedances are associated with the presence of VOCs in the groundwater combined with oxidizing conditions. The wells with exceedances generally are within the VOC plume, which supports this expectation. The chromium, nickel, and vanadium exceedances are associated with wells with stainless steel screens and are possibly associated with well materials. No explicit treatment is directed at reducing metals concentrations, because of the small percentage of hazard associated with them. Metals concentrations may potentially rise with implementation of in situ enhanced bioremediation treatment but typically attenuate without additional treatment. Monitoring will be performed to track metals concentrations for future potential treatment or elimination as COCs.

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-47. 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. **Figure 4-1** summarizes the applicable GRAs for soil at LHAAP-47. **Figure 4-2** summarizes the applicable GRAs for groundwater at LHAAP-47. A no action GRA must also be considered for a baseline of comparison.

4.3 Screening of 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 GRA, 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 soil RAO are presented in **Figure 4-1**. Those technology types considered most likely to meet the groundwater RAOs are presented in **Figure 4-2**.

4.4 Evaluation and Selection of Representative 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, 1988b).
- **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, 1988b).
- **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 Soil

The soil process options will be evaluated to address perchlorate in the soil. The risks and hazards posed by the potential migration of contaminants to groundwater from residual contamination will be addressed.

4.5.1.1 No Action

The "no action" process option does not provide additional remediation, maintenance, or security activities at contaminated soil or sediment areas at LHAAP-47. The lack of LUC can lead to receptor exposure to the contaminated soil or sediment. This process option is retained as a baseline with which other remediation alternatives are compared.

- **Effectiveness—**This response action could have negative long-term impacts on human health and the environment. Industrial use at LHAAP-47 would result in risks to humans from exposure to contaminated soil and sediment.
- **Implementability—**No implementation is required.
- **Cost—**None.

4.5.1.2 Containment

The containment GRA consists of technologies that limit the migration of contaminants and the associated potential for exposure, but they do not reduce contaminant mobility, toxicity, or volume. The technologies considered are soil, asphalt or multilayer capping.

4.5.1.2.1 Capping

The capping technology is intended to minimize (1) infiltration of surface water/precipitation and subsequent leachate generation caused by percolation of water through the waste, (2) mobilization of contaminants through wind or water erosion, or (3) direct contact with surface or subsurface contamination by intruders or biota. The capping process options considered are soil covers, asphalt caps, and multilayer caps.

Soil Cover. Soil covers consist of a layer of soil placed over contamination. Vegetation is generally encouraged to limit erosion. The purpose of the cover is to prevent access or exposure to the contamination, but the cover does not control infiltration of water through the contamination. It is best used on contamination that is relatively insoluble or in combination with a treatment technology that renders the contamination insoluble.

- **Effectiveness—**A soil cover can be very effective at preventing access to perchlorate in surface soil. It is not applicable to deeper soil where access prevention is not the concern. Around Building 25C, most of the perchlorate contaminated soil already has a layer of clean soil and a plastic liner between the contamination and the receptor.

- **Implementability—**Soil covers are easy to implement. Standard earthmoving equipment can move local soil over the contaminated areas. Portions of LHAAP-47 may require some initial clearing. Soil cover maintenance to limit large vegetative growth that could disrupt the cover and to control erosion would be needed. Frequent maintenance (mowing) would be required.

- **Cost—**Low.

Asphalt Cap. Asphalt caps control infiltration of rainwater or run-on water through the installation of impermeable asphalt. This process option is particularly useful if the site is to be used as a parking lot or other light industrial use.

- **Effectiveness—**Asphalt caps can be effective at reducing infiltration if sufficient maintenance occurs. Asphalt can quickly develop cracks and holes that need to be filled, and maintenance will be needed to repair them as they occur. These caps are most effective if the area needs to be asphalted for another use that will promote its long-term maintenance.

- **Implementability—**Asphalt caps are easy to install. As with other caps to control infiltration, they need to be sloped to encourage runoff during rain events. Frequent maintenance is less necessary than with multilayer caps as the asphalt does not require mowing. However, asphalt cracks easily and this must be controlled to maintain effectiveness.

- **Cost—**Low.

Multilayer Cap. A multilayer cap is an engineered cover that can consist of various layers of soil, clay, membranes and other materials. Multilayer caps control infiltration of rainwater or run-on water through the installation of impermeable layer materials and can prevent access or exposure to the contamination.

- **Effectiveness—**Multilayer caps can be effective at reducing infiltration if sufficient maintenance occurs. Long-term maintenance would be required for ensure cracks and holes do not develop. Maintenance will be needed to repair them as they occur.

- **Implementability—**A multilayer cap is more difficult to implement than a soil or asphalt cap due to the design and installation requirements. As with other caps to control infiltration, they need to be sloped to encourage runoff during rain events. More maintenance is necessary with a multilayer cap than an asphalt cap as frequent mowing is required. The multilayer cap must be inspected and maintained to ensure its long-term effectiveness.

- **Cost—**High.

4.5.1.2.2 Summary of Containment Process Options

The soil cover alternative is a representative process option for addressing the perchlorate contamination in soil. It provides the least expensive option that meets the needs of a containment option. However, the capping options do not prevent the contaminated soil from continuing to impact groundwater due to the potential of groundwater migration through the soil near the groundwater/soil interface, and thus would be less protective of human health and the environment than other alternatives. The perchlorate contamination in soil is more than 10 feet bgs and is at the groundwater/soil interface. Therefore, the containment process options for soil are removed from further consideration.

4.5.1.3 Removal

The removal GRA consists of technologies that remove contaminated media or waste material to either relocate it or prepare it for treatment and/or disposal. The removal technology considered is excavation with a process option of conventional excavation.

4.5.1.3.1 Excavation

Conventional Excavation. This excavation method uses a variety of conventional excavation equipment to remove debris, soil, and other buried waste. The equipment can include excavators, track loaders, bulldozers, and tool carriers of differing sizes with attachments or manipulators suitable for dealing with a varied waste profile. This equipment can be used individually or together as circumstances dictate. It is considered applicable to the contaminated soil at LHAAP-47. It can be used for both shallow and deep soil.

- **Effectiveness—**Conventional excavation equipment is applicable to the LHAAP-47 soil contamination. The equipment has consistently proven reliable and effective for removal of soil and other media in hazardous and non-hazardous applications for decades. Various attachments can increase the versatility of the equipment, allowing their use with a wide range of wastes. Ancillary equipment for screening, sorting, and segregation can be effectively integrated with conventional excavation equipment.

  The hazards to operators, in addition to the normal excavation hazards, come from exposure to contaminated media. Misting or fixative agents can reduce fugitive dust emissions during excavation. PPE can reduce or eliminate exposure from inhalation/ingestion or dermal contact.

- **Implementability—**Conventional excavation is readily implementable, and the equipment, attachments, and operators are widely available. The equipment can be readily adapted to the material and conditions at the site.

- **Cost—**Moderate.

4.5.1.3.2 Summary of Removal Process Options

Conventional excavation equipment is carried forward as the representative process option for soil removal because of its effective application for a wide range of wastes, its equipment availability, and its widespread use in environmental restoration activities.

4.5.1.4 Ex Situ Treatment

Ex situ treatment technologies provide varying levels of waste treatment following removal of the waste. These technologies are applied to reduce the volume, mobility, or toxicity of the waste. The ex situ treatment technologies considered are physical/chemical, thermal, and biological treatment. Ex situ treatment could be considered if excavated material requires treatment before disposal to meet waste acceptance criteria or if complete treatment could be achieved so remaining material is clean.

4.5.1.4.1 Thermal Treatment

Thermal treatment destroys and/or removes organic and metal contaminants. The process option considered is incineration.

Incineration. Incineration is an ex situ thermal destruction process in which compounds are destroyed by exposure to extremely high temperatures. It is considered applicable to the perchlorate source problems at LHAAP-47. Many different systems are available: rotary dryer systems, indirect-fired systems, direct-fired systems, screw-type systems, and asphalt plant aggregate driers. Each system uses the same basic principle of operation, which is a furnace to remove and destroy organic compounds in the waste feed. One of the more common systems, a rotary kiln incinerator, feeds the waste material into the upper end of a sloped rotating kiln. The slope and the rotating action conveys the waste to the low end of the kiln, exposing the waste to the heated gases (up to 1,800 degrees Fahrenheit [°F]) in the kiln and vaporizing and destroying the contaminants. The combustion gases are then drawn through an afterburner (2,200 ºF) and scrubbing system before discharge to the atmosphere.

- **Effectiveness—**Incinerators have been effectively used for years on organic-contaminated media and are the Best Demonstrated Available Technology for many VOCs and SVOCs. It has also been successfully tested for treatment of perchlorate in soil. It is applicable to most, if not all, of the perchlorate contaminated soil at LHAAP-47. The destruction capabilities of an incinerator allow the achievement of relatively low cleanup levels. Incineration is a robust technology that can handle a wide variety of organic compounds and concentrations because of its high temperatures. The disadvantages of incineration are that some compounds generate toxic products of incomplete combustion, some materials are not incinerable, the capital and operating costs are high, and supplemental fuel is often required. If the ash contains heavy metals, the ash may have to be stabilized before disposal.

- **Implementability**—Incineration systems are available for both on- and off-site use. The off-gas stream may require additional treatment and may produce a residue that requires disposal. Thermal treatment systems are generally not well received by the public because of concerns with air emissions.
- **Cost**—High.

4.5.1.4.2 Biological Treatment

Biological treatment process options use biological processes to degrade or destroy contaminants. The ex situ process evaluated is composting.

Composting. Composting is a controlled biological process by which contaminants (in this case perchlorate) are converted by microorganisms (under aerobic and anaerobic conditions) to innocuous, stabilized byproducts. Typically, thermophilic conditions (54–65 degrees Celsius) must be maintained to properly compost soil contaminated with perchlorate. The increased temperatures result from heat produced by microorganisms during the degradation of the organic material in the waste. In most cases, this is achieved by the use of indigenous microorganisms. Soil is excavated and mixed with bulking agents and organic amendments, such as citric acid, wood chips, and animal and vegetative wastes, to enhance the microbial activity of the mixture to be decomposed. Maximum perchlorate degradation efficiency is achieved through maintaining anaerobic conditions (covering soil with polyethylene sheet), soil amendments as necessary, and closely monitoring moisture content and temperature. The three standard process designs used in composting must be adapted for anaerobic conditions: static pile composting (compost is formed into piles and covered with polyethylene sheet), mechanically agitated in-vessel composting (compost is placed in a reactor vessel where it is mixed but not aerated), and windrow composting (not readily adaptable for anaerobic conditions). As chlorine gas may be generated during perchlorate decomposition, off-gas controls may be required.

- **Effectiveness—**The composting process may be applied to soil contaminated with perchlorate. Pilot and full-scale projects have demonstrated that anaerobic, thermophilic composting is able to reduce the concentration of perchlorate.
- **Implementability**—All materials and equipment used for composting are commercially available. Substantial space may be required for composting.
- **Cost—**Low.

4.5.1.4.3 Summary of Ex Situ Treatment Process Options

Currently the chemical in soil at LHAAP-47 that is considered to potentially require treatment is perchlorate. The thermal treatment option is effective for permanent destruction of perchlorate in soil, but the option is removed from further consideration because perchlorate is non-hazardous, and community concerns about emissions could hinder implementation. Biological treatment by composting has not achieved removal of perchlorate to the cleanup level for LHAAP-47 during the one full scale composting evaluation. Three pilot scale tests showed greater potential, but did not consistently reduce perchlorate levels to below the LHAAP-47 cleanup level. A pilot scale test for composting of soil from Building 25C failed to reduce perchlorate levels in all tested samples. Biological treatment by composting could potentially be successful, but would require successful pilot testing and successful scaling up. Due to this uncertainty, composting is removed from further consideration.

4.5.1.5 Disposal

The disposal GRA consists of those technologies that provide for the disposal of removed wastes at new or existing, permitted disposal facilities. Both on-site and off-site facilities are evaluated. A selection of on-site facilities versus off-site facilities is made for developing alternatives.

4.5.1.5.1 Off-Site Disposal

Off-site disposal options include off-site treatment and disposal facilities, a RCRA disposal facility, or an industrial landfill. The selection of the disposal facility depends on the waste characteristics and although all are evaluated here, no specific facility or category of facility is selected.

Treatment, Storage, Disposal Facility. A treatment, storage, disposal (TSD) facility is a commercial, permitted, off-site facility that is licensed to treat, store, and/or dispose of a variety of waste streams. There are numerous such facilities all over the country offering broad ranges of treatment options, many of which could effectively treat and dispose of the LHAAP-47 waste and soil. This option would be used if treatment before disposal is needed to meet ARARs.

- **Effectiveness—**A TSD facility is effective at treating and disposing of treated wastes in a permitted, off-site disposal facility.
- **Implementability—**Numerous facilities exist that have and are treating wastes similar to those found at LHAAP-47. These facilities are already permitted and licensed to operate. Wastes have to meet the waste acceptance criteria of the receiving TSD facility.
- **Cost—**Moderate.

RCRA Disposal Facility. This process option consists of any number of existing disposal facilities that use engineered features such as multilayer liners and caps, leachate detection and collection systems, run-on/-off controls, and intrusion barriers to isolate wastes from human and environmental receptors.

- **Effectiveness—**Disposal involves permanent disposition of the RCRA-generated contaminated soil in a manner that protects human health and the environment.

Off-site disposal would include the transportation of excavated soil to an approved and licensed facility.

- **Implementability—**Implementation is moderate if the waste acceptance criteria can be met.
- **Cost—**Moderate.

Industrial Landfill. An existing industrial landfill can be used to dispose of that debris or refuse that is not a RCRA waste or has been decontaminated to acceptable levels. Such a facility is a Class II lined facility permitted to receive industrial, commercial, institutional, land-clearing, and construction/demolition waste. The facility does not accept RCRA-hazardous waste or free liquids. This option would be used to dispose of waste that is considered hazardous to human health and the environment but is not a RCRA-hazardous waste.

- **Effectiveness—**Industrial landfills are effective in isolating low hazard wastes from the environment and human receptors because the waste acceptance criteria severely restrict the type and concentrations of waste that may be disposed.
- **Implementability—**Disposal of the excavated clean wastes or treated wastes would involve transportation and compliance with waste acceptance criteria.
- **Cost—**Moderate.

4.5.1.5.2 On-Site Disposal

On-site consolidation is considered as the technology process option for on-site disposal.

Consolidation. Consolidation involves placing treated LHAAP-47 soil back into LHAAP areas. The waste is excavated, partially treated on the site if needed, and then placed elsewhere on LHAAP. The contaminants in the treated waste would have to have been destroyed or rendered immobile, making the treated waste better suited for placement. This option precludes the need to transport the treated waste to an off-site disposal facility. A single or multilayer cap would then be placed over the waste. If the waste is fully treated, no special disposal process option is needed.

- **Effectiveness—**Consolidation is effective in isolating the very low hazard wastes from human receptors and the environment. It can limit the area requiring long-term institutional controls.
- **Implementability—**Consolidation is used at other hazardous waste sites around the country where off-site disposal options are unavailable or undesirable and where the continued on-site presence of treated waste is not problematic. Given the potential future land uses at the LHAAP, there may be regulatory and public reluctance to moving the waste around the LHAAP.
- **Cost—**Low compared to off-site disposal.

4.5.1.5.3 Summary of Disposal Process Options

All off-site disposal process options are carried forward for additional consideration until waste streams and volumes are more clearly identified in the alternative development process. The on-site disposal option of consolidation is not retained because of the potential regulatory and public concerns about leaving waste on the site after having already removed it, the potential future land uses, and the widespread availability of off-site treatment and disposal facilities.

4.5.1.6 Summary of Representative Process Options for Soil

The following representative GRAs, technologies or process options are retained:

- No action
- Removal
- Off-site disposal

Remedial alternatives are developed in **Section 5.0**.

4.5.2 Groundwater

In the following subsections, process options are evaluated to address shallow groundwater contaminated with perchlorate, and interconnected shallow/intermediate groundwater contaminated with VOCs.

4.5.2.1 No Action

The "no action" process option provides no groundwater remedial activities. No monitoring of the groundwater or surface water conditions occurs under this process option. This process option is retained as a baseline with which other remediation alternatives are compared.

- **Effectiveness—**Without access controls or remediation, the groundwater from LHAAP-47 could result in a future unacceptable risk to humans if the groundwater is ingested.
- **Implementability—**No implementation is required.
- **Cost—**None.

4.5.2.2 Land Use Control

LUC would be implemented to regulate access to groundwater and include access controls, 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-47. 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.

4.5.2.2.1 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 LUC (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 LUC.

- **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 five-year review will ensure that the covenants/deed restrictions are enforced and remain effective.
- **Implementability—**These options can be readily implemented.
- **Cost—**Low.

4.5.2.2.2 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-47. These measures may include internal notices and site inspections to serve as a reminder of the existence of LUC, a site approval process to review land-use changes at LHAAP-47 to ensure the LUC are followed, training of site personnel regarding the existence and care of the LUC, and regular inspection and maintenance of the LUC. 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 LUC are maintained.
- **Implementability—**Training and procedures are readily available and implemented. They may need to be modified for LHAAP.
- **Cost—**Low.

4.5.2.2.3 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.

4.5.2.2.4 Summary of Land Use Control Process Options

Covenants/deed restrictions and administrative controls are carried forward as representative process options for the LUC process options. Physical mechanisms are not carried forward. 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.

4.5.2.3 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 RAOs. 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.

4.5.2.4 Removal

The removal GRA consists of technologies that remove groundwater to either relocate it or prepare it for treatment. The removal technology considered is groundwater collection/removal.

4.5.2.4.1 Groundwater Collection/Removal

Groundwater collection and removal is accomplished by either extraction wells, interception trenches, or horizontal wells. Groundwater collection/removal can only be implemented at areas where groundwater is available in sufficient quantities for sustained removal over time.

Extraction Wells. These are vertically installed wells designed to collect and extract clean or contaminated groundwater to contain a plume or to reduce contaminant mass in the plume.

- **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.
- **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 all depths that might be required at LHAAP-47. Existing monitoring wells at LHAAP-47 could be converted to extraction wells.
- **Cost—**Low to moderate.

Interception Trenches. An interception 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—**Interception trenches are very effective at collecting groundwater. The trench functions like a continuous line of extraction wells. The trenches are also only applicable to shallow zone contamination.
- **Implementability—**Interception trenches are relatively easy to install to shallow depths with conventional construction equipment. The process requires long-term maintenance to ensure that the permeable media and collection piping do not become clogged. Interception trenches are difficult to install at depths to intercept the shallow/intermediate flow zone.
- **Cost—**Moderate.

Horizontal Wells. Horizontal wells are similar to vertical wells with the exception that they are installed horizontally and are typically screened their entire length. They function like drains and offer a water removal capability that exceeds that of a similarly sized vertical well. Horizontal wells could be installed under source areas to remove contaminated groundwater or collect migrating leachate.

- **Effectiveness—**Horizontal wells are very effective at removing large volumes of contaminated groundwater in applications where vertical wells cannot be used. Wells up to 12 inches in diameter and 10–500 feet deep can be installed over 1,000-foot lengths. A single horizontal well is generally equivalent to five vertical wells in sandy soil and ten vertical wells in clayey soil.
- **Implementability—**Although this process is commonly used in the oil industry, it is still uncommon in environmental restoration. It would likely be used underneath a source area to collect contaminated groundwater or leachate.
- **Cost—**High.

4.5.2.4.2 Summary of Removal Process Options

Horizontal wells are not retained as a representative groundwater removal process option because of their limited use in environmental restoration actions and because of their high costs. A horizontal well installed at LHAAP-18/24 for evaluation was found to be ineffective. Interception trenches are effective at removing groundwater though typically at a higher cost than extraction wells. Extraction well systems are flexible, robust, and effective in a wide range of hydrogeologic conditions. The removal process option of extraction wells is retained for further development. Because LHAAP-47 is distant from the existing groundwater treatment plant, extracted groundwater would have to be transported or a new treatment plant built and ex situ treatment will be needed.

4.5.2.5 In Situ Treatment

In situ treatment technologies provide varying levels of groundwater treatment without prior removal of the groundwater, and reduce the mobility or toxicity of the contaminants in groundwater. The in situ treatment technologies under consideration are physical/chemical and biological treatments.

4.5.2.5.1 Physical/Chemical Treatment

MNA, air sparging/soil vapor extraction, in situ oxidation, and permeable reactive barriers are process options considered potentially applicable to the groundwater at LHAAP-47.

Monitored Natural Attenuation. MNA is a passive remedial process option that will achieve the cleanup levels over time. Natural subsurface processes such as dilution, volatilization, biodegradation, adsorption, and chemical reactions with subsurface materials are monitored to confirm their progress in reducing contaminant concentrations. **Appendix A** provides an evaluation of the ongoing natural attenuation at LHAAP-47.

The VOCs and perchlorate are amenable to MNA.

- **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. MNA is effective when source term releases have been mitigated, off-site releases of contaminants at unacceptable levels are not occurring, and it can be demonstrated that natural attenuation mechanisms are occurring. Regular monitoring must be conducted throughout the process to confirm that attenuation is occurring in accordance with cleanup objectives. The MNA evaluation for LHAAP-47 (see **Appendix A**) demonstrated that natural attenuation was occurring and is effectively controlling COCs in the shallow and intermediate groundwater zones outside of the well field area.

- **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.

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., TCE) and highly permeable formations. It is incompatible with certain soil types, and high humic content inhibits volatilization of contaminants. Implementation at LHAAP-47 is complicated by high clay content soil that may limit the effectiveness of air sparging by retarding the movement of air and vapors through the soil column. 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.

In Situ Oxidation. Contaminated media are treated through the addition of oxidizers, such as potassium permanganate, hydrogen peroxide or activated persulfate, which convert the contaminants to a less mobile or toxic form. This process option is applicable to VOCs such as TCE.

- **Effectiveness—**In situ oxidation is effective on contaminants in a relatively homogeneous and porous medium. The approximately 10-foot clay to silty-clay layer between the shallow and the intermediate zones is not continuous and will not keep the natural attenuation process of the shallow/intermediate groundwater from being affected by the oxidative process applied at discrete locations. 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. Chemical oxidation is most effective for VOCs and is considered a suitable approach for one primary COC at LHAAP-47, TCE, but not for the other, perchlorate.
- **Implementability—**This process option may be difficult to implement in situ because of concerns regarding delivery and sufficient exposure of the contaminants to the chemical agents. An additional concern is the release of excess reactants or byproducts to the environment. There have been limited applications of these processes, which are generally more readily implemented in the ex situ mode. A recent USEPA evaluation by their Technology Innovation Office concluded that the application of in situ oxidation is highly dependent on the delivery system.
- **Cost—**Low to moderate.

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.

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 effective and more expensive forms of iron (palladized 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—**Moderate.

4.5.2.5.2 Biological Treatment

Biological treatment process options use living organisms such as bacteria or fungi to detoxify or immobilize contaminants in waste. These process options are primarily used to convert organic contaminants into nontoxic products.

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. Bioremediation would include bioaugmentation with microorganisms capable of completely degrading chlorinated solvents to harmless byproducts. Excessively high concentrations of contaminants could be toxic to microbes. Many organic contaminants, including some of the COCs at LHAAP-47, 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. The vast amount of chloride ions that would be produced through enhanced bioremediation would likely reduce the effectiveness of biodegradation.

- **Implementability—**Enhancing the biological activity may be difficult in some of the low permeability soil at LHAAP-47 because of complications associated with the delivery of nutrients and oxygen. Options for implementation include direct injection in an area or as a barrier wall, trench mixing, and recirculation using extraction and injection wells. Equipment and expertise are readily available, but significant treatability testing would be required.

- **Cost—**Low to moderate.

4.5.2.5.3 Summary of In Situ Treatment Process Options

There are numerous in situ groundwater treatment process options available. In general, any in situ treatment process option may be limited by site geology or hydrology and the contaminants. Significant reductions in perchlorate and VOC concentrations detected during the various rounds of groundwater monitoring indicates that natural attenuation is effectively occurring in the groundwater at some monitoring wells. MNA is retained as a remediation option in the interconnected shallow/intermediate zone. The effectiveness of the air sparging/soil vapor extraction and permeable reactive barrier process options for treatment of LHAAP-47 groundwater may be limited by site geology or hydraulic conditions, contaminant characteristics, or the degree of required long-term maintenance. In situ oxidation effectiveness may be limited by site geology or hydraulic conditions, and the application of oxidants may interrupt or terminate the natural attenuation that is occurring. In situ oxidation is not effective for addressing perchlorate contamination. In situ oxidation is not retained as a remediation option. In situ bioremediation is considered a fast and efficient process with respect to the primary COCs (TCE and perchlorate) in LHAAP-47 groundwater and the MNA evaluation (**Appendix A**) indicated conditions suitable for bioremediation, therefore enhanced bioremediation is retained for remedial alternative development.

4.5.2.6 Ex Situ Treatment

Ex situ treatment technologies provide varying levels of water treatment following extraction or collection of the water. These technologies are applied to reduce the volume, mobility, or toxicity of recovered groundwater. Although ex situ treatment technologies considered are physical/chemical, thermal, and biological, they have been grouped into two process options under an on-site treatment technology – the existing treatment system and a new mobile or skid-mounted system near the extraction point.

4.5.2.6.1 New 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 and air stripping could remove VOCs while ion exchange or a bioreactor would remove perchlorate. The new treatment plant may require a pretreatment system (e.g., precipitation) if iron and other interfering metals are present in the groundwater.

- **Effectiveness—**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.

4.5.2.6.2 Burning Ground No. 3 Groundwater Treatment Plant

This facility, which is currently processing contaminated groundwater from other LHAAP sites and includes unit operations such as neutralization, precipitation, and air stripping. The effluent from the plant is discharged to Harrison Bayou.

- **Effectiveness—**The existing plant 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 existing 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 plant would be necessary. Treatment capacity upgrades at the plant would likely be required for perchlorate, but not for other processes. However, LHAAP-47 is located approximately 1.5 miles from the existing plant and the length of a pipeline would be greater. A series of on-site holding tanks would be required to allow discontinuous pumping.
- **Cost—**Frequent transport of the contaminated groundwater from on-site holding tanks to the plant or construction of a new pipeline and plant upgrades make this option cost moderate to high in comparison to other alternatives.

4.5.2.6.3 Summary of Ex Situ Treatment Process Options

A new treatment plant will not be retained for remedial development. A design and treatability study would be required for effective design, and O&M of the new plant make it unattractive over the long term. The use of the existing LHAAP groundwater treatment plant will be retained for remedial alternative development. It is already effectively operational, and the capital costs for construction of the plant have already been spent. Currently, groundwater from other LHAAP sites provides the majority of the water that is treated by the plant. Use of the existing plant with upgrades and a new pipeline is retained for alternative development.

4.5.2.7 Surface Water Discharge (Disposal)

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 NPDES discharge limits can be met. The current treatment system discharges to Harrison Bayou through an NPDES-monitored point. Alternative discharge methods allowed include to storage at the INF pond, or for recirculation of LHAAP-18/24.
- **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.

4.5.2.8 Summary of Surface Water Discharge Process Options

Surface water discharge is retained since it would be evaluated in combination with groundwater extraction and use of the existing groundwater treatment plant which has been retained as a process option.

4.5.2.9 Summary of Representative Groundwater Process Options

The following representative GRAs, technologies or process options are retained:

- No action
- LUC
- Long-term monitoring
- MNA (both shallow and intermediate groundwater zones for perchlorate and VOCs)
- In situ bioremediation
- Extraction wells
- Ex situ treatment at the existing groundwater treatment plant
- Surface water discharge

Development of the remedial alternatives are included in **Section 5.0**.

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PLOT DATE: 04/01/2010
FORMAT REVISION 5/13/02

IMAGE	X-REF	OFFICE	DRAWN BY		CHECKED BY		APPROVED BY		DRAWING NUMBER
---	---	HOUSTON, TX.	L. JONES	04/01/10	R. DUFFIELD	04/2010	S. WATSON	04/2010	117591-A61

GENERAL RESPONSE ACTION	TECHNOLOGY	PROCESS OPTION	DESCRIPTION	SCREENING COMMENTS
No Action	None	Not applicable		Required for consideration
Containment	Capping	Soil cover	Clean soil placed over contaminated areas to prevent exposure and erosion	Not applicable for deep soil. Perchlorate to contamination to more than 10 feet.
		Asphalt cap	Asphalt placed over contaminated areas to prevent exposure and erosion	Not applicable for deep soil. Perchlorate to contamination to more than 10 feet.
		Multilayer cap	Multiple layers of soil, clay, membranes and other materials to prevent infiltration, biotic intrusion, etc.	Not applicable for deep soil. Perchlorate to contamination to more than 10 feet.

Process option screened out

Process option retained

U.S. Army Corps of Engineers
Tulsa District
Tulsa, Oklahoma

Figure 4-1 (1 of 2)

Soil Technology Screening
LHAAP-47 Feasibility Study

Longhorn Army Ammunition Plant
Karnack, Texas

00100543

PLOT DATE: 04/01/2010
FORMAT REVISION 5/13/02

IMAGE	X-REF	OFFICE	DRAWN BY		CHECKED BY		APPROVED BY		DRAWING NUMBER
---	---	HOUSTON, TX.	L. JONES	04/01/2010	R. DUFFIELD	04/2010	S. WATSON	04/2010	117591-A62

GENERAL RESPONSE ACTION	TECHNOLOGY	PROCESS OPTION	DESCRIPTION	SCREENING COMMENTS
Removal	Excavation	Conventional mechanical excavation	Ordinary earthmoving equipment such as backhoes, loaders, and bulldozers	Potentially applicable
Disposal	Off-site disposal	Treatment, storage, disposal facility	Contaminated media sent to an off-site facilty for treatment and/or disposal	Potentially applicable
		RCRA disposal facility	RCRA hazardous waste disposed in an off-site RCRA Subtitle C facility	Potentially applicable
		Industrial landfill	Nonhazardous waste disposed in an off-site RCRA Subtitle D landfill	Potentially applicable
	On-site disposal	Consolidation	Consolidate waste with other waste	Difficult to implement due to regulatory and public reluctance to dispose waste at LHAAP
Ex Situ Treatment	Thermal	Incineration	Thermal destruction of organic contaminants in a combustion chamber	Readily implemented, however, offgas may require additional treatment. Public may have concern with emissions
	Biological	Composting	Introduction of microbes and food source to pile of contaminated soil	Past full scale application did not achieve required cleanup level for LHAAP-47. Building 25C Bench scale test found it ineffective for perchlorate removal.

Process option screened out

Process option retained

Shaw

U.S. Army Corps of Engineers
Tulsa District
Tulsa, Oklahoma

Figure 4-1 (2 of 2)

Soil Technology Screening
LHAAP-47 Feasibility Study

Longhorn Army Ammunition Plant
Karnack, Texas

PLOT DATE: 08/15/2010
FORMAT REVISION: 08/15/2010

IMAGE	X-REF	OFFICE	DRAWN BY		CHECKED BY		APPROVED BY		Drawing Number
- - -	- - -	*HOUSTON, TX*	*L. JONES*	*04/2010*	*R. DUFFIELD*	*04/2010*	*S. WATSON*	*04/2010*	117591-A65

GENERAL RESPONSE ACTION	TECHNOLOGY	PROCESS OPTION	DESCRIPTION	SCREENING COMMENTS
No Action	None	Not Applicable		Required for consideration
Land Use Controls	Access controls	Deed restrictions	Restricts land use or zoning	Potentially applicable
		Covenants	Restricts land use or zoning	Potentially applicable
	Administrative controls	Training	Useful to distinguish allowed and unallowed uses	Not applicable, no current groundwater use
		Internal notices	Notices maintain consistent knowledge of restrictions	Potentially applicable
		Site inspections	Inspection to check uses are appropriate	Potentially applicable
	Physical Mechanisms	Fences	Inspection of Engineered remedial actions and conduct of maintenance to ensure proper operation of engineered controls	Incompatible with expected future land use
		Signs	Informs casual visitors of presence of chemical hazards	Groundwater not dangerous to casual visitors
Removal	Groundwater Collection / Removal	Extraction wells	Groundwater extraction wells designed to remove contaminated groundwater	Required for recirculation of groundwater in bioremediation
		Interception trenches	Trench filled with permeable media used to intercept and collect shallow groundwater	Difficult to implement. May be difficult to install and requires maintenance
		Horizontal wells	Wells installed horizontally beneath a waste area to collect groundwater and leachate	Medium difficulty to implement but not applicable without disposal or treatment

Process option screened out

Process option retained

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U.S. Army Corps of Engineers
Tulsa District
Tulsa, Oklahoma

Figure 4-2 (1 of 2)
Groundwater Technology Screening
LHAAP-47 Feasibility Study
Longhorn Army Ammunition Plant
Karnack, Texas

00100545

PLOT DATE: 08/15/2010	IMAGE	X-REF	OFFICE	DRAWN BY		CHECKED BY		APPROVED BY		Drawing Number	117591-A65
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GENERAL RESPONSE ACTION	TECHNOLOGY	PROCESS OPTION	DESCRIPTION	SCREENING COMMENTS
Long-Term Media Monitoring	Monitoring Wells	Groundwater Monitoring	Collect and analyze groundwater samples with approved techniques	Potentially applicable, used in conjunction with other process options
In Situ Treatment	Physical / Chemical	Monitored Natural Attenuation	The monitored degradation of contaminants through natural biological and chemical processes	Potentially applicable to dissolved phase
		Air Sparging	Air injected into saturated matrices to remove contaminants by volatilization	Would interfere with active natural attenuation. Limited by geology or hydraulic conditions
		In Situ Oxidation / Reduction	Chemical oxidants or reducers added in situ to convert organics to less toxic form	Would interfere with active natural attenuation. Limited by geology or hydraulic conditions
		Permeable Reactive Barrier	A trench filled with a reactive or sorbent material designed to treat groundwater as it passes through	Potentially applicable to both VOCs and perchlorate
	Biological	Enhanced Bioremediation	Microbes and nutrients are injected into the subsurface to biologically degrade organics	Potentially applicable to both VOCs and perchlorate
Ex Situ Treatment	On-Site Treatment	New Treatment Plant	Mobile or skid-mounted system near extraction point	Difficult to implement. A design and treatability study would be required. Long term maintenance
		Burning Ground No. 3 Treatment Plant	Treatment processes at existing water treatment plant are precipitation, air stripping, and fluidized bed reactor	Distance to existing plant will require a new pipeline
Disposal	On-Site Disposal	Surface Water Discharge	Discharge of treated groundwater to surface water	Applicable in conjunction with Burning Ground No. 3 treatment plant

Process option screened out

Process option retained

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Tulsa District
Tulsa, Oklahoma

Figure 4-2 (2 of 2)
Groundwater Technology Screening
LHAAP-47 Feasibility Study
Longhorn Army Ammunition Plant
Karnack, Texas

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 and applicable ARARs **(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 LUC for treatment residuals and untreated waste.
- Use of LUC, 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-47.

5.1.2 Development using Remediation Strategies and Process Options

The media at LHAAP-47 presenting an unacceptable risk or hazard are groundwater in the shallow and the interconnected shallow/intermediate zones, and soil at Building 25C. Thus, the purpose of the remedial alternatives is to present the decision maker with technical and economic options for remediation of soil and groundwater at LHAAP-47. Although all of the action alternatives have been designated to achieve the RAOs 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 were grouped and combined into alternatives to meet the RAOs as indicated on **Table 5-1**.

5.2 Description of Remedial Alternatives

The following sections describe the remedial alternatives in more detail (see **Table 5-1** for a presentation of the components of each alternative). The details included in the alternative descriptions (e.g., quantities and dimensions) support the evaluation in **Section 6.0** and the cost estimate in **Appendix D**. Quantities and dimensions are provided for cost estimating purposes only and may be changed based on the design. 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 the soil and groundwater 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, In Situ Bioremediation, MNA and LUC

The goals of this alternative are to prevent exposure of the hypothetical future maintenance worker to contaminated soil and groundwater at LHAAP-47. Soil that has the potential to impact groundwater would be removed. The shallow, shallow/intermediate, and intermediate zone groundwater have contaminants above cleanup levels that would be reduced over time via in situ bioremediation of the highest groundwater concentrations and MNA until contaminant concentrations are reduced over time to attain the cleanup levels. Biobarriers would be used as needed to prevent migration of contaminants and protect surface water in Goose Prairie Creek. Surface water in Goose Prairie Creek would be monitored to evaluate the soil to surface water and groundwater to surface water pathways. LUC would be maintained to prevent use of groundwater, except for environmental monitoring and testing until the cleanup levels are attained.

5.2.2.1 Excavation

The recommended removal action consists of excavation of the perchlorate-contaminated soil and off-site disposal at a RCRA Subtitle D-permitted landfill. Excavation of the contaminated soil and disposal in a RCRA-permitted landfill would result in the removal of contaminated soil that is a potential source of cross-contamination to groundwater. The estimated volume of soil to be removed is approximately 9,000 cy and is based on the cleanup level in **Table 3-4**. The proposed excavation areas are shown on **Figure 5-1**. The approximate area that will be disturbed by the excavation activities is greater than 1 acre. The removal of soil contamination would be verified by collecting confirmation samples from the floors of the excavation area and submitting them for laboratory analysis for perchlorate. It is assumed that perimeter delineation samples may substitute for post-excavation wall samples. Clean borrow soil would be used to backfill the excavations, and the area would be graded for proper drainage.

With the removal of the contaminated soil at LHAAP-47, the potential migration of perchlorate from soil to groundwater would be eliminated and long-term operations for soil would not be required.

Semi-annual performance monitoring of Goose Prairie Creek will be conducted at LHAAP-50 after excavation of the contaminated perchlorate soil. It is expected that the LHAAP-50 excavation will occur prior to the excavation at LHAAP-47. The GPW-1 location will be sampled and a location upgradient of LHAAP-50 will be sampled. The LHAAP-50 upgradient location will be used to evaluate any contaminated runoff from LHAAP-47. Evaluation of this data will be included in the annual reports for LHAAP-50. 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 2 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.

5.2.2.2 In Situ Bioremediation

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-47 is impacted by VOCs (TCE, VC, 1,1-DCE, cis-1,2-DCE, and PCE) and perchlorate that exceed their respective cleanup levels in groundwater. Treatment under anaerobic conditions is often applied to these types of contaminants. TCE makes up most of the volume and risk from chemicals in the groundwater. Bioaugmentation at LHAAP-47 will be applied at target areas with high COC concentrations and will consist of injection of nutrients and microbial cultures.

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

- **Defining the target areas.** Additional sampling was conducted in 2010. Based on these sample results, VOC and perchlorate plumes were defined in multiple zones. Wells with VOCs >1,000 µg/L and perchlorate > 20,000 µg/L are expected to be the target areas. For cost estimating purposes, target areas are assumed around monitoring wells 47WW09, 47WW25, 47WW30, 47WW34, LHSMW43, and LHSMW56 for VOCs, and LHSMW60 for perchlorate. To define the target area for treatment, a direct push investigation would be performed. The purpose of this investigation is: 1) to better delineate the target area sand and silt intervals, 2) determine the concentration of VOCs and obtain geochemistry information prior to treatment, and 3) identify the treatment zone (horizontal and vertical). 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.

- **Direct injection bioremediation at hot spots.** 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), or wastes (food processing, manure). The COCs at LHAAP-47 can degrade under anaerobic conditions, but microorganisms, mechanisms, and redox requirements differ. Based on results of an initial study, appropriate nutrients and other materials would be injected into the subsurface. For this FS, it is assumed that bioaugmentation would be used at the site. This form of bioremediation combines the injection of microbial cultures (SDC-9) capable of degrading the contaminants with a carbon source (emulsified soybean oil [ESO]) to provide adequate conditions for the proliferation of the dechlorinating organisms. Injection points would be placed at each area using direct push technology and a spacing of 20 feet between points. It is anticipated that the material would be injected once, and that the injection would occur in the contaminated interval, at approximately 30 feet bgs. Near 47WW25 to support continued remediation in the target area or at additional locations, it is anticipated a second injection will be needed. For cost estimating purposes, it is estimated injection will take place at one target area in the first year (47WW25), and a second injection will be applied for one target area in year 3. The actual timing of the second injection may differ from this estimate to ensure the conditions in the aquifer are conducive for continued dechlorination of TCE.

- **Biobarriers.** Biobarriers will be used to prevent further migration and treat target areas with greater amounts of groundwater (47WW09, 47WW30, 47WW34, LHSMW43, LHSMW56, and LHSMW60). For the biobarrier, the carbon source chosen will have persistence, such as ESO, wood chips, or a proprietary mix, such as HRC by Regenesis. For cost estimating purposes, these biobarriers are assumed to be installed by direct injection of a carbon source and a microbial culture. The carbon source is assumed to be ESO, and the microbial culture is assumed to be SDC-9. The biobarriers are assumed to be of variable lengths, and will be installed as noted on

Figure 5-2 to address areas within the 1,000 μg/L contour lines (shown in **Figures 2-5** and **2-6**). Injection points are assumed to have a 20-foot spacing to ensure overlap of injected material. The biobarriers are assumed to be installed in the first year, then follow-up injections would be administered as necessary to ensure that the conditions conducive to reductive dechlorination are maintained. For cost estimating purposes, it is assumed biobarriers may be renewed at ten-year intervals.

- **Monitoring wells.** Current well locations are shown on **Figure 1-3**. The effectiveness of the treatment would be monitored using the monitoring wells at the target areas and appropriate peripheral locations to be determined in the Remedial Design phase. A total of 35 existing wells will be sampled for monitoring the plume, and 5 additional monitoring wells would be installed at appropriate locations and depths. Hypothetical locations for five new monitoring wells are indicated on **Figure 5-2**.

- **Sampling wells to monitor effectiveness.** Monitoring for contaminants would be performed to assess the effectiveness of the treatment. Sampling would be performed quarterly for 2 years. The following geochemical parameters would also be included in the analytical program, dissolved oxygen (field), redox potential (field), ferrous iron (field), sulfate, nitrate, nitrites, alkalinity, and total organic carbon (TOC) to assist in evaluating treatment effectiveness.

- **Long-term monitoring.** Long-term monitoring begins after the first 2 years of quarterly monitoring. The cost estimate assumes a total of 40 monitoring wells would be sampled, 35 existing, and 5 new. The analytical program would consist of perchlorate, and VOCs (chlorinated compounds and degradation products) with other COCs not sampled after 5 years. It is assumed that the analytical program would be reduced once it is determined that the in situ bioremediation was effective and continued attenuation is occurring.

- **Schedule.** The first year would involve DPT studies, pilot studies, installing monitoring wells and biobarriers, the first application of bioaugmentation to target areas, and beginning of quarterly sampling. The second year would involve quarterly sampling and an evaluation of remedy effectiveness. The third year for cost estimating purposes, it is assumed that a reapplication will be needed in two areas. Performance monitoring in the third year is assumed to be reduced to semiannually. Following years would involve continued groundwater monitoring and reapplication of biobarriers as needed.

- **Reporting.** Annual reports would be prepared to document the effectiveness of the treatment. The first year annual report would include a review of the four quarters of data and provide an evaluation of the effectiveness of the bioremediation alternative. Wells sampled, sampling frequency, reporting frequency, or analytical suite may be modified based on the results of the sampling program.

5.2.2.3 Groundwater Monitoring

Monitoring will be performed for 8 quarterly sampling events. Groundwater monitoring will be conducted for attenuation of VOCs, for SVOCs (pentachlorophenol and bis[2-ethylhexyl] phthalate), explosives (2,4,6-TNT), and several metals (both COCs and metals that may be mobilized by in situ enhanced bioremediation treatment). Except for perchlorate and VOCs, these contaminants do not have distinct plumes, approximately 40 wells will be sampled. The MNA analytical program will consist of VOCs, including chlorinated compounds and 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). After eight quarterly sampling events, the data will be evaluated.

5.2.2.4 Long-Term Operation

Long-term operations would include monitoring of groundwater at LHAAP-47 for a fixed period of time (assumed to be 30 years in the estimate) and renewal of biobarriers as needed. Long-term groundwater sampling would begin after the first 2 years of sampling and would be conducted semiannually for 3 years, then annually until the next five-year review, then once every 5 years if the data suggest less frequent sampling is appropriate. Monitoring would be required to demonstrate reduction in concentrations is occurring, as well as compliance with ARARs and the RAO. Sampling and analysis of groundwater would be performed at LHAAP-47 for perchlorate, VOCs, SVOCs, explosives, metals, and general chemistry parameters. For cost estimating purposes, it is assumed that after 5 years, samples will only need to be tested for VOCs and perchlorate. Data obtained during the monitoring program would be used in support of the five-year reviews required by CERCLA Section 121(c).

An evaluation of MNA performance and potential will be made after completion of quarterly sampling for eight events. The following criteria are among those which will be considered to determine whether MNA is the appropriate remedy to address groundwater contamination:

- Demonstrate that MNA is occurring according to the expectations
- Verify there is no unacceptable impact to downgradient receptors
- Verify the plume is not expanding
- Demonstrate the effectiveness of LUCs to protect the hypothetical future maintenance worker, and
- Verify attainment of RAOs.

This evaluation will provide the rationale for MNA as a remedial method, and whether additional in situ bioremediation is needed. For the purpose of estimating cost, it is assumed the evaluation will be favorable.

The location and number of monitoring wells would be reviewed. 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, repaired, or substituted as needed. The need for continuing the long-term monitoring at the location would be evaluated based on existing and expected future groundwater conditions. All water quality results, and the results of the review, would be provided in a monitoring report.

Reports will be prepared as needed to document the program but are assumed to be at least once every five years until cleanup levels are attained. Sampling frequency or analytical suite may be modified based on the results of the sampling program.

5.2.2.5 Surface Water Monitoring

Surface water monitoring in Goose Prairie Creek will be conducted for evaluation of the soil to surface water and groundwater to surface water pathways. Past surface water monitoring in Goose Prairie Creek was periodically performed to check for perchlorate, which is the primary contaminant in soil. Remediation of the perchlorate in soil near Building 25C will eliminate the possibility of contamination from the soil source, but perchlorate and VOC plumes in groundwater will still exist, and surface water monitoring will be continued to evaluate the groundwater to surface water pathway.

Surface water sampling will take place concurrently with groundwater sampling and samples will be collected from three locations in Goose Prairie Creek, one upgradient and two downgradient of LHAAP-47 at locations to be proposed in the Remedial Design. When possible, the samples from the periodic surface water sampling, or surface water samples collected for LHAAP-50 will be used instead of collecting redundant separate samples for LHAAP-47. Samples will be tested for perchlorate and VOCs. Data obtained will be used in support of the five-year reviews required by CERCLA Section 121(c). The need for continuing surface water monitoring, sampling locations and analytes would be evaluated based on the pattern of test results. All surface water quality results would be provided in the same monitoring report with the groundwater results.

5.2.2.6 Land Use Control

LUC would be implemented to prevent any use of groundwater (other than environmental monitoring and testing) in the shallow, shallow/intermediate, and intermediate groundwater zones. This restriction would need to remain in place until COCs attain cleanup levels.

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 (ECP) 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 5 years to document that the use of LHAAP-47 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 Alternative 3 – Excavation, Recirculating Bioremediation, MNA and LUC

The goals of this alternative are to prevent exposure of the hypothetical future maintenance worker to contaminated groundwater at LHAAP-47. Soil that has the potential to impact groundwater would be removed. The shallow zone, shallow/intermediate, and intermediate zone groundwater have contaminants above cleanup levels that would be reduced over time via recirculating bioremediation of the highest groundwater concentrations, in situ bioremediation at hot spots (in areas with insufficient water for recirculation), and MNA until contaminant concentrations are reduced over time to attain the cleanup levels. Surface water in Goose Prairie Creek would be monitored to evaluate the soil to surface water and groundwater to surface water pathways. LUC would be maintained to prevent use of groundwater, except for environmental monitoring and testing, until the cleanup levels are attained.

5.2.3.1 Excavation

The recommended removal action consists of excavation of the perchlorate-contaminated soil and off-site disposal at a RCRA Subtitle D-permitted landfill. Excavation of the contaminated soil and disposal in a RCRA-permitted landfill would result in the removal of contaminated soil that is a potential source of cross-contamination to groundwater. The estimated volume of soil to be removed is approximately 9,000 cy and is based on the cleanup level in **Table 3-4**. The proposed excavation areas are shown on **Figure 5-1**. The approximate area that will be disturbed by the excavation activities is greater than 1 acre. The removal of soil contamination would be verified by collecting confirmation samples from the floors of the excavation area and submitting them for laboratory analysis for perchlorate. It is assumed that perimeter delineation samples may substitute for post-excavation wall samples. Clean borrow soil would be used to backfill the excavations, and the area would be graded for proper drainage.

With the removal of the contaminated soil at LHAAP-47, the potential migration of perchlorate from soil to groundwater would be eliminated and long-term operations for soil would not be required.

Semi-annual performance monitoring of Goose Prairie Creek will be conducted at LHAAP-50 after excavation of the contaminated perchlorate soil. It is expected that the LHAAP-50 excavation will occur prior to the excavation at LHAAP-47. The GPW-1 location will be sampled and a location upgradient of LHAAP-50 will be sampled. The LHAAP-50 upgradient location will be used to evaluate any contaminated runoff from LHAAP-47. Evaluation of this data will be included in the annual reports for LHAAP-50. 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 2 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.

5.2.3.2 Bioremediation

Recirculating bioremediation is a technology that encourages growth and reproduction of indigenous microorganisms to enhance biodegradation of organic constituents in the saturated zone. Recirculation enhances bioremediation by increasing mixing and improving contact between contaminants and injected bioremediation substrates and microbes. The microbiological processes are used to degrade or transform contaminants to ultimately less toxic or nontoxic forms. Groundwater at LHAAP-47 is impacted by VOCs (TCE, VC, 1,1-DCE, cis-1,2-DCE, and PCE) and perchlorate that exceed their respective cleanup levels in groundwater. Treatment under anaerobic conditions is often applied to these types of contaminants. TCE makes up most of the volume and risk from chemicals in the groundwater. Recirculating bioaugmentation at LHAAP-47 will be applied in areas with high COC concentrations that have enough water to extract groundwater downgradient, add microbes and a carbon source, then reinject the amended groundwater through wells upgradient of the area. This process will spread the bioremediation treatment across the area as water is drawn from injection wells toward extraction wells.

In general, the components of the recirculating bioremediation action include:

- **Defining the target areas.** Wells with VOCs >1,000 μg/L and perchlorate > 20,000 μg/L are expected to be the target areas. For recirculation to be effective, there must be groundwater available in sufficient amounts for the extraction wells to pump out. The recent groundwater elevations recorded at LHAAP-47 indicate that target areas around monitoring wells 47WW09, 47WW30, 47WW34, and LHSMW60 have sufficient groundwater, and recirculation could be readily established. At potential target areas with insufficient groundwater, direct injection bioremediation would be applied instead. For cost estimating purposes, recirculation systems are expected at four target areas around 47WW09, 47WW30, 47WW34 and LHSMW60. Direct injection bioremediation is expected at two target areas around 47WW25 and LHSMW56. To define the target area for treatment, a direct push investigation would be performed. The purpose of this investigation is: 1) to better delineate the target area sand and silt intervals, 2) determine the concentration of VOCs and obtain geochemistry information prior to treatment, and 3) identify the treatment zone (areal and vertical). 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.

- **Recirculating bioremediation.** 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), or wastes (food processing, manure). The COCs at LHAAP-47 can degrade under anaerobic conditions, but microorganisms, mechanisms, and redox requirements differ. Based on results of an initial study, appropriate nutrients and other materials would be introduced. For this FS, it is assumed that bioaugmentation would be used at the site. This form of bioremediation combines 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 extraction wells and injection wells will be used to establish recirculation zones at four target areas around 47WW09, 47WW30, 47WW34, and LHSMW60. Lactate and SDC-9 will be used in the recirculation systems (see **Figure 5-3**).

- **Direct injection bioremediation at hot spots.** For this FS, it is assumed that direct injection bioremediation would be used at the site. This form of bioremediation combines the injection of SDC-9 with a carbon source ESO to provide adequate conditions for the proliferation of the dechlorinating organisms. Injection points would be placed at each area using direct push technology and a spacing of 20 feet between points. It is anticipated that the material would be injected once, and that the injection would occur in the contaminated interval, at approximately 30 feet bgs. Additional injections would be applied as necessary to support continued remediation in the target areas or at additional locations. For cost estimating purposes, it is estimated injection will take place at two target areas in the first year (47WW25 and LHSMW56), and additional injections may be applied for two target areas in year 3 to treat additional areas or re-administer treatment where it has not succeeded.

- **Monitoring wells.** Current well locations are shown on **Figure 1-3**. The effectiveness of the treatment would be monitored using the monitoring wells at the target areas and appropriate peripheral locations to be determined in the Remedial Design phase. A total of 35 existing wells will be sampled for monitoring the plume, and 5 additional monitoring wells would be installed at appropriate locations and depths. Hypothetical locations for five new monitoring wells are indicated on **Figure 5-3**.

- **Sampling wells to monitor effectiveness.** Monitoring for contaminants would be performed to assess the effectiveness of the treatment. Sampling would be performed quarterly for 2 years. The following geochemical parameters would also be included in the analytical program, dissolved oxygen (field), redox potential (field), ferrous iron (field), sulfate, nitrate, nitrites, alkalinity, and TOC to assist in evaluating treatment effectiveness.

- **Long-term monitoring.** Long-term monitoring begins after the first 2 years of quarterly monitoring. The cost estimate assumes a total of 40 monitoring wells would be sampled, 35 existing, and 5 new. The analytical program would consist of perchlorate and VOCs (chlorinated compounds and degradation products) with other COCs not sampled after 5 years. It is assumed that the analytical program would be reduced once it is determined that the in situ bioremediation was effective and continued attenuation is occurring.

- **Schedule.** The first year would involve DPT studies, pilot studies, installing monitoring wells, injection wells, and extraction wells, beginning recirculation in the target areas with sufficient groundwater, direct injection bioremediation, and beginning of quarterly monitoring. The second year would involve evaluation of remedy effectiveness, ending of recirculation in areas with sufficient groundwater and continuation of quarterly monitoring. For cost estimating purposes, it is assumed that in the third year reapplication of direct injection bioremediation would be applied in two areas, MNA would be evaluated, and performance monitoring is assumed to be reduced to semiannually. Monitoring would continue in following years.

- **Reporting.** Annual reports would be prepared to document the effectiveness of the treatment. The first year annual report would include a review of the four quarters of data and provide an evaluation of the effectiveness of the bioremediation alternative. Wells sampled, sampling frequency, reporting frequency, or analytical suite may be modified based on the results of the sampling program.

5.2.3.3 Groundwater Monitoring

Monitoring will be performed for 8 quarterly sampling events. Groundwater monitoring will be conducted for attenuation of VOCs, for SVOCs (pentachlorophenol and bis[2-ethylhexyl] phthalate), explosives (2,4,6-TNT), and several metals (both COCs and metals that may be mobilized by in situ enhanced bioremediation treatment). Except for perchlorate and VOCs, these contaminants do not have distinct plumes, approximately 40 wells will be sampled. The MNA analytical program will consist of VOCs, including chlorinated compounds and 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). After eight quarterly sampling events, the data will be evaluated.

5.2.3.4 Long-Term Operation

Long-term operations would include operating the recirculating in situ enhanced bioremediation areas during the first five years, and monitoring of groundwater at LHAAP-47 for a fixed period of time (assumed to be 30 years in the estimate).

Operation and maintenance of the recirculating in situ enhanced bioremediation areas will include periodic inspections of the system for leaks from pipelines, tanks, pumps, or equipment. Only limited maintenance is expected to be necessary for the recirculation equipment as the operational phase is expected to last fewer than five years. The recirculating in situ enhanced bioremediation systems will need to be decommissioned at the end of treatment, which, for cost estimating purposes, is expected sometime in the fifth year after beginning of remediation.

Long-term groundwater sampling would begin after the first 2 years of sampling and would be conducted semiannually for 3 years, then annually until the next five-year review, then once every 5 years if the data suggest less frequent sampling is appropriate. Monitoring would be required to demonstrate reduction in concentrations is occurring, as well as compliance with ARARs and the RAO. Sampling and analysis of groundwater would be performed at LHAAP-47 for perchlorate, VOCs, SVOCs, explosives, metals, and general chemistry parameters. For cost estimating purposes, it is assumed that after 5 years, samples will only need to be tested for VOCs and perchlorate. Data obtained during the monitoring program would be used in support of the five-year reviews required by CERCLA Section 121(c).

An evaluation of MNA performance and potential will be made after completion of quarterly sampling for eight events. The following criteria are among those which will be considered to determine whether MNA is the appropriate remedy to address groundwater contamination:

- Demonstrate that MNA is occurring according to the expectations
- Verify there is no unacceptable impact to downgradient receptors
- Verify the plume is not expanding
- Demonstrate the effectiveness of LUCs to protect the hypothetical future maintenance worker, and
- Verify attainment of RAOs.

This evaluation will provide the rationale for MNA as a remedial method, and whether additional in situ bioremediation is needed. For the purpose of estimating cost, it is assumed the evaluation will be favorable.

The location and number of monitoring wells would be reviewed. 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, repaired, or substituted as needed. The need for continuing the long-term monitoring at the location would be evaluated based on existing and expected future groundwater conditions. All water quality results, and the results of the review, would be provided in a monitoring report.

Reports will be prepared as needed to document the program but are assumed to be at least once every five years until cleanup levels are attained. Sampling frequency or analytical suite may be modified based on the results of the sampling program.

5.2.3.5 Surface Water Monitoring

Surface water monitoring in Goose Prairie Creek will be conducted for evaluation of the soil to surface water and groundwater to surface water pathways. Past surface water monitoring in Goose Prairie Creek was periodically performed to check for perchlorate, which is the primary contaminant in soil. Remediation of the perchlorate in soil near Building 25C will eliminate the possibility of contamination from the soil source, but perchlorate and VOC plumes in groundwater will still exist, and surface water monitoring will be continued to evaluate the groundwater to surface water pathway.

Surface water sampling will take place concurrently with groundwater sampling and samples will be collected from three locations in Goose Prairie Creek, one upgradient and two downgradient of LHAAP-47 at locations to be proposed in the Remedial Design. When possible, the samples from the periodic surface water sampling, or surface water samples collected for LHAAP-50 will be used instead of collecting redundant separate samples for LHAAP-47. Samples will be tested for perchlorate and VOCs. Data obtained will be used in support of the five-year reviews required by CERCLA Section 121(c). The need for continuing surface water monitoring, sampling locations and analytes would be evaluated based on the pattern of test results. All surface water quality results would be provided in the same monitoring report with the groundwater results.

5.2.3.6 Land Use Control

LUC would be implemented to prevent any use of groundwater (other than environmental monitoring and testing) in the shallow, shallow/intermediate, and intermediate groundwater zones. This restriction would need to remain in place until COCs attain cleanup levels.

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 ECP 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 5 years to document that the use of LHAAP-47 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.

5.2.4 Alternative 4 – Excavation, Pump and Treat, In Situ Bioremediation, MNA, and LUC

The goals of this alternative are to prevent exposure of the hypothetical future maintenance worker to contaminated soil and groundwater at LHAAP-47. Soil that has the potential to impact groundwater would be removed. The shallow, shallow/intermediate, and intermediate groundwater zones have contaminants above cleanup levels that would be reduced over time via a pump and treat system targeting the highest groundwater concentrations and MNA for areas outside the pump and treat areas until contaminant concentrations attain cleanup levels. Areas around wells with high COC concentrations, but insufficient water for pumping will be regarded as hot spots and treated by in situ bioremediation. Surface water in Goose Prairie Creek would be monitored to evaluate the soil to surface water and groundwater to surface water pathways. LUC would be maintained to prevent use of groundwater, except for environmental monitoring and testing until the cleanup levels are attained.

5.2.4.1 Excavation

The recommended removal action consists of excavation of the perchlorate-contaminated soil and off-site disposal at a RCRA Subtitle D-permitted landfill. Excavation of the contaminated soil and disposal in a RCRA-permitted landfill would result in the removal of contaminated soil that is a potential source of cross-contamination to groundwater. The estimated volume of soil to be removed is approximately 9,000 cy and is based on the cleanup level in **Table 3-4**. The proposed excavation areas are shown on **Figure 5-1**. The approximate area that will be disturbed by the excavation activities is greater than 1 acre. The removal of soil contamination would be verified by collecting confirmation samples from the floors of the excavation area and submitting them for laboratory analysis for perchlorate. It is assumed that perimeter delineation samples may substitute for post-excavation wall samples. Clean borrow soil would be used to backfill the excavations, and the area would be graded for proper drainage.

With the removal of the contaminated soil at LHAAP-47, the potential migration of perchlorate from soil to groundwater would be eliminated and long-term operations for soil would not be required.

Semi-annual performance monitoring of Goose Prairie Creek will be conducted at LHAAP-50 after excavation of the contaminated perchlorate soil. It is expected that the LHAAP-50 excavation will occur prior to the excavation at LHAAP-47. The GPW-1 location will be sampled and a location upgradient of LHAAP-50 will be sampled. The LHAAP-50 upgradient location will be used to evaluate any contaminated runoff from LHAAP-47. Evaluation of this data will be included in the annual reports for LHAAP-50. 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 2 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.

5.2.4.2 Pump and Treat

Pump and treat is a technology that extracts contaminated groundwater and sends it through a treatment process to remove or neutralize the contaminants. Groundwater at LHAAP-47 is impacted by VOCs (TCE, VC,1,1-DCE, cis-1,2-DCE, and PCE) and perchlorate that exceed their respective cleanup levels in groundwater. TCE makes up most of the volume and risk from chemicals in the groundwater. Pump and treat at LHAAP-47 will consist of extraction wells at target areas with high COC concentrations and sufficient water available for pumping. Extracted groundwater will be transported to the existing groundwater treatment plant (GWTP) at Burning Ground No. 3. Treatment under anaerobic conditions is often applied to these types of contaminants, and will also be used in areas outside the influence of the pump and treat remedy and where there is not enough water to implement pump and treat.

In general, the components of the pump and treat action include:

- **Defining the target area.** Monitoring wells 47WW25 (13,300 µg/L) and LHSMW43 (6,240 µg/L) have the highest recent TCE concentrations, but very little groundwater available to extract. The wells with significant TCE concentrations and sufficient depth of water to extract are 47WW09, 47WW30, 47WW34, LHSMW45 and LHSMW54. Monitoring well LHSMW60 has no TCE, but contains the highest perchlorate concentration at the site (56,600 µg/L). Nearby intermediate monitoring well 47WW38 has the second highest perchlorate levels (4,110 µg/L). To better define the target areas for extraction, pump tests would be performed on existing wells. The purpose of the pump tests is: 1) to better define expected groundwater production rates; and 2) to determine whether a new extraction well is required or whether an existing monitoring well may be converted for extraction.
- **Direct injection bioremediation at hot spots.** 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), or wastes (food processing, manure). The COCs at LHAAP-47 can degrade under anaerobic conditions, but microorganisms, mechanisms, and redox requirements differ. Based on results of an initial study, appropriate nutrients and other materials would be injected into the subsurface. For this FS, it is assumed that bioaugmentation would be used at the site. This form of bioremediation combines the injection of SDC-9 with a carbon source ESO to provide adequate conditions for the proliferation of the dechlorinating organisms. Injection points would be placed at each area using direct push technology and a spacing of 20 feet between points. It is anticipated that the material would be injected once, and that the injection would occur in the contaminated interval, at approximately 30 feet bgs. Additional injections would be applied as necessary to support continued remediation in the target areas or at additional locations. For cost estimating

purposes, it is estimated injection will take place at three target areas in the first year (47WW25, LHSMW43, and LHSMW56), and additional injections may be applied for two target areas in year 3 to treat additional areas or re-administer treatment where it has not succeeded.

- **Installing wells for groundwater extraction.** Extraction wells would be installed near target areas and pumps would be placed in the wells and hooked to a control system allowing remote operation and status checks. Extracted groundwater would be piped to a local collection tank, and periodically pumped to the existing GWTP through a newly constructed pipeline. The collection piping and pipeline to the existing GWTP would be constructed as double walled piping and the collection tank would be provided with a secondary containment dike to prevent spills of contaminated water. **Figure 5-4** shows seven potential extraction well locations.

- **Upgrades to existing GWTP.** The existing GWTP operating throughput is currently most limited by the rate of treatment for perchlorate. Because perchlorate is one of the COCs from LHAAP-47, an upgrade to the existing GWTP would be needed to increase the rate of perchlorate treatment. Installing a second perchlorate treatment train at the existing GWTP would fulfill this requirement and add some operational flexibility to the plant.

- **Monitoring wells.** Current well locations are shown on **Figure 1-3**. The effectiveness of the treatment would be monitored using the monitoring wells at the target areas and appropriate peripheral locations to be determined in the Remedial Design phase. A total of 35 existing wells will be sampled for monitoring the plume, and 5 additional monitoring wells would be installed at appropriate locations and depths. Hypothetical locations for five additional monitoring wells are shown on **Figure 5-4**.

- **Sampling wells to monitor effectiveness.** Monitoring for contaminants would be performed to assess the effectiveness of the treatment. Sampling would be performed quarterly for 2 years. The following geochemical parameters would also be included in the analytical program, dissolved oxygen (field), redox potential (field), ferrous iron (field), sulfate, nitrate, nitrites, alkalinity, and TOC to assist in evaluating treatment effectiveness.

- **Long-term monitoring.** Long-term monitoring begins after the first 2 years of quarterly monitoring. The cost estimate assumes a total of 40 monitoring wells would be sampled, 35 existing, and 5 new. The analytical program would consist of perchlorate and VOCs (chlorinated compounds and degradation products) with other COCs not sampled after 5 years. It is assumed that the analytical program would be reduced once it is determined that the in situ bioremediation was effective and continued attenuation is occurring.

- **Schedule.** The first year would involve quarterly sampling for baseline concentrations, direct injection bioremediation, pump testing, installation of monitoring wells, extraction wells and piping, and upgrades to the existing GWTP. The second year would involve beginning groundwater extraction and transport to the

GWTP, along with continued quarterly monitoring. The third year involves possible reapplication of direct injection bioremediation, continued groundwater extraction and transport to the GWTP, evaluation of MNA, and continued groundwater monitoring. Following years would continue groundwater extraction, transport, and monitoring.

- **Reporting.** Annual reports would be prepared to document the effectiveness of the pump and treat system. The first year annual report would include a review of the baseline data, any quarterly data, and provide an evaluation of the effectiveness of the pump and treat system. Volumes extracted, contaminant mass removed, wells sampled, sampling frequency, reporting frequency, or analytical suite may be modified based on the results of the sampling program.

5.2.4.3 Groundwater Monitoring

Monitoring will be performed for 8 quarterly sampling events. Groundwater monitoring will be conducted for attenuation of VOCs, for SVOCs (pentachlorophenol and bis[2-ethylhexyl] phthalate), explosives (2,4,6-TNT), and several metals (both COCs and metals that may be mobilized by in situ enhanced bioremediation treatment). Except for perchlorate and VOCs, these contaminants do not have distinct plumes, approximately 40 wells will be sampled. The MNA analytical program will consist of VOCs, including chlorinated compounds and 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). After eight quarterly sampling events, the data will be evaluated.

5.2.4.4 Long-Term Operation

Long-term operations would include monitoring of groundwater and operation and maintenance of the pump and treat system.

Long-term groundwater sampling would begin after the first 2 years of quarterly sampling and would be conducted semiannually for 3 years, then annually until the next five-year review, then once every 5 years if the data suggest less frequent sampling is appropriate. Monitoring at LHAAP-47 is assumed to be for 30 years in the estimate. Sampling and analysis of groundwater would be performed at LHAAP-47 for perchlorate, VOCs, SVOCs, metals, explosives, and general chemistry parameters.

Monitoring would be required to demonstrate reduction in concentrations is occurring, as well as compliance with ARARs and the RAO. For cost estimating purposes, it is assumed that after 5 years, samples will only need to be tested for VOCs and perchlorate. Data obtained during the monitoring program would be used in support of the five-year reviews required by CERCLA Section 121(c).

An evaluation of MNA performance and potential will be made after completion of quarterly sampling for eight events. The following criteria are among those which will be considered to determine whether MNA is the appropriate remedy to address groundwater contamination:

- Demonstrate that MNA is occurring according to the expectations
- Verify there is no unacceptable impact to downgradient receptors
- Verify the plume is not expanding
- Demonstrate the effectiveness of LUCs to protect the hypothetical future maintenance worker, and
- Verify attainment of RAOs.

This evaluation will provide the rationale for MNA as a remedial method, and whether additional in situ bioremediation is needed. For the purpose of estimating cost, it is assumed the evaluation will be favorable.

The location and number of monitoring wells would be reviewed. 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 repaired, or substituted as needed. The need for continuing the long-term monitoring at the location would be evaluated based on existing and expected future groundwater conditions. All water quality results, and the results of the review, would be provided in a monitoring report.

Reports will be prepared as needed to document the program, but are assumed to be at least one every five years until cleanup levels are attained. Sampling frequency or analytical suite may be modified based on the results of the sampling program.

Operation and maintenance of the pump and treat system will include periodic inspections of the system for leaks from pipelines, tanks, or treatment train. Maintenance for pumps and equipment is assumed to take place at 10-year intervals for costing purposes. Ultimately the pump and treat system will need to be decommissioned, but it is estimated it will be beyond the 30-year period that is estimated.

5.2.4.5 Surface Water Monitoring

Surface water monitoring in Goose Prairie Creek will be conducted for evaluation of the soil to surface water and groundwater to surface water pathways. Past surface water monitoring in Goose Prairie Creek was periodically performed to check for perchlorate, which is the primary contaminant in soil. Remediation of the perchlorate in soil near Building 25C will eliminate the possibility of contamination from the soil source, but perchlorate and VOC plumes in groundwater will still exist, and surface water monitoring will be continued to evaluate the groundwater to surface water pathway.

Surface water sampling will take place concurrently with groundwater sampling and samples will be collected from three locations in Goose Prairie Creek, one upgradient and two downgradient of LHAAP-47 at locations to be proposed in the Remedial Design. When possible, the samples from the periodic surface water sampling, or surface water samples collected for LHAAP-50 will be used instead of collecting redundant separate samples for LHAAP-47. Samples will be tested for perchlorate and VOCs. Data obtained will be used in support of the five-year reviews required by CERCLA Section 121(c). The need for continuing surface water monitoring, sampling locations and analytes would be evaluated based on the pattern of test results. All surface water quality results would be provided in the same monitoring report with the groundwater results.

5.2.4.6 Land Use Control

LUC would be implemented to prevent any use of groundwater (other than environmental monitoring and testing) in the shallow, shallow/intermediate, and intermediate groundwater zones. This restriction would need to remain in place until COCs attain cleanup levels.

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 ECP 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 5 years to document that the use of LHAAP-47 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.

Table 5-1
Alternative Development

Contaminated Media	Process Option	Selected for Alternative Grouping			
		1 (No Action)	2	3	4
Solids Soil	Excavate media above cleanup levels, off-site disposal		✔	✔	✔
Groundwater	MNA, LUC until cleanup levels achieved		✔	✔	✔
	In situ bioremediation		✔	✔	✔
	Permeable reactive barrier (biobarriers)		✔	✔	
	Groundwater extraction			✔	✔
	Ex situ treatment				✔
	Groundwater recirculation (combination of groundwater extraction and in situ bioremediation)			✔	

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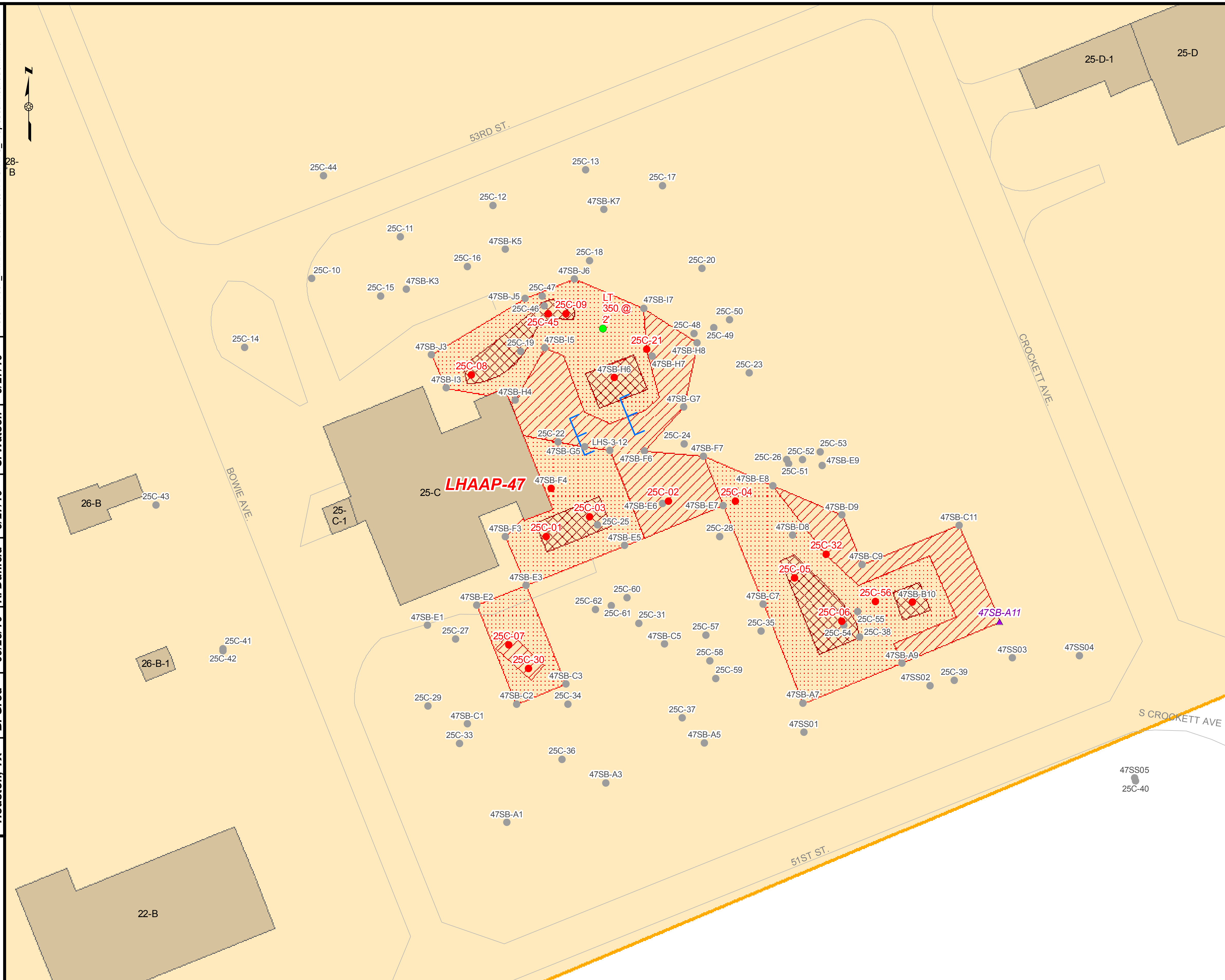

LEGEND

- Proposed Sample Location
- Perchlorate Sample Location above 7.2 mg/kg
- Perchlorate Sample Location
- Road

Proposed Excavation Area

- Slope or Step
- 4'
- 12'
- Building or Concrete Slab
- Site

Notes:

1. LT: Lyntech sampled 5 individual samples within a span of 35 feet.
2. Perchlorate concentrations are in milligrams per kilogram (mg/kg).
3. 25C series soil boring locations were placed at locations provided by Cliff Murray.
4. Excavation side slopes 1.5 to 10.

0 25 50 100 Feet

Shaw

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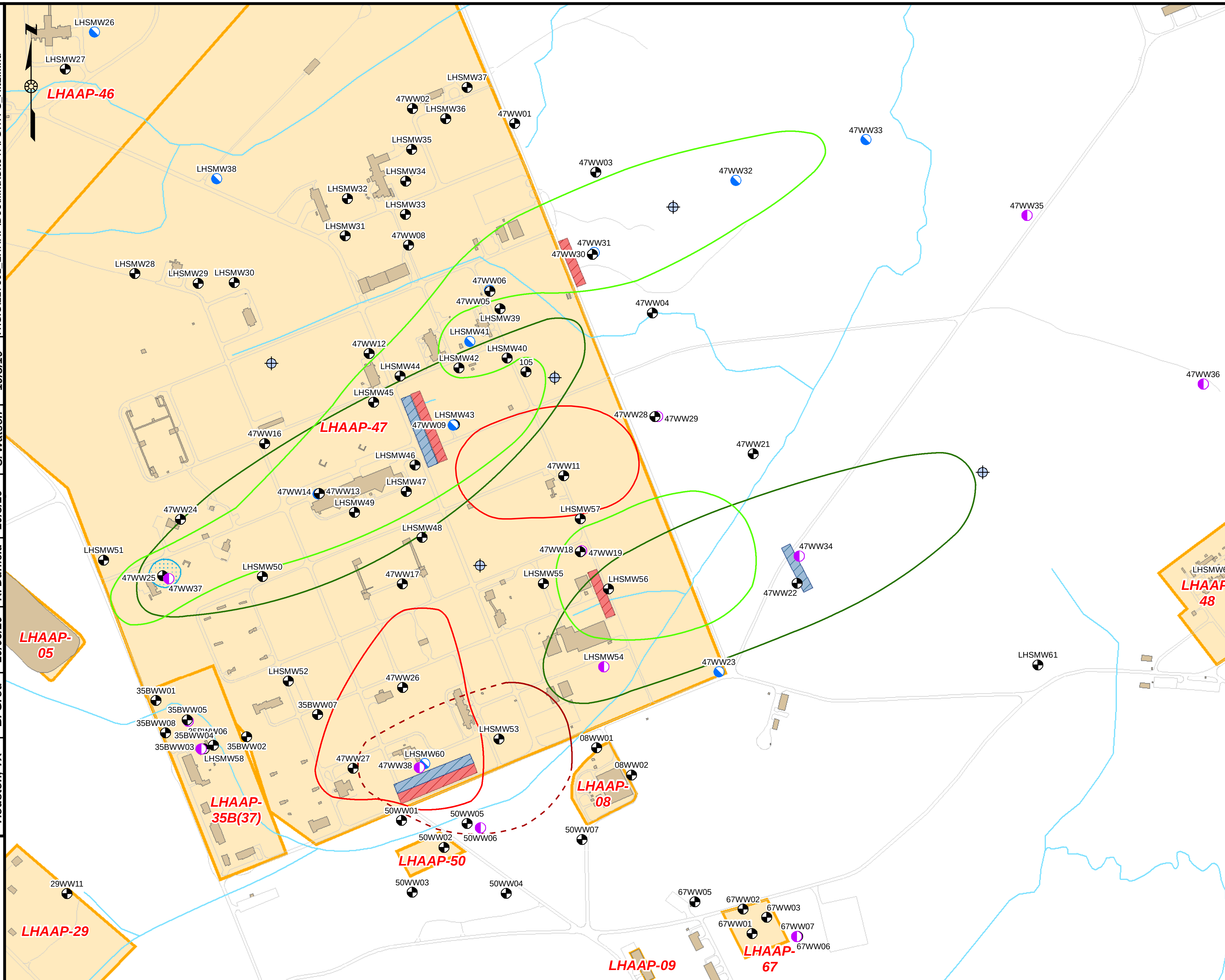
TULSA, OKLAHOMA

FIGURE 5-1

PROPOSED SOIL EXCAVATION AREA
LHAAP-47 FEASIBILITY STUDY

LONGHORN ARMY AMMUNITION PLANT
KARNACK, TEXAS



LEGEND

- Shallow Monitoring Well
- Shallow/Intermediate Monitoring Well
- Intermediate Monitoring Well
- Hypothetical New Monitoring Well
- Hot Spot DPT Grid ISEB
- ISEB Biobarrier Intermediate
- ISEB Biobarrier Shallow

Perchlorate Exceeding GW-Ind (72 µg/L)

- Shallow Zone
- Intermediate Zone

TCE Exceeding MCL (5 µg/L)

- Shallow Zone
- Intermediate Zone
- Stream
- Road
- Former Building or Concrete Slab
- Site

NOTES:

1. TCE - trichloroethene
2. PCE - tetrachloroethene
3. MCL - maximum contaminant level
4. Results reported in micrograms per liter (µg/L).
5. Most recent results are shown (1998 - 2010).
6. All PCE results that exceed MCL, are within the TCE area.
7. Plumes shown are in the interconnected shallow/intermediate zones and use the combined well data of both zones.
8. Biobarriers tied to 500 µg/L TCE.

0 300 600 1,200
Feet

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TULSA, OKLAHOMA

FIGURE 5-2
ALTERNATIVE 2
EXCAVATION, IN SITU BIOREMEDIATION, MNA, AND LUC
LHAAP-47 FEASIBILITY STUDY
LONGHORN ARMY AMMUNITION PLANT
KARNACK, TEXAS

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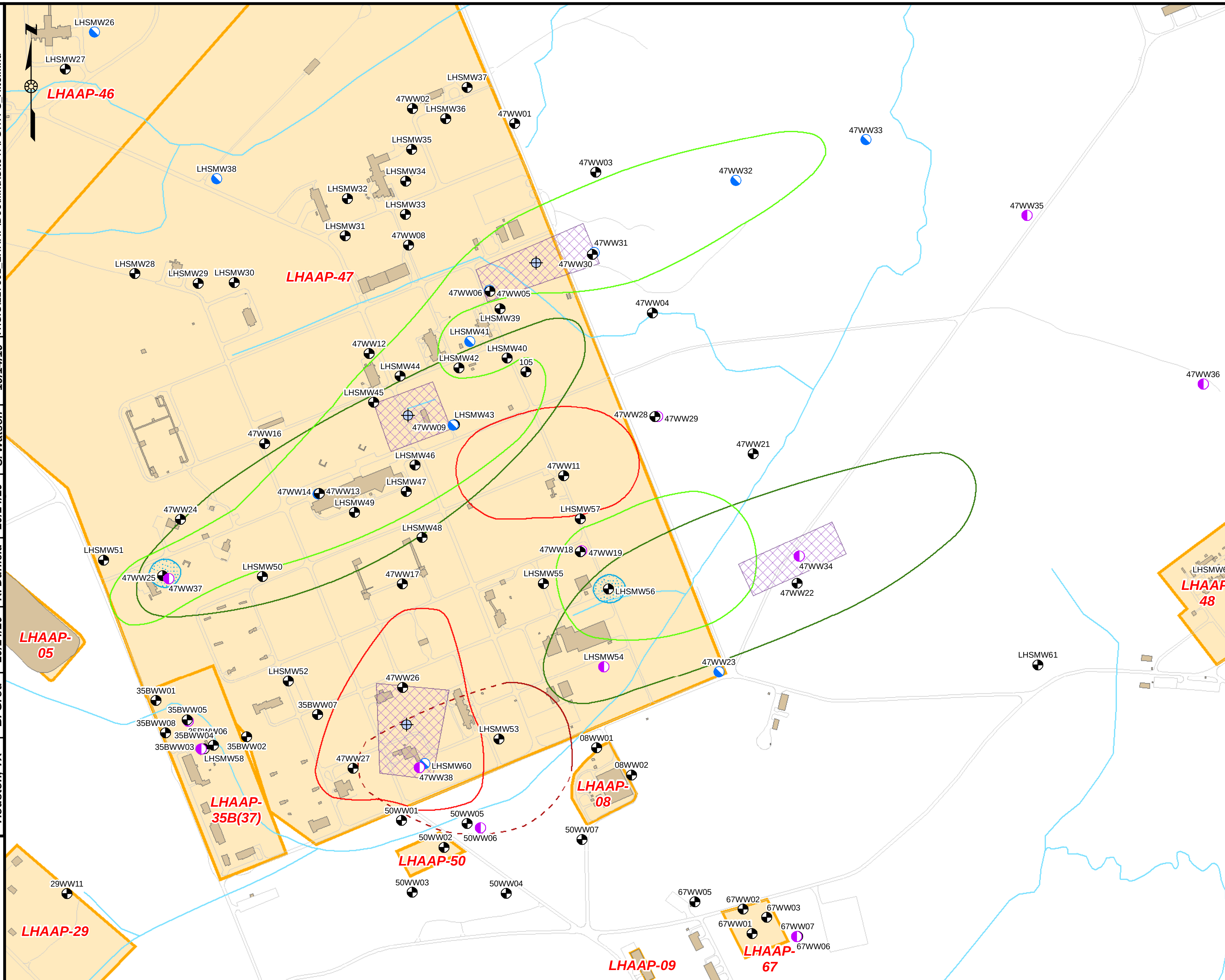

LEGEND

- Shallow Monitoring Well
- Shallow/Intermediate Monitoring Well
- Intermediate Monitoring Well
- Hypothetical New Monitoring Well
- Hot Spot DPT Grid ISEB
- ISEB Recirculation Zone

Perchlorate Exceeding GW-Ind (72 µg/L)

- Shallow Zone
- Intermediate Zone

TCE Exceeding MCL (5 µg/L)

- Shallow Zone
- Intermediate Zone
- Stream
- Road
- Former Building or Concrete Slab
- Site

NOTES:

1. TCE - trichloroethene
2. PCE - tetrachloroethene
3. MCL - maximum contaminant level
4. Results reported in micrograms per liter (µg/L).
5. Most recent results are shown (1998 - 2010).
6. All PCE results that exceed MCL, are within the TCE area.
7. Plumes shown are in the interconnected shallow/intermediate zones and use the combined well data of both zones.

0 300 600 1,200 Feet

Shaw

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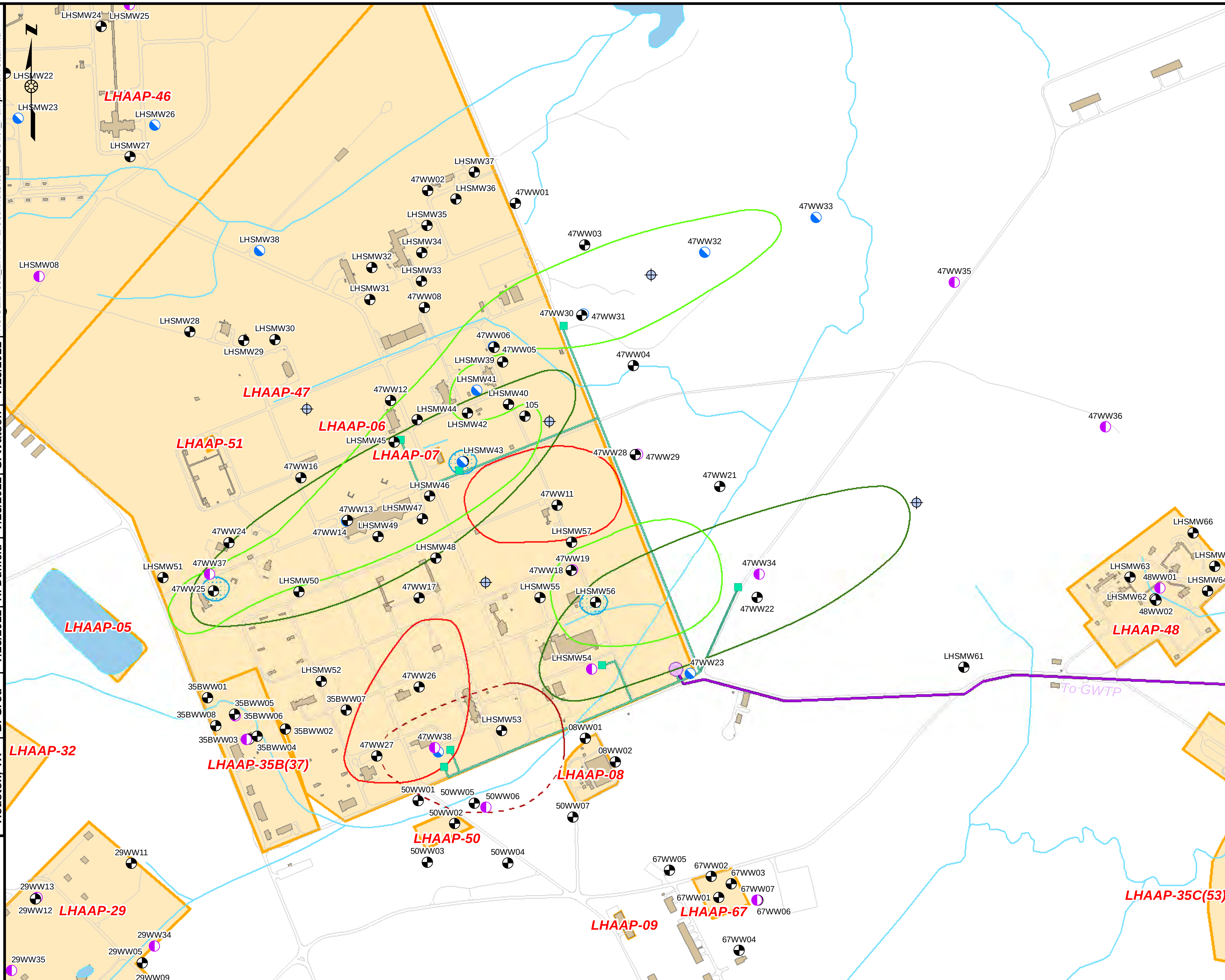
TULSA, OKLAHOMA

FIGURE 5-3
ALTERNATIVE 3
EXCAVATION, RECIRCULATING BIOREMEDIATION, MNA, AND LUC
LHAAP-47 FEASIBILITY STUDY
LONGHORN ARMY AMMUNITION PLANT
KARNACK, TEXAS



LEGEND

- Shallow Monitoring Well
- Shallow/Intermediate Monitoring Well
- Intermediate Monitoring Well
- Extraction Wells
- Hypothetical New Monitoring Well
- Hot Spot DPT Grid ISEB

TCE Exceeding MCL (5 µg/L)

- Shallow Zone
- Intermediate Zone

Perchlorate Exceeding GW-Ind (72 µg/L)

- Shallow Zone
- Intermediate Zone
- Collection Piping
- Transfer Piping
- Storage Tank
- Stream
- Road
- Former Building or Concrete Slab
- Site

0 350 700 1,400 Feet

Shaw

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TULSA, OKLAHOMA

FIGURE 5-4
ALTERNATIVE 4 -
EXCAVATION, PUMP AND TREAT,
IN SITU BIOREMEDIATION, MNA, AND LUC
LHAAP-47 FEASIBILITY STUDY
LONGHORN ARMY AMMUNITION PLANT
KARNACK, TEXAS

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6.0 Detailed Analysis of Alternatives

6.1 Introduction

This section 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 analyses, 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 evaluate each alternative with regard to 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 RAOs 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 LUC. 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 COCs. 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 RAOs are 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. LUC 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 RAOs are 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 remedial activities.

Potential short-term risks to the public 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 nonremediation worker exposures to airborne contaminants during waste and soil removal operations. Alternative analyses also include a description of mitigating measures such as engineering and LUC 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 TSD 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 2.8 percent and a base O&M and monitoring period of up to 30 years, unless the alternative evaluated is expected to be complete in less than 30 years.

Appendix D presents detailed cost estimates 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 PP 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 PP is issued for public comment. Therefore, this criterion is not considered in this FS.

6.3 Individual Analysis of Alternatives for Groundwater

6.3.1 Alternative 1 – No Action

Under the no action alternative, no further action will be taken at LHAAP-47 to control human exposure to contaminated groundwater or to monitor potential groundwater impacts to surface water. The contaminated soil and groundwater will remain in place without the implementation of any contaminant removal, treatment, or containment. The LUC to prevent access to the sites will not be established or will be discontinued. No environmental monitoring will occur. It is assumed that the public and ecological receptors could access the waste. 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 RAOs for LHAAP-47. This alternative provides no control of exposure to the contaminated soil and groundwater and no reduction in the risks to human and ecological receptors for current and future land use scenarios. Risks to receptors will exceed the USEPA-established threshold for acceptable incremental lifetime cancer risk of 1×10^{-4} for carcinogens or an HI of 1 for noncarcinogens from ingestion of groundwater. The contaminants causing the greatest amount of risk are perchlorate in the shallow and VOCs in the interconnected shallow/intermediate groundwater zones. Unacceptable risks to the environment were not determined to be associated with LHAAP-47 (part of the industrial sub area) in the Baseline Ecological Risk Assessment (Shaw, 2007a).

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 will not be met. Since no remedial activities will be conducted, action-specific and location-specific ARARs will not apply.

6.3.1.3 Long-Term Effectiveness and Permanence

6.3.1.3.1 Magnitude of Residual Risk

The no action alternative will not provide an effective or permanent long-term solution. Soil exposure routes generated a carcinogenic risk of 1.8×10^{-5} and an HI of 0.46 for the hypothetical future maintenance worker. These risks and hazards from soil are acceptable. However, the soil may be a potential source for the perchlorate contamination in groundwater, and the no action alternative would not reduce the soil to groundwater pathway for perchlorate. The residual risk and toxicity from groundwater exposure under a no action alternative will be unacceptable at LHAAP-47. For the hypothetical future maintenance worker, groundwater exposure routes account for over 99 percent of the overall carcinogenic and non-carcinogenic risks, generating a carcinogenic risk of 7.1×10^{-3} and an HI of 1,100. These risks were conservatively calculated for a hypothetical future maintenance worker ingesting the groundwater. Currently, the groundwater at LHAAP-47 is not used for drinking water, and is not anticipated to be used for drinking water under a wildlife refuge future use scenario. Based on the groundwater flow and transport model (Shaw, 2007c) groundwater will not adversely impact Goose Prairie Creek. Ongoing quarterly surface water sampling in Goose Prairie Creek serves to check this determination.

6.3.1.3.2 Adequacy and Reliability of Controls

The no action alternative will not establish or maintain any LUC at LHAAP-47 and, therefore, will not reduce the existing site risks posed by contaminated 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 will 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 will be taken; therefore, the short-term effectiveness criterion is not applicable to this alternative. The no action alternative will not cause any added short-term risks to remediation workers, the community or the environment.

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, In Situ Bioremediation, MNA, and LUC

This alternative reduces soil contamination by excavation of soil with high concentrations of perchlorate near Building 25C. The highest concentrations in the groundwater plume will be remediated by in situ bioremediation using bioaugmentation in target areas and biobarriers. Groundwater monitoring and long-term LUC will be maintained until COC cleanup levels are attained. It is estimated that cleanup levels in the groundwater would be achieved in 30 years in the treatment areas; however, it will take approximately 100 additional years for the balance of the plume to attain cleanup levels. This is purely an estimate since the hydrogeologic conditions and bioremediation effectiveness have not been fully defined. These actions would reduce COC concentrations in the groundwater to the cleanup levels throughout the site, provided bioremediation results are favorable. Areas with lower concentrations will be addressed through MNA. If MNA is not found to be effective in these areas, a contingency remedy may be implemented. The components of the contingency remedy will be determined based on the aquifer condition at that time and will be comprised of the process options retained as appropriate to satisfy the RAOs.

6.3.2.1 Overall Protection of Human Health and the Environment

6.3.2.1.1 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 soil remedial action proposed for this alternative would remove a source of potential perchlorate leaching to groundwater. The groundwater remedial action proposed for this alternative would eventually achieve the destruction of the COCs present in groundwater above cleanup levels established for LHAAP-47. Therefore, the residual site risk after completion of these actions would be within the target risk range for a hypothetical future maintenance worker.

6.3.2.1.2 Protection of the Environment

The facility-wide ecological baseline risk assessment concluded that risks to ecological receptors at the LHAAP-47 (part of the industrial sub area) were within the acceptable risk range (Shaw, 2007a).

6.3.2.2 Compliance with ARARs

6.3.2.2.1 Chemical-Specific ARARs

This alternative would comply with chemical-specific ARARs for surface soil at LHAAP-47, meeting the GWP-Ind of 7.2 mg/kg for perchlorate in soil. Soil excavation will positively impact groundwater by eliminating the potential for leaching of contaminants into groundwater at concentrations exceeding cleanup levels. This alternative would comply with chemical-specific ARARs for shallow, shallow/intermediate, and intermediate groundwater zones because the cleanup levels would be attained. VOCs and perchlorate would be actively addressed by treatment. The SVOCs and explosives can also degrade under anaerobic conditions. Metals levels may remain above cleanup levels while VOCs and perchlorate still exceed the cleanup levels, then dissipate to acceptable levels as the conditions revert to natural in the aquifer after VOCs and perchlorate have been exhausted.

6.3.2.2.2 Location-Specific ARARs

The activities that would be conducted under this alternative will comply with location-specific ARARs. No activities would take place in sensitive environments such as wetlands, and no impacts to archeological resources or threatened and endangered species are anticipated.

6.3.2.2.3 Action-Specific ARARs

The activities that would be conducted under this alternative will comply with action-specific ARARs. Soil remediation will occur in compliance with all transportation and disposal requirements. Runoff control will be important during soil excavation. All runoff requirements will be met to protect Goose Prairie Creek.

6.3.2.3 Long-Term Effectiveness and Permanence

6.3.2.3.1 Magnitude of Residual Risks

After completion of source removal, the residual site risk will be within the target risk range for a hypothetical future maintenance worker. Until the cleanup levels are achieved, LUC would be needed to prevent access to the contaminated groundwater.

6.3.2.3.2 Adequacy and Reliability of Controls

In situ groundwater bioremediation should be effective for reducing COC concentrations in LHAAP-47 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 hydrogeologic information and treatability data, the effectiveness of this technology at LHAAP-47 cannot be fully assessed.

The LUC would also prevent exposure to the groundwater COCs exceeding the cleanup levels during the time required for groundwater bioremediation. The reliability of LUC would depend on the maintenance of the controls until groundwater COC concentrations have attained their respective cleanup levels. 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 permitted landfill.

6.3.2.4 Reduction of Toxicity, Mobility, or Volume through Treatment

This alternative satisfies the USEPA statutory preference for remedial actions that permanently reduce the toxicity, mobility, and volume of the contaminants and use treatment as a principal element. In situ bioremediation would irreversibly reduce the toxicity, mobility and volume of the contaminants in LHAAP-47 groundwater. In the shallow, shallow/intermediate, and intermediate groundwater zones, MNA will further reduce the toxicity and volume through natural biological and chemical processes.

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

6.3.2.5.1 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. Truck traffic for equipment and materials, including the shipment of contaminated soil off site for disposal and on-site delivery of borrow material for backfilling, will occur. If a spill of contaminated soil occurs, the spill would be easy to contain and would not impact the surrounding communities. During remediation activities at LHAAP-47, control of surface runoff will be important to avoid releases of contamination to adjacent surface water bodies.

6.3.2.5.2 Protection of Workers during Remedial Action

Some short-term risks to human health or the environment will exist during implementation of this alternative. The soil excavation activity has the potential for transportation or construction accidents. Additionally, this alternative will involve potential short-term risks to workers associated with the operation of drilling equipment and potential exposure to decontamination fluids, contaminated groundwater, and excavated soil. Other risks to workers include those generally associated with construction activities (e.g., slips, trips, and falls).

The implementation of proper engineering controls and safety equipment will minimize potential short-term risks to remediation personnel conducting the installation of the groundwater injection system and groundwater sampling activities. Measures will be taken to prevent the contact of personnel with the extracted groundwater. Remediation workers will conform to the site health and safety program and will be equipped with the necessary PPE. A site-specific health and safety plan will be prepared prior to implementing this alternative.

6.3.2.5.3 Short-Term Environmental Effects

Minor clearing and grubbing at LHAAP-47 will be required to effectively excavate the soil and install monitoring wells or injection points for in situ bioremediation of groundwater. However, since these areas have been cleared in the past, it is unlikely that there are any sensitive species that will be impacted. If any sensitive areas are found, the appropriate regulation will be followed. The implementation of proper engineering controls will minimize the risk of environmental impacts.

6.3.2.5.4 Duration of Remedial Activities

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 100 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 duration of the groundwater remediation portion of this alternative is estimated to be approximately 30 years. It is assumed that; in year one, the field investigation to define the aquifer conditions would be performed, additional monitoring wells would be installed, quarterly monitoring would begin, the plans prepared and in situ bioremediation (direct injections and biobarriers) would be completed. In year two, quarterly monitoring would continue. In year three, direct injection bioremediation may be reapplied and groundwater monitoring would continue, semiannual sampling for 3 years, then annual sampling until the next five-year review, and once every 5 years groundwater monitoring thereafter. The time frames for this alternative are difficult to estimate due to 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. Aquifer studies are needed to determine the most effective locations for bioaugmentation injection. Monitoring would be needed until cleanup levels are attained 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.

LUC for the groundwater will continue until cleanup levels are attained.

6.3.2.6 Implementability

6.3.2.6.1 Technical Feasibility

All components of this alternative are implementable. For the groundwater portion, 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 portions of this alternative are readily available and can be implemented with conventional technologies.

6.3.2.6.2 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.

LUC, although administratively implementable, would require the following: development of an implementation plan and internal notices to relevant regulatory offices of the existence of the

LUC. The LUC implementation plan will be developed as part of the remedial design and is administratively implementable.

6.3.2.7 Cost

The total project present worth cost of Alternative 2 is approximately $5.09 million. The details of the cost estimates for all of the alternatives are presented in **Appendix D**.

6.3.2.7.1 Capital Cost

The total capital cost is estimated at approximately $2.98 million. The capital costs include mobilization, excavation of soil material, installing monitoring wells, injection of bioaugmentation material, transportation and disposal of excavated soil, demobilization of construction activities and the activities associated with LUC.

The capital costs also include a work plans, remedial design document, pre-design study and a closure report.

6.3.2.7.2 O&M Cost

The total O&M cost is estimated at approximately $2.11 million. The O&M costs include 2 years of quarterly monitoring followed by 3 years of semiannual, and annual groundwater monitoring until the next five-year review, monitoring to support the required CERCLA five-year review process, and LUC surveillance to verify continued non-residential use.

6.3.3 Alternative 3 – Excavation, Recirculating Bioremediation, MNA, and LUC

This alternative reduces soil contamination by excavation of soil with high concentrations of perchlorate near Building 25C. The highest concentrations in the groundwater plume will be remediated by bioaugmentation in target areas and recirculating bioremediation. Groundwater monitoring and long-term LUC will be maintained until COC cleanup levels are attained. It is estimated that cleanup levels in the groundwater would be achieved in 30 years in the treatment areas; however, it will take approximately 100 additional years for the balance of the plume to attain cleanup levels. This is purely an estimate since the hydrogeologic conditions and bioremediation effectiveness have not been fully defined. These actions would reduce COC concentrations in the groundwater to the cleanup levels throughout the site, provided bioremediation results are favorable. Areas with lower concentrations will be addressed through MNA. If MNA is not found to be effective in these areas, a contingency remedy may be implemented. The components of the contingency remedy will be determined based on the aquifer condition at that time and will be comprised of the process options retained as appropriate to satisfy the RAOs.

6.3.3.1 Overall Protection of Human Health and the Environment

6.3.3.1.1 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 soil remedial action proposed for this alternative would remove a source of potential perchlorate leaching to groundwater. The groundwater remedial action proposed for this alternative would eventually achieve the destruction of the COCs present in groundwater above cleanup levels established for LHAAP-47. Therefore, the residual site risk after completion of these actions would be within the target risk range for a hypothetical future maintenance worker.

6.3.3.1.2 Protection of the Environment

The facility-wide ecological baseline risk assessment concluded that risks to ecological receptors at the LHAAP-47 (part of the industrial sub area) were within the acceptable risk range (Shaw, 2007a).

6.3.3.2 Compliance with ARARs

6.3.3.2.1 Chemical-Specific ARARs

This alternative would comply with chemical-specific ARARs for surface soil at LHAAP-47, meeting the GWP-Ind of 7.2 mg/kg for perchlorate in soil. Soil excavation will positively impact groundwater by eliminating the potential for leaching of contaminants into groundwater at concentrations exceeding cleanup levels. This alternative would comply with chemical-specific ARARs for shallow, shallow/intermediate, and intermediate zone groundwater because the contaminant cleanup levels would be attained. VOCs and perchlorate would be actively addressed by treatment. The SVOCs and explosives can also degrade under anaerobic conditions. Metals levels may remain above cleanup levels while VOCs and perchlorate still exceed the cleanup levels, then dissipate to acceptable levels as the conditions revert to natural in the aquifer after VOCs and perchlorate have been exhausted.

6.3.3.2.2 Location-Specific ARARs

The activities that would be conducted under this alternative will comply with location-specific ARARs. No activities would take place in sensitive environments such as wetlands, and no impacts to archeological resources or threatened and endangered species are anticipated.

6.3.3.2.3 Action-Specific ARARs

The activities that would be conducted under this alternative will comply with action-specific ARARs. Soil remediation will occur in compliance with all transportation and disposal requirements. Runoff control will be important during soil excavation. All runoff requirements will be met to protect Goose Prairie Creek.

6.3.3.3 Long-Term Effectiveness and Permanence

6.3.3.3.1 Magnitude of Residual Risks

After completion of source removal, the residual site risk will be within the target risk range for a hypothetical future maintenance worker. Until the cleanup levels are achieved, LUC would be needed to prevent access to the contaminated groundwater.

6.3.3.3.2 Adequacy and Reliability of Controls

Recirculating bioremediation should be effective for reducing COC concentrations in LHAAP-47 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 hydrogeologic information and treatability data, the effectiveness of this technology at LHAAP-47 cannot be fully assessed.

The LUC would also prevent exposure to the groundwater COCs exceeding the cleanup levels during the time required for groundwater bioremediation. The reliability of LUC would depend on the maintenance of the controls until groundwater COC concentrations have attained their respective cleanup levels. 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 permitted landfill.

6.3.3.4 Reduction of Toxicity, Mobility, or Volume through Treatment

This alternative satisfies the USEPA statutory preference for remedial actions that permanently reduce the toxicity, mobility, and volume of the contaminants and use treatment as a principal element. Recirculating bioremediation would irreversibly reduce the toxicity, mobility and volume of the contaminants in LHAAP-47 groundwater. In the shallow, shallow/intermediate, and intermediate groundwater zones, MNA will further reduce the toxicity and volume through natural biological and chemical processes.

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

6.3.3.5.1 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. Truck traffic for equipment and materials, including the shipment of contaminated soil off site for disposal and on-site delivery of borrow material for backfilling, will occur. If a spill of contaminated soil occurs, the spill would be easy to contain and would not impact the surrounding communities. During remediation activities at LHAAP-47, control of surface runoff will be important to avoid releases of contamination to adjacent surface water bodies.

6.3.3.5.2 Protection of Workers during Remedial Action

Some short-term risks to human health or the environment will exist during implementation of this alternative. The soil excavation activity has the potential for transportation or construction accidents. Additionally, this alternative will involve potential short-term risks to workers associated with the operation of drilling equipment and potential exposure to decontamination fluids, contaminated groundwater, and excavated soil. Other risks to workers include those generally associated with construction activities (e.g., slips, trips, and falls).

The implementation of proper engineering controls and safety equipment will minimize potential short-term risks to remediation personnel conducting the installation of the groundwater recirculation systems and groundwater sampling activities. Measures will be taken to prevent the contact of personnel with the extracted groundwater. Remediation workers will conform to the site health and safety program and will be equipped with the necessary PPE. A site-specific health and safety plan will be prepared prior to implementing this alternative.

6.3.3.5.3 Short-Term Environmental Effects

Minor clearing and grubbing at LHAAP-47 will be required to effectively excavate the soil and install extraction and injection wells for the recirculating bioremediation of groundwater. However, since these areas have been cleared in the past, it is unlikely that there are any sensitive species that will be impacted. If any sensitive areas are found, the appropriate regulation will be followed. The implementation of proper engineering controls will minimize the risk of environmental impacts.

6.3.3.5.4 Duration of Remedial Activities

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 100 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 duration of the groundwater remediation portion of this alternative is estimated to be approximately 30 years for both recirculation and direct injection bioremediation. It is assumed that; in year one, the field investigation to define the aquifer conditions would be performed, direct injection bioremediation would be applied, additional monitoring wells would be installed, quarterly monitoring would begin, the plans prepared, and recirculation systems for bioremediation would be installed. In year two, quarterly monitoring would be performed, and recirculating bioremediation would be closed down. In year three; direct injection bioremediation may be repeated, and groundwater monitoring will continue, semiannual sampling for 3 years, then annual sampling until the next five-year review, and once every 5 years groundwater monitoring thereafter. The time frames for this alternative are difficult to estimate due to 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. Aquifer studies are needed to determine the most effective locations for recirculating bioremediation systems. Monitoring would be needed until cleanup levels are attained 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.

LUC for the groundwater will continue until the cleanup levels are attained.

6.3.3.6 Implementability

6.3.3.6.1 Technical Feasibility

All components of this alternative are implementable. For the groundwater portion, the equipment and materials required for microbe and carbon source delivery are commercially available, but specialized knowledge of recirculating bioremediation 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 expertise for LUC and soil excavation portions of this alternative are readily available and can be implemented with conventional technologies.

6.3.3.6.2 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.

LUC, although administratively implementable, would require the following: development of an implementation plan and internal notices to relevant regulatory offices of the existence of the LUC. The LUC implementation plan will be developed as part of the remedial design and is administratively implementable.

6.3.3.7 Cost

The total project present worth cost of Alternative 3 is approximately $7.62 million. The details of the cost estimates for all of the alternatives are presented in **Appendix D**.

6.3.3.7.1 Capital Cost

The total capital cost is estimated at approximately $5.51 million. The capital costs include mobilization, excavation of soil material, installing monitoring wells, injection and recirculation of bioaugmentation material, transportation and disposal of excavated soil, demobilization of construction activities and the activities associated with LUC.

The capital costs also include a work plans, remedial design document, pre-design study and a closure report.

6.3.3.7.2 O&M Cost

The total O&M cost is estimated at approximately $2.11 million. The O&M costs include 2 years of quarterly monitoring followed by 3 years of semiannual, and annual groundwater monitoring until the next five-year review, monitoring to support the required CERCLA five-year review process, and LUC surveillance to verify continued non-residential use.

6.3.4 Alternative 4 – Excavation, Pump and Treat, In Situ Bioremediation, MNA, and LUC

This alternative reduces soil contamination by excavation of soil with high concentrations of perchlorate near Building 25C. The highest concentrations in the groundwater plume will be remediated by in situ bioremediation and by pumping and treating groundwater. In situ bioremediation will be used around wells with high COC concentrations but insufficient water for pumping. Pumping and treating will be used in areas with high COC concentrations and sufficient groundwater to pump effectively. Groundwater monitoring and long-term LUC will be maintained until COC cleanup levels are attained. It is estimated that cleanup levels in the groundwater would be achieved in 30 years in the treatment areas; however, it will take approximately 100 additional years for the balance of the plume to attain cleanup levels. This is purely an estimate since the hydrogeologic conditions and bioremediation effectiveness have not been fully defined. These actions would reduce COC concentrations in the groundwater to the cleanup levels throughout the site, provided bioremediation results and progress in pumping and treating are favorable. Areas with lower concentrations will be addressed through MNA. If MNA is not found to be effective in these areas, a contingency remedy may be implemented.

The components of the contingency remedy will be determined based on the aquifer condition at that time and will be comprised of the process options retained as appropriate to satisfy RAOs.

6.3.4.1 Overall Protection of Human Health and the Environment

6.3.4.1.1 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 groundwater remedial action proposed for this alternative would eventually achieve the destruction of the COCs present in groundwater above cleanup levels established for LHAAP-47. The groundwater remedial action combines in situ enhanced bioremediation to treat highly contaminated groundwater near unproductive wells with pumping and treatment for parts of the plume with plentifully available groundwater, and MNA to contain and restore the remaining plume. MNA processes will be confirmed through long-term groundwater monitoring. In situ enhanced bioremediation to enhance biodegradation or additional groundwater extraction wells would be implemented in areas where MNA is demonstrated to be ineffective. This alternative also includes LUC to prevent human health exposure while MNA slowly reduces COC concentrations. Therefore, the residual site risk after completion of these actions would be within the target risk range for a hypothetical future maintenance worker.

6.3.4.1.2 Protection of the Environment

The facility-wide ecological baseline risk assessment concluded that risks to ecological receptors at the LHAAP-47 (part of the industrial sub area) were within the acceptable risk range (Shaw, 2007a).

6.3.4.2 Compliance with ARARs

6.3.4.2.1 Chemical-Specific ARARs

This alternative would comply with chemical-specific ARARs for surface soil at LHAAP-47, meeting the GWP-Ind of 7.2 mg/kg for perchlorate in soil. Soil excavation will positively impact groundwater by eliminating the potential for leaching of contaminants into groundwater at concentrations exceeding cleanup levels. This alternative would comply with chemical-specific ARARs for shallow and intermediate zone groundwater because the contaminant cleanup levels would be attained. VOCs and perchlorate would be actively addressed by treatment. The SVOCs and explosives can also degrade under anaerobic conditions. Metals levels may remain above cleanup levels while VOCs and perchlorate still exceed the cleanup levels, then dissipate to acceptable levels as the conditions revert to natural in the aquifer after VOCs and perchlorate have been exhausted.

6.3.4.2.2 Location-Specific ARARs

The activities that would be conducted under this alternative will comply with location-specific ARARs. No activities would take place in sensitive environments such as wetlands, and no impacts to archeological resources or threatened and endangered species are anticipated.

6.3.4.2.3 Action-Specific ARARs

The activities that would be conducted under this alternative will comply with action-specific ARARs. Soil remediation will occur in compliance with all transportation and disposal requirements. Runoff control will be important during soil excavation. All runoff requirements will be met to protect Goose Prairie Creek.

6.3.4.3 Long-Term Effectiveness and Permanence

6.3.4.3.1 Magnitude of Residual Risks

After completion of source removal, the residual site risk will be within the target risk range for a hypothetical future maintenance worker. Until the cleanup levels are achieved, LUC would be needed to prevent access to the contaminated groundwater.

6.3.4.3.2 Adequacy and Reliability of Controls

Pump and treat should be effective for reducing COC concentrations in LHAAP-47 groundwater. More extensive aquifer characterization is needed before designing the system and to determine the area for optimum extraction well locations. Due to the limited hydrogeologic information, the effectiveness of this technology at LHAAP-47 cannot be fully assessed.

The LUC would also prevent exposure to the groundwater COCs exceeding the cleanup levels during the time required for groundwater reduction to cleanup levels. The reliability of LUC would depend on the maintenance of the controls until groundwater COC concentrations have attained their respective cleanup levels. 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 permitted landfill.

6.3.4.4 Reduction of Toxicity, Mobility, or Volume through Treatment

This alternative satisfies the USEPA statutory preference for remedial actions that permanently reduce the toxicity, mobility, and volume of the contaminants and use treatment as a principal element. Pump and treat would irreversibly reduce the toxicity, mobility and volume of the contaminants in LHAAP-47 groundwater. In the shallow, shallow/intermediate, and intermediate groundwater zones, MNA will further reduce the toxicity and volume through natural biological and chemical processes.

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.

6.3.4.5 Short-Term Effectiveness

6.3.4.5.1 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. Truck traffic for equipment and materials, including the shipment of contaminated soil off site for disposal and on-site delivery of borrow material for backfilling, will occur. If a spill of contaminated soil occurs, the spill would be easy to contain and would not impact the surrounding communities. During remediation activities at LHAAP-47, control of surface runoff will be important to avoid releases of contamination to adjacent surface water bodies.

6.3.4.5.2 Protection of Workers during Remedial Action

Some short-term risks to human health or the environment will exist during implementation of this alternative. The soil excavation activity has the potential for transportation or construction accidents. Additionally, this alternative will involve potential short-term risks to workers associated with the operation of drilling equipment and potential exposure to decontamination fluids, contaminated groundwater, and excavated soil. Other risks to workers include those generally associated with construction activities (e.g., slips, trips, and falls).

The implementation of proper engineering controls and safety equipment will minimize potential short-term risks to remediation personnel conducting the installation of the groundwater injection system and groundwater sampling activities. Measures will be taken to prevent the contact of personnel with the extracted groundwater. Remediation workers will conform to the site health and safety program and will be equipped with the necessary PPE. A site-specific health and safety plan will be prepared prior to implementing this alternative.

6.3.4.5.3 Short-Term Environmental Effects

Minor clearing and grubbing at LHAAP-47 will be required to effectively excavate the soil and install monitoring wells or extraction wells, or pipelines for transport of groundwater. However, since these areas have been cleared in the past, it is unlikely that there are any sensitive species that will be impacted. If any sensitive areas are found, the appropriate regulation will be followed. The implementation of proper engineering controls will minimize the risk of environmental impacts.

6.3.4.5.4 Duration of Remedial Activities

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 100 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 duration of the groundwater remediation portion of this alternative is estimated to be approximately 130 years. It is assumed that; in year one, the field investigation to define the aquifer conditions would be performed, additional monitoring wells would be installed, a pump test conducted, the plans prepared and the extraction system and pipelines would be constructed, direct injection bioremediation would be performed, and quarterly monitoring would begin. In year two, four more quarters of monitoring would be performed, and groundwater extraction continued. In year three, direct injection bioremediation may be repeated and monitoring would continue with semiannual sampling for 3 years, then annual sampling until the next five-year review, and once every 5 years groundwater monitoring thereafter. The time frames for this alternative are difficult to estimate due to 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. Aquifer studies are needed to determine the most effective locations for placing extraction wells and bioaugmentation injection. Monitoring would be needed until cleanup levels are attained 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.

LUC for the groundwater will continue until the cleanup levels are attained.

6.3.4.6 Implementability

6.3.4.6.1 Technical Feasibility

All components of this alternative are implementable. For the groundwater portion, 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 portions of this alternative are readily available and can be implemented with conventional technologies.

6.3.4.6.2 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.

LUC, although administratively implementable, would require the following: development of an implementation plan and internal notices to relevant regulatory offices of the existence of the LUC. The LUC implementation plan will be developed as part of the remedial design and is administratively implementable.

6.3.4.7 Cost

The total project present worth cost of Alternative 4 is approximately $7.90 million. The details of the cost estimates for all of the alternatives are presented in **Appendix D**.

6.3.4.7.1 Capital Cost

The total capital cost is estimated at approximately $3.04 million. The capital costs include mobilization, excavation of soil material, installing monitoring wells, injection of bioaugmentation material, transportation and disposal of excavated soil, demobilization of construction activities and the activities associated with LUC.

The capital costs also include a work plans, remedial design document, pre-design study and a closure report.

6.3.4.7.2 O&M Cost

The total O&M cost for 30 years is estimated at approximately $4.86 million. The O&M costs include 2 years of quarterly monitoring followed by 3 years of semiannual, and annual groundwater monitoring until the next five-year review, monitoring to support the required CERCLA five-year review process, and LUC surveillance to verify continued non-residential use.

6.4 Comparative Analysis of Alternatives

6.4.1 Introduction

This section presents a comparative analysis of the remedial alternatives for LHAAP-47 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; and
- 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 PP. 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 four 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, 3, and 4 all satisfy the RAOs for LHAAP-47. Alternatives 2, 3, and 4 all remove the soil that may act as a continuing source of groundwater contamination. The imposition of LUC for the site will prevent use of groundwater, except for environmental monitoring and testing until cleanup levels are attained, further protecting human health. Alternative 2 would be most protective because contaminated groundwater will never be brought to the surface. Alternative 3 is less protective as it pulls groundwater to the surface for recirculation, which has some potential for human exposure. Alternative 4 pulls groundwater to the surface, then sends it to the existing GWTP through a long pipeline, which has more extensive potential for human and environmental exposure.

6.4.2.2 Compliance with ARARs

Alternative 1 does not comply with chemical-specific ARARs for soil and groundwater or TBC guidance for soil because no remedial action or measures would be implemented. Alternatives 2, 3, and 4 comply with all chemical-specific ARARs for soil and 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, 3, and 4 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. Alternatives 2, 3, and 4 all offer a similar level of long-term effectiveness and permanence.

Alternative 4 is expected to offer the highest degree of long-term effectiveness and permanence compared to the other alternatives. Alternative 4 is designed to remove soil with elevated levels of contaminants, reduce groundwater contaminant concentrations by spot treatment of high contaminant concentrations and by groundwater extraction, which will provide additional hydraulic control of the plume. The extracted groundwater will be treated and will not be returned to the site. However, the pump and treat remedy is expected to take longer to remove the contaminants.

Alternative 3 is expected to offer the next highest degree of long-term effectiveness and permanence. Alternative 3 is designed to remove soil with elevated levels of contaminants, reduce groundwater contaminant concentrations by direct injection bioremediation at high contaminant concentrations and by recirculating bioremediation cells constructed at other areas. The recirculation cells allow continued treatment application until the contaminants are removed.

Alternative 2 is expected to offer a lesser degree of long-term effectiveness and permanence. Alternative 2 is designed to remove soil with elevated levels of contaminants, reduce groundwater contaminant concentrations by direct injection bioremediation at high contaminant concentrations and installation of biobarriers. Biobarriers would need to be recharged periodically so long as contaminants remain above the cleanup levels.

6.4.3.2 Reduction of Toxicity, Mobility, or Volume through Treatment

Alternative 1 does not employ active treatment for groundwater to result in a reduction of toxicity, mobility, or volume of contaminants.

The soil excavation component of Alternatives 2, 3, and 4 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 as the form and quantity of the perchlorate is not altered.

Alternatives 2 and 3 offer a similar degree of reduction of toxicity, mobility and volume through treatment. Alternative 2 is designed to treat groundwater through direct injection bioremediation and construction of biobarriers. At no time is contaminated groundwater removed from the in situ condition in Alternative 2. Alternative 3 is designed to treat groundwater through recirculating bioremediation and direct injection bioremediation. Contaminated groundwater is only removed from in situ to apply treatment for recirculation and better contact.

Alternative 4 is expected to offer a lesser degree of reduction of toxicity, mobility and volume through treatment. Alternative 4 is designed to treat groundwater through extraction and transport to the existing GWTP. While the treatment there will effectively reduce toxicity and volume, there is a potential for increased mobility if the transport pipeline fails. Additionally, for chlorinated solvents, the pump and treat system may become ineffective at removing the contaminants before cleanup levels are attained, while in situ bioaugmentation will continue to harm less by-products.

6.4.3.3 Short-Term Effectiveness

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

Alternative 3 is expected to offer the best short-term effectiveness. The recirculating bioremediation is expected to improve degradation rates significantly over direct injection bioremediation, thus reducing the remedy duration.

Alternative 2 is expected to offer a lesser degree of short-term effectiveness. The direct injection bioremediation will increase the rate of degradation, and biobarriers will prevent further migration downgradient or into Goose Prairie Creek, but it will take longer than Alternative 3.

Alternative 4 is expected to offer the lowest degree of short-term effectiveness. The groundwater extraction system will control migration and begin removing contamination, while direct injection bioremediation will increase the rate of degradation in other portions of the plume.

By planning the construction, excavation, and transportation activities in accordance with industry and OSHA codes and requirements, risks from contaminant exposure and construction operations would be controlled to acceptable levels. Dust control and sediment deposition into adjacent surface water bodies can be controlled during earthwork and construction activities. Erosion control measures would include surface grading; emplacement of silt fences; covering surfaces with straw, mulch, riprap, and/or geotextile fabrics. Following completion of all construction and excavation, disturbed areas would be regraded with clean backfill and revegetated with native grasses. Appropriate PPE would be required for remediation workers.

6.4.3.4 Implementability

Administratively, all of the alternatives are implementable. Under Alternative 1, no remedial action would be taken. Therefore, no difficulties or uncertainties would be associated with its implementation.

The excavation, MNA, and LUC portions of Alternatives 2, 3, and 4 are all equivalent, and the relative comparison of the alternatives rests on the differences in groundwater treatment.

Alternative 2 is the easiest to implement. Biobarriers and direct injection bioremediation may be implemented with a minimum of additional study or testing. No additional equipment or pipelines will be required.

Alternative 3 will be the next easiest to implement. Direct injection bioremediation may be simply implemented, but the construction and operation of the recirculating bioremediation systems will require provision of power and piping in the area, and design and testing of wells and control systems will be necessary.

Alternative 4 will be the most difficult to implement. Hot spot treatment may be simply implemented, but the construction and operation of the groundwater extraction system will require provision of power and piping in the area, and design and testing of wells and control systems. The collection tank and pipeline to the existing GWTP will require additional piping construction and modifications and improvements to the existing GWTP physical plant and control systems.

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 D**.

The progression of present worth costs from the least expensive alternative to the most expensive alternative over a 30-year time period is as follows: Alternative 1, Alternative 2, Alternative 3, and Alternative 4. No costs are associated with Alternative 1 because no remedial activities would be conducted. Alternative 2 has a lower present worth and capital cost because fewer system components are installed, and O&M costs are less since no continuously active operations are included. Alternative 3 has a higher present worth and the highest capital cost because of the costs associated with the large numbers of wells installed. Alternative 4 has the highest present worth and the highest O&M cost because of the need for continued operation of the GWTP to treat extracted groundwater from LHAAP-47.

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Appendix A

Natural Attenuation Evaluation for LHAAP-47

APPENDIX A
NATURAL ATTENUATION EVALUATION

FINAL
FEASIBILITY STUDY
LHAAP-47, PLANT 3 AREA, GROUP 4
LONGHORN ARMY AMMUNITION PLANT
KARNACK, TEXAS

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Task Order No. DS02

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Table of Contents

List of Tables

List of Figures

Acronyms and Abbreviations

µg/L	micrograms per liter
cells/mL	cells per milliliter
Cl^-	chloride
ClO_2^-	chlorite
ClO_3^-	chlorate
ClO_4^-	perchlorate
CO_2	carbon dioxide
COC	chemical of concern
DCA	dichloroethane
DCE	dichloroethylene
DHC	*dehalococcoides*
DO	dissolved oxygen
Fe^{+3}	ferric iron
FS	feasibility study
GW-Ind	groundwater MSC for industrial use
GWRTAC	Ground-Water Remediation Technologies Analysis Center
LHAAP	Longhorn Army Ammunition Plant
MARC	Multiple Award Remediation Contract
MCL	maximum contaminant level
MNA	monitored natural attenuation
MSC	medium specific concentration
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
USAFCEE	U.S. Air Force Center for Environmental Excellence
USEPA	U.S. Environmental Protection Agency
VC	vinyl chloride
VOC	volatile organic compound

1.0 Introduction

The U.S. Army Corps of Engineers, Tulsa District, contracted Shaw Environmental, Inc. (Shaw), under the Louisville District's Multiple Award Remediation Contract (MARC) No. W912QR-04-D-0027, Task Order DS02, to conduct environmental restoration of LHAAP-47 at Longhorn Army Ammunition Plant (LHAAP). This report presents the evaluation of the occurrence of natural attenuation of groundwater contaminants at LHAAP-47.

LHAAP-47, known as the Plant 3 Area, is located in the north-central portion of LHAAP and covers an area of approximately 275 acres. The general location of this site is shown on **Figure A-1**. LHAAP-47 is bounded by LHAAP-46 to the north, Karnack Avenue to the east, Marshall Avenue to the south, and Avenue "P" to the west. LHAAP-06 and LHAAP-07 are within the LHAAP-47 boundary. LHAAP-37 is to the southwest of LHAAP-47, and LHAAP-50 and LHAAP-08 are to its south.

Construction of Plant 3 began in July 1953 and production of rocket motors began in December 1954. Rocket motor production continued until the early 1980s. Some of the rocket motor production facilities were converted to produce pyrotechnic and illumination devices and were active until approximately 1997. Industrial solid wastes and possibly hazardous wastes may have been generated by these activities. Fifty waste process sumps and three waste rack sumps were located at this site.

The subsurface is composed of medium plastic sandy silt, fine sands, and clay. The clay layers tend to separate this groundwater zone into shallow, intermediate, and deep groundwater zones. The groundwater flow direction in all three zones is generally northeast toward Caddo Lake (**Figure A-2**).

Contamination has been detected in both the shallow and intermediate groundwater zones. A difference between the shallow and intermediate groundwater zone elevations was not observed except at 47WW13 (shallow) and 47WW14 (shallow/intermediate), and surface infiltration nearby is suspected to be the cause of the higher groundwater elevation at 47WW13. The groundwater zones were re-evaluated by reviewing the well logs and groundwater elevation data. Of the 10 wells at LHAAP-47 that were redesignated as shallow/intermediate – six used to be designated shallow, and four used to be designated intermediate. The overlapping depth range of the wells, the minimal difference between groundwater elevations in the shallow and intermediate zones, and the redesignations of wells to shallow/intermediate zone, indicate that the shallow and intermediate zones at LHAAP-47 are interconnected, and the groundwater in the shallow and intermediate zones will be treated as one interconnected shallow/intermediate zone.

The monitoring wells sampled in February 2007 for evaluation of natural attenuation are 47WW09, 47WW13, 47WW14, 47WW30, and LHSMW43. Monitoring wells 105, 47WW09, 47WW13, 47WW14, 47WW34, LHSMW43, LHSMW45, and LHSMW50 were sampled in February 2009 to gather additional information to evaluate natural attenuation. Monitoring wells 47WW12, 47WW16, 47WW25 and LHSMW56 were sampled in April 2009 to evaluate concentrations at those wells.

Additional groundwater sampling was conducted in 2010 to address concerns of regulators. Groundwater samples were collected from 20 wells; 17 more wells could not be sampled for lack of water, and 18 samples were collected from temporary wells.

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 to result 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 conditions 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. Monitored natural attenuation (MNA) entails the use of natural attenuation within the context of a monitoring plan to demonstrate reductions in contaminant concentrations and achievement of remedial 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), was used in the evaluation of the data to date to assess if natural attenuation could be considered as an alternative in the feasibility study (FS). 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, 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 chemical of concern (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 (MSC) for industrial use (GW-Ind) levels established by the Texas Commission on Environmental Quality (TCEQ) (TCEQ, 2006).
3. ***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-47 to demonstrate the occurrence of natural attenuation of groundwater COCs.

2.2 First Line of Evidence – Contaminant Reduction

The first line of evidence is the observed reduction in concentrations through various attenuation processes. Biodegradation occurs when bacteria use contaminants as carbon sources or electron acceptors. COCs at LHAAP-47 include perchlorate (ClO_4^-) and chlorinated solvents exceeding their MCLs or GW-Ind levels. The COCs can be degraded through microbial activity in the subsurface. Under the right conditions, all site COCs are amenable to biodegradation. The following subsections provide a brief description of biodegradation of perchlorate and chlorinated solvents, COCs for LHAAP-47.

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 groundwater via leaks and spills during rocket motor production activities. The perchlorate anion is very mobile in aqueous systems, and can persist in the environment for many decades under aerobic conditions because of its resistance to react with other available constituents. However, perchlorate can be reduced to chlorite (ClO_2^-) in the presence of indigenous perchlorate-reducing microbes under anaerobic conditions (Ground-Water Remediation Technologies Analysis Center [GWRTAC], 2001). The reduction in perchlorate concentration can be direct evidence for the occurrence of biodegradation supporting the first line of evidence.

Perchlorate-reducing organisms couple the oxidation of an organic or inorganic electron donor to the reduction of perchlorate in a form of anaerobic respiration. Perchlorate reduction produces chlorate (ClO_3^-), which can be further reduced to chlorite, 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 trichloroethene (TCE). Chlorinated ethenes and ethanes include parent compounds, TCE, tetrachloroethene [PCE], 1,1,1-trichloroethane (TCA) and 1,1,2-TCA that biodegrade via multiple pathways and generate a variety of daughter products (cis-1,2-dichloroethylene [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 decreasing trends 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, DCE isomers, DCA and VC can be utilized as carbon sources and undergo biodegradation to carbon dioxide and chloride ion via aerobic or anaerobic oxidation.

Chlorinated solvent can also undergo the biogeochemical reductive dechlorinated 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.

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 five or less, devotes inadequate evidence of anaerobic degradation. A point total of 15 or more is adequate evidence for anaerobic biodegradation. In between five 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.).

2.3 Second Line of Evidence – Geomicrobiology

Biological monitoring parameters are indicators of microbiological activity in the subsurface and are evaluated in support of the second line 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 oxygen (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 perchlorate 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 conditions, 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 coexists with chlorinated solvents in groundwater, microbes derive more energy from perchlorate degradation, thus chlorinated solvents 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, 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 concentration may be observed as a result of biodegradation of chlorinated solvents. However, high background chloride concentrations were observed at LHAAP-47, thus the slight contribution of chloride to groundwater through biodegradation is not quantifiable.

2.4 Third Line of Evidence – 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* (DHC) can completely reduce the DCE isomers and VC to ethene. The presence of DHC in the groundwater can be used as evidence to support the third line of evidence.

3.0 Natural Attenuation Evaluation Results

This section presents the results of the natural attenuation evaluation in accordance with the three lines of evidence. For the purposes of this evaluation, the USEPA MCLs for drinking water or the GW-Ind under TCEQ guidelines (Standard No. 2 MSCs) were used as the cleanup levels for LHAAP-47. COCs that exceed their MCLs include PCE, TCE, cis-1,2-DCE, trans-1,2-DCE, 1,1-DCE, and VC. The GW-Ind was used for the evaluation of the COCs without MCLs. The COC at this site exceeding the GW-Ind is perchlorate. Due to interaction with other COCs, a lower site-specific cleanup level of 26 micrograms per liter (µg/L) has been used for evaluation.

Current data along with historical data for wells in the shallow/intermediate zone used in this evaluation is summarized in **Tables A-1**, **A-2**, and **A-3** at the end of this report. The last round of samples used for this report was September 2010. **Figures A-3** through **A-8** present concentration trends of individual COCs. **Figures A-9** through **A-11** present concentrations over distance from the plume to downgradient wells. **Figures A-12** through **A-15** present natural attenuation rate estimates at selected wells for the COCs. The figures are presented at the end of the report following the tables. The groundwater sample forms and laboratory reports associated with the February 2007, October 2007, November 2007, February 2009, April 2009, and Summer 2010 groundwater sample rounds for this natural attenuation evaluation are presented in Appendix C of the FS.

The preliminary screening worksheet was used to evaluate the occurrence of anaerobic degradation for multiple well locations in the volatile organic compound (VOC) plume at LHAAP-47. Twenty-seven various parameters are used in the preliminary worksheet. Eight of the wells had available data for 20 to 25 parameters. The screening totals ranged from 7 to 13 for wells 105, 49WW09, 47WW13, 47WW14, 47WW30, LHSMW43, LHSMW45, and LHSMW56, showing limited evidence of anaerobic degradation. Three other wells within the plume had available data for only 9 to 14 parameters (47WW05, 47WW25, and LHSMW50) and scored 4 or 3 points; even with the lack of available data for the parameters (i.e., there is no possible point for several parameters). **Table A-4** shows the preliminary screening scores for these wells. Because the preliminary screening shows limited evidence for anaerobic biodegradation at the time of sampling, additional evaluation needs to be conducted to determine if natural attenuation can meet the cleanup objectives.

The evaluation of the lines of evidence for the shallow/intermediate groundwater at LHAAP-47 is presented below.

3.1 First Line of Evidence – 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-47. Wells 47WW09, 47WW13, 47WW14, 47WW30, and LHSMW43 were sampled for natural attenuation parameters during the February 2007 sampling event. Wells 47WW19, 47WW29, and LHSMW54 were sampled during October 2007, and 47WW19 was also sampled in November 2007 and tested for natural attenuation parameters. Wells 105, 47WW09, 47WW13, LHSMW45, and LHSMW50 were sampled in February 2009 and tested for natural attenuation parameters. Wells 47WW12, 47WW16, 47WW25, and LHSMW56 were sampled in April 2009 and tested for perchlorate and chlorinated hydrocarbons. Wells 105, 47WW04, 47WW09, 47WW13, 47WW14, 47WW21, 47WW23, 47WW27, 47WW28, 47WW29, 47WW30, 47WW32, 47WW33, 47WW34, 47WW37, 47WW38, LHSMW38, LHSMW44, LHSMW54, and LHSMW60 were sampled in July, August, and September 2010 and tested for perchlorate and/or chlorinated hydrocarbons. Some samples collected in 1996, October and November 2007, and Summer 2010 were also tested for some natural attenuation parameters.

3.1.1 Perchlorate

Perchlorate was detected in the southern and central part of LHAAP-47. Monitoring wells 47WW11, 47WW26, 47WW27, LHSMW42, LHSMW53, and LHSMW60 had perchlorate concentrations above the cleanup level of 26 µg/L at least once (**Table A-1**). The perchlorate concentrations in all six wells exhibited decreasing concentration trends over time, with perchlorate concentrations decreasing from 82,900 µg/L in 1998 to 56,600 µg/L in August 2010 in LHSMW60, to below 26 µg/L in LHSMW42 and LHSMW53 in 1998, and less dramatic reductions in the other wells (**Figure A-3**). During the July 2010 sampling event the perchlorate concentration was 168 µg/L at 47WW27, which is much lower than the maximum perchlorate concentration at that well (2,460 µg/L in December 2000). Historical data indicates that perchlorate concentrations that exceed the cleanup level have been observed at 47WW11, 47WW26, 47WW27, LHSMW42, LHSMW53, and LHSMW60 and the most recent results are currently above the cleanup level at 47WW11, 47WW26, 47WW27, and LHSMW60. The current perchlorate plume map is located in the main text of the FS.

3.1.2 Chlorinated Ethenes

According to historical and current data, PCE, TCE, cis-1,2-DCE, 1,1-DCE, and VC, were detected above their respective MCLs. Daughter products are also discussed in this section. Only wells that had a concentration exceeding its MCL and that had at least three results were plotted on the figures.

PCE: PCE was detected exceeding its MCL (5 µg/L) in four monitoring wells, 47WW09, LHSMW30, LHSMW34, and LHSMW43. LHSMW30 had one PCE concentration exceeding the MCL, with later results indicating that PCE was not detected. 47WW09 has four PCE results and shows a range from 2.4 µg/L to 13 µg/L with an August 2010 value of 9.08 J µg/L. In LHSMW43, where the highest PCE concentration was observed, PCE concentration decreased from 168 µg/L in February 1996 to 38.4 µg/L in February 2009 (**Figure A-4**). LHSMW43 was dry in 2010. Historical data suggest that degradation of PCE is occurring at monitoring wells LHSMW30, LHSMW34, and LHSMW43. The current PCE plume map is located in the main text of the FS.

TCE: TCE may be either a daughter product from degradation of PCE or an independent contaminant. TCE was detected exceeding its MCL (**Table A-2**) in 28 of the 65 monitoring wells. Five of these wells (47WW12, 47WW16, 47WW32, 47WW37, and 47WW38) had only one or two results, so cannot be evaluated for concentration trends. Monitoring well 47WW23 had only one detection of TCE (30 µg/L) exceeding the MCL (5 µg/L), but later TCE results were lower than the MCL or not detected. Three other wells (LHSMW34, LHSMW41, and LHSMW55) have exceeded the MCL and have more recent results below the MCL. Of the remaining 20 monitoring wells, about half show a rising concentration trend, and the other half show a falling concentration trend. **Figure A-5a** plots the six wells with the highest TCE concentrations that have sufficient TCE information to establish concentration trends. Of these six wells, three show trends of decreasing concentrations (47WW05, 47WW34, and LHSMW43) and the other three show mixed or rising trends (47WW09, 47WW25, and LHSMW56). **Figure A-5b** plots the six wells with medium TCE concentrations. Of these six wells, three show decreasing concentrations (47WW13, 47WW14, and LHSMW48) and the other three show mixed or rising trends (47WW30, LHSMW45, and LHSMW54). **Figure A-5c** plots the six wells with low TCE concentrations. Of these six wells, one shows decreasing concentrations (LHSMW49) and the other five show mixed or rising trends (105, 47WW18, LHSMW44, LHSMW46, and LHSMW47). It should be noted that LHSMW43, LHSMW46, LHSMW47, LHSMW48, and LHSMW56 were dry in 2010 and could not be resampled. Based on the contaminant reductions indicated by the analytical results, natural attenuation is effectively controlling TCE concentrations in the shallow/intermediate groundwater zone in approximately half of the wells. The current TCE plume map is located in the main text of the FS.

DCE: As TCE is degraded via reductive dechlorination, the next lower chlorinated daughter products formed are cis-1,2-DCE and trans-1,2-DCE at approximately a 100:1 to 10:1 ratio. For the 100 samples with detectable cis-1,2-DCE, the average cis/trans ratio was 88.8. These ratios indicate the detected DCE is a daughter product of TCE produced by reductive dechlorination. Concentrations of trans-1,2-DCE do not exceed its MCL (100 µg/L). Historically, concentrations of cis-1,2-DCE exceeded its MCL (70 µg/L) in ten monitoring wells. One of these wells (LHSMW48) had only two results, so the data cannot be evaluated for concentration trends. The most recent result from LHSMW34 was less than the MCL. Of the remaining eight wells, six show trends of decreasing concentrations (47WW09, 47WW14, 47WW25, 47WW34, LHSMW43, and LHSMW56) and two show trends of increasing concentrations (47WW13 and LHSMW45). **Figure A-6a** includes the four wells with higher concentrations and **Figure A-6b** includes the four wells with lower concentrations. The trends suggest that reductive dechlorination is occurring at LHAAP-47.

The daughter product 1,1-DCE has also been observed in six monitoring wells (47WW13, 47WW34, LHSMW39, LHSMW43, LHSMW48, and LHSWM56) at relatively low concentrations that are stable or decreasing at all wells except one. At monitoring well LHSMW43, the 1,1-DCE concentrations ranged from 27 µg/L to 10.3 µg/L (**Figure A-7**). Monitoring well LHSMW56 deviates from this general trend by showing an increase to 184 µg/L in the sample from October 2007, though this was followed by a decrease to 108 µg/L in April 2009. LHSMW56 was dry in 2010 and could not be resampled. This suggests dechlorination of the parent compounds is occurring near LHSMW56.

VC: As the parent compounds PCE and TCE are reduced, the final chlorinated daughter product during reductive dechlorination is VC. VC has been detected above its MCL (2 µg/L) in seven wells (47WW13, 47WW14, 47WW25, 47WW34, LHSMW34, LHSMW43, and LHSMW56). In February 2007, elevated concentrations of VC were observed in three monitoring wells and ranged from 3.7 µg/L to 88.6 µg/L. In February 2009, elevated concentrations of VC were observed in 3 of the 11 sampled monitoring wells and ranged from 4.05 µg/L to 105 µg/L. In 2010, elevated concentrations of VC were observed in 2 of 20 sampled monitoring wells and ranged from 14.1 µg/L to 249 µg/L (**Table A-2**). VC concentrations are stable or decreasing in most of the shallow monitoring wells (**Figures A-8a** and **A-8b**). The presence of VC is an indicator that reductive dechlorination is occurring.

The reduction of TCE concentrations at approximately half the monitoring wells, and the presence of daughter products DCE and VC are strong indicators supporting the occurrence of natural attenuation at LHAAP-47 under the first line of evidence.

3.1.3 Distance

The evaluation of changes in COC concentrations with time has shown evidence of the occurrence of natural attenuation. The evaluation of changes in COC concentrations with respect to distance further elucidates that natural attenuation mechanisms have controlled plume migration. In downgradient monitoring wells 47WW03, 47WW04, 47WW21, 47WW23, 47WW28, 47WW29, 47WW33, 47WW35, and 47WW36 elevated concentrations of COC above their respective MCLs have not been observed during their most recent sampling events in 2007 and 2008 (**Table A-2**). Additionally, in the upgradient well, LHSMW51, the COCs have not been detected above their respective MCLs.

Figure A-9 shows the most recent TCE concentrations along the northern arm of the TCE plume from monitoring well 47WW05 (759 µg/L) to 47WW30 (1,100 µg/L) and on to 47WW32 (30.8 µg/L) to 47WW33 (2.2 µg/L). **Figure A-10** shows the most recent TCE concentrations along the southern arm of the TCE plume from monitoring well LHSMW56 (4,610 µg/L) to 47WW34 (1,340 µg/L) to 47WW36 (not detected). **Figure A-11** shows the most recent TCE concentrations across the middle of the TCE plume from monitoring well 47WW25 (13,300 µg/L) to 47WW13 (647 µg/L) to LHSMW43 (6,240 µg/L) to 105 (25.8 µg/L) to 47WW04 (not detected). At LHAAP-47, several operations used chlorinated solvents or degreasers. The wells with the higher concentrations were near areas where chlorinated solvent or degreaser use was documented. Beyond these areas, the concentrations decrease with distance until they are below their respective MCLs.

3.2 Second Line of Evidence – Geochemical Indicators

Groundwater field parameters, including DO, ORP, pH, temperature, and conductivity, were analyzed in the field during the 2007 sampling events. 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 geochemical indicator results of the February and October 2007, February 2009, and Summer 2010 sampling events and previous sampling events at LHAAP-47 are presented in **Table A-3**.

Dissolved Oxygen: Oxygen is the preferred terminal electron acceptor during aerobic microbial respiration. A DO level less than 500 µg/L is the most favorable condition for anaerobic reductive dechlorination, and anaerobic microbial activity would not tolerate DO levels above 5,000 µg/L (USEPA, 1998). DO levels ranged from 220 µg/L (LHSMW54) to 6,710 µg/L (47WW29) during the February and October 2007 sampling events. In February 2009, DO levels ranged from 250 µg/L to 7,350 µg/L (**Table A-3**). The range of DO levels is for the most part appropriate for anaerobic microbial activity (58 of 64 readings <5,000 µg/L), and most favorable (<500 µg/L) in 11 readings from wells 105, 47WW04, 47WW09, 47WW13, 47WW21, 47WW28, LHSMW38, LHSMW44, and LHSMW54.

Oxygen Reduction Potential: 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 occur in the subsurface. Reductive dechlorination could occur under an ORP level of less than 50 millivolts (mV) (USEPA, 1998). The ORP measurements ranged from -24.6 mV (47WW09 in November 2007) to 6,655 mV (47WW03 in October 2007). Three of 29 ORP readings collected in 2007 were less than 50 mV. In February 2009, ORP measurements ranged from -198.1 to 291.9 mV (**Table A-3**). Of the ten ORP readings collected in 2009, only two were above 50 mV. In 2010, ORP measurements ranged from -46.7 to 117.2 mV. Field measurements in 2004 found lower ORP readings at sampled wells. The 2009 DO and ORP values in the groundwater suggest some areas are favorable for reductive dechlorination.

The elevated DO and ORP values in 2007 suggest that the groundwater is not favorable for complete reductive dechlorination at every well location. However, due to the presence of microbial degradation products which require anaerobic and reductive conditions, and lower DO and ORP levels in 2004, 2009, and 2010 the elevated DO and ORP values in 2007 may not be completely representative of long term groundwater conditions.

Nitrate: Following oxygen, microorganisms preferentially use nitrate as a terminal electron acceptor. Concentrations of nitrate less than 1,000 µg/L are not expected to interfere with anaerobic reductive dechlorination (USEPA, 1998) of chlorinated ethanes and ethanes. 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 degradation. In February 2007, nitrate concentrations ranged from non detect in three wells to 980 µg/L in 47WW13, and nitrite concentrations ranged from non detect to 20 µg/L in 47WW13 (**Table A-3**). In February 2009, nitrate concentration ranged from non detect to 159 µg/L, and nitrite was not detected. In 2010, nitrate concentrations ranged from non detect to 570 µg/L, and nitrite was not detected. Previous nitrate and nitrite results from 1996 indicated concentrations of both nitrate and nitrite were mostly below the detection limit. Thus, nitrate reduction is not a likely mode of microbial respiration at the site, and the lack of nitrate is favorable for achieving the highly reducing conditions ideal for anaerobic reductive dechlorination.

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 1,000 µg/L suggest the iron-reducing conditions are likely established (USEPA, 1998). Reductive dechlorination cannot occur under iron-reducing conditions, which are favorable for perchlorate degradation. During the February 2007 sampling event, elevated levels of ferrous iron above 1,000 µg/L were not observed (**Table A-3**). In 2010, ferrous iron concentrations ranged from 0 to 3,300 µg/L, with two wells, 47WW21 and 47WW27, showing ferrous iron above 1,000 µg/L. The results of ferrous iron suggest that ferric iron has either been depleted in the past or has not yet been used as an electron acceptor at LHAAP-47. The results indicate ferric iron is not a likely mode of microbial respiration at the 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 20,000 µg/L may cause competitive exclusion of reductive dechlorination (USEPA, 1998), but no significant effect on perchlorate degradation. Perchlorate degradation occurs under nitrate-reducing conditions which could not be interfered by sulfate reduction. Furthermore, TCE can be transformed via biogeochemical pathways under elevated iron and sulfate concentrations (USAFCEE, 2003). **Table A-3** indicates that the sulfate concentrations at LHAAP-47 in February 2007 ranged from 160,000 µg/L in 47WW14 to 1,440,000 µg/L in 47WW13. Sulfide was not detected in the 2007 samples. This data suggest that sulfate reducing conditions are not favorable in the wells sampled in February 2007. In February 2009, sulfate concentrations ranged from 26,900 to 2,210,000 µg/L. In 2010, sulfate concentrations ranged from 35,800 to 1,540,000 µg/L. Sulfate concentrations in samples from 1996 ranged from non detect up to 2,029,000 µg/L with most of the low sulfate levels in wells at the north end of LHAAP-47. Concentrations between different years were at comparable levels. Much of the site groundwater is not favorable for sulfate reducing conditions at this time.

Methane: Methanogenesis occurs in highly reducing conditions and an accumulation of methane above 500 µg/L is considered to be methanogenic conditions (USEPA, 1998). During the February 2007 sampling event, methane concentrations ranged from non detect to 44.8 µg/L. In February 2009, methane concentrations ranged from non detect to 31.5 µg/L. In 2010, methane concentrations ranged from non detect to 271 µg/L. Thus, methanogenic conditions were not observed (**Table A-3**).

Ethane and Ethene: Ethane and ethene are the end products of reductive dechlorination of chlorinated ethenes. Ethane and ethene were detected at very low concentrations, 0.62 J µg/L and 2.7 µg/L, respectively, at only one well (LHSMW43) in February 2007 with all other results being non detect. In February 2009, ethane was not detected and ethene was detected at very low estimated concentrations, 2.06 µg/L, with all other results being non detect. In 2010, ethane was not detected and ethene was detected only at 47WW13 at 27.4 µg/L. The detection of ethane and ethene suggests that complete reductive dechlorination has occurred in the groundwater at LHAAP-47 (**Table A-3**).

*Chloride***:** Elevated chloride levels more than two times above the background concentrations may be evidence that degradation of chlorinated compounds are occurring. During the February 2007 sampling, chloride concentrations ranged from 13,000 µg/L to 726,000 µg/L at 47WW13 and 47WW30, respectively. In February 2009, chloride concentrations ranged from 12,200 µg/L to 833,000 µg/L (**Table A-3**). In 2010, chloride concentrations ranged from 9,370 to 674,000 µg/L. The background chloride level calculated for the Group 4 Remedial Investigation was 1,416,000 µg/L (Jacobs, 2002). Therefore, the background chloride concentration is too high to determine any influence by the degradation of the COCs.

Total Organic Carbon: Regardless of the electron acceptor being used, organic carbon is a required source of reduced carbon and energy to sustain microbial activity. TOC concentrations greater than 20,000 µg/L are considered adequate to support microbial activity (USEPA, 1998). In the wells sampled in February 2007, TOC ranged from 2,000 µg/L in 47WW30 to 6,000 µg/L in 47WW09 at LHAAP-47 in the shallow groundwater zone. In February 2009, TOC ranged from 7,500 µg/L to 31,700 µg/L (**Table A-3**). In 2010, TOC ranged from 3,850 to 20,300 µg/L. Although the TOC levels are mostly lower than the USEPA suggested concentrations, data suggest that TOC levels are adequate to sustain reductive dechlorination in the groundwater at this time.

pH: Optimal pH range for microbial activity is between 6 and 8 standard units. The pH within the groundwater ranged from 6.1 to 7.3 standard units during the February 2007 sampling event. In October and November 2007, pH values ranged from 5.15 to 6.99 standard units. In February 2009, pH values ranged from 5.4 to 7.32 standard units (**Table A-3**). In 2010, pH values ranged from 5.48 to 7.57 standard units. The pH values at LHAAP-47 are generally within the optimal range (43 of 57 readings) to support biodegradation. The exceptions showed acidic water with pH <6.0 in the shallowest wells, but still above a pH of 5.0.

3.3 Third Line of Evidence – Attenuation and Degradation Rates and Microbial Analysis

Natural attenuation rate estimation and microbial analysis provide evidence supporting the third line of evidence for the groundwater at LHAAP-47.

3.3.1 Natural Attenuation Rate Estimation

Attenuation rates were computed and evaluated in accordance with the USEPA guidance material (USEPA, 1998). Time-dependent attenuation rate constants and estimated in-well cleanup times were determined based on TCE and perchlorate concentration data over time from individual wells assuming first order degradation kinetics. Attenuation rates were calculated for the monitoring wells with the highest concentrations for which the available data allow such a calculation. This attenuation rate estimation incorporates all of the attenuation pathways, but cannot determine which pathway accounts for what portion of the attenuation.

Perchlorate: A time-dependent attenuation rate constant for perchlorate was calculated for well 47WW11 with a current concentration of 387 µg/L and available sequential data. The time-dependent attenuation rate at 47WW11 is 0.000936 per day. The cleanup time to achieve the cleanup level for perchlorate (26 µg/L) at monitoring well 47WW11 is 7.9 years (**Table A-5**) based on the attenuation half-life of 2.0 years.

A time-dependent attenuation rate constant for perchlorate was calculated for well 47WW26 with a current concentration of 840 µg/L and available sequential data. The time-dependent attenuation rate at 47WW26 is 0.000147 per day. The cleanup time to achieve the cleanup level for perchlorate (26 µg/L) at monitoring well 47WW26 is 65 years (**Table A-5**) based on the attenuation half-life of 13 years.

A time-dependent attenuation rate constant for perchlorate was calculated for well 47WW27 with a current concentration of 168 µg/L and available sequential data. The time-dependent attenuation rate at 47WW27 is 0.000253 per day. The cleanup time to achieve the cleanup level for perchlorate (26 µg/L) at monitoring well 47WW26 is 20 years (**Table A-5**) based on the attenuation half-life of 7.5 years.

A time-dependent attenuation rate constant for perchlorate was calculated for well LHSMW60 with a current concentration of 56,600 µg/L and available sequential data. The time-dependent attenuation rate at LHSMW60 is 0.000710 per day. The cleanup time to achieve the cleanup level for perchlorate (26 µg/L) at monitoring well 47WW26 is 30 years (**Table A-5**) based on the attenuation half-life of 2.7 years.

Perchlorate was not detected in the most recent samples from wells LHSMW42, but that well had an elevated perchlorate concentration in the past and a time-dependent attenuation rate constant was calculated. The time-dependent attenuation rate at well LHSMW42 is 0.00205 per day, and an equivalent half-life is 0.93 years (**Table A-5**).

Figure A-12 shows the curves for 47WW11, 47WW26, 47WW27, and LHSMW60.

PCE: A time-dependent attenuation rate constant was not calculated for PCE in well 47WW09 since the most recent estimated concentration of PCE (9.08 µg/L) is down from the high of 13 µg/L, but the trend is mixed or rising. Time-dependent attenuation rate constants were calculated for wells LHSMW30 and LHSMW34 because PCE has decreased in the most recent samples from those wells to non detect levels. The time-dependent attenuation rate at LHSMW30 is 0.00163 per day with an equivalent half life of 1.2 years (**Table A-5**). The time-dependent attenuation rate at LHSMW34 is 0.000374 per day with an equivalent half-life of 5.1 years (**Table A-5**). A time-dependent attenuation rate constant for PCE was calculated for LHSMW43 with a current concentration of 38.4 µg/L and available sequential data. The time-dependent attenuation rate at LHSMW43 is 0.0000921 per day. The cleanup time to achieve the MCL for PCE (5 µg/L) at monitoring well LHSMW43 is 61 years based on the estimated half-life of 21 years.

TCE: A time-dependent attenuation rate constant for TCE was calculated for well 47WW05 with a 2007 concentration of 759 µg/L and available sequential data (**Figure A-13**). The time-dependent attenuation rate at 47WW05 is 0.000277 per day. The cleanup time to achieve the MCL for TCE (5 µg/L) at monitoring well 47WW05 is 50 years (**Table A-5**) based on the estimated half-life of 6.9 years.

A time-dependent attenuation rate constant for TCE was calculated for well 47WW13 with a 2010 concentration of 647 µg/L and available sequential data (**Figure A-14**). The time-dependent attenuation rate at 47WW13 is 0.0000721 per day. The cleanup time to achieve the MCL for TCE (5 µg/L) at monitoring well 47WW13 is 185 years (**Table A-5**) based on the estimated half-life of 26 years.

A time-dependent attenuation rate constant for TCE was calculated for well 47WW14 with a 2010 concentration of 353 µg/L and available sequential data (**Figure A-14**). The time-dependent attenuation rate at 47WW14 is 0.000175 per day. The cleanup time to achieve the MCL for TCE (5 µg/L) at monitoring well 47WW14 is 67 years (**Table A-5**) based on the estimated half-life of 11 years.

A time-dependent attenuation rate constant for TCE was calculated for well 47WW34 with a 2010 concentration of 1,340 µg/L and available sequential data (**Figure A-13**). The time-dependent attenuation rate at 47WW34 is 0.000795 per day. The cleanup time to achieve the MCL for TCE (5 µg/L) at monitoring well 47WW34 is 19 years (**Table A-5**) based on the estimated half-life of 2.4 years.

A time-dependent attenuation rate constant for TCE was calculated for well LHSMW43 with a 2009 concentration of 6,240 µg/L and available sequential data (**Figure A-13**). The time-dependent attenuation rate at LHSMW43 is 0.000209. The cleanup time to achieve the MCL for TCE (5 µg/L) at monitoring well LHSMW43 is 93 years (**Table A-5**) based on the estimated half-life of 9.1 years.

A time-dependent attenuation rate constant for TCE was calculated for well LHSMW48 with a 1998 concentration of 220 µg/L and available sequential data (**Figure A-14**). The time-dependent attenuation rate at LHSMW48 is 0.000588 per day. The cleanup time to achieve the MCL for TCE (5 µg/L) at monitoring well LHSMW48 is 18 years (**Table A-5**) based on the estimated half-life of 3.2 years.

A time-dependent attenuation rate constant for TCE was calculated for well LHSMW49 with a 1998 concentration of 67 µg/L and available sequential data (**Figure A-15**). The time-dependent attenuation rate at LHSMW49 is 0.000411 per day. The cleanup time to achieve the MCL for TCE (5 µg/L) at monitoring well 47WW14 is 17 years (**Table A-5**) based on the estimated half-life of 4.6 years.

Time-dependent attenuation rate constants, but not estimated cleanup times, were calculated for wells 47WW21, 47WW23, 47WW33, LHSMW34, LHSMW41, and LHSMW55. These wells contained past elevated COC concentrations (8 to 30 µg/L) with the most recent results falling below the detection limit. The time-dependent attenuation rates ranged from 0.000216 to 0.00188 per day. Equivalent half-lives would be 8.8 to 1.0 years (**Table A-5**).

Time-dependent attenuation rate constants were not calculated for wells 47WW12 and 47WW16. These wells had TCE concentrations above the MCL in the first of two samples, but TCE was not detected or less than the MCL in the second, more recent sample.

3.3.2 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 February 2007 sampling event, DHC was observed at a low level of 15 cells per milliliter (cells/mL) in well 47WW14. In February 2009, DHC levels were higher than in 2007 and ranged from 900 to 39,000 cells/mL. In 2010, DHC levels were all below detectable levels (**Table A-3**). The presence of the dechlorinating microorganisms coupled with the presence of daughter products in February 2007 and February 2009 adds to the evidence that localized areas at LHAAP-47 are able to support reductive dechlorination.

4.0 Summary of Results and Conclusions

Historical perchlorate and VOC data and geochemical indicators were evaluated for the groundwater at LHAAP-47 to determine if MNA can be used as a feasible remedy for chlorinated solvents and perchlorate present in the groundwater. Preliminary screening of multiple wells within the TCE plume indicated limited evidence for anaerobic biodegradation, and a more detailed evaluation was made. A tiered approach using three lines of evidence was used to demonstrate 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 rates and microbial analysis. The results of the tiered evaluation and the conclusions are summarized below.

The COCs exceeding MCLs or GW-Ind at LHAAP-47 are TCE, cis-1,2-DCE, 1,1-DCE, VC, PCE, and perchlorate in the groundwater. These COCs were present in wells designated as shallow, shallow/intermediate, and intermediate. These zones are interconnected at LHAAP-47 and the groundwater in these wells is treated as one interconnected groundwater zone. Wells designated as deep are not affected.

First line of evidence: Historical analytical trends indicate the occurrence of perchlorate biodegradation at LHAAP-47. In several wells, TCE, cis-1,2-DCE, 1,1-DCE, VC, PCE, and perchlorate exhibited decreasing trends, suggesting natural attenuation is effectively controlling the contaminants in the groundwater. The elevated concentrations of TCE and cis-1,2-DCE suggest that although MNA may be reducing concentrations, the time for TCE to reach its MCL would be more than 100 years. Wells designated as deep have no detectable COCs in them. A thick clay layer above the deep groundwater zone appears to be preventing further vertical migration of contaminants. Downgradient and upgradient wells have COC concentrations less than the MCLs or the GW-Ind (perchlorate), so the groundwater plumes are bounded horizontally.

Second line of evidence: The qualitative assessment of the geochemical indicators in the groundwater at LHAAP-47 presents evidence that geochemical conditions are adequate for the reductive dechlorination of TCE and cis-1,2-DCE in localized areas. The elevated DO, ORP, and sulfate values observed throughout the site suggest that the groundwater is aerobic and oxidative. The TOC concentrations observed at LHAAP-47 are at levels able to support microbial activity, although the site groundwater conditions are not favorable everywhere to reduce such elevated COC levels. Localized pockets of groundwater near wells 105, 47WW09, LHSMW43, and LHSMW45, have been observed with conditions that are more favorable for reductive dechlorination. Therefore, an evaluation of the second line of evidence demonstrates that MNA is occurring in limited areas, although most of the site is not favorable for the complete reduction of COCs in groundwater at LHAAP-47 at this time.

Third line of evidence: An important indicator of reductive dechlorination is the presence of DHC which is the only known species capable of complete dechlorination of TCE. During the February 2007 sampling event, DHC was observed in one well, 47WW14, at 15 cells/mL. During the February 2009 sampling event, DHC was observed in all five wells sampled (105, 47WW09, 47WW13, LHSMW45, LHSMW50) at 900 to 39,000 cells/mL. The presence of the dechlorinating microorganisms and TCE, coupled with the production of TCE daughter products is further evidence that site conditions are conducive for the reduction of site COCs via natural attenuation in localized areas.

Time-dependent in-well natural attenuation rates were calculated for perchlorate and TCE. Perchlorate attenuation rates range from 0.000147 to 0.00205 day^{-1} in the groundwater, and the estimated time to achieve GW-Ind ranges from 7.9 to 65 years. In the groundwater, TCE attenuation rates ranged from 0.0000721 to 0.00188 day^{-1}, with the estimated times to reach the MCL ranging from 17 to 185 years.

Conclusion: Reductions in concentrations of perchlorate, TCE, and other VOCs demonstrate that natural attenuation is occurring in the groundwater at LHAAP-47. Even though natural attenuation may not be currently active in some individual monitoring wells (rising or mixed TCE concentrations at 47WW09, 47WW25, LHSMW45, and LHSMW56), by evaluating the trends at monitoring wells with some of the highest TCE concentrations, it has been demonstrated that attenuation is occurring. Reduction of COC concentrations is occurring by reductive dechlorination at some locations, but is also occurring through other natural attenuation processes including dispersion, dilution, and sorption as shown by reduction of concentration with distance. Thus, this evaluation concludes natural attenuation is occurring at LHAAP-47. The time period required for natural attenuation is long (estimated up to 185 years), but the affected groundwater is not in use, and is not expected to be used in the future over that time period.

5.0 References

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Tables

Table A-1
Summary of Perchlorate Analytical Results
LHAAP-47

ZONE	LOCATION	DATE	SAMPLE_NO	PURP	Perchlorate (µg/L)	Qual	VQ	RC	DF
SHALLOW	105	9/21/2002	105-020921	REG	1.45	U	U		1
SHALLOW	47WW01	11/7/1998	47WW01-981107	REG	1	<	U		1
SHALLOW	47WW01	11/7/1998	47WW01-981107FD	FD	1	<	U		1
SHALLOW	47WW02	11/4/1998	47WW02-981104	REG	1	<	U		1
SHALLOW	47WW03	11/5/1998	47WW03-981105	REG	1	<	U		1
SHALLOW	47WW04	11/5/1998	47WW04-981105	REG	1	<	U		1
SHALLOW	47WW04	8/6/2010	47WW04-100806	REG	0.1	U	U		1
SHALLOW	47WW05	11/9/1998	47WW05-981109	REG	1	<	U		1
SHALLOW	47WW05	9/1/2004	47WW05-040901	REG	1	U	U		1
SHALLOW/INTERMEDIATE	47WW06	11/6/1998	47WW06-981106	REG	1	<	U		1
SHALLOW/INTERMEDIATE	47WW06	9/1/2004	47WW06-040901	REG	1	U	U		1
SHALLOW	47WW08	11/4/1998	47WW08-981104	REG	1	<	U		1
SHALLOW/INTERMEDIATE	47WW09	11/4/1998	47WW09-981104	REG	1	<	U		1
SHALLOW/INTERMEDIATE	47WW09	2/21/2007	47WW09-FEB2007	REG	4	U	U		1
SHALLOW/INTERMEDIATE	47WW09	8/3/2010	47WW09-100803	REG	0.1	U	U		1
SHALLOW	47WW11	11/7/1998	47WW11-981107	REG	*2400*				100
SHALLOW	47WW11	5/24/2000	47WW11-000524	REG	*146*		J		5
SHALLOW	47WW11	5/24/2000	47WW11-000524	REG	*936*		J		5
SHALLOW	47WW11	10/3/2000	47WW11-001003	REG	*100*				2
SHALLOW	47WW11	2/12/2001	47WW11-010212	REG	*394*				4
SHALLOW	47WW11	3/8/2002	47WW11-020308	REG	*836*				25
SHALLOW	47WW11	9/21/2002	47WW11-020921	REG	*387*				20
SHALLOW	47WW12	11/4/1998	47WW12-981104	REG	1	<	U		1
SHALLOW	47WW13	11/4/1998	47WW13-981104	REG	1	<	U		1
SHALLOW	47WW13	9/2/2004	47WW13-040902	REG	1	U	U		1
SHALLOW	47WW13	2/20/2007	47WW13-FEB2007	REG	4	U	U		1
SHALLOW	47WW13	8/4/2010	47WW13-100804	REG	0.1	U	U		1
SHALLOW/INTERMEDIATE	47WW14	11/4/1998	47WW14-981104	REG	1	<	U		1
SHALLOW/INTERMEDIATE	47WW14	9/2/2004	47WW14-040902	REG	1	U	U		1
SHALLOW/INTERMEDIATE	47WW14	2/20/2007	47WW14-FEB2007	REG	4	U	U		1
SHALLOW/INTERMEDIATE	47WW14	2/20/2007	47WW14-FEB2007FD	FD	4	U	U		1
SHALLOW/INTERMEDIATE	47WW14	8/4/2010	47WW14-100804	REG	0.1	U	U		1
SHALLOW/INTERMEDIATE	47WW14	8/4/2010	47WW14-100804-FD	FD	0.1	U	U		1
SHALLOW	47WW16	11/4/1998	47WW16-981104	REG	1	<	U		1
SHALLOW	47WW17	11/9/1998	47WW17-981109	REG	1	<	U		1

Table A-1
Summary of Perchlorate Analytical Results
LHAAP-47

ZONE	LOCATION	DATE	SAMPLE_NO	PURP	Perchlorate (µg/L)	Qual	VQ	RC	DF
SHALLOW	47WW18	11/6/1998	47WW18-981106	REG	1	<	U		1
SHALLOW	47WW18	11/6/1998	47WW18-981106FD	FD	1	<	U		1
SHALLOW	47WW18	3/8/2002	47WW18-020308	REG	4	U	U		1
SHALLOW	47WW18	3/8/2002	47WW18-020308FD	FD	4	U	U		1
SHALLOW	47WW18	9/22/2002	47WW18-020922	REG	1.45	U	U		1
INTERMEDIATE	47WW19	11/6/1998	47WW19-981106	REG	1	<	U		1
INTERMEDIATE	47WW19	3/8/2002	47WW19-020308	REG	4	U	U		1
INTERMEDIATE	47WW19	9/22/2002	47WW19-020922	REG	1.45	U	U		1
SHALLOW	47WW21	11/5/1998	47WW21-981105	REG	1	<	U		1
SHALLOW	47WW21	3/9/2002	47WW21-020309	REG	4	U	U		1
SHALLOW	47WW21	9/22/2002	47WW21-020922	REG	1.45	U	U		1
SHALLOW	47WW21	7/31/2010	47WW21-103107 *	REG	0.1	U	U		1
SHALLOW	47WW22	11/5/1998	47WW22-981105	REG	1	<	U		1
SHALLOW/INTERMEDIATE	47WW23	11/5/1998	47WW23-981105	REG	1	<	U		1
SHALLOW/INTERMEDIATE	47WW23	11/5/1998	47WW23-981105FD	FD	1	<	U		1
SHALLOW/INTERMEDIATE	47WW23	3/9/2002	47WW23-020309	REG	4	U	U		1
SHALLOW/INTERMEDIATE	47WW23	9/22/2002	47WW23-020922	REG	1.45	U	U		1
SHALLOW/INTERMEDIATE	47WW23	8/6/2010	47WW23-100806	REG	0.1	U	U		1
SHALLOW	47WW24	12/20/2000	47WW24-001220	REG	0.3	<	U		1
SHALLOW	47WW25	12/20/2000	47WW25-001220	REG	0.3	<	U		1
SHALLOW	47WW25	4/3/2009	47WW25-040309	REG	0.44	U	U		1
SHALLOW	47WW26	12/20/2000	47WW26-001220	REG	*871*				10
SHALLOW	47WW26	3/8/2002	47WW26-020308	REG	*671*				25
SHALLOW	47WW26	9/21/2002	47WW26-020921	REG	*840*				50
SHALLOW	47WW27	12/19/2000	47WW27-001219	REG	*2460*				100
SHALLOW	47WW27	12/19/2000	47WW27-001219FD	FD	*2790*				100
SHALLOW	47WW27	3/9/2002	47WW27-020309	REG	*164*				10
SHALLOW	47WW27	9/21/2002	47WW27-020921	REG	*368*				20
SHALLOW	47WW27	10/18/2007	47WW27-101807	REG	*1170*				15
SHALLOW	47WW27	7/31/2010	47WW27-103107 *	REG	*168*				1
SHALLOW	47WW28	9/1/2004	47WW28-040901	REG	1	U	U		1
SHALLOW	47WW28	10/17/2007	47WW28-101707	REG	1	U	U		1
SHALLOW	47WW28	7/31/2010	47WW28-103107 *	REG	0.302				1
INTERMEDIATE	47WW29	9/1/2004	47WW29-040901	REG	1	U	U		1
INTERMEDIATE	47WW29	10/17/2007	47WW29-101707	REG	1	U	U		1

Table A-1
Summary of Perchlorate Analytical Results
LHAAP-47

ZONE	LOCATION	DATE	SAMPLE_NO	PURP	Perchlorate (µg/L)	Qual	VQ	RC	DF
INTERMEDIATE	47WW29	7/31/2010	47WW29-103107 *	REG	0.1	U	U		1
INTERMEDIATE	47WW29	7/31/2010	47WW29-103107-FD *	FD	0.1	U	U		1
SHALLOW	47WW30	9/1/2004	47WW30-040901	REG	1	U	U		1
SHALLOW	47WW30	2/22/2007	47WW30-FEB2007	REG	4	U	U		1
SHALLOW	47WW30	8/4/2010	47WW30-100804	REG	1.47				1
SHALLOW/INTERMEDIATE	47WW31	9/2/2004	47WW31-040902	REG	1	U	U		1
INTERMEDIATE	47WW34	8/3/2010	47WW34-100803	REG	0.1	U	U		1
INTERMEDIATE	47WW37	9/1/2010	47WW37-100901	REG	6.42				1
INTERMEDIATE	47WW38	9/1/2010	47WW38-100901	REG	*4110*				1
INTERMEDIATE	47WW38	9/1/2010	47WW38-100901-FD	FD	*4520*				1
SHALLOW	LHSMW29	5/19/2000	LHSMW29-000519	REG	1	<	U		1
SHALLOW	LHSMW29	9/30/2000	LHSMW29-000930	REG	8	<	U		2
SHALLOW	LHSMW29	9/30/2000	LHSMW29-000930FD	FD	8	<	U		2
SHALLOW	LHSMW31	5/21/2000	LHSMW31-000521	REG	1	<	U		1
SHALLOW	LHSMW31	10/2/2000	LHSMW31-001002	REG	4	<	U		1
SHALLOW	LHSMW31	10/2/2000	LHSMW31-001002FD	FD	4	<	U		1
SHALLOW	LHSMW32	5/19/2000	LHSMW32-000519	REG	1	<	U		1
SHALLOW	LHSMW32	10/5/2000	LHSMW32-001005	REG	*51*				1
SHALLOW	LHSMW32	2/12/2001	LHSMW32-010212	REG	0.71	<	U		1
SHALLOW	LHSMW42	5/19/2000	LHSMW42-000519	REG	25				1
SHALLOW	LHSMW42	9/30/2000	LHSMW42-000930	REG	8	<	U		2
SHALLOW	LHSMW42	2/12/2001	LHSMW42-010212	REG	*85*				2
SHALLOW	LHSMW42	3/7/2002	LHSMW42-020307	REG	7.1				1
SHALLOW	LHSMW42	9/22/2002	LHSMW42-020922	REG	1.45	U	U		1
SHALLOW	LHSMW43	5/20/2000	LHSMW43-000520	REG	3.6				1
SHALLOW	LHSMW43	10/1/2000	LHSMW43-001001	REG	0.85	<	U		1
SHALLOW	LHSMW43	2/12/2001	LHSMW43-010212	REG	1.4	<	U		2
SHALLOW	LHSMW43	3/7/2002	LHSMW43-020307	REG	0.958	U	U		1
SHALLOW	LHSMW43	9/21/2002	LHSMW43-020921	REG	1.45	U	U		1
SHALLOW	LHSMW43	2/22/2007	LHSMW43-FEB2007	REG	4	U	U		1
SHALLOW	LHSMW46	5/20/2000	LHSMW46-000520	REG	1	<	U		1
SHALLOW	LHSMW46	10/2/2000	LHSMW46-001002	REG	4	<	U		1
SHALLOW	LHSMW46	3/7/2002	LHSMW46-020307	REG	2.28	J	J		1
SHALLOW	LHSMW46	9/23/2002	LHSMW46-020923	REG	29	U	U		20
SHALLOW	LHSMW47	5/20/2000	LHSMW47-000520	REG	1	<	U		1

Table A-1
Summary of Perchlorate Analytical Results
LHAAP-47

ZONE	LOCATION	DATE	SAMPLE_NO	PURP	Perchlorate (µg/L)	Qual	VQ	RC	DF
SHALLOW	LHSMW47	10/2/2000	LHSMW47-001002	REG	4	<	U		1
SHALLOW	LHSMW47	3/7/2002	LHSMW47-020307	REG	0.958	U	U		1
SHALLOW	LHSMW47	9/23/2002	LHSMW47-020923	REG	1.45	U	U		1
SHALLOW	LHSMW48	5/20/2000	LHSMW48-000520	REG	1	<	U		1
SHALLOW	LHSMW48	5/20/2000	LHSMW48-000520FD	FD	1	<	U		1
SHALLOW	LHSMW48	10/5/2000	LHSMW48-001005	REG	0.85	<	U		1
SHALLOW	LHSMW49	10/2/2000	LHSMW49-001002	REG	0.85	<	U		1
SHALLOW	LHSMW53	10/22/1998	LHSMW53-981022	REG	*42.9*				1
SHALLOW	LHSMW53	5/20/2000	LHSMW53-000520	REG	0.97		J		1
SHALLOW	LHSMW53	5/24/2000	LHSMW53-000524	REG	3.6				?
SHALLOW	LHSMW53	9/14/2000	LHSMW53-000914	REG	0.85	<	U		1
SHALLOW	LHSMW53	2/12/2001	LHSMW53-010212	REG	0.71	<	U		1
SHALLOW	LHSMW53	3/9/2002	LHSMW53-020309	REG	9.32				1
SHALLOW	LHSMW53	9/23/2002	LHSMW53-020923	REG	29	U	U		20
INTERMEDIATE	LHSMW54	5/21/2000	LHSMW54-000521	REG	1	<	U		1
INTERMEDIATE	LHSMW54	3/9/2002	LHSMW54-020309	REG	0.958	U	U		1
INTERMEDIATE	LHSMW54	9/21/2002	LHSMW54-020921	REG	1.45	U	U		1
INTERMEDIATE	LHSMW54	10/17/2007	LHSMW54-101707	REG	0.5	U	U		1
INTERMEDIATE	LHSMW54	8/6/2010	LHSMW54-100806	REG	0.1	U	U		1
SHALLOW	LHSMW55	3/8/2002	LHSMW55-020308	REG	0.958	U	U		1
SHALLOW	LHSMW55	9/23/2002	LHSMW55-020923	REG	1.45	U	U		1
SHALLOW	LHSMW56	3/8/2002	LHSMW56-020308	REG	0.958	U	U		1
SHALLOW	LHSMW56	9/21/2002	LHSMW56-020921	REG	1.45	U	U		1
SHALLOW	LHSMW56	4/3/2009	LHSMW56-040309	REG	0.44	U	U		1
SHALLOW	LHSMW57	5/20/2000	LHSMW57-000520	REG	1	<	U		1
SHALLOW	LHSMW57	3/8/2002	LHSMW57-020308	REG	0.958	U	U		1
SHALLOW	LHSMW57	9/24/2002	LHSMW57-020924	REG	29	U	U		20
SHALLOW/INTERMEDIATE	LHSMW60	10/22/1998	LHSMW60-981022	REG	*82900*				1000
SHALLOW/INTERMEDIATE	LHSMW60	5/23/2000	LHSMW60-000523	REG	*23500*				1000
SHALLOW/INTERMEDIATE	LHSMW60	5/23/2000	LHSMW60-000523FD	FD	*24400*				1000
SHALLOW/INTERMEDIATE	LHSMW60	9/13/2000	LHSMW60-000913	REG	*72000*				1000
SHALLOW/INTERMEDIATE	LHSMW60	2/10/2001	LHSMW60-010210FD	FD	*67000*				2000
SHALLOW/INTERMEDIATE	LHSMW60	2/10/2001	LHSMW60-010210	REG	*71000*				2000
SHALLOW/INTERMEDIATE	LHSMW60	3/9/2002	LHSMW60-020309	REG	*56700*				5000
SHALLOW/INTERMEDIATE	LHSMW60	9/21/2002	LHSMW60-020921	REG	*72100*				5000

Table A-1
Summary of Perchlorate Analytical Results
LHAAP-47

ZONE	LOCATION	DATE	SAMPLE_NO	PURP	Perchlorate (µg/L)	Qual	VQ	RC	DF
SHALLOW/INTERMEDIATE	LHSMW60	10/18/2007	LHSMW60-101807	REG	0.5	U	U		1
SHALLOW/INTERMEDIATE	LHSMW60	10/18/2007	LHSMW60-101807-QC	FD	0.5	U	U		1
SHALLOW/INTERMEDIATE	LHSMW60	6/22/2010	47-LHSMW60-102206	REG	***63600***				10000
SHALLOW/INTERMEDIATE	LHSMW60	8/30/2010	LHSMW60-100830	REG	***56600***				10000

Notes:

* Sample_NO reads yy/dd/mm

1. Results that exceed 26 µg/L are noted with ***bold and Italic*** text.

DF - Dilution Factor

µg/L - micrograms per liter

RC - reason code

Qual - laboratory data qualifier

VQ - validation data qualifier

< - Same as U.

J - The analyte was positively identified; the reported value is the estimated concentration.

U - Not detected. The analyte was analyzed for, but not detected above the associated reporting limit.

Table A-2
Summary of VOC Analytical Results
LHAAP-47

Location	Date	Sample Number	Purpose	Parameter	Result (µg/L)	Qual	VQ	RC	DF	MCL
105	2/13/1996	105-960213	REG	1,1-Dichloroethene	1	ND	U			7
105	8/22/1996	105-960822	REG	1,1-Dichloroethene	0.2	<	U		1	7
105	5/18/1998	105-980518	REG	1,1-Dichloroethene	1	<	U		1	7
105	2/18/2009	105-021809	REG	1,1-Dichloroethene	0.5	U	U			7
105	7/31/2010	105-103107 *	REG	1,1-Dichloroethene	0.5	U	U			7
47WW01	9/29/1998	47WW01-980929	REG	1,1-Dichloroethene	1	<	U		1	7
47WW01	11/7/1998	47WW01-981107	REG	1,1-Dichloroethene	1	<	U		1	7
47WW01	10/18/2007	47WW01-101807	REG	1,1-Dichloroethene	1	U	UJ	07A	1	7
47WW02	11/4/1998	47WW02-981104	REG	1,1-Dichloroethene	1	<	U		1	7
47WW03	11/5/1998	47WW03-981105	REG	1,1-Dichloroethene	1	<	U		1	7
47WW03	10/17/2007	47WW03-101707	REG	1,1-Dichloroethene	1	U	U		1	7
47WW04	11/5/1998	47WW04-981105	REG	1,1-Dichloroethene	1	<	U		1	7
47WW04	10/18/2007	47WW04-101807	REG	1,1-Dichloroethene	1	U	U		1	7
47WW04	8/6/2010	47WW04-100806	REG	1,1-Dichloroethene	0.5	U	U		1	7
47WW05	11/9/1998	47WW05-981109	REG	1,1-Dichloroethene	40	<	U		40	7
47WW05	9/1/2004	47WW05-040901	REG	1,1-Dichloroethene	5	U	U		1	7
47WW05	10/20/2007	47WW05-102007	REG	1,1-Dichloroethene	0.702	J	J	15	1	7
47WW06	11/6/1998	47WW06-981106	REG	1,1-Dichloroethene	1	<	U		1	7
47WW06	9/1/2004	47WW06-040901	REG	1,1-Dichloroethene	5	U	U		1	7
47WW08	11/4/1998	47WW08-981104	REG	1,1-Dichloroethene	1	<	U		1	7
47WW09	11/4/1998	47WW09-981104	REG	1,1-Dichloroethene	0.87		J		1	7
47WW09	2/21/2007	47WW09-FEB2007	REG	1,1-Dichloroethene	4.6				1	7
47WW09	2/18/2009	47WW09-021809	REG	1,1-Dichloroethene	10	U	U			7
47WW09	8/3/2010	47WW09-100803	REG	1,1-Dichloroethene	5	U	U		1	7
47WW11	11/7/1998	47WW11-981107	REG	1,1-Dichloroethene	4	<	U		4	7
47WW11	5/24/2000	47WW11-000524	REG	1,1-Dichloroethene	1	<	U		1	7
47WW11	10/3/2000	47WW11-001003	REG	1,1-Dichloroethene	1	<	U		1	7
47WW12	11/4/1998	47WW12-981104	REG	1,1-Dichloroethene	0.56		J		1	7
47WW12	4/22/2009	47WW12-042209	REG	1,1-Dichloroethene	0.5	U			1	7
47WW13	11/4/1998	47WW13-981104	REG	1,1-Dichloroethene	7.9				1	7
47WW13	9/2/2004	47WW13-040902	REG	1,1-Dichloroethene	2	J	J	15	1	7
47WW13	2/20/2007	47WW13-FEB2007	REG	1,1-Dichloroethene	4.2				1	7
47WW13	2/17/2009	47WW13-021709	REG	1,1-Dichloroethene	3.64					7
47WW13	2/17/2009	47WW13-021709-FD	FD	1,1-Dichloroethene	3.87					7
47WW13	8/4/2010	47WW13-100804	REG	1,1-Dichloroethene	5.51				1	7
47WW14	11/4/1998	47WW14-981104	REG	1,1-Dichloroethene	6.3				1	7
47WW14	9/2/2004	47WW14-040902	REG	1,1-Dichloroethene	3	J	J	15	1	7
47WW14	2/20/2007	47WW14-FEB2007	REG	1,1-Dichloroethene	3.6				1	7
47WW14	2/20/2007	47WW14-FEB2007FD	FD	1,1-Dichloroethene	3.2				1	7
47WW14	2/19/2009	47WW14-021909	REG	1,1-Dichloroethene	2.24					7
47WW14	2/19/2009	47WW14-021909-FD	FD	1,1-Dichloroethene	2.75					7
47WW14	8/4/2010	47WW14-100804	REG	1,1-Dichloroethene	2.77				1	7
47WW14	8/4/2010	47WW14-100804-FD	FD	1,1-Dichloroethene	2.73				1	7
47WW16	11/4/1998	47WW16-981104	REG	1,1-Dichloroethene	1	<	U		1	7
47WW16	4/22/2009	47WW16-042209	REG	1,1-Dichloroethene	0.5	U			1	7
47WW17	11/9/1998	47WW17-981109	REG	1,1-Dichloroethene	1	<	U		1	7
47WW18	9/29/1998	47WW18-980929	REG	1,1-Dichloroethene	1	<	U		1	7
47WW18	11/6/1998	47WW18-981106	REG	1,1-Dichloroethene	1	<	U		1	7
47WW18	10/18/2007	47WW18-101807	REG	1,1-Dichloroethene	0.756	J	J	15	1	7
47WW18	10/18/2007	47WW18-101807-DUP	FD	1,1-Dichloroethene	0.68	J	J	15	1	7
47WW19	11/6/1998	47WW19-981106	REG	1,1-Dichloroethene	1	<	U		1	7
47WW19	2/19/2009	47WW19-021909	REG	1,1-Dichloroethene	0.5	U	U			7
47WW21	11/5/1998	47WW21-981105	REG	1,1-Dichloroethene	0.52		J		1	7
47WW21	10/18/2007	47WW21-101807	REG	1,1-Dichloroethene	0.566	J	J	15	1	7
47WW21	10/18/2007	47WW21-101807-QC	FD	1,1-Dichloroethene	1	U	U		1	7
47WW21	7/31/2010	47WW21-103107 *	REG	1,1-Dichloroethene	0.5	U	U			7
47WW22	11/5/1998	47WW22-981105	REG	1,1-Dichloroethene	1	<	U		1	7
47WW22	10/18/2007	47WW22-101807	REG	1,1-Dichloroethene	1	U	U		1	7
47WW23	9/29/1998	47WW23-980929	REG	1,1-Dichloroethene	1	<	U		1	7
47WW23	11/5/1998	47WW23-981105	REG	1,1-Dichloroethene	1	<	U		1	7
47WW23	11/5/1998	47WW23-981105FD	FD	1,1-Dichloroethene	1	<	U		1	7
47WW23	10/19/2007	47WW23-101907	REG	1,1-Dichloroethene	1	U	U		1	7

Table A-2
Summary of VOC Analytical Results
LHAAP-47

Location	Date	Sample Number	Purpose	Parameter	Result (µg/L)	Qual	VQ	RC	DF	MCL
47WW23	8/6/2010	47WW23-100806	REG	1,1-Dichloroethene	0.5	U	U		1	7
47WW24	12/20/2000	47WW24-001220	REG	1,1-Dichloroethene	0.2	<	U		1	7
47WW25	12/20/2000	47WW25-001220	REG	1,1-Dichloroethene	*17.1*				1	7
47WW25	10/18/2007	47WW25-101607	REG	1,1-Dichloroethene	*19.3*		J	07A	1	7
47WW25	4/3/2009	47WW25-040309	REG	1,1-Dichloroethene	50	U	U		100	7
47WW26	12/20/2000	47WW26-001220	REG	1,1-Dichloroethene	0.2	<	U		1	7
47WW27	12/19/2000	47WW27-001219	REG	1,1-Dichloroethene	0.2	<	U		1	7
47WW27	12/19/2000	47WW27-001219FD	FD	1,1-Dichloroethene	0.2	<	U		1	7
47WW27	7/31/2010	47WW27-103107 *	REG	1,1-Dichloroethene	0.5	U	U			7
47WW28	9/1/2004	47WW28-040901	REG	1,1-Dichloroethene	5	U	U		1	7
47WW28	10/17/2007	47WW28-101707	REG	1,1-Dichloroethene	1	U	U		1	7
47WW28	7/31/2010	47WW28-103107 *	REG	1,1-Dichloroethene	0.5	U	U			7
47WW29	9/1/2004	47WW29-040901	REG	1,1-Dichloroethene	5	U	U		1	7
47WW29	10/17/2007	47WW29-101707	REG	1,1-Dichloroethene	1	U	U		1	7
47WW29	7/31/2010	47WW29-103107 *	REG	1,1-Dichloroethene	0.5	U	U			7
47WW29	7/31/2010	47WW29-103107-FD *	FD	1,1-Dichloroethene	0.5	U	U			7
47WW30	9/1/2004	47WW30-040901	REG	1,1-Dichloroethene	2	J	J	15	1	7
47WW30	2/22/2007	47WW30-FEB2007	REG	1,1-Dichloroethene	1.9	J			1	7
47WW30	10/18/2007	47WW30-101807	REG	1,1-Dichloroethene	1.94				1	7
47WW30	8/4/2010	47WW30-100804	REG	1,1-Dichloroethene	5	U	U		1	7
47WW31	9/2/2004	47WW31-040902	REG	1,1-Dichloroethene	5	U	U		1	7
47WW31	10/18/2007	47WW31-101807	REG	1,1-Dichloroethene	1	U	U		1	7
47WW32	10/18/2007	47WW32-101807	REG	1,1-Dichloroethene	0.632	J	J	15	1	7
47WW32	7/31/2010	47WW32-103107 *	REG	1,1-Dichloroethene	0.5	U	U			7
47WW33	2/20/2008	47WW33-022008	REG	1,1-Dichloroethene	0.5	U	U		1	7
47WW33	2/20/2008	47WW33-022008-QC	FD	1,1-Dichloroethene	0.5	U	U		1	7
47WW33	3/14/2008	47WW33-031408	REG	1,1-Dichloroethene	0.5	U	U		1	7
47WW33	7/30/2010	47WW33-103007 *	REG	1,1-Dichloroethene	0.5	U	U			7
47WW34	2/19/2008	47WW34-021908	REG	1,1-Dichloroethene	*16.5*				1	7
47WW34	3/14/2008	47WW34-031408	REG	1,1-Dichloroethene	12.5	U	U		25	7
47WW34	2/23/2009	47WW34-022309	REG	1,1-Dichloroethene	*10.9*				1	7
47WW34	8/3/2010	47WW34-100803	REG	1,1-Dichloroethene	5	U	U		1	7
47WW35	10/9/2008	47WW35-100808	REG	1,1-Dichloroethene	0.5	U			1	7
47WW35	10/9/2008	47WW35-100808-QA	FD	1,1-Dichloroethene	0.5	U			1	7
47WW36	10/8/2008	47WW36-100808	REG	1,1-Dichloroethene	0.5	U			1	7
47WW37	9/1/2010	47WW37-100901	REG	1,1-Dichloroethene	0.5	U	U		1	7
47WW38	9/1/2010	47WW38-100901	REG	1,1-Dichloroethene	0.5	U	U		1	7
47WW38	9/1/2010	47WW38-100901-FD	FD	1,1-Dichloroethene	0.5	U	U		1	7
LHSMW28	12/7/1994	LHSMW28-941207	REG	1,1-Dichloroethene	5	<	U		1	7
LHSMW28	2/11/1996	LHSMW28-960211	REG	1,1-Dichloroethene	1	ND	U			7
LHSMW28	8/20/1996	LHSMW28-960820	REG	1,1-Dichloroethene	0.2	<	U		1	7
LHSMW28	5/16/1998	LHSMW28-980516	REG	1,1-Dichloroethene	1	<	U		1	7
LHSMW29	12/7/1994	LHSMW29-941207	REG	1,1-Dichloroethene	5	<	U		1	7
LHSMW29	2/11/1996	LHSMW29-960211	REG	1,1-Dichloroethene	1	ND	U			7
LHSMW29	8/20/1996	LHSMW29-960820	REG	1,1-Dichloroethene	0.2	<	U		1	7
LHSMW29	5/16/1998	LHSMW29-980516	REG	1,1-Dichloroethene	1	<	U		1	7
LHSMW30	12/7/1994	LHSMW30-941207	REG	1,1-Dichloroethene	5	<	U		1	7
LHSMW30	2/12/1996	LHSMW30-960212	REG	1,1-Dichloroethene	1	ND	U			7
LHSMW30	8/20/1996	LHSMW30-960820	REG	1,1-Dichloroethene	0.2	<	U		1	7
LHSMW30	5/16/1998	LHSMW30-980516	REG	1,1-Dichloroethene	1	<	U		1	7
LHSMW31	12/6/1994	LHSMW31-941206	REG	1,1-Dichloroethene	5	<	U		1	7
LHSMW31	12/6/1994	LHSMW31-941206FD	FD	1,1-Dichloroethene	5	<	U		1	7
LHSMW31	2/12/1996	LHSMW31-960212	REG	1,1-Dichloroethene	1	ND	U			7
LHSMW31	8/20/1996	LHSMW31-960820	REG	1,1-Dichloroethene	0.2	<	U		1	7
LHSMW31	8/20/1996	LHSMW31-960820FD	FD	1,1-Dichloroethene	0.2	<	U		1	7
LHSMW31	5/16/1998	LHSMW31-980516	REG	1,1-Dichloroethene	1	<	U		1	7
LHSMW32	12/5/1994	LHSMW32-941205	REG	1,1-Dichloroethene	5	<	U		1	7
LHSMW32	2/12/1996	LHSMW32-960212	REG	1,1-Dichloroethene	1	ND	U			7
LHSMW32	8/20/1996	LHSMW32-960820	REG	1,1-Dichloroethene	0.2	<	U		1	7
LHSMW32	5/17/1998	LHSMW32-980517	REG	1,1-Dichloroethene	1	<	U		1	7
LHSMW33	12/5/1994	LHSMW33-941205	REG	1,1-Dichloroethene	5	<	U		1	7
LHSMW33	2/13/1996	LHSMW33-960213	REG	1,1-Dichloroethene	1	ND	U			7

Table A-2
Summary of VOC Analytical Results
LHAAP-47

Location	Date	Sample Number	Purpose	Parameter	Result (µg/L)	Qual	VQ	RC	DF	MCL
LHSMW33	8/20/1996	LHSMW33-960820	REG	1,1-Dichloroethene	0.2	<	U		1	7
LHSMW33	5/17/1998	LHSMW33-980517	REG	1,1-Dichloroethene	1	<	U		1	7
LHSMW34	12/5/1994	LHSMW34-941205	REG	1,1-Dichloroethene	5	<	U		1	7
LHSMW34	2/13/1996	LHSMW34-960213	REG	1,1-Dichloroethene	1	ND	U			7
LHSMW34	8/20/1996	LHSMW34-960820	REG	1,1-Dichloroethene	0.2	<	U		1	7
LHSMW34	5/17/1998	LHSMW34-980517	REG	1,1-Dichloroethene	1	<	U		1	7
LHSMW34	10/18/2007	LHSMW34-101807	REG	1,1-Dichloroethene	2	U	U		2	7
LHSMW35	12/5/1994	LHSMW35-941205	REG	1,1-Dichloroethene	5	<	U		1	7
LHSMW35	2/8/1996	LHSMW35-960208	REG	1,1-Dichloroethene	1	ND	U			7
LHSMW35	8/20/1996	LHSMW35-960820	REG	1,1-Dichloroethene	0.2	<	U		1	7
LHSMW35	5/17/1998	LHSMW35-980517	REG	1,1-Dichloroethene	6.4				1	7
LHSMW36	12/5/1994	LHSMW36-941205	REG	1,1-Dichloroethene	5	<	U		1	7
LHSMW36	2/13/1996	LHSMW36-960213	REG	1,1-Dichloroethene	1	ND	U			7
LHSMW36	8/22/1996	LHSMW36-960822	REG	1,1-Dichloroethene	0.2	<	U		1	7
LHSMW36	5/17/1998	LHSMW36-980517	REG	1,1-Dichloroethene	1	<	U		1	7
LHSMW36	5/17/1998	LHSMW36-980517FD	FD	1,1-Dichloroethene	1	<	U		1	7
LHSMW36	10/19/2007	47WW36-101907	REG	1,1-Dichloroethene	1	U	UJ	07A	1	7
LHSMW37	12/5/1994	LHSMW37-941205	REG	1,1-Dichloroethene	5	<	U		1	7
LHSMW37	2/8/1996	LHSMW37-960208	REG	1,1-Dichloroethene	1	ND	U			7
LHSMW37	8/22/1996	LHSMW37-960822	REG	1,1-Dichloroethene	0.2	<	U		1	7
LHSMW37	5/17/1998	LHSMW37-980517	REG	1,1-Dichloroethene	1	<	U		1	7
LHSMW37	5/17/1998	LHSMW37-980517FD	FD	1,1-Dichloroethene	1	<	U		1	7
LHSMW38	12/6/1994	LHSMW38-941206	REG	1,1-Dichloroethene	5	<	U		1	7
LHSMW38	2/12/1996	LHSMW38-960212	REG	1,1-Dichloroethene	1	ND	U			7
LHSMW38	8/21/1996	LHSMW38-960821	REG	1,1-Dichloroethene	0.2	<	U		1	7
LHSMW38	8/21/1996	LHSMW38-960821FD	FD	1,1-Dichloroethene	0.2	<	U		1	7
LHSMW38	5/17/1998	LHSMW38-980517	REG	1,1-Dichloroethene	1	<	U		1	7
LHSMW38	5/17/1998	LHSMW38-980517FD	FD	1,1-Dichloroethene	1	<	U		1	7
LHSMW38	7/30/2010	LHSMW38-103007 *	REG	1,1-Dichloroethene	0.5	U	U			7
LHSMW39	12/6/1994	LHSMW39-941206	REG	1,1-Dichloroethene	5	<	U		1	7
LHSMW39	12/6/1994	LHSMW39-941206FD	FD	1,1-Dichloroethene	5	<	U		1	7
LHSMW39	2/10/1996	LHSMW39-960210	REG	1,1-Dichloroethene	*29*					7
LHSMW39	8/22/1996	LHSMW39-960822	REG	1,1-Dichloroethene	0.2	<	U		1	7
LHSMW39	5/18/1998	LHSMW39-980518	REG	1,1-Dichloroethene	*28*				1	7
LHSMW40	12/6/1994	LHSMW40-941206	REG	1,1-Dichloroethene	5	<	U		1	7
LHSMW40	12/6/1994	LHSMW40-941206FD	FD	1,1-Dichloroethene	5	<	U		1	7
LHSMW41	12/8/1994	LHSMW41-941208	REG	1,1-Dichloroethene	5	<	U		1	7
LHSMW41	2/9/1996	LHSMW41-960209	REG	1,1-Dichloroethene	1	ND	U			7
LHSMW41	8/22/1996	LHSMW41-960822	REG	1,1-Dichloroethene	0.2	<	U		1	7
LHSMW41	5/18/1998	LHSMW41-980518	REG	1,1-Dichloroethene	1	<	U		1	7
LHSMW41	2/23/2009	LHSMW41-022309	REG	1,1-Dichloroethene	0.5	U	U			7
LHSMW42	12/6/1994	LHSMW42-941206	REG	1,1-Dichloroethene	5	<	U		1	7
LHSMW42	2/11/1996	LHSMW42-960211	REG	1,1-Dichloroethene	1	ND	U			7
LHSMW42	8/22/1996	LHSMW42-960822	REG	1,1-Dichloroethene	0.2	<	U		1	7
LHSMW42	5/18/1998	LHSMW42-980518	REG	1,1-Dichloroethene	1	<	U		1	7
LHSMW43	12/8/1994	LHSMW43-941208	REG	1,1-Dichloroethene	*27*				1	7
LHSMW43	12/8/1994	LHSMW43-941208FD	FD	1,1-Dichloroethene	5	<	U		1	7
LHSMW43	2/9/1996	LHSMW43-960209	REG	1,1-Dichloroethene	*18*					7
LHSMW43	8/22/1996	LHSMW43-960822	REG	1,1-Dichloroethene	*12.7*				1	7
LHSMW43	8/22/1996	LHSMW43-960822FD	FD	1,1-Dichloroethene	*17.7*				1	7
LHSMW43	5/18/1998	LHSMW43-980518	REG	1,1-Dichloroethene	*17*				1	7
LHSMW43	2/22/2007	LHSMW43-FEB2007	REG	1,1-Dichloroethene	*10.3*				1	7
LHSMW43	2/19/2009	LHSMW43-021909	REG	1,1-Dichloroethene	25	U	U			7
LHSMW44	12/8/1994	LHSMW44-941208	REG	1,1-Dichloroethene	5	<	U		1	7
LHSMW44	2/8/1996	LHSMW44-960208	REG	1,1-Dichloroethene	2					7
LHSMW44	8/22/1996	LHSMW44-960822	REG	1,1-Dichloroethene	0.2	<	U		1	7
LHSMW44	5/18/1998	LHSMW44-980518	REG	1,1-Dichloroethene	3.3				1	7
LHSMW44	7/30/2010	LHSMW44-103007 *	REG	1,1-Dichloroethene	0.526	J	J	15		7
LHSMW45	12/8/1994	LHSMW45-941208	REG	1,1-Dichloroethene	5	<	U		1	7
LHSMW45	12/8/1994	LHSMW45-941208FD	FD	1,1-Dichloroethene	5	<	U		1	7
LHSMW45	2/10/1996	LHSMW45-960210	REG	1,1-Dichloroethene	1	ND	U			7
LHSMW45	8/22/1996	LHSMW45-960822	REG	1,1-Dichloroethene	0.41				1	7

Table A-2
Summary of VOC Analytical Results
LHAAP-47

Location	Date	Sample Number	Purpose	Parameter	Result (µg/L)	Qual	VQ	RC	DF	MCL
LHSMW45	5/18/1998	LHSMW45-980518	REG	1,1-Dichloroethene	1	<	U		1	7
LHSMW45	2/19/2009	LHSMW45-021909	REG	1,1-Dichloroethene	2.63	J	J			7
LHSMW46	12/8/1994	LHSMW46-941208	REG	1,1-Dichloroethene	5	<	U		1	7
LHSMW46	2/8/1996	LHSMW46-960208	REG	1,1-Dichloroethene	1	ND	U			7
LHSMW46	8/22/1996	LHSMW46-960822	REG	1,1-Dichloroethene	0.2	<	U		1	7
LHSMW46	5/18/1998	LHSMW46-980518	REG	1,1-Dichloroethene	1.1				1	7
LHSMW47	12/7/1994	LHSMW47-941207	REG	1,1-Dichloroethene	5	<	U		1	7
LHSMW47	2/8/1996	LHSMW47-960208	REG	1,1-Dichloroethene	1	ND	U			7
LHSMW47	8/22/1996	LHSMW47-960822	REG	1,1-Dichloroethene	0.43				1	7
LHSMW47	5/18/1998	LHSMW47-980518	REG	1,1-Dichloroethene	1	<	U		1	7
LHSMW48	12/9/1994	LHSMW48-941209	REG	1,1-Dichloroethene	*28*				1	7
LHSMW48	8/22/1996	LHSMW48-960822	REG	1,1-Dichloroethene	*32.2*				1	7
LHSMW48	5/19/1998	LHSMW48-980519	REG	1,1-Dichloroethene	2.9				1	7
LHSMW49	12/7/1994	LHSMW49-941207	REG	1,1-Dichloroethene	5	<	U		1	7
LHSMW49	2/9/1996	LHSMW49-960209	REG	1,1-Dichloroethene	1	ND	U			7
LHSMW49	8/22/1996	LHSMW49-960822	REG	1,1-Dichloroethene	1.5				1	7
LHSMW49	5/19/1998	LHSMW49-980519	REG	1,1-Dichloroethene	0.79		J		1	7
LHSMW49	5/19/1998	LHSMW49-980519FD	FD	1,1-Dichloroethene	0.75		J		1	7
LHSMW50	12/9/1994	LHSMW50-941209	REG	1,1-Dichloroethene	5	<	U		1	7
LHSMW50	2/9/1996	LHSMW50-960209	REG	1,1-Dichloroethene	1	ND	U			7
LHSMW50	8/22/1996	LHSMW50-960822	REG	1,1-Dichloroethene	0.2	<	U		1	7
LHSMW50	5/19/1998	LHSMW50-980519	REG	1,1-Dichloroethene	1	<	U		1	7
LHSMW50	2/17/2009	LHSMW50-021709	REG	1,1-Dichloroethene	0.5	U	U			7
LHSMW51	12/11/1994	LHSMW51-941211	REG	1,1-Dichloroethene	5	<	U		1	7
LHSMW51	2/13/1996	LHSMW51-960213	REG	1,1-Dichloroethene	1	ND	U			7
LHSMW51	8/22/1996	LHSMW51-960822	REG	1,1-Dichloroethene	0.2	<	U		1	7
LHSMW51	5/19/1998	LHSMW51-980519	REG	1,1-Dichloroethene	1	<	U		1	7
LHSMW52	12/11/1994	LHSMW52-941211	REG	1,1-Dichloroethene	5	<	U		1	7
LHSMW52	2/9/1996	LHSMW52-960209	REG	1,1-Dichloroethene	1	ND	U			7
LHSMW52	8/22/1996	LHSMW52-960822	REG	1,1-Dichloroethene	0.2	<	U		1	7
LHSMW52	5/19/1998	LHSMW52-980519	REG	1,1-Dichloroethene	1	<	U		1	7
LHSMW53	12/7/1994	LHSMW53-941207	REG	1,1-Dichloroethene	5	<	U		1	7
LHSMW53	2/10/1996	LHSMW53-960210	REG	1,1-Dichloroethene	1	ND	U			7
LHSMW53	8/22/1996	LHSMW53-960822	REG	1,1-Dichloroethene	0.2	<	U		1	7
LHSMW53	5/20/1998	LHSMW53-980520	REG	1,1-Dichloroethene	1	<	U		1	7
LHSMW54	12/9/1994	LHSMW54-941209	REG	1,1-Dichloroethene	5	<	U		1	7
LHSMW54	2/12/1996	LHSMW54-960212	REG	1,1-Dichloroethene	1	ND	U			7
LHSMW54	8/21/1996	LHSMW54-960821	REG	1,1-Dichloroethene	0.2	<	U		1	7
LHSMW54	5/20/1998	LHSMW54-980520	REG	1,1-Dichloroethene	1	<	U		1	7
LHSMW54	10/17/2007	LHSMW54-101707	REG	1,1-Dichloroethene	1	U	U		1	7
LHSMW54	8/6/2010	LHSMW54-100806	REG	1,1-Dichloroethene	1.25	U	U		2.5	7
LHSMW55	12/9/1994	LHSMW55-941209	REG	1,1-Dichloroethene	5	<	U		1	7
LHSMW55	2/10/1996	LHSMW55-960210	REG	1,1-Dichloroethene	1	ND	U			7
LHSMW55	8/22/1996	LHSMW55-960822	REG	1,1-Dichloroethene	0.2	<	U		1	7
LHSMW55	5/20/1998	LHSMW55-980520	REG	1,1-Dichloroethene	1	<	U		1	7
LHSMW56	12/7/1994	LHSMW56-941207	REG	1,1-Dichloroethene	5	<	U		1	7
LHSMW56	2/9/1996	LHSMW56-960209	REG	1,1-Dichloroethene	*30*					7
LHSMW56	8/21/1996	LHSMW56-960821	REG	1,1-Dichloroethene	3.4				1	7
LHSMW56	5/20/1998	LHSMW56-980520	REG	1,1-Dichloroethene	3.5				1	7
LHSMW56	10/20/2007	LHSMW56-102007	REG	1,1-Dichloroethene	*184*		J	07A	1	7
LHSMW56	4/3/2009	LHSMW56-040309	REG	1,1-Dichloroethene	*108*				50	7
LHSMW57	12/9/1994	LHSMW57-941209	REG	1,1-Dichloroethene	5	<	U		1	7
LHSMW57	2/8/1996	LHSMW57-960208	REG	1,1-Dichloroethene	1	ND	U			7
LHSMW57	8/21/1996	LHSMW57-960821	REG	1,1-Dichloroethene	0.2	<	U		1	7
LHSMW57	5/20/1998	LHSMW57-980520	REG	1,1-Dichloroethene	1	<	U		1	7
LHSMW57	2/23/2009	LHSMW57-022309	REG	1,1-Dichloroethene	0.5	U	U			7
LHSMW60	12/11/1994	LHSMW60-941211	REG	1,1-Dichloroethene	5	<	U		1	7
LHSMW60	2/9/1996	LHSMW60-960209	REG	1,1-Dichloroethene	1	ND	U			7
LHSMW60	8/21/1996	LHSMW60-960821	REG	1,1-Dichloroethene	0.2	<	U		1	7
LHSMW60	8/21/1996	LHSMW60-960821FD	FD	1,1-Dichloroethene	0.2	<	U		1	7
LHSMW60	5/20/1998	LHSMW60-980520	REG	1,1-Dichloroethene	1	<	U		1	7
LHSMW60	5/23/2000	LHSMW60-000523	REG	1,1-Dichloroethene	1	<	UJ		1	7

Table A-2
Summary of VOC Analytical Results
LHAAP-47

Location	Date	Sample Number	Purpose	Parameter	Result (µg/L)	Qual	VQ	RC	DF	MCL
LHSMW60	5/23/2000	LHSMW60-000523FD	FD	1,1-Dichloroethene	1	<	UJ		1	7
LHSMW60	10/3/2000	LHSMW60-001003	REG	1,1-Dichloroethene	1	<	U		1	7
LHSMW60	8/30/2010	LHSMW60-100830	REG	1,1-Dichloroethene	0.5	U	U		1	7
105	2/13/1996	105-960213	REG	cis-1,2-Dichloroethene	1	ND	U			70
105	8/22/1996	105-960822	REG	cis-1,2-Dichloroethene	2				1	70
105	5/18/1998	105-980518	REG	cis-1,2-Dichloroethene	1	<	U		1	70
105	2/18/2009	105-021809	REG	cis-1,2-Dichloroethene	1.64					70
105	7/31/2010	105-103107 *	REG	cis-1,2-Dichloroethene	0.71	J	J	15		70
47WW01	9/29/1998	47WW01-980929	REG	cis-1,2-Dichloroethene	1	<	U		1	70
47WW01	11/7/1998	47WW01-981107	REG	cis-1,2-Dichloroethene	1	<	U		1	70
47WW01	10/18/2007	47WW01-101807	REG	cis-1,2-Dichloroethene	1	U	UJ	07A	1	70
47WW02	11/4/1998	47WW02-981104	REG	cis-1,2-Dichloroethene	1	<	U		1	70
47WW03	11/5/1998	47WW03-981105	REG	cis-1,2-Dichloroethene	1	<	U		1	70
47WW03	10/17/2007	47WW03-101707	REG	cis-1,2-Dichloroethene	1	U	U		1	70
47WW04	11/5/1998	47WW04-981105	REG	cis-1,2-Dichloroethene	1	<	U		1	70
47WW04	10/18/2007	47WW04-101807	REG	cis-1,2-Dichloroethene	1	U	U		1	70
47WW04	8/6/2010	47WW04-100806	REG	cis-1,2-Dichloroethene	0.25	U	U		1	70
47WW05	11/9/1998	47WW05-981109	REG	cis-1,2-Dichloroethene	40	<	U		40	70
47WW05	9/1/2004	47WW05-040901	REG	cis-1,2-Dichloroethene	15		JL	11A	1	70
47WW05	10/20/2007	47WW05-102007	REG	cis-1,2-Dichloroethene	6.44				1	70
47WW06	11/6/1998	47WW06-981106	REG	cis-1,2-Dichloroethene	1	<	U		1	70
47WW06	9/1/2004	47WW06-040901	REG	cis-1,2-Dichloroethene	5	U	UJL	11A	1	70
47WW08	11/4/1998	47WW08-981104	REG	cis-1,2-Dichloroethene	1	<	U		1	70
47WW09	11/4/1998	47WW09-981104	REG	cis-1,2-Dichloroethene	*92*				1	70
47WW09	2/21/2007	47WW09-FEB2007	REG	cis-1,2-Dichloroethene	*144*				1	70
47WW09	2/18/2009	47WW09-021809	REG	cis-1,2-Dichloroethene	*127*					70
47WW09	8/3/2010	47WW09-100803	REG	cis-1,2-Dichloroethene	*86.5*				1	70
47WW11	11/7/1998	47WW11-981107	REG	cis-1,2-Dichloroethene	4	<	U		4	70
47WW11	5/24/2000	47WW11-000524	REG	cis-1,2-Dichloroethene	1	<	U		1	70
47WW11	5/24/2000	47WW11-000524	REG	cis-1,2-Dichloroethene	6.3		J		1	70
47WW11	10/3/2000	47WW11-001003	REG	cis-1,2-Dichloroethene	1	<	U		1	70
47WW12	11/4/1998	47WW12-981104	REG	cis-1,2-Dichloroethene	51				1	70
47WW12	4/22/2009	47WW12-042209	REG	cis-1,2-Dichloroethene	0.538	J	J	15	1	70
47WW13	11/4/1998	47WW13-981104	REG	cis-1,2-Dichloroethene	*890*				40	70
47WW13	9/2/2004	47WW13-040902	REG	cis-1,2-Dichloroethene	*1600*	D			10	70
47WW13	2/20/2007	47WW13-FEB2007	REG	cis-1,2-Dichloroethene	*1160*				50	70
47WW13	2/17/2009	47WW13-021709	REG	cis-1,2-Dichloroethene	*1010*					70
47WW13	2/17/2009	47WW13-021709-FD	FD	cis-1,2-Dichloroethene	*1010*					70
47WW13	8/4/2010	47WW13-100804	REG	cis-1,2-Dichloroethene	*1440*				1	70
47WW14	11/4/1998	47WW14-981104	REG	cis-1,2-Dichloroethene	*730*				40	70
47WW14	9/2/2004	47WW14-040902	REG	cis-1,2-Dichloroethene	*120*				1	70
47WW14	2/20/2007	47WW14-FEB2007	REG	cis-1,2-Dichloroethene	*334*				5	70
47WW14	2/20/2007	47WW14-FEB2007FD	FD	cis-1,2-Dichloroethene	*359*				50	70
47WW14	2/19/2009	47WW14-021909	REG	cis-1,2-Dichloroethene	*102*					70
47WW14	2/19/2009	47WW14-021909-FD	FD	cis-1,2-Dichloroethene	*111*					70
47WW14	8/4/2010	47WW14-100804	REG	cis-1,2-Dichloroethene	*140*				1	70
47WW14	8/4/2010	47WW14-100804-FD	FD	cis-1,2-Dichloroethene	*133*				1	70
47WW16	11/4/1998	47WW16-981104	REG	cis-1,2-Dichloroethene	1.4				1	70
47WW16	4/22/2009	47WW16-042209	REG	cis-1,2-Dichloroethene	0.25	U			1	70
47WW17	11/9/1998	47WW17-981109	REG	cis-1,2-Dichloroethene	1	<	U		1	70
47WW18	9/29/1998	47WW18-980929	REG	cis-1,2-Dichloroethene	2.1				1	70
47WW18	11/6/1998	47WW18-981106	REG	cis-1,2-Dichloroethene	1.6				1	70
47WW18	10/18/2007	47WW18-101807	REG	cis-1,2-Dichloroethene	5.61				1	70
47WW18	10/18/2007	47WW18-101807-DUP	FD	cis-1,2-Dichloroethene	5.4				1	70
47WW19	11/6/1998	47WW19-981106	REG	cis-1,2-Dichloroethene	1	<	U		1	70
47WW19	2/19/2009	47WW19-021909	REG	cis-1,2-Dichloroethene	0.25	U	U			70
47WW21	11/5/1998	47WW21-981105	REG	cis-1,2-Dichloroethene	7.1				1	70
47WW21	10/18/2007	47WW21-101807	REG	cis-1,2-Dichloroethene	1.99				1	70
47WW21	10/18/2007	47WW21-101807-QC	FD	cis-1,2-Dichloroethene	2.1				1	70
47WW21	7/31/2010	47WW21-103107 *	REG	cis-1,2-Dichloroethene	0.33	J	J	15		70
47WW22	11/5/1998	47WW22-981105	REG	cis-1,2-Dichloroethene	1	<	U		1	70
47WW22	10/18/2007	47WW22-101807	REG	cis-1,2-Dichloroethene	1	U	U		1	70

Table A-2
Summary of VOC Analytical Results
LHAAP-47

Location	Date	Sample Number	Purpose	Parameter	Result (µg/L)	Qual	VQ	RC	DF	MCL
47WW23	9/29/1998	47WW23-980929	REG	cis-1,2-Dichloroethene	21				1	70
47WW23	11/5/1998	47WW23-981105	REG	cis-1,2-Dichloroethene	1	<	U		1	70
47WW23	11/5/1998	47WW23-981105FD	FD	cis-1,2-Dichloroethene	1	<	U		1	70
47WW23	10/19/2007	47WW23-101907	REG	cis-1,2-Dichloroethene	1	U	U		1	70
47WW23	8/6/2010	47WW23-100806	REG	cis-1,2-Dichloroethene	0.25	U	U		1	70
47WW24	12/20/2000	47WW24-001220	REG	cis-1,2-Dichloroethene	0.1	<	U		1	70
47WW25	12/20/2000	47WW25-001220	REG	cis-1,2-Dichloroethene	*1310*		J		1	70
47WW25	10/18/2007	47WW25-101607	REG	cis-1,2-Dichloroethene	*1420*				100	70
47WW25	4/3/2009	47WW25-040309	REG	cis-1,2-Dichloroethene	*942*				100	70
47WW26	12/20/2000	47WW26-001220	REG	cis-1,2-Dichloroethene	0.1	<	U		1	70
47WW27	12/19/2000	47WW27-001219	REG	cis-1,2-Dichloroethene	0.1	<	U		1	70
47WW27	12/19/2000	47WW27-001219FD	FD	cis-1,2-Dichloroethene	0.1	<	U		1	70
47WW27	7/31/2010	47WW27-103107 *	REG	cis-1,2-Dichloroethene	0.25	U	U			70
47WW28	9/1/2004	47WW28-040901	REG	cis-1,2-Dichloroethene	5	U	UJL	11A	1	70
47WW28	10/17/2007	47WW28-101707	REG	cis-1,2-Dichloroethene	1	U	U		1	70
47WW28	7/31/2010	47WW28-103107 *	REG	cis-1,2-Dichloroethene	0.25	U	U			70
47WW29	9/1/2004	47WW29-040901	REG	cis-1,2-Dichloroethene	5	U	UJL	11A	1	70
47WW29	10/17/2007	47WW29-101707	REG	cis-1,2-Dichloroethene	1	U	U		1	70
47WW29	7/31/2010	47WW29-103107 *	REG	cis-1,2-Dichloroethene	0.25	U	U			70
47WW29	7/31/2010	47WW29-103107-FD *	FD	cis-1,2-Dichloroethene	0.25	U	U			70
47WW30	9/1/2004	47WW30-040901	REG	cis-1,2-Dichloroethene	9				1	70
47WW30	2/22/2007	47WW30-FEB2007	REG	cis-1,2-Dichloroethene	6.8				1	70
47WW30	10/18/2007	47WW30-101807	REG	cis-1,2-Dichloroethene	10.4				1	70
47WW30	8/4/2010	47WW30-100804	REG	cis-1,2-Dichloroethene	6.97	J	J	15	1	70
47WW31	9/2/2004	47WW31-040902	REG	cis-1,2-Dichloroethene	5	U	U		1	70
47WW31	10/18/2007	47WW31-101807	REG	cis-1,2-Dichloroethene	1	U	U		1	70
47WW32	10/18/2007	47WW32-101807	REG	cis-1,2-Dichloroethene	0.698	J	J	15	1	70
47WW32	7/31/2010	47WW32-103107 *	REG	cis-1,2-Dichloroethene	0.929	J	J	15		70
47WW33	2/20/2008	47WW33-022008	REG	cis-1,2-Dichloroethene	0.735	J	J	15	1	70
47WW33	2/20/2008	47WW33-022008-QC	FD	cis-1,2-Dichloroethene	0.628	J	J	15	1	70
47WW33	3/14/2008	47WW33-031408	REG	cis-1,2-Dichloroethene	0.25	U	U		1	70
47WW33	7/30/2010	47WW33-103007 *	REG	cis-1,2-Dichloroethene	1.35					70
47WW34	2/19/2008	47WW34-021908	REG	cis-1,2-Dichloroethene	*211*				50	70
47WW34	3/14/2008	47WW34-031408	REG	cis-1,2-Dichloroethene	*183*				25	70
47WW34	2/23/2009	47WW34-022309	REG	cis-1,2-Dichloroethene	*165*					70
47WW34	8/3/2010	47WW34-100803	REG	cis-1,2-Dichloroethene	*136*				1	70
47WW35	10/9/2008	47WW35-100808	REG	cis-1,2-Dichloroethene	0.25	U			1	70
47WW35	10/9/2008	47WW35-100808-QA	FD	cis-1,2-Dichloroethene	0.25	U			1	70
47WW36	10/8/2008	47WW36-100808	REG	cis-1,2-Dichloroethene	0.25	U			1	70
47WW37	9/1/2010	47WW37-100901	REG	cis-1,2-Dichloroethene	1.62				1	70
47WW38	9/1/2010	47WW38-100901	REG	cis-1,2-Dichloroethene	0.25	U	U		1	70
47WW38	9/1/2010	47WW38-100901-FD	FD	cis-1,2-Dichloroethene	0.25	U	U		1	70
LHSMW28	2/11/1996	LHSMW28-960211	REG	cis-1,2-Dichloroethene	1	ND	U			70
LHSMW28	8/20/1996	LHSMW28-960820	REG	cis-1,2-Dichloroethene	0.2	<	U		1	70
LHSMW28	5/16/1998	LHSMW28-980516	REG	cis-1,2-Dichloroethene	1	<	U		1	70
LHSMW29	2/11/1996	LHSMW29-960211	REG	cis-1,2-Dichloroethene	1	ND	U			70
LHSMW29	8/20/1996	LHSMW29-960820	REG	cis-1,2-Dichloroethene	0.2	<	U		1	70
LHSMW29	5/16/1998	LHSMW29-980516	REG	cis-1,2-Dichloroethene	1	<	U		1	70
LHSMW30	2/12/1996	LHSMW30-960212	REG	cis-1,2-Dichloroethene	1	ND	U			70
LHSMW30	8/20/1996	LHSMW30-960820	REG	cis-1,2-Dichloroethene	0.2	<	U		1	70
LHSMW30	5/16/1998	LHSMW30-980516	REG	cis-1,2-Dichloroethene	1	<	U		1	70
LHSMW31	2/12/1996	LHSMW31-960212	REG	cis-1,2-Dichloroethene	1	ND	U			70
LHSMW31	8/20/1996	LHSMW31-960820	REG	cis-1,2-Dichloroethene	0.2	<	U		1	70
LHSMW31	8/20/1996	LHSMW31-960820FD	FD	cis-1,2-Dichloroethene	0.2	<	U		1	70
LHSMW31	5/16/1998	LHSMW31-980516	REG	cis-1,2-Dichloroethene	1	<	U		1	70
LHSMW32	2/12/1996	LHSMW32-960212	REG	cis-1,2-Dichloroethene	1	ND	U			70
LHSMW32	8/20/1996	LHSMW32-960820	REG	cis-1,2-Dichloroethene	0.2	<	U		1	70
LHSMW32	5/17/1998	LHSMW32-980517	REG	cis-1,2-Dichloroethene	1	<	U		1	70
LHSMW33	2/13/1996	LHSMW33-960213	REG	cis-1,2-Dichloroethene	1	ND	U			70
LHSMW33	8/20/1996	LHSMW33-960820	REG	cis-1,2-Dichloroethene	0.2	<	U		1	70
LHSMW33	5/17/1998	LHSMW33-980517	REG	cis-1,2-Dichloroethene	1	<	U		1	70
LHSMW34	2/13/1996	LHSMW34-960213	REG	cis-1,2-Dichloroethene	35.9					70

Table A-2
Summary of VOC Analytical Results
LHAAP-47

Location	Date	Sample Number	Purpose	Parameter	Result (µg/L)	Qual	VQ	RC	DF	MCL
LHSMW34	8/20/1996	LHSMW34-960820	REG	cis-1,2-Dichloroethene	59.3				1	70
LHSMW34	5/17/1998	LHSMW34-980517	REG	cis-1,2-Dichloroethene	*89*				1	70
LHSMW34	10/18/2007	LHSMW34-101807	REG	cis-1,2-Dichloroethene	0.523	J	J	15	2	70
LHSMW35	2/8/1996	LHSMW35-960208	REG	cis-1,2-Dichloroethene	1	ND	U			70
LHSMW35	8/20/1996	LHSMW35-960820	REG	cis-1,2-Dichloroethene	0.2	<	U		1	70
LHSMW35	5/17/1998	LHSMW35-980517	REG	cis-1,2-Dichloroethene	0.82		J		1	70
LHSMW36	2/13/1996	LHSMW36-960213	REG	cis-1,2-Dichloroethene	1	ND	U			70
LHSMW36	8/22/1996	LHSMW36-960822	REG	cis-1,2-Dichloroethene	0.2	<	U		1	70
LHSMW36	5/17/1998	LHSMW36-980517	REG	cis-1,2-Dichloroethene	1	<	U		1	70
LHSMW36	5/17/1998	LHSMW36-980517FD	FD	cis-1,2-Dichloroethene	1	<	U		1	70
LHSMW36	10/19/2007	47WW36-101907	REG	cis-1,2-Dichloroethene	1	U	UJ	07A	1	70
LHSMW37	2/8/1996	LHSMW37-960208	REG	cis-1,2-Dichloroethene	1	ND	U			70
LHSMW37	8/22/1996	LHSMW37-960822	REG	cis-1,2-Dichloroethene	0.2	<	U		1	70
LHSMW37	5/17/1998	LHSMW37-980517	REG	cis-1,2-Dichloroethene	1	<	U		1	70
LHSMW37	5/17/1998	LHSMW37-980517FD	FD	cis-1,2-Dichloroethene	1	<	U		1	70
LHSMW38	2/12/1996	LHSMW38-960212	REG	cis-1,2-Dichloroethene	1	ND	U			70
LHSMW38	8/21/1996	LHSMW38-960821	REG	cis-1,2-Dichloroethene	0.2	<	U		1	70
LHSMW38	8/21/1996	LHSMW38-960821FD	FD	cis-1,2-Dichloroethene	0.2	<	U		1	70
LHSMW38	5/17/1998	LHSMW38-980517	REG	cis-1,2-Dichloroethene	1	<	U		1	70
LHSMW38	5/17/1998	LHSMW38-980517FD	FD	cis-1,2-Dichloroethene	1	<	U		1	70
LHSMW38	7/30/2010	LHSMW38-103007 *	REG	cis-1,2-Dichloroethene	0.25	U	U			70
LHSMW39	2/10/1996	LHSMW39-960210	REG	cis-1,2-Dichloroethene	1	ND	U			70
LHSMW39	8/22/1996	LHSMW39-960822	REG	cis-1,2-Dichloroethene	1.1				1	70
LHSMW39	5/18/1998	LHSMW39-980518	REG	cis-1,2-Dichloroethene	1				1	70
LHSMW41	2/9/1996	LHSMW41-960209	REG	cis-1,2-Dichloroethene	8					70
LHSMW41	8/22/1996	LHSMW41-960822	REG	cis-1,2-Dichloroethene	0.2	<	U		1	70
LHSMW41	5/18/1998	LHSMW41-980518	REG	cis-1,2-Dichloroethene	1	<	U		1	70
LHSMW41	2/23/2009	LHSMW41-022309	REG	cis-1,2-Dichloroethene	0.25	U	U			70
LHSMW42	2/11/1996	LHSMW42-960211	REG	cis-1,2-Dichloroethene	1	ND	U			70
LHSMW42	8/22/1996	LHSMW42-960822	REG	cis-1,2-Dichloroethene	0.2	<	U		1	70
LHSMW42	5/18/1998	LHSMW42-980518	REG	cis-1,2-Dichloroethene	1	<	U		1	70
LHSMW43	2/9/1996	LHSMW43-960209	REG	cis-1,2-Dichloroethene	*1840*					70
LHSMW43	8/22/1996	LHSMW43-960822	REG	cis-1,2-Dichloroethene	*2020*				100	70
LHSMW43	8/22/1996	LHSMW43-960822FD	FD	cis-1,2-Dichloroethene	*2090*				100	70
LHSMW43	5/18/1998	LHSMW43-980518	REG	cis-1,2-Dichloroethene	*1400*				400	70
LHSMW43	2/22/2007	LHSMW43-FEB2007	REG	cis-1,2-Dichloroethene	*605*				100	70
LHSMW43	2/19/2009	LHSMW43-021909	REG	cis-1,2-Dichloroethene	*325*					70
LHSMW44	2/8/1996	LHSMW44-960208	REG	cis-1,2-Dichloroethene	21					70
LHSMW44	8/22/1996	LHSMW44-960822	REG	cis-1,2-Dichloroethene	37.4				1	70
LHSMW44	5/18/1998	LHSMW44-980518	REG	cis-1,2-Dichloroethene	28				1	70
LHSMW44	7/30/2010	LHSMW44-103007 *	REG	cis-1,2-Dichloroethene	5.93					70
LHSMW45	2/10/1996	LHSMW45-960210	REG	cis-1,2-Dichloroethene	16					70
LHSMW45	8/22/1996	LHSMW45-960822	REG	cis-1,2-Dichloroethene	63.7				1	70
LHSMW45	5/18/1998	LHSMW45-980518	REG	cis-1,2-Dichloroethene	*93*				1	70
LHSMW45	2/19/2009	LHSMW45-021909	REG	cis-1,2-Dichloroethene	*869*					70
LHSMW46	2/8/1996	LHSMW46-960208	REG	cis-1,2-Dichloroethene	15					70
LHSMW46	8/22/1996	LHSMW46-960822	REG	cis-1,2-Dichloroethene	15.1				1	70
LHSMW46	5/18/1998	LHSMW46-980518	REG	cis-1,2-Dichloroethene	13				1	70
LHSMW47	2/8/1996	LHSMW47-960208	REG	cis-1,2-Dichloroethene	4					70
LHSMW47	8/22/1996	LHSMW47-960822	REG	cis-1,2-Dichloroethene	4.3				1	70
LHSMW47	5/18/1998	LHSMW47-980518	REG	cis-1,2-Dichloroethene	3.4				1	70
LHSMW48	8/22/1996	LHSMW48-960822	REG	cis-1,2-Dichloroethene	*554*				10	70
LHSMW48	5/19/1998	LHSMW48-980519	REG	cis-1,2-Dichloroethene	35				1	70
LHSMW49	2/9/1996	LHSMW49-960209	REG	cis-1,2-Dichloroethene	28					70
LHSMW49	8/22/1996	LHSMW49-960822	REG	cis-1,2-Dichloroethene	29				1	70
LHSMW49	5/19/1998	LHSMW49-980519	REG	cis-1,2-Dichloroethene	19				1	70
LHSMW49	5/19/1998	LHSMW49-980519FD	FD	cis-1,2-Dichloroethene	20				1	70
LHSMW50	2/9/1996	LHSMW50-960209	REG	cis-1,2-Dichloroethene	1	ND	U			70
LHSMW50	8/22/1996	LHSMW50-960822	REG	cis-1,2-Dichloroethene	0.2	<	U		1	70
LHSMW50	5/19/1998	LHSMW50-980519	REG	cis-1,2-Dichloroethene	1	<	U		1	70
LHSMW50	2/17/2009	LHSMW50-021709	REG	cis-1,2-Dichloroethene	0.25	U	U			70
LHSMW51	2/13/1996	LHSMW51-960213	REG	cis-1,2-Dichloroethene	1	ND	U			70

Table A-2
Summary of VOC Analytical Results
LHAAP-47

Location	Date	Sample Number	Purpose	Parameter	Result (µg/L)	Qual	VQ	RC	DF	MCL
LHSMW51	8/22/1996	LHSMW51-960822	REG	cis-1,2-Dichloroethene	0.2	<	U		1	70
LHSMW51	5/19/1998	LHSMW51-980519	REG	cis-1,2-Dichloroethene	1	<	U		1	70
LHSMW52	2/9/1996	LHSMW52-960209	REG	cis-1,2-Dichloroethene	1	ND	U			70
LHSMW52	8/22/1996	LHSMW52-960822	REG	cis-1,2-Dichloroethene	0.2	<	U		1	70
LHSMW52	5/19/1998	LHSMW52-980519	REG	cis-1,2-Dichloroethene	1	<	U		1	70
LHSMW53	2/10/1996	LHSMW53-960210	REG	cis-1,2-Dichloroethene	1	ND	U			70
LHSMW53	8/22/1996	LHSMW53-960822	REG	cis-1,2-Dichloroethene	0.2	<	U		1	70
LHSMW53	5/20/1998	LHSMW53-980520	REG	cis-1,2-Dichloroethene	1	<	U		1	70
LHSMW54	2/12/1996	LHSMW54-960212	REG	cis-1,2-Dichloroethene	1	ND	U			70
LHSMW54	8/21/1996	LHSMW54-960821	REG	cis-1,2-Dichloroethene	0.2	<	U		1	70
LHSMW54	5/20/1998	LHSMW54-980520	REG	cis-1,2-Dichloroethene	0.7		J		1	70
LHSMW54	10/17/2007	LHSMW54-101707	REG	cis-1,2-Dichloroethene	1.59				1	70
LHSMW54	8/6/2010	LHSMW54-100806	REG	cis-1,2-Dichloroethene	0.657	J	J		2.5	70
LHSMW55	2/10/1996	LHSMW55-960210	REG	cis-1,2-Dichloroethene	1	ND	U			70
LHSMW55	8/22/1996	LHSMW55-960822	REG	cis-1,2-Dichloroethene	0.2	<	U		1	70
LHSMW55	5/20/1998	LHSMW55-980520	REG	cis-1,2-Dichloroethene	1	<	U		1	70
LHSMW56	2/9/1996	LHSMW56-960209	REG	cis-1,2-Dichloroethene	*738*					70
LHSMW56	8/21/1996	LHSMW56-960821	REG	cis-1,2-Dichloroethene	*716*				10	70
LHSMW56	5/20/1998	LHSMW56-980520	REG	cis-1,2-Dichloroethene	*670*				10	70
LHSMW56	10/20/2007	LHSMW56-102007	REG	cis-1,2-Dichloroethene	*171*				100	70
LHSMW56	4/3/2009	LHSMW56-040309	REG	cis-1,2-Dichloroethene	*269*				50	70
LHSMW57	2/8/1996	LHSMW57-960208	REG	cis-1,2-Dichloroethene	1	ND	U			70
LHSMW57	8/21/1996	LHSMW57-960821	REG	cis-1,2-Dichloroethene	0.2	<	U		1	70
LHSMW57	5/20/1998	LHSMW57-980520	REG	cis-1,2-Dichloroethene	1	<	U		1	70
LHSMW57	2/23/2009	LHSMW57-022309	REG	cis-1,2-Dichloroethene	0.25	U	U			70
LHSMW60	2/9/1996	LHSMW60-960209	REG	cis-1,2-Dichloroethene	1	ND	U			70
LHSMW60	8/21/1996	LHSMW60-960821	REG	cis-1,2-Dichloroethene	0.2	<	U		1	70
LHSMW60	8/21/1996	LHSMW60-960821FD	FD	cis-1,2-Dichloroethene	0.2	<	U		1	70
LHSMW60	5/20/1998	LHSMW60-980520	REG	cis-1,2-Dichloroethene	1	<	U		1	70
LHSMW60	5/23/2000	LHSMW60-000523	REG	cis-1,2-Dichloroethene	1.7		J		1	70
LHSMW60	5/23/2000	LHSMW60-000523FD	FD	cis-1,2-Dichloroethene	1	<	UJ		1	70
LHSMW60	10/3/2000	LHSMW60-001003	REG	cis-1,2-Dichloroethene	1	<	U		1	70
LHSMW60	8/30/2010	LHSMW60-100830	REG	cis-1,2-Dichloroethene	0.25	U	U		1	70
105	2/13/1996	105-960213	REG	Tetrachloroethene	1	ND	U			5
105	8/22/1996	105-960822	REG	Tetrachloroethene	0.25	<	U		1	5
105	5/18/1998	105-980518	REG	Tetrachloroethene	1	<	U		1	5
105	2/18/2009	105-021809	REG	Tetrachloroethene	0.25	U	U			5
105	7/31/2010	105-103107 *	REG	Tetrachloroethene	0.25	U	U			5
47WW01	9/29/1998	47WW01-980929	REG	Tetrachloroethene	1	<	U		1	5
47WW01	11/7/1998	47WW01-981107	REG	Tetrachloroethene	1	<	U		1	5
47WW01	10/18/2007	47WW01-101807	REG	Tetrachloroethene	1	U	UJ	07A	1	5
47WW02	11/4/1998	47WW02-981104	REG	Tetrachloroethene	1	<	U		1	5
47WW03	11/5/1998	47WW03-981105	REG	Tetrachloroethene	1	<	U		1	5
47WW03	10/17/2007	47WW03-101707	REG	Tetrachloroethene	1	U	U		1	5
47WW04	11/5/1998	47WW04-981105	REG	Tetrachloroethene	1	<	U		1	5
47WW04	10/18/2007	47WW04-101807	REG	Tetrachloroethene	1	U	U		1	5
47WW04	8/6/2010	47WW04-100806	REG	Tetrachloroethene	0.25	U	U		1	5
47WW05	11/9/1998	47WW05-981109	REG	Tetrachloroethene	40	<	U		40	5
47WW05	9/1/2004	47WW05-040901	REG	Tetrachloroethene	5	U	U		1	5
47WW05	10/20/2007	47WW05-102007	REG	Tetrachloroethene	1	U	U		1	5
47WW06	11/6/1998	47WW06-981106	REG	Tetrachloroethene	1	<	U		1	5
47WW06	9/1/2004	47WW06-040901	REG	Tetrachloroethene	5	U	U		1	5
47WW08	11/4/1998	47WW08-981104	REG	Tetrachloroethene	1	<	U		1	5
47WW09	11/4/1998	47WW09-981104	REG	Tetrachloroethene	2.4				1	5
47WW09	2/21/2007	47WW09-FEB2007	REG	Tetrachloroethene	*12.2*				1	5
47WW09	2/18/2009	47WW09-021809	REG	Tetrachloroethene	13	J	J			5
47WW09	8/3/2010	47WW09-100803	REG	Tetrachloroethene	*9.08*	J	J		1	5
47WW11	11/7/1998	47WW11-981107	REG	Tetrachloroethene	4	<	U		4	5
47WW11	5/24/2000	47WW11-000524	REG	Tetrachloroethene	1	<	U		1	5
47WW11	10/3/2000	47WW11-001003	REG	Tetrachloroethene	1	<	U		1	5
47WW12	11/4/1998	47WW12-981104	REG	Tetrachloroethene	1	<	U		1	5
47WW12	4/22/2009	47WW12-042209	REG	Tetrachloroethene	0.25	U			1	5

Table A-2
Summary of VOC Analytical Results
LHAAP-47

Location	Date	Sample Number	Purpose	Parameter	Result (µg/L)	Qual	VQ	RC	DF	MCL
47WW13	11/4/1998	47WW13-981104	REG	Tetrachloroethene	1	<	U		1	5
47WW13	9/2/2004	47WW13-040902	REG	Tetrachloroethene	5	U	U		1	5
47WW13	2/20/2007	47WW13-FEB2007	REG	Tetrachloroethene	0.74	U	U		1	5
47WW13	2/17/2009	47WW13-021709	REG	Tetrachloroethene	0.25	U	U			5
47WW13	2/17/2009	47WW13-021709-FD	FD	Tetrachloroethene	0.25	U	U			5
47WW13	8/4/2010	47WW13-100804	REG	Tetrachloroethene	1.25	U	U		1	5
47WW14	11/4/1998	47WW14-981104	REG	Tetrachloroethene	1	<	U		1	5
47WW14	9/2/2004	47WW14-040902	REG	Tetrachloroethene	5	U	U		1	5
47WW14	2/20/2007	47WW14-FEB2007	REG	Tetrachloroethene	0.74	U	U		1	5
47WW14	2/20/2007	47WW14-FEB2007FD	FD	Tetrachloroethene	0.74	U	U		1	5
47WW14	2/19/2009	47WW14-021909	REG	Tetrachloroethene	0.5	U	U			5
47WW14	2/19/2009	47WW14-021909-FD	FD	Tetrachloroethene	0.25	U	U			5
47WW14	8/4/2010	47WW14-100804	REG	Tetrachloroethene	0.25	U	U		1	5
47WW14	8/4/2010	47WW14-100804-FD	FD	Tetrachloroethene	0.25	U	U		1	5
47WW16	11/4/1998	47WW16-981104	REG	Tetrachloroethene	1	<	U		1	5
47WW16	4/22/2009	47WW16-042209	REG	Tetrachloroethene	0.25	U			1	5
47WW17	11/9/1998	47WW17-981109	REG	Tetrachloroethene	1	<	U		1	5
47WW18	9/29/1998	47WW18-980929	REG	Tetrachloroethene	1	<	U		1	5
47WW18	11/6/1998	47WW18-981106	REG	Tetrachloroethene	1	<	U		1	5
47WW18	10/18/2007	47WW18-101807	REG	Tetrachloroethene	1	U	U		1	5
47WW18	10/18/2007	47WW18-101807-DUP	FD	Tetrachloroethene	1	U	U		1	5
47WW19	11/6/1998	47WW19-981106	REG	Tetrachloroethene	1	<	U		1	5
47WW19	2/19/2009	47WW19-021909	REG	Tetrachloroethene	0.25	U	U			5
47WW21	11/5/1998	47WW21-981105	REG	Tetrachloroethene	1	<	U		1	5
47WW21	10/18/2007	47WW21-101807	REG	Tetrachloroethene	1	U	U		1	5
47WW21	10/18/2007	47WW21-101807-QC	FD	Tetrachloroethene	1	U	U		1	5
47WW21	7/31/2010	47WW21-103107 *	REG	Tetrachloroethene	0.25	U	U			5
47WW22	11/5/1998	47WW22-981105	REG	Tetrachloroethene	1	<	U		1	5
47WW22	10/18/2007	47WW22-101807	REG	Tetrachloroethene	1	U	U		1	5
47WW23	9/29/1998	47WW23-980929	REG	Tetrachloroethene	1	<	U		1	5
47WW23	11/5/1998	47WW23-981105	REG	Tetrachloroethene	1	<	U		1	5
47WW23	11/5/1998	47WW23-981105FD	FD	Tetrachloroethene	1	<	U		1	5
47WW23	10/19/2007	47WW23-101907	REG	Tetrachloroethene	1	U	U		1	5
47WW23	8/6/2010	47WW23-100806	REG	Tetrachloroethene	0.25	U	U		1	5
47WW24	12/20/2000	47WW24-001220	REG	Tetrachloroethene	0.1	<	U		1	5
47WW25	12/20/2000	47WW25-001220	REG	Tetrachloroethene	0.1	<	U		1	5
47WW25	10/18/2007	47WW25-101607	REG	Tetrachloroethene	0.343	J	J	15, 07A	1	5
47WW25	4/3/2009	47WW25-040309	REG	Tetrachloroethene	25	U	U		100	5
47WW26	12/20/2000	47WW26-001220	REG	Tetrachloroethene	0.1	<	U		1	5
47WW27	12/19/2000	47WW27-001219	REG	Tetrachloroethene	0.1	<	U		1	5
47WW27	12/19/2000	47WW27-001219FD	FD	Tetrachloroethene	0.1	<	U		1	5
47WW27	7/31/2010	47WW27-103107 *	REG	Tetrachloroethene	0.25	U	U			5
47WW28	9/1/2004	47WW28-040901	REG	Tetrachloroethene	5	U	U		1	5
47WW28	10/17/2007	47WW28-101707	REG	Tetrachloroethene	1	U	U		1	5
47WW28	7/31/2010	47WW28-103107 *	REG	Tetrachloroethene	0.25	U	U			5
47WW29	9/1/2004	47WW29-040901	REG	Tetrachloroethene	5	U	U		1	5
47WW29	10/17/2007	47WW29-101707	REG	Tetrachloroethene	1	U	U		1	5
47WW29	7/31/2010	47WW29-103107 *	REG	Tetrachloroethene	0.25	U	U			5
47WW29	7/31/2010	47WW29-103107-FD *	FD	Tetrachloroethene	0.25	U	U			5
47WW30	9/1/2004	47WW30-040901	REG	Tetrachloroethene	5	U	U		1	5
47WW30	2/22/2007	47WW30-FEB2007	REG	Tetrachloroethene	0.74	U	U		1	5
47WW30	10/18/2007	47WW30-101807	REG	Tetrachloroethene	1	U	U		1	5
47WW30	8/4/2010	47WW30-100804	REG	Tetrachloroethene	2.5	U	U		1	5
47WW31	9/2/2004	47WW31-040902	REG	Tetrachloroethene	5	U	U		1	5
47WW31	10/18/2007	47WW31-101807	REG	Tetrachloroethene	1	U	U		1	5
47WW32	10/18/2007	47WW32-101807	REG	Tetrachloroethene	1	U	U		1	5
47WW32	7/31/2010	47WW32-103107 *	REG	Tetrachloroethene	0.25	U	U			5
47WW33	2/20/2008	47WW33-022008	REG	Tetrachloroethene	0.25	U	U		1	5
47WW33	2/20/2008	47WW33-022008-QC	FD	Tetrachloroethene	0.25	U	U		1	5
47WW33	3/14/2008	47WW33-031408	REG	Tetrachloroethene	0.25	U	U		1	5
47WW33	7/30/2010	47WW33-103007 *	REG	Tetrachloroethene	0.25	U	U			5
47WW34	2/19/2008	47WW34-021908	REG	Tetrachloroethene	0.25	U	U		1	5

Table A-2
Summary of VOC Analytical Results
LHAAP-47

Location	Date	Sample Number	Purpose	Parameter	Result (µg/L)	Qual	VQ	RC	DF	MCL
47WW34	3/14/2008	47WW34-031408	REG	Tetrachloroethene	6.25	U	U		25	5
47WW34	2/23/2009	47WW34-022309	REG	Tetrachloroethene	0.25	U	U			5
47WW34	8/3/2010	47WW34-100803	REG	Tetrachloroethene	2.5	U	U		1	5
47WW35	10/9/2008	47WW35-100808	REG	Tetrachloroethene	0.25	U			1	5
47WW35	10/9/2008	47WW35-100808-QA	FD	Tetrachloroethene	0.25	U			1	5
47WW36	10/8/2008	47WW36-100808	REG	Tetrachloroethene	0.25	U			1	5
47WW37	9/1/2010	47WW37-100901	REG	Tetrachloroethene	0.25	U	U		1	5
47WW38	9/1/2010	47WW38-100901	REG	Tetrachloroethene	0.25	U	U		1	5
47WW38	9/1/2010	47WW38-100901-FD	FD	Tetrachloroethene	0.25	U	U		1	5
LHSMW28	12/7/1994	LHSMW28-941207	REG	Tetrachloroethene	3		J		1	5
LHSMW28	2/11/1996	LHSMW28-960211	REG	Tetrachloroethene	1	ND	U			5
LHSMW28	8/20/1996	LHSMW28-960820	REG	Tetrachloroethene	0.25	<	U		1	5
LHSMW28	5/16/1998	LHSMW28-980516	REG	Tetrachloroethene	1	<	U		1	5
LHSMW29	12/7/1994	LHSMW29-941207	REG	Tetrachloroethene	5	<	U		1	5
LHSMW29	2/11/1996	LHSMW29-960211	REG	Tetrachloroethene	1	ND	U			5
LHSMW29	8/20/1996	LHSMW29-960820	REG	Tetrachloroethene	0.25	<	U		1	5
LHSMW29	5/16/1998	LHSMW29-980516	REG	Tetrachloroethene	1	<	U		1	5
LHSMW30	12/7/1994	LHSMW30-941207	REG	Tetrachloroethene	*9*				1	5
LHSMW30	2/12/1996	LHSMW30-960212	REG	Tetrachloroethene	1	ND	U			5
LHSMW30	8/20/1996	LHSMW30-960820	REG	Tetrachloroethene	0.25	<	U		1	5
LHSMW30	5/16/1998	LHSMW30-980516	REG	Tetrachloroethene	1	<	U		1	5
LHSMW31	12/6/1994	LHSMW31-941206	REG	Tetrachloroethene	5	<	U		1	5
LHSMW31	12/6/1994	LHSMW31-941206FD	FD	Tetrachloroethene	5	<	U		1	5
LHSMW31	2/12/1996	LHSMW31-960212	REG	Tetrachloroethene	1	ND	U			5
LHSMW31	8/20/1996	LHSMW31-960820	REG	Tetrachloroethene	0.25	<	U		1	5
LHSMW31	8/20/1996	LHSMW31-960820FD	FD	Tetrachloroethene	0.25	<	U		1	5
LHSMW31	5/16/1998	LHSMW31-980516	REG	Tetrachloroethene	1	<	U		1	5
LHSMW32	12/5/1994	LHSMW32-941205	REG	Tetrachloroethene	5	<	U		1	5
LHSMW32	2/12/1996	LHSMW32-960212	REG	Tetrachloroethene	1	ND	U			5
LHSMW32	8/20/1996	LHSMW32-960820	REG	Tetrachloroethene	0.57				1	5
LHSMW32	5/17/1998	LHSMW32-980517	REG	Tetrachloroethene	1	<	U		1	5
LHSMW33	12/5/1994	LHSMW33-941205	REG	Tetrachloroethene	5	<	U		1	5
LHSMW33	2/13/1996	LHSMW33-960213	REG	Tetrachloroethene	1	ND	U			5
LHSMW33	8/20/1996	LHSMW33-960820	REG	Tetrachloroethene	0.39				1	5
LHSMW33	5/17/1998	LHSMW33-980517	REG	Tetrachloroethene	1	<	U		1	5
LHSMW34	12/5/1994	LHSMW34-941205	REG	Tetrachloroethene	*6*				1	5
LHSMW34	2/13/1996	LHSMW34-960213	REG	Tetrachloroethene	*13.6*					5
LHSMW34	8/20/1996	LHSMW34-960820	REG	Tetrachloroethene	*18*				1	5
LHSMW34	5/17/1998	LHSMW34-980517	REG	Tetrachloroethene	*13*				1	5
LHSMW34	10/18/2007	LHSMW34-101807	REG	Tetrachloroethene	2	U	U		2	5
LHSMW35	12/5/1994	LHSMW35-941205	REG	Tetrachloroethene	1		J		1	5
LHSMW35	2/8/1996	LHSMW35-960208	REG	Tetrachloroethene	1	ND	U			5
LHSMW35	8/20/1996	LHSMW35-960820	REG	Tetrachloroethene	0.92				1	5
LHSMW35	5/17/1998	LHSMW35-980517	REG	Tetrachloroethene	0.64		J		1	5
LHSMW36	12/5/1994	LHSMW36-941205	REG	Tetrachloroethene	5	<	U		1	5
LHSMW36	2/13/1996	LHSMW36-960213	REG	Tetrachloroethene	1	ND	U			5
LHSMW36	8/22/1996	LHSMW36-960822	REG	Tetrachloroethene	0.25	<	U		1	5
LHSMW36	5/17/1998	LHSMW36-980517	REG	Tetrachloroethene	1	<	U		1	5
LHSMW36	5/17/1998	LHSMW36-980517FD	FD	Tetrachloroethene	1	<	U		1	5
LHSMW36	10/19/2007	47WW36-101907	REG	Tetrachloroethene	1	U	UJ	07A	1	5
LHSMW37	12/5/1994	LHSMW37-941205	REG	Tetrachloroethene	5	<	U		1	5
LHSMW37	2/8/1996	LHSMW37-960208	REG	Tetrachloroethene	1	ND	U			5
LHSMW37	8/22/1996	LHSMW37-960822	REG	Tetrachloroethene	0.25	<	U		1	5
LHSMW37	5/17/1998	LHSMW37-980517	REG	Tetrachloroethene	1	<	U		1	5
LHSMW37	5/17/1998	LHSMW37-980517FD	FD	Tetrachloroethene	1	<	U		1	5
LHSMW38	12/6/1994	LHSMW38-941206	REG	Tetrachloroethene	5	<	U		1	5
LHSMW38	2/12/1996	LHSMW38-960212	REG	Tetrachloroethene	1	ND	U			5
LHSMW38	8/21/1996	LHSMW38-960821	REG	Tetrachloroethene	0.25	<	U		1	5
LHSMW38	8/21/1996	LHSMW38-960821FD	FD	Tetrachloroethene	0.25	<	U		1	5
LHSMW38	5/17/1998	LHSMW38-980517	REG	Tetrachloroethene	1	<	U		1	5
LHSMW38	5/17/1998	LHSMW38-980517FD	FD	Tetrachloroethene	1	<	U		1	5
LHSMW38	7/30/2010	LHSMW38-103007 *	REG	Tetrachloroethene	0.25	U	U			5

Table A-2
Summary of VOC Analytical Results
LHAAP-47

Location	Date	Sample Number	Purpose	Parameter	Result (µg/L)	Qual	VQ	RC	DF	MCL
LHSMW39	12/6/1994	LHSMW39-941206	REG	Tetrachloroethene	5	<	U		1	5
LHSMW39	12/6/1994	LHSMW39-941206FD	FD	Tetrachloroethene	5	<	U		1	5
LHSMW39	2/10/1996	LHSMW39-960210	REG	Tetrachloroethene	1	ND	U			5
LHSMW39	8/22/1996	LHSMW39-960822	REG	Tetrachloroethene	0.25	<	U		1	5
LHSMW39	5/18/1998	LHSMW39-980518	REG	Tetrachloroethene	1	<	U		1	5
LHSMW40	12/6/1994	LHSMW40-941206	REG	Tetrachloroethene	5	<	U		1	5
LHSMW40	12/6/1994	LHSMW40-941206FD	FD	Tetrachloroethene	5	<	U		1	5
LHSMW41	12/8/1994	LHSMW41-941208	REG	Tetrachloroethene	5	<	U		1	5
LHSMW41	2/9/1996	LHSMW41-960209	REG	Tetrachloroethene	1	ND	U			5
LHSMW41	8/22/1996	LHSMW41-960822	REG	Tetrachloroethene	0.25	<	U		1	5
LHSMW41	5/18/1998	LHSMW41-980518	REG	Tetrachloroethene	1	<	U		1	5
LHSMW41	2/23/2009	LHSMW41-022309	REG	Tetrachloroethene	0.25	U	U			5
LHSMW42	12/6/1994	LHSMW42-941206	REG	Tetrachloroethene	5	<	U		1	5
LHSMW42	2/11/1996	LHSMW42-960211	REG	Tetrachloroethene	1	ND	U			5
LHSMW42	8/22/1996	LHSMW42-960822	REG	Tetrachloroethene	0.25	<	U		1	5
LHSMW42	5/18/1998	LHSMW42-980518	REG	Tetrachloroethene	1	<	U		1	5
LHSMW43	12/8/1994	LHSMW43-941208	REG	Tetrachloroethene	*57*				1	5
LHSMW43	12/8/1994	LHSMW43-941208FD	FD	Tetrachloroethene	5	<	U		1	5
LHSMW43	2/9/1996	LHSMW43-960209	REG	Tetrachloroethene	*168*					5
LHSMW43	8/22/1996	LHSMW43-960822	REG	Tetrachloroethene	*51.7*				1	5
LHSMW43	8/22/1996	LHSMW43-960822FD	FD	Tetrachloroethene	*83.6*				1	5
LHSMW43	5/18/1998	LHSMW43-980518	REG	Tetrachloroethene	*97*				1	5
LHSMW43	2/22/2007	LHSMW43-FEB2007	REG	Tetrachloroethene	*82*				1	5
LHSMW43	2/19/2009	LHSMW43-021909	REG	Tetrachloroethene	38.4	J	J			5
LHSMW44	12/8/1994	LHSMW44-941208	REG	Tetrachloroethene	5	<	U		1	5
LHSMW44	2/8/1996	LHSMW44-960208	REG	Tetrachloroethene	1	ND	U			5
LHSMW44	8/22/1996	LHSMW44-960822	REG	Tetrachloroethene	0.25	<	U		1	5
LHSMW44	5/18/1998	LHSMW44-980518	REG	Tetrachloroethene	1	<	U		1	5
LHSMW44	7/30/2010	LHSMW44-103007 *	REG	Tetrachloroethene	0.25	U	U			5
LHSMW45	12/8/1994	LHSMW45-941208	REG	Tetrachloroethene	5	<	U		1	5
LHSMW45	12/8/1994	LHSMW45-941208FD	FD	Tetrachloroethene	5	<	U		1	5
LHSMW45	2/10/1996	LHSMW45-960210	REG	Tetrachloroethene	1	ND	U			5
LHSMW45	8/22/1996	LHSMW45-960822	REG	Tetrachloroethene	0.25	<	U		1	5
LHSMW45	5/18/1998	LHSMW45-980518	REG	Tetrachloroethene	1	<	U		1	5
LHSMW45	2/19/2009	LHSMW45-021909	REG	Tetrachloroethene	1.25	U	U			5
LHSMW46	12/8/1994	LHSMW46-941208	REG	Tetrachloroethene	5	<	U		1	5
LHSMW46	2/8/1996	LHSMW46-960208	REG	Tetrachloroethene	1	ND	U			5
LHSMW46	8/22/1996	LHSMW46-960822	REG	Tetrachloroethene	0.25	<	U		1	5
LHSMW46	5/18/1998	LHSMW46-980518	REG	Tetrachloroethene	1	<	U		1	5
LHSMW47	12/7/1994	LHSMW47-941207	REG	Tetrachloroethene	5	<	U		1	5
LHSMW47	2/8/1996	LHSMW47-960208	REG	Tetrachloroethene	1	ND	U			5
LHSMW47	8/22/1996	LHSMW47-960822	REG	Tetrachloroethene	0.25	<	U		1	5
LHSMW47	5/18/1998	LHSMW47-980518	REG	Tetrachloroethene	1	<	U		1	5
LHSMW48	12/9/1994	LHSMW48-941209	REG	Tetrachloroethene	5	<	U		1	5
LHSMW48	8/22/1996	LHSMW48-960822	REG	Tetrachloroethene	0.25	<	U		1	5
LHSMW48	5/19/1998	LHSMW48-980519	REG	Tetrachloroethene	1	<	U		1	5
LHSMW49	12/7/1994	LHSMW49-941207	REG	Tetrachloroethene	5	<	U		1	5
LHSMW49	2/9/1996	LHSMW49-960209	REG	Tetrachloroethene	1	ND	U			5
LHSMW49	8/22/1996	LHSMW49-960822	REG	Tetrachloroethene	0.25	<	U		1	5
LHSMW49	5/19/1998	LHSMW49-980519	REG	Tetrachloroethene	1	<	U		1	5
LHSMW49	5/19/1998	LHSMW49-980519FD	FD	Tetrachloroethene	1	<	U		1	5
LHSMW50	12/9/1994	LHSMW50-941209	REG	Tetrachloroethene	5	<	U		1	5
LHSMW50	2/9/1996	LHSMW50-960209	REG	Tetrachloroethene	1	ND	U			5
LHSMW50	8/22/1996	LHSMW50-960822	REG	Tetrachloroethene	0.25	<	U		1	5
LHSMW50	5/19/1998	LHSMW50-980519	REG	Tetrachloroethene	1	<	U		1	5
LHSMW50	2/17/2009	LHSMW50-021709	REG	Tetrachloroethene	0.25	U	U			5
LHSMW51	12/11/1994	LHSMW51-941211	REG	Tetrachloroethene	5	<	U		1	5
LHSMW51	2/13/1996	LHSMW51-960213	REG	Tetrachloroethene	1	ND	U			5
LHSMW51	8/22/1996	LHSMW51-960822	REG	Tetrachloroethene	0.25	<	U		1	5
LHSMW51	5/19/1998	LHSMW51-980519	REG	Tetrachloroethene	1	<	U		1	5
LHSMW52	12/11/1994	LHSMW52-941211	REG	Tetrachloroethene	5	<	U		1	5
LHSMW52	2/9/1996	LHSMW52-960209	REG	Tetrachloroethene	1	ND	U			5

Table A-2
Summary of VOC Analytical Results
LHAAP-47

Location	Date	Sample Number	Purpose	Parameter	Result (µg/L)	Qual	VQ	RC	DF	MCL
LHSMW52	8/22/1996	LHSMW52-960822	REG	Tetrachloroethene	0.25	<	U		1	5
LHSMW52	5/19/1998	LHSMW52-980519	REG	Tetrachloroethene	1	<	U		1	5
LHSMW53	12/7/1994	LHSMW53-941207	REG	Tetrachloroethene	5	<	U		1	5
LHSMW53	2/10/1996	LHSMW53-960210	REG	Tetrachloroethene	1	ND	U			5
LHSMW53	8/22/1996	LHSMW53-960822	REG	Tetrachloroethene	0.25	<	U		1	5
LHSMW53	5/20/1998	LHSMW53-980520	REG	Tetrachloroethene	1	<	U		1	5
LHSMW54	12/9/1994	LHSMW54-941209	REG	Tetrachloroethene	5	<	U		1	5
LHSMW54	2/12/1996	LHSMW54-960212	REG	Tetrachloroethene	1	ND	U			5
LHSMW54	8/21/1996	LHSMW54-960821	REG	Tetrachloroethene	0.25	<	U		1	5
LHSMW54	5/20/1998	LHSMW54-980520	REG	Tetrachloroethene	1	<	U		1	5
LHSMW54	10/17/2007	LHSMW54-101707	REG	Tetrachloroethene	1	U	U		1	5
LHSMW54	8/6/2010	LHSMW54-100806	REG	Tetrachloroethene	0.625	U	U		2.5	5
LHSMW55	12/9/1994	LHSMW55-941209	REG	Tetrachloroethene	5	<	U		1	5
LHSMW55	2/10/1996	LHSMW55-960210	REG	Tetrachloroethene	1	ND	U			5
LHSMW55	8/22/1996	LHSMW55-960822	REG	Tetrachloroethene	0.25	<	U		1	5
LHSMW55	5/20/1998	LHSMW55-980520	REG	Tetrachloroethene	1	<	U		1	5
LHSMW56	12/7/1994	LHSMW56-941207	REG	Tetrachloroethene	5	<	U		1	5
LHSMW56	2/9/1996	LHSMW56-960209	REG	Tetrachloroethene	1	ND	U			5
LHSMW56	8/21/1996	LHSMW56-960821	REG	Tetrachloroethene	0.25	<	U		1	5
LHSMW56	5/20/1998	LHSMW56-980520	REG	Tetrachloroethene	1	<	U		1	5
LHSMW56	10/20/2007	LHSMW56-102007	REG	Tetrachloroethene	0.746	J	J	15, 07A	1	5
LHSMW56	4/3/2009	LHSMW56-040309	REG	Tetrachloroethene	12.5	U	U		50	5
LHSMW57	12/9/1994	LHSMW57-941209	REG	Tetrachloroethene	5	<	U		1	5
LHSMW57	2/8/1996	LHSMW57-960208	REG	Tetrachloroethene	1	ND	U			5
LHSMW57	8/21/1996	LHSMW57-960821	REG	Tetrachloroethene	0.25	<	U		1	5
LHSMW57	5/20/1998	LHSMW57-980520	REG	Tetrachloroethene	1	<	U		1	5
LHSMW57	2/23/2009	LHSMW57-022309	REG	Tetrachloroethene	0.25	U	U			5
LHSMW60	12/11/1994	LHSMW60-941211	REG	Tetrachloroethene	5	<	U		1	5
LHSMW60	2/9/1996	LHSMW60-960209	REG	Tetrachloroethene	1	ND	U			5
LHSMW60	8/21/1996	LHSMW60-960821	REG	Tetrachloroethene	0.25	<	U		1	5
LHSMW60	8/21/1996	LHSMW60-960821FD	FD	Tetrachloroethene	0.25	<	U		1	5
LHSMW60	5/20/1998	LHSMW60-980520	REG	Tetrachloroethene	1	<	U		1	5
LHSMW60	5/23/2000	LHSMW60-000523	REG	Tetrachloroethene	1	<	UJ		1	5
LHSMW60	5/23/2000	LHSMW60-000523FD	FD	Tetrachloroethene	1	<	UJ		1	5
LHSMW60	10/3/2000	LHSMW60-001003	REG	Tetrachloroethene	1	<	U		1	5
LHSMW60	8/30/2010	LHSMW60-100830	REG	Tetrachloroethene	0.25	U	U		1	5
105	2/13/1996	105-960213	REG	trans-1,2-Dichloroethene	1	ND	U			100
105	8/22/1996	105-960822	REG	trans-1,2-Dichloroethene	0.29	<	U		1	100
105	5/18/1998	105-980518	REG	trans-1,2-Dichloroethene	1	<	U		1	100
105	2/18/2009	105-021809	REG	trans-1,2-Dichloroethene	0.25	U	U			100
105	7/31/2010	105-103107 *	REG	trans-1,2-Dichloroethene	0.25	U	U			100
47WW01	9/29/1998	47WW01-980929	REG	trans-1,2-Dichloroethene	1	<	U		1	100
47WW01	11/7/1998	47WW01-981107	REG	trans-1,2-Dichloroethene	1	<	U		1	100
47WW01	10/18/2007	47WW01-101807	REG	trans-1,2-Dichloroethene	1	U	UJ	07A	1	100
47WW02	11/4/1998	47WW02-981104	REG	trans-1,2-Dichloroethene	1	<	U		1	100
47WW03	11/5/1998	47WW03-981105	REG	trans-1,2-Dichloroethene	1	<	U		1	100
47WW03	10/17/2007	47WW03-101707	REG	trans-1,2-Dichloroethene	1	U	U		1	100
47WW04	11/5/1998	47WW04-981105	REG	trans-1,2-Dichloroethene	1	<	U		1	100
47WW04	10/18/2007	47WW04-101807	REG	trans-1,2-Dichloroethene	1	U	U		1	100
47WW04	8/6/2010	47WW04-100806	REG	trans-1,2-Dichloroethene	0.25	U	U		1	100
47WW05	11/9/1998	47WW05-981109	REG	trans-1,2-Dichloroethene	40	<	U		40	100
47WW05	9/1/2004	47WW05-040901	REG	trans-1,2-Dichloroethene	5	U	U		1	100
47WW05	10/20/2007	47WW05-102007	REG	trans-1,2-Dichloroethene	1	U	U		1	100
47WW06	11/6/1998	47WW06-981106	REG	trans-1,2-Dichloroethene	1	<	U		1	100
47WW06	9/1/2004	47WW06-040901	REG	trans-1,2-Dichloroethene	5	U	U		1	100
47WW08	11/4/1998	47WW08-981104	REG	trans-1,2-Dichloroethene	1	<	U		1	100
47WW09	11/4/1998	47WW09-981104	REG	trans-1,2-Dichloroethene	1	<	U		1	100
47WW09	2/21/2007	47WW09-FEB2007	REG	trans-1,2-Dichloroethene	0.75	U	U		1	100
47WW09	2/18/2009	47WW09-021809	REG	trans-1,2-Dichloroethene	5	U	U			100
47WW09	8/3/2010	47WW09-100803	REG	trans-1,2-Dichloroethene	2.5	U	U		1	100
47WW11	11/7/1998	47WW11-981107	REG	trans-1,2-Dichloroethene	4	<	U		4	100
47WW11	5/24/2000	47WW11-000524	REG	trans-1,2-Dichloroethene	1	<	U		1	100

Table A-2
Summary of VOC Analytical Results
LHAAP-47

Location	Date	Sample Number	Purpose	Parameter	Result (µg/L)	Qual	VQ	RC	DF	MCL
47WW11	10/3/2000	47WW11-001003	REG	trans-1,2-Dichloroethene	1	<	U		1	100
47WW12	11/4/1998	47WW12-981104	REG	trans-1,2-Dichloroethene	0.75		J		1	100
47WW12	4/22/2009	47WW12-042209	REG	trans-1,2-Dichloroethene	0.25	U				100
47WW13	11/4/1998	47WW13-981104	REG	trans-1,2-Dichloroethene	21				1	100
47WW13	9/2/2004	47WW13-040902	REG	trans-1,2-Dichloroethene	18				1	100
47WW13	2/20/2007	47WW13-FEB2007	REG	trans-1,2-Dichloroethene	14.5				1	100
47WW13	2/17/2009	47WW13-021709	REG	trans-1,2-Dichloroethene	13.2					100
47WW13	2/17/2009	47WW13-021709-FD	FD	trans-1,2-Dichloroethene	13.4					100
47WW13	8/4/2010	47WW13-100804	REG	trans-1,2-Dichloroethene	18.8				1	100
47WW14	11/4/1998	47WW14-981104	REG	trans-1,2-Dichloroethene	2.4				1	100
47WW14	9/2/2004	47WW14-040902	REG	trans-1,2-Dichloroethene	5	U	U		1	100
47WW14	2/20/2007	47WW14-FEB2007	REG	trans-1,2-Dichloroethene	31.1				1	100
47WW14	2/20/2007	47WW14-FEB2007FD	FD	trans-1,2-Dichloroethene	24.4				1	100
47WW14	2/19/2009	47WW14-021909	REG	trans-1,2-Dichloroethene	0.702	J	J			100
47WW14	2/19/2009	47WW14-021909-FD	FD	trans-1,2-Dichloroethene	0.699	J	J			100
47WW14	8/4/2010	47WW14-100804	REG	trans-1,2-Dichloroethene	0.972	J	J	15	1	100
47WW14	8/4/2010	47WW14-100804-FD	FD	trans-1,2-Dichloroethene	1.01				1	100
47WW16	11/4/1998	47WW16-981104	REG	trans-1,2-Dichloroethene	1	<	U		1	100
47WW16	4/22/2009	47WW16-042209	REG	trans-1,2-Dichloroethene	0.25	U				100
47WW17	11/9/1998	47WW17-981109	REG	trans-1,2-Dichloroethene	1	<	U		1	100
47WW18	9/29/1998	47WW18-980929	REG	trans-1,2-Dichloroethene	1	<	U		1	100
47WW18	11/6/1998	47WW18-981106	REG	trans-1,2-Dichloroethene	1	<	U		1	100
47WW18	10/18/2007	47WW18-101807	REG	trans-1,2-Dichloroethene	1	U	U		1	100
47WW18	10/18/2007	47WW18-101807-DUP	FD	trans-1,2-Dichloroethene	1	U	U		1	100
47WW19	11/6/1998	47WW19-981106	REG	trans-1,2-Dichloroethene	1	<	U		1	100
47WW19	2/19/2009	47WW19-021909	REG	trans-1,2-Dichloroethene	0.25	U	U			100
47WW21	11/5/1998	47WW21-981105	REG	trans-1,2-Dichloroethene	1	<	U		1	100
47WW21	10/18/2007	47WW21-101807	REG	trans-1,2-Dichloroethene	1	U	U		1	100
47WW21	10/18/2007	47WW21-101807-QC	FD	trans-1,2-Dichloroethene	1	U	U		1	100
47WW21	7/31/2010	47WW21-103107 *	REG	trans-1,2-Dichloroethene	0.25	U	U			100
47WW22	11/5/1998	47WW22-981105	REG	trans-1,2-Dichloroethene	1	<	U		1	100
47WW22	10/18/2007	47WW22-101807	REG	trans-1,2-Dichloroethene	1	U	U		1	100
47WW23	9/29/1998	47WW23-980929	REG	trans-1,2-Dichloroethene	1	<	U		1	100
47WW23	11/5/1998	47WW23-981105	REG	trans-1,2-Dichloroethene	1	<	U		1	100
47WW23	11/5/1998	47WW23-981105FD	FD	trans-1,2-Dichloroethene	1	<	U		1	100
47WW23	10/19/2007	47WW23-101907	REG	trans-1,2-Dichloroethene	1	U	U		1	100
47WW23	8/6/2010	47WW23-100806	REG	trans-1,2-Dichloroethene	0.25	U	U		1	100
47WW24	12/20/2000	47WW24-001220	REG	trans-1,2-Dichloroethene	0.1	<	U		1	100
47WW25	12/20/2000	47WW25-001220	REG	trans-1,2-Dichloroethene	5.48		J		1	100
47WW25	10/18/2007	47WW25-101607	REG	trans-1,2-Dichloroethene	3.6		J	07A	1	100
47WW25	4/3/2009	47WW25-040309	REG	trans-1,2-Dichloroethene	25	U	U			100
47WW26	12/20/2000	47WW26-001220	REG	trans-1,2-Dichloroethene	0.1	<	U		1	100
47WW27	12/19/2000	47WW27-001219	REG	trans-1,2-Dichloroethene	0.1	<	U		1	100
47WW27	12/19/2000	47WW27-001219FD	FD	trans-1,2-Dichloroethene	0.1	<	U		1	100
47WW27	7/31/2010	47WW27-103107 *	REG	trans-1,2-Dichloroethene	0.25	U	U			100
47WW28	9/1/2004	47WW28-040901	REG	trans-1,2-Dichloroethene	5	U	U		1	100
47WW28	10/17/2007	47WW28-101707	REG	trans-1,2-Dichloroethene	1	U	U		1	100
47WW28	7/31/2010	47WW28-103107 *	REG	trans-1,2-Dichloroethene	0.25	U	U			100
47WW29	9/1/2004	47WW29-040901	REG	trans-1,2-Dichloroethene	5	U	U		1	100
47WW29	10/17/2007	47WW29-101707	REG	trans-1,2-Dichloroethene	1	U	U		1	100
47WW29	7/31/2010	47WW29-103107 *	REG	trans-1,2-Dichloroethene	0.25	U	U			100
47WW29	7/31/2010	47WW29-103107-FD *	FD	trans-1,2-Dichloroethene	0.25	U	U			100
47WW30	9/1/2004	47WW30-040901	REG	trans-1,2-Dichloroethene	5	U	U		1	100
47WW30	2/22/2007	47WW30-FEB2007	REG	trans-1,2-Dichloroethene	0.75	U	U		1	100
47WW30	10/18/2007	47WW30-101807	REG	trans-1,2-Dichloroethene	0.336	J	J	15	1	100
47WW30	8/4/2010	47WW30-100804	REG	trans-1,2-Dichloroethene	2.5	U	U		1	100
47WW31	9/2/2004	47WW31-040902	REG	trans-1,2-Dichloroethene	5	U	U		1	100
47WW31	10/18/2007	47WW31-101807	REG	trans-1,2-Dichloroethene	1	U	U		1	100
47WW32	10/18/2007	47WW32-101807	REG	trans-1,2-Dichloroethene	1	U	U		1	100
47WW32	7/31/2010	47WW32-103107 *	REG	trans-1,2-Dichloroethene	0.25	U	U			100
47WW33	2/20/2008	47WW33-022008	REG	trans-1,2-Dichloroethene	0.25	U	U		1	100
47WW33	2/20/2008	47WW33-022008-QC	FD	trans-1,2-Dichloroethene	0.25	U	U		1	100

Table A-2
Summary of VOC Analytical Results
LHAAP-47

Location	Date	Sample Number	Purpose	Parameter	Result (µg/L)	Qual	VQ	RC	DF	MCL
47WW33	3/14/2008	47WW33-031408	REG	trans-1,2-Dichloroethene	0.25	U	U		1	100
47WW33	7/30/2010	47WW33-103007 *	REG	trans-1,2-Dichloroethene	0.25	U	U			100
47WW34	2/19/2008	47WW34-021908	REG	trans-1,2-Dichloroethene	2.66				1	100
47WW34	3/14/2008	47WW34-031408	REG	trans-1,2-Dichloroethene	6.25	U	U		25	100
47WW34	2/23/2009	47WW34-022309	REG	trans-1,2-Dichloroethene	1.63					100
47WW34	8/3/2010	47WW34-100803	REG	trans-1,2-Dichloroethene	2.5	U	U		1	100
47WW35	10/9/2008	47WW35-100808	REG	trans-1,2-Dichloroethene	0.25	U			1	100
47WW35	10/9/2008	47WW35-100808-QA	FD	trans-1,2-Dichloroethene	0.25	U			1	100
47WW36	10/8/2008	47WW36-100808	REG	trans-1,2-Dichloroethene	0.25	U			1	100
47WW37	9/1/2010	47WW37-100901	REG	trans-1,2-Dichloroethene	0.25	U	U		1	100
47WW38	9/1/2010	47WW38-100901	REG	trans-1,2-Dichloroethene	0.25	U	U		1	100
47WW38	9/1/2010	47WW38-100901-FD	FD	trans-1,2-Dichloroethene	0.25	U	U		1	100
LHSMW28	2/11/1996	LHSMW28-960211	REG	trans-1,2-Dichloroethene	1	ND	U			100
LHSMW28	8/20/1996	LHSMW28-960820	REG	trans-1,2-Dichloroethene	0.29	<	U		1	100
LHSMW28	5/16/1998	LHSMW28-980516	REG	trans-1,2-Dichloroethene	1	<	U		1	100
LHSMW29	2/11/1996	LHSMW29-960211	REG	trans-1,2-Dichloroethene	1	ND	U			100
LHSMW29	8/20/1996	LHSMW29-960820	REG	trans-1,2-Dichloroethene	0.29	<	U		1	100
LHSMW29	5/16/1998	LHSMW29-980516	REG	trans-1,2-Dichloroethene	1	<	U		1	100
LHSMW30	2/12/1996	LHSMW30-960212	REG	trans-1,2-Dichloroethene	1	ND	U			100
LHSMW30	8/20/1996	LHSMW30-960820	REG	trans-1,2-Dichloroethene	0.29	<	U		1	100
LHSMW30	5/16/1998	LHSMW30-980516	REG	trans-1,2-Dichloroethene	1	<	U		1	100
LHSMW31	2/12/1996	LHSMW31-960212	REG	trans-1,2-Dichloroethene	1	ND	U			100
LHSMW31	8/20/1996	LHSMW31-960820	REG	trans-1,2-Dichloroethene	0.29	<	U		1	100
LHSMW31	8/20/1996	LHSMW31-960820FD	FD	trans-1,2-Dichloroethene	0.29	<	U		1	100
LHSMW31	5/16/1998	LHSMW31-980516	REG	trans-1,2-Dichloroethene	1	<	U		1	100
LHSMW32	2/12/1996	LHSMW32-960212	REG	trans-1,2-Dichloroethene	1	ND	U			100
LHSMW32	8/20/1996	LHSMW32-960820	REG	trans-1,2-Dichloroethene	0.29	<	U		1	100
LHSMW32	5/17/1998	LHSMW32-980517	REG	trans-1,2-Dichloroethene	1	<	U		1	100
LHSMW33	2/13/1996	LHSMW33-960213	REG	trans-1,2-Dichloroethene	1	ND	U			100
LHSMW33	8/20/1996	LHSMW33-960820	REG	trans-1,2-Dichloroethene	0.29	<	U		1	100
LHSMW33	5/17/1998	LHSMW33-980517	REG	trans-1,2-Dichloroethene	1	<	U		1	100
LHSMW34	2/13/1996	LHSMW34-960213	REG	trans-1,2-Dichloroethene	1	ND	U			100
LHSMW34	8/20/1996	LHSMW34-960820	REG	trans-1,2-Dichloroethene	0.29	<	U		1	100
LHSMW34	5/17/1998	LHSMW34-980517	REG	trans-1,2-Dichloroethene	0.68		J		1	100
LHSMW34	10/18/2007	LHSMW34-101807	REG	trans-1,2-Dichloroethene	2	U	U		2	100
LHSMW35	2/8/1996	LHSMW35-960208	REG	trans-1,2-Dichloroethene	1	ND	U			100
LHSMW35	8/20/1996	LHSMW35-960820	REG	trans-1,2-Dichloroethene	0.29	<	U		1	100
LHSMW35	5/17/1998	LHSMW35-980517	REG	trans-1,2-Dichloroethene	1	<	U		1	100
LHSMW36	2/13/1996	LHSMW36-960213	REG	trans-1,2-Dichloroethene	1	ND	U			100
LHSMW36	8/22/1996	LHSMW36-960822	REG	trans-1,2-Dichloroethene	0.29	<	U		1	100
LHSMW36	5/17/1998	LHSMW36-980517	REG	trans-1,2-Dichloroethene	1	<	U		1	100
LHSMW36	5/17/1998	LHSMW36-980517FD	FD	trans-1,2-Dichloroethene	1	<	U		1	100
LHSMW36	10/19/2007	47WW36-101907	REG	trans-1,2-Dichloroethene	1	U	UJ	07A	1	100
LHSMW37	2/8/1996	LHSMW37-960208	REG	trans-1,2-Dichloroethene	1	ND	U			100
LHSMW37	8/22/1996	LHSMW37-960822	REG	trans-1,2-Dichloroethene	0.29	<	U		1	100
LHSMW37	5/17/1998	LHSMW37-980517	REG	trans-1,2-Dichloroethene	1	<	U		1	100
LHSMW37	5/17/1998	LHSMW37-980517FD	FD	trans-1,2-Dichloroethene	1	<	U		1	100
LHSMW38	2/12/1996	LHSMW38-960212	REG	trans-1,2-Dichloroethene	1	ND	U			100
LHSMW38	8/21/1996	LHSMW38-960821	REG	trans-1,2-Dichloroethene	0.29	<	U		1	100
LHSMW38	8/21/1996	LHSMW38-960821FD	FD	trans-1,2-Dichloroethene	0.29	<	U		1	100
LHSMW38	5/17/1998	LHSMW38-980517	REG	trans-1,2-Dichloroethene	1	<	U		1	100
LHSMW38	5/17/1998	LHSMW38-980517FD	FD	trans-1,2-Dichloroethene	1	<	U		1	100
LHSMW38	7/30/2010	LHSMW38-103007 *	REG	trans-1,2-Dichloroethene	0.25	U	U			100
LHSMW39	2/10/1996	LHSMW39-960210	REG	trans-1,2-Dichloroethene	1	ND	U			100
LHSMW39	8/22/1996	LHSMW39-960822	REG	trans-1,2-Dichloroethene	0.29	<	U		1	100
LHSMW39	5/18/1998	LHSMW39-980518	REG	trans-1,2-Dichloroethene	1	<	U		1	100
LHSMW41	2/9/1996	LHSMW41-960209	REG	trans-1,2-Dichloroethene	1	ND	U			100
LHSMW41	8/22/1996	LHSMW41-960822	REG	trans-1,2-Dichloroethene	0.29	<	U		1	100
LHSMW41	5/18/1998	LHSMW41-980518	REG	trans-1,2-Dichloroethene	1	<	U		1	100
LHSMW41	2/23/2009	LHSMW41-022309	REG	trans-1,2-Dichloroethene	0.25	U	U			100
LHSMW42	2/11/1996	LHSMW42-960211	REG	trans-1,2-Dichloroethene	1	ND	U			100
LHSMW42	8/22/1996	LHSMW42-960822	REG	trans-1,2-Dichloroethene	0.29	<	U		1	100

Table A-2
Summary of VOC Analytical Results
LHAAP-47

Location	Date	Sample Number	Purpose	Parameter	Result (µg/L)	Qual	VQ	RC	DF	MCL
LHSMW42	5/18/1998	LHSMW42-980518	REG	trans-1,2-Dichloroethene	1	<	U		1	100
LHSMW43	2/9/1996	LHSMW43-960209	REG	trans-1,2-Dichloroethene	1	ND	U			100
LHSMW43	8/22/1996	LHSMW43-960822	REG	trans-1,2-Dichloroethene	3.9				1	100
LHSMW43	8/22/1996	LHSMW43-960822FD	FD	trans-1,2-Dichloroethene	4.3				1	100
LHSMW43	5/18/1998	LHSMW43-980518	REG	trans-1,2-Dichloroethene	3.8				1	100
LHSMW43	2/22/2007	LHSMW43-FEB2007	REG	trans-1,2-Dichloroethene	1.9	J	J	15	1	100
LHSMW43	2/19/2009	LHSMW43-021909	REG	trans-1,2-Dichloroethene	12.5	U	U			100
LHSMW44	2/8/1996	LHSMW44-960208	REG	trans-1,2-Dichloroethene	1	ND	U			100
LHSMW44	8/22/1996	LHSMW44-960822	REG	trans-1,2-Dichloroethene	0.29	<	U		1	100
LHSMW44	5/18/1998	LHSMW44-980518	REG	trans-1,2-Dichloroethene	1	<	U		1	100
LHSMW44	7/30/2010	LHSMW44-103007 *	REG	trans-1,2-Dichloroethene	0.25	U	U			100
LHSMW45	2/10/1996	LHSMW45-960210	REG	trans-1,2-Dichloroethene	1	ND	U			100
LHSMW45	8/22/1996	LHSMW45-960822	REG	trans-1,2-Dichloroethene	0.29	<	U		1	100
LHSMW45	5/18/1998	LHSMW45-980518	REG	trans-1,2-Dichloroethene	1	<	U		1	100
LHSMW45	2/19/2009	LHSMW45-021909	REG	trans-1,2-Dichloroethene	2.35	J	J			100
LHSMW46	2/8/1996	LHSMW46-960208	REG	trans-1,2-Dichloroethene	1	ND	U			100
LHSMW46	8/22/1996	LHSMW46-960822	REG	trans-1,2-Dichloroethene	0.29	<	U		1	100
LHSMW46	5/18/1998	LHSMW46-980518	REG	trans-1,2-Dichloroethene	1	<	U		1	100
LHSMW47	2/8/1996	LHSMW47-960208	REG	trans-1,2-Dichloroethene	1	ND	U			100
LHSMW47	8/22/1996	LHSMW47-960822	REG	trans-1,2-Dichloroethene	0.29	<	U		1	100
LHSMW47	5/18/1998	LHSMW47-980518	REG	trans-1,2-Dichloroethene	1	<	U		1	100
LHSMW48	8/22/1996	LHSMW48-960822	REG	trans-1,2-Dichloroethene	5.7				1	100
LHSMW48	5/19/1998	LHSMW48-980519	REG	trans-1,2-Dichloroethene	1	<	U		1	100
LHSMW49	2/9/1996	LHSMW49-960209	REG	trans-1,2-Dichloroethene	1	ND	U			100
LHSMW49	8/22/1996	LHSMW49-960822	REG	trans-1,2-Dichloroethene	0.34				1	100
LHSMW49	5/19/1998	LHSMW49-980519	REG	trans-1,2-Dichloroethene	1	<	U		1	100
LHSMW49	5/19/1998	LHSMW49-980519FD	FD	trans-1,2-Dichloroethene	1	<	U		1	100
LHSMW50	2/9/1996	LHSMW50-960209	REG	trans-1,2-Dichloroethene	1	ND	U			100
LHSMW50	8/22/1996	LHSMW50-960822	REG	trans-1,2-Dichloroethene	0.29	<	U		1	100
LHSMW50	5/19/1998	LHSMW50-980519	REG	trans-1,2-Dichloroethene	1	<	U		1	100
LHSMW50	2/17/2009	LHSMW50-021709	REG	trans-1,2-Dichloroethene	0.25	U	U			100
LHSMW51	2/13/1996	LHSMW51-960213	REG	trans-1,2-Dichloroethene	1	ND	U			100
LHSMW51	8/22/1996	LHSMW51-960822	REG	trans-1,2-Dichloroethene	0.29	<	U		1	100
LHSMW51	5/19/1998	LHSMW51-980519	REG	trans-1,2-Dichloroethene	1	<	U		1	100
LHSMW52	2/9/1996	LHSMW52-960209	REG	trans-1,2-Dichloroethene	1	ND	U			100
LHSMW52	8/22/1996	LHSMW52-960822	REG	trans-1,2-Dichloroethene	0.29	<	U		1	100
LHSMW52	5/19/1998	LHSMW52-980519	REG	trans-1,2-Dichloroethene	1	<	U		1	100
LHSMW53	2/10/1996	LHSMW53-960210	REG	trans-1,2-Dichloroethene	1	ND	U			100
LHSMW53	8/22/1996	LHSMW53-960822	REG	trans-1,2-Dichloroethene	0.29	<	U		1	100
LHSMW53	5/20/1998	LHSMW53-980520	REG	trans-1,2-Dichloroethene	1	<	U		1	100
LHSMW54	2/12/1996	LHSMW54-960212	REG	trans-1,2-Dichloroethene	1	ND	U			100
LHSMW54	8/21/1996	LHSMW54-960821	REG	trans-1,2-Dichloroethene	0.29	<	U		1	100
LHSMW54	5/20/1998	LHSMW54-980520	REG	trans-1,2-Dichloroethene	1	<	U		1	100
LHSMW54	10/17/2007	LHSMW54-101707	REG	trans-1,2-Dichloroethene	1	U	U		1	100
LHSMW54	8/6/2010	LHSMW54-100806	REG	trans-1,2-Dichloroethene	0.625	U	U		2.5	100
LHSMW55	2/10/1996	LHSMW55-960210	REG	trans-1,2-Dichloroethene	1	ND	U			100
LHSMW55	8/22/1996	LHSMW55-960822	REG	trans-1,2-Dichloroethene	0.29	<	U		1	100
LHSMW55	5/20/1998	LHSMW55-980520	REG	trans-1,2-Dichloroethene	1	<	U		1	100
LHSMW56	2/9/1996	LHSMW56-960209	REG	trans-1,2-Dichloroethene	6					100
LHSMW56	8/21/1996	LHSMW56-960821	REG	trans-1,2-Dichloroethene	10.5				1	100
LHSMW56	5/20/1998	LHSMW56-980520	REG	trans-1,2-Dichloroethene	7				1	100
LHSMW56	10/20/2007	LHSMW56-102007	REG	trans-1,2-Dichloroethene	2.47		J	07A	1	100
LHSMW56	4/3/2009	LHSMW56-040309	REG	trans-1,2-Dichloroethene	12.5	U	U			100
LHSMW57	2/8/1996	LHSMW57-960208	REG	trans-1,2-Dichloroethene	1	ND	U			100
LHSMW57	8/21/1996	LHSMW57-960821	REG	trans-1,2-Dichloroethene	0.29	<	U		1	100
LHSMW57	5/20/1998	LHSMW57-980520	REG	trans-1,2-Dichloroethene	1	<	U		1	100
LHSMW57	2/23/2009	LHSMW57-022309	REG	trans-1,2-Dichloroethene	0.25	U	U			100
LHSMW60	2/9/1996	LHSMW60-960209	REG	trans-1,2-Dichloroethene	1	ND	U			100
LHSMW60	8/21/1996	LHSMW60-960821	REG	trans-1,2-Dichloroethene	0.29	<	U		1	100
LHSMW60	8/21/1996	LHSMW60-960821FD	FD	trans-1,2-Dichloroethene	0.29	<	U		1	100
LHSMW60	5/20/1998	LHSMW60-980520	REG	trans-1,2-Dichloroethene	1	<	U		1	100
LHSMW60	5/23/2000	LHSMW60-000523	REG	trans-1,2-Dichloroethene	1	<	UJ		1	100

Table A-2
Summary of VOC Analytical Results
LHAAP-47

Location	Date	Sample Number	Purpose	Parameter	Result (µg/L)	Qual	VQ	RC	DF	MCL
LHSMW60	5/23/2000	LHSMW60-000523FD	FD	trans-1,2-Dichloroethene	1	<	UJ		1	100
LHSMW60	10/3/2000	LHSMW60-001003	REG	trans-1,2-Dichloroethene	1	<	U		1	100
LHSMW60	8/30/2010	LHSMW60-100830	REG	trans-1,2-Dichloroethene	0.25	U	U		1	100
105	2/13/1996	105-960213	REG	Trichloroethene	1	ND	U			5
105	8/22/1996	105-960822	REG	Trichloroethene	1.2				1	5
105	5/18/1998	105-980518	REG	Trichloroethene	1.2				1	5
105	2/18/2009	105-021809	REG	Trichloroethene	*21.9*					5
105	7/31/2010	105-103107 *	REG	Trichloroethene	25.8					5
47WW01	9/29/1998	47WW01-980929	REG	Trichloroethene	1	<	U		1	5
47WW01	11/7/1998	47WW01-981107	REG	Trichloroethene	1	<	U		1	5
47WW01	10/18/2007	47WW01-101807	REG	Trichloroethene	0.337	J	J	15, 07A	1	5
47WW02	11/4/1998	47WW02-981104	REG	Trichloroethene	1	<	U		1	5
47WW03	11/5/1998	47WW03-981105	REG	Trichloroethene	0.96				1	5
47WW03	10/17/2007	47WW03-101707	REG	Trichloroethene	1	U	U		1	5
47WW04	11/5/1998	47WW04-981105	REG	Trichloroethene	1	<	U		1	5
47WW04	10/18/2007	47WW04-101807	REG	Trichloroethene	1	U	U		1	5
47WW04	8/6/2010	47WW04-100806	REG	Trichloroethene	0.25	U	U		1	5
47WW05	11/9/1998	47WW05-981109	REG	Trichloroethene	*2300*				40	5
47WW05	9/1/2004	47WW05-040901	REG	Trichloroethene	*3200*	D			20	5
47WW05	10/20/2007	47WW05-102007	REG	Trichloroethene	*759*				10	5
47WW06	11/6/1998	47WW06-981106	REG	Trichloroethene	1.8				1	5
47WW06	9/1/2004	47WW06-040901	REG	Trichloroethene	5	U	UJ	05B	1	5
47WW08	11/4/1998	47WW08-981104	REG	Trichloroethene	1	<	U		1	5
47WW09	11/4/1998	47WW09-981104	REG	Trichloroethene	*560*				20	5
47WW09	2/21/2007	47WW09-FEB2007	REG	Trichloroethene	*2230*				100	5
47WW09	2/18/2009	47WW09-021809	REG	Trichloroethene	*2820*					5
47WW09	8/3/2010	47WW09-100803	REG	Trichloroethene	*1720*				1	5
47WW11	11/7/1998	47WW11-981107	REG	Trichloroethene	4	<	U		4	5
47WW11	5/24/2000	47WW11-000524	REG	Trichloroethene	1	<	U		1	5
47WW11	10/3/2000	47WW11-001003	REG	Trichloroethene	1	<	U		1	5
47WW12	11/4/1998	47WW12-981104	REG	Trichloroethene	*12*				1	5
47WW12	4/22/2009	47WW12-042209	REG	Trichloroethene	0.36	J	J	15	1	5
47WW13	11/4/1998	47WW13-981104	REG	Trichloroethene	*740*				40	5
47WW13	9/2/2004	47WW13-040902	REG	Trichloroethene	*720*	D			10	5
47WW13	2/20/2007	47WW13-FEB2007	REG	Trichloroethene	*565*				50	5
47WW13	2/17/2009	47WW13-021709	REG	Trichloroethene	*470*				50	5
47WW13	2/17/2009	47WW13-021709-FD	FD	Trichloroethene	*473*				50	5
47WW13	8/4/2010	47WW13-100804	REG	Trichloroethene	*647*				1	5
47WW14	11/4/1998	47WW14-981104	REG	Trichloroethene	*610*				40	5
47WW14	9/2/2004	47WW14-040902	REG	Trichloroethene	*280*	D			3	5
47WW14	2/20/2007	47WW14-FEB2007	REG	Trichloroethene	*346*				5	5
47WW14	2/20/2007	47WW14-FEB2007FD	FD	Trichloroethene	*378*				50	5
47WW14	2/19/2009	47WW14-021909	REG	Trichloroethene	*196*				1	5
47WW14	2/19/2009	47WW14-021909-FD	FD	Trichloroethene	*186*				1	5
47WW14	8/4/2010	47WW14-100804	REG	Trichloroethene	*353*				1	5
47WW14	8/4/2010	47WW14-100804-FD	FD	Trichloroethene	*351*				1	5
47WW16	11/4/1998	47WW16-981104	REG	Trichloroethene	*7.9*				1	5
47WW16	4/22/2009	47WW16-042209	REG	Trichloroethene	0.25	U			1	5
47WW17	11/9/1998	47WW17-981109	REG	Trichloroethene	1	<	U		1	5
47WW18	9/29/1998	47WW18-980929	REG	Trichloroethene	*40*				1	5
47WW18	11/6/1998	47WW18-981106	REG	Trichloroethene	*38*				1	5
47WW18	10/18/2007	47WW18-101807	REG	Trichloroethene	*147*				1	5
47WW18	10/18/2007	47WW18-101807-DUP	FD	Trichloroethene	*134*				1	5
47WW19	11/6/1998	47WW19-981106	REG	Trichloroethene	0.93		J		1	5
47WW19	2/19/2009	47WW19-021909	REG	Trichloroethene	2				1	5
47WW21	11/5/1998	47WW21-981105	REG	Trichloroethene	*9.7*				1	5
47WW21	10/18/2007	47WW21-101807	REG	Trichloroethene	2.61				1	5
47WW21	10/18/2007	47WW21-101807-QC	FD	Trichloroethene	3.06				1	5
47WW21	7/31/2010	47WW21-103107 *	REG	Trichloroethene	0.495	J	J	15		5
47WW22	11/5/1998	47WW22-981105	REG	Trichloroethene	1	<	U		1	5
47WW22	10/18/2007	47WW22-101807	REG	Trichloroethene	1	U	U		1	5
47WW23	9/29/1998	47WW23-980929	REG	Trichloroethene	*30*				1	5

Table A-2
Summary of VOC Analytical Results
LHAAP-47

Location	Date	Sample Number	Purpose	Parameter	Result (µg/L)	Qual	VQ	RC	DF	MCL
47WW23	11/5/1998	47WW23-981105	REG	Trichloroethene	0.64		J		1	5
47WW23	11/5/1998	47WW23-981105FD	FD	Trichloroethene	1	<	U		1	5
47WW23	10/19/2007	47WW23-101907	REG	Trichloroethene	1	U	U		1	5
47WW23	8/6/2010	47WW23-100806	REG	Trichloroethene	0.25	U	U		1	5
47WW24	12/20/2000	47WW24-001220	REG	Trichloroethene	0.1	<	U		1	5
47WW25	12/20/2000	47WW25-001220	REG	Trichloroethene	*9280*				100	5
47WW25	10/18/2007	47WW25-101607	REG	Trichloroethene	*26700*				500	5
47WW25	4/3/2009	47WW25-040309	REG	Trichloroethene	*13300*				100	5
47WW26	12/20/2000	47WW26-001220	REG	Trichloroethene	1.78				1	5
47WW27	12/19/2000	47WW27-001219	REG	Trichloroethene	0.1	<	U		1	5
47WW27	12/19/2000	47WW27-001219FD	FD	Trichloroethene	0.1	<	U		1	5
47WW27	7/31/2010	47WW27-103107 *	REG	Trichloroethene	0.25	U	U			5
47WW28	9/1/2004	47WW28-040901	REG	Trichloroethene	5	U	UJ	05B	1	5
47WW28	10/17/2007	47WW28-101707	REG	Trichloroethene	1	U	U		1	5
47WW28	7/31/2010	47WW28-103107 *	REG	Trichloroethene	0.25	U	U			5
47WW29	9/1/2004	47WW29-040901	REG	Trichloroethene	5	U	UJ	05B	1	5
47WW29	10/17/2007	47WW29-101707	REG	Trichloroethene	1	U	U		1	5
47WW29	7/31/2010	47WW29-103107 *	REG	Trichloroethene	0.25	U	U			5
47WW29	7/31/2010	47WW29-103107-FD *	FD	Trichloroethene	0.25	U	U			5
47WW30	9/1/2004	47WW30-040901	REG	Trichloroethene	*1100*	D			8	5
47WW30	2/22/2007	47WW30-FEB2007	REG	Trichloroethene	*1060*				10	5
47WW30	10/18/2007	47WW30-101807	REG	Trichloroethene	*1370*				25	5
47WW30	8/4/2010	47WW30-100804	REG	Trichloroethene	*1100*				1	5
47WW31	9/2/2004	47WW31-040902	REG	Trichloroethene	5	U	U		1	5
47WW31	10/18/2007	47WW31-101807	REG	Trichloroethene	0.329	J	J	15	1	5
47WW32	10/18/2007	47WW32-101807	REG	Trichloroethene	*34*				1	5
47WW32	7/31/2010	47WW32-103107 *	REG	Trichloroethene	*30.8*					5
47WW33	2/20/2008	47WW33-022008	REG	Trichloroethene	*7.09*				1	5
47WW33	2/20/2008	47WW33-022008-QC	FD	Trichloroethene	*7.65*				1	5
47WW33	3/14/2008	47WW33-031408	REG	Trichloroethene	1.44				1	5
47WW33	7/30/2010	47WW33-103107 *	REG	Trichloroethene	2.21					5
47WW34	2/19/2008	47WW34-021908	REG	Trichloroethene	*3270*				50	5
47WW34	3/14/2008	47WW34-031408	REG	Trichloroethene	*2150*				25	5
47WW34	2/23/2009	47WW34-022309	REG	Trichloroethene	*1730*				20	5
47WW34	8/3/2010	47WW34-100803	REG	Trichloroethene	*1340*				1	5
47WW35	10/9/2008	47WW35-100808	REG	Trichloroethene	0.25	U			1	5
47WW35	10/9/2008	47WW35-100808-QA	FD	Trichloroethene	0.25	U			1	5
47WW36	10/8/2008	47WW36-100808	REG	Trichloroethene	0.25	U			1	5
47WW37	9/1/2010	47WW37-100901	REG	Trichloroethene	*29.4*				1	5
47WW38	9/1/2010	47WW38-100901	REG	Trichloroethene	0.565	J	J	15	1	5
47WW38	9/1/2010	47WW38-100901-FD	FD	Trichloroethene	0.605	J	J	15	1	5
LHSMW28	12/7/1994	LHSMW28-941207	REG	Trichloroethene	5	<	U		1	5
LHSMW28	2/11/1996	LHSMW28-960211	REG	Trichloroethene	1	ND	U		1	5
LHSMW28	8/20/1996	LHSMW28-960820	REG	Trichloroethene	0.25	<	U		1	5
LHSMW28	5/16/1998	LHSMW28-980516	REG	Trichloroethene	0.69		J		1	5
LHSMW29	12/7/1994	LHSMW29-941207	REG	Trichloroethene	5	<	U		1	5
LHSMW29	2/11/1996	LHSMW29-960211	REG	Trichloroethene	1	ND	U		1	5
LHSMW29	8/20/1996	LHSMW29-960820	REG	Trichloroethene	0.25	<	U		1	5
LHSMW29	5/16/1998	LHSMW29-980516	REG	Trichloroethene	1	<	U		1	5
LHSMW30	12/7/1994	LHSMW30-941207	REG	Trichloroethene	5	<	U		1	5
LHSMW30	2/12/1996	LHSMW30-960212	REG	Trichloroethene	1	ND	U		1	5
LHSMW30	8/20/1996	LHSMW30-960820	REG	Trichloroethene	0.25	<	U		1	5
LHSMW30	5/16/1998	LHSMW30-980516	REG	Trichloroethene	1	<	U		1	5
LHSMW31	2/12/1996	LHSMW31-960212	REG	Trichloroethene	1	ND	U		1	5
LHSMW31	8/20/1996	LHSMW31-960820	REG	Trichloroethene	0.25	<	U		1	5
LHSMW31	8/20/1996	LHSMW31-960820FD	FD	Trichloroethene	0.25	<	U		1	5
LHSMW31	5/16/1998	LHSMW31-980516	REG	Trichloroethene	1	<	U		1	5
LHSMW32	12/5/1994	LHSMW32-941205	REG	Trichloroethene	5	<	U		1	5
LHSMW32	2/12/1996	LHSMW32-960212	REG	Trichloroethene	1	ND	U		1	5
LHSMW32	8/20/1996	LHSMW32-960820	REG	Trichloroethene	0.25	<	U		1	5
LHSMW32	5/17/1998	LHSMW32-980517	REG	Trichloroethene	1	<	U		1	5
LHSMW33	12/5/1994	LHSMW33-941205	REG	Trichloroethene	5	<	U		1	5

Table A-2
Summary of VOC Analytical Results
LHAAP-47

Location	Date	Sample Number	Purpose	Parameter	Result (µg/L)	Qual	VQ	RC	DF	MCL
LHSMW33	2/13/1996	LHSMW33-960213	REG	Trichloroethene	1	ND	U		1	5
LHSMW33	8/20/1996	LHSMW33-960820	REG	Trichloroethene	0.25	<	U		1	5
LHSMW33	5/17/1998	LHSMW33-980517	REG	Trichloroethene	1	<	U		1	5
LHSMW34	12/5/1994	LHSMW34-941205	REG	Trichloroethene	5				1	5
LHSMW34	2/13/1996	LHSMW34-960213	REG	Trichloroethene	7.5				1	5
LHSMW34	8/20/1996	LHSMW34-960820	REG	Trichloroethene	14.7				1	5
LHSMW34	5/17/1998	LHSMW34-980517	REG	Trichloroethene	22				1	5
LHSMW34	10/18/2007	LHSMW34-101807	REG	Trichloroethene	2	U	U		2	5
LHSMW35	12/5/1994	LHSMW35-941205	REG	Trichloroethene	5	<	U		1	5
LHSMW35	2/8/1996	LHSMW35-960208	REG	Trichloroethene	1	ND	U		1	5
LHSMW35	8/20/1996	LHSMW35-960820	REG	Trichloroethene	0.25	<	U		1	5
LHSMW35	5/17/1998	LHSMW35-980517	REG	Trichloroethene	1	<	U		1	5
LHSMW36	12/5/1994	LHSMW36-941205	REG	Trichloroethene	5	<	U		1	5
LHSMW36	2/13/1996	LHSMW36-960213	REG	Trichloroethene	1	ND	U		1	5
LHSMW36	8/22/1996	LHSMW36-960822	REG	Trichloroethene	0.25	<	U		1	5
LHSMW36	5/17/1998	LHSMW36-980517	REG	Trichloroethene	1	<	U		1	5
LHSMW36	5/17/1998	LHSMW36-980517FD	FD	Trichloroethene	1	<	U		1	5
LHSMW36	10/19/2007	47WW36-101907	REG	Trichloroethene	0.799	J	J	07A, 15	1	5
LHSMW37	12/5/1994	LHSMW37-941205	REG	Trichloroethene	5	<	U		1	5
LHSMW37	2/8/1996	LHSMW37-960208	REG	Trichloroethene	1	ND	U		1	5
LHSMW37	8/22/1996	LHSMW37-960822	REG	Trichloroethene	0.25	<	U		1	5
LHSMW37	5/17/1998	LHSMW37-980517	REG	Trichloroethene	1	<	U		1	5
LHSMW37	5/17/1998	LHSMW37-980517FD	FD	Trichloroethene	1	<	U		1	5
LHSMW38	2/12/1996	LHSMW38-960212	REG	Trichloroethene	1	ND	U		1	5
LHSMW38	8/21/1996	LHSMW38-960821	REG	Trichloroethene	0.25	<	U		1	5
LHSMW38	8/21/1996	LHSMW38-960821FD	FD	Trichloroethene	0.25	<	U		1	5
LHSMW38	5/17/1998	LHSMW38-980517	REG	Trichloroethene	1	<	U		1	5
LHSMW38	5/17/1998	LHSMW38-980517FD	FD	Trichloroethene	1	<	U		1	5
LHSMW38	7/30/2010	LHSMW38-103007 *	REG	Trichloroethene	0.25	U	U			5
LHSMW39	12/6/1994	LHSMW39-941206	REG	Trichloroethene	2	J			1	5
LHSMW39	2/10/1996	LHSMW39-960210	REG	Trichloroethene	2				1	5
LHSMW39	8/22/1996	LHSMW39-960822	REG	Trichloroethene	1.9				1	5
LHSMW39	5/18/1998	LHSMW39-980518	REG	Trichloroethene	1.4				1	5
LHSMW41	12/8/1994	LHSMW41-941208	REG	Trichloroethene	6				1	5
LHSMW41	2/9/1996	LHSMW41-960209	REG	Trichloroethene	8				1	5
LHSMW41	8/22/1996	LHSMW41-960822	REG	Trichloroethene	0.25	<	U		1	5
LHSMW41	5/18/1998	LHSMW41-980518	REG	Trichloroethene	1	<	U		1	5
LHSMW41	2/23/2009	LHSMW41-022309	REG	Trichloroethene	0.957	J	J		1	5
LHSMW42	2/11/1996	LHSMW42-960211	REG	Trichloroethene	1	ND	U		1	5
LHSMW42	8/22/1996	LHSMW42-960822	REG	Trichloroethene	0.25	<	U		1	5
LHSMW42	5/18/1998	LHSMW42-980518	REG	Trichloroethene	1	<	U		1	5
LHSMW43	12/8/1994	LHSMW43-941208	REG	Trichloroethene	21000				500	5
LHSMW43	2/9/1996	LHSMW43-960209	REG	Trichloroethene	29140				500	5
LHSMW43	8/22/1996	LHSMW43-960822	REG	Trichloroethene	12700				500	5
LHSMW43	8/22/1996	LHSMW43-960822FD	FD	Trichloroethene	27800				500	5
LHSMW43	5/18/1998	LHSMW43-980518	REG	Trichloroethene	5500				400	5
LHSMW43	2/22/2007	LHSMW43-FEB2007	REG	Trichloroethene	11600				100	5
LHSMW43	2/19/2009	LHSMW43-021909	REG	Trichloroethene	6240					5
LHSMW44	12/8/1994	LHSMW44-941208	REG	Trichloroethene	18					5
LHSMW44	2/8/1996	LHSMW44-960208	REG	Trichloroethene	83					5
LHSMW44	8/22/1996	LHSMW44-960822	REG	Trichloroethene	151				1	5
LHSMW44	5/18/1998	LHSMW44-980518	REG	Trichloroethene	89				1	5
LHSMW44	7/30/2010	LHSMW44-103007 *	REG	Trichloroethene	26.4					5
LHSMW45	12/8/1994	LHSMW45-941208	REG	Trichloroethene	37					5
LHSMW45	2/10/1996	LHSMW45-960210	REG	Trichloroethene	4					5
LHSMW45	8/22/1996	LHSMW45-960822	REG	Trichloroethene	22.1				1	5
LHSMW45	5/18/1998	LHSMW45-980518	REG	Trichloroethene	36				1	5
LHSMW45	2/19/2009	LHSMW45-021909	REG	Trichloroethene	926					5
LHSMW46	12/8/1994	LHSMW46-941208	REG	Trichloroethene	12					5
LHSMW46	2/8/1996	LHSMW46-960208	REG	Trichloroethene	23					5
LHSMW46	8/22/1996	LHSMW46-960822	REG	Trichloroethene	30.4				1	5
LHSMW46	5/18/1998	LHSMW46-980518	REG	Trichloroethene	21				1	5

Table A-2
Summary of VOC Analytical Results
LHAAP-47

Location	Date	Sample Number	Purpose	Parameter	Result (µg/L)	Qual	VQ	RC	DF	MCL
LHSMW47	12/7/1994	LHSMW47-941207	REG	Trichloroethene	*19*				1	5
LHSMW47	2/8/1996	LHSMW47-960208	REG	Trichloroethene	*20*					5
LHSMW47	8/22/1996	LHSMW47-960822	REG	Trichloroethene	*35.9*				1	5
LHSMW47	5/18/1998	LHSMW47-980518	REG	Trichloroethene	*17*				1	5
LHSMW48	12/9/1994	LHSMW48-941209	REG	Trichloroethene	*460*				1	5
LHSMW48	8/22/1996	LHSMW48-960822	REG	Trichloroethene	*398*				10	5
LHSMW48	5/19/1998	LHSMW48-980519	REG	Trichloroethene	*220*				2.5	5
LHSMW49	12/7/1994	LHSMW49-941207	REG	Trichloroethene	*110*				1	5
LHSMW49	2/9/1996	LHSMW49-960209	REG	Trichloroethene	*115*					5
LHSMW49	8/22/1996	LHSMW49-960822	REG	Trichloroethene	*127*				1	5
LHSMW49	5/19/1998	LHSMW49-980519	REG	Trichloroethene	*67*				1	5
LHSMW49	5/19/1998	LHSMW49-980519FD	FD	Trichloroethene	*69*				1	5
LHSMW50	2/9/1996	LHSMW50-960209	REG	Trichloroethene	1	ND	U			5
LHSMW50	8/22/1996	LHSMW50-960822	REG	Trichloroethene	0.96				1	5
LHSMW50	5/19/1998	LHSMW50-980519	REG	Trichloroethene	1	<	U		1	5
LHSMW50	2/17/2009	LHSMW50-021709	REG	Trichloroethene	0.25	U	U			5
LHSMW51	2/13/1996	LHSMW51-960213	REG	Trichloroethene	1	ND	U			5
LHSMW51	8/22/1996	LHSMW51-960822	REG	Trichloroethene	0.25	<	U		1	5
LHSMW51	5/19/1998	LHSMW51-980519	REG	Trichloroethene	1	<	U		1	5
LHSMW52	2/9/1996	LHSMW52-960209	REG	Trichloroethene	1	ND	U			5
LHSMW52	8/22/1996	LHSMW52-960822	REG	Trichloroethene	0.25	<	U		1	5
LHSMW52	5/19/1998	LHSMW52-980519	REG	Trichloroethene	1	<	U		1	5
LHSMW53	12/7/1994	LHSMW53-941207	REG	Trichloroethene	5	<	U		1	5
LHSMW53	2/10/1996	LHSMW53-960210	REG	Trichloroethene	1	ND	U			5
LHSMW53	8/22/1996	LHSMW53-960822	REG	Trichloroethene	0.25	<	U		1	5
LHSMW53	5/20/1998	LHSMW53-980520	REG	Trichloroethene	1	<	U		1	5
LHSMW54	12/9/1994	LHSMW54-941209	REG	Trichloroethene	*12*					5
LHSMW54	2/12/1996	LHSMW54-960212	REG	Trichloroethene	*11*					5
LHSMW54	8/21/1996	LHSMW54-960821	REG	Trichloroethene	*15.7*				1	5
LHSMW54	5/20/1998	LHSMW54-980520	REG	Trichloroethene	*210*				4	5
LHSMW54	10/17/2007	LHSMW54-101707	REG	Trichloroethene	*601*				10	5
LHSMW54	8/6/2010	LHSMW54-100806	REG	Trichloroethene	*369*				2.5	5
LHSMW55	12/9/1994	LHSMW55-941209	REG	Trichloroethene	*13*					5
LHSMW55	2/10/1996	LHSMW55-960210	REG	Trichloroethene	1	ND	U			5
LHSMW55	8/22/1996	LHSMW55-960822	REG	Trichloroethene	0.25	<	U		1	5
LHSMW55	5/20/1998	LHSMW55-980520	REG	Trichloroethene	1	<	U		1	5
LHSMW56	12/7/1994	LHSMW56-941207	REG	Trichloroethene	2		J		1	5
LHSMW56	2/9/1996	LHSMW56-960209	REG	Trichloroethene	*13*					5
LHSMW56	8/21/1996	LHSMW56-960821	REG	Trichloroethene	*6.2*				1	5
LHSMW56	5/20/1998	LHSMW56-980520	REG	Trichloroethene	*17*				1	5
LHSMW56	10/20/2007	LHSMW56-102007	REG	Trichloroethene	*8740*				100	5
LHSMW56	4/3/2009	LHSMW56-040309	REG	Trichloroethene	*4610*				50	5
LHSMW57	2/8/1996	LHSMW57-960208	REG	Trichloroethene	1	ND	U			5
LHSMW57	8/21/1996	LHSMW57-960821	REG	Trichloroethene	0.25	<	U		1	5
LHSMW57	5/20/1998	LHSMW57-980520	REG	Trichloroethene	1	<	U		1	5
LHSMW57	2/23/2009	LHSMW57-022309	REG	Trichloroethene	0.25	U	U			5
LHSMW60	2/9/1996	LHSMW60-960209	REG	Trichloroethene	1	ND	U			5
LHSMW60	8/21/1996	LHSMW60-960821	REG	Trichloroethene	0.25	<	U		1	5
LHSMW60	8/21/1996	LHSMW60-960821FD	FD	Trichloroethene	0.25	<	U		1	5
LHSMW60	5/20/1998	LHSMW60-980520	REG	Trichloroethene	1	<	U		1	5
LHSMW60	5/23/2000	LHSMW60-000523	REG	Trichloroethene	2.8		J		1	5
LHSMW60	5/23/2000	LHSMW60-000523FD	FD	Trichloroethene	1	<	UJ		1	5
LHSMW60	10/3/2000	LHSMW60-001003	REG	Trichloroethene	1	<	U		1	5
LHSMW60	8/30/2010	LHSMW60-100830	REG	Trichloroethene	0.25	U	U		1	5
105	2/13/1996	105-960213	REG	Vinyl chloride	1	ND	U			2
105	8/22/1996	105-960822	REG	Vinyl chloride	0.48				1	2
105	5/18/1998	105-980518	REG	Vinyl chloride	1	<	U		1	2
105	2/18/2009	105-021809	REG	Vinyl chloride	0.25	U	U			2
105	7/31/2010	105-103107 *	REG	Vinyl chloride	0.25	U	U		1	2
47WW01	9/29/1998	47WW01-980929	REG	Vinyl chloride	1	<	U		1	2
47WW01	11/7/1998	47WW01-981107	REG	Vinyl chloride	1	<	U		1	2
47WW01	10/18/2007	47WW01-101807	REG	Vinyl chloride	1	U	UJ	07A	1	2

Table A-2
Summary of VOC Analytical Results
LHAAP-47

Location	Date	Sample Number	Purpose	Parameter	Result (µg/L)	Qual	VQ	RC	DF	MCL
47WW02	11/4/1998	47WW02-981104	REG	Vinyl chloride	1	<	U		1	2
47WW03	11/5/1998	47WW03-981105	REG	Vinyl chloride	1	<	U		1	2
47WW03	10/17/2007	47WW03-101707	REG	Vinyl chloride	1	U	U		1	2
47WW04	11/5/1998	47WW04-981105	REG	Vinyl chloride	1	<	U		1	2
47WW04	10/18/2007	47WW04-101807	REG	Vinyl chloride	1	U	U		1	2
47WW04	8/6/2010	47WW04-100806	REG	Vinyl chloride	0.25	U	U		1	2
47WW05	11/9/1998	47WW05-981109	REG	Vinyl chloride	40	<	U		40	2
47WW05	9/1/2004	47WW05-040901	REG	Vinyl chloride	5	U	U		1	2
47WW05	10/20/2007	47WW05-102007	REG	Vinyl chloride	1	U	U		1	2
47WW06	11/6/1998	47WW06-981106	REG	Vinyl chloride	1	<	U		1	2
47WW06	9/1/2004	47WW06-040901	REG	Vinyl chloride	5	U	U		1	2
47WW08	11/4/1998	47WW08-981104	REG	Vinyl chloride	1	<	U		1	2
47WW09	11/4/1998	47WW09-981104	REG	Vinyl chloride	1	<	U		1	2
47WW09	2/21/2007	47WW09-FEB2007	REG	Vinyl chloride	0.32	U	U		1	2
47WW09	2/18/2009	47WW09-021809	REG	Vinyl chloride	5	U	U			2
47WW09	8/3/2010	47WW09-100803	REG	Vinyl chloride	2.5	U	U		1	2
47WW11	11/7/1998	47WW11-981107	REG	Vinyl chloride	4	<	U		4	2
47WW11	5/24/2000	47WW11-000524	REG	Vinyl chloride	1	<	U		1	2
47WW11	10/3/2000	47WW11-001003	REG	Vinyl chloride	1	<	U		1	2
47WW12	11/4/1998	47WW12-981104	REG	Vinyl chloride	*6.9*				1	2
47WW12	4/22/2009	47WW12-042209	REG	Vinyl chloride	0.25	U			1	2
47WW13	11/4/1998	47WW13-981104	REG	Vinyl chloride	*42*				1	2
47WW13	9/2/2004	47WW13-040902	REG	Vinyl chloride	*6*				1	2
47WW13	2/20/2007	47WW13-FEB2007	REG	Vinyl chloride	*36*				1	2
47WW13	2/17/2009	47WW13-021709	REG	Vinyl chloride	*103*					2
47WW13	2/17/2009	47WW13-021709-FD	FD	Vinyl chloride	*105*					2
47WW13	8/4/2010	47WW13-100804	REG	Vinyl chloride	*249*				1	2
47WW14	11/4/1998	47WW14-981104	REG	Vinyl chloride	1	<	U		1	2
47WW14	9/2/2004	47WW14-040902	REG	Vinyl chloride	*18*				1	2
47WW14	2/20/2007	47WW14-FEB2007	REG	Vinyl chloride	*28.1*				1	2
47WW14	2/20/2007	47WW14-FEB2007FD	FD	Vinyl chloride	*20.5*				1	2
47WW14	2/19/2009	47WW14-021909	REG	Vinyl chloride	*11.3*		J			2
47WW14	2/19/2009	47WW14-021909-FD	FD	Vinyl chloride	*17.1*		J			2
47WW14	8/4/2010	47WW14-100804	REG	Vinyl chloride	*15.2*				1	2
47WW14	8/4/2010	47WW14-100804-FD	FD	Vinyl chloride	*14.1*				1	2
47WW16	11/4/1998	47WW16-981104	REG	Vinyl chloride	1	<	U		1	2
47WW16	4/22/2009	47WW16-042209	REG	Vinyl chloride	0.25	U			1	2
47WW17	11/9/1998	47WW17-981109	REG	Vinyl chloride	1	<	U		1	2
47WW18	9/29/1998	47WW18-980929	REG	Vinyl chloride	1	<	U		1	2
47WW18	11/6/1998	47WW18-981106	REG	Vinyl chloride	1	<	U		1	2
47WW18	10/18/2007	47WW18-101807	REG	Vinyl chloride	0.575	J	J	15	1	2
47WW18	10/18/2007	47WW18-101807-DUP	FD	Vinyl chloride	0.52	J	J	15	1	2
47WW19	11/6/1998	47WW19-981106	REG	Vinyl chloride	1	<	U		1	2
47WW19	2/19/2009	47WW19-021909	REG	Vinyl chloride	0.25	U	U			2
47WW21	11/5/1998	47WW21-981105	REG	Vinyl chloride	1	<	U		1	2
47WW21	10/18/2007	47WW21-101807	REG	Vinyl chloride	1	U	U		1	2
47WW21	10/18/2007	47WW21-101807-QC	FD	Vinyl chloride	1	U	U		1	2
47WW21	7/31/2010	47WW21-103107 *	REG	Vinyl chloride	0.25	U	U		1	2
47WW22	11/5/1998	47WW22-981105	REG	Vinyl chloride	1	<	U		1	2
47WW22	10/18/2007	47WW22-101807	REG	Vinyl chloride	1	U	U		1	2
47WW23	9/29/1998	47WW23-980929	REG	Vinyl chloride	1	<	U		1	2
47WW23	11/5/1998	47WW23-981105	REG	Vinyl chloride	1	<	U		1	2
47WW23	11/5/1998	47WW23-981105FD	FD	Vinyl chloride	1	<	U		1	2
47WW23	10/19/2007	47WW23-101907	REG	Vinyl chloride	1	U	U		1	2
47WW23	8/6/2010	47WW23-100806	REG	Vinyl chloride	0.25	U	U		1	2
47WW24	12/20/2000	47WW24-001220	REG	Vinyl chloride	0.2	<	U		1	2
47WW25	12/20/2000	47WW25-001220	REG	Vinyl chloride	*88.6*				1	2
47WW25	10/18/2007	47WW25-101607	REG	Vinyl chloride	*34.9*		J	07A	1	2
47WW25	4/3/2009	47WW25-040309	REG	Vinyl chloride	25	U	U		100	2
47WW26	12/20/2000	47WW26-001220	REG	Vinyl chloride	0.2	<	U		1	2
47WW27	12/19/2000	47WW27-001219	REG	Vinyl chloride	0.2	<	U		1	2
47WW27	12/19/2000	47WW27-001219FD	FD	Vinyl chloride	0.2	<	U		1	2

Table A-2
Summary of VOC Analytical Results
LHAAP-47

Location	Date	Sample Number	Purpose	Parameter	Result (µg/L)	Qual	VQ	RC	DF	MCL
47WW27	7/31/2010	47WW27-103107 *	REG	Vinyl chloride	0.25	U	U		1	2
47WW28	9/1/2004	47WW28-040901	REG	Vinyl chloride	5	U	U		1	2
47WW28	10/17/2007	47WW28-101707	REG	Vinyl chloride	1	U	U		1	2
47WW28	7/31/2010	47WW28-103107 *	REG	Vinyl chloride	0.25	U	U		1	2
47WW29	9/1/2004	47WW29-040901	REG	Vinyl chloride	5	U	U		1	2
47WW29	10/17/2007	47WW29-101707	REG	Vinyl chloride	1	U	U		1	2
47WW29	7/31/2010	47WW29-103107 *	REG	Vinyl chloride	0.25	U	U		1	2
47WW29	7/31/2010	47WW29-103107-FD *	FD	Vinyl chloride	0.25	U	U		1	2
47WW30	9/1/2004	47WW30-040901	REG	Vinyl chloride	5	U	U		1	2
47WW30	2/22/2007	47WW30-FEB2007	REG	Vinyl chloride	0.32	U	U		1	2
47WW30	10/18/2007	47WW30-101807	REG	Vinyl chloride	0.747	J	J	15	1	2
47WW30	8/4/2010	47WW30-100804	REG	Vinyl chloride	2.5	U	U		1	2
47WW31	9/2/2004	47WW31-040902	REG	Vinyl chloride	5	U	U		1	2
47WW31	10/18/2007	47WW31-101807	REG	Vinyl chloride	1	U	U		1	2
47WW32	10/18/2007	47WW32-101807	REG	Vinyl chloride	0.302	J	J	15	1	2
47WW32	7/31/2010	47WW32-103107 *	REG	Vinyl chloride	0.25	U	U		1	2
47WW33	2/20/2008	47WW33-022008	REG	Vinyl chloride	0.25	U	U		1	2
47WW33	2/20/2008	47WW33-022008-QC	FD	Vinyl chloride	0.25	U	U		1	2
47WW33	3/14/2008	47WW33-031408	REG	Vinyl chloride	0.25	U	U		1	2
47WW33	7/30/2010	47WW33-103007 *	REG	Vinyl chloride	0.25	U	U		1	2
47WW34	2/19/2008	47WW34-021908	REG	Vinyl chloride	*23.4*				1	2
47WW34	3/14/2008	47WW34-031408	REG	Vinyl chloride	*11.1*	J	J	15	25	2
47WW34	2/23/2009	47WW34-022309	REG	Vinyl chloride	*4.05*					2
47WW34	8/3/2010	47WW34-100803	REG	Vinyl chloride	2.5	U	U		1	2
47WW35	10/9/2008	47WW35-100808	REG	Vinyl chloride	0.25	U			1	2
47WW35	10/9/2008	47WW35-100808-QA	FD	Vinyl chloride	0.25	U			1	2
47WW36	10/8/2008	47WW36-100808	REG	Vinyl chloride	0.25	U			1	2
47WW37	9/1/2010	47WW37-100901	REG	Vinyl chloride	0.25	U	U		1	2
47WW38	9/1/2010	47WW38-100901	REG	Vinyl chloride	0.25	U	U		1	2
47WW38	9/1/2010	47WW38-100901-FD	FD	Vinyl chloride	0.25	U	U		1	2
LHSMW28	2/11/1996	LHSMW28-960211	REG	Vinyl chloride	1	ND	U			2
LHSMW28	8/20/1996	LHSMW28-960820	REG	Vinyl chloride	0.24	<	U		1	2
LHSMW28	5/16/1998	LHSMW28-980516	REG	Vinyl chloride	1	<	U		1	2
LHSMW29	2/11/1996	LHSMW29-960211	REG	Vinyl chloride	1	ND	U			2
LHSMW29	8/20/1996	LHSMW29-960820	REG	Vinyl chloride	0.24	<	U		1	2
LHSMW29	5/16/1998	LHSMW29-980516	REG	Vinyl chloride	1	<	U		1	2
LHSMW30	2/12/1996	LHSMW30-960212	REG	Vinyl chloride	1	ND	U			2
LHSMW30	8/20/1996	LHSMW30-960820	REG	Vinyl chloride	0.24	<	U		1	2
LHSMW30	5/16/1998	LHSMW30-980516	REG	Vinyl chloride	1	<	U		1	2
LHSMW31	2/12/1996	LHSMW31-960212	REG	Vinyl chloride	1	ND	U			2
LHSMW31	8/20/1996	LHSMW31-960820	REG	Vinyl chloride	0.24	<	U		1	2
LHSMW31	8/20/1996	LHSMW31-960820FD	FD	Vinyl chloride	0.24	<	U		1	2
LHSMW31	5/16/1998	LHSMW31-980516	REG	Vinyl chloride	1	<	U		1	2
LHSMW32	2/12/1996	LHSMW32-960212	REG	Vinyl chloride	1	ND	U			2
LHSMW32	8/20/1996	LHSMW32-960820	REG	Vinyl chloride	0.24	<	U		1	2
LHSMW32	5/17/1998	LHSMW32-980517	REG	Vinyl chloride	1	<	U		1	2
LHSMW33	2/13/1996	LHSMW33-960213	REG	Vinyl chloride	1	ND	U			2
LHSMW33	8/20/1996	LHSMW33-960820	REG	Vinyl chloride	0.24	<	U		1	2
LHSMW33	5/17/1998	LHSMW33-980517	REG	Vinyl chloride	1	<	U		1	2
LHSMW34	2/13/1996	LHSMW34-960213	REG	Vinyl chloride	1	ND	U			2
LHSMW34	8/20/1996	LHSMW34-960820	REG	Vinyl chloride	*3.3*				1	2
LHSMW34	5/17/1998	LHSMW34-980517	REG	Vinyl chloride	*7*				1	2
LHSMW34	10/18/2007	LHSMW34-101807	REG	Vinyl chloride	2	U	U		2	2
LHSMW35	2/8/1996	LHSMW35-960208	REG	Vinyl chloride	1	ND	U			2
LHSMW35	8/20/1996	LHSMW35-960820	REG	Vinyl chloride	0.24	<	U		1	2
LHSMW35	5/17/1998	LHSMW35-980517	REG	Vinyl chloride	1	<	U		1	2
LHSMW36	2/13/1996	LHSMW36-960213	REG	Vinyl chloride	1	ND	U			2
LHSMW36	8/22/1996	LHSMW36-960822	REG	Vinyl chloride	0.24	<	U		1	2
LHSMW36	5/17/1998	LHSMW36-980517	REG	Vinyl chloride	1	<	U		1	2
LHSMW36	5/17/1998	LHSMW36-980517FD	FD	Vinyl chloride	1	<	U		1	2
LHSMW36	10/19/2007	47WW36-101907	REG	Vinyl chloride	1	U	UJ	07A	1	2
LHSMW37	2/8/1996	LHSMW37-960208	REG	Vinyl chloride	1	ND	U			2

Table A-2
Summary of VOC Analytical Results
LHAAP-47

Location	Date	Sample Number	Purpose	Parameter	Result (µg/L)	Qual	VQ	RC	DF	MCL
LHSMW37	8/22/1996	LHSMW37-960822	REG	Vinyl chloride	0.24	<	U		1	2
LHSMW37	5/17/1998	LHSMW37-980517	REG	Vinyl chloride	1	<	U		1	2
LHSMW37	5/17/1998	LHSMW37-980517FD	FD	Vinyl chloride	1	<	U		1	2
LHSMW38	2/12/1996	LHSMW38-960212	REG	Vinyl chloride	1	ND	U			2
LHSMW38	8/21/1996	LHSMW38-960821	REG	Vinyl chloride	0.24	<	U		1	2
LHSMW38	8/21/1996	LHSMW38-960821FD	FD	Vinyl chloride	0.24	<	U		1	2
LHSMW38	5/17/1998	LHSMW38-980517	REG	Vinyl chloride	1	<	U		1	2
LHSMW38	5/17/1998	LHSMW38-980517FD	FD	Vinyl chloride	1	<	U		1	2
LHSMW38	7/30/2010	LHSMW38-103007 *	REG	Vinyl chloride	0.25	U	U			2
LHSMW39	2/10/1996	LHSMW39-960210	REG	Vinyl chloride	1	ND	U			2
LHSMW39	8/22/1996	LHSMW39-960822	REG	Vinyl chloride	0.24	<	U		1	2
LHSMW39	5/18/1998	LHSMW39-980518	REG	Vinyl chloride	1	<	U		1	2
LHSMW41	2/9/1996	LHSMW41-960209	REG	Vinyl chloride	1	ND	U			2
LHSMW41	8/22/1996	LHSMW41-960822	REG	Vinyl chloride	0.24	<	U		1	2
LHSMW41	5/18/1998	LHSMW41-980518	REG	Vinyl chloride	1	<	U		1	2
LHSMW41	2/23/2009	LHSMW41-022309	REG	Vinyl chloride	0.25	U	U			2
LHSMW42	2/11/1996	LHSMW42-960211	REG	Vinyl chloride	1	ND	U			2
LHSMW42	8/22/1996	LHSMW42-960822	REG	Vinyl chloride	0.24	<	U		1	2
LHSMW42	5/18/1998	LHSMW42-980518	REG	Vinyl chloride	1	<	U		1	2
LHSMW43	12/8/1994	LHSMW43-941208	REG	Vinyl chloride	*4*	J				2
LHSMW43	2/9/1996	LHSMW43-960209	REG	Vinyl chloride	*9*					2
LHSMW43	8/22/1996	LHSMW43-960822	REG	Vinyl chloride	*4.5*				1	2
LHSMW43	8/22/1996	LHSMW43-960822FD	FD	Vinyl chloride	*6.2*				1	2
LHSMW43	5/18/1998	LHSMW43-980518	REG	Vinyl chloride	*6.9*				1	2
LHSMW43	2/22/2007	LHSMW43-FEB2007	REG	Vinyl chloride	*3.7*				1	2
LHSMW43	2/19/2009	LHSMW43-021909	REG	Vinyl chloride	12.5	U	U			2
LHSMW44	2/8/1996	LHSMW44-960208	REG	Vinyl chloride	1	ND	U			2
LHSMW44	8/22/1996	LHSMW44-960822	REG	Vinyl chloride	0.92				1	2
LHSMW44	5/18/1998	LHSMW44-980518	REG	Vinyl chloride	1	<	U		1	2
LHSMW44	7/30/2010	LHSMW44-103007 *	REG	Vinyl chloride	0.25	U	U			2
LHSMW45	2/10/1996	LHSMW45-960210	REG	Vinyl chloride	1	ND	U			2
LHSMW45	8/22/1996	LHSMW45-960822	REG	Vinyl chloride	0.56				1	2
LHSMW45	5/18/1998	LHSMW45-980518	REG	Vinyl chloride	1	<	U		1	2
LHSMW45	2/19/2009	LHSMW45-021909	REG	Vinyl chloride	1.6	J	J			2
LHSMW46	2/8/1996	LHSMW46-960208	REG	Vinyl chloride	1	ND	U			2
LHSMW46	8/22/1996	LHSMW46-960822	REG	Vinyl chloride	0.24	<	U		1	2
LHSMW46	5/18/1998	LHSMW46-980518	REG	Vinyl chloride	1	<	U		1	2
LHSMW47	2/8/1996	LHSMW47-960208	REG	Vinyl chloride	1	ND	U			2
LHSMW47	8/22/1996	LHSMW47-960822	REG	Vinyl chloride	0.26				1	2
LHSMW47	5/18/1998	LHSMW47-980518	REG	Vinyl chloride	1	<	U		1	2
LHSMW48	8/22/1996	LHSMW48-960822	REG	Vinyl chloride	*2.8*				1	2
LHSMW48	5/19/1998	LHSMW48-980519	REG	Vinyl chloride	1	<	U		1	2
LHSMW49	2/9/1996	LHSMW49-960209	REG	Vinyl chloride	1	ND	U			2
LHSMW49	8/22/1996	LHSMW49-960822	REG	Vinyl chloride	0.72				1	2
LHSMW49	5/19/1998	LHSMW49-980519	REG	Vinyl chloride	1	<	U		1	2
LHSMW49	5/19/1998	LHSMW49-980519FD	FD	Vinyl chloride	1	<	U		1	2
LHSMW50	2/9/1996	LHSMW50-960209	REG	Vinyl chloride	1	ND	U			2
LHSMW50	8/22/1996	LHSMW50-960822	REG	Vinyl chloride	0.24	<	U		1	2
LHSMW50	5/19/1998	LHSMW50-980519	REG	Vinyl chloride	1	<	U		1	2
LHSMW50	2/17/2009	LHSMW50-021709	REG	Vinyl chloride	0.25	U	U			2
LHSMW51	2/13/1996	LHSMW51-960213	REG	Vinyl chloride	1	ND	U			2
LHSMW51	8/22/1996	LHSMW51-960822	REG	Vinyl chloride	0.24	<	U		1	2
LHSMW51	5/19/1998	LHSMW51-980519	REG	Vinyl chloride	1	<	U		1	2
LHSMW52	2/9/1996	LHSMW52-960209	REG	Vinyl chloride	1	ND	U			2
LHSMW52	8/22/1996	LHSMW52-960822	REG	Vinyl chloride	0.24	<	U		1	2
LHSMW52	5/19/1998	LHSMW52-980519	REG	Vinyl chloride	1	<	U		1	2
LHSMW53	2/10/1996	LHSMW53-960210	REG	Vinyl chloride	1	ND	U			2
LHSMW53	8/22/1996	LHSMW53-960822	REG	Vinyl chloride	0.24	<	U		1	2
LHSMW53	5/20/1998	LHSMW53-980520	REG	Vinyl chloride	1	<	U		1	2
LHSMW54	2/12/1996	LHSMW54-960212	REG	Vinyl chloride	1	ND	U			2
LHSMW54	8/21/1996	LHSMW54-960821	REG	Vinyl chloride	0.24	<	U		1	2
LHSMW54	5/20/1998	LHSMW54-980520	REG	Vinyl chloride	1	<	U		1	2

Table A-2
Summary of VOC Analytical Results
LHAAP-47

Location	Date	Sample Number	Purpose	Parameter	Result (µg/L)	Qual	VQ	RC	DF	MCL
LHSMW54	10/17/2007	LHSMW54-101707	REG	Vinyl chloride	1	U	U		1	2
LHSMW54	8/6/2010	LHSMW54-100806	REG	Vinyl chloride	0.625	U	U		2.5	2
LHSMW55	2/10/1996	LHSMW55-960210	REG	Vinyl chloride	1	ND	U			2
LHSMW55	8/22/1996	LHSMW55-960822	REG	Vinyl chloride	0.24	<	U		1	2
LHSMW55	5/20/1998	LHSMW55-980520	REG	Vinyl chloride	1	<	U		1	2
LHSMW56	12/7/1994	LHSMW56-941207	REG	Vinyl chloride	***100***					2
LHSMW56	2/9/1996	LHSMW56-960209	REG	Vinyl chloride	***100***					2
LHSMW56	8/21/1996	LHSMW56-960821	REG	Vinyl chloride	***127***				1	2
LHSMW56	5/20/1998	LHSMW56-980520	REG	Vinyl chloride	***110***				10	2
LHSMW56	10/20/2007	LHSMW56-102007	REG	Vinyl chloride	***33.6***		J	07A	1	2
LHSMW56	4/3/2009	LHSMW56-040309	REG	Vinyl chloride	***14.3***	J	J	15	50	2
LHSMW57	2/8/1996	LHSMW57-960208	REG	Vinyl chloride	1	ND	U			2
LHSMW57	8/21/1996	LHSMW57-960821	REG	Vinyl chloride	0.24	<	U		1	2
LHSMW57	5/20/1998	LHSMW57-980520	REG	Vinyl chloride	1	<	U		1	2
LHSMW57	2/23/2009	LHSMW57-022309	REG	Vinyl chloride	0.25	U	U			2
LHSMW60	2/9/1996	LHSMW60-960209	REG	Vinyl chloride	1	ND	U			2
LHSMW60	8/21/1996	LHSMW60-960821	REG	Vinyl chloride	0.24	<	U		1	2
LHSMW60	8/21/1996	LHSMW60-960821FD	FD	Vinyl chloride	0.24	<	U		1	2
LHSMW60	5/20/1998	LHSMW60-980520	REG	Vinyl chloride	1	<	U		1	2
LHSMW60	5/23/2000	LHSMW60-000523	REG	Vinyl chloride	1	<	UJ		1	2
LHSMW60	5/23/2000	LHSMW60-000523FD	FD	Vinyl chloride	1	<	UJ		1	2
LHSMW60	10/3/2000	LHSMW60-001003	REG	Vinyl chloride	1	<	U		1	2
LHSMW60	8/30/2010	LHSMW60-100830	REG	Vinyl chloride	0.25	U	U		1	2

Notes:

* Sample Number reads yy/dd/mm

1. Results that exceed the MCL are noted with ***bold and Italic*** text.

DF - Dilution Factor

µg/L - micrograms per liter

MCL - maximum contaminant level

Qual - laboratory data qualifier

VQ - validation data qualifier

< - Same as U.

J - The analyte was positively identified; the reported value is the estimated concentration.

L - Result may be biased low

ND - Same as U.

U - Not detected. The analyte was analyzed for, but not detected above the associated reporting limit.

RC - Reason code

5B - Compound % deviation QC criteria not met.

07A - Sample

11A - Recovery

15 - Quantitation

Table A-3
Summary of Geochemical Results
LHAAP-47

Location	Date	Sample Number	Purpose	Parameter	Result	Qual	VQ	RC	DF	Units
Dissolved Oxygen										
105	2/18/2009	105-021809	REG	Dissolved Oxygen	250				1	µg/L
105	7/31/2010	105-103107 *	REG	Dissolved Oxygen	4500				1	µg/L
47WW01	10/18/2007	47WW01-101807	REG	Dissolved Oxygen	3300				1	µg/L
47WW03	10/17/2007	47WW03-101707	REG	Dissolved Oxygen	550				1	µg/L
47WW04	10/18/2007	47WW04-101807	REG	Dissolved Oxygen	410				1	µg/L
47WW04	8/6/2010	47WW04-100806	REG	Dissolved Oxygen	880				1	µg/L
47WW05	9/1/2004	47WW05-090104	REG	Dissolved Oxygen	1500				1	µg/L
47WW05	10/20/2007	47WW05-102007	REG	Dissolved Oxygen	3410				1	µg/L
47WW06	9/1/2004	47WW06-090104	REG	Dissolved Oxygen	1270				1	µg/L
47WW08	10/17/2007	47WW08-101707	REG	Dissolved Oxygen	4240				1	µg/L
47WW09	2/21/2007	47WW09-FEB2007	REG	Dissolved Oxygen	2020				1	µg/L
47WW09	10/16/2007	47WW09-101607	REG	Dissolved Oxygen	290				1	µg/L
47WW09	11/30/2007	47WW09-113007	REG	Dissolved Oxygen	470				1	µg/L
47WW09	2/18/2009	47WW09-021809	REG	Dissolved Oxygen	280				1	µg/L
47WW09	8/3/2010	47WW09-100803	REG	Dissolved Oxygen	950				1	µg/L
47WW13	9/2/2004	47WW13-090204	REG	Dissolved Oxygen	1300				1	µg/L
47WW13	2/20/2007	47WW13-FEB2007	REG	Dissolved Oxygen	4880				1	µg/L
47WW13	10/16/2007	47WW13-101607	REG	Dissolved Oxygen	1870				1	µg/L
47WW13	11/30/2007	47WW13-113007	REG	Dissolved Oxygen	2880				1	µg/L
47WW13	2/17/2009	47WW13-021709	REG	Dissolved Oxygen	5530				1	µg/L
47WW13	8/4/2010	47WW13-100804	REG	Dissolved Oxygen	490				1	µg/L
47WW14	9/2/2004	47WW14-090204	REG	Dissolved Oxygen	990				1	µg/L
47WW14	2/20/2007	47WW14-FEB2007	REG	Dissolved Oxygen	1320				1	µg/L
47WW14	2/19/2009	47WW14-021909	REG	Dissolved Oxygen	500				1	µg/L
47WW14	8/4/2010	47WW14-100804	REG	Dissolved Oxygen	1400				1	µg/L
47WW19	10/17/2007	47WW19-101707	REG	Dissolved Oxygen	4110				1	µg/L
47WW19	11/30/2007	47WW19-113007	REG	Dissolved Oxygen	6190				1	µg/L
47WW19	2/19/2009	47WW19-021909	REG	Dissolved Oxygen	500				1	µg/L
47WW21	10/18/2007	47WW21-101807	REG	Dissolved Oxygen	4030				1	µg/L
47WW21	7/31/2010	47WW21-100731	REG	Dissolved Oxygen	380				1	µg/L
47WW22	10/18/2007	47WW22-101807	REG	Dissolved Oxygen	2290				1	µg/L
47WW23	10/19/2007	47WW23-101907	REG	Dissolved Oxygen	1150				1	µg/L
47WW23	8/6/2010	47WW23-100806	REG	Dissolved Oxygen	540				1	µg/L
47WW27	10/18/2007	47WW27-101807	REG	Dissolved Oxygen	2360				1	µg/L
47WW27	7/31/2010	47WW27-100731	REG	Dissolved Oxygen	5080				1	µg/L
47WW28	9/1/2004	47WW28-090104	REG	Dissolved Oxygen	830				1	µg/L
47WW28	10/17/2007	47WW28-101707	REG	Dissolved Oxygen	1990				1	µg/L
47WW28	7/31/2010	47WW28-100731	REG	Dissolved Oxygen	420				1	µg/L
47WW29	9/1/2004	47WW29-090104	REG	Dissolved Oxygen	660				1	µg/L
47WW29	10/17/2007	47WW29-101707	REG	Dissolved Oxygen	6710				1	µg/L
47WW29	7/31/2010	47WW29-100731	REG	Dissolved Oxygen	3440				1	µg/L
47WW30	9/1/2004	47WW30-090104	REG	Dissolved Oxygen	930				1	µg/L
47WW30	2/22/2007	47WW30-FEB2007	REG	Dissolved Oxygen	1830				1	µg/L
47WW30	10/18/2007	47WW30-101807	REG	Dissolved Oxygen	2820				1	µg/L
47WW30	8/4/2010	47WW30-100804	REG	Dissolved Oxygen	4200				1	µg/L
47WW31	9/1/2004	47WW31-090104	REG	Dissolved Oxygen	840				1	µg/L
47WW31	10/18/2007	47WW31-101807	REG	Dissolved Oxygen	1900				1	µg/L
47WW32	10/18/2007	47WW32-101807	REG	Dissolved Oxygen	2480				1	µg/L
47WW32	7/31/2010	47WW32-100731	REG	Dissolved Oxygen	3100				1	µg/L
47WW33	7/30/2010	47WW33-100730	REG	Dissolved Oxygen	660				1	µg/L
47WW34	2/23/2009	47WW34-022309	REG	Dissolved Oxygen	530				1	µg/L
47WW34	8/3/2010	47WW34-100803	REG	Dissolved Oxygen	4930				1	µg/L
47WW37	9/1/2010	47WW37-100901	REG	Dissolved Oxygen	920				1	µg/L
47WW38	9/1/2010	47WW38-100901	REG	Dissolved Oxygen	870				1	µg/L
LHSMW34	10/18/2007	LHSMW34-101807	REG	Dissolved Oxygen	2290				1	µg/L
LHSMW36	10/19/2007	47WW36-101907	REG	Dissolved Oxygen	2300				1	µg/L
LHSMW38	7/30/2010	LHSMW38-100730	REG	Dissolved Oxygen	340				1	µg/L

Table A-3
Summary of Geochemical Results
LHAAP-47

Location	Date	Sample Number	Purpose	Parameter	Result	Qual	VQ	RC	DF	Units
LHSMW41	2/23/2009	LHSMW41-022309	REG	Dissolved Oxygen	600				1	µg/L
LHSMW43	2/22/2007	LHSMW43-FEB2007	REG	Dissolved Oxygen	6030				1	µg/L
LHSMW44	7/30/2010	LHSMW44-100730	REG	Dissolved Oxygen	300				1	µg/L
LHSMW45	2/19/2009	LHSMW45-021909	REG	Dissolved Oxygen	2610				1	µg/L
LHSMW50	2/17/2009	LHSMW50-021709	REG	Dissolved Oxygen	670				1	µg/L
LHSMW54	10/17/2007	LHSMW54-101707	REG	Dissolved Oxygen	220				1	µg/L
LHSMW54	8/6/2010	LHSMW54-100806	REG	Dissolved Oxygen	580				1	µg/L
LHSMW56	10/20/2007	LHSMW56-102007	REG	Dissolved Oxygen	4870				1	µg/L
LHSMW57	2/23/2009	LHSMW57-022309	REG	Dissolved Oxygen	7350				1	µg/L
LHSMW60	8/30/2010	LHSMW60-100830	REG	Dissolved Oxygen	1080				1	µg/L
Oxygen Reduction Potential										
105	2/18/2009	105-021809	REG	ORP	0.36				1	mV
105	7/31/2010	105-103107 *	REG	ORP	84.2				1	mV
47WW01	10/18/2007	47WW01-101807	REG	ORP	482.9				1	mV
47WW03	10/17/2007	47WW03-101707	REG	ORP	6655				1	mV
47WW04	10/18/2007	47WW04-101807	REG	ORP	783.1				1	mV
47WW04	8/6/2010	47WW04-100806	REG	ORP	-24.7				1	mV
47WW05	9/1/2004	47WW05-090104	REG	ORP	30.3				1	mV
47WW05	10/20/2007	47WW05-102007	REG	ORP	564.6				1	mV
47WW06	9/1/2004	47WW06-090104	REG	ORP	-9.4				1	mV
47WW08	10/17/2007	47WW08-101707	REG	ORP	493.6				1	mV
47WW09	2/21/2007	47WW09-FEB2007	REG	ORP	116.5				1	mV
47WW09	10/16/2007	47WW09-101607	REG	ORP	100.1				1	mV
47WW09	11/30/2007	47WW09-113007	REG	ORP	-24.6				1	mV
47WW09	2/18/2009	47WW09-021809	REG	ORP	-198.1				1	mV
47WW09	8/3/2010	47WW09-100803	REG	ORP	-46.7				1	mV
47WW13	9/2/2004	47WW13-090204	REG	ORP	34.4				1	mV
47WW13	2/20/2007	47WW13-FEB2007	REG	ORP	404				1	mV
47WW13	10/16/2007	47WW13-101607	REG	ORP	156.4				1	mV
47WW13	11/30/2007	47WW13-113007	REG	ORP	410.7				1	mV
47WW13	2/17/2009	47WW13-021709	REG	ORP	291.9				1	mV
47WW13	8/4/2010	47WW13-100804	REG	ORP	31.7				1	mV
47WW14	9/2/2004	47WW14-090204	REG	ORP	62.4				1	mV
47WW14	2/20/2007	47WW14-FEB2007	REG	ORP	242.2				1	mV
47WW14	2/19/2009	47WW14-021909	REG	ORP	-40.1				1	mV
47WW14	8/4/2010	47WW14-100804	REG	ORP	27.9				1	mV
47WW19	10/17/2007	47WW19-101707	REG	ORP	46.4				1	mV
47WW19	11/30/2007	47WW19-113007	REG	ORP	213.2				1	mV
47WW19	2/19/2009	47WW19-021909	REG	ORP	-27.5				1	mV
47WW21	10/18/2007	47WW21-101807	REG	ORP	141.3				1	mV
47WW21	7/31/2010	47WW21-100731	REG	ORP	82.9				1	mV
47WW22	10/18/2007	47WW22-101807	REG	ORP	505.3				1	mV
47WW23	10/19/2007	47WW23-101907	REG	ORP	587.1				1	mV
47WW23	8/6/2010	47WW23-100806	REG	ORP	-22.5				1	mV
47WW27	10/18/2007	47WW27-101807	REG	ORP	399.5				1	mV
47WW27	7/31/2010	47WW27-100731	REG	ORP	117.2				1	mV
47WW28	9/1/2004	47WW28-090104	REG	ORP	-12.9				1	mV
47WW28	10/17/2007	47WW28-101707	REG	ORP	111.2				1	mV
47WW28	7/31/2010	47WW28-100731	REG	ORP	104.5				1	mV
47WW29	9/1/2004	47WW29-090104	REG	ORP	-28.5				1	mV
47WW29	10/17/2007	47WW29-101707	REG	ORP	-9.3				1	mV
47WW29	7/31/2010	47WW29-100731	REG	ORP	99				1	mV
47WW30	9/1/2004	47WW30-090104	REG	ORP	-49.5				1	mV
47WW30	2/22/2007	47WW30-FEB2007	REG	ORP	205.6				1	mV
47WW30	10/18/2007	47WW30-101807	REG	ORP	144.7				1	mV
47WW30	8/4/2010	47WW30-100804	REG	ORP	9.4				1	mV
47WW31	9/1/2004	47WW31-090104	REG	ORP	42.9				1	mV
47WW31	10/18/2007	47WW31-101807	REG	ORP	141				1	mV

Table A-3
Summary of Geochemical Results
LHAAP-47

Location	Date	Sample Number	Purpose	Parameter	Result	Qual	VQ	RC	DF	Units
47WW32	10/18/2007	47WW32-101807	REG	ORP	133.9				1	mV
47WW32	7/31/2010	47WW32-100731	REG	ORP	94.7				1	mV
47WW33	7/30/2010	47WW33-100730	REG	ORP	111.9				1	mV
47WW34	2/23/2009	47WW34-022309	REG	ORP	-36.7				1	mV
47WW34	8/3/2010	47WW34-100803	REG	ORP	58.7				1	mV
47WW37	9/1/2010	47WW37-100901	REG	ORP	116				1	mV
47WW38	9/1/2010	47WW38-100901	REG	ORP	165.9				1	mV
LHSMW34	10/18/2007	LHSMW34-101807	REG	ORP	70.9				1	mV
LHSMW36	10/19/2007	47WW36-101907	REG	ORP	149.1				1	mV
LHSMW38	7/30/2010	LHSMW38-100730	REG	ORP	123				1	mV
LHSMW41	2/23/2009	LHSMW41-022309	REG	ORP	49.2				1	mV
LHSMW43	2/22/2007	LHSMW43-FEB2007	REG	ORP	266.5				1	mV
LHSMW44	7/30/2010	LHSMW44-100730	REG	ORP	96				1	mV
LHSMW45	2/19/2009	LHSMW45-021909	REG	ORP	9.1				1	mV
LHSMW50	2/17/2009	LHSMW50-021709	REG	ORP	49.5				1	mV
LHSMW54	10/17/2007	LHSMW54-101707	REG	ORP	715				1	mV
LHSMW54	8/6/2010	LHSMW54-100806	REG	ORP	-18.1				1	mV
LHSMW56	10/20/2007	LHSMW56-102007	REG	ORP	439.5				1	mV
LHSMW57	2/23/2009	LHSMW57-022309	REG	ORP	166.5				1	mV
LHSMW60	8/30/2010	LHSMW60-100830	REG	ORP	197				1	mV
Nitrate and Nitrite										
105	2/13/1996	105-960213	REG	Nitrate	500	<	U		10	µg/L
105	2/18/2009	105-021809	REG	Nitrate	2000	U	U			µg/L
47WW09	2/21/2007	47WW09-FEB2007	REG	Nitrate	5	U	U		1	µg/L
47WW09	2/18/2009	47WW09-021809	REG	Nitrate	1000	U	U			µg/L
47WW09	8/3/2010	47WW09-100803	REG	Nitrate	1000	U	U		1	µg/L
47WW13	2/20/2007	47WW13-FEB2007	REG	Nitrate	980				1	µg/L
47WW13	2/17/2009	47WW13-021709	REG	Nitrate	159	J	J			µg/L
47WW13	2/17/2009	47WW13-021709-FD	FD	Nitrate	142	J	J			µg/L
47WW13	8/4/2010	47WW13-100804	REG	Nitrate	119	J	J		1	µg/L
47WW14	2/20/2007	47WW14-FEB2007	REG	Nitrate	200				1	µg/L
47WW14	2/20/2007	47WW14-FEB2007FD	FD	Nitrate	200				1	µg/L
47WW14	8/4/2010	47WW14-100804	REG	Nitrate	327	J	J		3	µg/L
47WW14	8/4/2010	47WW14-100804-FD	FD	Nitrate	300	U	U		3	µg/L
47WW30	2/22/2007	47WW30-FEB2007	REG	Nitrate	5	U	U		1	µg/L
47WW30	8/4/2010	47WW30-100804	REG	Nitrate	1000	U	U		1	µg/L
47WW34	8/3/2010	47WW34-100803	REG	Nitrate	174				1	µg/L
LHSMW28	2/11/1996	LHSMW28-960211	REG	Nitrate	1000				1	µg/L
LHSMW28	8/20/1996	LHSMW28-960820	REG	Nitrate	1000				1	µg/L
LHSMW29	2/11/1996	LHSMW29-960211	REG	Nitrate	500	<	U		10	µg/L
LHSMW29	2/11/1996	LHSMW29-960211FD	FD	Nitrate	500	<	U		10	µg/L
LHSMW29	8/20/1996	LHSMW29-960820	REG	Nitrate	500	<	U		1	µg/L
LHSMW30	2/12/1996	LHSMW30-960212	REG	Nitrate	500	<	U		10	µg/L
LHSMW30	8/20/1996	LHSMW30-960820	REG	Nitrate	500	<	U		1	µg/L
LHSMW31	2/12/1996	LHSMW31-960212	REG	Nitrate	500	<	U		1	µg/L
LHSMW31	8/20/1996	LHSMW31-960820	REG	Nitrate	500	<	U		1	µg/L
LHSMW32	2/12/1996	LHSMW32-960212	REG	Nitrate	500	<	U		1	µg/L
LHSMW32	8/20/1996	LHSMW32-960820	REG	Nitrate	500	<	U		1	µg/L
LHSMW33	2/13/1996	LHSMW33-960213	REG	Nitrate	500	<	U		1	µg/L
LHSMW34	2/13/1996	LHSMW34-960213	REG	Nitrate	500	<	U		1	µg/L
LHSMW34	2/13/1996	LHSMW34-960213FD	FD	Nitrate	500	<	U		1	µg/L
LHSMW34	8/20/1996	LHSMW34-960820	REG	Nitrate	500	<	U		1	µg/L
LHSMW35	2/8/1996	LHSMW35-960208	REG	Nitrate	500	<	U		1	µg/L
LHSMW35	8/20/1996	LHSMW35-960820	REG	Nitrate	500	<	U		1	µg/L
LHSMW36	2/13/1996	LHSMW36-960213	REG	Nitrate	500	<	U		1	µg/L
LHSMW37	2/8/1996	LHSMW37-960208	REG	Nitrate	500	<	U		1	µg/L
LHSMW38	2/12/1996	LHSMW38-960212	REG	Nitrate	790				1	µg/L
LHSMW38	8/21/1996	LHSMW38-960821	REG	Nitrate	600				1	µg/L

Table A-3
Summary of Geochemical Results
LHAAP-47

Location	Date	Sample Number	Purpose	Parameter	Result	Qual	VQ	RC	DF	Units
LHSMW38	8/21/1996	LHSMW38-960821FD	FD	Nitrate	1300				1	µg/L
LHSMW39	2/10/1996	LHSMW39-960210	REG	Nitrate	1000				10	µg/L
LHSMW41	2/9/1996	LHSMW41-960209	REG	Nitrate	500	<	U		1	µg/L
LHSMW42	2/11/1996	LHSMW42-960211	REG	Nitrate	500	<	U		10	µg/L
LHSMW43	2/22/2007	LHSMW43-FEB2007	REG	Nitrate	5	U	U		1	µg/L
LHSMW43	2/19/2009	LHSMW43-021909	REG	Nitrate	1000	U	U			µg/L
LHSMW44	2/8/1996	LHSMW44-960208	REG	Nitrate	500	<	U		1	µg/L
LHSMW45	2/10/1996	LHSMW45-960210	REG	Nitrate	500	<	U		10	µg/L
LHSMW45	2/19/2009	LHSMW45-021909	REG	Nitrate	300	U	U			µg/L
LHSMW46	2/8/1996	LHSMW46-960208	REG	Nitrate	500	<	U		1	µg/L
LHSMW47	2/8/1996	LHSMW47-960208	REG	Nitrate	500	<	U		10	µg/L
LHSMW49	2/9/1996	LHSMW49-960209	REG	Nitrate	500	<	U		1	µg/L
LHSMW50	2/9/1996	LHSMW50-960209	REG	Nitrate	500	<	U		1	µg/L
LHSMW50	2/17/2009	LHSMW50-021709	REG	Nitrate	400	U	U			µg/L
LHSMW51	2/13/1996	LHSMW51-960213	REG	Nitrate	500	<	U		10	µg/L
LHSMW52	2/9/1996	LHSMW52-960209	REG	Nitrate	500	<	U		1	µg/L
LHSMW53	2/10/1996	LHSMW53-960210	REG	Nitrate	500	<	U		10	µg/L
LHSMW54	2/12/1996	LHSMW54-960212	REG	Nitrate	500	<	U		1	µg/L
LHSMW54	2/12/1996	LHSMW54-960212FD	FD	Nitrate	500	<	U		1	µg/L
LHSMW54	8/21/1996	LHSMW54-960821	REG	Nitrate	500	<	U		1	µg/L
LHSMW55	2/10/1996	LHSMW55-960210	REG	Nitrate	500	<	U		10	µg/L
LHSMW56	2/9/1996	LHSMW56-960209	REG	Nitrate	500	<	U		1	µg/L
LHSMW56	8/21/1996	LHSMW56-960821	REG	Nitrate	500	<	U		10	µg/L
LHSMW57	2/8/1996	LHSMW57-960208	REG	Nitrate	500	<	U		1	µg/L
LHSMW57	2/8/1996	LHSMW57-960208FD	FD	Nitrate	500	<	U		1	µg/L
LHSMW57	8/21/1996	LHSMW57-960821	REG	Nitrate	500	<	U		1	µg/L
LHSMW60	2/9/1996	LHSMW60-960209	REG	Nitrate	500	<	U		1	µg/L
LHSMW60	8/21/1996	LHSMW60-960821	REG	Nitrate	500	<	U		1	µg/L
LHSMW60	8/21/1996	LHSMW60-960821FD	FD	Nitrate	500	<	U		1	µg/L
LHSMW60	8/30/2010	LHSMW60-100830	REG	Nitrate	570	J	J		1	µg/L
47WW09	2/21/2007	47WW09-FEB2007	REG	Nitrate / Nitrite	5	U	U		1	µg/L
47WW13	2/20/2007	47WW13-FEB2007	REG	Nitrate / Nitrite	1000				4	µg/L
47WW14	2/20/2007	47WW14-FEB2007	REG	Nitrate / Nitrite	200				1	µg/L
47WW14	2/20/2007	47WW14-FEB2007FD	FD	Nitrate / Nitrite	200				1	µg/L
47WW30	2/22/2007	47WW30-FEB2007	REG	Nitrate / Nitrite	5	U	U		1	µg/L
LHSMW43	2/22/2007	LHSMW43-FEB2007	REG	Nitrate / Nitrite	5	U	U		1	µg/L
105	2/13/1996	105-960213	REG	Nitrite	500	<	U		10	µg/L
105	2/18/2009	105-021809	REG	Nitrite	2000	U	U			µg/L
47WW09	2/21/2007	47WW09-FEB2007	REG	Nitrite	3	U	U		1	µg/L
47WW09	2/18/2009	47WW09-021809	REG	Nitrite	1000	U	U			µg/L
47WW09	8/3/2010	47WW09-100803	REG	Nitrite	1000	U	U		1	µg/L
47WW13	2/20/2007	47WW13-FEB2007	REG	Nitrite	20	B	J	15	2	µg/L
47WW13	2/17/2009	47WW13-021709	REG	Nitrite	100	U	U			µg/L
47WW13	2/17/2009	47WW13-021709-FD	FD	Nitrite	100	U	U			µg/L
47WW13	8/4/2010	47WW13-100804	REG	Nitrite	100	U	U		1	µg/L
47WW14	2/20/2007	47WW14-FEB2007	REG	Nitrite	3	U	U		1	µg/L
47WW14	2/20/2007	47WW14-FEB2007FD	FD	Nitrite	3	U	U		1	µg/L
47WW14	8/4/2010	47WW14-100804	REG	Nitrite	300	U	U		3	µg/L
47WW14	8/4/2010	47WW14-100804-FD	FD	Nitrite	300	U	U		3	µg/L
47WW30	2/22/2007	47WW30-FEB2007	REG	Nitrite	3000	U	U		1	µg/L
47WW30	8/4/2010	47WW30-100804	REG	Nitrite	1000	U	U		1	µg/L
47WW34	8/3/2010	47WW34-100803	REG	Nitrite	100	U	U		1	µg/L
LHSMW28	2/11/1996	LHSMW28-960211	REG	Nitrite	500	<	U		1	µg/L
LHSMW28	8/20/1996	LHSMW28-960820	REG	Nitrite	500	<	U		1	µg/L
LHSMW29	2/11/1996	LHSMW29-960211	REG	Nitrite	500	<	U		10	µg/L
LHSMW29	2/11/1996	LHSMW29-960211FD	FD	Nitrite	500	<	U		10	µg/L
LHSMW29	8/20/1996	LHSMW29-960820	REG	Nitrite	500	<	U		1	µg/L
LHSMW30	2/12/1996	LHSMW30-960212	REG	Nitrite	500	<	U		10	µg/L

Table A-3
Summary of Geochemical Results
LHAAP-47

Location	Date	Sample Number	Purpose	Parameter	Result	Qual	VQ	RC	DF	Units
LHSMW30	8/20/1996	LHSMW30-960820	REG	Nitrite	500	<	U		1	µg/L
LHSMW31	2/12/1996	LHSMW31-960212	REG	Nitrite	500	<	U		1	µg/L
LHSMW31	8/20/1996	LHSMW31-960820	REG	Nitrite	500	<	U		1	µg/L
LHSMW32	2/12/1996	LHSMW32-960212	REG	Nitrite	500	<	U		1	µg/L
LHSMW32	8/20/1996	LHSMW32-960820	REG	Nitrite	500	<	U		1	µg/L
LHSMW33	2/13/1996	LHSMW33-960213	REG	Nitrite	500	<	U		1	µg/L
LHSMW34	2/13/1996	LHSMW34-960213	REG	Nitrite	500	<	U		1	µg/L
LHSMW34	2/13/1996	LHSMW34-960213FD	FD	Nitrite	500	<	U		1	µg/L
LHSMW34	8/20/1996	LHSMW34-960820	REG	Nitrite	500	<	U		1	µg/L
LHSMW35	2/8/1996	LHSMW35-960208	REG	Nitrite	500	<	U		1	µg/L
LHSMW35	8/20/1996	LHSMW35-960820	REG	Nitrite	500	<	U		1	µg/L
LHSMW36	2/13/1996	LHSMW36-960213	REG	Nitrite	500	<	U		1	µg/L
LHSMW37	2/8/1996	LHSMW37-960208	REG	Nitrite	500	<	U		1	µg/L
LHSMW38	2/12/1996	LHSMW38-960212	REG	Nitrite	500	<	U		1	µg/L
LHSMW38	8/21/1996	LHSMW38-960821	REG	Nitrite	500	<	U		1	µg/L
LHSMW38	8/21/1996	LHSMW38-960821FD	FD	Nitrite	500	<	U		1	µg/L
LHSMW39	2/10/1996	LHSMW39-960210	REG	Nitrite	500	<	U		10	µg/L
LHSMW41	2/9/1996	LHSMW41-960209	REG	Nitrite	1900				1	µg/L
LHSMW42	2/11/1996	LHSMW42-960211	REG	Nitrite	500	<	U		10	µg/L
LHSMW43	2/22/2007	LHSMW43-FEB2007	REG	Nitrite	3	U	U		1	µg/L
LHSMW43	2/19/2009	LHSMW43-021909	REG	Nitrite	1000	U	U			µg/L
LHSMW44	2/8/1996	LHSMW44-960208	REG	Nitrite	500	<	U		1	µg/L
LHSMW45	2/10/1996	LHSMW45-960210	REG	Nitrite	500	<	U		10	µg/L
LHSMW45	2/19/2009	LHSMW45-021909	REG	Nitrite	300	U	U			µg/L
LHSMW46	2/8/1996	LHSMW46-960208	REG	Nitrite	500	<	U		1	µg/L
LHSMW47	2/8/1996	LHSMW47-960208	REG	Nitrite	500	<	U		10	µg/L
LHSMW49	2/9/1996	LHSMW49-960209	REG	Nitrite	500	<	U		1	µg/L
LHSMW50	2/9/1996	LHSMW50-960209	REG	Nitrite	500	<	U		1	µg/L
LHSMW50	2/17/2009	LHSMW50-021709	REG	Nitrite	400	U	U			µg/L
LHSMW51	2/13/1996	LHSMW51-960213	REG	Nitrite	500	<	U		10	µg/L
LHSMW52	2/9/1996	LHSMW52-960209	REG	Nitrite	500	<	U		1	µg/L
LHSMW53	2/10/1996	LHSMW53-960210	REG	Nitrite	2000				10	µg/L
LHSMW54	2/12/1996	LHSMW54-960212	REG	Nitrite	500	<	U		1	µg/L
LHSMW54	2/12/1996	LHSMW54-960212FD	FD	Nitrite	500	<	U		1	µg/L
LHSMW54	8/21/1996	LHSMW54-960821	REG	Nitrite	500	<	U		1	µg/L
LHSMW55	2/10/1996	LHSMW55-960210	REG	Nitrite	500	<	U		10	µg/L
LHSMW56	2/9/1996	LHSMW56-960209	REG	Nitrite	500	<	U		1	µg/L
LHSMW56	8/21/1996	LHSMW56-960821	REG	Nitrite	500	<	U		10	µg/L
LHSMW57	2/8/1996	LHSMW57-960208	REG	Nitrite	500	<	U		1	µg/L
LHSMW57	2/8/1996	LHSMW57-960208FD	FD	Nitrite	500	<	U		1	µg/L
LHSMW57	8/21/1996	LHSMW57-960821	REG	Nitrite	500	<	U		1	µg/L
LHSMW60	2/9/1996	LHSMW60-960209	REG	Nitrite	500	<	U		1	µg/L
LHSMW60	8/21/1996	LHSMW60-960821	REG	Nitrite	500	<	U		1	µg/L
LHSMW60	8/21/1996	LHSMW60-960821FD	FD	Nitrite	500	<	U		1	µg/L
LHSMW60	8/30/2010	LHSMW60-100830	REG	Nitrite	200	U	U		1	µg/L
Ferrous Iron										
105	7/31/2010	105-103107 *	REG	Ferrous iron	370				1	µg/L
47WW04	8/6/2010	47WW04-100806	REG	Ferrous iron	100				1	µg/L
47WW09	2/21/2007	47WW09-FEB2007	REG	Ferrous iron	0				1	µg/L
47WW13	2/20/2007	47WW13-FEB2007	REG	Ferrous iron	0				1	µg/L
47WW13	8/4/2010	47WW13-100804	REG	Ferrous iron	690				1	µg/L
47WW14	2/20/2007	47WW14-FEB2007	REG	Ferrous iron	0				1	µg/L
47WW14	8/4/2010	47WW14-100804	REG	Ferrous iron	10				1	µg/L
47WW21	7/31/2010	47WW21-100731	REG	Ferrous iron	3300				1	µg/L
47WW23	8/6/2010	47WW23-100806	REG	Ferrous iron	20				1	µg/L
47WW27	7/31/2010	47WW27-100731	REG	Ferrous iron	1560				1	µg/L
47WW28	7/31/2010	47WW28-100731	REG	Ferrous iron	0				1	µg/L
47WW29	7/31/2010	47WW29-100731	REG	Ferrous iron	200				1	µg/L

Table A-3
Summary of Geochemical Results
LHAAP-47

Location	Date	Sample Number	Purpose	Parameter	Result	Qual	VQ	RC	DF	Units
47WW30	2/22/2007	47WW30-FEB2007	REG	Ferrous iron	0				1	µg/L
47WW30	8/4/2010	47WW30-100804	REG	Ferrous iron	450				1	µg/L
47WW32	7/31/2010	47WW32-100731	REG	Ferrous iron	220				1	µg/L
47WW34	8/3/2010	47WW34-100803	REG	Ferrous iron	170				1	µg/L
47WW37	9/1/2010	47WW37-100901	REG	Ferrous iron	710				1	µg/L
47WW38	9/1/2010	47WW38-100901	REG	Ferrous iron	1210				1	µg/L
LHSMW38	7/30/2010	LHSMW38-100730	REG	Ferrous iron	660				1	µg/L
LHSMW43	2/22/2007	LHSMW43-FEB2007	REG	Ferrous iron	20				1	µg/L
LHSMW44	7/30/2010	LHSMW44-100730	REG	Ferrous iron	660				1	µg/L
LHSMW54	8/6/2010	LHSMW54-100806	REG	Ferrous iron	190				1	µg/L
LHSMW60	8/30/2010	LHSMW60-100830	REG	Ferrous iron	110				1	µg/L
Sulfate and Sulfide										
105	2/13/1996	105-960213	REG	Sulfate	2029000				10	µg/L
105	2/18/2009	105-021809	REG	Sulfate	2210000					µg/L
47WW09	2/21/2007	47WW09-FEB2007	REG	Sulfate	946000				10	µg/L
47WW09	2/18/2009	47WW09-021809	REG	Sulfate	965000					µg/L
47WW09	8/3/2010	47WW09-100803	REG	Sulfate	949000				1	µg/L
47WW09	2/21/2007	47WW09-FEB2007	REG	Sulfide	200	U	U		1	µg/L
47WW13	2/20/2007	47WW13-FEB2007	REG	Sulfate	1440000		JH	19	100	µg/L
47WW13	2/17/2009	47WW13-021709	REG	Sulfate	26900					µg/L
47WW13	2/17/2009	47WW13-021709-FD	FD	Sulfate	26800					µg/L
47WW13	8/4/2010	47WW13-100804	REG	Sulfate	35800				1	µg/L
47WW13	2/20/2007	47WW13-FEB2007	REG	Sulfide	200	U	U		1	µg/L
47WW14	2/20/2007	47WW14-FEB2007	REG	Sulfate	178000				2	µg/L
47WW14	2/20/2007	47WW14-FEB2007FD	FD	Sulfate	160000				2	µg/L
47WW14	8/4/2010	47WW14-100804	REG	Sulfate	313000				1	µg/L
47WW14	8/4/2010	47WW14-100804-FD	FD	Sulfate	301000				1	µg/L
47WW14	2/20/2007	47WW14-FEB2007	REG	Sulfide	200	U	U		1	µg/L
47WW14	2/20/2007	47WW14-FEB2007FD	FD	Sulfide	200	U	U		1	µg/L
47WW30	2/22/2007	47WW30-FEB2007	REG	Sulfate	637000				4	µg/L
47WW30	8/4/2010	47WW30-100804	REG	Sulfate	1540000				1	µg/L
47WW30	2/22/2007	47WW30-FEB2007	REG	Sulfide	200	UB	U		1	µg/L
47WW34	8/3/2010	47WW34-100803	REG	Sulfate	66400				1	µg/L
LHSMW28	2/11/1996	LHSMW28-960211	REG	Sulfate	9600				1	µg/L
LHSMW28	8/20/1996	LHSMW28-960820	REG	Sulfate	9000				1	µg/L
LHSMW29	2/11/1996	LHSMW29-960211	REG	Sulfate	301000				10	µg/L
LHSMW29	2/11/1996	LHSMW29-960211FD	FD	Sulfate	312000				10	µg/L
LHSMW29	8/20/1996	LHSMW29-960820	REG	Sulfate	322000				1	µg/L
LHSMW30	2/12/1996	LHSMW30-960212	REG	Sulfate	269000				10	µg/L
LHSMW30	8/20/1996	LHSMW30-960820	REG	Sulfate	288000				1	µg/L
LHSMW31	2/12/1996	LHSMW31-960212	REG	Sulfate	258000				1	µg/L
LHSMW31	8/20/1996	LHSMW31-960820	REG	Sulfate	279000				1	µg/L
LHSMW32	2/12/1996	LHSMW32-960212	REG	Sulfate	12000				1	µg/L
LHSMW32	8/20/1996	LHSMW32-960820	REG	Sulfate	10000				1	µg/L
LHSMW33	2/13/1996	LHSMW33-960213	REG	Sulfate	88000				1	µg/L
LHSMW34	2/13/1996	LHSMW34-960213	REG	Sulfate	16000				1	µg/L
LHSMW34	2/13/1996	LHSMW34-960213FD	FD	Sulfate	16000				1	µg/L
LHSMW34	8/20/1996	LHSMW34-960820	REG	Sulfate	27000				1	µg/L
LHSMW35	2/8/1996	LHSMW35-960208	REG	Sulfate	46000				1	µg/L
LHSMW35	8/20/1996	LHSMW35-960820	REG	Sulfate	67000				1	µg/L
LHSMW36	2/13/1996	LHSMW36-960213	REG	Sulfate	18000				1	µg/L
LHSMW37	2/8/1996	LHSMW37-960208	REG	Sulfate	226000				1	µg/L
LHSMW38	2/12/1996	LHSMW38-960212	REG	Sulfate	5100				1	µg/L
LHSMW38	8/21/1996	LHSMW38-960821	REG	Sulfate	9000				1	µg/L
LHSMW38	8/21/1996	LHSMW38-960821FD	FD	Sulfate	2000	<	U		1	µg/L
LHSMW39	2/10/1996	LHSMW39-960210	REG	Sulfate	486000				10	µg/L
LHSMW41	2/9/1996	LHSMW41-960209	REG	Sulfate	308000				1	µg/L
LHSMW42	2/11/1996	LHSMW42-960211	REG	Sulfate	390000				10	µg/L

Table A-3
Summary of Geochemical Results
LHAAP-47

Location	Date	Sample Number	Purpose	Parameter	Result	Qual	VQ	RC	DF	Units
LHSMW43	2/22/2007	LHSMW43-FEB2007	REG	Sulfate	756000				4	µg/L
LHSMW43	2/19/2009	LHSMW43-021909	REG	Sulfate	731000					µg/L
LHSMW43	2/22/2007	LHSMW43-FEB2007	REG	Sulfide	200	UB	U		1	µg/L
LHSMW44	2/8/1996	LHSMW44-960208	REG	Sulfate	242000				1	µg/L
LHSMW45	2/10/1996	LHSMW45-960210	REG	Sulfate	477000				10	µg/L
LHSMW45	2/19/2009	LHSMW45-021909	REG	Sulfate	379000					µg/L
LHSMW46	2/8/1996	LHSMW46-960208	REG	Sulfate	64000				1	µg/L
LHSMW47	2/8/1996	LHSMW47-960208	REG	Sulfate	419000				10	µg/L
LHSMW49	2/9/1996	LHSMW49-960209	REG	Sulfate	18000				1	µg/L
LHSMW50	2/9/1996	LHSMW50-960209	REG	Sulfate	330000				1	µg/L
LHSMW50	2/17/2009	LHSMW50-021709	REG	Sulfate	397000					µg/L
LHSMW51	2/13/1996	LHSMW51-960213	REG	Sulfate	465000				10	µg/L
LHSMW52	2/9/1996	LHSMW52-960209	REG	Sulfate	53000				1	µg/L
LHSMW53	2/10/1996	LHSMW53-960210	REG	Sulfate	128000				10	µg/L
LHSMW54	2/12/1996	LHSMW54-960212	REG	Sulfate	89000				1	µg/L
LHSMW54	2/12/1996	LHSMW54-960212FD	FD	Sulfate	86000				1	µg/L
LHSMW54	8/21/1996	LHSMW54-960821	REG	Sulfate	93000				1	µg/L
LHSMW55	2/10/1996	LHSMW55-960210	REG	Sulfate	215000				10	µg/L
LHSMW56	2/9/1996	LHSMW56-960209	REG	Sulfate	36000				1	µg/L
LHSMW56	8/21/1996	LHSMW56-960821	REG	Sulfate	39000				10	µg/L
LHSMW57	2/8/1996	LHSMW57-960208	REG	Sulfate	11000				1	µg/L
LHSMW57	2/8/1996	LHSMW57-960208FD	FD	Sulfate	16000				1	µg/L
LHSMW57	8/21/1996	LHSMW57-960821	REG	Sulfate	2000	<	U		1	µg/L
LHSMW60	2/9/1996	LHSMW60-960209	REG	Sulfate	293000				1	µg/L
LHSMW60	8/21/1996	LHSMW60-960821	REG	Sulfate	20000				1	µg/L
LHSMW60	8/21/1996	LHSMW60-960821FD	FD	Sulfate	20000				1	µg/L
LHSMW60	8/30/2010	LHSMW60-100830	REG	Sulfate	257000				1	µg/L
				Gases						
105	2/18/2009	105-021809	REG	Methane	1.19	J	J			µg/L
47WW09	2/21/2007	47WW09-FEB2007	REG	Methane	0.3	U	U		1	µg/L
47WW09	2/18/2009	47WW09-021809	REG	Methane	3.55	J	J			µg/L
47WW09	8/3/2010	47WW09-100803	REG	Methane	2.5	J	J		1	ug/L
47WW13	2/20/2007	47WW13-FEB2007	REG	Methane	20.6				1	µg/L
47WW13	2/17/2009	47WW13-021709	REG	Methane	31.5					µg/L
47WW13	2/17/2009	47WW13-021709-FD	FD	Methane	31.8					µg/L
47WW13	8/4/2010	47WW13-100804	REG	Methane	271				1	ug/L
47WW14	2/20/2007	47WW14-FEB2007	REG	Methane	44.8				1	µg/L
47WW14	2/20/2007	47WW14-FEB2007FD	FD	Methane	42.7				1	µg/L
47WW14	8/4/2010	47WW14-100804	REG	Methane	53.3				1	ug/L
47WW14	8/4/2010	47WW14-100804-FD	FD	Methane	55.8				1	ug/L
47WW30	2/22/2007	47WW30-FEB2007	REG	Methane	1.68				1	µg/L
47WW30	8/4/2010	47WW30-100804	REG	Methane	30.1				1	ug/L
47WW34	8/3/2010	47WW34-100803	REG	Methane	1.23	J	J		1	ug/L
LHSMW43	2/22/2007	LHSMW43-FEB2007	REG	Methane	7.07				1	µg/L
LHSMW43	2/19/2009	LHSMW43-021909	REG	Methane	4.28	J	J			µg/L
LHSMW45	2/19/2009	LHSMW45-021909	REG	Methane	7.84					µg/L
LHSMW50	2/17/2009	LHSMW50-021709	REG	Methane	1	U	U			µg/L
LHSMW60	8/30/2010	LHSMW60-100830	REG	Methane	1	U	U		1	ug/L
105	2/18/2009	105-021809	REG	Ethane	1	U	U			µg/L
47WW09	2/21/2007	47WW09-FEB2007	REG	Ethane	0.6	U	U		1	µg/L
47WW09	2/18/2009	47WW09-021809	REG	Ethane	1	U	U			µg/L
47WW09	8/3/2010	47WW09-100803	REG	Ethane	1	U	U		1	ug/L
47WW13	2/20/2007	47WW13-FEB2007	REG	Ethane	0.6	U	U		1	µg/L
47WW13	2/17/2009	47WW13-021709	REG	Ethane	1	U	U			µg/L
47WW13	2/17/2009	47WW13-021709-FD	FD	Ethane	1	U	U			µg/L
47WW13	8/4/2010	47WW13-100804	REG	Ethane	1	U	U		1	ug/L
47WW14	2/20/2007	47WW14-FEB2007	REG	Ethane	0.6	U	U		1	µg/L
47WW14	2/20/2007	47WW14-FEB2007FD	FD	Ethane	0.6	U	U		1	µg/L

Table A-3
Summary of Geochemical Results
LHAAP-47

Location	Date	Sample Number	Purpose	Parameter	Result	Qual	VQ	RC	DF	Units
47WW14	8/4/2010	47WW14-100804	REG	Ethane	1	U	U		1	ug/L
47WW14	8/4/2010	47WW14-100804-FD	FD	Ethane	1	U	U		1	ug/L
47WW30	2/22/2007	47WW30-FEB2007	REG	Ethane	0.6	U	U		1	µg/L
47WW30	8/4/2010	47WW30-100804	REG	Ethane	1	U	U		1	ug/L
47WW34	8/3/2010	47WW34-100803	REG	Ethane	1	U	U		1	ug/L
LHSMW43	2/22/2007	LHSMW43-FEB2007	REG	Ethane	0.62	J	J	15	1	µg/L
LHSMW43	2/19/2009	LHSMW43-021909	REG	Ethane	1	U	U			µg/L
LHSMW45	2/19/2009	LHSMW45-021909	REG	Ethane	1	U	U			µg/L
LHSMW50	2/17/2009	LHSMW50-021709	REG	Ethane	1	U	U			µg/L
LHSMW60	8/30/2010	LHSMW60-100830	REG	Ethane	1	U	U		1	ug/L
105	2/18/2009	105-021809	REG	Ethylene	1	U	U			µg/L
47WW09	2/21/2007	47WW09-FEB2007	REG	Ethylene	0.8	U	U		1	µg/L
47WW09	2/18/2009	47WW09-021809	REG	Ethylene	1	U	U			µg/L
47WW09	8/3/2010	47WW09-100803	REG	Ethylene	1	U	U		1	ug/L
47WW13	2/20/2007	47WW13-FEB2007	REG	Ethylene	0.8	U	U		1	µg/L
47WW13	2/17/2009	47WW13-021709	REG	Ethylene	2.06	J	J			µg/L
47WW13	2/17/2009	47WW13-021709-FD	FD	Ethylene	2.13	J	J			µg/L
47WW13	8/4/2010	47WW13-100804	REG	Ethylene	27.4				1	ug/L
47WW14	2/20/2007	47WW14-FEB2007	REG	Ethylene	0.8	U	U		1	µg/L
47WW14	2/20/2007	47WW14-FEB2007FD	FD	Ethylene	0.8	U	U		1	µg/L
47WW14	8/4/2010	47WW14-100804	REG	Ethylene	1	U	U		1	ug/L
47WW14	8/4/2010	47WW14-100804-FD	FD	Ethylene	1	U	U		1	ug/L
47WW30	2/22/2007	47WW30-FEB2007	REG	Ethylene	0.8	U	U		1	µg/L
47WW30	8/4/2010	47WW30-100804	REG	Ethylene	1	U	U		1	ug/L
47WW34	8/3/2010	47WW34-100803	REG	Ethylene	1	U	U		1	ug/L
LHSMW43	2/22/2007	LHSMW43-FEB2007	REG	Ethylene	2.7				1	µg/L
LHSMW43	2/19/2009	LHSMW43-021909	REG	Ethylene	1	U	U			µg/L
LHSMW45	2/19/2009	LHSMW45-021909	REG	Ethylene	1	U	U			µg/L
LHSMW50	2/17/2009	LHSMW50-021709	REG	Ethylene	1	U	U			µg/L
LHSMW60	8/30/2010	LHSMW60-100830	REG	Ethylene	1	U	U		1	ug/L
Chloride										
105	2/13/1996	105-960213	REG	Chloride	833000				10	µg/L
105	2/18/2009	105-021809	REG	Chloride	811000					µg/L
47WW09	2/21/2007	47WW09-FEB2007	REG	Chloride	585000				1	µg/L
47WW09	2/18/2009	47WW09-021809	REG	Chloride	513000					µg/L
47WW09	8/3/2010	47WW09-100803	REG	Chloride	497000				1	µg/L
47WW13	2/20/2007	47WW13-FEB2007	REG	Chloride	13000				1	µg/L
47WW13	2/17/2009	47WW13-021709	REG	Chloride	12200					µg/L
47WW13	2/17/2009	47WW13-021709-FD	FD	Chloride	10700					µg/L
47WW13	8/4/2010	47WW13-100804	REG	Chloride	9370				1	µg/L
47WW14	2/20/2007	47WW14-FEB2007	REG	Chloride	190000				1	µg/L
47WW14	2/20/2007	47WW14-FEB2007FD	FD	Chloride	200000				1	µg/L
47WW14	8/4/2010	47WW14-100804	REG	Chloride	322000				1	µg/L
47WW14	8/4/2010	47WW14-100804-FD	FD	Chloride	312000				1	µg/L
47WW30	2/22/2007	47WW30-FEB2007	REG	Chloride	726000				20	µg/L
47WW30	8/4/2010	47WW30-100804	REG	Chloride	674000				1	µg/L
47WW34	8/3/2010	47WW34-100803	REG	Chloride	184000				1	µg/L
LHSMW28	2/11/1996	LHSMW28-960211	REG	Chloride	73000				1	µg/L
LHSMW28	8/20/1996	LHSMW28-960820	REG	Chloride	53000				1	µg/L
LHSMW29	2/11/1996	LHSMW29-960211	REG	Chloride	1168000		J		10	µg/L
LHSMW29	2/11/1996	LHSMW29-960211FD	FD	Chloride	1156000		J		10	µg/L
LHSMW29	8/20/1996	LHSMW29-960820	REG	Chloride	914000				1	µg/L
LHSMW30	2/12/1996	LHSMW30-960212	REG	Chloride	980000				10	µg/L
LHSMW30	8/20/1996	LHSMW30-960820	REG	Chloride	824000				1	µg/L
LHSMW31	2/12/1996	LHSMW31-960212	REG	Chloride	263000				1	µg/L
LHSMW31	8/20/1996	LHSMW31-960820	REG	Chloride	290000				1	µg/L
LHSMW32	2/12/1996	LHSMW32-960212	REG	Chloride	15000				1	µg/L
LHSMW32	8/20/1996	LHSMW32-960820	REG	Chloride	36000				1	µg/L

Table A-3
Summary of Geochemical Results
LHAAP-47

Location	Date	Sample Number	Purpose	Parameter	Result	Qual	VQ	RC	DF	Units
LHSMW33	2/13/1996	LHSMW33-960213	REG	Chloride	560000				1	µg/L
LHSMW34	2/13/1996	LHSMW34-960213	REG	Chloride	245000				1	µg/L
LHSMW34	2/13/1996	LHSMW34-960213FD	FD	Chloride	248000				1	µg/L
LHSMW34	8/20/1996	LHSMW34-960820	REG	Chloride	175000				1	µg/L
LHSMW35	2/8/1996	LHSMW35-960208	REG	Chloride	159000				1	µg/L
LHSMW35	8/20/1996	LHSMW35-960820	REG	Chloride	169000				1	µg/L
LHSMW36	2/13/1996	LHSMW36-960213	REG	Chloride	38000				1	µg/L
LHSMW37	2/8/1996	LHSMW37-960208	REG	Chloride	5000				1	µg/L
LHSMW38	2/12/1996	LHSMW38-960212	REG	Chloride	6900				1	µg/L
LHSMW38	8/21/1996	LHSMW38-960821	REG	Chloride	2000	<	U		1	µg/L
LHSMW38	8/21/1996	LHSMW38-960821FD	FD	Chloride	2000	<	U		1	µg/L
LHSMW39	2/10/1996	LHSMW39-960210	REG	Chloride	692000				10	µg/L
LHSMW41	2/9/1996	LHSMW41-960209	REG	Chloride	248000				1	µg/L
LHSMW42	2/11/1996	LHSMW42-960211	REG	Chloride	795000				10	µg/L
LHSMW43	2/22/2007	LHSMW43-FEB2007	REG	Chloride	290000				33.3	µg/L
LHSMW43	2/19/2009	LHSMW43-021909	REG	Chloride	297000					µg/L
LHSMW44	2/8/1996	LHSMW44-960208	REG	Chloride	305000				1	µg/L
LHSMW45	2/10/1996	LHSMW45-960210	REG	Chloride	492000				10	µg/L
LHSMW45	2/19/2009	LHSMW45-021909	REG	Chloride	377000					µg/L
LHSMW46	2/8/1996	LHSMW46-960208	REG	Chloride	14000				1	µg/L
LHSMW47	2/8/1996	LHSMW47-960208	REG	Chloride	604000				10	µg/L
LHSMW49	2/9/1996	LHSMW49-960209	REG	Chloride	5000				1	µg/L
LHSMW50	2/9/1996	LHSMW50-960209	REG	Chloride	483000				1	µg/L
LHSMW50	2/17/2009	LHSMW50-021709	REG	Chloride	655000					µg/L
LHSMW51	2/13/1996	LHSMW51-960213	REG	Chloride	620000				10	µg/L
LHSMW52	2/9/1996	LHSMW52-960209	REG	Chloride	46000				1	µg/L
LHSMW53	2/10/1996	LHSMW53-960210	REG	Chloride	1773000		J		10	µg/L
LHSMW54	2/12/1996	LHSMW54-960212	REG	Chloride	267000				1	µg/L
LHSMW54	2/12/1996	LHSMW54-960212FD	FD	Chloride	271000				1	µg/L
LHSMW54	8/21/1996	LHSMW54-960821	REG	Chloride	311000				1	µg/L
LHSMW55	2/10/1996	LHSMW55-960210	REG	Chloride	548000				10	µg/L
LHSMW56	2/9/1996	LHSMW56-960209	REG	Chloride	185000				1	µg/L
LHSMW56	8/21/1996	LHSMW56-960821	REG	Chloride	236000				10	µg/L
LHSMW57	2/8/1996	LHSMW57-960208	REG	Chloride	17000				1	µg/L
LHSMW57	2/8/1996	LHSMW57-960208FD	FD	Chloride	17000				1	µg/L
LHSMW57	8/21/1996	LHSMW57-960821	REG	Chloride	20000				1	µg/L
LHSMW60	2/9/1996	LHSMW60-960209	REG	Chloride	152000				1	µg/L
LHSMW60	8/21/1996	LHSMW60-960821	REG	Chloride	143000				1	µg/L
LHSMW60	8/21/1996	LHSMW60-960821FD	FD	Chloride	145000				1	µg/L
LHSMW60	8/30/2010	LHSMW60-100830	REG	Chloride	128000				1	µg/L
Total Organic Carbon										
105	2/18/2009	105-021809	REG	TOC	31700					µg/L
47WW09	2/21/2007	47WW09-FEB2007	REG	TOC	6000				1	µg/L
47WW09	2/18/2009	47WW09-021809	REG	TOC	14300					µg/L
47WW09	8/3/2010	47WW09-100803	REG	TOC	13200				1	µg/L
47WW13	2/20/2007	47WW13-FEB2007	REG	TOC	5000				1	µg/L
47WW13	2/17/2009	47WW13-021709	REG	TOC	7960					µg/L
47WW13	2/17/2009	47WW13-021709-FD	FD	TOC	7070					µg/L
47WW13	8/4/2010	47WW13-100804	REG	TOC	11900				1	µg/L
47WW14	2/20/2007	47WW14-FEB2007	REG	TOC	3000				1	µg/L
47WW14	2/20/2007	47WW14-FEB2007FD	FD	TOC	2000				1	µg/L
47WW14	8/4/2010	47WW14-100804	REG	TOC	8940				1	µg/L
47WW14	8/4/2010	47WW14-100804-FD	FD	TOC	9840				1	µg/L
47WW30	2/22/2007	47WW30-FEB2007	REG	TOC	2000				1	µg/L
47WW30	8/4/2010	47WW30-100804	REG	TOC	20300				1	µg/L
47WW34	8/3/2010	47WW34-100803	REG	TOC	5940				1	µg/L
LHSMW43	2/22/2007	LHSMW43-FEB2007	REG	TOC	4000				1	µg/L
LHSMW43	2/19/2009	LHSMW43-021909	REG	TOC	11800					µg/L

Table A-3
Summary of Geochemical Results
LHAAP-47

Location	Date	Sample Number	Purpose	Parameter	Result	Qual	VQ	RC	DF	Units
LHSMW45	2/19/2009	LHSMW45-021909	REG	TOC	10800					µg/L
LHSMW50	2/17/2009	LHSMW50-021709	REG	TOC	7500					µg/L
LHSMW60	8/30/2010	LHSMW60-100830	REG	TOC	5850				1	µg/L
pH										
105	2/18/2009	105-021809	REG	pH	6.47				1	STD UNIT
105	7/31/2010	105-103107 *	REG	pH	6.88				1	STD UNIT
47WW01	10/18/2007	47WW01-101807	REG	pH	6.58				1	STD UNIT
47WW03	10/17/2007	47WW03-101707	REG	pH	6.39				1	STD UNIT
47WW04	10/18/2007	47WW04-101807	REG	pH	6.34				1	STD UNIT
47WW04	8/6/2010	47WW04-100806	REG	pH	7.03				1	STD UNIT
47WW05	10/20/2007	47WW05-102007	REG	pH	6.06				1	STD UNIT
47WW08	10/17/2007	47WW08-101707	REG	pH	6.33				1	STD UNIT
47WW09	2/21/2007	47WW09-FEB2007	REG	pH	7.1				1	STD UNIT
47WW09	10/16/2007	47WW09-101607	REG	pH	6.82				1	STD UNIT
47WW09	11/30/2007	47WW09-113007	REG	pH	6.99				1	STD UNIT
47WW09	2/18/2009	47WW09-021809	REG	pH	7.32				1	STD UNIT
47WW09	8/3/2010	47WW09-100803	REG	pH	7.57				1	STD UNIT
47WW13	2/20/2007	47WW13-FEB2007	REG	pH	6.1				1	STD UNIT
47WW13	10/16/2007	47WW13-101607	REG	pH	5.63				1	STD UNIT
47WW13	11/30/2007	47WW13-113007	REG	pH	5.78				1	STD UNIT
47WW13	2/17/2009	47WW13-021709	REG	pH	5.73				1	STD UNIT
47WW13	8/4/2010	47WW13-100804	REG	pH	5.62				1	STD UNIT
47WW14	2/20/2007	47WW14-FEB2007	REG	pH	7.2				1	STD UNIT
47WW14	2/20/2007	47WW14-FEB2007FD	FD	pH	7.3				1	STD UNIT
47WW14	2/19/2009	47WW14-021909	REG	pH	6.72				1	STD UNIT
47WW14	8/4/2010	47WW14-100804	REG	pH	6.53				1	STD UNIT
47WW19	10/17/2007	47WW19-101707	REG	pH	6.27				1	STD UNIT
47WW19	11/30/2007	47WW19-113007	REG	pH	6.63				1	STD UNIT
47WW19	2/19/2009	47WW19-021909	REG	pH	6.06				1	STD UNIT
47WW21	10/18/2007	47WW21-101807	REG	pH	5.15				1	STD UNIT
47WW21	7/31/2010	47WW21-100731	REG	pH	5.76				1	STD UNIT
47WW22	10/18/2007	47WW22-101807	REG	pH	5.52				1	STD UNIT
47WW23	10/19/2007	47WW23-101907	REG	pH	5.95				1	STD UNIT
47WW23	8/6/2010	47WW23-100806	REG	pH	6.47				1	STD UNIT
47WW27	10/18/2007	47WW27-101807	REG	pH	5.51				1	STD UNIT
47WW27	7/31/2010	47WW27-100731	REG	pH	5.95				1	STD UNIT
47WW28	10/17/2007	47WW28-101707	REG	pH	6.44				1	STD UNIT
47WW28	7/31/2010	47WW28-100731	REG	pH	6.32				1	STD UNIT
47WW29	10/17/2007	47WW29-101707	REG	pH	6.61				1	STD UNIT
47WW29	7/31/2010	47WW29-100731	REG	pH	7.48				1	STD UNIT
47WW30	2/22/2007	47WW30-FEB2007	REG	pH	7.1				1	STD UNIT
47WW30	10/18/2007	47WW30-101807	REG	pH	6.75				1	STD UNIT
47WW30	8/4/2010	47WW30-100804	REG	pH	6.98				1	STD UNIT
47WW31	10/18/2007	47WW31-101807	REG	pH	6.91				1	STD UNIT
47WW32	10/18/2007	47WW32-101807	REG	pH	6.73				1	STD UNIT
47WW32	7/31/2010	47WW32-100731	REG	pH	7.01				1	STD UNIT
47WW33	7/30/2010	47WW33-100730	REG	pH	5.48				1	STD UNIT
47WW34	2/23/2009	47WW34-022309	REG	pH	6.9				1	STD UNIT
47WW34	8/3/2010	47WW34-100803	REG	pH	7.42				1	STD UNIT
47WW37	9/1/2010	47WW37-100901	REG	pH	10.28				1	STD UNIT
47WW38	9/1/2010	47WW38-100901	REG	pH	6.97				1	STD UNIT
LHSMW34	10/18/2007	LHSMW34-101807	REG	pH	6.42				1	STD UNIT
LHSMW36	10/19/2007	47WW36-101907	REG	pH	6.28				1	STD UNIT
LHSMW38	7/30/2010	LHSMW38-100730	REG	pH	5.5				1	STD UNIT
LHSMW41	2/23/2009	LHSMW41-022309	REG	pH	5.93				1	STD UNIT
LHSMW43	2/22/2007	LHSMW43-FEB2007	REG	pH	6.8				1	STD UNIT
LHSMW44	7/30/2010	LHSMW44-100730	REG	pH	6.72				1	STD UNIT
LHSMW45	2/19/2009	LHSMW45-021909	REG	pH	6.88				1	STD UNIT

Table A-3
Summary of Geochemical Results
LHAAP-47

Location	Date	Sample Number	Purpose	Parameter	Result	Qual	VQ	RC	DF	Units
LHSMW50	2/17/2009	LHSMW50-021709	REG	pH	6.69				1	STD UNIT
LHSMW54	10/17/2007	LHSMW54-101707	REG	pH	6.31				1	STD UNIT
LHSMW54	8/6/2010	LHSMW54-100806	REG	pH	6.58				1	STD UNIT
LHSMW56	10/20/2007	LHSMW56-102007	REG	pH	6.43				1	STD UNIT
LHSMW57	2/23/2009	LHSMW57-022309	REG	pH	5.4				1	STD UNIT
LHSMW60	8/30/2010	LHSMW60-100830	REG	pH	5.95				1	STD UNIT
Microbial Analysis										
105	2/18/2009	105-021809	REG	Dehalococcoides	39000					cells/ml
47WW09	2/21/2007	47WW09-FEB2007	REG	Dehalococcoides	12	U	U		1.2	cells/ml
47WW09	2/18/2009	47WW09-021809	REG	Dehalococcoides	2600					cells/ml
47WW09	8/3/2010	47WW09-100803	REG	Dehalococcoides	10	U	U		1	cells/ml
47WW13	2/20/2007	47WW13-FEB2007	REG	Dehalococcoides	77	U	U		7.7	cells/ml
47WW13	2/17/2009	47WW13-021709	REG	Dehalococcoides	11000					cells/ml
47WW13	8/4/2010	47WW13-100804	REG	Dehalococcoides	10	U	U		1	cells/ml
47WW14	2/20/2007	47WW14-FEB2007	REG	Dehalococcoides	10	U	U		1	cells/ml
47WW14	2/20/2007	47WW14-FEB2007FD	FD	Dehalococcoides	15				1	cells/ml
47WW14	8/4/2010	47WW14-100804	REG	Dehalococcoides	10	U	U		1	cells/ml
47WW14	8/4/2010	47WW14-100804-FD	FD	Dehalococcoides	22	U	U		1	cells/ml
47WW30	2/22/2007	47WW30-FEB2007	REG	Dehalococcoides	10	U	U		1	cells/ml
47WW30	8/4/2010	47WW30-100804	REG	Dehalococcoides	10	U	U		1	cells/ml
47WW34	8/3/2010	47WW34-100803	REG	Dehalococcoides	10	U	U		1	cells/ml
LHSMW43	2/22/2007	LHSMW43-FEB2007	REG	Dehalococcoides	22	U	U		2.2	cells/ml
LHSMW45	2/19/2009	LHSMW45-021909	REG	Dehalococcoides	1600					cells/ml
LHSMW50	2/17/2009	LHSMW50-021709	REG	Dehalococcoides	900					cells/ml
Total Alkalinity										
47WW09	2/21/2007	47WW09-FEB2007	REG	Total Alkalinity	459000				1	µg/L
47WW09	8/3/2010	47WW09-100803	REG	Total Alkalinity	372000				1	µg/L
47WW13	2/20/2007	47WW13-FEB2007	REG	Total Alkalinity	67000				1	µg/L
47WW13	8/4/2010	47WW13-100804	REG	Total Alkalinity	56500				1	µg/L
47WW14	2/20/2007	47WW14-FEB2007	REG	Total Alkalinity	315000				1	µg/L
47WW14	2/20/2007	47WW14-FEB2007FD	FD	Total Alkalinity	258000				1	µg/L
47WW14	8/4/2010	47WW14-100804	REG	Total Alkalinity	322000				1	µg/L
47WW14	8/4/2010	47WW14-100804-FD	FD	Total Alkalinity	307000				1	µg/L
47WW30	2/22/2007	47WW30-FEB2007	REG	Total Alkalinity	752000				5	µg/L
47WW30	8/4/2010	47WW30-100804	REG	Total Alkalinity	613000				1	µg/L
47WW34	8/3/2010	47WW34-100803	REG	Total Alkalinity	303000				1	µg/L
LHSMW43	2/22/2007	LHSMW43-FEB2007	REG	Total Alkalinity	295000				5	µg/L
LHSMW60	8/30/2010	LHSMW60-100830	REG	Total Alkalinity	109000				1	µg/L
Carbon Dioxide										
47WW09	2/21/2007	47WW09-FEB2007	REG	Carbon Dioxide	73000				1	µg/L
47WW13	2/20/2007	47WW13-FEB2007	REG	Carbon Dioxide	110000				1	µg/L
47WW14	2/20/2007	47WW14-FEB2007	REG	Carbon Dioxide	40000				1	µg/L
47WW14	2/20/2007	47WW14-FEB2007FD	FD	Carbon Dioxide	26000				1	µg/L
47WW30	2/22/2007	47WW30-FEB2007	REG	Carbon Dioxide	150000				1	µg/L
LHSMW43	2/22/2007	LHSMW43-FEB2007	REG	Carbon Dioxide	93000				1	µg/L
Temperature										
105	7/31/2010	105-103107 *	REG	Temperature	21.4				1	Deg C
47WW01	10/18/2007	47WW01-101807	REG	Temperature	21.53				1	Deg C
47WW03	10/17/2007	47WW03-101707	REG	Temperature	21.72				1	Deg C
47WW04	10/18/2007	47WW04-101807	REG	Temperature	22.5				1	Deg C
47WW04	8/6/2010	47WW04-100806	REG	Temperature	19.66				1	Deg C
47WW05	10/20/2007	47WW05-102007	REG	Temperature	21.89				1	Deg C
47WW08	10/17/2007	47WW08-101707	REG	Temperature	23.32				1	Deg C
47WW09	2/21/2007	47WW09-FEB2007	REG	Temperature	19.26				1	Deg C
47WW09	10/16/2007	47WW09-101607	REG	Temperature	20.04				1	Deg C
47WW09	11/30/2007	47WW09-113007	REG	Temperature	17.58				1	Deg C
47WW09	8/3/2010	47WW09-100803	REG	Temperature	21.34				1	Deg C
47WW13	2/20/2007	47WW13-FEB2007	REG	Temperature	18.42				1	Deg C

Table A-3
Summary of Geochemical Results
LHAAP-47

Location	Date	Sample Number	Purpose	Parameter	Result	Qual	VQ	RC	DF	Units
47WW13	10/16/2007	47WW13-101607	REG	Temperature	24.83				1	Deg C
47WW13	11/30/2007	47WW13-113007	REG	Temperature	22.2				1	Deg C
47WW13	8/4/2010	47WW13-100804	REG	Temperature	26.24				1	Deg C
47WW14	2/20/2007	47WW14-FEB2007	REG	Temperature	20.74				1	Deg C
47WW14	8/4/2010	47WW14-100804	REG	Temperature	24.51				1	Deg C
47WW19	10/17/2007	47WW19-101707	REG	Temperature	19.85				1	Deg C
47WW19	11/30/2007	47WW19-113007	REG	Temperature	18.47				1	Deg C
47WW21	10/18/2007	47WW21-101807	REG	Temperature	25.05				1	Deg C
47WW21	7/31/2010	47WW21-100731	REG	Temperature	20.53				1	Deg C
47WW22	10/18/2007	47WW22-101807	REG	Temperature	20.48				1	Deg C
47WW23	10/19/2007	47WW23-101907	REG	Temperature	20.84				1	Deg C
47WW23	8/6/2010	47WW23-100806	REG	Temperature	22.69				1	Deg C
47WW27	10/18/2007	47WW27-101807	REG	Temperature	19.68				1	Deg C
47WW27	7/31/2010	47WW27-100731	REG	Temperature	20.6				1	Deg C
47WW28	10/17/2007	47WW28-101707	REG	Temperature	20.14				1	Deg C
47WW28	7/31/2010	47WW28-100731	REG	Temperature	20.33				1	Deg C
47WW29	10/17/2007	47WW29-101707	REG	Temperature	20.24				1	Deg C
47WW29	7/31/2010	47WW29-100731	REG	Temperature	23.1				1	Deg C
47WW30	2/22/2007	47WW30-FEB2007	REG	Temperature	18.08				1	Deg C
47WW30	10/18/2007	47WW30-101807	REG	Temperature	20.25				1	Deg C
47WW30	8/4/2010	47WW30-100804	REG	Temperature	23.08				1	Deg C
47WW31	10/18/2007	47WW31-101807	REG	Temperature	19.15				1	Deg C
47WW32	10/18/2007	47WW32-101807	REG	Temperature	15.15				1	Deg C
47WW32	7/31/2010	47WW32-100731	REG	Temperature	19.5				1	Deg C
47WW33	7/30/2010	47WW33-100730	REG	Temperature	26.37				1	Deg C
47WW34	8/3/2010	47WW34-100803	REG	Temperature	21.18				1	Deg C
47WW37	9/1/2010	47WW37-100901	REG	Temperature	21.9				1	Deg C
47WW38	9/1/2010	47WW38-100901	REG	Temperature	21.31				1	Deg C
LHSMW34	10/18/2007	LHSMW34-101807	REG	Temperature	20.56				1	Deg C
LHSMW36	10/19/2007	47WW36-101907	REG	Temperature	18.41				1	Deg C
LHSMW38	7/30/2010	LHSMW38-100730	REG	Temperature	21.52				1	Deg C
LHSMW43	2/22/2007	LHSMW43-FEB2007	REG	Temperature	18.36				1	Deg C
LHSMW44	7/30/2010	LHSMW44-100730	REG	Temperature	20.51				1	Deg C
LHSMW54	10/17/2007	LHSMW54-101707	REG	Temperature	19.5				1	Deg C
LHSMW54	8/6/2010	LHSMW54-100806	REG	Temperature	18.49				1	Deg C
LHSMW56	10/20/2007	LHSMW56-102007	REG	Temperature	22.19				1	Deg C
LHSMW60	8/30/2010	LHSMW60-100830	REG	Temperature	19.79				1	Deg C

Notes and Abbreviations:

* Sample Number reads yy/dd/mm

cells/ml - cells per milliliter
DF - Dilution Factor
mV - millivolts
µg/L - micrograms per liter
ORP - oxygen reduction potential
Qual - laboratory data qualifier
STD UNIT - standard units (for pH)
VQ - validation data qualifier
< - Same as U.
B - The analyte reported was detected in an associated blank.
J - The analyte was positively identified; the reported value is the estimated concentration.
H - Result may be biased high
U - Not detected. The analyte was analyzed for, but not detected above the associated reporting limit.
RC - Reason code
15 - Quantitation
19 - Professional judgement was used to qualify the data

Table A-4
Preliminary Screening Scores for Anaerobic Biodegradation
LHAAP-47

Analytical Parameters and Weighting for Preliminary Screening for Anaerobic Biodegradation Processes				105	47WW14	47WW30	47WW13	LHSMW56	47WW09	LHSMW45	LHSMW43	47WW05	47WW25
Analysis	Concentration in Most Contaminated Zone	Interpretation	Value	Points Assigned	Points Assigned	Points Assigned	Points Assigned	Points Assigned	Points Assigned	Points Assigned	Points Assigned	Points Assigned	Points Assigned
Oxygen*	<0.5 mg/L	Tolerated, suppresses the reductive pathway at higher concentrations	3	3	0	0	0	0	3	0	0	0	NT
Oxygen*	>5 mg/L	Not tolerated; however, VC may be oxidized aerobically	-3	0	0	0	0	0	0	0	-3	0	NT
Nitrate*	<1 mg/L	At higher concentrations may compete with reductive pathway	2	2	2	2	2	2	2	2	2	NT	NT
Iron II*	>1 mg/L	Reductive pathway possible; VC may be oxidized under Fe(III)-reducing conditions	3	0	0	0	0	NT	0	NT	0	NT	NT
Sulfate*	<20 mg/L	At higher concentrations may compete with reductive pathway	2	0	0	0	0	0	0	0	0	NT	NT
Sulfide*	>1 mg/L	Reductive pathway possible	3	NT	0	NT	0	NT	0	NT	0	NT	NT
Methane*	<0.5 mg/L >0.5 mg/L	VC oxidizes Ultimate reductive daughter product, VC Accumulates	0 3	0	0	0	0	0	0	0	0	NT	NT
Oxidation Reduction Potential* (ORP) against Ag/AgCl electrode	<50 millivolts (mV) <-100mV	Reductive pathway possible Reductive pathway likely	1 2	1	1	1	0	0	1	1	0	1	NT
pH*	5 < pH < 9 5 > pH >9	Optimal range for reductive pathway Outside optimal range for reductive pathway	0 -2	0	0	0	0	0	0	0	0	0	NT
TOC	> 20 mg/L	Carbon and energy source; drives dechlorination; can be natural or anthropogenic	2	2	0	2	0	NT	0	0	0	NT	NT
Temperature*	> 20°C	At T >20°C biochemical process is accelerated	1	1	1	1	1	1	0	NT	0	1	NT
Carbon Dioxide	>2x background	Ultimate oxidative daughter product	1	NT	0	0	0	NT	0	NT	0	NT	NT
Alkalinity	>2x background	Results from interaction between CO2 and aquifer minerals	1	NT	0	0	0	NT	0	NT	0	NT	NT
Chloride*	>2x background	Daughter product of organic chlorine	2	0	0	0	0	0	0	0	0	NT	NT
Hydrogen	>1 nM	Reductive pathway possible, VC may accumulate	3	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
Hydrogen	<1 nM	VC oxidized	0	NT	NT	NT	NT	NT	NT	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	NT	NT	NT	NT	NT	NT
BTEX*	> 0.1 mg/L	Carbon and energy source; drives dechlorination	2	0	0	0	0	0	0	0	0	0	0
Tetrachloroethene		Material released	0	0	0	0	0	0	0	0	0	0	0
Trichloroethene*		Material released Daughter product of PCE	0 2a	0	0	0	0	0	0	0	0	0	0
DCE*		Material released Daughter product of TCE If cis is > 80% of total DCE it is likely a daughter product 1,1-DCE can be chemical reaction product of TCA	0 2a	2	2	2	2	2	2	2	2	2	2
VC*		Material released Daughter product of DCE	0 2a	2	2	2	2	2	0	2	2	0	2
1,1,1-Trichloroethane*		Material released	0	0	0	0	0	0	0	0	0	0	0
DCA		Daughter product of TCA under reducing conditions	2	0	2	0	2	2	0	0	2	0	0
Carbon Tetrachloride		Material released	0	0	0	0	0	0	0	0	0	0	0
Chloroethane*		Daughter product of DCA or VC under reducing conditions	2	0	0	0	0	0	0	0	0	0	0
Ethene/Ethane	>0.01mg/L >0.1 mg/L	Daughter product of VC/ethene	2 3	0	0	0	0	0	0	0	0	NT	NT
Chloroform		Material released Daughter product of Carbon Tetrachloride	0 2	0	0	0	0	0	0	0	0	0	0
Dichloromethane (Methylene Chloride)		Material released Daughter product of Chloroform	0 2	0	0	0	0	0	0	0	0	0	0
			Totals	13	10	10	9	9	8	7	5	4	4
			TCE (µg/L)	25.8	353	1100	647	4610	1730	926	6240	759	13300
			best DHC (cells/L)	39,000,000	15,000	< 10,000	11,000,000	NT	2,600,000	1,600,000	< 22,000	NT	NT

Notes and Abbreviations:
* - 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, or test result not available in referenced table
Scored for groundwater results available in the database.

Table A-5
Summary of Natural Attenuation Rates and Estimated Cleanup Times
LHAAP-47

Well	Attenuation Rate Constant	Attenuation Half-life		Most Recent Concentration		Target Concentration	Estimated Cleanup Time
	(day^{-1})	(days)	(years)	Date	(µg/L)	(µg/L)	(years)
Perchlorate							
47WW11	0.000936	740.5	2.0	Sep-02	387	26	7.9
47WW26	0.000147	4715.3	13	Sep-02	840	26	65
47WW27	0.000253	2739.7	7.5	Jul-10	168	26	20
LHSMW42	0.00205	338.1	0.93	Sep-02	< 4	26	Complete
LHSMW60	0.000710	976.3	2.7	Aug-10	56,600	26	30
Tetrachloroethene (PCE)							
LHSMW30	0.00163	425.2	1.2	May-98	< 1	5	Complete
LHSMW34	0.000374	1853.3	5.1	Oct-07	< 2	5	Complete
LHSMW43	0.0000921	7526.0	21	Feb-09	38.4	5	61
Trichloroethene (TCE)							
47WW05	0.000277	2502.3	6.9	Oct-07	759	5	50
47WW13	0.0000721	9613.7	26	Aug-10	647	5	185
47WW14	0.000175	3960.8	11	Aug-10	353	5	67
47WW34	0.000795	871.9	2.4	Aug-10	1,340	5	19
LHSMW43	0.000209	3316.5	9.1	Feb-09	6,240	5	93
LHSMW48	0.000588	1178.8	3.2	May-98	220	5	18
LHSMW49	0.000411	1686.5	4.6	May-98	67	5	17
47WW12	Only 2 samples, first above target, second below			Apr-09	0.36 J	5	Complete
47WW16	Only 2 samples, first above target, second below			Apr-09	< 0.25	5	Complete
47WW21	0.000623	1112.6	3.0	Jul-10	< 0.25	5	Complete
47WW23	0.000603	1149.5	3.1	Aug-10	< 0.25	5	Complete
47WW33	0.000454	1526.8	4.2	Jul-10	2.21	5	Complete
LHSMW34	0.000314	2207.5	6.0	Oct-07	< 2	5	Complete
LHSMW41	0.000216	3209.0	8.8	Feb-09	0.957 J	5	Complete
LHSMW55	0.00188	368.7	1.0	May-98	< 1	5	Complete

Notes:

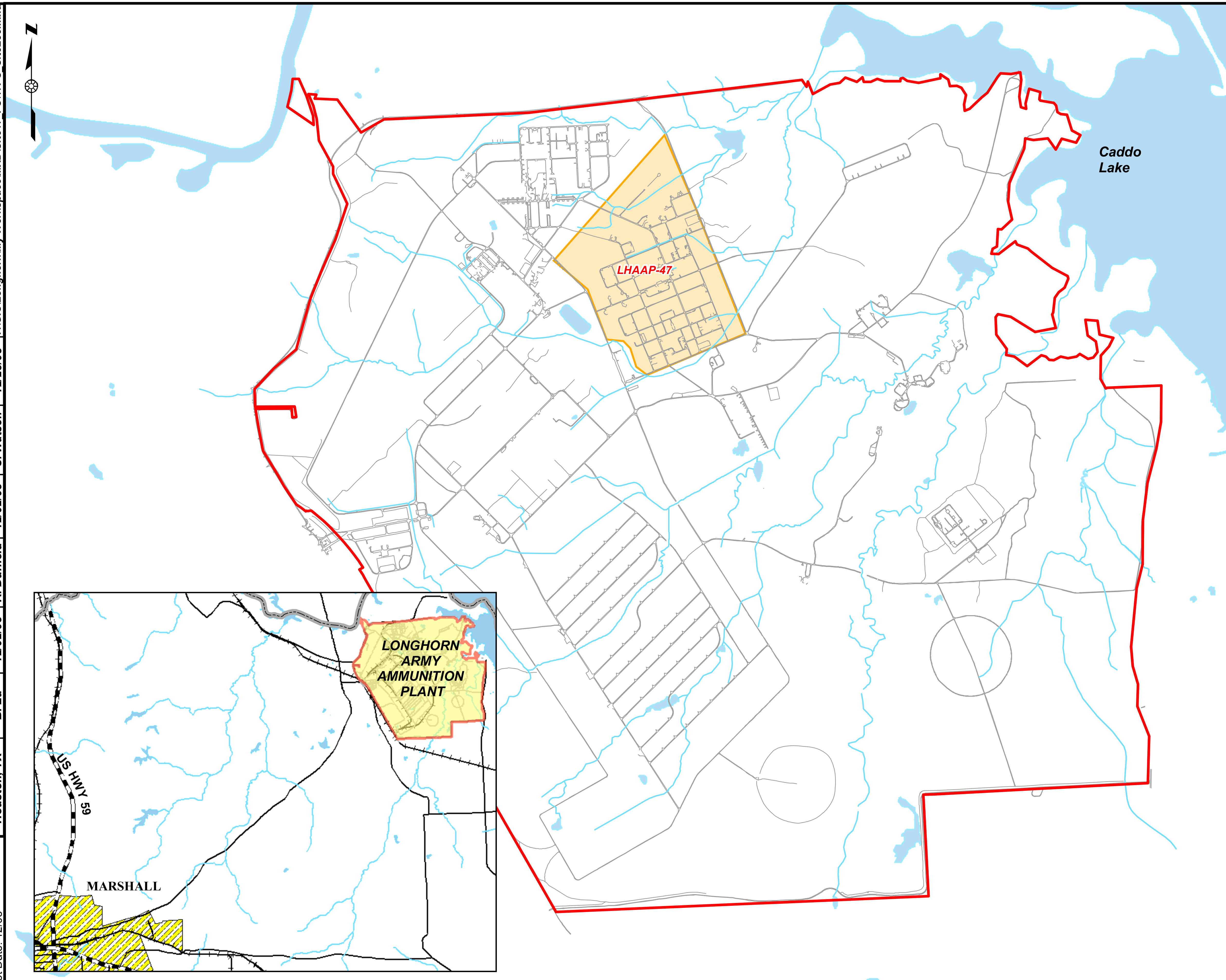
µg/L - micrograms per liter

< - Not detected. The analyte was analyzed for, but not detected above the associated reporting limit.

J - The analyte was positively identified; the reported value is the estimated concentration.

Figures

00100668



LEGEND

- LHAAP Boundary
- Stream
- Road
- Site
- Lake/Pond

0 1,250 2,500 5,000 Feet

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

Shaw

FIGURE A-1

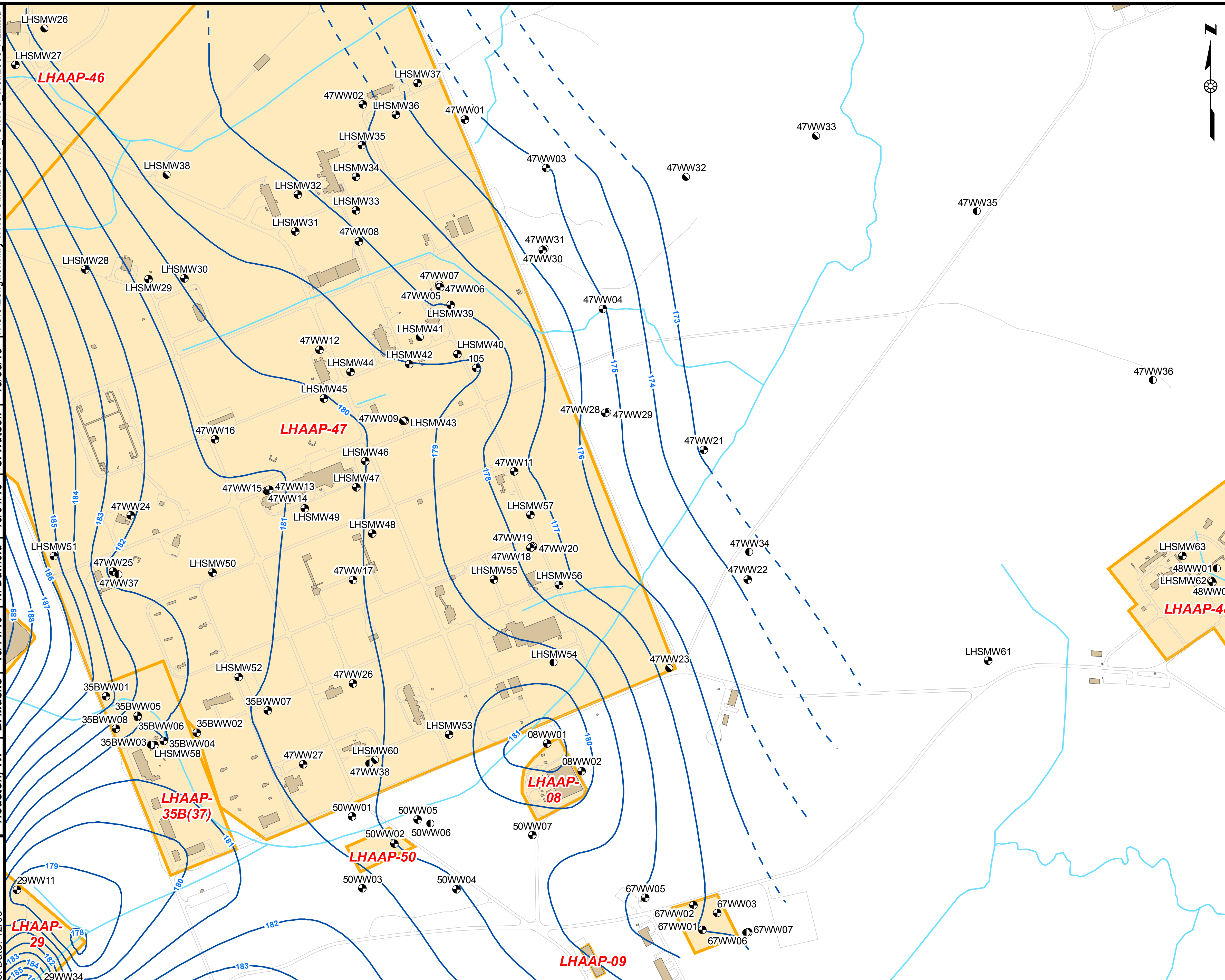
SITE LOCATION MAP
LHAAP-47

LONGHORN ARMY AMMUNITION PLANT
KARNACK, TEXAS

OFFICE	DRAWN BY	CHECKED BY	APPROVED BY	FILE PATH
Houston, TX	B. Lu 12/02/08	R. Duffield 12/02/08	S. Watson 12/23/08	T:\GIS\Longhorn\My Workspace\MXD\Site47_FS\47FS_SiteLoc.mxd

Plot Date: 12/08

00100669



LEGEND

- Shallow Monitoring Well
- Shallow/Intermediate Monitoring Well
- Intermediate Monitoring Well
- Deep Monitoring Well
- Groundwater Elevation Contour
- Inferred Groundwater Elevation Contour
- Stream
- Road
- Former Building or Concrete Slab
- Site

NOTE:

1. Groundwater contours are based on data collected November 29, 2007 through December 3, 2007.
2. The 2010 well and DPT locations and elevations shown are approximate, and will be revised once the survey data is received.

0 300 600 1,200 Feet

Shaw

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

FIGURE A-2

MONITORING WELL LOCATIONS
LHAAP-47 FEASIBILITY STUDY

LONGHORN ARMY AMMUNITION PLANT
KARNACK, TEXAS

OFFICE	DRAWN BY	CHECKED BY	APPROVED BY	FILE PATH
Houston, TX	B. Muske 10/11/10	R. Duffield 10/01/10	S. Watson 10/05/10	T:\GIS\Longhorn\My WKSPC\MXD\Site47 FS\47FS_WellLocs_A2.mxd

Plot Date: 12/08

Figure A-3
Perchlorate Concentration Trends in Groundwater
LHAAP-47

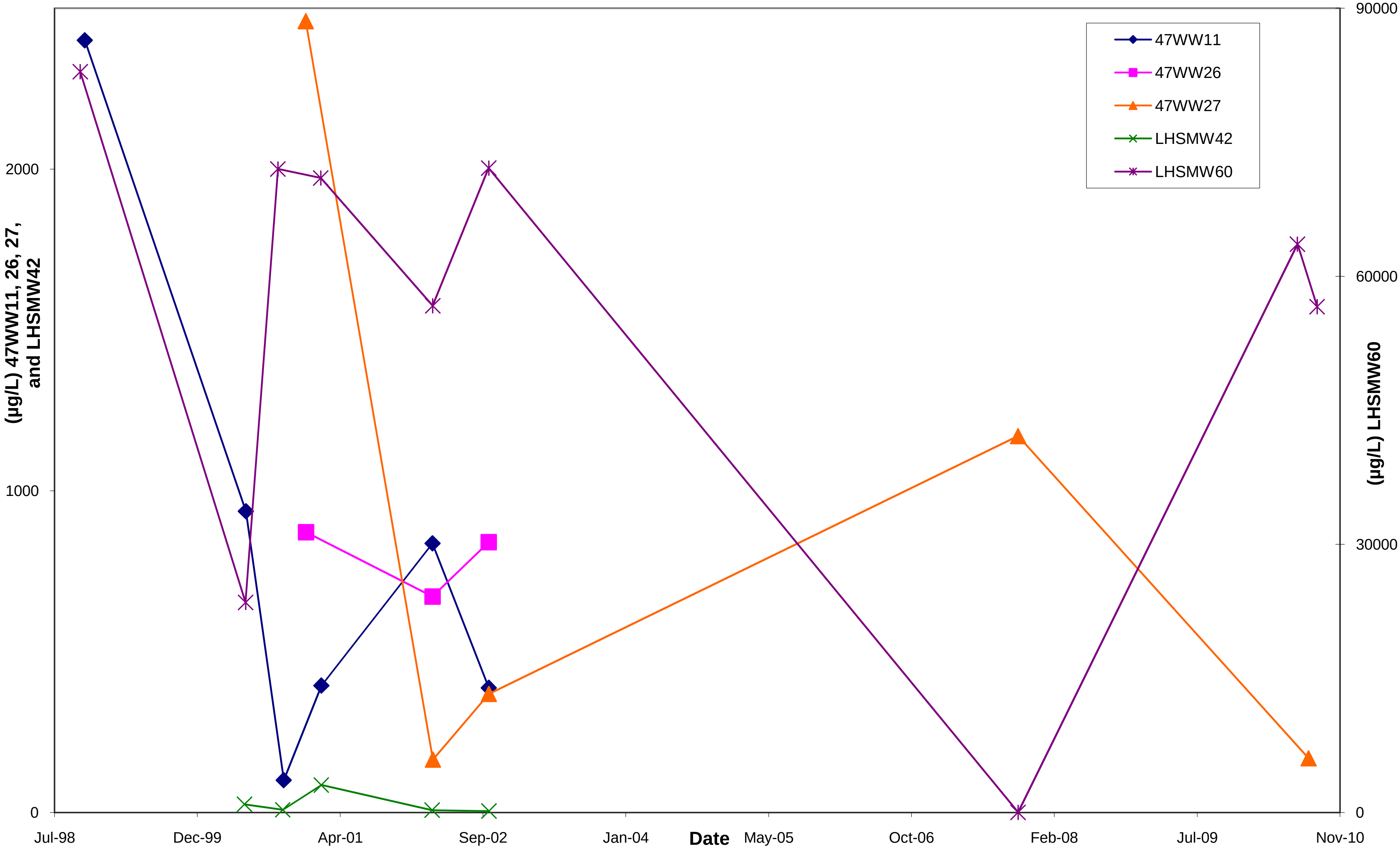


Figure A-4
Tetrachloroethene Concentration Trends in Groundwater
LHAAP-47

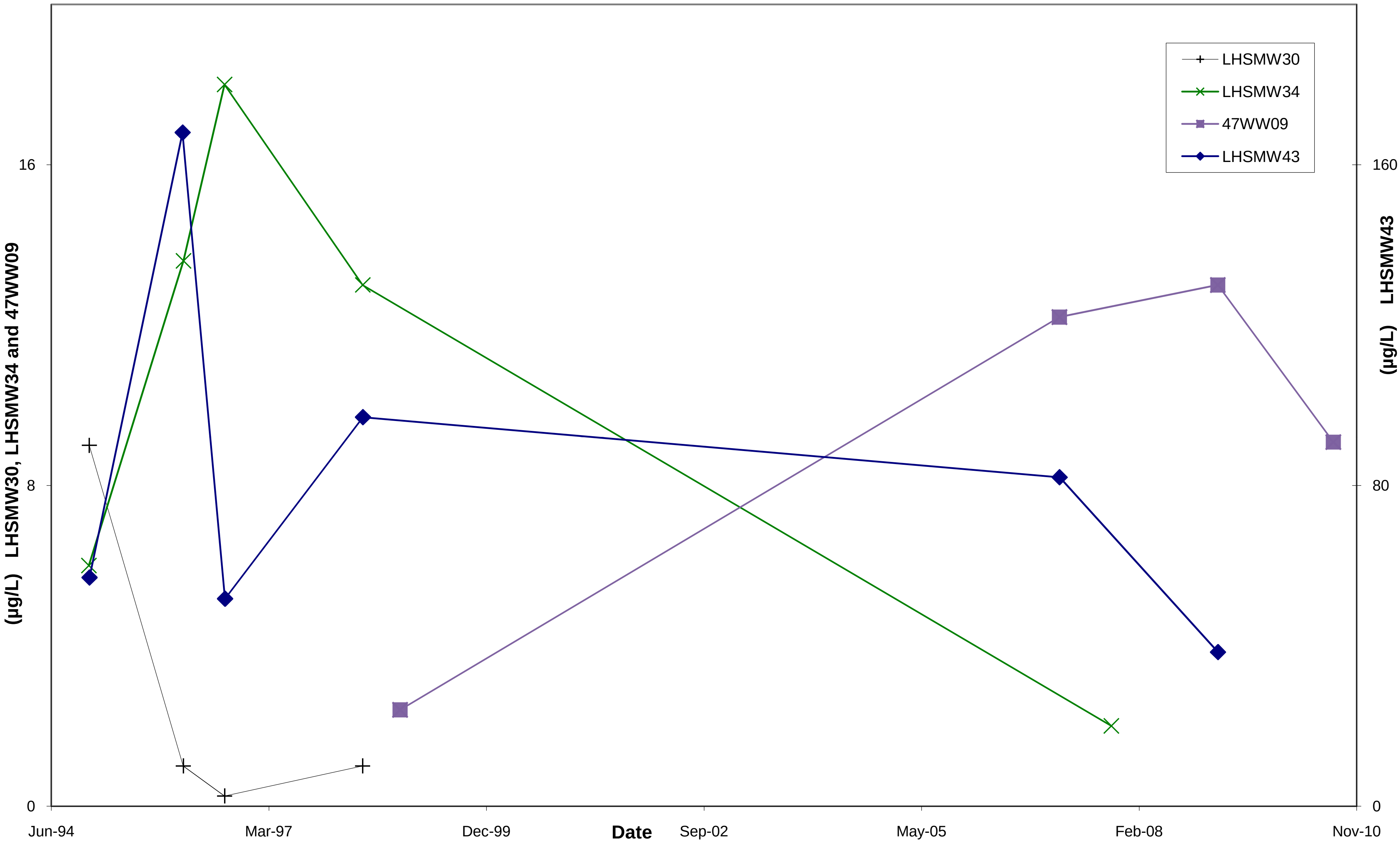


Figure A-5a
Trichloroethene Concentration Trends in Groundwater (High)
LHAAP-47

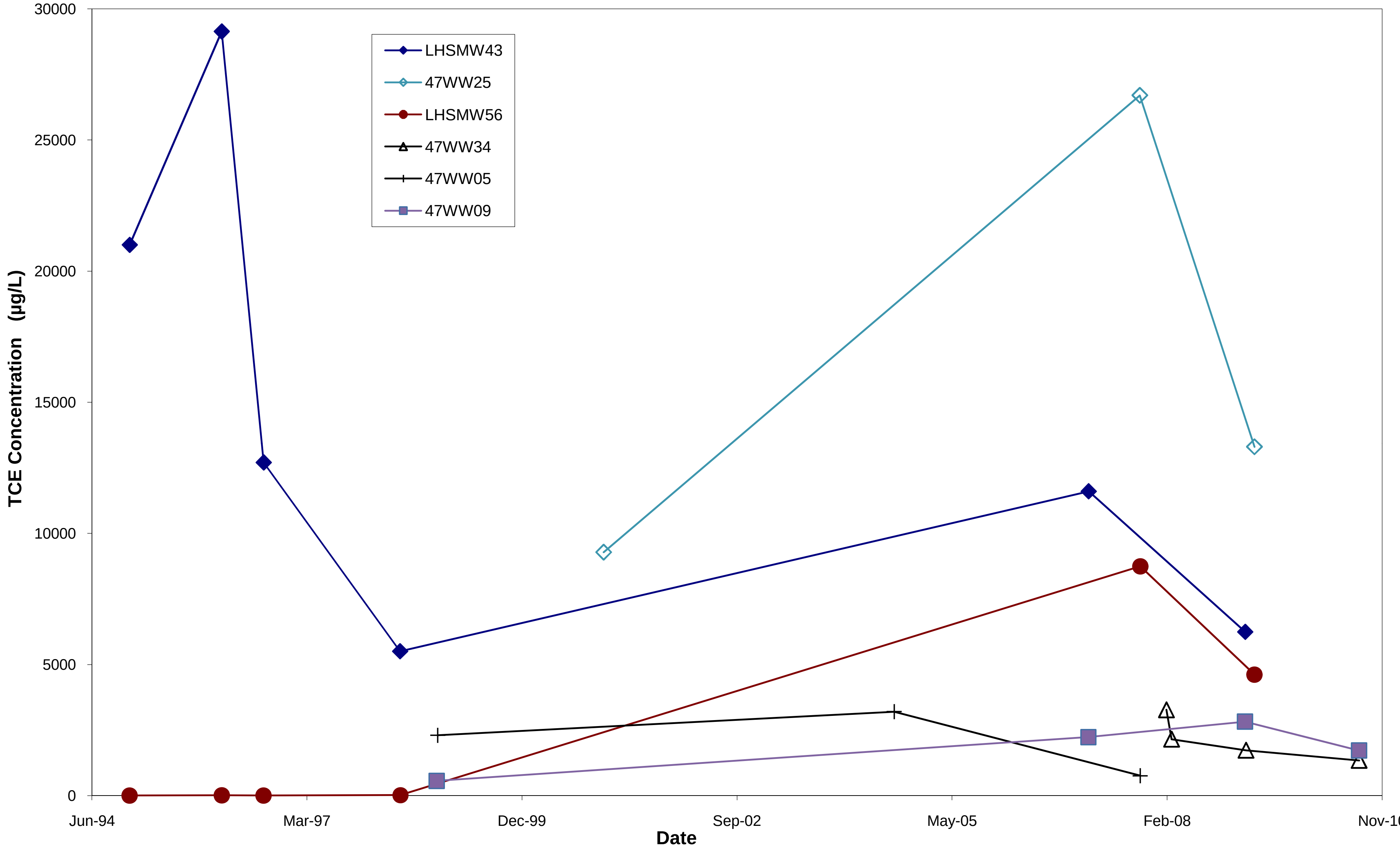


Figure A-5b
Trichloroethene Concentration Trends in Groundwater (Medium)
LHAAP-47

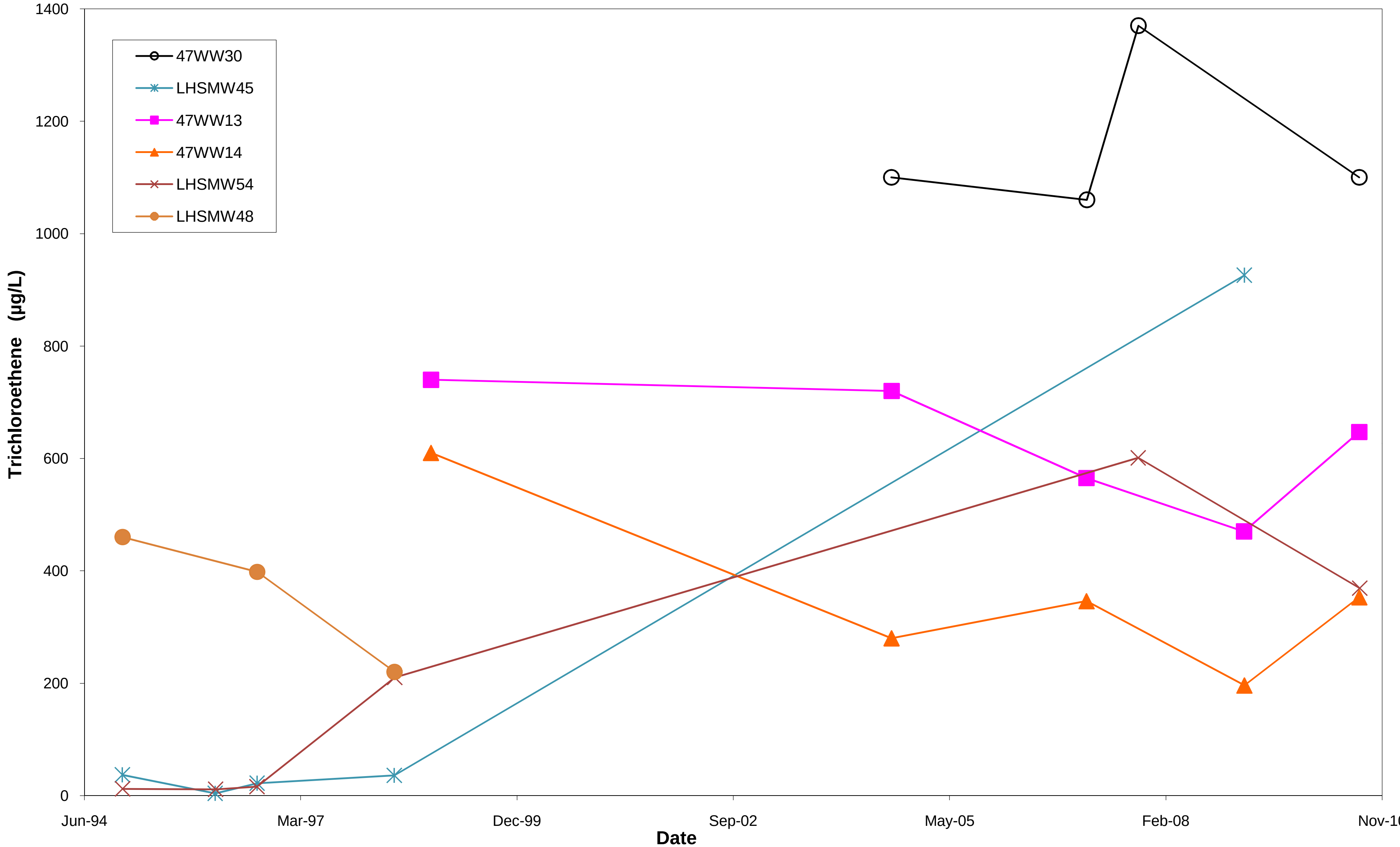


Figure A-5c
Trichloroethene Concentration Trends in Groundwater (Low)
LHAAP-47

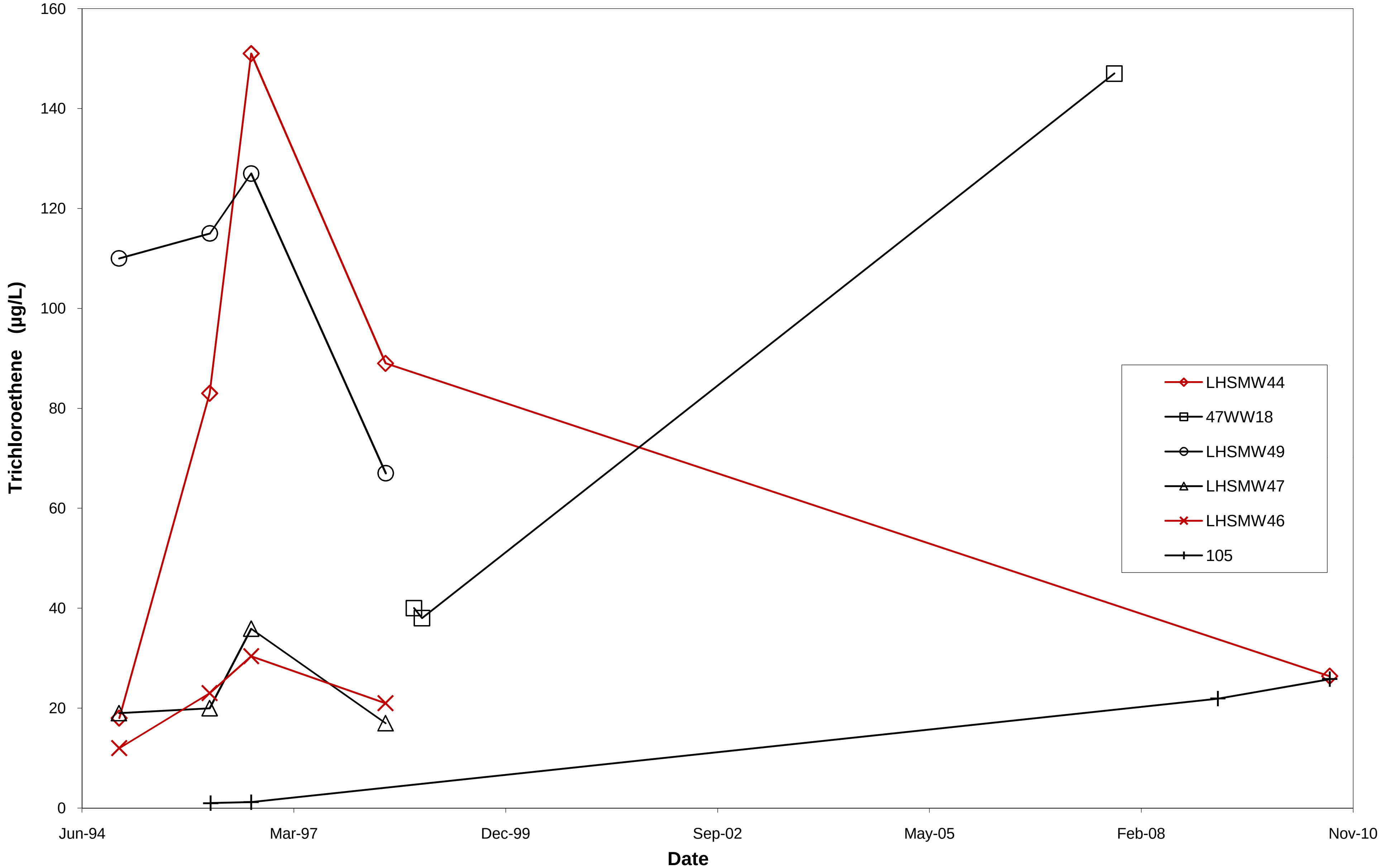


Figure A-6a
cis-1,2-Dichloroethene Concentration Trends in Groundwater (High)
LHAAP-47

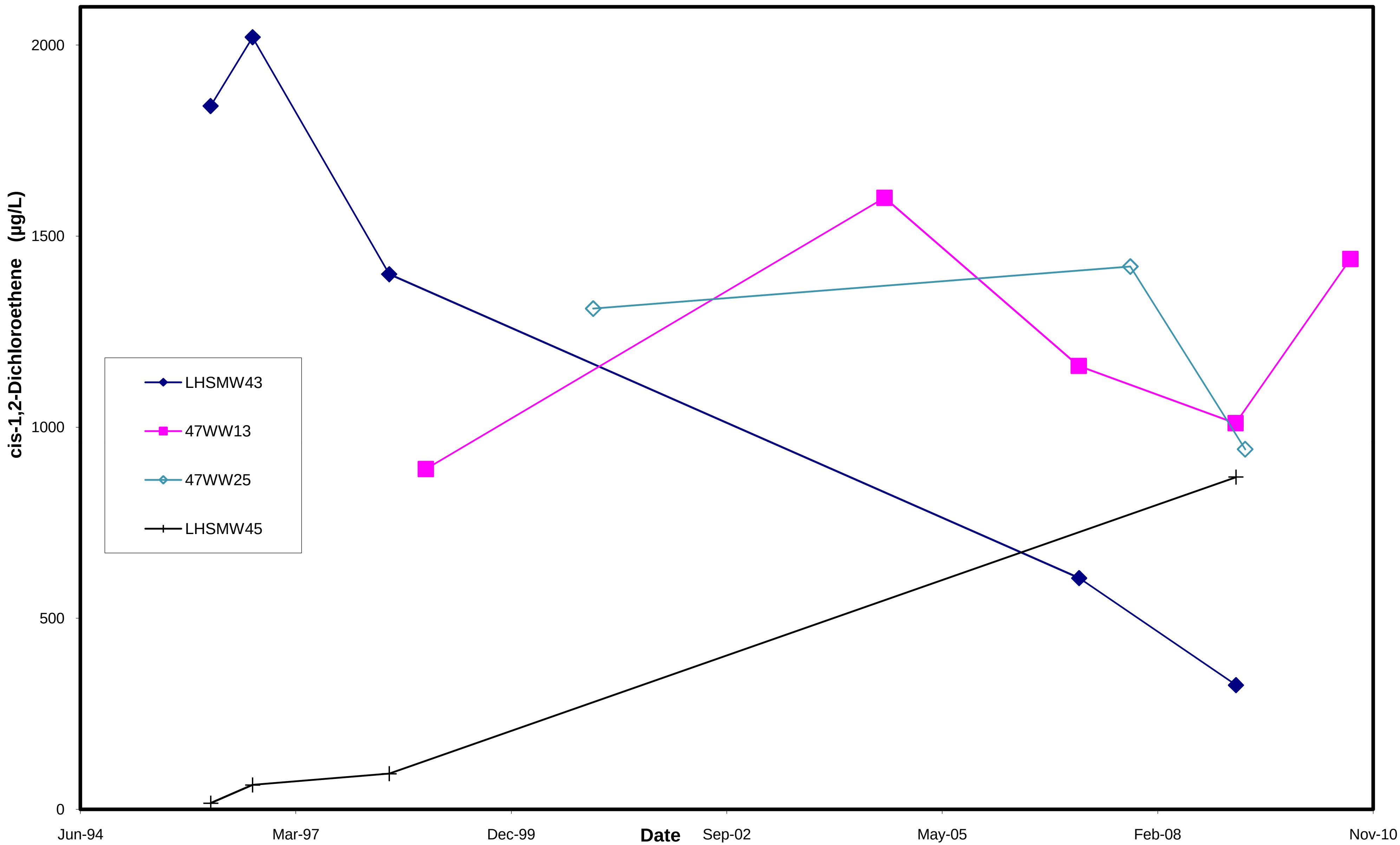


Figure A-6b
cis-1,2-Dichloroethene Concentration Trends in Groundwater (Low)
LHAAP-47

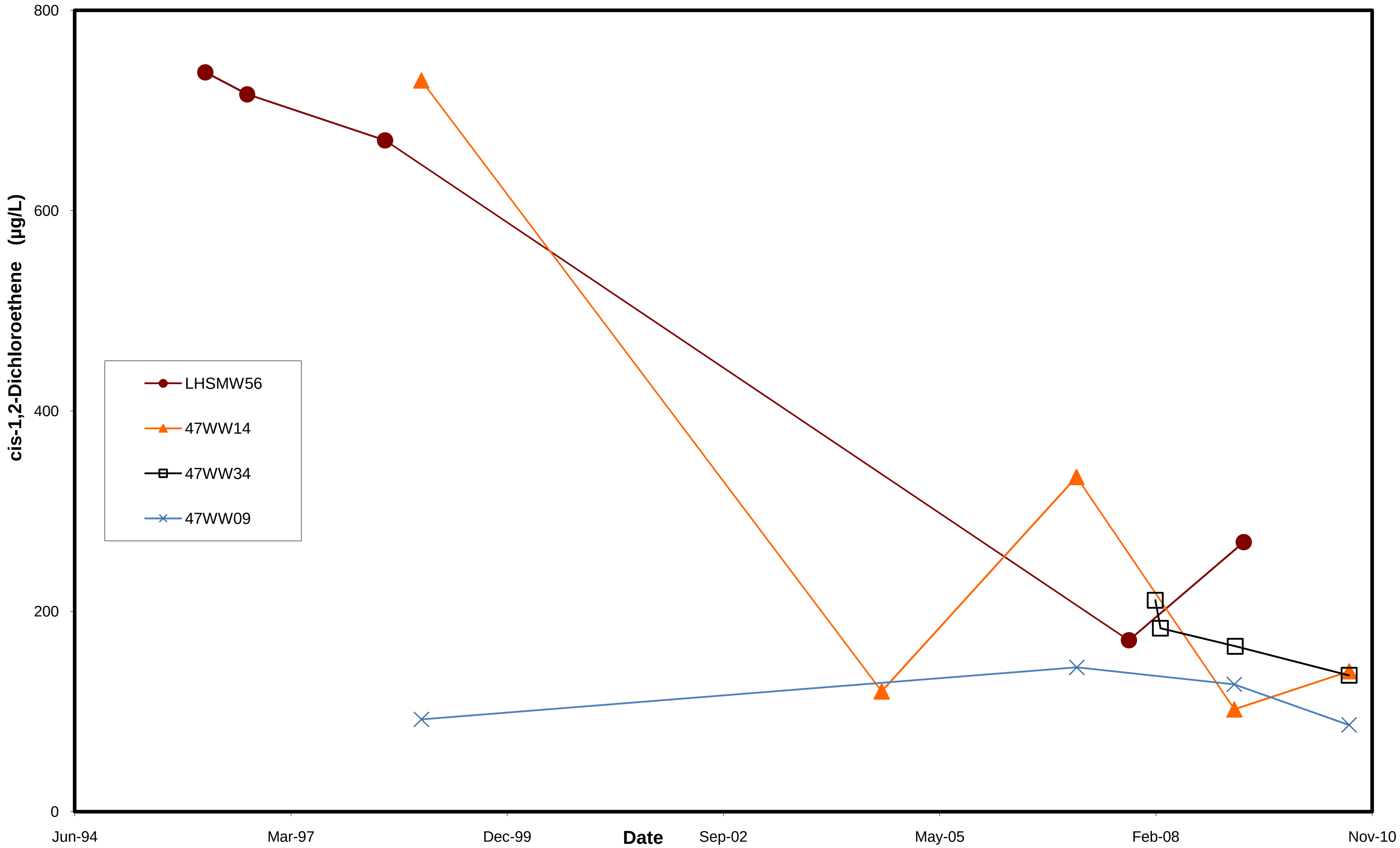


Figure A-7
1,1-Dichloroethene Concentration Trends in Groundwater
LHAAP-47

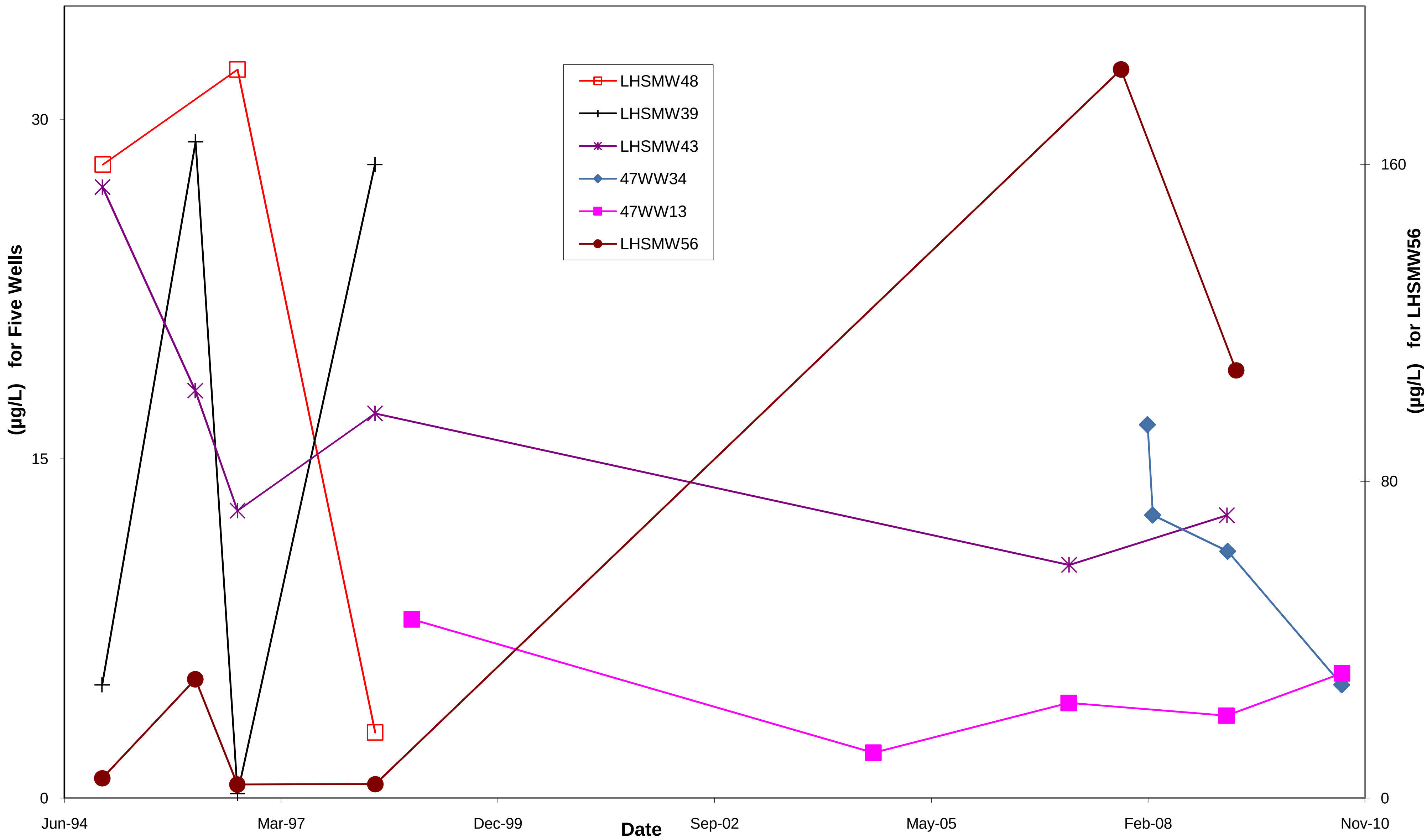


Figure A-8a
Vinyl Chloride Concentration Trends in Groundwater (Low)
LHAAP-47

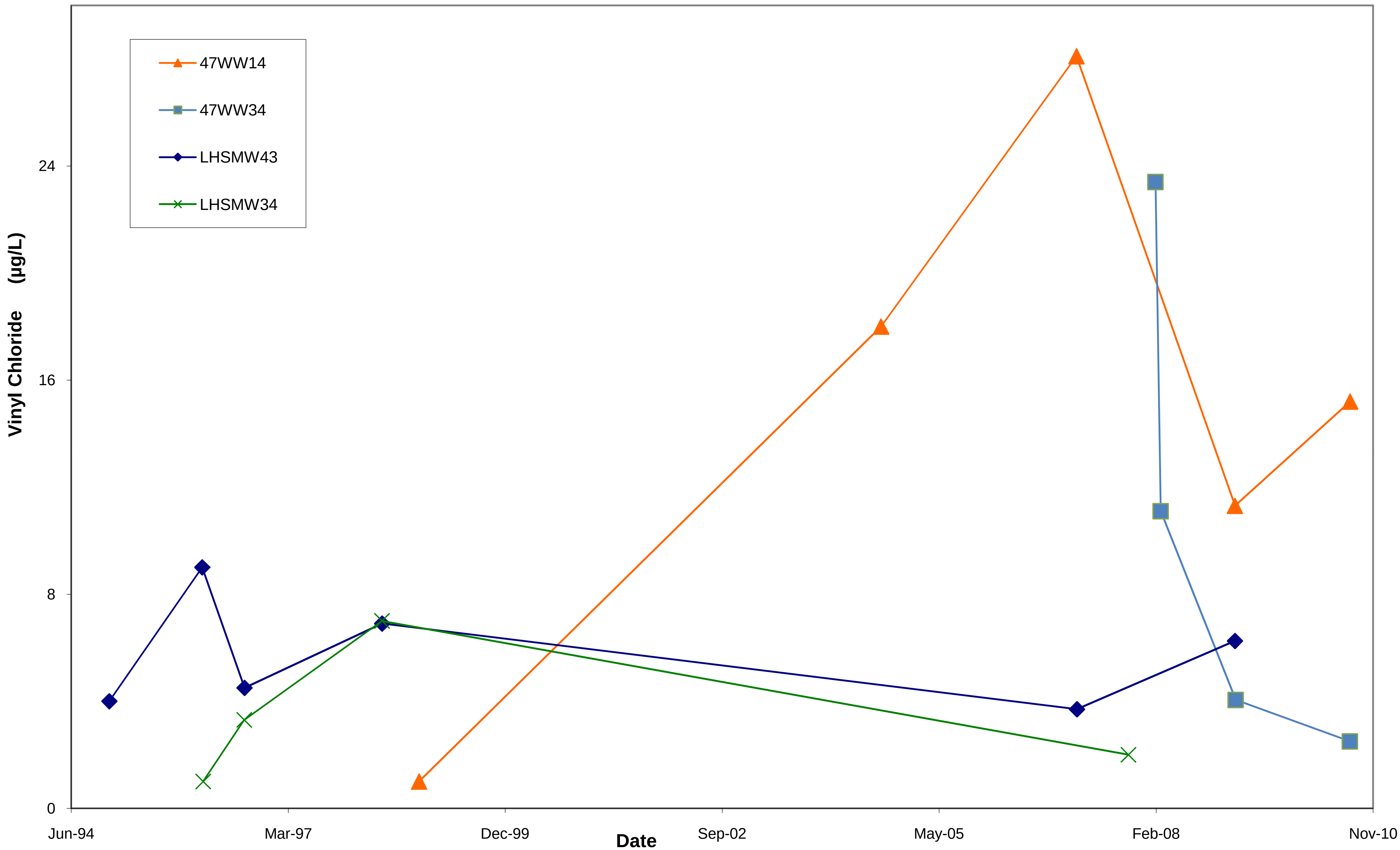


Figure A-8b
Vinyl Chloride Concentration Trends in Groundwater (High)
LHAAP-47

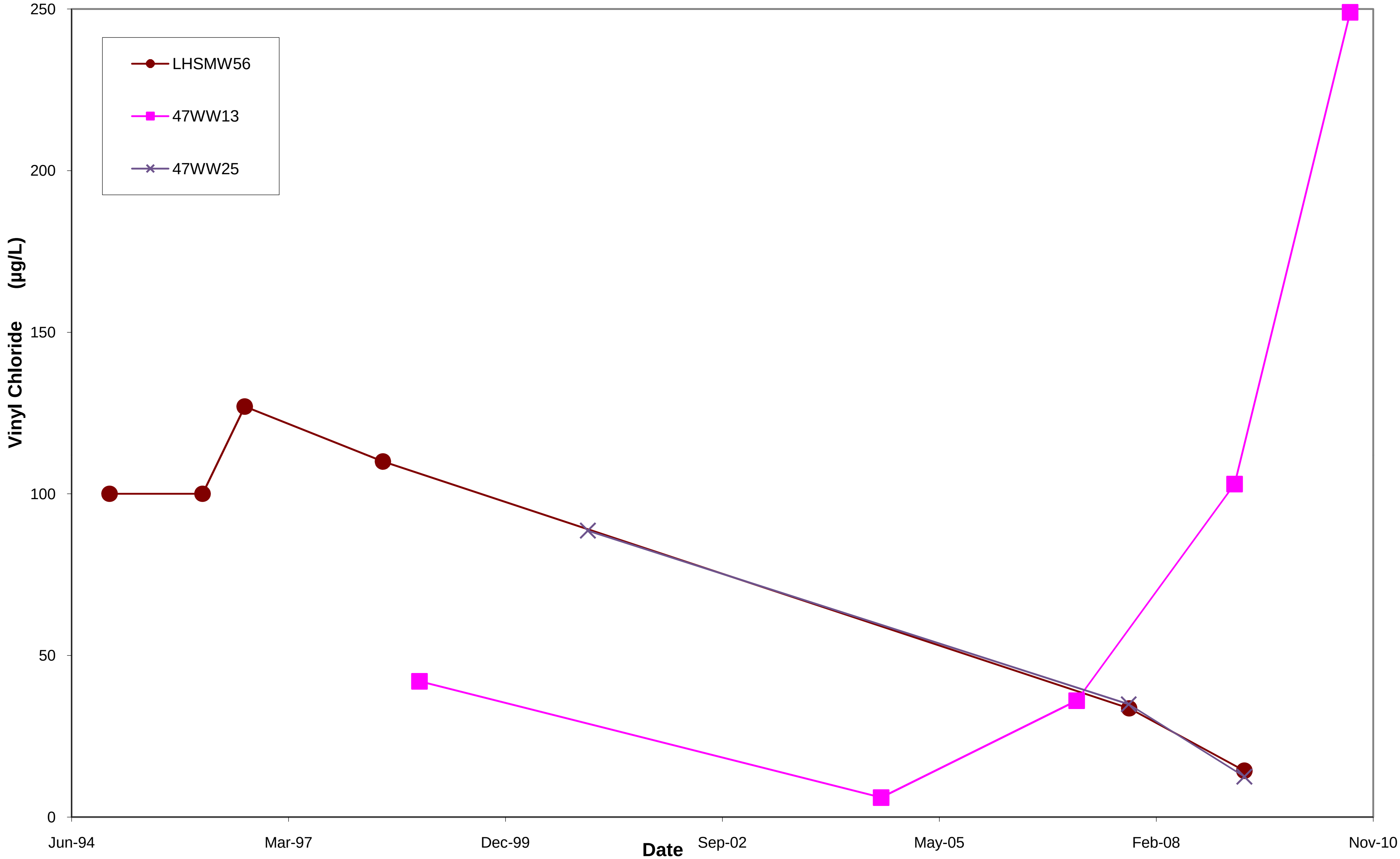


Figure A-9
TCE Concentrations Across Northern Arm of Plume
LHAAP-47

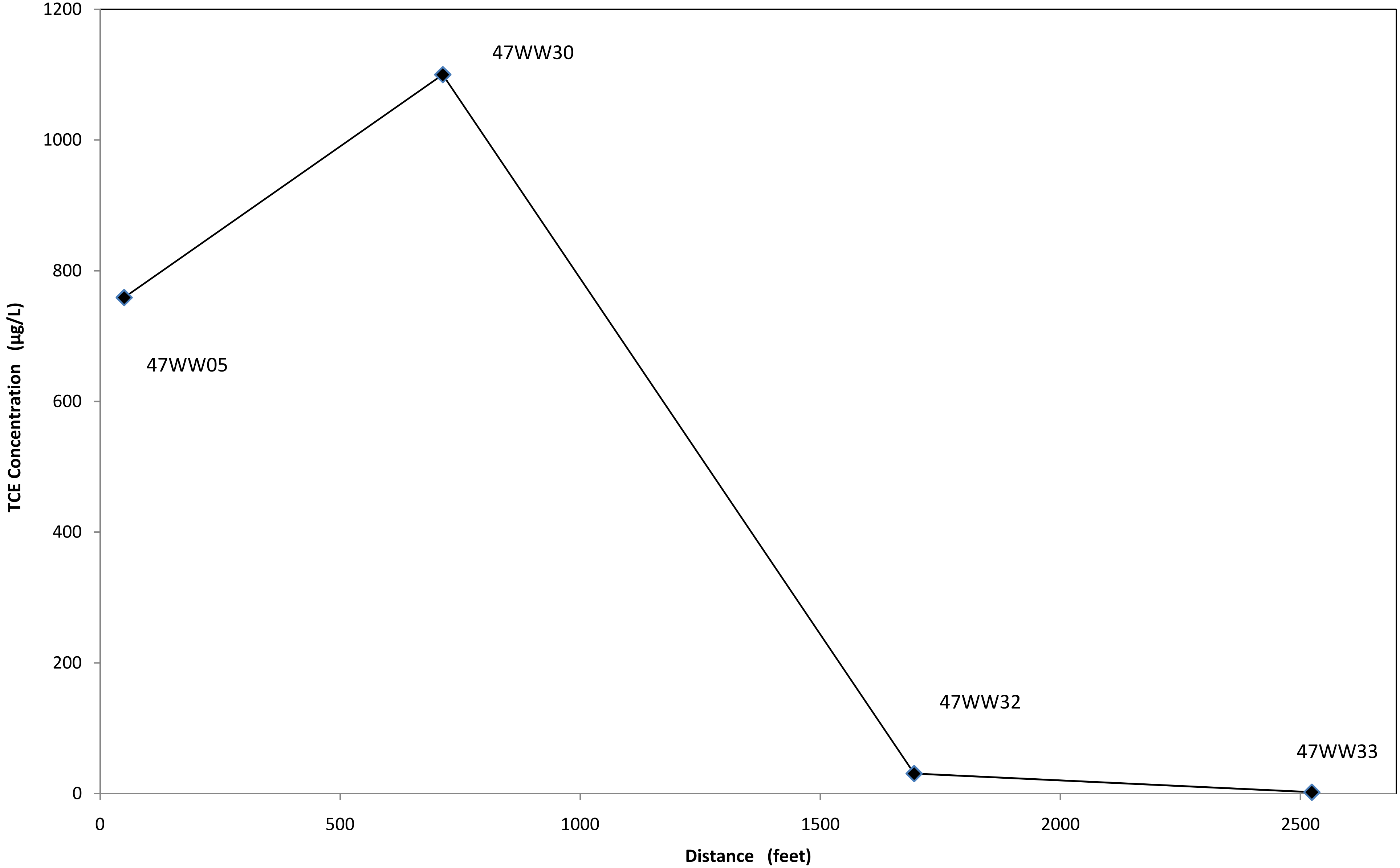


Figure A-10
TCE Concentrations Across Southern Arm of Plume
LHAAP-47

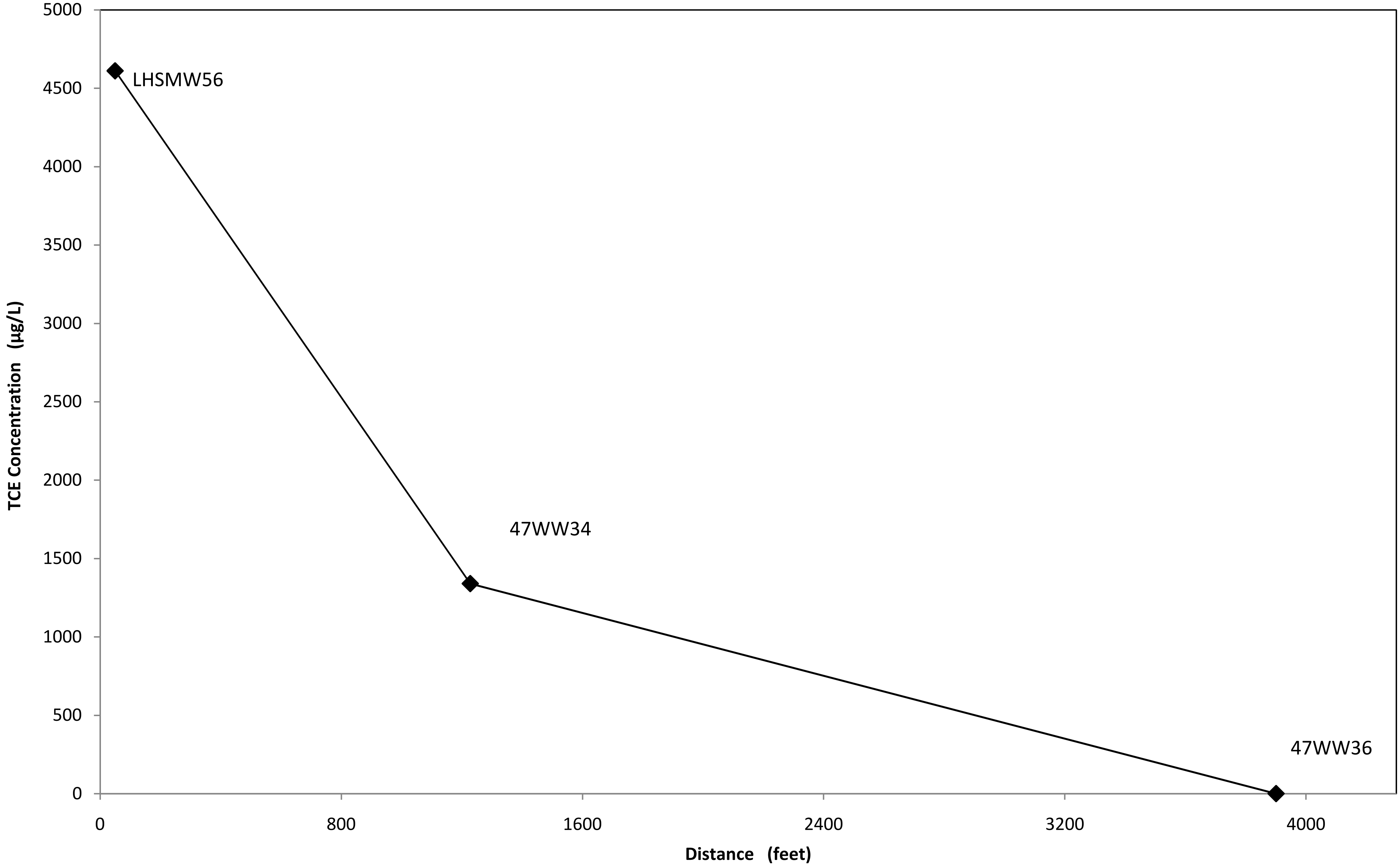


Figure A-11
TCE Concentrations Across Middle of Plume
LHAAP-47

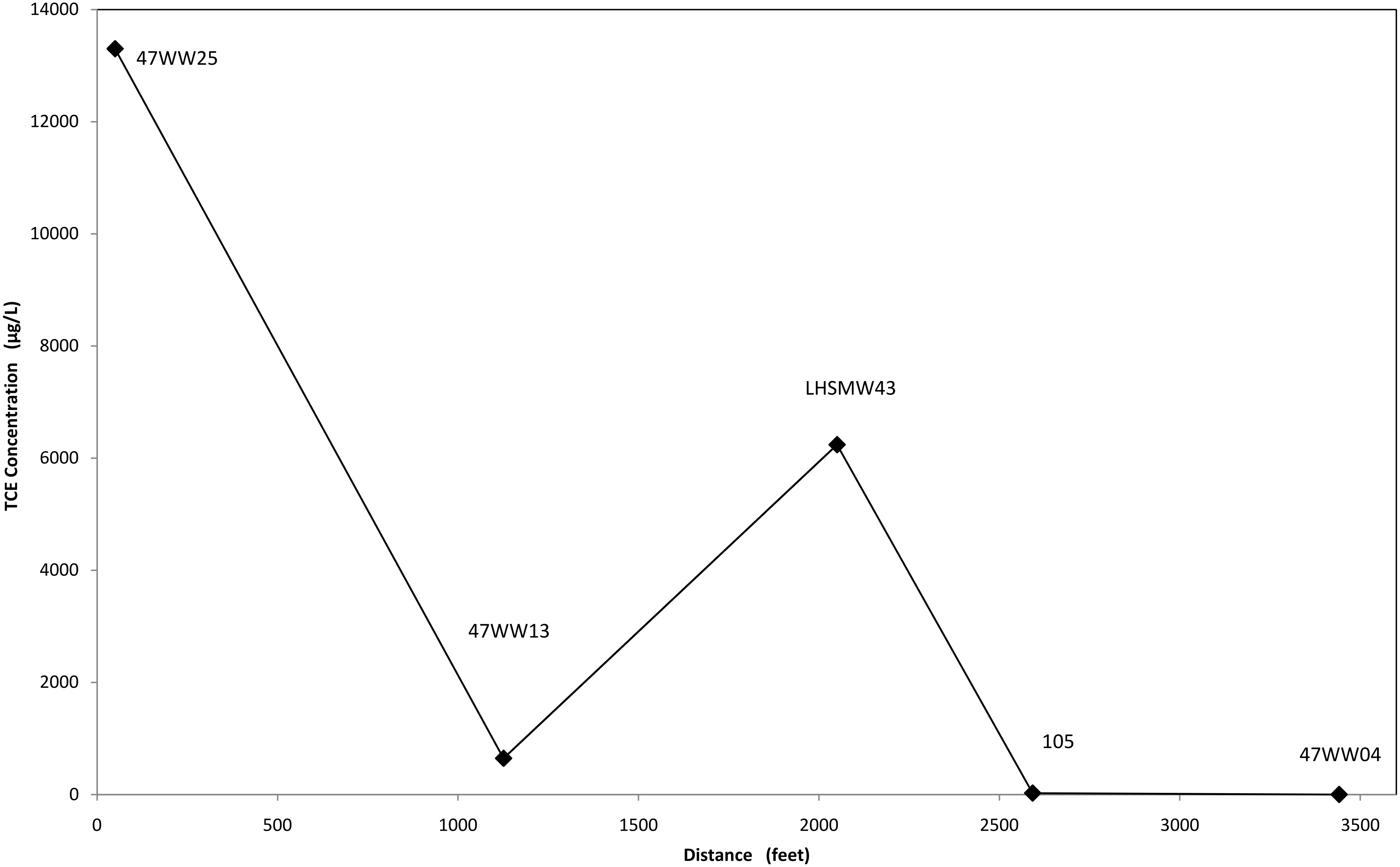


Figure A-12
Natural Attenuation Rate Estimation for Perchlorate
LHAAP-47

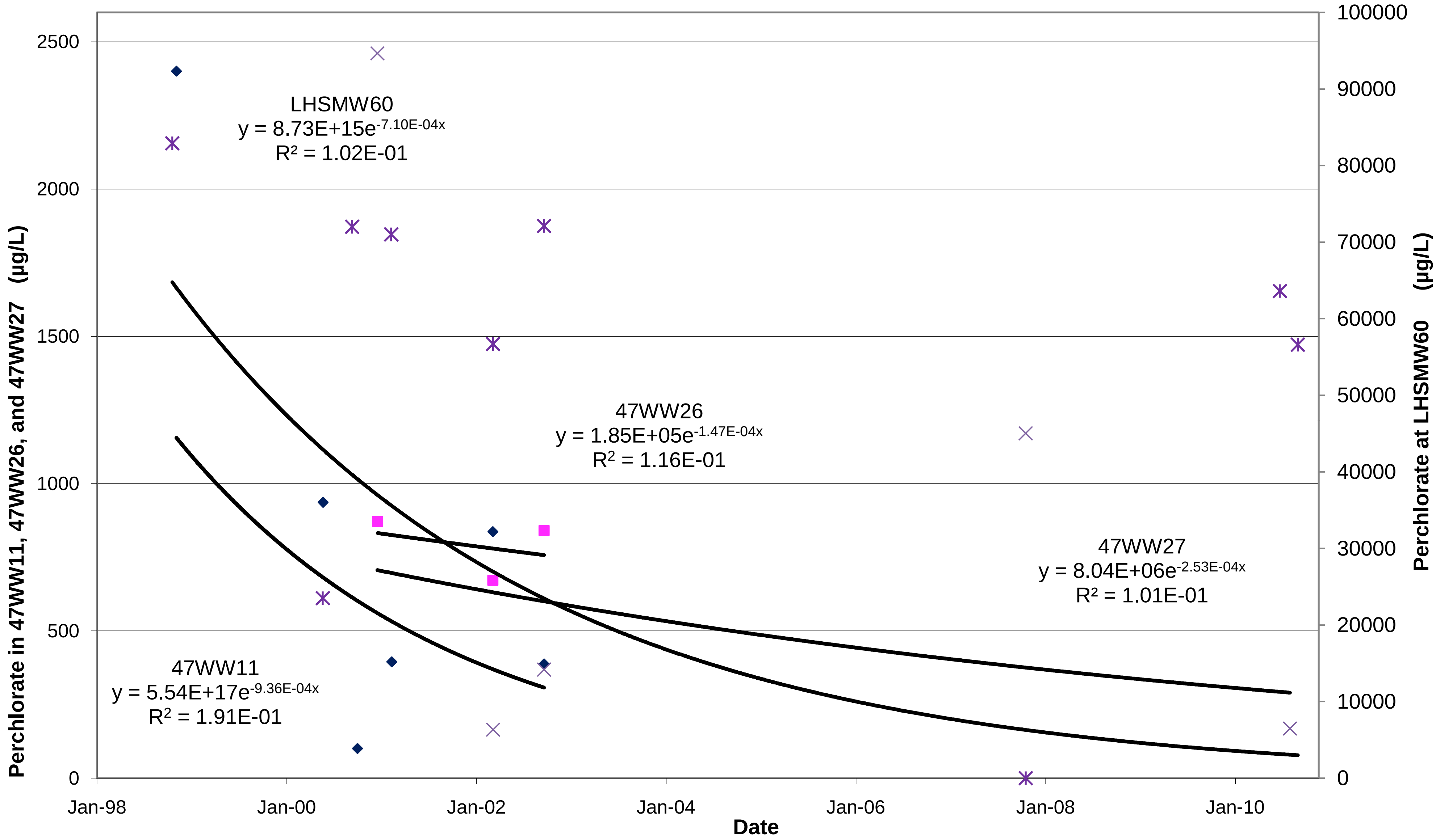


Figure A-13
Natural Attenuation Rate Estimation for TCE at 47WW05, 47WW34, and LHSMW43
LHAAP-47

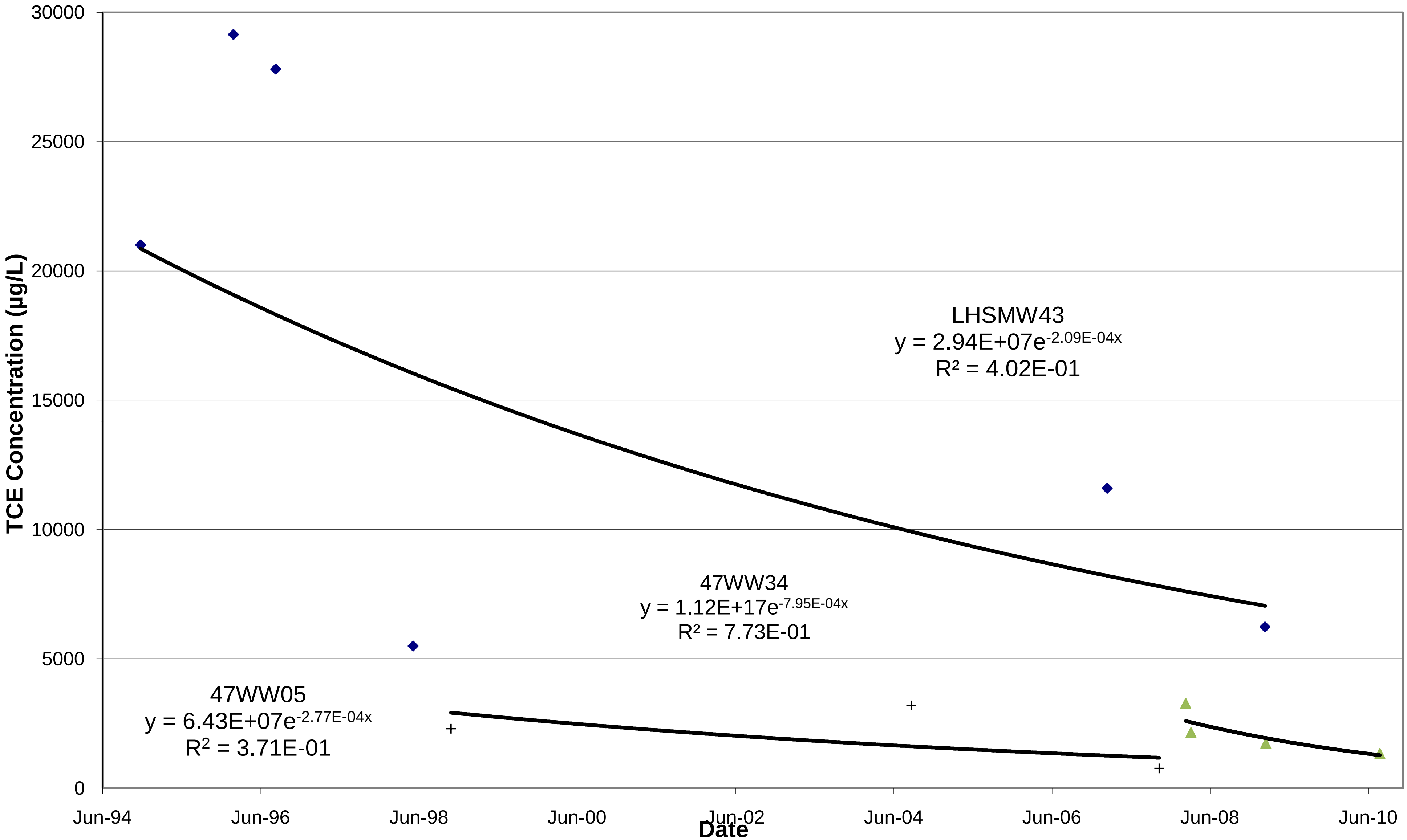


Figure A-14
Natural Attenuation Rate Estimation for TCE at 47WW13, 47WW14, and LHSMW48
LHAAP-47

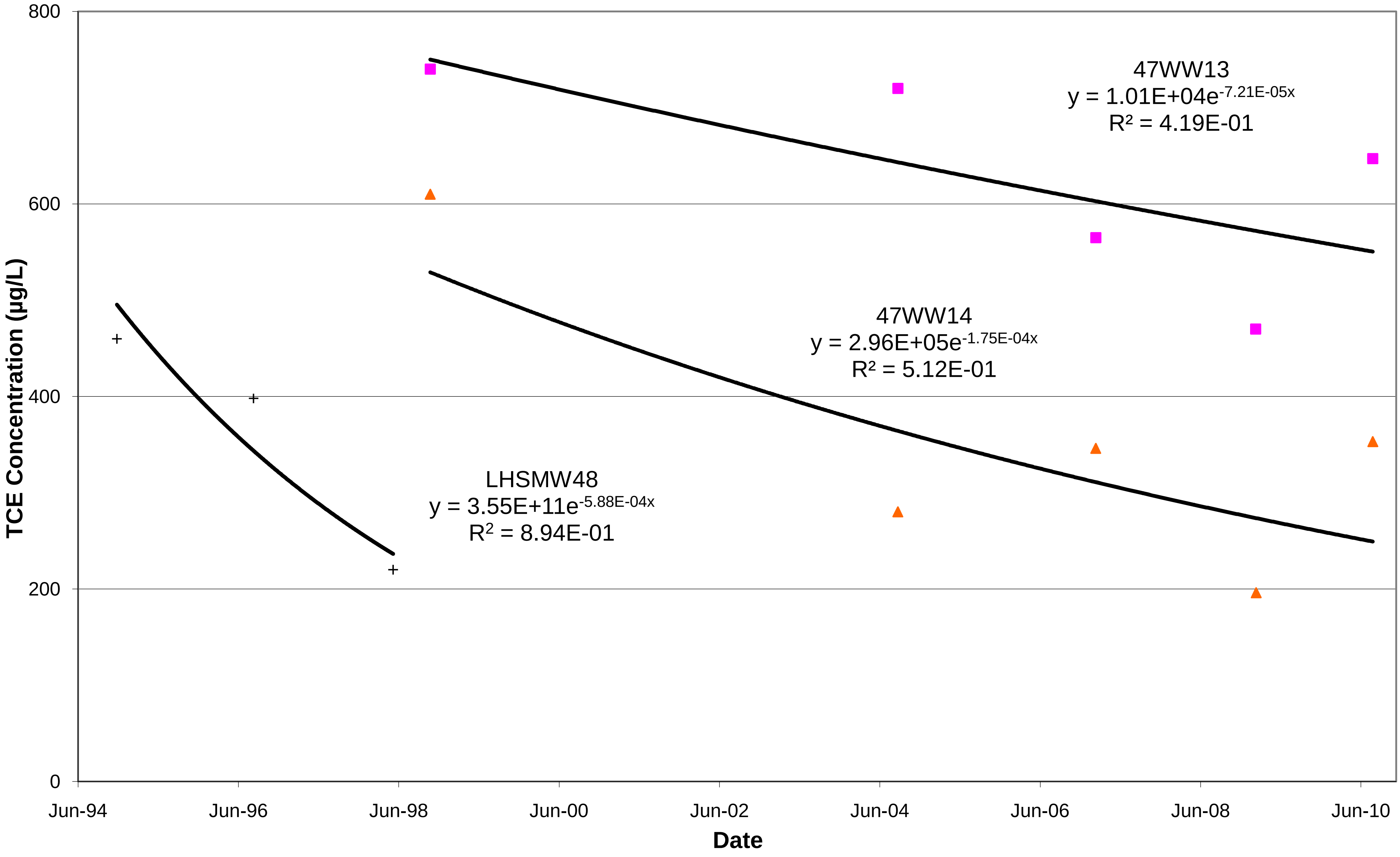
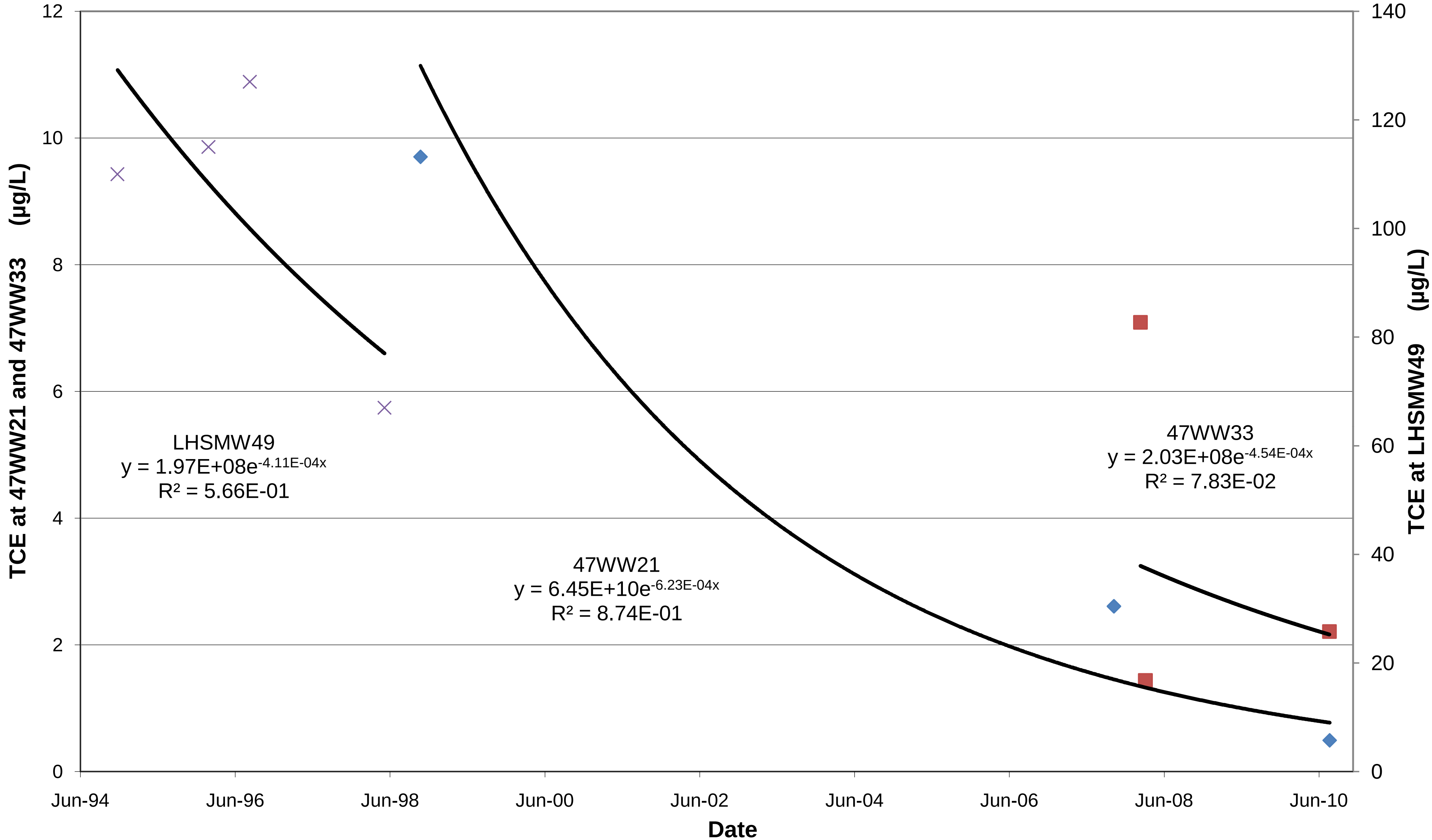


Figure A-15
Natural Attenuation Rate Estimation for TCE at 47WW21, 47WW33, and LHSMW49
LHAAP-47



Appendix B

Geochemical Evaluation of Selected Elements in Groundwater at LHAAP-47

00100688

APPENDIX B
GEOCHEMICAL EVALUATION
OF SELECTED ELEMENTS IN GROUNDWATER AT LHAAP-47

FINAL
FEASIBILITY STUDY
LHAAP-47, PLANT 3 AREA, 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, Shaw Project No. 117591
Task Order No. DS02

July 2011

Table of Contents

List of Tables

List of Figures

Acronyms and Abbreviations

µg/L	micrograms per liter
Al	aluminum
As	arsenic
Ba	barium
Be	beryllium
Cr	chromium
DCE	dichloroethene
DO	dissolved oxygen
EPRI	Electric Power Research Institute
Fe	iron
LHAAP	Longhorn Army Ammunition Plant
mg/L	milligrams per liter
Mn	manganese
mV	millivolts
Ni	nickel
NTU	nephelometric turbidity units
ORP	oxidation-reduction potential
Pb	lead
PCE	tetrachloroethene
Sb	antimony
Shaw	Shaw Environmental, Inc.
TAL	target analyte list
TCE	trichloroethene
TDS	total dissolved solids
TSS	total suspended solids
Tl	thallium
VC	vinyl chloride
VOCs	volatile organic compounds
Zn	zinc

1.0 Introduction

This report provides the results of a geochemical evaluation of inorganic constituents in groundwater samples from the Plant 3 area at Longhorn Army Ammunition Plant (LHAAP) designated as LHAAP-47, in Karnack, Texas. Elevated concentrations of aluminum, antimony, arsenic, barium, beryllium, cadmium, chromium, lead, manganese, nickel, silver, and thallium were observed in the historical site data set, which includes samples collected from December 1994 through December 2000 at 54 site wells. Preliminary geochemical evaluation indicated that anomalously high concentrations of most of these elements were present in the historical data set. A new round of samples was subsequently obtained from a subset of the site wells in September and November 2007, and further geochemical evaluation was performed to determine if detected concentrations in these samples are naturally occurring or reflect site-related contamination.

Included in the following evaluation are the seven groundwater samples (including one field duplicate) that were collected in September and November 2007 from wells 47WW06, -07, -09, -13, -19, and -22. These six wells were selected because of consistently detectable past metals concentrations which would provide representative metals information for LHAAP-47 groundwater. Two wells (47WW06 and -07) were sampled in September 2007 and four wells (47WW09, -13, -19 and -22) were sampled in November 2007. Well 47WW07 is completed in the deep groundwater zone, well 47WW19 is completed in the intermediate groundwater zone, and the other 4 are completed in the shallow groundwater zone. The 143 historical samples (including 14 field duplicates) are also included for comparative purposes and to permit qualitative evaluation of temporal trends in element concentrations at the site. All of the samples were analyzed for the full suite of 23 target analyte list (TAL) metals, and the 2007 samples were also analyzed for total dissolved solids (TDS) and total suspended solids (TSS). Installation-wide background data for TAL metals in groundwater are provided in the *Final Evaluation of Perimeter Well Data for Use as Groundwater Background* (Shaw Environmental, Inc. [Shaw], 2007) and are used for comparative purposes in the evaluation.

2.0 Geochemical Evaluation Methodology

Geochemical evaluations are based on the well-known chemical behavior of elements in groundwater and are performed to determine if the observed metals concentrations at a site reflect natural conditions or site-related contamination (Thorbjornsen and Myers, 2007, 2008). Elevated concentrations of inorganic constituents in groundwater samples may be due to naturally high dissolved concentrations, the presence of suspended particulates in the samples, reductive dissolution, or contamination resulting from site activities. The effects of suspended particulates and reductive dissolution are discussed below.

2.1 Effects of Suspended Particulates

Under natural conditions, metals concentrations are commonly controlled through adsorption on suspended particulates. The most common suspended particulates in ground water samples are clay minerals, hydrous aluminum oxides ($Al_2O_3 \bullet nH_2O$), and aluminum hydroxides [$Al(OH)_3$], hereafter referred to as "clays"; and iron oxide (Fe_2O_3), hydrous iron oxide, iron hydroxide [$Fe(OH)_3$], and iron oxyhydroxide ($FeO \bullet OH$) minerals, hereafter referred to as "iron oxides." Aluminum is a primary component of all clay minerals, which have low solubilities over the neutral pH range (6 to 8). Measured concentrations of aluminum greater than approximately 1,000 micrograms per liter (µg/L) indicate the presence of suspended clay minerals (Hem, 1985; Stumm and Morgan, 1996); the higher the aluminum concentration, the greater the mass of suspended clay minerals in the sample. Iron oxides also have very low solubilities under oxic neutral-pH conditions, but they are redox-sensitive. Measured iron concentrations above approximately 1,000 µg/L under neutral-pH and moderate to oxidizing redox conditions indicate the presence of suspended iron oxides (Hem, 1985).

Samples containing trace elements adsorbed on suspended clay particulates should show a positive correlation with aluminum concentrations, and samples containing trace elements adsorbed on suspended iron oxides should show a positive correlation with iron concentrations. These correlations are evaluated by generating x-y plots of the concentrations of an elevated trace metal versus aluminum or iron (depending on the trace element). Divalent cations such as barium, lead, and zinc have an affinity to adsorb on clay surfaces, which tend to maintain a net negative charge under neutral-pH conditions (Electric Power Research Institute [EPRI], 1984; Brookins, 1988). Concentrations of barium, lead, or zinc in a set of samples can be evaluated through comparison to the corresponding aluminum concentrations. Under oxidizing conditions, elements such as arsenic, selenium, and vanadium are usually present as oxyanions and have a strong affinity to adsorb on iron oxide surfaces, which tend to maintain a net positive charge (Pourbaix, 1974; Hem, 1985; Brookins, 1988; Bowell, 1994). Concentrations of arsenic, selenium, or vanadium can be evaluated through comparison to the corresponding iron (Fe) concentrations. Chromium can exist as a mixture of aqueous species with different charges [$Cr(OH)_2^+$, $Cr(OH)_3^o$, and $Cr(OH)_4^-$], depending on pH (EPRI, 1984), so it can be distributed on several different types of sorptive surfaces, including clay and iron oxide minerals.

If the concentrations of trace elements in unfiltered samples are positively correlated with aluminum (Al) or Fe, then they are most likely adsorbed to the surfaces of suspended particulates. If all of the samples fall on a common trend with a positive slope, then the elevated concentrations are most likely natural.

As an example geochemical evaluation, the detected concentrations of zinc (Zn) (y-axis) would be plotted against the corresponding detected concentrations of aluminum (x-axis), due to the affinity for zinc adsorption on clays under neutral-pH conditions. If all of the samples display a common trend with a positive slope (similar Zn/Al ratios), then it is likely that the zinc concentrations are due to the presence of suspended clay minerals in the samples. If a sample plots above the trend established by the other samples, then that sample has an anomalously high Zn/Al ratio and likely contains excess zinc that cannot be explained by these natural processes.

Ratio plots are also a useful tool for interpreting the relationship between trace and major elements and for identifying anomalous samples that may contain a component of contamination. Ratio plots display trace element concentrations on the y-axis and trace/major element ratios on the x-axis, and they are employed in conjunction with correlation plots in those cases where it is not immediately apparent which site samples have anomalously high elemental ratios on the correlation plots. However, ratio plots must be used with care when depicting aqueous data. For samples from low-redox areas, redox-sensitive elements (such as arsenic, iron, and manganese) are expected to display a higher degree of scatter on correlation plots and, hence, a wider range of ratios on ratio plots.

In addition to the evaluation of trace-versus-major element correlations, the effects of suspended particulates can be assessed via the evaluation of element-versus-turbidity correlations, evaluation of element-versus-TSS correlations, and comparison of filtered versus unfiltered splits. Evaluations of turbidity and TSS measurements provide additional lines of evidence that support the conclusions drawn from the evaluation of trace-versus-major element correlations. However, turbidity and TSS measurements are qualitative and cannot distinguish between suspended iron oxides, clay minerals, and natural organic material. Consequently, they do not provide the mechanistic information afforded by the correlations of trace elements versus aluminum or trace elements versus iron. Turbidity readings are also affected by the size and shape of suspended particulates. Comparisons of filtered versus unfiltered splits of samples are highly informative and permit the identification of elements that are present as suspended particulates versus those that are in true solution. Although filtered splits were not obtained during the historical sampling events, they were obtained during the September-November 2007 sampling event. Comparisons of filtered versus unfiltered splits are provided below for data from this event.

2.2 Effects of Reductive Dissolution

The release of organic contaminants such as chlorinated solvents, volatile organic compounds (VOCs), jet fuel, or gasoline can establish local reducing environments caused by microbial degradation of the organic compounds. The establishment of local reducing conditions can drive the dissolution of iron and manganese oxides, which become soluble as the redox potential drops below a threshold value. Dissolution of these oxide minerals can mobilize the trace elements adsorbed on the oxide surfaces, which is a process termed "reductive dissolution." Many investigations have documented the mobilization of arsenic, selenium, and other trace elements under locally reducing redox conditions (e.g., Sullivan and Aller, 1996; Nickson et al., 2000; Belzile et al., 2000). Reducing conditions can also exist naturally in groundwaters and surface waters that are associated with swamp or wetland environments.

Evidence for reductive dissolution includes high Fe/Al ratios, as well as correlation between elevated trace element concentrations (arsenic, selenium, and vanadium in particular) versus lower redox conditions. Low redox conditions can be identified by local depressions in oxidation-reduction potential (ORP) or dissolved oxygen (DO) measurements or by the presence of reducing gases such as hydrogen, methane, ethane, or ethene. Anaerobic microbes can also reduce sulfate to sulfide and nitrate to ammonia, resulting in local depressions in sulfate and nitrate concentrations and local detections of sulfide and ammonia. In areas impacted by chlorinated solvents, additional evidence for the establishment of anaerobic reducing conditions is the presence of VOCs such as *cis*-1,2-dichloroethene (DCE) and/or vinyl chloride (VC), which are reductive dechlorination products resulting from the microbial degradation of trichloroethene (TCE) or tetrachloroethene (PCE) under anaerobic conditions.

3.0 Geochemical Evaluation of Selected Elements in LHAAP-47 Groundwater Samples

This section presents the results of the geochemical evaluation of aluminum, antimony, arsenic, barium, beryllium, cadmium, chromium, lead, manganese, nickel, silver, and thallium concentrations in the September-November 2007 LHAAP-47 groundwater samples. Aluminum is evaluated first (along with iron) because it is one of the primary reference elements used to evaluate trace element concentrations, and because the Al/Fe ratios provide important information regarding redox conditions at the sampled locations. Samples exhibiting high trace-versus-major element ratios relative to background samples (or other uncontaminated samples) are described as having "anomalously high" elemental ratios, if such elevated ratios cannot be explained as the result of natural processes. The term "anomalously high" is also used in reference to the elevated element concentrations of such samples. **Table B-1** provides a list of the site samples that were identified in the LHAAP-46 geochemical evaluation as having anomalously high element concentrations (i.e., ratios), which may reflect site-related contamination.

Field readings are available for the two wells sampled in September 2007 (47WW06 and -07) and three of the four wells sampled in November 2007 (47WW09, -13, and -19). The pH readings range from 5.43 to 8.12, with a median of 6.63 and mean of 6.59. These values indicate neutral to slightly acidic conditions at the sample locations. Field-measured DO readings range from 0.12 to 6.19 milligrams per liter (mg/L), with a median of 0.47 mg/L and mean of 1.96 mg/L; and ORP readings range from -24.6 to +411 millivolts (mV), with a median of +64 mV and mean of +143 mV. These values suggest moderate to oxidizing redox conditions at the sample locations.

The field-measured turbidity readings range from 0 to 25.9 nephelometric turbidity units (NTU), with a median of 9.8 NTU and mean of 11 NTU. These values suggest that the samples from the measured wells contained a relatively low mass of suspended particulates. Although a turbidity reading is unavailable for the sample from well 47WW22, the laboratory-measured TSS concentration for this sample is 3,770 mg/L. This concentration is two to three orders of magnitude higher than the other six TSS detections (which range from 4 J to 82 mg/L), which indicates that the 47WW22 sample contained a significantly larger mass of suspended particulates than the other samples.

3.1 Aluminum and Iron

Aluminum was detected in only four of the seven unfiltered groundwater samples, with detected concentrations ranging from 69.4 J to 78,000 µg/L. As discussed previously, aluminum concentrations greater than approximately 1,000 µg/L in neutral-pH groundwater represent suspended clay minerals. Some fraction of detected aluminum will be present in solution when the pH is below about 4 or above 10 (Drever, 1997), but the site pH readings are within this range. Iron was detected in all seven unfiltered groundwater samples, at concentrations ranging from 2,130 to 551,000 µg/L. Iron concentrations greater than approximately 1,000 µg/L in neutral-pH, moderate to oxidizing groundwater indicate the presence of suspended iron oxides. Iron, unlike aluminum, is a redox-sensitive element, and its dissolved concentrations will increase under reducing conditions. Reducing conditions can be natural, or they can be induced by the microbial degradation of chlorinated solvents and fuel hydrocarbons (**Section 2.0**). The available DO and ORP readings suggest moderate to oxidizing conditions at the sampled wells; iron is therefore expected to be present in particulate form in at least some of the site samples.

A plot of aluminum versus iron concentrations can be used as a qualitative indicator of the amount of suspended particulates in the groundwater samples, as well as an indicator of the redox conditions at the sample locations (**Figure B-1**). A linear trend with a positive slope is typically observed when both aluminum and iron are present in particulate form, and just such a trend is observed in **Figure B-1** for most of the historical site samples, background samples, and the detected aluminum in four 2007 site samples. The samples with the highest aluminum concentrations also have proportionally higher iron and lie on the trend. A plot of unfiltered aluminum concentrations versus the corresponding Al/Fe ratios is provided in **Figure B-2**. The 2007 site samples exhibit Al/Fe ratios that are consistent with or below those of the background samples, which suggests that they do not contain excess aluminum from a contaminant source. These observations suggest that the detected aluminum is due to the presence of suspended clay particulates, and that it is natural.

This conclusion is corroborated by comparison of filtered versus unfiltered splits and comparison of unfiltered aluminum concentrations versus TSS concentrations. Three of the four site samples with detectable aluminum in the unfiltered splits are nondetect for aluminum in the corresponding filtered splits, at a reporting limit of 100 µg/L. The samples with the highest unfiltered aluminum concentrations also have high TSS concentrations, as seen in **Figure B-3**. The decrease in concentration after filtration and the correlation between unfiltered aluminum versus TSS provide additional lines of evidence that aluminum detected in the unfiltered splits is associated with filterable suspended particulates, such as clays. The exception is the sample from well 47WW13, which has 78,000 µg/L aluminum in its unfiltered split and a filtered/unfiltered ratio of 1.3. Its TSS concentration of 82 mg/L is relatively low; in contrast, the sample (47WW22) with the second-highest aluminum concentration (63,000 µg/L) has a TSS concentration that is significantly higher (3,770 mg/L). The 47WW13 sample may contain a component of aluminum contamination; because its Al/Fe ratio is consistent with background, however, any contamination is not significant.

As indicated above, some portion of the iron in the 2007 site samples is also associated with suspended particulates. The calculated ratios of filtered/unfiltered iron range from 0.03 to 1.17, with a mean of 0.24. Fe was nondetect in one filtered split. The conclusion that Fe is associated with suspended particulates is corroborated by the low filtered/unfiltered iron ratios of the 2007 samples and a positive correlation between unfiltered iron concentrations versus TSS concentrations.

3.2 Antimony

Antimony was detected in only two of the seven unfiltered site groundwater samples, at concentrations of 2.44 and 7.5 µg/L. Under oxidizing conditions, antimony (Sb) is typically present as oxyanions, and its concentrations are often controlled by adsorption on iron oxides. A positive correlation between antimony and iron concentrations is therefore expected for uncontaminated samples under those conditions. Both elements are redox-active, however, and will be present in solution under reducing conditions. Under reducing conditions, strong correlations between the two elements are not necessarily expected.

A plot of antimony versus iron in the LHAAP-47 and background samples is provided in **Figure B-4**. Only samples with detectable antimony can be depicted. The shallow-zone background samples and several historical site samples exhibit similar Sb/Fe ratios and form a common trend with a positive slope. The consistent Sb/Fe ratios of these samples suggests a natural source for their antimony concentrations. The two 2007 site samples with detectable antimony lie below the trend; the low Sb/Fe ratios of these samples suggests that they do not contain antimony as a contaminant.

Another perspective on the data is provided in **Figure B-5**, which depicts the unfiltered antimony concentrations versus the corresponding Sb/Fe ratios. If a sample contains excess antimony from a contaminant source, then it will have an anomalously high Sb/Fe ratio relative to background and will lie to the right of the background samples in the plot. Only four historical site samples (the August 1996 samples from wells LHSMW38, -54, -57, and -60) have such anomalously high Sb/Fe ratios. The antimony concentrations (56 J to 76 J µg/L) of these samples were not reproducible. In each case, the subsequent samples (May 1998) from these four wells were either nondetect for antimony (well LHSMW38) or had “R”-qualified antimony concentrations, indicating that the laboratory-reported concentration was rejected during the validation process (wells LHSMW54, -57, and -60; reporting limit of 5 µg/L). In addition, the field duplicate of the anomalously high LHSMW60 sample was nondetect for antimony (at a reporting limit of 40 µg/L). The anomalously high LHSMW38 sample is itself a field duplicate, and the corresponding regular sample was nondetect for antimony (at a reporting limit of 40 µg/L).

The site sample (47WW22) with the higher of the two 2007 antimony detections is characterized by the highest TSS concentration (3,770 mg/L), elevated aluminum (63,000 µg/L), and a decrease in antimony after filtration (the filtered split is nondetect for the element, at a reporting limit of 1 µg/L). These observations suggest that the antimony in this sample is associated with filterable, suspended particulates; and the low Sb/Fe ratio suggests that the antimony has a natural source.

3.3 Arsenic

Arsenic (As) was detected in all seven unfiltered site groundwater samples, at concentrations ranging from 3.05 J to 135 µg/L. As discussed previously, arsenic under natural conditions is present in groundwater primarily as oxyanions and its concentrations are often controlled by adsorption on iron oxides. A positive correlation between arsenic and iron concentrations is expected for uncontaminated samples under oxidizing conditions. However, arsenic exhibits complex behavior in groundwater systems, and it is strongly affected by both pH and redox conditions. Arsenic (as arsenate) is less strongly sorbed to iron oxides as pH increases above 9 (Smedley and Kinniburgh, 2002), but the pH values for the LHAAP-47 samples with detectable arsenic are all below 9. Arsenic will also desorb from iron oxides under reducing conditions, and these reducing conditions may be natural or caused by the degradation of organic contaminants such as fuel hydrocarbons and chlorinated solvents. In addition to these mechanisms, arsenic concentrations can also increase if the element is added to the groundwater system as a primary contaminant – e.g., through the release of arsenic compounds such as arsenical herbicides. Such contamination would be manifested as anomalously high As/Fe ratios relative to the background samples.

A plot of arsenic versus iron in the LHAAP-47 and background samples is provided in **Figure B-6**. Many historical site samples, two background samples, and four 2007 site samples form a common trend with a positive slope. The As/Fe ratios of these four site samples are relatively consistent and similar to those of the background samples. Several samples lie above this trend, including one background sample. The anomalously high As/Fe ratios of these samples suggest that they contain excess arsenic from a contaminant source or that their arsenic concentrations may be elevated due to reductive dissolution.

Another perspective on the data sets is provided by a plot of unfiltered arsenic concentrations versus the corresponding As/Fe ratios (**Figure B-7**). This ratio plot more clearly reveals that two of the 2007 site samples with elevated arsenic concentrations (57.8 J µg/L and 73.9 µg/L in the samples from wells 47WW06 and 47WW13, respectively) also have anomalously high As/Fe ratios relative to background. The elevated arsenic in these samples should be considered suspect (**Table B-1**). Volatile organic compound data are not available for the 2007 site samples. However, VOC data are available for many of the historical site samples. Historical detections of such VOCs as cis-1,2-dichloroethene at well 47WW13 suggest that the arsenic is most likely elevated due to reductive dissolution of naturally occurring iron oxide and manganese oxide minerals, which is a secondary effect of the VOC contamination at that location.

Four 2007 site samples with low arsenic concentrations cluster together near the center of the ratio plot (**Figure B-7**); they have slightly elevated As/Fe ratios relative to background (slightly higher than 0.001), but their arsenic concentrations are less than 4 µg/L and only slightly higher than that of the adjacent background sample. This suggests that any arsenic contamination in these four samples, if present, would not be significant; likewise, any reductive dissolution effects are not significant. The site sample (47WW22) with the highest arsenic concentration (135 µg/L) has a low As/Fe ratio that is nearly identical to the lowest background As/Fe ratio. This sample also has the highest TSS concentration (3,770 mg/L), second-highest aluminum (63,000 µg/L), and lowest filtered/unfiltered arsenic ratio of the 2007 site samples (0.17; see **Figure B-8**). These observations indicate that arsenic in the 47WW22 sample is most likely associated with suspended particulates and that it has a natural source.

3.4 Barium

Barium (Ba) was detected in all seven unfiltered site groundwater samples, at concentrations ranging from 18.6 to 1,040 µg/L. As discussed previously, cationic species such as barium have an affinity to adsorb on the surfaces of suspended clay minerals, and barium concentrations can covary with aluminum concentrations in uncontaminated samples. However, aluminum is nondetect in three of the 2007 site samples, so a plot of barium versus iron is presented instead (**Figure B-9**). Iron was detected in all the 2007 samples, and was previously demonstrated to be present in particulate form (as iron oxides), to varying degrees, depending on the sample.

Most of the historical site samples, most of the background samples, and all of the 2007 site samples form a common trend with a positive slope in **Figure B-9**, indicating consistent Ba/Fe ratios among a large number of the samples. The two 2007 samples with elevated barium also have proportionally higher iron. As seen in the ratio plot (**Figure B-10**), these two samples have Ba/Fe ratios that are similar to or less than those of the background samples. This indicates that these site samples do not contain excess barium from a contaminant source, and that their barium concentrations are most likely natural.

It is worth noting that site sample with the highest unfiltered barium concentration (from well 47WW22; 1,040 µg/L Ba) also has the highest TSS concentration of the 2007 samples (3,770 mg/L), contains elevated aluminum (63,000 µg/L), and exhibited a significant decrease upon filtration (filtered/unfiltered barium ratio of 0.04). These observations provide corroborating evidence that barium in this sample is associated with filterable, suspended particulates. The fact that the sample's Ba/Al ratio (not shown) and Ba/Fe ratio are below their respective maximum background ratios supports the contention that the barium has a natural source.

3.5 Beryllium

Beryllium (Be) was detected in only one of the seven unfiltered site groundwater samples, at a concentration of 5.65 J µg/L. Beryllium has an affinity to adsorb on iron oxides (Vesely, et al., 2002), and thus a positive correlation between beryllium and iron is often observed in uncontaminated samples when adsorption is the dominant process. A plot of beryllium versus iron reveals a common trend with a positive slope for the background and LHAAP-47 samples (**Figure B-11**). Only samples with detectable beryllium can be depicted on the plot. The single 2007 site sample has the highest beryllium concentration, but it also contains proportionally higher iron and lies on the trend established by the other samples.

Another perspective on the data sets is provided in **Figure B-12**, which displays the beryllium concentrations of the site and background samples (y-axis) versus their corresponding Be/Fe ratios (x-axis). If a site sample contained excess beryllium from a contaminant source, then it would exhibit an anomalously high Be/Fe ratio relative to background and would plot to the right of the background samples in **Figure B-12**. However, the samples (including the 2007 samples) exhibit Be/Fe ratios that are within the background range. This suggests a natural source for the site beryllium detections.

3.6 Cadmium

An anomalously high cadmium concentration (200.1 µg/L) was observed in the 1998 sample from well LHSMW57. All seven of the 2007 unfiltered groundwater samples are nondetect for cadmium (most with reporting limits of 5 to 10 µg/L; the unfiltered split from well 47WW22 has a reporting limit of 1,000 µg/L and an estimated [“J”-qualified] cadmium concentration of 5.07 µg/L in the associated filtered split). These observations suggest that cadmium contamination is not present at the recently sampled locations.

3.7 Chromium

Chromium (Cr) was detected in all seven unfiltered site groundwater samples, at concentrations ranging from 65.2 to 356,000 µg/L. Chromium can be present in solution as Cr(VI) species under strongly oxidizing conditions or as Cr(III) species under oxidizing to reducing conditions (Brookins, 1988). Naturally occurring Cr(VI) species have been observed but are not common; therefore, the identification of Cr(VI) is generally considered to be an indicator of contamination. Chromium (VI) species are highly soluble and do not strongly adsorb, so they are not associated with suspended particulates. In contrast, Cr (III) species have low solubilities and strongly adsorb, so they usually are associated with suspended particulates. The degree of association with suspended particulates can thus be used to determine if the detected concentrations are natural or have a contaminant source. As noted in **Section 2.0**, chromium can adsorb on suspended clays or iron oxides, depending on pH. If a sample contains suspended clays or iron oxides, then it is expected to contain detectable concentrations of aluminum or iron and associated trace elements such as chromium.

Chromium and iron are components of the stainless steel used to construct the LHAAP-47 monitoring wells. Iron released from the corrosion of steel will form insoluble oxides (rust) in an oxidizing environment, and will locally contribute suspended oxide particulates to groundwater in the vicinity of the well. Chromium released from the corrosion of the steel will be in the insoluble trivalent state, and will tend to remain with the iron oxide particles. Filtered/unfiltered chromium ratios below 1 would therefore be expected, as would a positive correlation between chromium and iron concentrations (although the Cr/Fe ratios may differ from those of samples from unaffected groundwater).

The background samples and most of the LHAAP-47 samples form a common trend with a positive slope in a plot of chromium versus iron (**Figure B-13**). Covariance between chromium and iron concentrations is often observed for uncontaminated samples under natural conditions, although it can also be observed in samples from groundwater impacted by corrosion of stainless steel, as discussed above. Some of the historical site samples and one 2007 site sample have Cr/Fe ratios that are consistent with background (**Figure B-14**). However, several site samples have elevated Cr/Fe ratios relative to background, and the elevated chromium in these samples should be considered suspect.

Chromium concentrations in all of the 2007 site samples decreased upon filtration, as seen in the plot of unfiltered chromium versus filtered/unfiltered ratios (**Figure B-15**). Four samples cannot be depicted in the plot because their filtered splits are nondetect for chromium (at a reporting limit of 20 µg/L). In addition, the samples with elevated chromium also have high TSS concentrations (**Figure B-16**). The significant decrease in chromium concentrations upon filtration and the positive correlation with TSS concentrations suggest that chromium in the site samples is associated with filterable, suspended particulates, such as iron oxides.

Evaluation of the LHAAP-47 data suggests localized chromium contamination from well construction, but not necessarily site-related contamination from historical LHAAP activities. The nickel evaluation (below) provides more details on the corrosion of stainless steel in contact with groundwater, and the geochemical factors that affect it. **Table 1** identifies the six 2007 samples that exhibit anomalously high chromium relative to background.

3.8 Lead

Lead (Pb) was detected in five of the seven unfiltered site groundwater samples, at concentrations ranging from 0.275 J to 45.4 µg/L. As discussed in **Section 2.0**, cationic species such as lead have an affinity to adsorb on the surfaces of suspended clay minerals, which tend to maintain a net negative surface charge. Lead also has an affinity to adsorb on the surfaces of iron oxides. Adsorption of Pb2+ on iron oxides is pH-dependent: very little adsorption occurs at low pH (below approximately pH of 4), but adsorption increases to nearly 100 percent as pH approaches 5 (Drever, 1997). If an uncontaminated sample contains a high proportion of suspended minerals such as clays and iron oxides, then it is expected to contain naturally high concentrations of aluminum, iron, and associated trace elements such as lead. The field readings for the LHAAP-47 samples with detectable lead indicate pH of 5.78 to 6.99. As discussed previously, the site aluminum and iron detections reflect the presence of suspended particulates in most of the site samples. Given these observations, the lead concentrations in these samples are expected to be controlled primarily by adsorption on suspended particulates.

A plot of lead versus iron reveals a common trend with a positive slope for the 2007 site samples, intermediate-zone background samples, and the majority of historical site samples (**Figure B-17**). The 2007 site samples with the highest lead concentrations also have proportionally higher iron content. All of the 2007 site samples have Pb/Fe ratios that are similar to or less than those of the background samples (**Figure B-18**), which suggests that they do not contain excess lead from a contaminant source. Two samples with filtered/unfiltered ratios greater than 1 have low, J-qualified lead concentrations in their filtered and/or unfiltered splits; the analytical uncertainty associated with these estimated concentrations contributes to their high filtered/unfiltered ratios. The samples with elevated lead had filtered/unfiltered ratios below 1 (**Figure B-19**) and high TSS concentrations (**Figure B-20**). These observations suggest that some proportion of lead in the samples is associated with filterable, suspended particulates. The filtered/unfiltered ratios were evaluated. The similar Pb/Fe ratios of the 2007 site samples and background samples suggest a natural source for the recent site lead detections.

3.9 Manganese

Manganese (Mn) was detected in all seven unfiltered site groundwater samples, at concentrations ranging from 95.6 J to 3,280 µg/L. Manganese usually displays complex behavior in natural systems because of three possible valence states (+2, +3, and +4), each with different solubilities and sorptive properties (Hem, 1985). Manganese, like iron, is soluble under reducing conditions but has very low solubilities under oxidizing conditions. However, the critical redox potential for dissolution of manganese oxides is higher than that of iron oxides. Dissolved manganese concentrations are therefore a more sensitive indicator of local redox depressions than dissolved iron concentrations. Reducing conditions can be natural, or they can be induced by the microbial degradation of chlorinated solvents and fuels (**Section 2.0**).

A plot of manganese versus iron in the LHAAP-47 and background samples is provided in **Figure B-21**. Many the historical site samples, all of the intermediate-zone background samples, a few shallow-zone background samples, and most of the 2007 site samples exhibit similar Mn/Fe ratios in the plots. Several historical site samples, the majority of shallow-zone background samples, and one 2007 site sample lie above the trend established by the other samples in **Figure B-21**, and they exhibit a higher degree of scatter. The higher Mn/Fe ratios of these samples most likely indicate slightly lower redox conditions than are present at the other sampling locations with lower Mn/Fe ratios.

The filtered/unfiltered ratios for manganese in most of the site samples are close to 1 (**Figure B-22**), which indicates that the element is primarily in solution in these samples. However, a low filtered/unfiltered ratio (0.08) is observed for the site sample with the lowest unfiltered manganese concentration (95.6 J µg/L). This low ratio indicates that some portion of the manganese in the sample is associated with suspended particulates, which may reflect slightly higher redox conditions at that sampling location. A plot of unfiltered manganese versus TSS concentrations is provided in **Figure B-23**. The covariance between manganese and TSS for most samples suggests that some proportion of the manganese may be associated with particulates small enough to pass through the filter pores.

All of the Mn/Fe ratios of the LHAAP-47 samples are consistent with those of the background samples, which indicates that the site samples do not contain excess manganese from a contaminant source. This also suggests that any VOC-induced reductive dissolution, if present, is not a significant control on the manganese concentrations. Manganese detected in the site samples is most likely natural.

3.10 Nickel

Nickel (Ni) was detected in five of the seven unfiltered site groundwater samples, at concentrations ranging from 34.6 J to 17,500 µg/L. Under natural conditions, nickel is commonly present as the divalent cation (Ni2+) at pH values below about 8 (Brookins, 1988). As discussed in **Section 2.0**, cationic species have an affinity to adsorb on the surfaces of suspended clay minerals, which tend to maintain a net negative surface charge. If an uncontaminated sample contains a high proportion of suspended clay minerals, then it is expected to contain naturally high concentrations of aluminum and proportionally higher concentrations of associated trace elements such as nickel. Additionally, if nickel is adsorbed on suspended particulates, it would be expected to exhibit low filtered/unfiltered ratios and its unfiltered concentrations should covary with TSS concentrations.

A plot of nickel versus aluminum in the LHAAP-47 and background data sets is provided in **Figure B-24**. Although a common trend with a positive slope is observed for some of the background and historical site samples, there are many samples that lie above this trend (giving the appearance of multiple, parallel trends). The samples that lie above the background samples in **Figure B-24** lie to the right of the background samples in the ratio plot (**Figure B-25**), indicating higher Ni/Al ratios. Of the samples depicted in the ratio plot, two 2007 samples and several historical site samples have Ni/Al ratios that exceed the background ratio range. Only samples with both detectable nickel and detectable aluminum can be depicted on the correlation plot and ratio plot. Samples not shown in **Figure B-24** and **Figure B-25** include one 2007 site sample (from well 47WW19) with detectable nickel (48.4 µg/L) and nondetectable aluminum (<100 µg/L), as well as several historical samples with detectable nickel and nondetectable aluminum. The 47WW19 sample has a Ni/Fe ratio that is consistent with those of the background samples, indicating a natural source for its nickel concentration.

The nickel concentrations in most of the 2007 site samples did not decrease significantly upon filtration, as seen in the plot of unfiltered nickel versus filtered/unfiltered ratios (**Figure B-26**). Four samples have filtered/unfiltered ratios close to 1, which indicates that most of the detected nickel in these samples is in solution (although some proportion may be associated with particulates small enough to pass through the filter pores).

A plot of nickel versus chromium in the unfiltered samples is provided in **Figure B-27**. This plot reveals that the samples with high nickel also have high chromium, which suggests that nickel and chromium are co-contaminants at the site. This is expected, as nickel and chromium are components of the stainless steel used to construct the monitoring wells.

Type 304 stainless steel is a commonly used alloy for well screens and risers. This alloy contains 18 percent chromium and 8 percent nickel. All steel alloys are susceptible to several types of corrosion when in contact with groundwater. Pitting corrosion starts with the oxidation and dissolution of a small area of exposed metal, which initiates the formation of a pit. Subsequent pit growth is aided by electrochemical reactions. Metal inside of the pit acts as an anode, while the remaining metal surface in contact with the bulk electrolyte (groundwater) acts as a cathode. The establishment of this electrochemical cell drives the pit growth forward. Factors that affect the initiation of pitting include the extent of heat treatment, surface roughness, internal stresses, and local impurities, as well as time, temperature, and groundwater composition (Oakley and Korte, 1996). The diversity of these factors may explain why screens and casings of the same compositions at LHAAP may display different corrosion behavior at different wells.

The corrosion of some metal alloys is self-limited by the formation of a "passivating layer," which is a thin film of metal oxide adhering to the surface of the alloy. The rate-limiting step for corrosion under these conditions is the diffusion of oxidants across the passivating layer, and this process can be slow. However, the presence of natural metal complexing agents such as chloride, and to a lesser extent, fluoride and sulfate, can dissolve the passivating layer and expose fresh metal surfaces.

The susceptibility of stainless-steel alloys to corrosion in natural water compositions was investigated by Kain, et al. (1984). Test results showed that chloride concentrations as low as 100,000 µg/L could accelerate crevice corrosion in Type 304 stainless steel. Elevated chloride concentrations were observed in the historical LHAAP-47 samples (5,000 to 1,77,300 µg/L; mean of 361,000 µg/L) and shallow background samples (2,070 to 1,930,000 µg/L; mean of 974,000 µg/L). These concentrations are relatively high and approach those observed in groundwaters impacted by oil-field brines or saltwater intrusion. The high chloride concentrations in LHAAP-47 groundwater thus permit continued corrosion of the stainless steel well materials and continued release of iron, nickel and chromium to groundwater.

Iron released from the corrosion of steel will form insoluble oxides (rust) in an oxidizing environment, and will locally contribute suspended oxide particulates to groundwater in the vicinity of the well. Chromium released from the corrosion of the steel will be in the insoluble trivalent state, and will tend to remain with the iron oxide particles. Nickel released from the corrosion of the casings and screens is more soluble than iron or chromium, and will tend to dissolve in the groundwater.

Evaluation of the LHAAP-47 data suggests localized nickel contamination from well construction, but not necessarily site-related contamination from historical LHAAP activities. **Table B-1** lists the two 2007 samples that exhibit anomalously high Ni/Al ratios relative to background.

3.11 Silver

Anomalously high silver concentrations were observed in twelve historical samples from wells 47WW13, 47WW18, LHSMW28, -31, -43, -45, -46, -47, -48, -51, -53, and -55. These concentrations ranged from 7 J to 1,000 µg/L, with a mean of 134 µg/L. However, all of the 2007 site samples are nondetect for silver in both the unfiltered and filtered splits (most at a reporting limit of 10 µg/L; the exception is the unfiltered split from well 47WW22, which has a reporting limit of 1,000 µg/L). These observations suggest that silver contamination is not present at the recently sampled locations, including well 47WW13 (which had 40 µg/L in the November 1998 sample, versus <10 µg/L in the November 2007 sample).

3.12 Thallium

Thallium (Tl) was detected in five of the seven unfiltered site groundwater samples, at concentrations ranging from 0.0568 J to 4.21 J µg/L. All of the background samples are nondetect for thallium; however, the background reporting limit of 20 µg/L and background method detection limit of 10 µg/L are higher than those of the 2007 site samples (reporting limits of 0.2 to 2 µg/L; note that most of the historical site samples with detectable thallium have a reporting limit of 1 µg/L). The large difference in site versus background detection limits precludes proper comparison of the site and background thallium concentrations. It is worth noting that all of the 2007 site detections are below the background method detection limit.

Thallium can occur in three oxidation states (+1, +2, and +3), and it is known to adsorb on iron oxides and manganese oxides (Kabata-Pendias, 2001). A plot of thallium versus iron is provided in **Figure B-28**. Only samples with detectable thallium and iron can be depicted, so only the 2007 site samples and a subset of historical site samples are shown. One historical site sample (93 µg/L Tl) lies well above the other samples in **Figure B-28**. The anomalously high Tl/Fe ratio of this sample suggests contamination (**Figure B-29**). The Tl/Fe ratios of the 2007 samples, however, are much lower and consistent with those of the other samples, suggesting a natural source. A correlation is not observed for the 2007 site samples partly because their thallium detections are estimated (J-qualified) and therefore uncertain. In addition, some portion of the thallium in is in solution in these samples, as evidenced by their filtered/unfiltered ratios of 0.14 to 1.5 (mean of 0.87) shown in **Figure B-30**.

4.0 Summary

A geochemical evaluation was performed to determine if aluminum, antimony, arsenic, barium, beryllium, cadmium, chromium, lead, manganese, nickel, silver, and thallium concentrations in the September-November 2007 LHAAP-47 groundwater samples represent potential contamination or have a natural source. The evaluation indicated that all detected concentrations of aluminum, antimony, barium, beryllium, lead, manganese, and thallium in the seven site samples are most likely natural. Anomalously high arsenic concentrations are present in the samples from wells 47WW06 and 47WW13. Arsenic is most likely elevated at 47WW13 due to reductive dissolution of naturally occurring iron oxide and manganese oxide minerals, which is a secondary effect of the VOC contamination at that location. Anomalously high concentrations of chromium and nickel are present in six samples and two samples, respectively; they most likely represent localized contamination from the stainless-steel monitoring wells, as opposed to contamination from historical site operations. **Table B-1** lists the samples with anomalously high element concentrations. Cadmium and silver were not detected in all seven samples, which indicates that these two infrequently detected elements are not contaminants at the sampled locations.

5.0 References

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Tables

Table B-1
2007 Groundwater Samples with Anomalous Element Concentrations
LHAAP-47
Longhorn Army Ammunition Plant, Karnack, Texas

Well	Sample	Date	Purpose	Element(s)
47WW06	47WW06-091307	13-Sep-07	REG	Arsenic
47WW07	47WW07-091307	13-Sep-07	REG	Chromium, Nickel
47WW09	47WW09-113007	30-Nov-07	REG	Chromium
47WW09	47WW09-113007-QA	30-Nov-07	FD	Chromium
47WW13	47WW13-113007	30-Nov-07	REG	Arsenic, Chromium
47WW19	47WW19-113007	30-Nov-07	REG	Chromium
47WW22	47WW22-113007	29-Nov-07	REG	Chromium, Nickel

Note: aluminum, antimony, arsenic, barium, beryllium, cadmium, chromium, lead, manganese, nickel silver, and thallium were evaluated.

FD - Field duplicate.

REG - Regular environmental sample.

Figures

Figure B-1
Aluminum vs. Iron in Unfiltered Groundwater
LHAAP-47

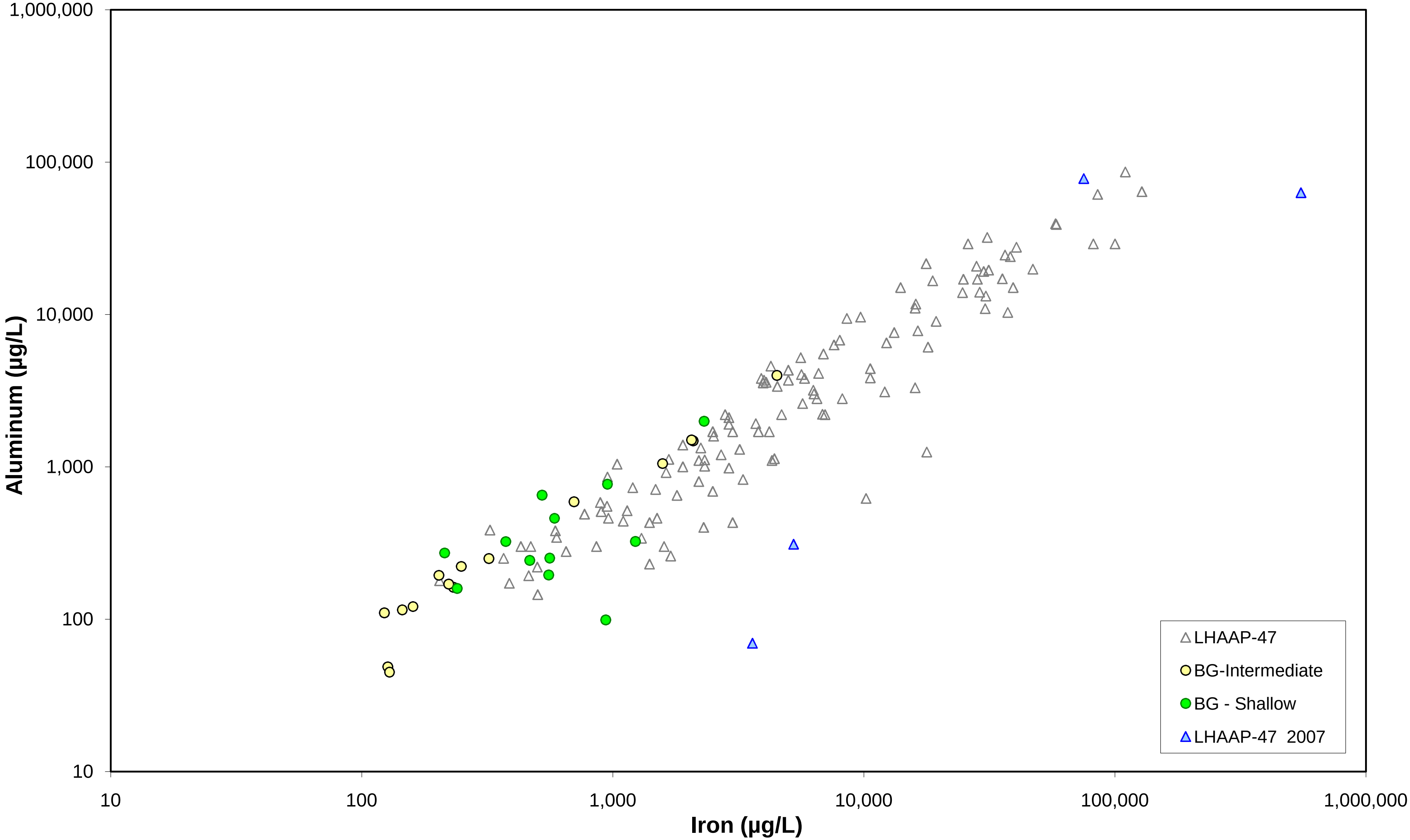


Figure B-2
Aluminum vs. Al/Fe Ratio in Unfiltered Groundwater
LHAAP-47

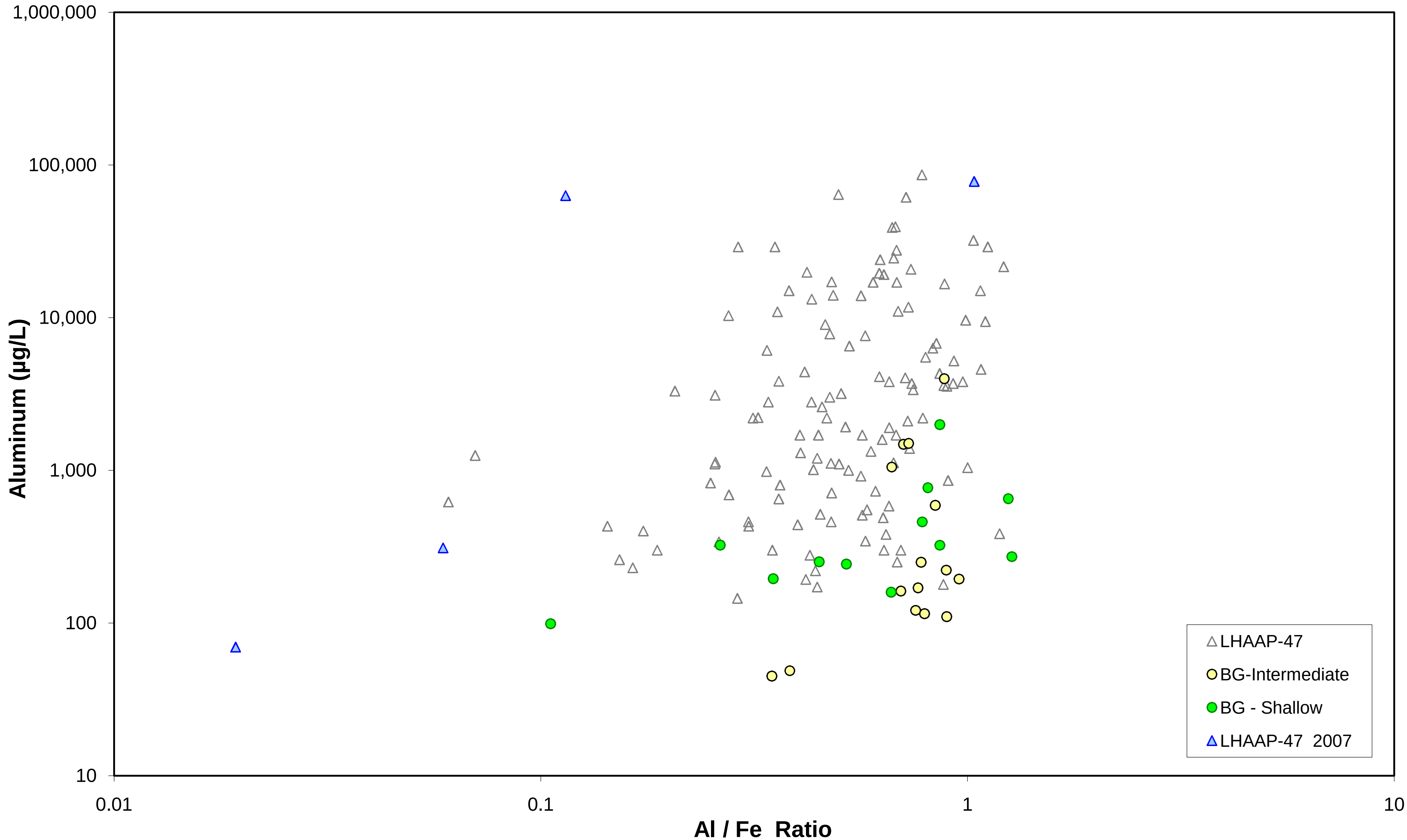


Figure B-3
Unfiltered Aluminum vs. Total Suspended Solids
LHAAP-47

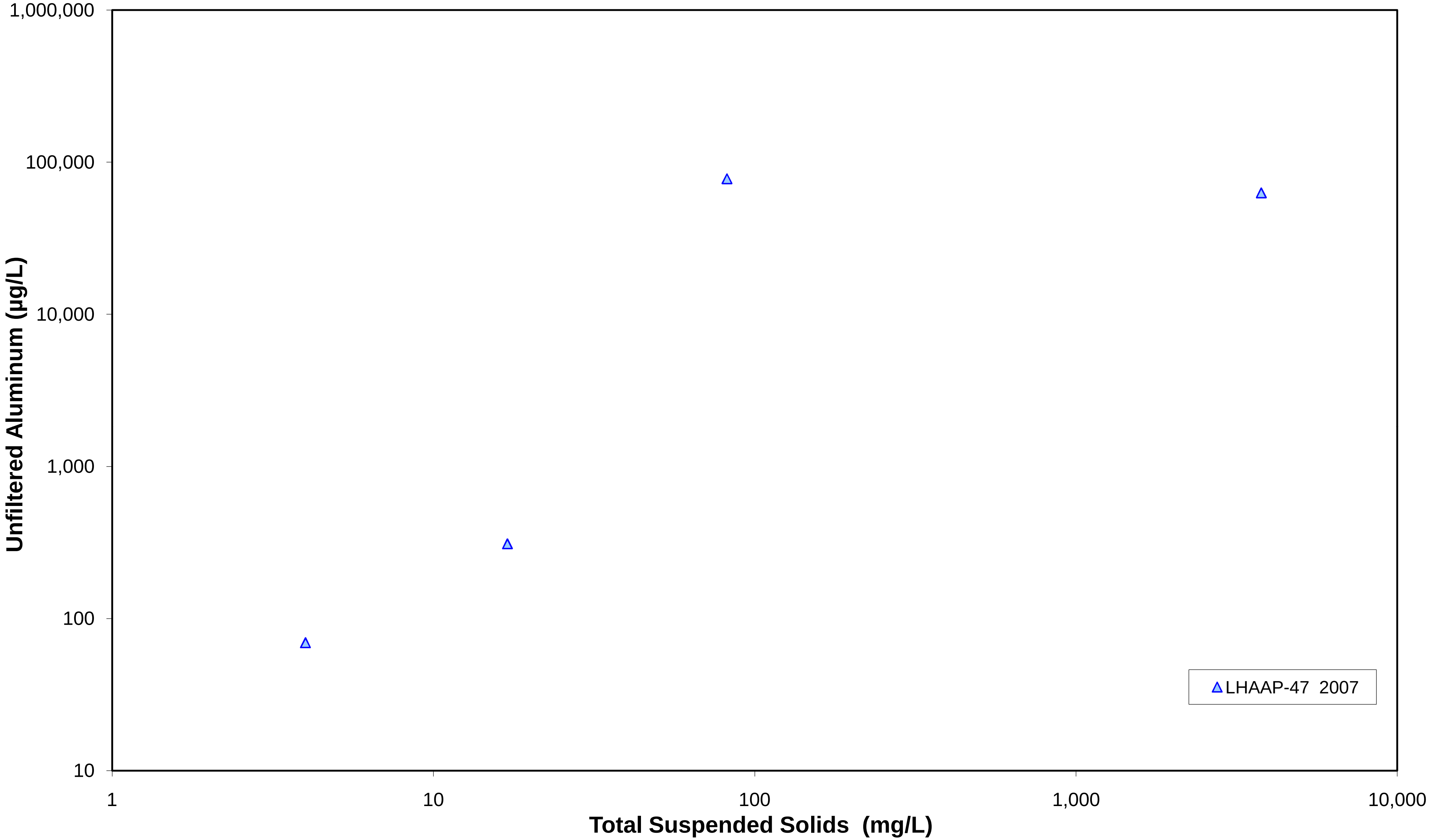


Figure B-4
Antimony vs. Iron in Unfiltered Groundwater
LHAAP-47

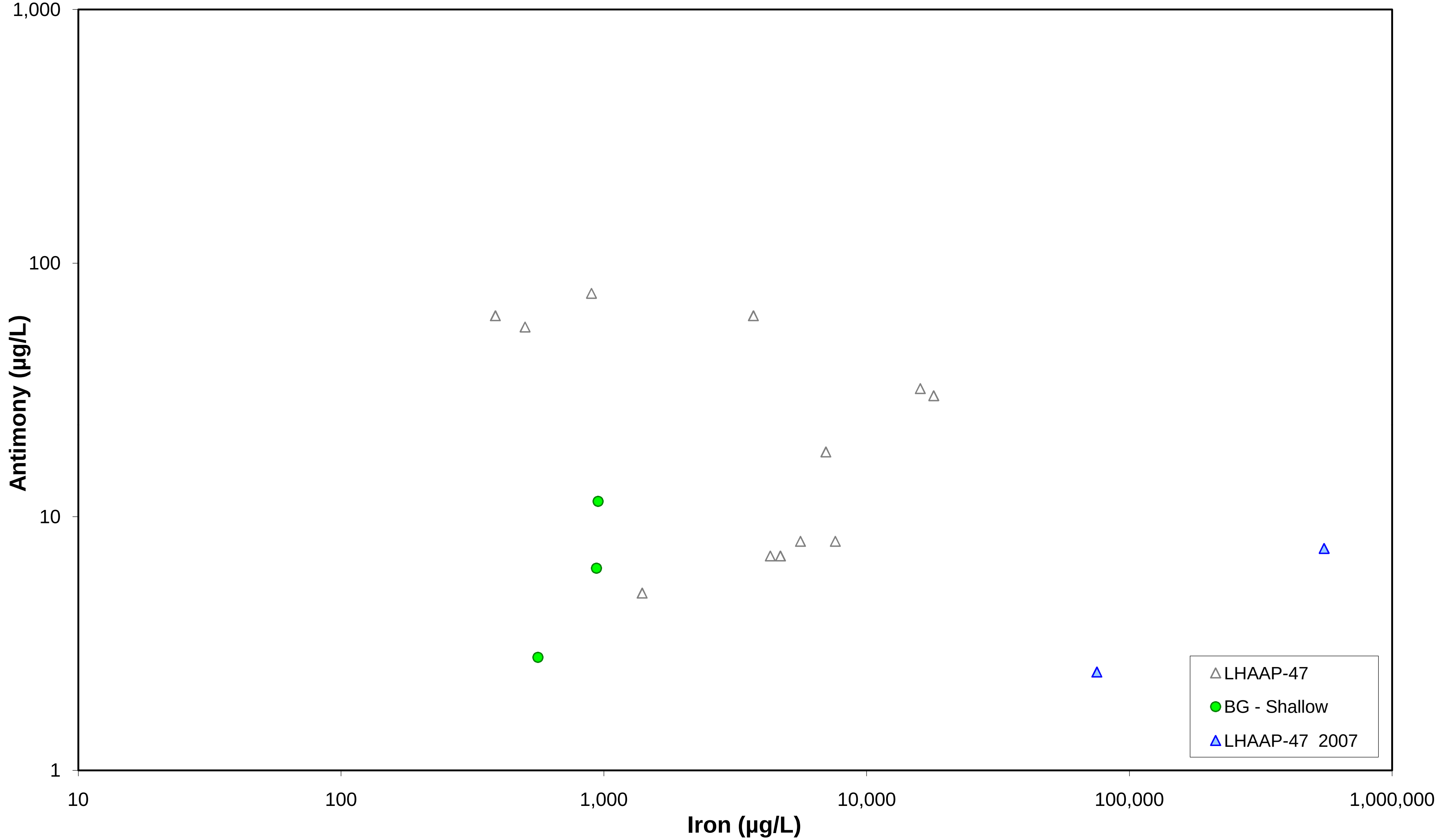


Figure B-5
Antimony vs. Sb/Fe Ratio in Unfiltered Groundwater
LHAAP-47

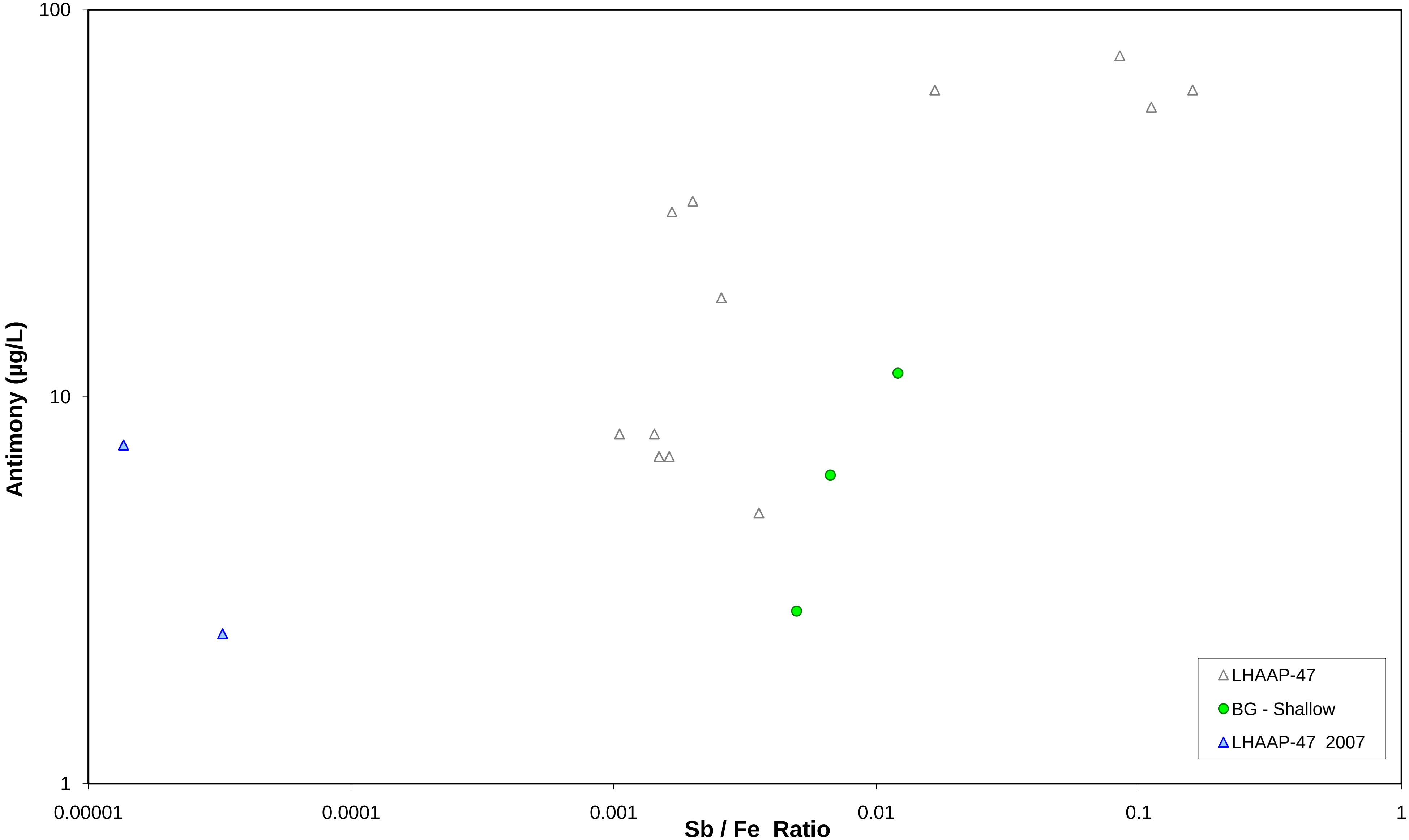


Figure B-6
Arsenic vs. Iron in Unfiltered Groundwater
LHAAP-47

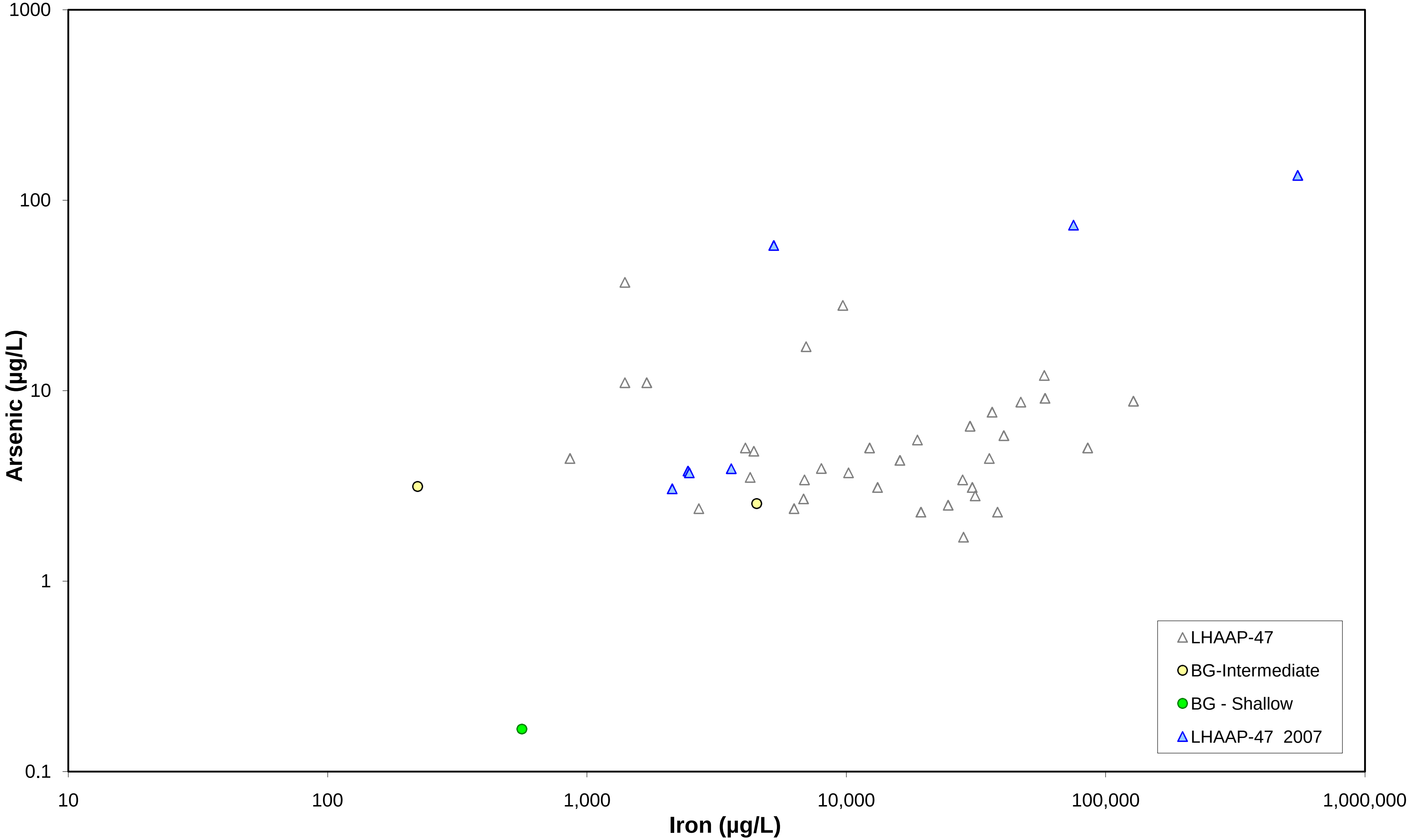


Figure B-7
Arsenic vs. As/Fe Ratio in Unfiltered Groundwater
LHAAP-47

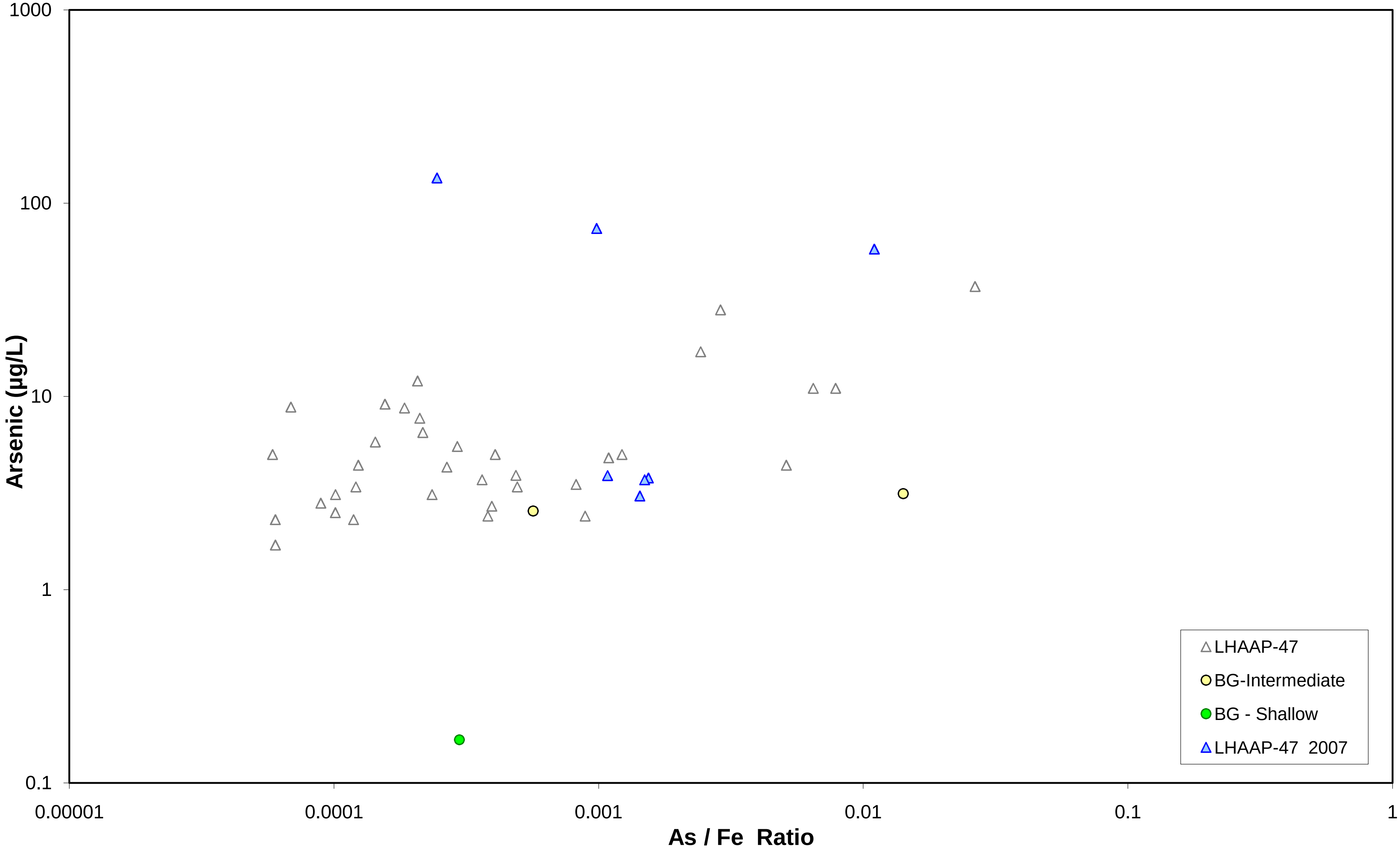


Figure B-8
Unfiltered Arsenic vs. Total Suspended Solids
LHAAP-47

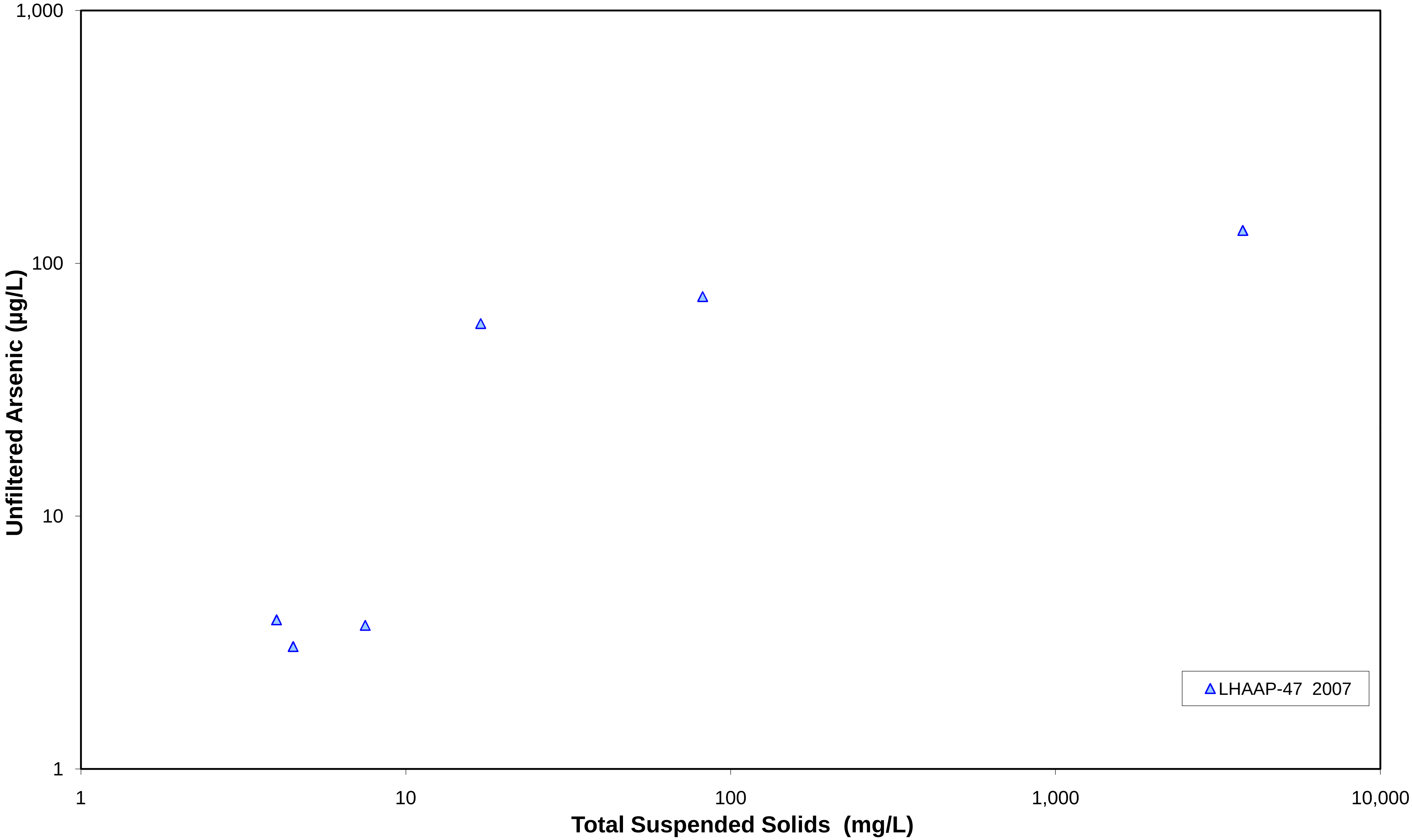


Figure B-9
Barium vs. Iron in Unfiltered Groundwater
LHAAP-47

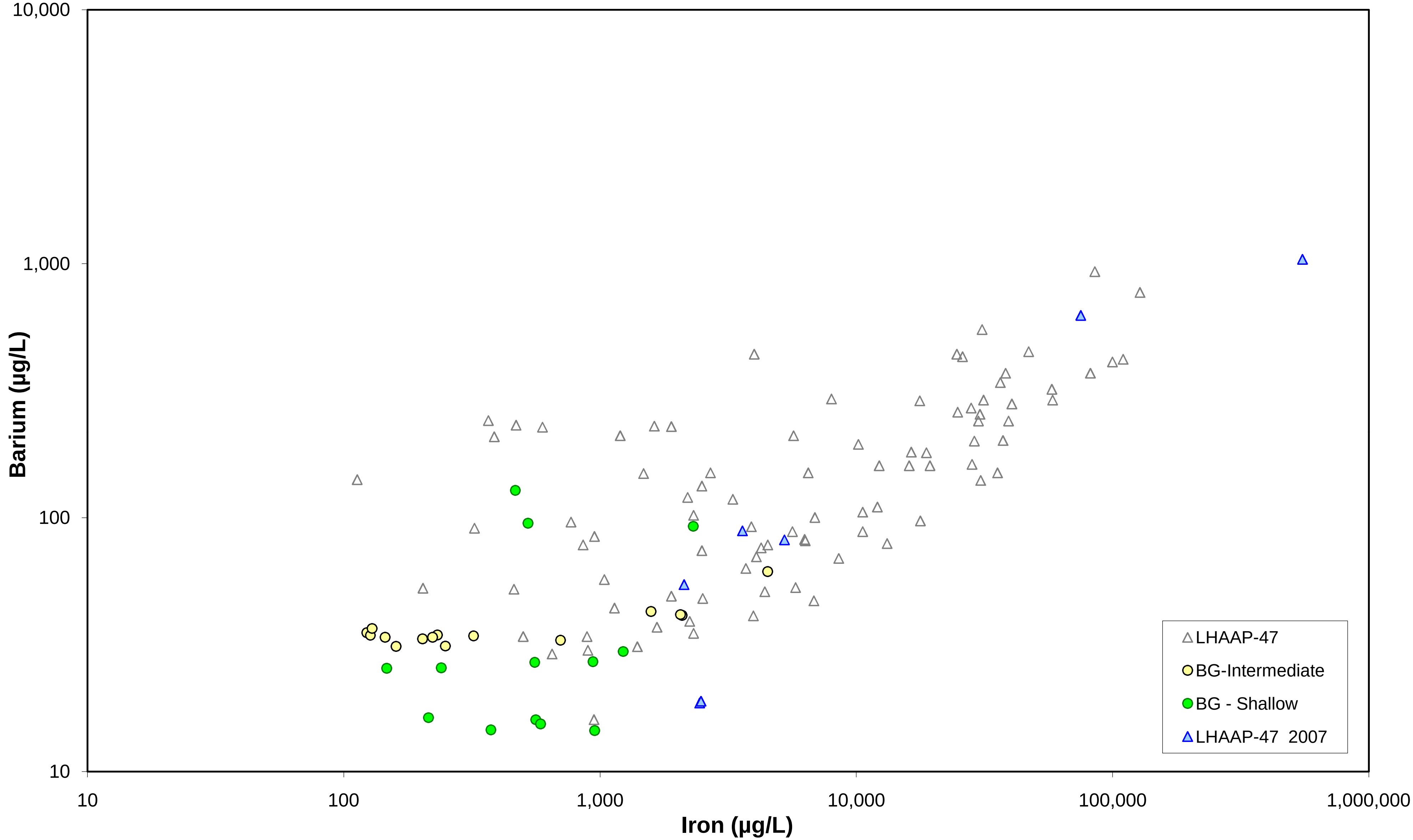


Figure B-10
Barium vs. Ba/Fe Ratio in Unfiltered Groundwater
LHAAP-47

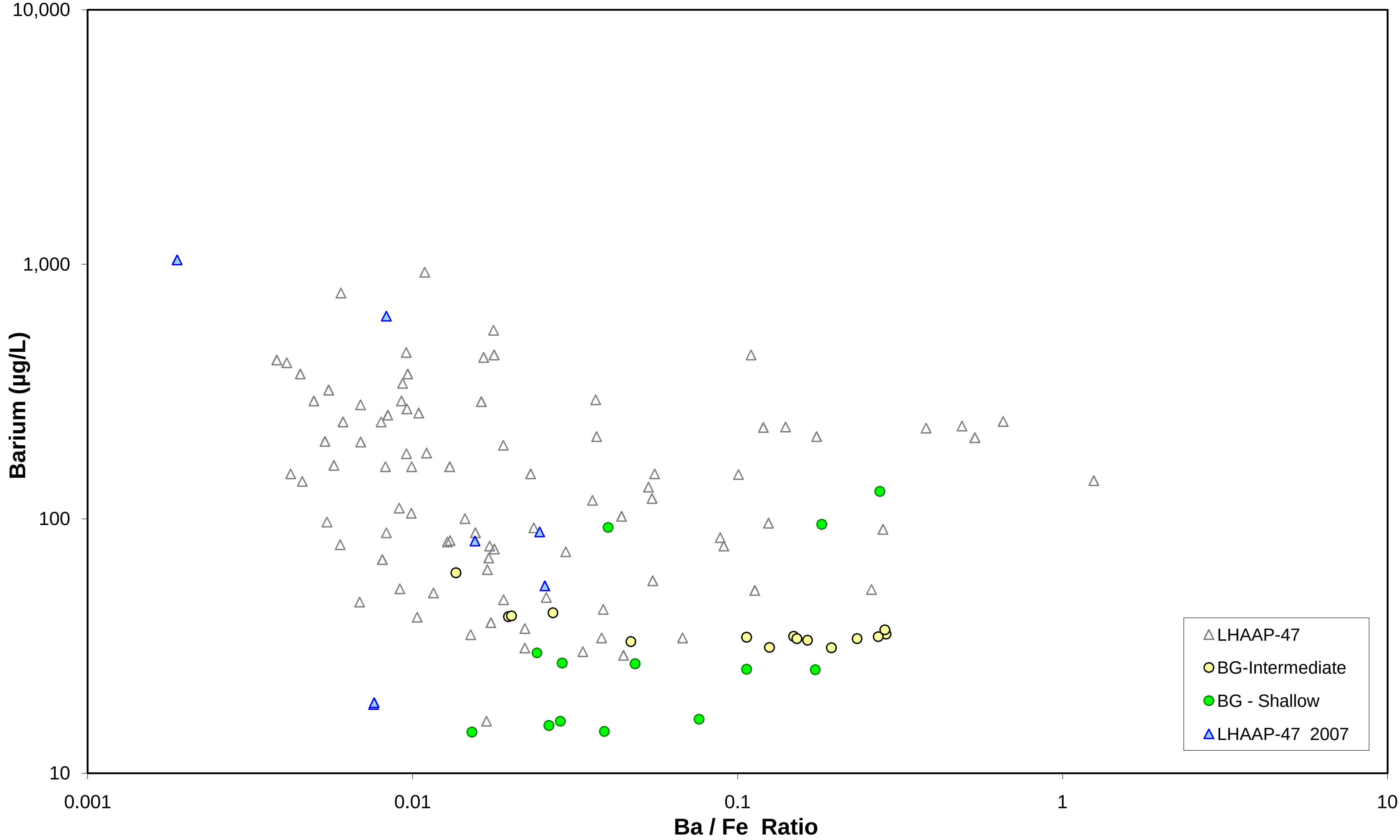


Figure B-11
Beryllium vs. Iron in Unfiltered Groundwater
LHAAP-47

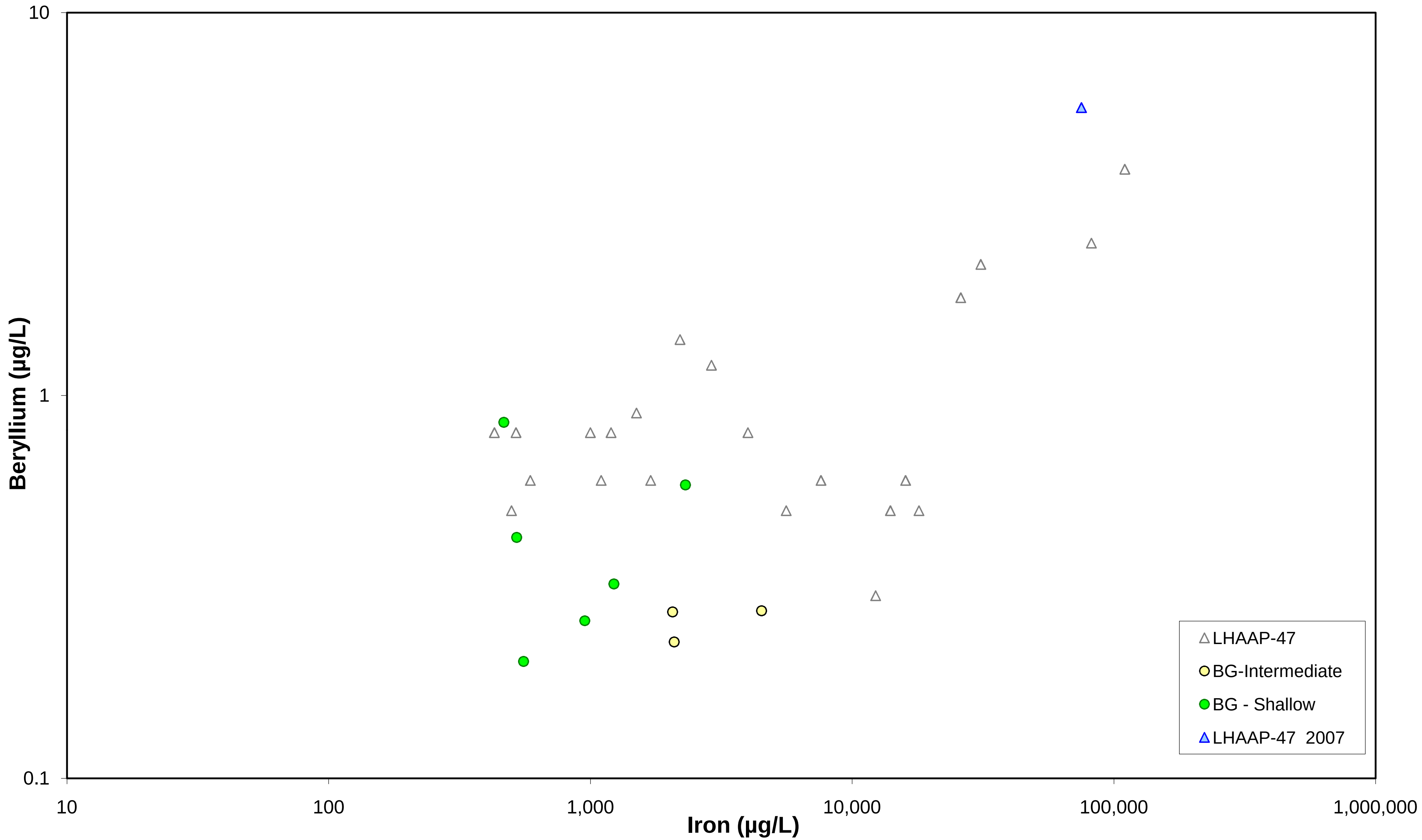


Figure B-12
Beryllium vs. Be/Fe Ratio in Unfiltered Groundwater
LHAAP-47

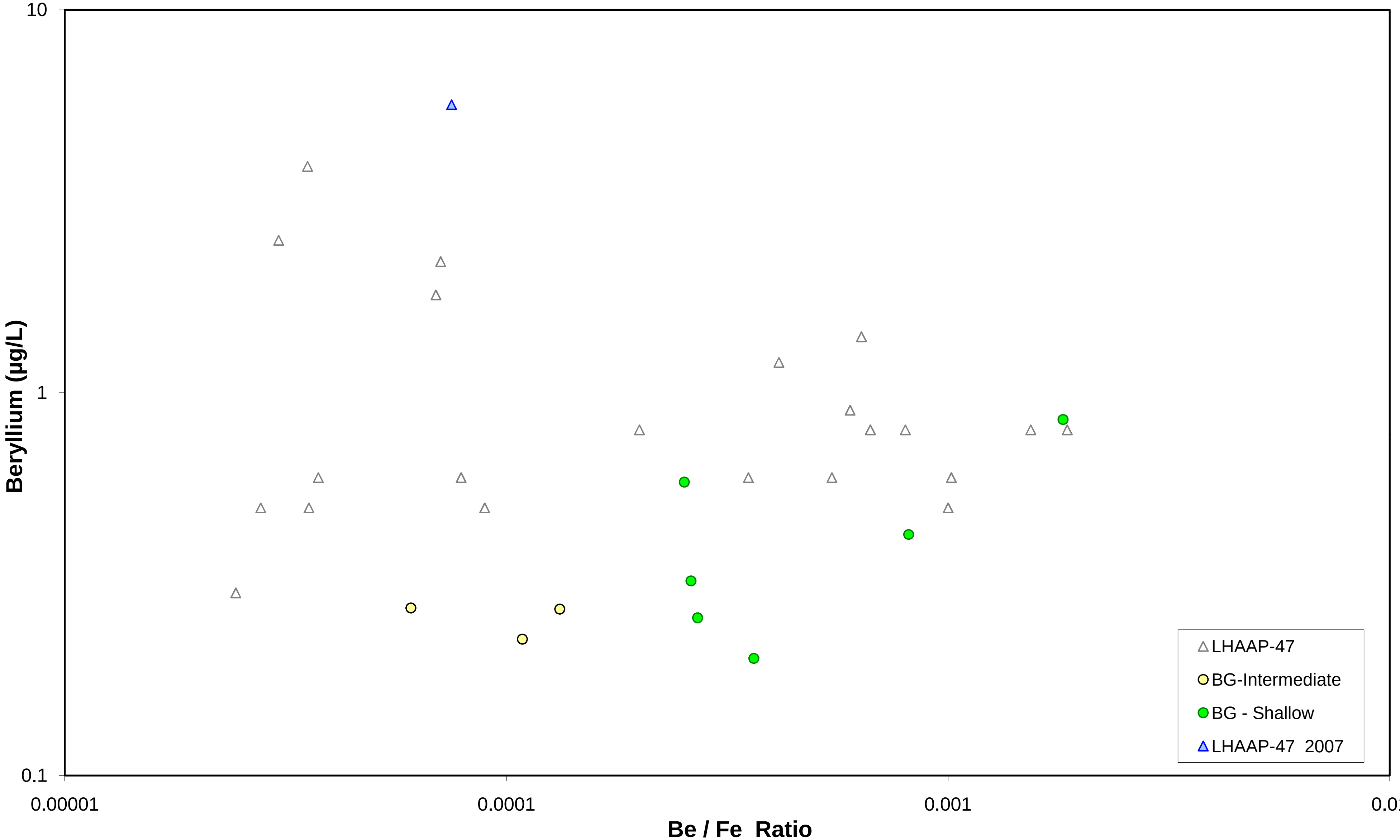


Figure B-13
Chromium vs. Iron in Unfiltered Groundwater
LHAAP-47

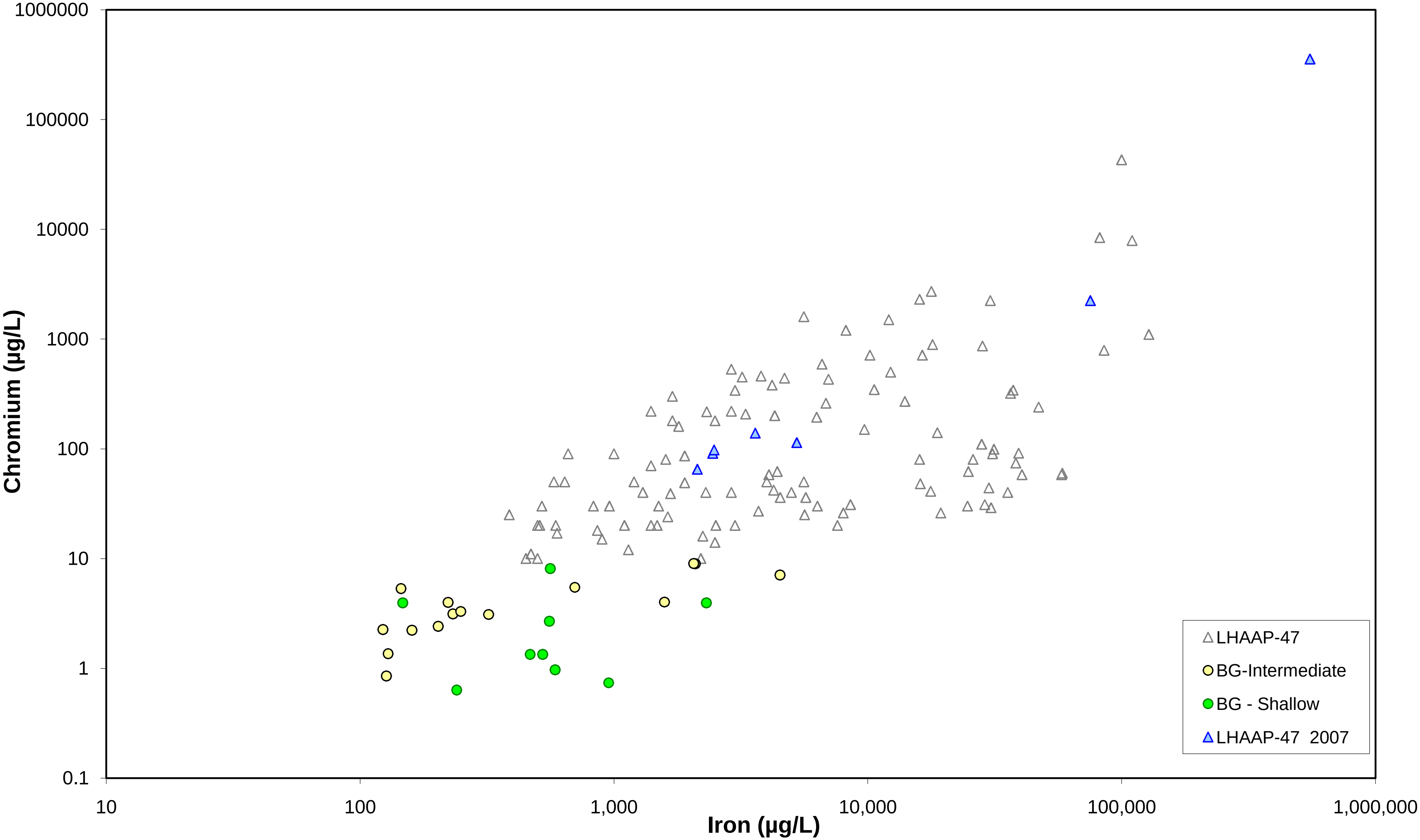


Figure B-14
Chromium vs. Cr/Fe Ratio in Unfiltered Groundwater
LHAAP-47

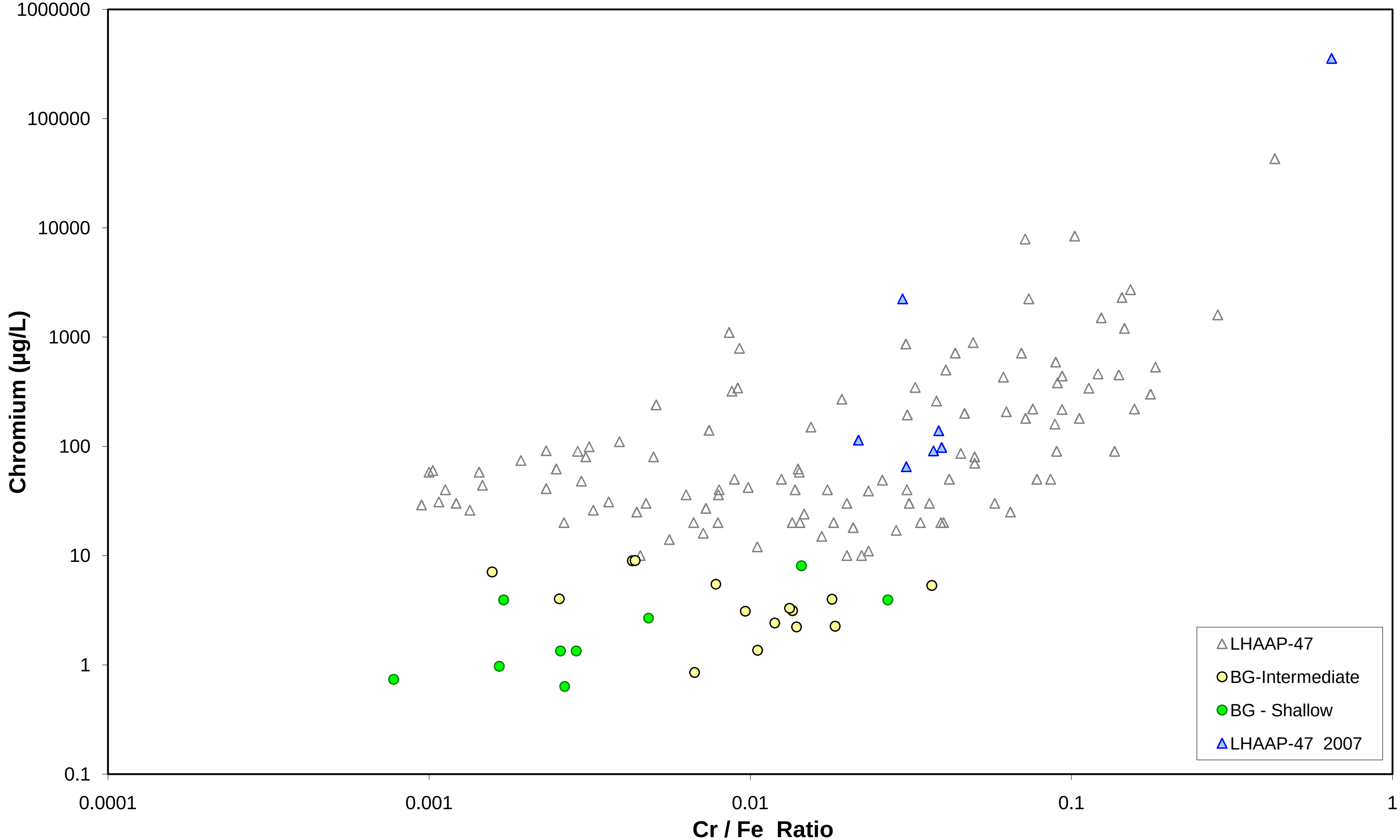


Figure B-15
Filtered Chromium vs. Filtered/Unfiltered Chromium Ratio
LHAAP-47

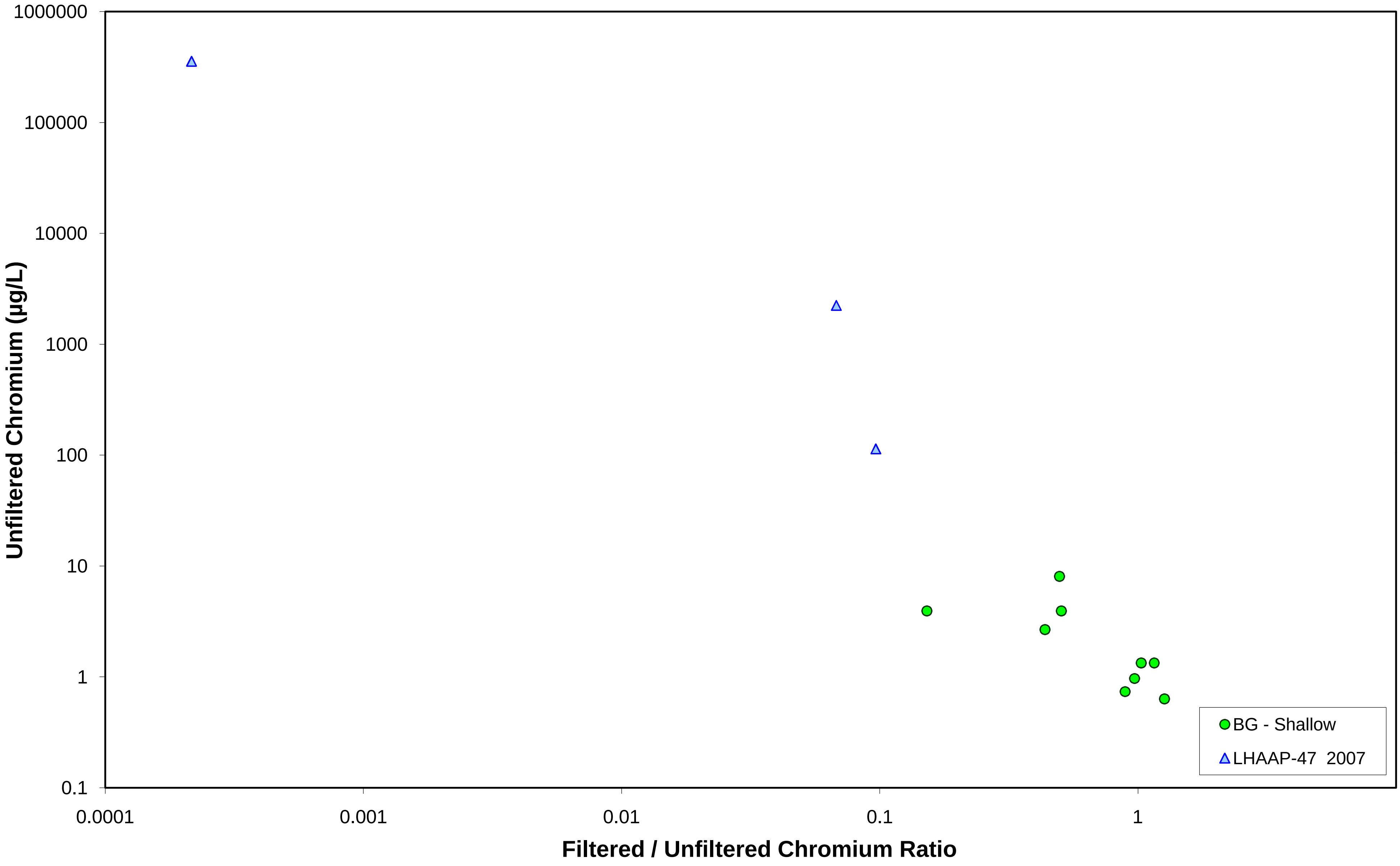


Figure B-16
Unfiltered Chromium vs. Total Suspended Solids
LHAAP-47

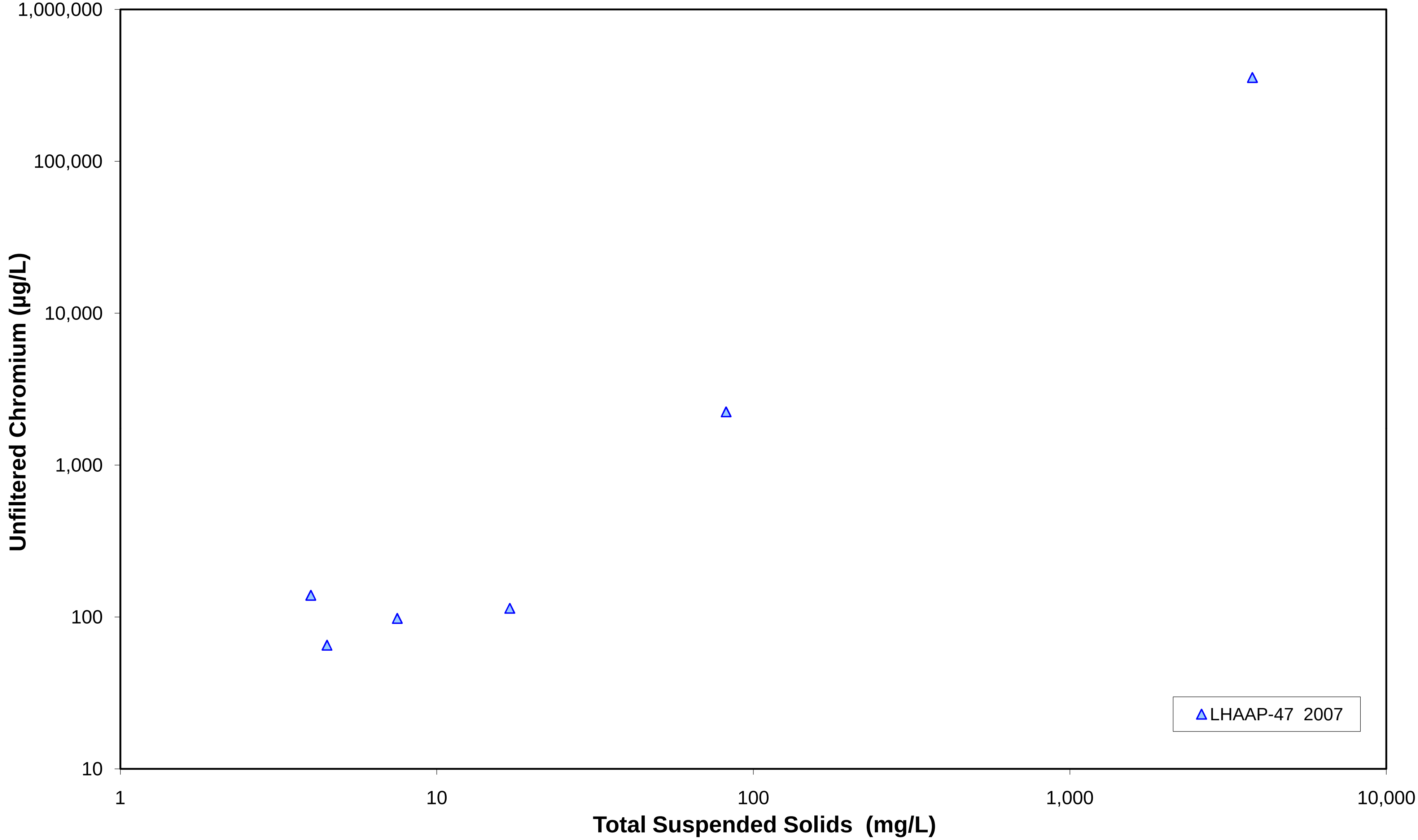


Figure B-17
Lead vs. Iron in Unfiltered Groundwater
LHAAP-47

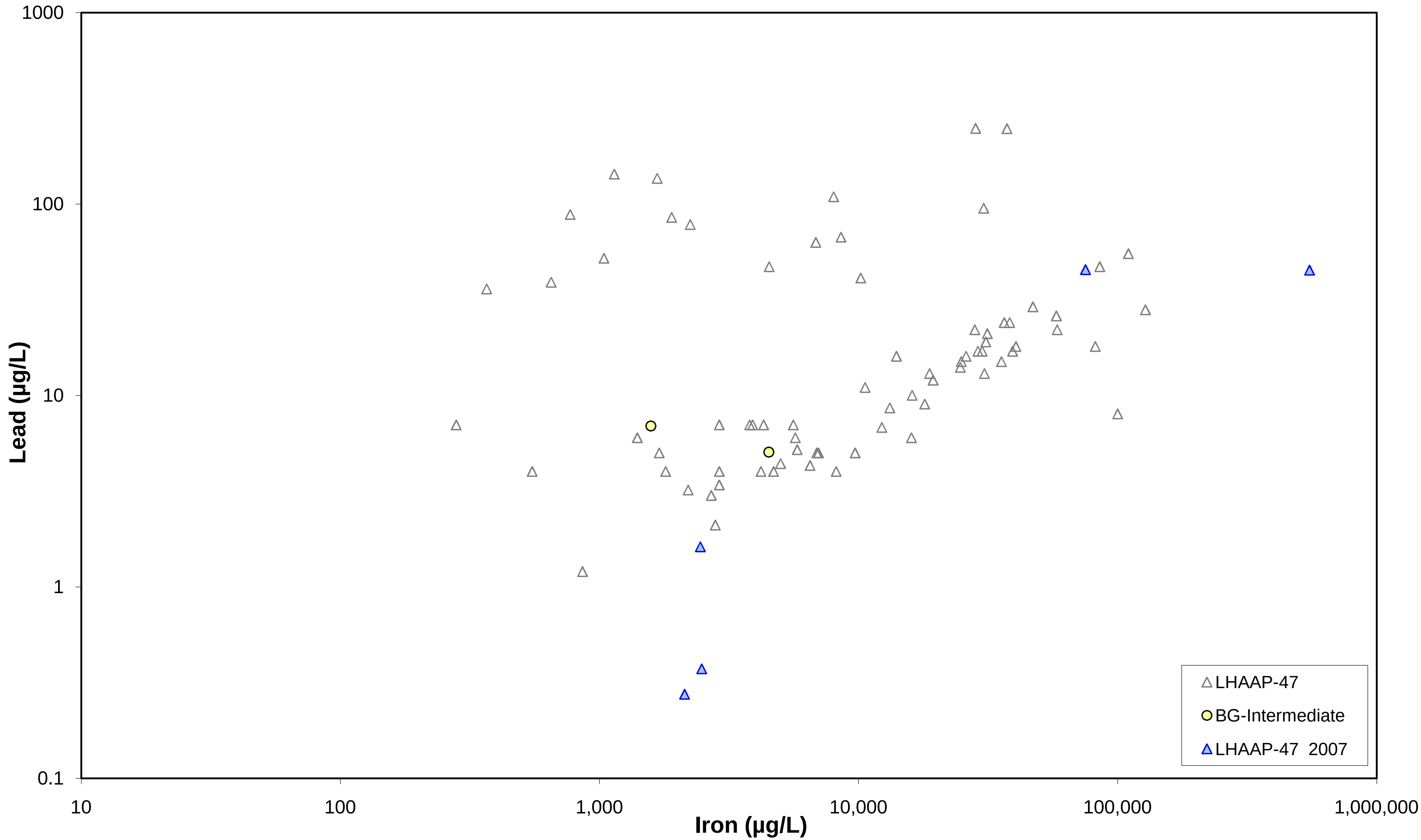


Figure B-18
Lead vs. Pb/Fe Ratio in Unfiltered Groundwater
LHAAP-47

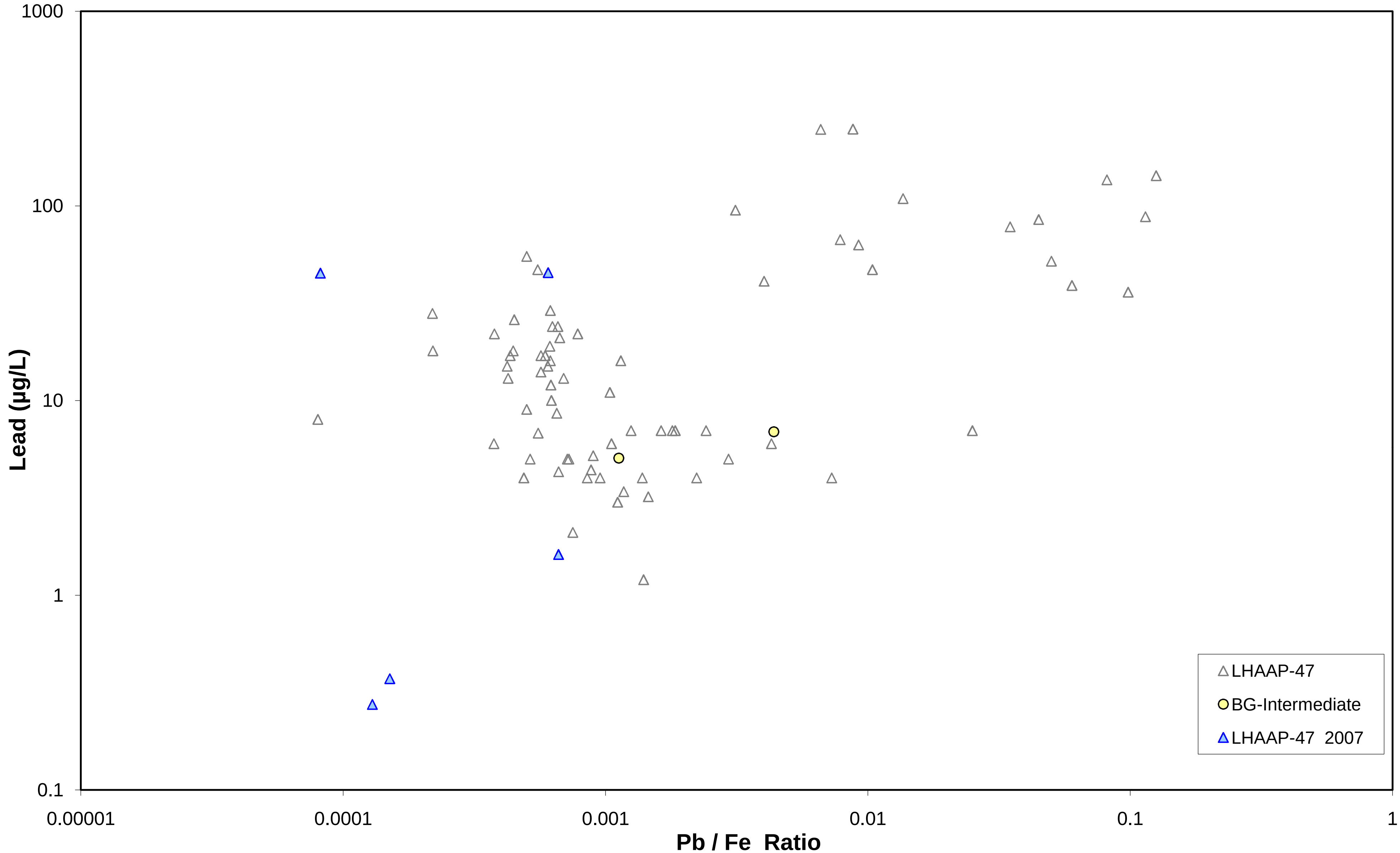


Figure B-19
Filtered Lead vs. Filtered/Unfiltered Lead Ratio
LHAAP-47

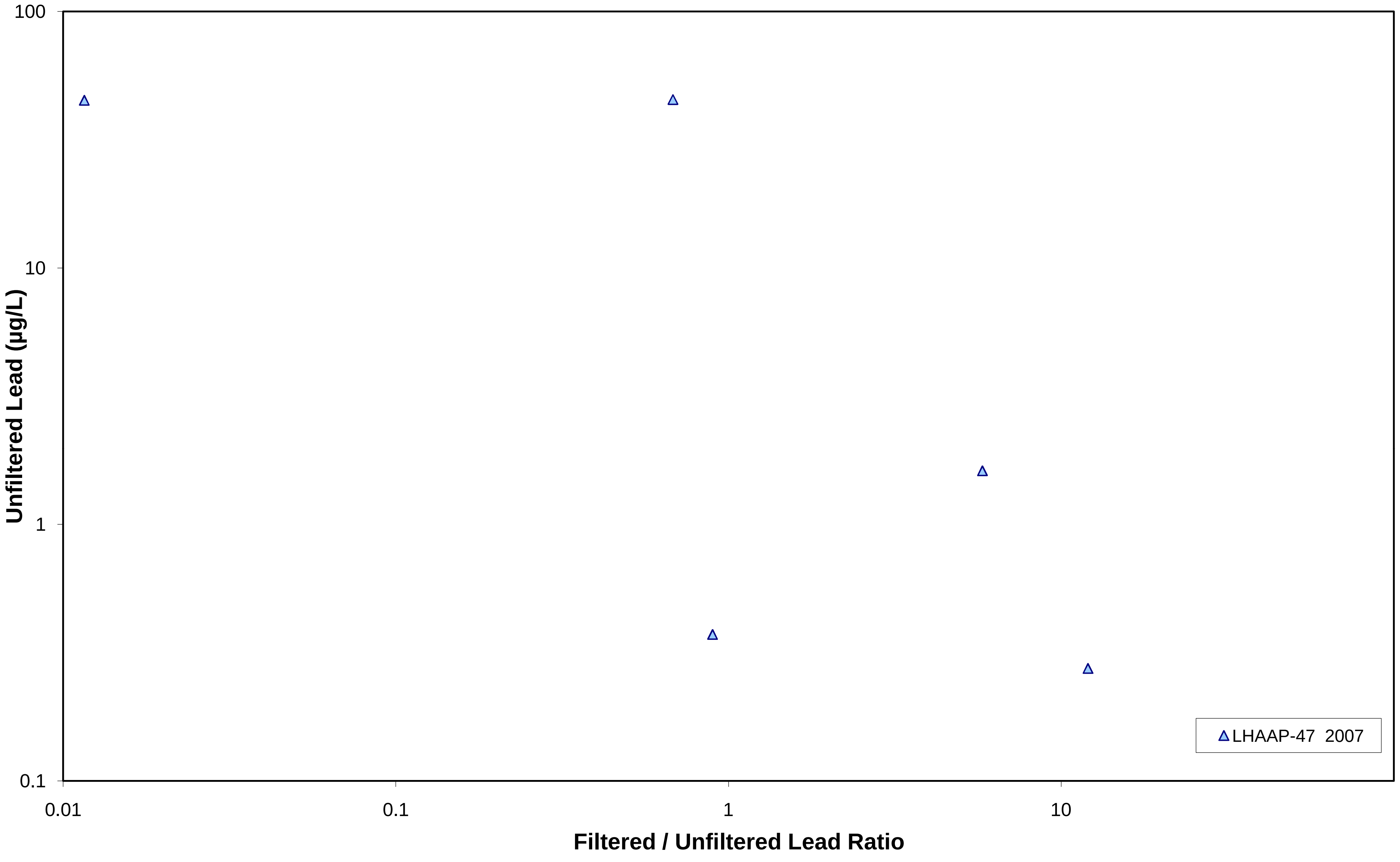


Figure B-20
Unfiltered Lead vs. Total Suspended Solids
LHAAP-47

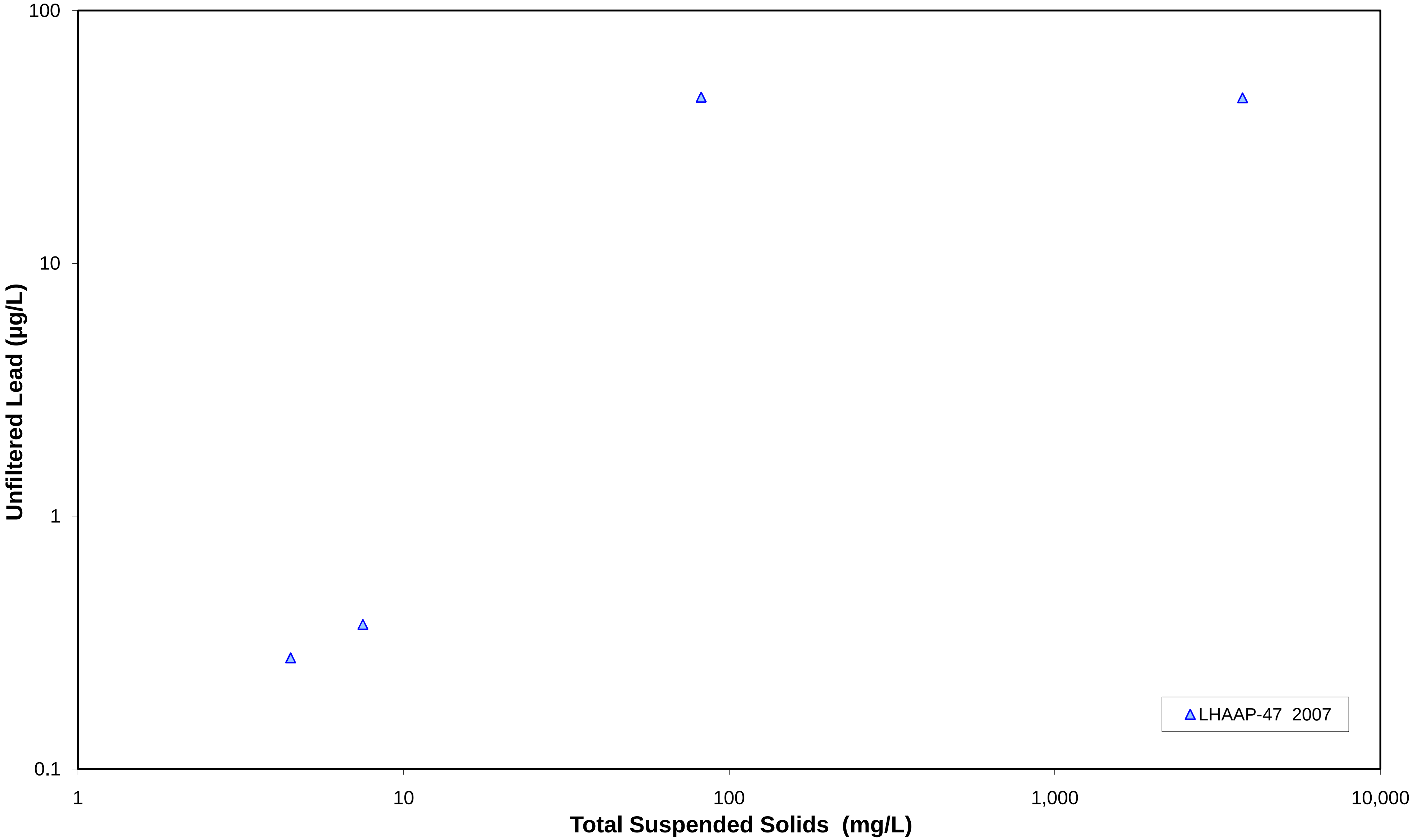


Figure B-21
Manganese vs. Iron in Unfiltered Groundwater
LHAAP-47

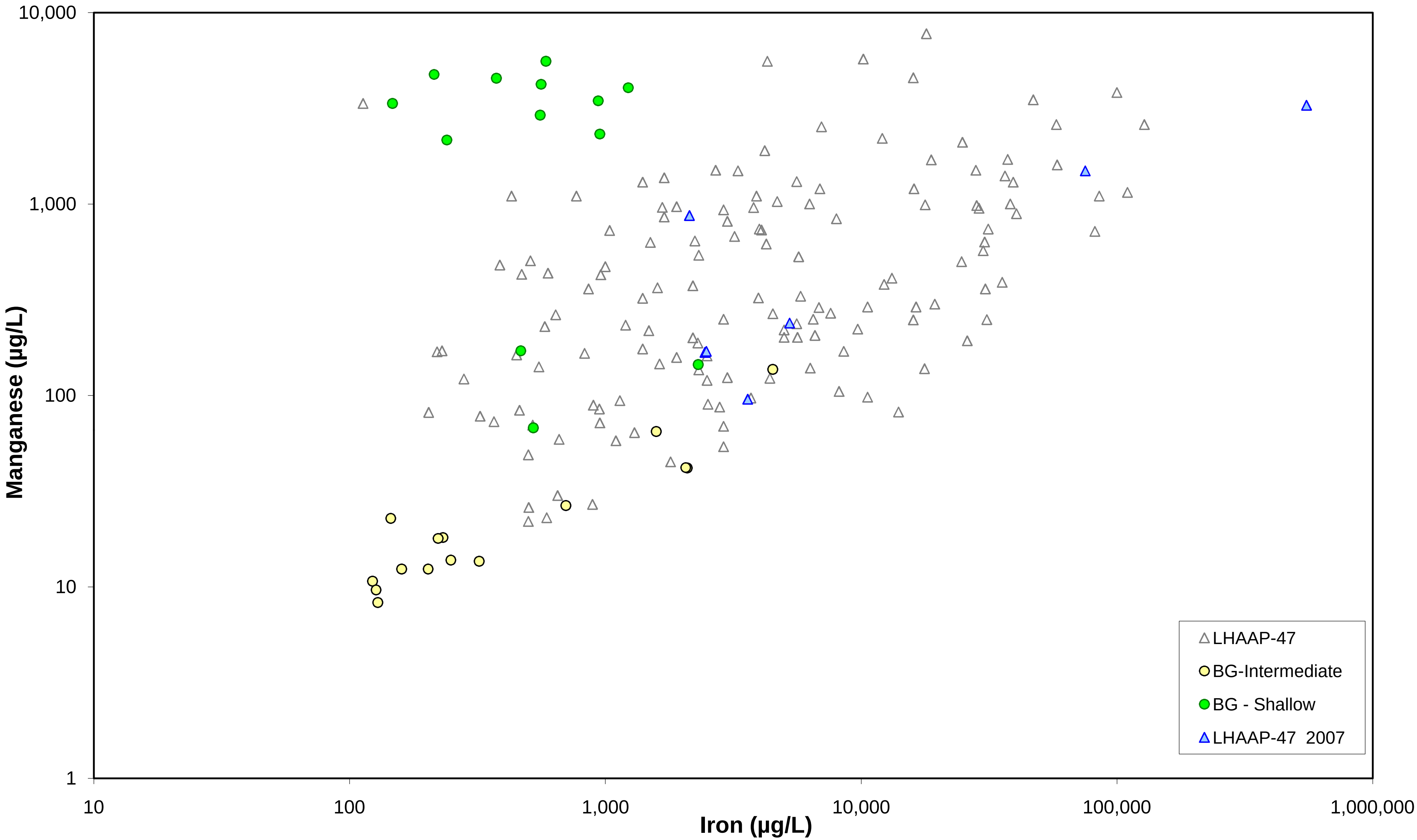


Figure B-22
Unfiltered Manganese vs. Filtered/Unfiltered Manganese Ratio
LHAAP-47

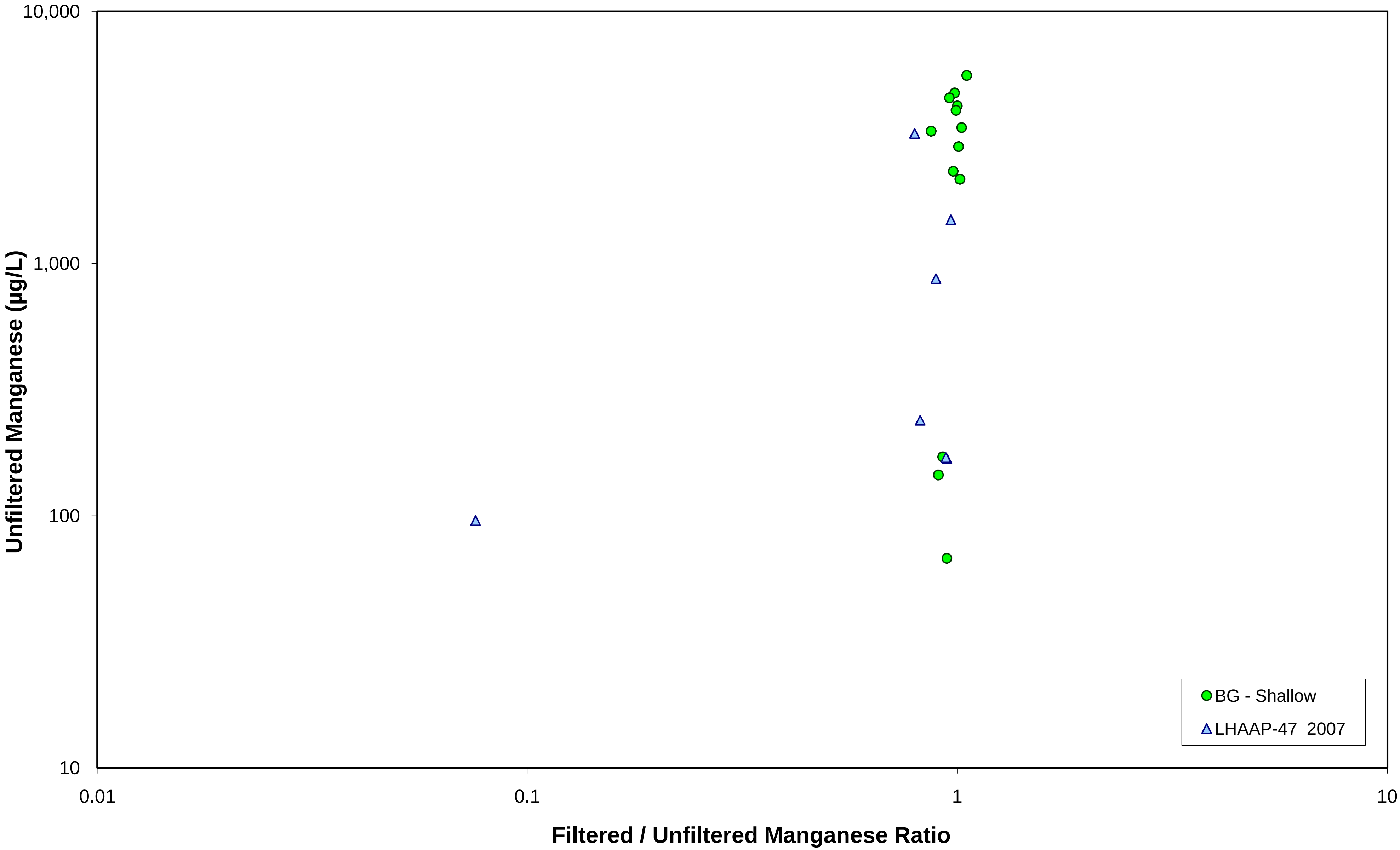


Figure B-23
Unfiltered Manganese vs. Total Suspended Solids
LHAAP-47

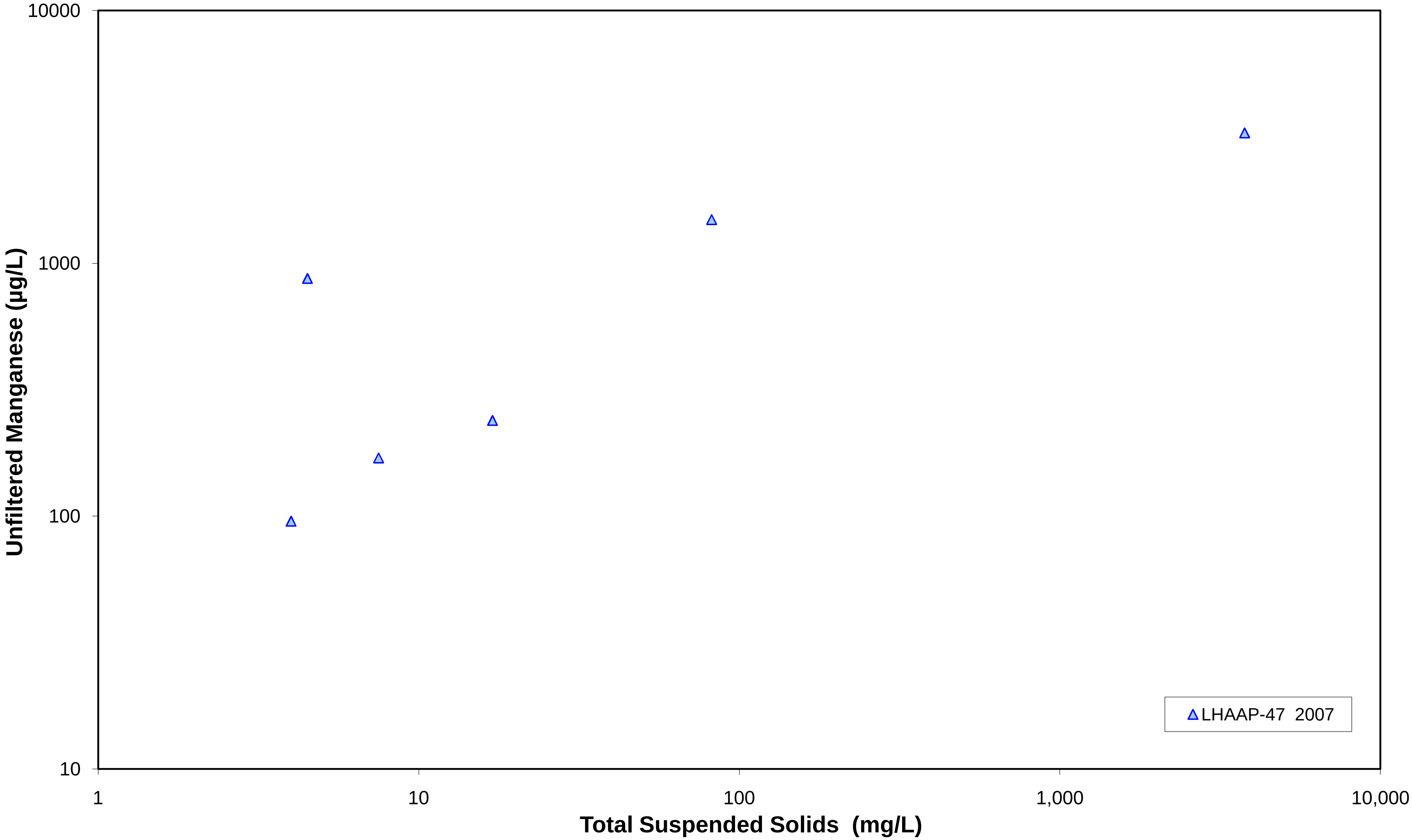


Figure B-24
NIckel vs. Aluminum in Unfiltered Groundwater
LHAAP-47

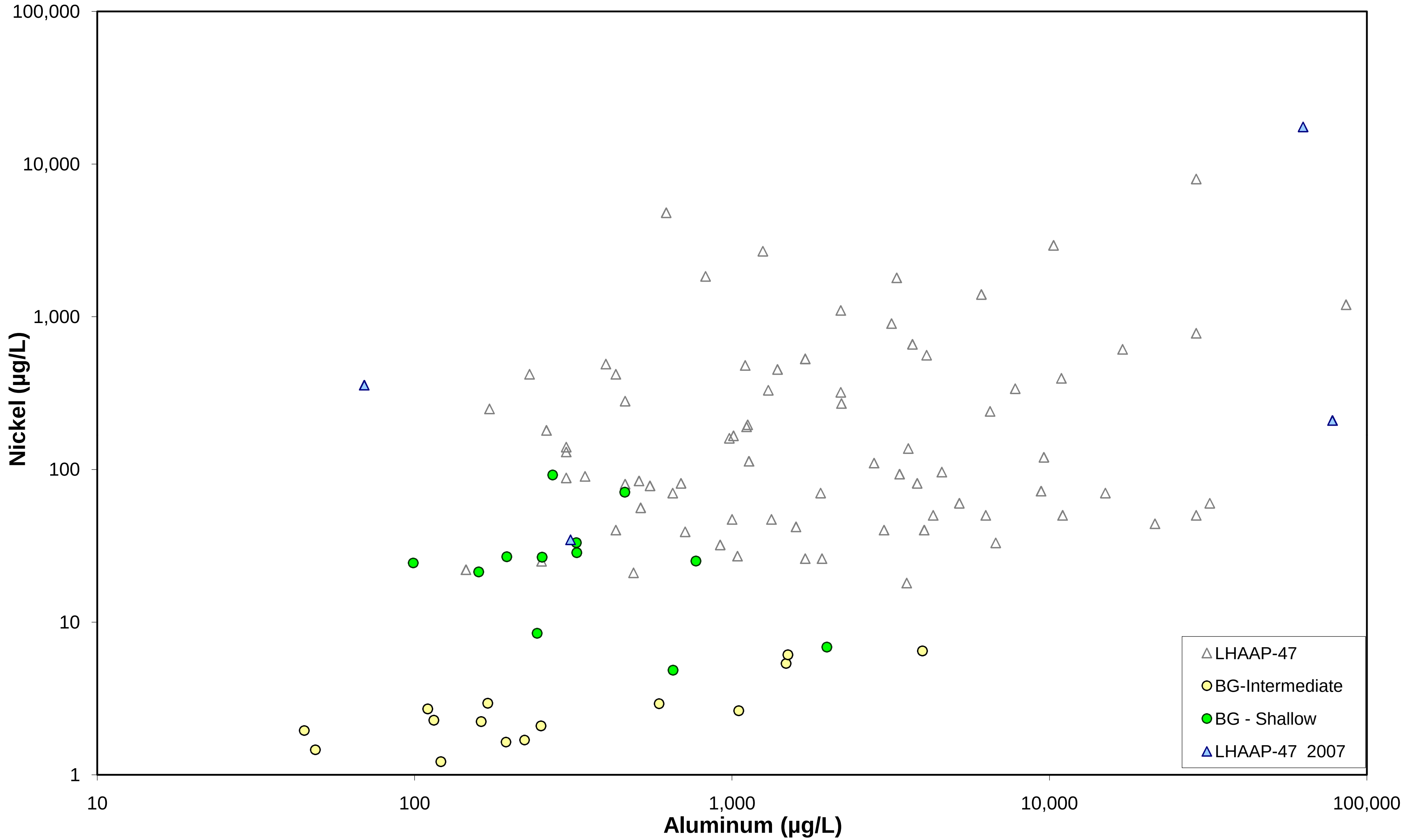


Figure B-25
Nickel vs. Ni/Al Ratio in Unfiltered Groundwater
LHAAP-47

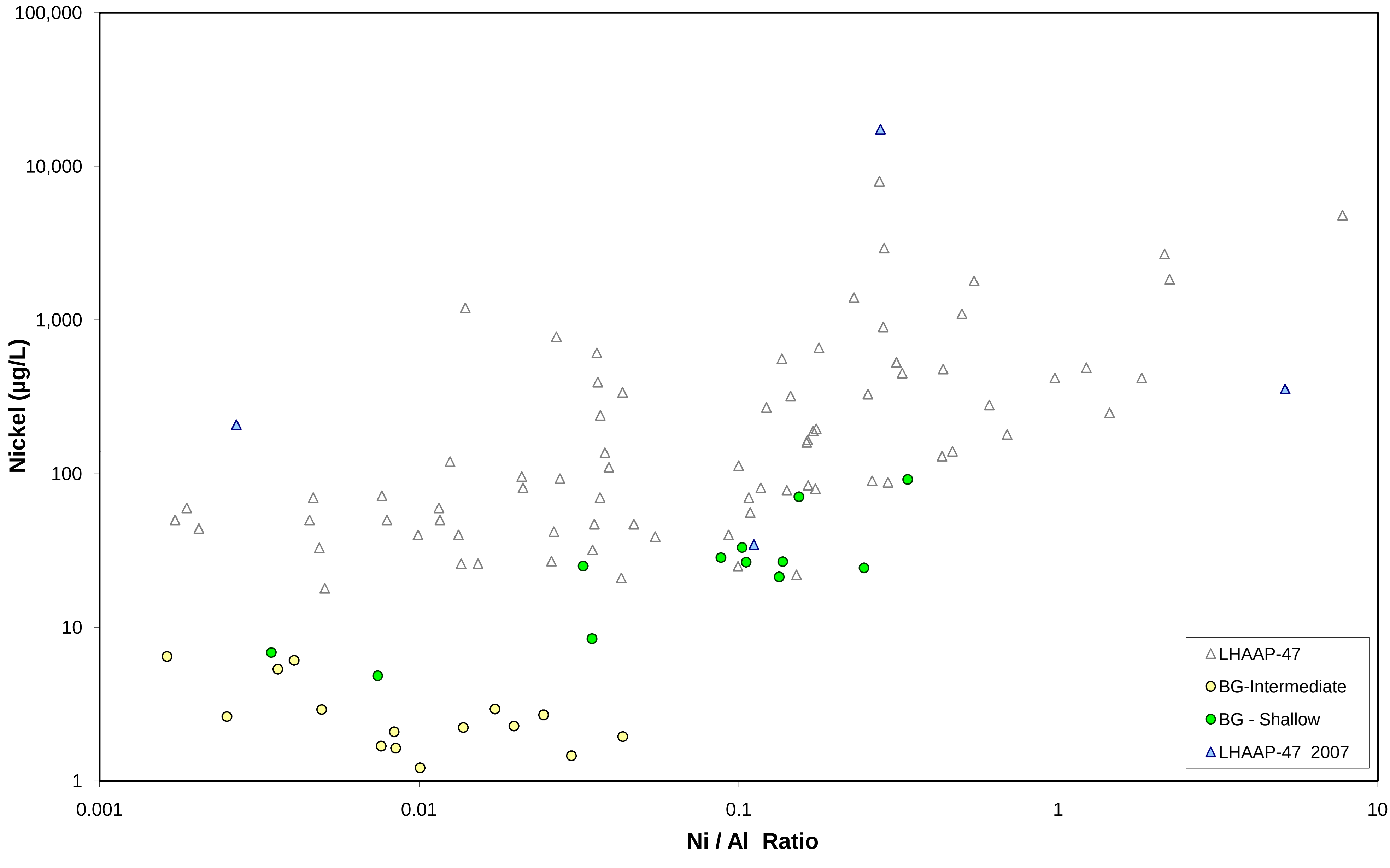


Figure B-26
Unfiltered Nickel vs. Filtered/Unfiltered Nickel Ratio
LHAAP-47

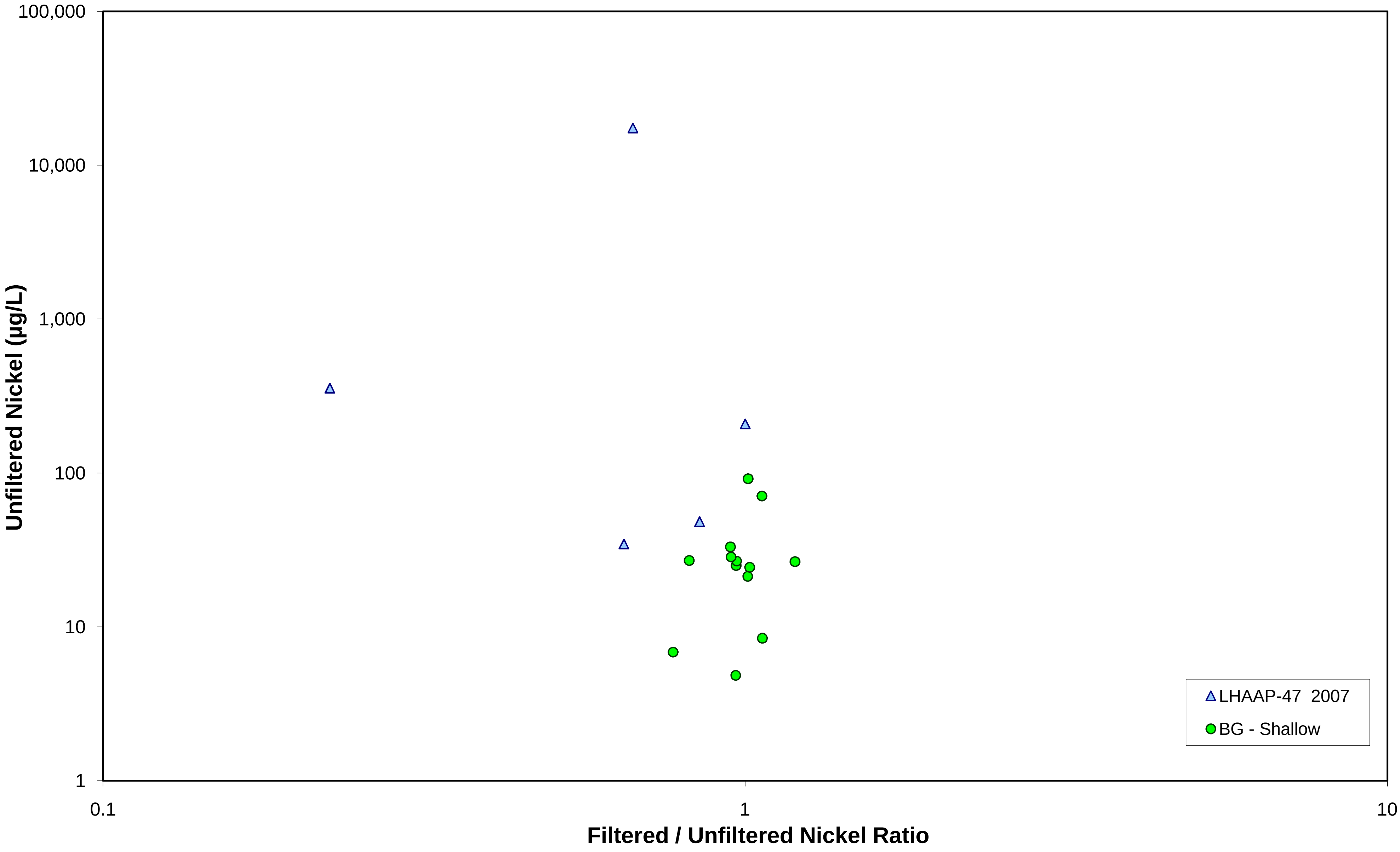


Figure B-27
NIckel vs. Chromium in Unfiltered Groundwater
LHAAP-47

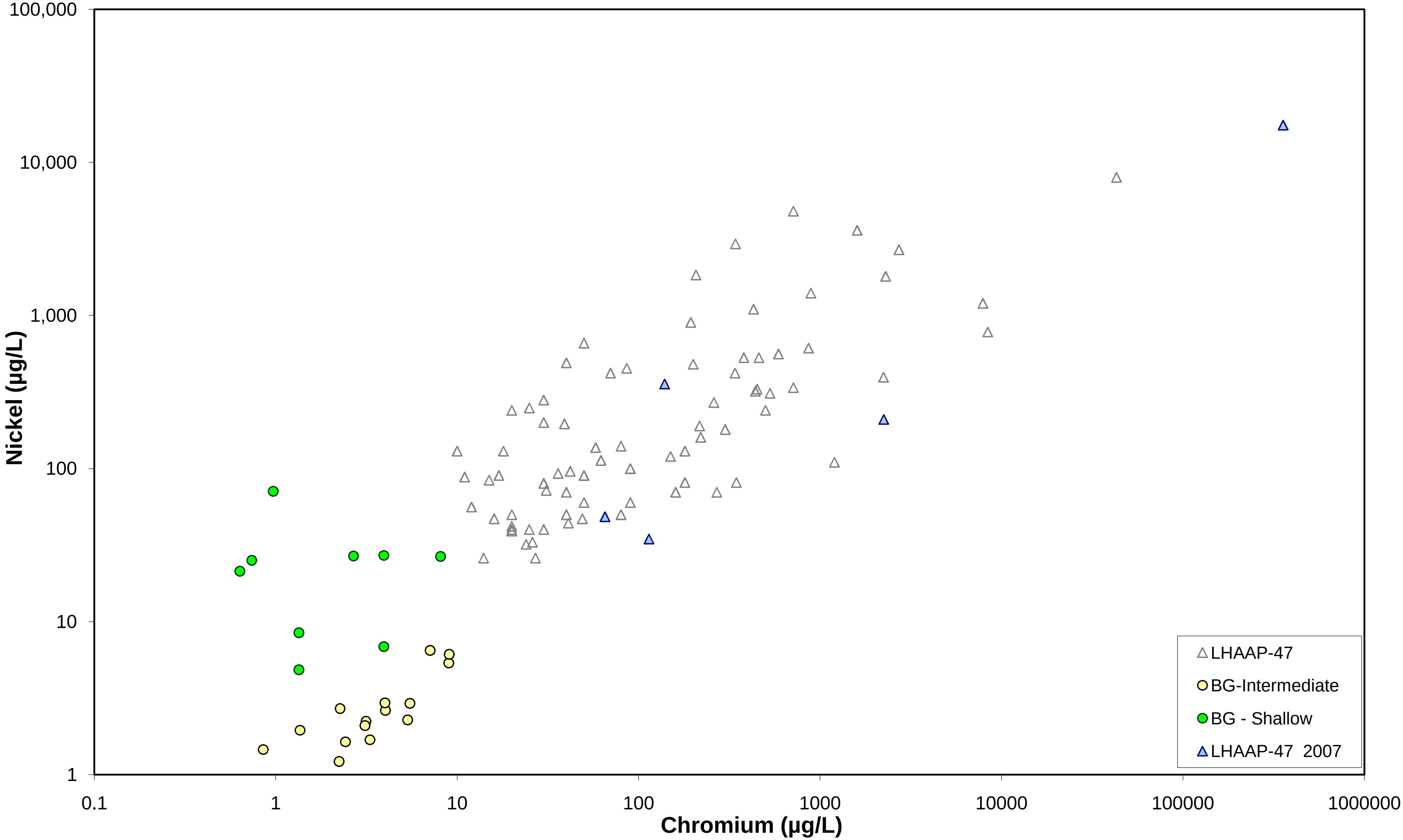


Figure B-28
Thallium vs. Iron in Unfiltered Groundwater
LHAAP-47

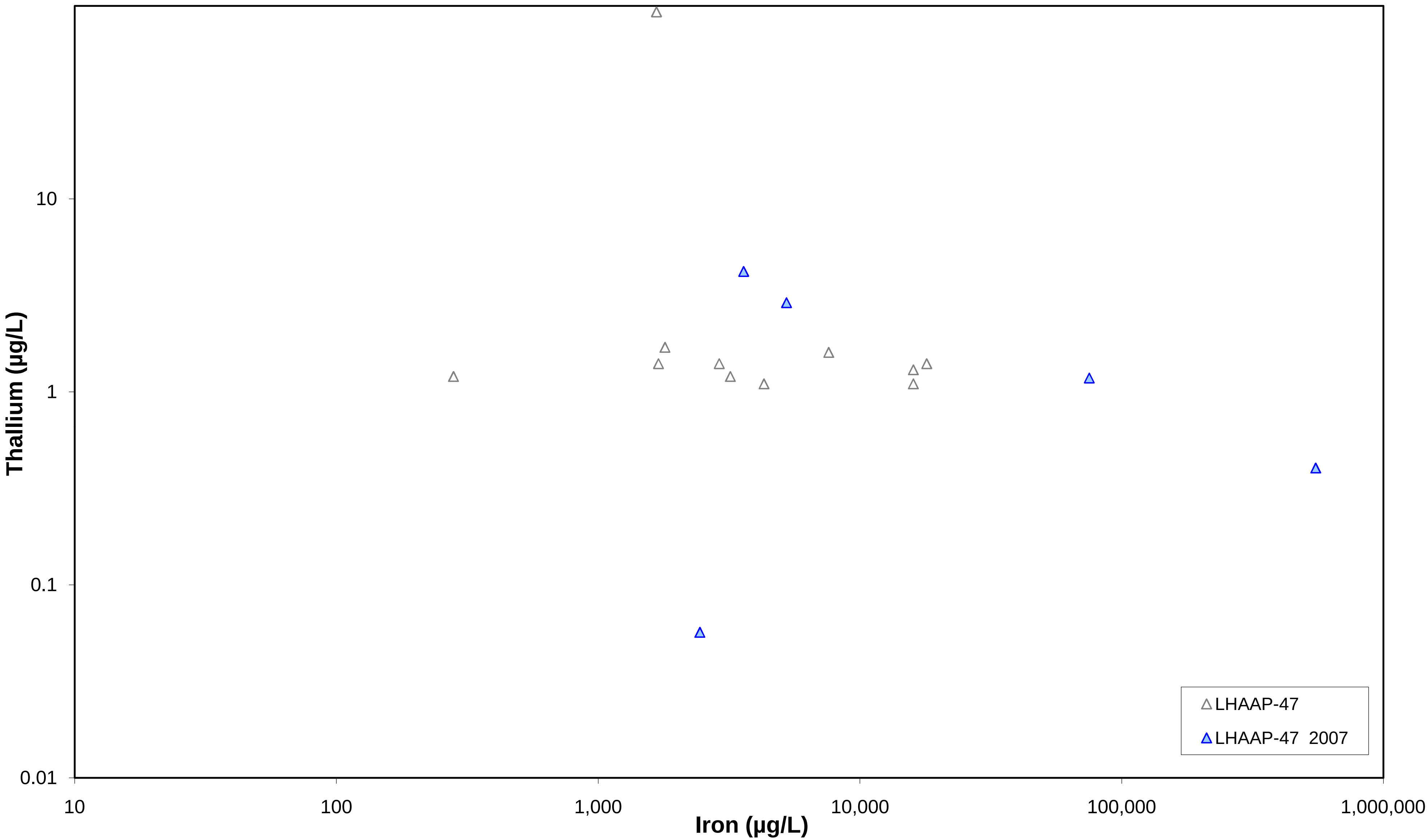


Figure B-29
Thallium vs. Tl/Fe Ratio in Unfiltered Groundwater
LHAAP-47

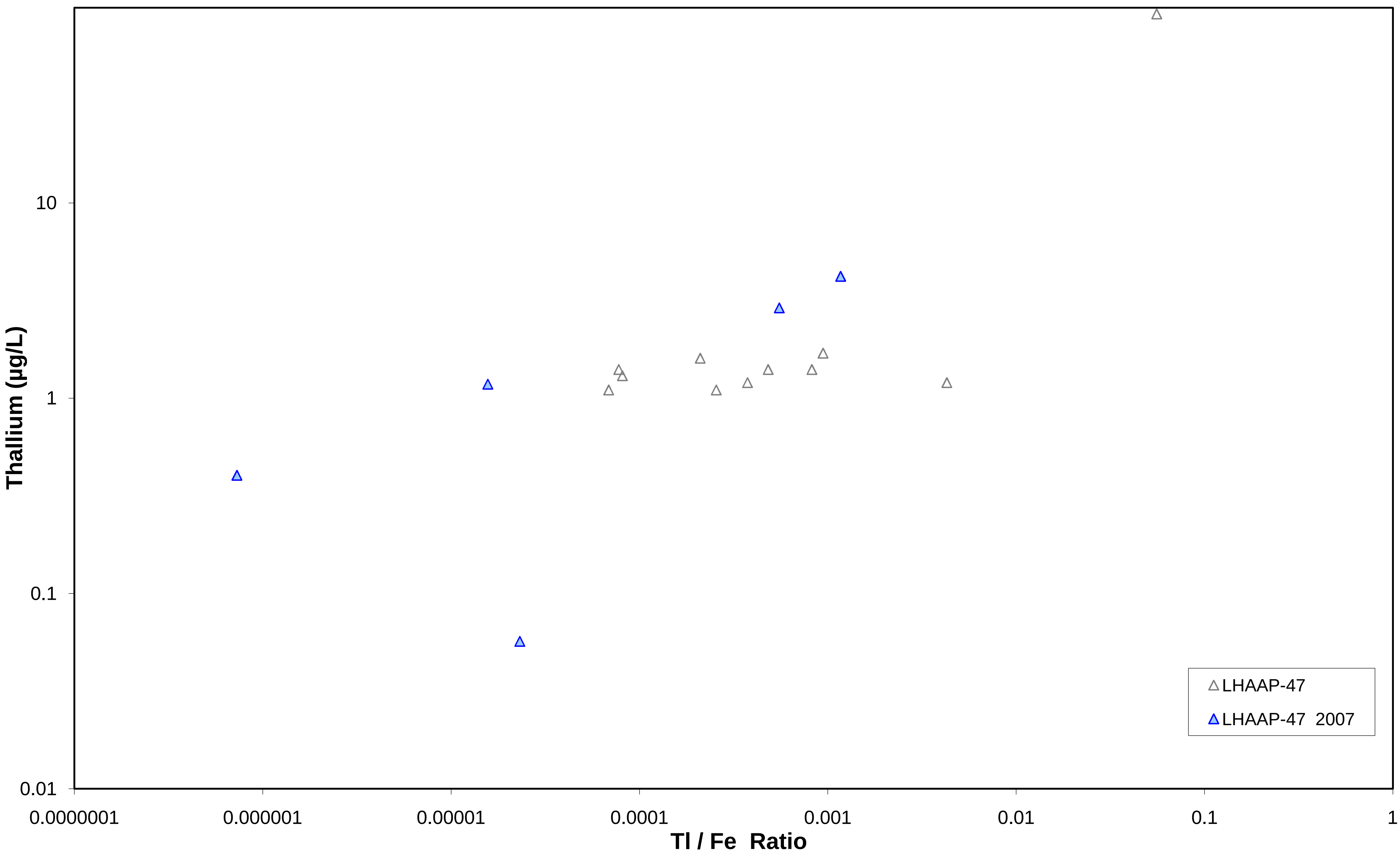
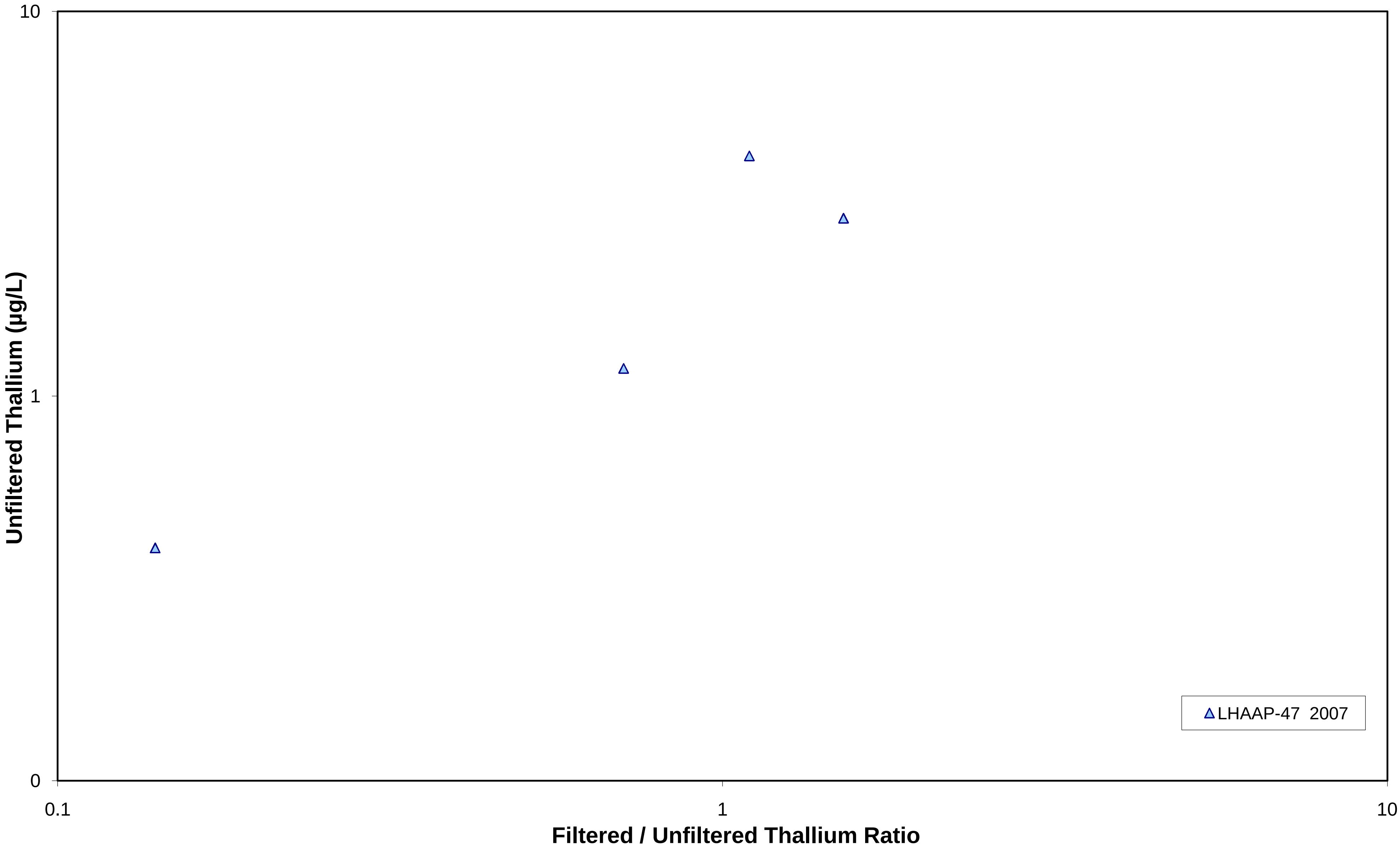


Figure B-30
Unfiltered Thallium vs. Filtered/Unfiltered Thallium Ratio
LHAAP-47



Appendix C

Well Logs, Sample Collection Logs, Field Work from 2010, Survey Locations from 2010, and Additional Sample Results from 2007, 2008, 2009, and 2010

Analytical Data Reports
(on attached CD)

List of Sample Analyses for Appendix C

Location	Sample No.	Date	DHE	Field Tests	Gases	Gen Chemistry	Metals	Metals-DISS	Volatiles	Laboratory Report
105	105-021809	2/18/09	X	X	X	X			X	L09020400
105	105-103107	7/31/10				X			X	L10080026
47DPT01	47DPT01-100813	8/13/10				X				L10080330
47DPT02	47DPT02-100812	8/12/10							X	L10080308
47DPT03	47DPT03-100813	8/13/10				X			X	L10080330
47DPT04	47DPT04-100812	8/12/10				X			X	L10080308
47DPT05	47DPT05-100813	8/13/10				X			X	L10080330
47DPT06	47DPT06-100813	8/13/10				X			X	L10080330
47DPT07	47DPT07-100820	8/20/10							X	L10080553
47DPT08	47DPT08-100820	8/20/10							X	L10080553
47DPT09	47DPT09-100820	8/20/10							X	L10080553
47DPT10	47DPT10-100820	8/20/10							X	L10080553
47DPT10I	47DPT10I-100915	9/15/10							X	L10090358
47DPT11	47DPT11-100820	8/20/10							X	L10080553
47DPT11I	47DPT11I-100915	9/15/10							X	L10090358
47DPT12	47DPT12-100820	8/20/10							X	L10080553
47DPT12I	47DPT12I-100915	9/15/10							X	L10090358
47DPT13	47DPT13-100820	8/20/10				X			X	L10080553
47DPT14	47DPT14-100915	9/15/10				X			X	L10090358
47DPT15	47DPT15-100915	9/15/10				X			X	L10090358
47SB-25D-01	47SB-25D-01(0-2)	8/16/10				X				L10080403
47SB-25D-01	47SB-25D-01(4-6)	8/16/10				X				L10080402
47SB-25D-01	47SB-25D-01(9-11)	8/13/10				X				L10080489
47SB-25D-01	47SB-25D-01(GWVZ)	8/16/10				X				L10080385
47SB-25D-02	47SB-25D-02(0-2)	8/13/10				X				L10080403
47SB-25D-02	47SB-25D-02(4-6)	8/13/10				X				L10080402
47SB-25D-02	47SB-25D-02(9-11)	8/13/10				X				L10080389
47SB-25D-02	47SB-25D-02(GWVZ)	8/13/10				X				L10080329
47SB-25D-03	47SB-25D-03(0-2)	8/16/10				X				L10080489
47SB-25D-03	47SB-25D-03(4-6)	8/16/10				X				L10080446
47SB-25D-03	47SB-25D-03(9-11)	8/13/10				X				L10080390
47SB-25D-03	47SB-25D-03(GWVZ)	8/16/10				X				L10080385
47SB-25D-04	47SB-25D-04(0-2)	8/16/10				X				L10080403
47SB-25D-04	47SB-25D-04(4-6)	8/16/10				X				L10080402
47SB-25D-04	47SB-25D-04(9-11)	8/13/10				X				L10080489
47SB-25D-04	47SB-25D-04(GWVZ)	8/16/10				X				L10080385
47SB-25D-05	47SB-25D-05(0-2)	8/16/10				X				L10080403
47SB-25D-05	47SB-25D-05(4-6)	8/16/10				X				L10080402
47SB-25D-05	47SB-25D-05(9-11)	8/16/10				X				L10080489

List of Sample Analyses for Appendix C

Location	Sample No.	Date	DHE	Field Tests	Gases	Gen Chemistry	Metals	Metals-DISS	Volatiles	Laboratory Report
47SB-25D-05	47SB-25D-05(GWVZ)	8/16/10				X				L10080385
47SB-A01	47SB-A01(0-2)	8/24/10				X				L10080749
47SB-A01	47SB-A01(4-6)	8/24/10				X				L10080750
47SB-A01	47SB-A01(9-11)	8/24/10				X				L10080740
47SB-A01	47SB-A01(GWVZ)	8/24/10				X				L10080741
47SB-A03	47SB-A03(0-2)	8/24/10				X				L10080749
47SB-A03	47SB-A03(4-6)	8/24/10				X				L10080750
47SB-A03	47SB-A03(9-11)	8/24/10				X				L10080740
47SB-A03	47SB-A03(GWVZ)	8/24/10				X				L10080741
47SB-A05	47SB-A05(0-2)	8/25/10				X				L10080749
47SB-A05	47SB-A05(4-6)	8/25/10				X				L10080750
47SB-A05	47SB-A05(9-11)	8/25/10				X				L10080740
47SB-A05	47SB-A05(GWVZ)	8/25/10				X				L10080741
47SB-A07	47SB-A07(0-2)	8/25/10				X				L10080749
47SB-A07	47SB-A07(GWVZ)	8/25/10				X				L10080741
47SB-A09	47SB-A09(0-2)	8/25/10				X				L10080749
47SB-A09	47SB-A09(4-6)	8/25/10				X				L10080750
47SB-A09	47SB-A09(GWVZ)	8/25/10				X				L10080741
47SB-B10	47SB-B10(12-13)	9/21/10				X				L10090609
47SB-C01	DUP-02-100820	8/20/10				X				L10080655
47SB-C01	47SB-C01(0-2)	8/20/10				X				L10080655
47SB-C01	47SB-C01(4-6)	8/20/10				X				L10080654
47SB-C01	47SB-C01(GWVZ)	8/20/10				X				L10080609
47SB-C02	47SB-C02 [0-2]	9/20/10				X				L10090610
47SB-C02	47SB-C02 [4-6]	9/20/10				X				L10100086
47SB-C02	47SB-C02 [6-7]	9/20/10				X				L10090609
47SB-C03	47SB-C03(0-2)	8/20/10				X				L10080655
47SB-C03	47SB-C03(4-6)	8/20/10				X				L10080654
47SB-C03	47SB-C03(9-11)	8/20/10				X				L10080608
47SB-C03	47SB-C03(GWVZ)	8/20/10				X				L10080609
47SB-C05	DUP-03-100820	8/20/10				X				L10080655
47SB-C05	47SB-C05(0-2)	8/20/10				X				L10080655
47SB-C05	47SB-C05(4-6)	8/20/10				X				L10080654
47SB-C05	47SB-C05(9-11)	8/20/10				X				L10080608
47SB-C07	47SB-C07(0-2)	8/25/10				X				L10080749
47SB-C07	47SB-C07(4-6)	8/25/10				X				L10080750
47SB-C07	47SB-C07(9-11)	8/25/10				X				L10080740
47SB-C07	47SB-C07(GWVZ)	8/25/10				X				L10080741
47SB-C09	47SB-C09(0-2)	8/26/10				X				L10080800

List of Sample Analyses for Appendix C

Location	Sample No.	Date	DHE	Field Tests	Gases	Gen Chemistry	Metals	Metals-DISS	Volatiles	Laboratory Report
47SB-C09	47SB-C09(4-6)	8/26/10				X				L10080803
47SB-C09	47SB-C09(GWVZ)	8/26/10				X				L10080792
47SB-C09	DUP-05-100827	8/27/10				X				L10080793
47SB-C11	47SB-C11(0-2)	8/26/10				X				L10080800
47SB-C11	47SB-C11(4-6)	8/26/10				X				L10080803
47SB-C11	47SB-C11(9-11)	8/26/10				X				L10080794
47SB-C11	47SB-C11(GWVZ)	8/26/10				X				L10080792
47SB-C11	DUP-06-100827	8/27/10				X				L10080793
47SB-D08	47SB-D08(0-2)	9/21/10				X				L10090610
47SB-D08	47SB-D08(4-6)	9/21/10				X				L10100086
47SB-D08	47SB-D08(6-7)	9/21/10				X				L10090609
47SB-D09	47SB-D09(0-2)	9/21/10				X				L10100086
47SB-D09	47SB-D09(4-6)	9/21/10				X				L10090609
47SB-E01	47SB-E01(0-2)	8/20/10				X				L10080655
47SB-E01	47SB-E01(4-6)	8/20/10				X				L10080654
47SB-E01	47SB-E01(GWVZ)	8/20/10				X				L10080609
47SB-E02	47SB-E02 (0-2)	9/20/10				X				L10090610
47SB-E02	47SB-E02 (4-6)	9/20/10				X				L10100086
47SB-E02	47SB-E02 (8-9)	9/20/10				X				L10090609
47SB-E03	47SB-E03(0-2)	8/20/10				X				L10080655
47SB-E03	47SB-E03(4-6)	8/20/10				X				L10080654
47SB-E03	47SB-E03(GWVZ)	8/20/10				X				L10080609
47SB-E05	DUP-04-100820	8/20/10				X				L10080655
47SB-E05	47SB-E05(0-2)	8/20/10				X				L10080655
47SB-E05	47SB-E05(4-6)	8/20/10				X				L10080654
47SB-E05	47SB-E05(GWVZ)	8/20/10				X				L10080609
47SB-E06	47SB-E06 (0-2)	9/20/10				X				L10090610
47SB-E06	47SB-E06 (4-6)	9/20/10				X				L10100086
47SB-E06	47SB-E06 (8-10)	9/20/10				X				L10090609
47SB-E07	47SB-E07(0-2)	8/26/10				X				L10080800
47SB-E07	47SB-E07(GWVZ)	8/26/10				X				L10080792
47SB-E07	DUP-08-100827	8/27/10				X				L10080793
47SB-E08	47SB-E08 (0-2)	9/20/10				X				L10100086
47SB-E08	47SB-E08 (4-6)	9/20/10				X				L10090609
47SB-E09	47SB-E09(0-2)	8/26/10				X				L10080800
47SB-E09	47SB-E09(4-6)	8/26/10				X				L10080803
47SB-E09	47SB-E09(GWVZ)	8/26/10				X				L10080792
47SB-E09	DUP-07-100827	8/27/10				X				L10080793
47SB-F03	47SB-F03 (0-2)	9/20/10				X				L10090610

List of Sample Analyses for Appendix C

Location	Sample No.	Date	DHE	Field Tests	Gases	Gen Chemistry	Metals	Metals-DISS	Volatiles	Laboratory Report
47SB-F03	47SB-F03 (4-6)	9/20/10				X				L10100086
47SB-F03	47SB-F03 (9-11)	9/20/10				X				L10090612
47SB-F03	47SB-F03 (12-13)	9/20/10				X				L10090609
47SB-F04	47SB-F04 (0-2)	9/20/10				X				L10090610
47SB-F04	47SB-F04 (4-6)	9/20/10				X				L10100086
47SB-F04	47SB-F04 (9-11)	9/20/10				X				L10090609
47SB-F06	47SB-F06 (0-2)	9/20/10				X				L10090610
47SB-F06	47SB-F06 (4-6)	9/20/10				X				L10100086
47SB-F06	47SB-F06 (8-10)	9/20/10				X				L10090609
47SB-F07	47SB-F07 (0-2)	9/20/10				X				L10100095
47SB-F07	47SB-F07 (4-6)	9/20/10				X				L10090689
47SB-G05	47SB-G05(0-2)	8/26/10				X				L10080800
47SB-G05	47SB-G05(4-6)	8/26/10				X				L10080803
47SB-G05	47SB-G05(9-11)	8/26/10				X				L10080794
47SB-G05	47SB-G05(GWVZ)	8/26/10				X				L10080792
47SB-G07	47SB-G07(0-2)	8/26/10				X				L10080800
47SB-G07	47SB-G07(4-6)	8/26/10				X				L10080803
47SB-G07	47SB-G07(9-11)	8/26/10				X				L10080794
47SB-G07	47SB-G07(GWVZ)	8/26/10				X				L10080792
47SB-G07	DUP-09-100827	8/27/10				X				L10080793
47SB-H04	47SB-H04 (0-2)	9/17/10				X				L10100283
47SB-H04	47SB-H04 (4-6)	9/17/10				X				L10090498
47SB-H04	47SB-H04 (9-11)	9/17/10				X				L10090492
47SB-H04	47SB-H04 (12-13)	9/17/10				X				L10090491
47SB-H04	DUP02-100917	9/17/10				X				L10090490
47SB-H06	47SB-H06 (4-6)	9/17/10				X				L10090498
47SB-H06	47SB-H06 (9-11)	9/17/10				X				L10090492
47SB-H06	47SB-H06 (20-21)	9/17/10				X				L10090491
47SB-H06	DUP03-100917	9/17/10				X				L10090490
47SB-H07	47SB-H07 (0-2)	9/17/10				X				L10100283
47SB-H07	47SB-H07 (4-6)	9/17/10				X				L10090498
47SB-H07	47SB-H07 (9-11)	9/17/10				X				L10090492
47SB-H07	47SB-H07 (18-19)	9/17/10				X				L10090491
47SB-H07	DUP04-100917	9/17/10				X				L10090490
47SB-H08	47SB-H08 (0-2)	9/17/10				X				L10100283
47SB-H08	47SB-H08 (4-6)	9/17/10				X				L10090498
47SB-H08	47SB-H08 (9-11)	9/17/10				X				L10090492
47SB-H08	47SB-H08 (14-15)	9/17/10				X				L10090491
47SB-H08	DUP05-100917	9/17/10				X				L10090490

List of Sample Analyses for Appendix C

Location	Sample No.	Date	DHE	Field Tests	Gases	Gen Chemistry	Metals	Metals-DISS	Volatiles	Laboratory Report
47SB-I03	47SB-I03(0-2)	8/27/10				X				L10090229
47SB-I03	47SB-I03(4-6)	8/27/10				X				L10090229
47SB-I05	47SB-I05(0-2)	8/26/10				X				L10080800
47SB-I05	47SB-I05(4-6)	8/26/10				X				L10080803
47SB-I05	47SB-I05(GWVZ)	8/26/10				X				L10080792
47SB-I05	DUP-10-100827	8/27/10				X				L10080793
47SB-I07	47SB-I07(0-2)	8/26/10				X				L10080800
47SB-I07	47SB-I07(4-6)	8/26/10				X				L10080803
47SB-I07	47SB-I07(GWVZ)	8/26/10				X				L10080792
47SB-J03	47SB-J03 (0-2)	9/20/10				X				L10100086
47SB-J03	47SB-J03 (4.5-6.5)	9/20/10				X				L10090609
47SB-J05	47SB-J05 (0-2)	9/17/10				X				L10100283
47SB-J05	47SB-J05 (4-6)	9/17/10				X				L10090498
47SB-J05	47SB-J05 (9-11)	9/17/10				X				L10090492
47SB-J05	47SB-J05 (17.5-18.5)	9/17/10				X				L10090491
47SB-J05	DUP01-100917	9/17/10				X				L10090490
47SB-J06	47SB-J06 (0-2)	9/20/10				X				L10090610
47SB-J06	47SB-J06 (4-6)	9/20/10				X				L10100086
47SB-J06	47SB-J06 (9-11)	9/20/10				X				L10090612
47SB-J06	47SB-J06 (11-12)	9/20/10				X				L10090609
47SB-K03	47SB-K03(0-2)	8/26/10				X				L10080800
47SB-K03	47SB-K03(4-6)	8/26/10				X				L10090229
47SB-K03	47SB-K03(9-11)	8/26/10				X				L10090229
47SB-K03	47SB-K03(GWVZ)	8/26/10				X				L10080792
47SB-K05	47SB-K05(0-2)	8/26/10				X				L10080800
47SB-K05	47SB-K05(4-6)	8/26/10				X				L10080803
47SB-K05	47SB-K05(9-11)	8/26/10				X				L10080794
47SB-K05	47SB-K05(GWVZ)	8/26/10				X				L10080792
47SB-K07	47SB-K07(0-2)	8/26/10				X				L10080800
47SB-K07	47SB-K07(4-6)	8/26/10				X				L10080803
47SB-K07	47SB-K07(9-11)	8/26/10				X				L10080794
47SB-K07	47SB-K07(GWVZ)	8/26/10				X				L10080792
47WW01	47WW01-101807	10/18/07		X					X	L0710596
47WW03	47WW03-101707	10/17/07		X					X	L0710557
47WW04	47WW04-101807	10/18/07		X					X	L0710596
47WW04	47WW04-100806	8/6/10				X			X	L10080224
47WW05	47WW05-102007	10/20/07		X					X	L0710596
47WW06	47WW06-091307	9/13/07				X	X	X		L0709400
47WW07	47WW07-091307	9/13/07				X	X	X		L0709400

List of Sample Analyses for Appendix C

Location	Sample No.	Date	DHE	Field Tests	Gases	Gen Chemistry	Metals	Metals-DISS	Volatiles	Laboratory Report
47WW08	47WW08-101707	10/17/07		X		X		X		L0710557
47WW09	47WW09-FEB2007	2/21/07	X	X	X	X			X	T16432
47WW09	47WW09-101607	10/16/07		X		X		X		L0710557
47WW09	47WW09-101607FD	10/16/07				X		X		L0710557
47WW09	47WW09-113007	11/30/07		X		X	X	X		L0712060
47WW09	47WW09-113007-QA	11/30/07				X	X	X		L0712060
47WW09	47WW09-021809	2/18/09	X	X	X	X			X	L09020400
47WW09	47WW09-100803	8/3/10	X	X	X	X	X		X	L10080063
47WW12	47WW12-042209	4/22/09							X	L09040570
47WW13	47WW13-FEB2007	2/20/07	X	X	X	X			X	T16411
47WW13	47WW13-101607	10/16/07		X		X		X		L0710557
47WW13	47WW13-113007	11/30/07		X		X	X	X		L0712060
47WW13	47WW13-021709	2/17/09	X	X	X	X			X	L09020346
47WW13	47WW13-021709-FD	2/17/09	X		X	X			X	L09020346
47WW13	47WW13-100804	8/4/10	X	X	X	X	X		X	L10080104
47WW14	47WW14-FEB2007	2/20/07	X	X	X	X			X	T16411
47WW14	47WW14-FEB2007FD	2/20/07	X		X	X			X	T16411
47WW14	47WW14-021909	2/19/09		X					X	L09020438
47WW14	47WW14-021909-FD	2/19/09							X	L09020438
47WW14	47WW14-100804	8/4/10	X	X	X	X	X		X	L10080104
47WW14	47WW14-100804-FD	8/4/10	X	X	X	X	X		X	L10080104
47WW16	47WW16-042209	4/22/09							X	L09040570
47WW18	47WW18-101807	10/18/07							X	L0710597
47WW18	47WW18-101807-DUP	10/18/07							X	L0710597
47WW19	47WW19-101707	10/17/07		X		X		X		L0710557
47WW19	47WW19-113007	11/30/07		X		X	X	X		L0712060
47WW19	47WW19-021909	2/19/09		X					X	L09020438
47WW21	47WW21-101807	10/18/07		X					X	L0710596
47WW21	47WW21-101807-QC	10/18/07							X	L0710596
47WW21	47WW21-103107	7/31/10		X		X			X	L10080026
47WW22	47WW22-101807	10/18/07		X		X		X	X	L0710596
47WW22	47WW22-113007	11/29/07				X	X	X		L0712060
47WW23	47WW23-101907	10/19/07		X					X	L0710596
47WW23	47WW23-100806	8/6/10		X		X			X	L10080224
47WW25	47WW25-101607	10/18/07							X	L0710597
47WW25	47WW25-040309	4/3/09				X			X	L09040142, L09040628
47WW27	47WW27-101807	10/18/07		X		X				L0710596
47WW27	47WW27-103107	7/31/10		X		X			X	L10080026
47WW28	47WW28-101707	10/17/07		X		X			X	L0710557

List of Sample Analyses for Appendix C

Location	Sample No.	Date	DHE	Field Tests	Gases	Gen Chemistry	Metals	Metals-DISS	Volatiles	Laboratory Report
47WW28	47WW28-103107	7/31/10		X		X			X	L10080026
47WW29	47WW29-101707	10/17/07		X		X			X	L0710557
47WW29	47WW29-103107	7/31/10		X		X			X	L10080026
47WW29	47WW29-103107-FD	7/31/10		X		X			X	L10080026
47WW30	47WW30-FEB2007	2/22/07	X	X	X	X			X	T16445
47WW30	47WW30-101807	10/18/07		X					X	L0710597
47WW30	47WW30-100804	8/4/10		X	X	X	X		X	L10080104
47WW31	47WW31-101807	10/18/07		X					X	L0710597
47WW32	47WW32-101807	10/18/07		X					X	L0710597
47WW32	47WW32-103107	7/31/10		X					X	L10080026
47WW33	47WW33-022008	2/20/08							X	L08020525
47WW33	47WW33-022008-QC	2/20/08							X	L08020525
47WW33	47WW33-031408	3/14/08							X	L08030315
47WW33	47WW33-103007	7/30/10							X	L10080026
47WW34	47WW34-021908	2/19/08							X	L08020525
47WW34	47WW34-031408	3/14/08							X	L08030315
47WW34	47WW34-022309	2/23/09		X					X	L09020556
47WW34	47WW34-100803	8/3/10	X	X	X	X	X		X	L10080063
47WW35	47WW35-100808	10/9/08							X	L08100416
47WW35	47WW35-100808-QA	10/9/08							X	L08100416
47WW36	47WW36-100808	10/8/08							X	L08100416
47WW37	47WW37-100901	9/1/10		X		X	X		X	L10090073
47WW38	47WW38-100901	9/1/10		X		X	X		X	L10090073
47WW38	47WW38-100901-FD	9/1/10		X		X	X		X	L10090073
48WW01	48WW01-100807	8/7/10				X			X	L10080224
67WW06	67WW06-100806	8/6/10				X			X	L10080224
FIX DUP	DUP1-100820	8/20/10							X	L10080330
LHSMN60	LHSMW60-102206	6/22/10	X	X	X	X	X		X	L10060637
LHSMN60	LHSMW60-100830	8/30/10			X	X	X		X	L10080844, L10080846
LHSMW34	LHSMW34-101807	10/18/07		X					X	L0710597
LHSMW36	47WW36-101907	10/19/07		X					X	L0710597
LHSMW38	LHSMW38-103007	7/30/10		X					X	L10080026
LHSMW41	LHSMW41-022309	2/23/09		X					X	L09020556
LHSMW43	LHSMW43-FEB2007	2/22/07	X	X	X	X			X	T16445
LHSMW43	LHSMW43-021909	2/19/09			X	X			X	L09020438
LHSMW44	LHSMW44-103007	7/30/10		X					X	L10080026
LHSMW45	LHSMW45-021909	2/19/09	X	X	X	X			X	L09020438
LHSMW50	LHSMW50-021709	2/17/09	X	X	X	X			X	L09020346
LHSMW54	LHSMW54-101707	10/17/07		X		X			X	L0710557

List of Sample Analyses for Appendix C

Location	Sample No.	Date	DHE	Field Tests	Gases	Gen Chemistry	Metals	Metals-DISS	Volatiles	Laboratory Report
LHSMW54	LHSMW54-100806	8/6/10		X		X			X	L10080224
LHSMW56	LHSMW56-102007	10/20/07		X					X	L0710596
LHSMW56	LHSMW56-040309	4/3/09				X			X	L09040142, L09040628
LHSMW57	LHSMW57-022309	2/23/09		X					X	L09020556
LHSMW60	LHSMW60-101807	10/18/07				X				L0710596
LHSMW60	LHSMW60-101807-QC	10/18/07				X				L0710596
LHSMW61	LHSMW61-100806	8/6/10				X			X	L10080224

List of Laboratory Reports for Appendix C

Lab Report	Report Date	Laboratory	Description
L0709400	10/2/07	Kemron	Samples from 47WW06, 47WW06-091307, 47WW07, 47WW07-091307
L0710557	10/29/07	Kemron	Samples from 08, 09, 13, 19, 28, 29, 47WW03, 47WW03-101707, 47WW08-101707, 47WW09-101607, 47WW09-101607FD, 47WW13-101607, 47WW19-101707, 47WW28-101707, 47WW29-101707, LHSMW54, LHSMW54-101707
L0710596	11/2/07	Kemron	Samples from 04, 05, 21, 22, 23, 47WW01, 47WW01-101807, 47WW04-101807, 47WW05-102007, 47WW21-101807, 47WW21-101807-QC, 47WW22-101807, 47WW23-101907, 47WW27-101807, LHSMW56, LHSMW56-102007, LHSMW60-101807, LHSMW60-101807-QC
L0710597	11/2/07	Kemron	Samples from 47WW18, 47WW18-101807, 47WW18-101807-DUP, 47WW25-101607, 47WW30-101807, 47WW31-101807, 47WW32-101807, 47WW36-101907, 25, 30, 31, 32, LHSMW34, LHSMW34-101807, 3(
L0712060	12/18/07	Kemron	Metals tests at 47WW09, 47WW09-113007, 47WW09-113007-QA, 47WW13, 47WW13-113007, 47WW19, 47WW19-113007, 47WW22, 47WW22-113007
L08020525	3/4/08	Kemron	Samples from 47WW33, 47WW33-022008, 47WW33-022008-QC, 47WW34, 47WW34-021908
L08030315	3/25/08	Microbac	Samples from 47WW33, 47WW33-031408, 47WW34, 47WW34-031408
L08100416	10/29/08	Microbac	Samples from 47WW35, 47WW35-100808, 47WW35-100808-QA, 47WW36, and 47WW36-100808
L09020346	2/25/09	Microbac	Samples from 47WW13, 47WW13-021709, 47WW13-021709-FD, LHSMW50, LHSMW50-021709
L09020400	2/24/09	Microbac	Samples from 105, 105-021809, 47WW09, 47WW09-021809
L09020438	3/2/09	Microbac	Samples from 47WW14, 47WW14-021909, 47WW14-021909-FD, 47WW19, 47WW19-021909, LHSMW43, LHSMW43-021909, LHSMW45, LHSMW45-021909
L09020556	3/2/09	Microbac	Samples from 47WW34, 47WW34-022309, LHSMW41, LHSMW41-022309, LHSMW57, LHSMW57-022309
L09040142	4/13/09	Microbac	Samples from 47WW25, 47WW25-040309, LHSMW56, LHSMW56-040309
L09040570	4/30/09	Microbac	Samples from 47WW12, 47WW12-042209, 47WW16, 47WW16-042209
L09040628 680-46134-1	4/8/09	Microbac	Perchlorate for 47WW25, 47WW25-040309, LHSMW56, and LHSMW56-040309
L10060637	6/24/10	Microbac	Perchlorate sample from LHSMW60
L10080026	8/16/10	Microbac	Samples from 105-103107, 47WW21-103107, 47WW27-103107, 47WW28-103107, 47WW29-103107, 47WW29-103107-FD, 47WW32-103107, 47WW33-103007, LHSMW38-100820, LHSMW44-1003007
L10080063	8/18/10	Microbac	Samples from 47WW09-100803, 47WW34-100803
L10080104	8/19/10	Microbac	Samples from 47WW13-100804, 47WW14-100804, 47WW14-100804-FD, 47WW30-100804
L10080224	8/30/10	Microbac	Samples from LHSMW54-100806, 47WW04-100806, 47WW23-100806
L10080308	8/17/10	Microbac	Samples from 47DPT02-100812, 47DPT04-100812
L10080329	8/27/10	Microbac	Samples from 47SB-25D-02 (GW/VZ)
L10080330	8/23/10	Microbac	Samples from 47DPT01-100813, 47DPT03-100813, 47DPT05-100813, 47DPT06-100813
L10080385	8/27/10	Microbac	Samples from 47SB-25D-01 (GW/VZ), 47SB-25D-03 (GW/VZ), 47SB-25D-04 (GW/VZ), 47SB-25D-05 (GW/VZ)
L10080389	8/13/10	Microbac	Samples from 47SB-25D-02 (9-11)
L10080390	8/27/10	Microbac	Sample from 47SB-25D-03 (9-11)
L10080402	8/25/10	Microbac	Samples from 47SB-25D-02 (4-6), 47SB-25D-01 (4-6), 47SB-25D-04 (4-6), 47SB-25D-05 (4-6
L10080403	8/30/10	Microbac	Samples from 47SB-25D-01 (0-2), 47SB-25D-02 (0-2), 47SB-25D-04 (0-2), 47SB-25D-05 (0-2
L10080446	8/27/10	Microbac	Samples from 47SB-25D-03 (4-6)
L10080489	8/27/10	Microbac	Samples from 47SB-25D-01 (9-11), 47SB-25D-04 (9-11), 47SB-25D-05 (9-11), 47SB-25D-03 (0-2
L10080553	8/27/10	Microbac	Samples from 47DPT07-100820, 47DPT08-100820, 47DPT09-100820, 47DPT10-100820, 47DPT11-100820, 47DPT12-100820, 47DPT13-100820
L10080608	8/27/10	Microbac	Samples from 47SB-C03 (9-11), 47SB-C05 (9-11)
L10080609	9/29/10	Microbac	Samples from 47SB-C01 (GW/VZ), 47SB-C03 (GW/VZ), 47SB-E01 (GW/VZ), 47SB-E03 (GW/VZ), 47SB-E05 (GW/VZ)
L10080654	8/30/10	Microbac	Samples from 47SB-C01 (4-6), 47SB-C03 (4-6), 47SB-C05 (4-6), 47SB-E01 (4-6), 47SB-E03 (4-6), 47SB-E05 (4-6
L10080655	9/3/10	Microbac	Samples from 47SB-C01 (0-2), 47SB-C03 (0-2), 47SB-C05 (0-2), 47SB-E01 (0-2), 47SB-E03 (0-2), 47SB-E05 (0-2), DUP-02-100820, DUP-03-100820, DUP-04-100820
L10080740	9/8/10	Microbac	Samples from 47SB-A01 (9-11), 47SB-A03 (9-11), 47SB-A05 (9-11), 47SB-C07 (9-11
L10080741	9/3/10	Microbac	Samples from 47SB-A01 (GW/VZ), 47SB-A03 (GW/VZ), 47SB-A05 (GW/VZ), 47SB-A07 (GW/VZ), 47SB-A09 (GW/VZ), 47SB-C07 (GW/VZ)
L10080749	9/15/10	Microbac	Samples from 47SB-A01 (0-2), 47SB-A03 (0-2), 47SB-A05 (0-2), 47SB-A07 (0-2), 47SB-A09 (0-2), 47SB-C07 (0-2
L10080750	9/8/10	Microbac	Samples from 47SB-A01 (4-6), 47SB-A03 (4-6), 47SB-A05 (4-6), 47SB-A09 (4-6), 47SB-C07 (4-6
L10080792	9/8/10	Microbac	Samples from 47SB-C09 (GW/VZ), 47SB-C11 (GW/VZ), 47SB-E07 (GW/VZ), 47SB-E09 (GW/VZ), 47SB-G05 (GW/VZ), 47SB-G07 (GW/VZ), 47SB-K03 (GW/VZ), 47SB-K05 (GW/VZ), 47SB-K07, (GW/VZ), 47SB-I05 (GW/VZ), 47SB-I07 (GW/VZ)
L10080793	8/26/10 & 8/27/10	Microbac	Samples from DUP-05-100827, DUP-06-100827, DUP-07-100827, DUP-08-100827, DUP-09-100827, DUP-10-100827
L10080794	8/27/10	Microbac	Samples from 47SB-C11 (9-11), 47SB-G05 (9-11), 47SB-G07 (9-11), 47SB-K05 (9-11), 47SB-K07 (9-11
L10080800	9/15/10	Microbac	Samples from 47SB-C09 (0-2), 47SB-C11 (0-2), 47SB-E07 (0-2), 47SB-E09 (0-2), 47SB-G05 (0-2), 47SB-G07 (0-2), 47SB-K03 (0-2), 47SB-K05 (0-2), 47SB-K07 (0-2), 47SB-I05 (0-2), 47SB-I07 (0-2

List of Laboratory Reports for Appendix C

Lab Report	Report Date	Laboratory	Description
L10080803	8/27/10	Microbac	Samples from 47SB-C09(4-6), 47SB-C11 (4-6), 47SB-G05 (4-6), 47SB-G07 (4-6), 47SB-I05 (4-6), 47SB-I07 (4-6), 47SB-K05 (4-6), 47SB-K07 (4-6)
L10080844	9/15/10	Microbac	Samples from LHSMW60-100830
L10080846	9/15/10	Microbac	Samples from LHSMW60-100830
L10090073	9/15/10	Microbac	Samples from 47WW37-100901, 47WW38-100901, 47WW38-100901-FD
L10090229	9/21/10	Microbac	Samples from 47SB-I03 (0-2), 47SB-I03 (4-6), 47SB-K03 (9-11), 47SB-K03 (4-6
L10090358	9/21/10	Microbac	Samples from 47DPT14-100915, 47DPT15-100915
L10090490	10/6/2010	Microbac	Samples from five duplicate soil samples
L10090491	10/6/2010	Microbac	Samples from 47SB-J05 (17.5-18.5), 47SB-H04 (12-13), 47SB-H06 (20-21), 47SB-H07 (18-19), 47SB-H08 (14-15
L10090492	10/6/2010	Microbac	Samples from 47SB-J05 (9-11), 47SB-H04 (9-11), 47SB-H06 (9-11), 47SB-H07 (9-11), 47SB-H08 (9-11
L10090498	10/15/2010	Microbac	Samples from 47SB-J05 (4-6), 47SB-H04 (4-6), 47SB-H06 (4-6), 47SB-H07 (4-6), 47SB-H08 (4-6
L10090609	10/6/2010	Microbac	Samples from 47SB-J03 (4.5-6.5) and other samples
L10090610	10/21/2010	Microbac	Samples from 47SB-F04 and other soil samples, E09 is really E08
L10090612	10/21/2010	Microbac	Samples from 47SB-F03 (9-11), 47SB-B10 (9-11), 47SB-J06 (9-11)
L10090689	10/6/2010	Microbac	Sample from 47SB-F07 (4-6)
L10100086	10/11/2010	Microbac	Samples from 47SB-F04 (4-6) and other samples, E09 is really E08
L10100195	10/15/2010	Microbac	Sample from 47SB-F07 (0-2)
L10100283	10/22/2010	Microbac	Samples from 47SB-J05 (0-2), 47SB-H04 (0-2), 47SB-H06 (0-2), 47SB-H08 (0-2
T16411	4/10/07	Accutest	Samples from 47WW13, 47WW13-FEB2007, 47WW14, 47WW14-FEB2007, 47WW14-FEB2007FD
T16432	2/21/07	Accutest	Sample from 47WW09, 47WW09-FEB2007
T16445	2/22/07	Accutest	Samples from 47WW30, 47WW30-FEB2007, LHSMW43, LHSMW43-FEB2007

Notes:

Accutest Gulf Coast, 10165 Harwin Drive, Suite 150, Houston, Texas 77036
Kemron Environmental Services, 156 Starlite Drive, Marietta, Ohio 45750
Microbac Laboratories, Inc., 158 Starlite Drive, Marietta, Ohio 45750
Scanned laboratory reports are available on the CD included in the Final Feasibility Study.

00100755

Table C-1
Additional Sample Results Not Previously Presented

	Location Code		105					47WW01					47WW03					47WW04					47WW05					47WW06				
	Sample No.		105-021809					47WW01-101807					47WW03-101707					47WW04-101807					47WW05-102007					47WW06-091307				
	Sample Date		2/18/09					10/18/07					10/17/07					10/18/07					10/20/07					9/13/07				
	Groundwater Zone		SHALLOW					SHALLOW					SHALLOW					SHALLOW					SHALLOW					SHALLOW/INTERMEDIATE				
	Sample Purpose		REG					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**	**Result**	**Qual**	**ValQual**	**RC**	**DF**
DHE	Dehalococcoides	cells/ml	39000				10																									
FIELD TESTS	Dissolved Oxygen	µg/L	250					3300				1	550				1	410				1	3410				1					
FIELD TESTS	Ferrous iron	µg/L																														
FIELD TESTS	Oxygen Reduction Potential	mV	-360					482.9				1	6655				1	783.1				1	564.6				1					
FIELD TESTS	pH	STD UNIT	6.47					6.58				1	6.39				1	6.34				1	6.06				1					
FIELD TESTS	Salinity	µg/L																														
FIELD TESTS	Specific Conductivity	uS/cm	6990					2190				1	4870				1	5997				1	2880				1					
FIELD TESTS	Temperature	Deg C	18.63					21.53				1	21.72				1	22.5				1	21.89				1					
FIELD TESTS	Turbidity	NTU	2285					27.1				1	1.5				1	12.5				1	738.7				1					
GASES	Ethane	µg/L	1	U	U		1																									
GASES	Ethylene	µg/L	1	U	U		1																									
GASES	Methane	µg/L	1.19	J	J	15	1																									
GEN CHEMISTRY	Carbon Dioxide	µg/L																														
GEN CHEMISTRY	Chloride	µg/L	811000				1																									
GEN CHEMISTRY	Fluoride, Total	mg/L	2000	U	U		1																									
GEN CHEMISTRY	Nitrate	µg/L	2000	U	U		1																									
GEN CHEMISTRY	Nitrate / Nitrite	µg/L																														
GEN CHEMISTRY	Nitrite	µg/L	2000	U	U		1																									
GEN CHEMISTRY	Perchlorate	µg/L																														
GEN CHEMISTRY	pH	STD UNIT																														
GEN CHEMISTRY	Specific Conductivity	uS/cm																														
GEN CHEMISTRY	Sulfate	µg/L	2210000				1																									
GEN CHEMISTRY	Sulfide	µg/L																														
GEN CHEMISTRY	Total Alkalinity	µg/L																														
GEN CHEMISTRY	TOTAL DISSOLVED SOLIDS	µg/L																										892000				1
GEN CHEMISTRY	Total Organic Carbon	µg/L	31700				1																									
GEN CHEMISTRY	TOTAL SUSPENDED SOLIDS	µg/L																										17000				1
METALS	Aluminum	µg/L																										310		J	13	1
METALS	Antimony	µg/L																										10	U	U		10
METALS	Arsenic	µg/L																										57.8		J	13	10
METALS	Barium	µg/L																										81.7				10
METALS	Beryllium	µg/L																										2	U	U		1
METALS	Cadmium	µg/L																										5	U	U		10
METALS	Calcium	µg/L																										27200		J	09	1
METALS	Chromium	µg/L																										114				10
METALS	Cobalt	µg/L																										14.4		J	13	1
METALS	Copper	µg/L																										5.92	J	J	13, 15	10
METALS	Iron	µg/L																										5250				1
METALS	Lead	µg/L																										5	U	U		10
METALS	Magnesium	µg/L																										17300				1
METALS	Manganese	µg/L																										239		J	13	10
METALS	Mercury	µg/L																										0.2	U	U		1
METALS	Nickel	µg/L																										34.6	J	J	15	10
METALS	Potassium	µg/L																										2990				1
METALS	Selenium	µg/L																										9.92	J	J	13, 15	10
METALS	Silver	µg/L																										10	U	U		10
METALS	Sodium	µg/L																										292000		J	09	20
METALS	Thallium	µg/L																										2.9		J	13	10
METALS	Vanadium	µg/L																										10	U	U		1
METALS	Zinc	µg/L																										27.9		J	13	1
METALS-DISS	Aluminum	µg/L																										100	U	UJ	13	1
METALS-DISS	Antimony	µg/L																										10	U	U		10
METALS-DISS	Arsenic	µg/L																										20.6		J	13	10
METALS-DISS	Barium	µg/L																										49.4				10
METALS-DISS	Beryllium	µg/L																										2	U	U		1
METALS-DISS	Cadmium	µg/L																										5	U	U		10
METALS-DISS	Calcium	µg/L																										28700		J	09	1
METALS-DISS	Chromium	µg/L																										11	J	J	13, 15	10
METALS-DISS	Cobalt	µg/L																										10.6		J	13	1
METALS-DISS	Copper	µg/L																										20	U	U		10
METALS-DISS	Iron	µg/L																										361				1
METALS-DISS	Lead	µg/L																										5	U	U		10
METALS-DISS	Magnesium	µg/L																										14900				1
METALS-DISS	Manganese	µg/L																										196				10
METALS-DISS	Mercury	µg/L																										0.2	U	U		1
METALS-DISS	Nickel	µg/L																										22.4	J	J	13, 15	10
METALS-DISS	Potassium	µg/L																										3010				1
METALS-DISS	Selenium	µg/L																										10	U	U		10
METALS-DISS	Silver	µg/L																										10	U	U		10
METALS-DISS	Sodium	µg/L																										331000		J	09	20
METALS-DISS	Thallium	µg/L																										4.41				10
METALS-DISS	Vanadium	µg/L																										10	U	U		1
METALS-DISS	Zinc	µg/L																										20.5		J	13	1

Table C-1
Additional Sample Results Not Previously Presented

	Location Code		105					47WW01					47WW03					47WW04					47WW05					47WW06				
	Sample No.		105-021809					47WW01-101807					47WW03-101707					47WW04-101807					47WW05-102007					47WW06-091307				
	Sample Date		2/18/09					10/18/07					10/17/07					10/18/07					10/20/07					9/13/07				
	Groundwater Zone		SHALLOW					SHALLOW					SHALLOW					SHALLOW					SHALLOW					SHALLOW/INTERMEDIATE				
	Sample Purpose		REG					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	Result	Qual	ValQual	RC	DF
VOLATILES	1,1,1,2-Tetrachloroethane	µg/L	0.25	U	U		1																									
VOLATILES	1,1,1-Trichloroethane	µg/L	0.25	U	U		1	1	U	UJ	07A	1	1	U	U		1	1	U	U		1	1	U	U		1					
VOLATILES	1,1,2,2-Tetrachloroethane	µg/L	0.125	U	U		1	1	U	UJ	07A	1	1	U	U		1	1	U	U		1	1	U	U		1					
VOLATILES	1,1,2-Trichloroethane	µg/L	0.25	U	U		1	1	U	UJ	07A	1	1	U	U		1	1	U	U		1	1	U	U		1					
VOLATILES	1,1-Dichloroethane	µg/L	0.125	U	U		1	0.536	J	J	15, 07A	1	1	U	U		1	1	U	U		1	1	U	U		1					
VOLATILES	1,1-Dichloroethene	µg/L	0.5	U	U		1	1	U	UJ	07A	1	1	U	U		1	1	U	U		1	0.702	J	J	15	1					
VOLATILES	1,1-Dichloropropene	µg/L	0.25	U	U		1																									
VOLATILES	1,2,3-Trichlorobenzene	µg/L	0.15	U	U		1																									
VOLATILES	1,2,3-Trichloropropane	µg/L	0.5	U	U		1																									
VOLATILES	1,2,4-Trichlorobenzene	µg/L	0.2	U	U		1	1	U	UJ	07A	1	1	U	U		1	1	U	U		1	1	U	U		1					
VOLATILES	1,2,4-Trimethylbenzene	µg/L	0.25	U	U		1																									
VOLATILES	1,2-Dibromo-3-chloropropane	µg/L	1	U	U		1	5	U	UJ	07A	1	5	U	U		1	5	U	U		1	5	U	U		1					
VOLATILES	1,2-Dibromoethane	µg/L	0.25	U	U		1	1	U	UJ	07A	1	1	U	U		1	1	U	U		1	1	U	U		1					
VOLATILES	1,2-Dichlorobenzene	µg/L	0.125	U	U		1	1	U	UJ	07A	1	1	U	U		1	1	U	U		1	1	U	U		1					
VOLATILES	1,2-Dichloroethane	µg/L	0.25	U	U		1	1	U	UJ	07A	1	1	U	U		1	1	U	U		1	1	U	U		1					
VOLATILES	1,2-Dichloropropane	µg/L	0.2	U	U		1	1	U	UJ	07A	1	1	U	U		1	1	U	U		1	1	U	U		1					
VOLATILES	1,2-Dimethylbenzene (o-Xylene)	µg/L	0.25	U	U		1																									
VOLATILES	1,3,5-Trimethylbenzene	µg/L	0.25	U	U		1																									
VOLATILES	1,3-Dichlorobenzene	µg/L	0.25	U	U		1	1	U	UJ	07A	1	1	U	U		1	1	U	U		1	1	U	U		1					
VOLATILES	1,3-Dichloropropane	µg/L	0.2	U	U		1																									
VOLATILES	1,4-Dichlorobenzene	µg/L	0.125	U	U		1	1	U	UJ	07A	1	1	U	U		1	1	U	U		1	1	U	U		1					
VOLATILES	2,2-Dichloropropane	µg/L	0.25	U	U		1																									
VOLATILES	2-Butanone	µg/L	2.5	U	U		1	10	U	UJ	07A	1	10	U	U		1	10	U	U		1	10	U	U		1					
VOLATILES	2-Chloroethyl vinyl ether	µg/L	2	U	U		1																									
VOLATILES	2-Chlorotoluene	µg/L	0.125	U	U		1																									
VOLATILES	2-Hexanone	µg/L	2.5	U	U		1	10	U	UJ	07A	1	10	U	U		1	10	U	U		1	10	U	U		1					
VOLATILES	4-Chlorotoluene	µg/L	0.25	U	U		1																									
VOLATILES	Acetone	µg/L	2.5	U	U		1	10	U	UJ	07A	1	10	U	U		1	10	U	U		1	10	U	U		1					
VOLATILES	Benzene	µg/L	0.125	U	U		1	1	U	UJ	07A	1	1	U	U		1	1	U	U		1	1	U	U		1					
VOLATILES	Bromobenzene	µg/L	0.125	U	U		1																									
VOLATILES	Bromochloromethane	µg/L	0.2	U	U		1																									
VOLATILES	Bromodichloromethane	µg/L	0.25	U	U		1	1	U	UJ	07A	1	1	U	U		1	1	U	U		1	1	U	U		1					
VOLATILES	Bromoform	µg/L	0.5	U	U		1	1	U	UJ	07A	1	1	U	U		1	1	U	U		1	1	U	U		1					
VOLATILES	Bromomethane	µg/L	0.5	U	U		1	1	U	UJ	07A	1	1	U	U		1	1	U	U		1	1	U	U		1					
VOLATILES	Carbon disulfide	µg/L	0.5	U	U		1	1	U	UJ	07A	1	1	U	U		1	1	U	U		1	1	U	U		1					
VOLATILES	Carbon tetrachloride	µg/L	0.25	U	U		1	1	U	UJ	07A	1	1	U	U		1	1	U	U		1	1	U	U		1					
VOLATILES	Chlorobenzene	µg/L	0.125	U	U		1	1	U	UJ	07A	1	1	U	U		1	1	U	U		1	1	U	U		1					
VOLATILES	Chloroethane	µg/L	0.5	U	U		1	1	U	UJ	07A	1	1	U	U		1	1	U	U		1	1	U	U		1					
VOLATILES	Chloroform	µg/L	0.125	U	U		1	1	U	UJ	07A	1	1	U	U		1	1	U	U		1	0.277	J	J	15	1					
VOLATILES	Chloromethane	µg/L	0.25	U	U		1	0.31	J	J	15, 07A	1	1	U	U		1	1	U	U		1	1	U	U		1					
VOLATILES	cis-1,2-Dichloroethene	µg/L	1.64				1	1	U	UJ	07A	1	1	U	U		1	1	U	U		1	6.44				1					
VOLATILES	cis-1,3-Dichloropropene	µg/L	0.25	U	U		1	1	U	UJ	07A	1	1	U	U		1	1	U	U		1	1	U	U		1					
VOLATILES	Cyclohexane	µg/L						5	U	UJ	07A	1	5	U	U		1	5	U	U		1	5	U	U		1					
VOLATILES	Dibromochloromethane	µg/L	0.25	U	U		1	1	U	UJ	07A	1	1	U	U		1	1	U	U		1	1	U	U		1					
VOLATILES	Dibromomethane	µg/L	0.25	U	U		1																									
VOLATILES	Dichlorodifluoromethane	µg/L	0.25	U	U		1	1	U	UJ	07A	1	1	U	U		1	1	U	U		1	1	U	U		1					
VOLATILES	Ethylbenzene	µg/L	0.25	U	U		1	1	U	UJ	07A	1	1	U	U		1	1	U	U		1	1	U	U		1					
VOLATILES	Freon 113	µg/L						1420				20	0.602	J	J	15	1	5	U	U		1	3.16	J	J	15	1					
VOLATILES	Hexachlorobutadiene	µg/L	0.25	U	U		1																									
VOLATILES	Isopropylbenzene	µg/L	0.25	U	U		1	1	U	UJ	07A	1	1	U	U		1	1	U	U		1	1	U	U		1					
VOLATILES	m,p-Xylenes	µg/L	0.5	U	U		1																									
VOLATILES	Methyl Acetate	µg/L						10	U	UJ	07A	1	10	U	U		1	10	U	U		1	10	U	U		1					
VOLATILES	Methyl isobutyl ketone	µg/L	2.5	U	U		1	10	U	UJ	07A	1	10	U	U		1	10	U	U		1	10	U	U		1					
VOLATILES	Methyl tert-butyl ether	µg/L						5	U	UJ	07A	1	5	U	U		1	5	U	U		1	5	U	U		1					
VOLATILES	Methylcyclohexane	µg/L						10	U	UJ	07A	1	10	U	U		1	10	U	U		1	10	U	U		1					
VOLATILES	Methylene chloride	µg/L	0.25	U	U		1	2	U	UJ	07A	1	2	U	U		1	2	U	U		1	2	U	U		1					
VOLATILES	Naphthalene	µg/L	0.2	U	U		1																									
VOLATILES	n-BUTYLBENZENE	µg/L	0.25	U	U		1																									
VOLATILES	n-PROPYLBENZENE	µg/L	0.125	U	U		1																									
VOLATILES	p-ISOPROPYLTOLUENE	µg/L	0.25	U	U		1																									
VOLATILES	sec-BUTYLBENZENE	µg/L	0.25	U	U		1																									
VOLATILES	Styrene	µg/L	0.125	U	U		1	1	U	UJ	07A	1	1	U	U		1	1	U	U		1	1	U	U		1					
VOLATILES	tert-BUTYLBENZENE	µg/L	0.25	U	U		1																									
VOLATILES	Tetrachloroethene	µg/L	0.25	U	U		1	1	U	UJ	07A	1	1	U	U		1	1	U	U		1	1	U	U		1					
VOLATILES	Toluene	µg/L	0.25	U	U		1	1	U	UJ	07A	1	1	U	U		1	1	U	U		1	1	U	U		1					
VOLATILES	trans-1,2-Dichloroethene	µg/L	0.25	U	U		1	1	U	UJ	07A	1	1	U	U		1	1	U	U		1	1	U	U		1					
VOLATILES	trans-1,3-Dichloropropene	µg/L	0.5	U	U		1	1	U	UJ	07A	1	1	U	U		1	1	U	U		1	1	U	U		1					
VOLATILES	Trichloroethene	µg/L	21.9				1	0.337	J	J	15, 07A	1	1	U	U		1	1	U	U		1	759				10					
VOLATILES	Trichlorofluoromethane	µg/L	0.25	U	U		1	1	U	UJ	07A	1	1	U	U		1	1	U	U		1	1	U	U		1					
VOLATILES	Vinyl acetate	µg/L	2.5	U	U		1																									
VOLATILES	Vinyl chloride	µg/L	0.25	U	U		1	1	U	UJ	07A	1	1	U	U		1	1	U	U		1	1	U	U		1					
VOLATILES	Xylenes, Total	µg/L						1	U	UJ	07A	1	1	U	U		1	1	U	U		1	1	U	U		1					

Table C-1
Additional Sample Results Not Previously Presented

		Location Code	47WW07					47WW08				
		Sample No.	47WW07-091307					47WW08-101707				
		Sample Date	9/13/07					10/17/07				
		Groundwater Zone	DEEP					SHALLOW				
		Sample Purpose	REG					REG				
Test Group	**Parameter**	**Units**	**Result**	**Qual**	**ValQual**	**RC**	**DF**	**Result**	**Qual**	**ValQual**	**RC**	**DF**
DHE	Dehalococcoides	cells/ml										
FIELD TESTS	Dissolved Oxygen	µg/L						4240				1
FIELD TESTS	Ferrous iron	µg/L										
FIELD TESTS	Oxygen Reduction Potential	mV						493.6				1
FIELD TESTS	pH	STD UNIT						6.33				1
FIELD TESTS	Salinity	µg/L										
FIELD TESTS	Specific Conductivity	uS/cm						6485				1
FIELD TESTS	Temperature	Deg C						23.32				1
FIELD TESTS	Turbidity	NTU						2655.9				1
GASES	Ethane	µg/L										
GASES	Ethylene	µg/L										
GASES	Methane	µg/L										
GEN CHEMISTRY	Carbon Dioxide	µg/L										
GEN CHEMISTRY	Chloride	µg/L										
GEN CHEMISTRY	Fluoride, Total	mg/L										
GEN CHEMISTRY	Nitrate	µg/L										
GEN CHEMISTRY	Nitrate / Nitrite	µg/L										
GEN CHEMISTRY	Nitrite	µg/L										
GEN CHEMISTRY	Perchlorate	µg/L										
GEN CHEMISTRY	pH	STD UNIT										
GEN CHEMISTRY	Specific Conductivity	uS/cm										
GEN CHEMISTRY	Sulfate	µg/L										
GEN CHEMISTRY	Sulfide	µg/L										
GEN CHEMISTRY	Total Alkalinity	µg/L										
GEN CHEMISTRY	TOTAL DISSOLVED SOLIDS	µg/L	848000				1	1350000				1
GEN CHEMISTRY	Total Organic Carbon	µg/L										
GEN CHEMISTRY	TOTAL SUSPENDED SOLIDS	µg/L	4000	J	J	15	1	5190000				1
METALS	Aluminum	µg/L	69.4	J	J	13	1					
METALS	Antimony	µg/L	10	U	U		10					
METALS	Arsenic	µg/L	3.89	J	J	13, 15	10					
METALS	Barium	µg/L	88.6				10					
METALS	Beryllium	µg/L	2	U	U		1					
METALS	Cadmium	µg/L	5	U	U		10					
METALS	Calcium	µg/L	11300		J	09	1					
METALS	Chromium	µg/L	139				10					
METALS	Cobalt	µg/L	4.63	J	J	13	1					
METALS	Copper	µg/L	14.6	J	J	13, 15	10					
METALS	Iron	µg/L	3600				1					
METALS	Lead	µg/L	5	U	U		10					
METALS	Magnesium	µg/L	4270				1					
METALS	Manganese	µg/L	95.6		J	13	10					
METALS	Mercury	µg/L	0.2	U	U		1					
METALS	Nickel	µg/L	356				10					
METALS	Potassium	µg/L	3630				1					
METALS	Selenium	µg/L	11.5		J	13	10					
METALS	Silver	µg/L	10	U	U		10					
METALS	Sodium	µg/L	10000	U	UJ	09	20					
METALS	Thallium	µg/L	4.21		J	13	10					
METALS	Vanadium	µg/L	6.75	J	U	06A	1					
METALS	Zinc	µg/L	20	U	UJ	13	1					
METALS-DISS	Aluminum	µg/L	100	U	UJ	13	1	100	U	U		1
METALS-DISS	Antimony	µg/L	10	U	U		10	10	U	U		10
METALS-DISS	Arsenic	µg/L	10	U	UJ	13	10	5.32	J	J	15, 13	10
METALS-DISS	Barium	µg/L	43.9				10	43.3				10
METALS-DISS	Beryllium	µg/L	2	U	U		1	2	U	U		1
METALS-DISS	Cadmium	µg/L	5	U	U		10	5	U	U		10
METALS-DISS	Calcium	µg/L	12000		J	09	1	179000		J	09	1
METALS-DISS	Chromium	µg/L	20	U	UJ	13	10	72.5		J	13	10
METALS-DISS	Cobalt	µg/L	5	U	U		1	51		J	13	1
METALS-DISS	Copper	µg/L	20	U	U		10	20	U	U		10
METALS-DISS	Iron	µg/L	302		UJ	13	1	1510		J	13	1
METALS-DISS	Lead	µg/L	5	U	U		10	5	U	U		10
METALS-DISS	Magnesium	µg/L	4190				1	91900				1
METALS-DISS	Manganese	µg/L	7.25	J	J	15	10	2060		J	13	10
METALS-DISS	Mercury	µg/L	0.2	U	U		1	0.137	J	J	15, 06A	1
METALS-DISS	Nickel	µg/L	80.3		J	13	10	7410				100
METALS-DISS	Potassium	µg/L	3750				1	7130		J	13, 09	1
METALS-DISS	Selenium	µg/L	10	U	U		10	25.6				10
METALS-DISS	Silver	µg/L	10	U	U		10	10	U	U		10
METALS-DISS	Sodium	µg/L	367000		J	09	20	1010000		J	13, 09	10
METALS-DISS	Thallium	µg/L	4.62				10	4.1		J	13	10
METALS-DISS	Vanadium	µg/L	10	U	U		1	100	U	U		10
METALS-DISS	Zinc	µg/L	20	U	UJ	13	1	20	U	U		1

		Location Code	47WW09					47WW09				
		Sample No.	47WW09-FEB2007					47WW09-101607				
		Sample Date	2/21/07					10/16/07				
		Groundwater Zone	SHALLOW/INTERMEDIATE					SHALLOW/INTERMEDIATE				
		Sample Purpose	REG					REG				
Test Group	**Parameter**	**Units**	**Result**	**Qual**	**ValQual**	**RC**	**DF**	**Result**	**Qual**	**ValQual**	**RC**	**DF**
DHE	Dehalococcoides	cells/ml	12	U	U		1.2					
FIELD TESTS	Dissolved Oxygen	µg/L	2020				1	290				1
FIELD TESTS	Ferrous iron	µg/L	0				1					
FIELD TESTS	Oxygen Reduction Potential	mV	116.5				1	100.1				1
FIELD TESTS	pH	STD UNIT	7.37				1	6.82				1
FIELD TESTS	Salinity	µg/L	2570				1					
FIELD TESTS	Specific Conductivity	uS/cm	4800				1	4348				1
FIELD TESTS	Temperature	Deg C	19.26				1	20.04				1
FIELD TESTS	Turbidity	NTU	16.3				1	0.4				1
GASES	Ethane	µg/L	0.6	U	U		1					
GASES	Ethylene	µg/L	0.8	U	U		1					
GASES	Methane	µg/L	0.3	U	U		1					
GEN CHEMISTRY	Carbon Dioxide	µg/L	73000				1					
GEN CHEMISTRY	Chloride	µg/L	585000				1					
GEN CHEMISTRY	Fluoride, Total	mg/L										
GEN CHEMISTRY	Nitrate	µg/L	5	U	U		1					
GEN CHEMISTRY	Nitrate / Nitrite	µg/L	5	U	U		1					
GEN CHEMISTRY	Nitrite	µg/L	3	U	U		1					
GEN CHEMISTRY	Perchlorate	µg/L	4	U	U		1					
GEN CHEMISTRY	pH	STD UNIT	7.1				1					
GEN CHEMISTRY	Specific Conductivity	uS/cm	3750				1					
GEN CHEMISTRY	Sulfate	µg/L	946000				10					
GEN CHEMISTRY	Sulfide	µg/L	200	U	U		1					
GEN CHEMISTRY	Total Alkalinity	µg/L	459000				1					
GEN CHEMISTRY	TOTAL DISSOLVED SOLIDS	µg/L						2750000				1
GEN CHEMISTRY	Total Organic Carbon	µg/L	6000				1					
GEN CHEMISTRY	TOTAL SUSPENDED SOLIDS	µg/L						7500				1
METALS	Aluminum	µg/L										
METALS	Antimony	µg/L										
METALS	Arsenic	µg/L										
METALS	Barium	µg/L										
METALS	Beryllium	µg/L										
METALS	Cadmium	µg/L										
METALS	Calcium	µg/L										
METALS	Chromium	µg/L										
METALS	Cobalt	µg/L										
METALS	Copper	µg/L										
METALS	Iron	µg/L										
METALS	Lead	µg/L										
METALS	Magnesium	µg/L										
METALS	Manganese	µg/L										
METALS	Mercury	µg/L										
METALS	Nickel	µg/L										
METALS	Potassium	µg/L										
METALS	Selenium	µg/L										
METALS	Silver	µg/L										
METALS	Sodium	µg/L										
METALS	Thallium	µg/L										
METALS	Vanadium	µg/L										
METALS	Zinc	µg/L										
METALS-DISS	Aluminum	µg/L						100	U	U		1
METALS-DISS	Antimony	µg/L						10	U	U		10
METALS-DISS	Arsenic	µg/L						3.91	J	J	15, 13	10
METALS-DISS	Barium	µg/L						18.3	J	J	15	10
METALS-DISS	Beryllium	µg/L						2	U	U		1
METALS-DISS	Cadmium	µg/L						5	U	UJ	13	10
METALS-DISS	Calcium	µg/L						176000		J	09	1
METALS-DISS	Chromium	µg/L						9.23	J	J	15	10
METALS-DISS	Cobalt	µg/L						5	U	UJ	13	1
METALS-DISS	Copper	µg/L						20	U	U		10
METALS-DISS	Iron	µg/L						196		J	13	1
METALS-DISS	Lead	µg/L						5	U	U		10
METALS-DISS	Magnesium	µg/L						124000				1
METALS-DISS	Manganese	µg/L						141		J	13	10
METALS-DISS	Mercury	µg/L						0.2	U	U		1
METALS-DISS	Nickel	µg/L						10.7	J	J	15	10
METALS-DISS	Potassium	µg/L						6680		J	13, 09	1
METALS-DISS	Selenium	µg/L						16.7				10
METALS-DISS	Silver	µg/L						10	U	U		10
METALS-DISS	Sodium	µg/L						633000		J	13, 09	10
METALS-DISS	Thallium	µg/L						2.44		J	13	10
METALS-DISS	Vanadium	µg/L						100	U	U		10
METALS-DISS	Zinc	µg/L						20	U	U		1

		Location Code	47WW09					47WW09				
		Sample No.	47WW09-101607FD					47WW09-113007				
		Sample Date	10/16/07					11/30/07				
		Groundwater Zone	SHALLOW/INTERMEDIATE					SHALLOW/INTERMEDIATE				
		Sample Purpose	FD					REG				
Test Group	**Parameter**	**Units**	**Result**	**Qual**	**ValQual**	**RC**	**DF**	**Result**	**Qual**	**ValQual**	**RC**	**DF**
DHE	Dehalococcoides	cells/ml										
FIELD TESTS	Dissolved Oxygen	µg/L						470				1
FIELD TESTS	Ferrous iron	µg/L										
FIELD TESTS	Oxygen Reduction Potential	mV						-24.6				1
FIELD TESTS	pH	STD UNIT						6.99				1
FIELD TESTS	Salinity	µg/L										
FIELD TESTS	Specific Conductivity	uS/cm						4339				1
FIELD TESTS	Temperature	Deg C						17.58				1
FIELD TESTS	Turbidity	NTU						0				1
GASES	Ethane	µg/L										
GASES	Ethylene	µg/L										
GASES	Methane	µg/L										
GEN CHEMISTRY	Carbon Dioxide	µg/L										
GEN CHEMISTRY	Chloride	µg/L										
GEN CHEMISTRY	Fluoride, Total	mg/L										
GEN CHEMISTRY	Nitrate	µg/L										
GEN CHEMISTRY	Nitrate / Nitrite	µg/L										
GEN CHEMISTRY	Nitrite	µg/L										
GEN CHEMISTRY	Perchlorate	µg/L										
GEN CHEMISTRY	pH	STD UNIT										
GEN CHEMISTRY	Specific Conductivity	uS/cm										
GEN CHEMISTRY	Sulfate	µg/L										
GEN CHEMISTRY	Sulfide	µg/L										
GEN CHEMISTRY	Total Alkalinity	µg/L										
GEN CHEMISTRY	TOTAL DISSOLVED SOLIDS	µg/L	2840000				1	3660000				1
GEN CHEMISTRY	Total Organic Carbon	µg/L										
GEN CHEMISTRY	TOTAL SUSPENDED SOLIDS	µg/L	13500				1	5000	U	UJ	17	1
METALS	Aluminum	µg/L						100	U	U		1
METALS	Antimony	µg/L						1	U	U		1
METALS	Arsenic	µg/L						3.78				1
METALS	Barium	µg/L						18.6				1
METALS	Beryllium	µg/L						10	U	U		1
METALS	Cadmium	µg/L						10	U	U		1
METALS	Calcium	µg/L						172000				1
METALS	Chromium	µg/L						91.1				1
METALS	Cobalt	µg/L						20	U	U		1
METALS	Copper	µg/L						20	U	U		1
METALS	Iron	µg/L						2450				1
METALS	Lead	µg/L						1.62		J	17	1
METALS	Magnesium	µg/L						123000				1
METALS	Manganese	µg/L						168				1
METALS	Mercury	µg/L						0.2	U	U		1
METALS	Nickel	µg/L						40	U	U		1
METALS	Potassium	µg/L						6710				1
METALS	Selenium	µg/L						5.24				1
METALS	Silver	µg/L						10	U	U		1
METALS	Sodium	µg/L						627000				5
METALS	Thallium	µg/L						0.0568	J	J	15	1
METALS	Vanadium	µg/L						100	U	U		10
METALS	Zinc	µg/L						20	U	U		1
METALS-DISS	Aluminum	µg/L	384				1	100	U	U		1
METALS-DISS	Antimony	µg/L	10	U	U		10	1	U	U		1
METALS-DISS	Arsenic	µg/L	4.61	J	J	15	10	3.57				1
METALS-DISS	Barium	µg/L	20.6	J	J	15	10	17.5				1
METALS-DISS	Beryllium	µg/L	2	U	U		1	10	U	U		1
METALS-DISS	Cadmium	µg/L	5	U	U		10	10	U	U		1
METALS-DISS	Calcium	µg/L	171000		J	09	1	175000				1
METALS-DISS	Chromium	µg/L	5.14	J	J	15, 13	10	20	U	U		1
METALS-DISS	Cobalt	µg/L	5	U	UJ	13	1	20	U	U		1
METALS-DISS	Copper	µg/L	20	U	U		10	20	U	U		1
METALS-DISS	Iron	µg/L	348		J	13	1	70.3	J	J	15	1
METALS-DISS	Lead	µg/L	5	U	U		10	9.39		J	17	1
METALS-DISS	Magnesium	µg/L	120000				1	123000				1
METALS-DISS	Manganese	µg/L	151		J	13	10	159				1
METALS-DISS	Mercury	µg/L	0.2	U	U		1	0.2	U	U		1
METALS-DISS	Nickel	µg/L	12.8	J	J	15	10	40	U	U		1
METALS-DISS	Potassium	µg/L	6290		J	13, 09	1	6230				1
METALS-DISS	Selenium	µg/L	16.7				10	4.19				1
METALS-DISS	Silver	µg/L	10	U	U		10	10	U	U		1
METALS-DISS	Sodium	µg/L	618000		J	13, 09	10	627000				10
METALS-DISS	Thallium	µg/L	1.72	J	J	15, 13	10	0.2	U	U		1
METALS-DISS	Vanadium	µg/L	100	U	U		10	100	U	U		10
METALS-DISS	Zinc	µg/L	20	U	U		1	20	U	U		1

Shaw Environmental, Inc.

Table C-1
Additional Sample Results Not Previously Presented

	Location Code		47WW07					47WW08					47WW09					47WW09					47WW09					47WW09				
	Sample No.		47WW07-091307					47WW08-101707					47WW09-FEB2007					47WW09-101607					47WW09-101607FD					47WW09-113007				
	Sample Date		9/13/07					10/17/07					2/21/07					10/16/07					10/16/07					11/30/07				
	Groundwater Zone		DEEP					SHALLOW					SHALLOW/INTERMEDIATE					SHALLOW/INTERMEDIATE					SHALLOW/INTERMEDIATE					SHALLOW/INTERMEDIATE				
	Sample Purpose		REG					REG					REG					REG					FD					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	Result	Qual	ValQual	RC	DF
VOLATILES	1,1,1,2-Tetrachloroethane	µg/L																														
VOLATILES	1,1,1-Trichloroethane	µg/L											0.37	U	U		1															
VOLATILES	1,1,2,2-Tetrachloroethane	µg/L											0.46	U	U		1															
VOLATILES	1,1,2-Trichloroethane	µg/L											0.66	U	U		1															
VOLATILES	1,1-Dichloroethane	µg/L											0.52	U	U		1															
VOLATILES	1,1-Dichloroethene	µg/L											4.6				1															
VOLATILES	1,1-Dichloropropene	µg/L																														
VOLATILES	1,2,3-Trichlorobenzene	µg/L																														
VOLATILES	1,2,3-Trichloropropane	µg/L																														
VOLATILES	1,2,4-Trichlorobenzene	µg/L																														
VOLATILES	1,2,4-Trimethylbenzene	µg/L																														
VOLATILES	1,2-Dibromo-3-chloropropane	µg/L																														
VOLATILES	1,2-Dibromoethane	µg/L																														
VOLATILES	1,2-Dichlorobenzene	µg/L																														
VOLATILES	1,2-Dichloroethane	µg/L											0.53	U	U		1															
VOLATILES	1,2-Dichloropropane	µg/L											0.59	U	U		1															
VOLATILES	1,2-Dimethylbenzene (o-Xylene)	µg/L																														
VOLATILES	1,3,5-Trimethylbenzene	µg/L																														
VOLATILES	1,3-Dichlorobenzene	µg/L																														
VOLATILES	1,3-Dichloropropane	µg/L																														
VOLATILES	1,4-Dichlorobenzene	µg/L																														
VOLATILES	2,2-Dichloropropane	µg/L																														
VOLATILES	2-Butanone	µg/L											3	U	U		1															
VOLATILES	2-Chloroethyl vinyl ether	µg/L																														
VOLATILES	2-Chlorotoluene	µg/L																														
VOLATILES	2-Hexanone	µg/L											1.9	U	U		1															
VOLATILES	4-Chlorotoluene	µg/L																														
VOLATILES	Acetone	µg/L											2.8	U	U		1															
VOLATILES	Benzene	µg/L											0.23	U	U		1															
VOLATILES	Bromobenzene	µg/L																														
VOLATILES	Bromochloromethane	µg/L																														
VOLATILES	Bromodichloromethane	µg/L											0.33	U	U		1															
VOLATILES	Bromoform	µg/L											0.65	U	U		1															
VOLATILES	Bromomethane	µg/L											0.47	U	U		1															
VOLATILES	Carbon disulfide	µg/L											0.62	U	U		1															
VOLATILES	Carbon tetrachloride	µg/L											0.52	U	U		1															
VOLATILES	Chlorobenzene	µg/L											0.54	U	U		1															
VOLATILES	Chloroethane	µg/L											0.46	U	UJ	05B	1															
VOLATILES	Chloroform	µg/L											0.66	U	U		1															
VOLATILES	Chloromethane	µg/L											0.6	U	U		1															
VOLATILES	cis-1,2-Dichloroethene	µg/L											144				1															
VOLATILES	cis-1,3-Dichloropropene	µg/L											0.59	U	U		1															
VOLATILES	Cyclohexane	µg/L																														
VOLATILES	Dibromochloromethane	µg/L											0.68	U	U		1															
VOLATILES	Dibromomethane	µg/L																														
VOLATILES	Dichlorodifluoromethane	µg/L																														
VOLATILES	Ethylbenzene	µg/L											0.48	U	U		1															
VOLATILES	Freon 113	µg/L																														
VOLATILES	Hexachlorobutadiene	µg/L																														
VOLATILES	Isopropylbenzene	µg/L																														
VOLATILES	m,p-Xylenes	µg/L																														
VOLATILES	Methyl Acetate	µg/L																														
VOLATILES	Methyl isobutyl ketone	µg/L											7.3	U	U		1															
VOLATILES	Methyl tert-butyl ether	µg/L																														
VOLATILES	Methylcyclohexane	µg/L																														
VOLATILES	Methylene chloride	µg/L											0.67	U	U		1															
VOLATILES	Naphthalene	µg/L																														
VOLATILES	n-BUTYLBENZENE	µg/L																														
VOLATILES	n-PROPYLBENZENE	µg/L																														
VOLATILES	p-ISOPROPYLTOLUENE	µg/L																														
VOLATILES	sec-BUTYLBENZENE	µg/L																														
VOLATILES	Styrene	µg/L											0.5	U	U		1															
VOLATILES	tert-BUTYLBENZENE	µg/L																														
VOLATILES	Tetrachloroethene	µg/L											12.2				1															
VOLATILES	Toluene	µg/L											0.54	U	U		1															
VOLATILES	trans-1,2-Dichloroethene	µg/L											0.75	U	U		1															
VOLATILES	trans-1,3-Dichloropropene	µg/L											0.61	U	U		1															
VOLATILES	Trichloroethene	µg/L											2230				100															
VOLATILES	Trichlorofluoromethane	µg/L																														
VOLATILES	Vinyl acetate	µg/L																														
VOLATILES	Vinyl chloride	µg/L											0.32	U	U		1															
VOLATILES	Xylenes, Total	µg/L											1.1	U	U		1															

Table C-1
Additional Sample Results Not Previously Presented

	Location Code		47WW09					47WW09					47WW12					47WW13					47WW13					47WW13					
	Sample No.		47WW09-113007-QA					47WW09-021809					47WW12-042209					47WW13-FEB2007					47WW13-101607					47WW13-113007					
	Sample Date		11/30/07					2/18/09					4/22/09					2/20/07					10/16/07					11/30/07					
	Groundwater Zone		SHALLOW/INTERMEDIATE					SHALLOW/INTERMEDIATE					SHALLOW					SHALLOW					SHALLOW					SHALLOW					
	Sample Purpose		FD					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	Result	Qual	ValQual	RC	DF	Result
DHE	Dehalococcoides	cells/ml						2600				1						77	U	U		7.7											11000
FIELD TESTS	Dissolved Oxygen	µg/L						280										4880				1	1870				1	2880				1	5530
FIELD TESTS	Ferrous iron	µg/L																0				1											
FIELD TESTS	Oxygen Reduction Potential	mV						-198.1										404				1	156.4				1	410.7				1	291.9
FIELD TESTS	pH	STD UNIT						7.32										5.95				1	5.63				1	5.78				1	5.73
FIELD TESTS	Salinity	µg/L																100				1											
FIELD TESTS	Specific Conductivity	uS/cm						4074										203				1	212				1	212				1	200
FIELD TESTS	Temperature	Deg C						18.81										18.42				1	24.83				1	22.2				1	15.38
FIELD TESTS	Turbidity	NTU						-19.1										1423.4				1	163.2				1	12.4				1	181.1
GASES	Ethane	µg/L						1	U	U		1						0.6	U	U		1											1
GASES	Ethylene	µg/L						1	U	U		1						0.8	U	U		1											2.06
GASES	Methane	µg/L						3.55	J	J	15	1						20.6				1											31.5
GEN CHEMISTRY	Carbon Dioxide	µg/L																110000				1											
GEN CHEMISTRY	Chloride	µg/L						513000				1						13000				1											12200
GEN CHEMISTRY	Fluoride, Total	mg/L						1000	U	U		1																					345
GEN CHEMISTRY	Nitrate	µg/L						1000	U	U		1						980				1											159
GEN CHEMISTRY	Nitrate / Nitrite	µg/L																1000				4											
GEN CHEMISTRY	Nitrite	µg/L						1000	U	U		1						20	B	J	15	2											100
GEN CHEMISTRY	Perchlorate	µg/L																4	U	U		1											
GEN CHEMISTRY	pH	STD UNIT																6.1				1											
GEN CHEMISTRY	Specific Conductivity	uS/cm																143				1											
GEN CHEMISTRY	Sulfate	µg/L						965000				1						1440000		JH	19	100											26900
GEN CHEMISTRY	Sulfide	µg/L																200	U	U		1											
GEN CHEMISTRY	Total Alkalinity	µg/L																67000				1											
GEN CHEMISTRY	TOTAL DISSOLVED SOLIDS	µg/L	2810000				1																674000				1	2340000				1	
GEN CHEMISTRY	Total Organic Carbon	µg/L						14300				1						5000				1											7960
GEN CHEMISTRY	TOTAL SUSPENDED SOLIDS	µg/L	7500		UJ	17, 06, 06A	1																18000				1	82000				1	
METALS	Aluminum	µg/L	100	U	U		1																					78000				1	
METALS	Antimony	µg/L	1	U	U		1																					2.44				1	
METALS	Arsenic	µg/L	3.7				1																					73.9				1	
METALS	Barium	µg/L	18.9				1																					625				1	
METALS	Beryllium	µg/L	10	U	U		1																					5.65	J	J	15	1	
METALS	Cadmium	µg/L	10	U	U		1																					10	U	U		1	
METALS	Calcium	µg/L	176000				1																					15700				1	
METALS	Chromium	µg/L	97.8				1																					2240				1	
METALS	Cobalt	µg/L	20	U	U		1																					58.7				1	
METALS	Copper	µg/L	20	U	U		1																					62.3				1	
METALS	Iron	µg/L	2480				1																					75200				1	
METALS	Lead	µg/L	0.373	J	J	17	1																					45.4				1	
METALS	Magnesium	µg/L	127000				1																					11500				1	
METALS	Manganese	µg/L	170				1																					1490				1	
METALS	Mercury	µg/L	0.2	U	U		1																					0.2	U	U		1	
METALS	Nickel	µg/L	40	U	U		1																					209				1	
METALS	Potassium	µg/L	6920				1																					4890				1	
METALS	Selenium	µg/L	4.86				1																					0.652	J	J	15	1	
METALS	Silver	µg/L	10	U	U		1																					10	U	U		1	
METALS	Sodium	µg/L	645000				5																					36500				1	
METALS	Thallium	µg/L	0.2	U	U		1																					1.18				1	
METALS	Vanadium	µg/L	100	U	U		10																					141				1	
METALS	Zinc	µg/L	20	U	U		1																					198				1	
METALS-DISS	Aluminum	µg/L	100	U	U		1																22000				1	101000				1	
METALS-DISS	Antimony	µg/L	1	U	U		1																10	U	U		10	1.54				1	
METALS-DISS	Arsenic	µg/L	3.96				1																35.9				10	35.9				1	
METALS-DISS	Barium	µg/L	17.1				1																136				10	531				1	
METALS-DISS	Beryllium	µg/L	10	U	U		1																1.16	J	J	15	1	6.55	J	J	15	1	
METALS-DISS	Cadmium	µg/L	10	U	U		1																5	U	U		10	10	U	U		1	
METALS-DISS	Calcium	µg/L	175000				1																10200		J	09	1	17100				1	
METALS-DISS	Chromium	µg/L	20	U	U		1																29.4		J	13	10	152				1	
METALS-DISS	Cobalt	µg/L	20	U	U		1																38.8		J	13	1	63.2				1	
METALS-DISS	Copper	µg/L	20	U	U		1																23.6				10	57.1				1	
METALS-DISS	Iron	µg/L	76.8	J	J	15	1																17500		J	13	1	88100				1	
METALS-DISS	Lead	µg/L	0.334	J	J	15, 17	1																10.6				10	30.9				1	
METALS-DISS	Magnesium	µg/L	124000				1																4250				1	15000				1	
METALS-DISS	Manganese	µg/L	160				1																899		J	13	10	1440				1	
METALS-DISS	Mercury	µg/L	0.2	U	U		1																0.2	U	U		1	0.2	U	U		1	
METALS-DISS	Nickel	µg/L	40	U	U		1																157				10	209				1	
METALS-DISS	Potassium	µg/L	6400				1																2250		J	13, 09	1	6230				1	
METALS-DISS	Selenium	µg/L	4.89				1																6.52	J	J	15	10	0.562	J	J	15	1	
METALS-DISS	Silver	µg/L	10	U	U		1																10	U	U		10	10	U	U		1	
METALS-DISS	Sodium	µg/L	645000				10																60300		J	13, 09	1	82500				1	
METALS-DISS	Thallium	µg/L	0.2	U	U		1																0.728	J	J	15, 13	10	0.838				1	
METALS-DISS	Vanadium	µg/L	100	U	U		10																34.3				1	157				1	
METALS-DISS	Zinc	µg/L	20	U	U		1																57				1	229				1	

Table C-1
Additional Sample Results Not Previously Presented

	Location Code		47WW09					47WW09					47WW12					47WW13					47WW13					47WW13					
	Sample No.		47WW09-113007-QA					47WW09-021809					47WW12-042209					47WW13-FEB2007					47WW13-101607					47WW13-113007					
	Sample Date		11/30/07					2/18/09					4/22/09					2/20/07					10/16/07					11/30/07					
	Groundwater Zone		SHALLOW/INTERMEDIATE					SHALLOW/INTERMEDIATE					SHALLOW					SHALLOW					SHALLOW					SHALLOW					
	Sample Purpose		FD					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	Result	Qual	ValQual	RC	DF	Result
VOLATILES	1,1,1,2-Tetrachloroethane	µg/L						5	U	U		20	0.25	U			1																0.25
VOLATILES	1,1,1-Trichloroethane	µg/L						5	U	U		20	0.25	U			1	0.37	U	U		1											0.25
VOLATILES	1,1,2,2-Tetrachloroethane	µg/L						2.5	U	U		20	0.125	U			1	0.46	U	U		1											0.125
VOLATILES	1,1,2-Trichloroethane	µg/L						5	U	U		20	0.25	U			1	0.66	U	U		1											0.25
VOLATILES	1,1-Dichloroethane	µg/L						2.5	U	U		20	0.125	U			1	3.4				1											2.2
VOLATILES	1,1-Dichloroethene	µg/L						10	U	U		20	0.5	U			1	4.2				1											3.64
VOLATILES	1,1-Dichloropropene	µg/L						5	U	U		20	0.25	U			1																0.25
VOLATILES	1,2,3-Trichlorobenzene	µg/L						3	U	U		20	0.15	U			1																0.15
VOLATILES	1,2,3-Trichloropropane	µg/L						10	U	U		20	0.5	U			1																0.5
VOLATILES	1,2,4-Trichlorobenzene	µg/L						4	U	U		20	0.2	U			1																0.2
VOLATILES	1,2,4-Trimethylbenzene	µg/L						5	U	U		20	0.25	U			1																0.25
VOLATILES	1,2-Dibromo-3-chloropropane	µg/L						20	U	U		20	1	U			1																1
VOLATILES	1,2-Dibromoethane	µg/L						5	U	U		20	0.25	U			1																0.25
VOLATILES	1,2-Dichlorobenzene	µg/L						2.5	U	U		20	0.125	U			1																0.125
VOLATILES	1,2-Dichloroethane	µg/L						5	U	U		20	0.25	U			1	0.53	U	U		1											0.25
VOLATILES	1,2-Dichloropropane	µg/L						4	U	U		20	0.2	U			1	0.59	U	U		1											0.2
VOLATILES	1,2-Dimethylbenzene (o-Xylene)	µg/L						5	U	U		20	0.25	U			1																0.25
VOLATILES	1,3,5-Trimethylbenzene	µg/L						5	U	U		20	0.25	U			1																0.25
VOLATILES	1,3-Dichlorobenzene	µg/L						5	U	U		20	0.25	U			1																0.25
VOLATILES	1,3-Dichloropropane	µg/L						4	U	U		20	0.2	U			1																0.2
VOLATILES	1,4-Dichlorobenzene	µg/L						2.5	U	U		20	0.125	U			1																0.125
VOLATILES	2,2-Dichloropropane	µg/L						5	U	U		20	0.25	U			1																0.25
VOLATILES	2-Butanone	µg/L						50	U	U		20	2.5	U			1	3	U	U		1											2.5
VOLATILES	2-Chloroethyl vinyl ether	µg/L						40	U	U		20	2	U			1																2
VOLATILES	2-Chlorotoluene	µg/L						2.5	U	U		20	0.125	U			1																0.125
VOLATILES	2-Hexanone	µg/L						50	U	U		20	2.5	U			1	1.9	U	U		1											2.5
VOLATILES	4-Chlorotoluene	µg/L						5	U	U		20	0.25	U			1																0.25
VOLATILES	Acetone	µg/L						50	U	U		20	2.5	U			1	2.8	U	U		1											2.5
VOLATILES	Benzene	µg/L						2.5	U	U		20	0.125	U			1	0.37	J	J	15	1											0.352
VOLATILES	Bromobenzene	µg/L						2.5	U	U		20	0.125	U			1																0.125
VOLATILES	Bromochloromethane	µg/L						4	U	U		20	0.2	U			1																0.2
VOLATILES	Bromodichloromethane	µg/L						5	U	U		20	0.25	U			1	0.33	U	U		1											0.25
VOLATILES	Bromoform	µg/L						10	U	U		20	0.5	U			1	0.65	U	U		1											0.5
VOLATILES	Bromomethane	µg/L						10	U	U		20	0.5	U			1	0.47	U	U		1											0.5
VOLATILES	Carbon disulfide	µg/L						10	U	U		20	0.5	U			1	0.62	U	U		1											0.5
VOLATILES	Carbon tetrachloride	µg/L						5	U	U		20	0.25	U			1	0.52	U	U		1											0.25
VOLATILES	Chlorobenzene	µg/L						2.5	U	U		20	0.125	U			1	0.54	U	U		1											0.125
VOLATILES	Chloroethane	µg/L						10	U	U		20	0.5	U			1	0.46	U	U		1											0.5
VOLATILES	Chloroform	µg/L						2.5	U	U		20	0.125	U			1	0.66	U	U		1											0.125
VOLATILES	Chloromethane	µg/L						5	U	U		20	0.25	U			1	0.6	U	U		1											0.25
VOLATILES	cis-1,2-Dichloroethene	µg/L						127				20	0.538	J	J	15	1	1160				50											1010
VOLATILES	cis-1,3-Dichloropropene	µg/L						5	U	U		20	0.25	U			1	0.59	U	U		1											0.25
VOLATILES	Cyclohexane	µg/L																															
VOLATILES	Dibromochloromethane	µg/L						5	U	U		20	0.25	U			1	0.68	U	U		1											0.25
VOLATILES	Dibromomethane	µg/L						5	U	U		20	0.25	U			1																0.25
VOLATILES	Dichlorodifluoromethane	µg/L						5	U	U		20	0.25	U			1																0.25
VOLATILES	Ethylbenzene	µg/L						5	U	U		20	0.25	U			1	0.48	U	U		1											0.25
VOLATILES	Freon 113	µg/L																															
VOLATILES	Hexachlorobutadiene	µg/L						5	U	U		20	0.25	U			1																0.25
VOLATILES	Isopropylbenzene	µg/L						5	U	U		20	0.25	U			1																0.25
VOLATILES	m,p-Xylenes	µg/L						10	U	U		20	0.5	U			1																0.5
VOLATILES	Methyl Acetate	µg/L																															
VOLATILES	Methyl isobutyl ketone	µg/L						50	U	U		20	2.5	U			1	7.3	U	U		1											2.5
VOLATILES	Methyl tert-butyl ether	µg/L																															
VOLATILES	Methylcyclohexane	µg/L																															
VOLATILES	Methylene chloride	µg/L						5	U	U		20	0.25	U			1	0.67	U	U		1											0.25
VOLATILES	Naphthalene	µg/L						4	U	U		20	0.2	U			1																0.2
VOLATILES	n-BUTYLBENZENE	µg/L						5	U	U		20	0.25	U			1																0.25
VOLATILES	n-PROPYLBENZENE	µg/L						2.5	U	U		20	0.125	U			1																0.125
VOLATILES	p-ISOPROPYLTOLUENE	µg/L						5	U	U		20	0.25	U			1																0.25
VOLATILES	sec-BUTYLBENZENE	µg/L						5	U	U		20	0.25	U			1																0.25
VOLATILES	Styrene	µg/L						2.5	U	U		20	0.125	U			1	0.5	U	U		1											0.125
VOLATILES	tert-BUTYLBENZENE	µg/L						5	U	U		20	0.25	U			1																0.25
VOLATILES	Tetrachloroethene	µg/L						13	J	J	15	20	0.25	U			1	0.74	U	U		1											0.25
VOLATILES	Toluene	µg/L						5	U	U		20	0.25	U			1	0.54	U	U		1											0.369
VOLATILES	trans-1,2-Dichloroethene	µg/L						5	U	U		20	0.25	U			1	14.5				1											13.2
VOLATILES	trans-1,3-Dichloropropene	µg/L						10	U	U		20	0.5	U			1	0.61	U	U		1											0.5
VOLATILES	Trichloroethene	µg/L						2820				20	0.36	J	J	15	1	565				50											470
VOLATILES	Trichlorofluoromethane	µg/L						5	U	U		20	0.25	U			1																0.25
VOLATILES	Vinyl acetate	µg/L						50	U	U		20	2.5	U			1																2.5
VOLATILES	Vinyl chloride	µg/L						5	U	U		20	0.25	U			1	36				1											103
VOLATILES	Xylenes, Total	µg/L																1.1	U	U		1											

00100761 Shaw Environmental, Inc.

Table C-1
Additional Sample Results Not Previously Presented

Test Group	Parameter	Units	47WW13				47WW13					47WW14				
		Sample No.	47WW13-021709				47WW13-021709-FD					47WW14-FEB2007				
		Sample Date	2/17/09				2/17/09					2/20/07				
		Groundwater Zone	SHALLOW				SHALLOW					SHALLOW/INTERMEDIATE				
		Sample Purpose	REG				FD					REG				
			Qual	ValQual	RC	DF	Result	Qual	ValQual	RC	DF	Result	Qual	ValQual	RC	DF
DHE	Dehalococcoides	cells/ml				1	9000	D			10	10	U	U		1
FIELD TESTS	Dissolved Oxygen	µg/L										1320				1
FIELD TESTS	Ferrous iron	µg/L										0				1
FIELD TESTS	Oxygen Reduction Potential	mV										242.2				1
FIELD TESTS	pH	STD UNIT										7.32				1
FIELD TESTS	Salinity	µg/L										870				1
FIELD TESTS	Specific Conductivity	uS/cm										1718				1
FIELD TESTS	Temperature	Deg C										20.74				1
FIELD TESTS	Turbidity	NTU										46.9				1
GASES	Ethane	µg/L	U	U		1	1	U	U		1	0.6	U	U		1
GASES	Ethylene	µg/L	J	J	15	1	2.13	J	J	15	1	0.8	U	U		1
GASES	Methane	µg/L				1	31.8				1	44.8				1
GEN CHEMISTRY	Carbon Dioxide	µg/L										40000				1
GEN CHEMISTRY	Chloride	µg/L				1	10700				1	190000				1
GEN CHEMISTRY	Fluoride, Total	mg/L				1	454				1					
GEN CHEMISTRY	Nitrate	µg/L	J	J	15	1	142	J	J	15	1	200				1
GEN CHEMISTRY	Nitrate / Nitrite	µg/L										200				1
GEN CHEMISTRY	Nitrite	µg/L	U	U		1	100	U	U		1	3	U	U		1
GEN CHEMISTRY	Perchlorate	µg/L										4	U	U		1
GEN CHEMISTRY	pH	STD UNIT										7.2				1
GEN CHEMISTRY	Specific Conductivity	uS/cm										1410				1
GEN CHEMISTRY	Sulfate	µg/L				1	26800				1	178000				2
GEN CHEMISTRY	Sulfide	µg/L										200	U	U		1
GEN CHEMISTRY	Total Alkalinity	µg/L										315000				1
GEN CHEMISTRY	TOTAL DISSOLVED SOLIDS	µg/L														
GEN CHEMISTRY	Total Organic Carbon	µg/L				1	7070				1	3000				1
GEN CHEMISTRY	TOTAL SUSPENDED SOLIDS	µg/L														
METALS	Aluminum	µg/L														
METALS	Antimony	µg/L														
METALS	Arsenic	µg/L														
METALS	Barium	µg/L														
METALS	Beryllium	µg/L														
METALS	Cadmium	µg/L														
METALS	Calcium	µg/L														
METALS	Chromium	µg/L														
METALS	Cobalt	µg/L														
METALS	Copper	µg/L														
METALS	Iron	µg/L														
METALS	Lead	µg/L														
METALS	Magnesium	µg/L														
METALS	Manganese	µg/L														
METALS	Mercury	µg/L														
METALS	Nickel	µg/L														
METALS	Potassium	µg/L														
METALS	Selenium	µg/L														
METALS	Silver	µg/L														
METALS	Sodium	µg/L														
METALS	Thallium	µg/L														
METALS	Vanadium	µg/L														
METALS	Zinc	µg/L														
METALS-DISS	Aluminum	µg/L														
METALS-DISS	Antimony	µg/L														
METALS-DISS	Arsenic	µg/L														
METALS-DISS	Barium	µg/L														
METALS-DISS	Beryllium	µg/L														
METALS-DISS	Cadmium	µg/L														
METALS-DISS	Calcium	µg/L														
METALS-DISS	Chromium	µg/L														
METALS-DISS	Cobalt	µg/L														
METALS-DISS	Copper	µg/L														
METALS-DISS	Iron	µg/L														
METALS-DISS	Lead	µg/L														
METALS-DISS	Magnesium	µg/L														
METALS-DISS	Manganese	µg/L														
METALS-DISS	Mercury	µg/L														
METALS-DISS	Nickel	µg/L														
METALS-DISS	Potassium	µg/L														
METALS-DISS	Selenium	µg/L														
METALS-DISS	Silver	µg/L														
METALS-DISS	Sodium	µg/L														
METALS-DISS	Thallium	µg/L														
METALS-DISS	Vanadium	µg/L														
METALS-DISS	Zinc	µg/L														

Test Group	Parameter	Units	47WW14					47WW14					47WW14					
		Sample No.	47WW14-FEB2007FD					47WW14-021909					47WW14-021909-FD					
		Sample Date	2/20/07					2/19/09					2/19/09					
		Groundwater Zone	SHALLOW/INTERMEDIATE					SHALLOW/INTERMEDIATE					SHALLOW/INTERMEDIATE					
		Sample Purpose	FD					REG					REG					
			Result	Qual	ValQual	RC	DF	Result	Qual	ValQual	RC	DF	Result	Qual	ValQual	RC	DF	Result
DHE	Dehalococcoides	cells/ml	15				1											
FIELD TESTS	Dissolved Oxygen	µg/L						500										
FIELD TESTS	Ferrous iron	µg/L																
FIELD TESTS	Oxygen Reduction Potential	mV						-40.1										
FIELD TESTS	pH	STD UNIT						6.72										
FIELD TESTS	Salinity	µg/L																
FIELD TESTS	Specific Conductivity	uS/cm						1999										
FIELD TESTS	Temperature	Deg C						19.09										
FIELD TESTS	Turbidity	NTU						-12.2										
GASES	Ethane	µg/L	0.6	U	U		1											
GASES	Ethylene	µg/L	0.8	U	U		1											
GASES	Methane	µg/L	42.7				1											
GEN CHEMISTRY	Carbon Dioxide	µg/L	26000				1											
GEN CHEMISTRY	Chloride	µg/L	200000				1											
GEN CHEMISTRY	Fluoride, Total	mg/L																
GEN CHEMISTRY	Nitrate	µg/L	200				1											
GEN CHEMISTRY	Nitrate / Nitrite	µg/L	200				1											
GEN CHEMISTRY	Nitrite	µg/L	3	U	U		1											
GEN CHEMISTRY	Perchlorate	µg/L	4	U	U		1											
GEN CHEMISTRY	pH	STD UNIT	7.3				1											
GEN CHEMISTRY	Specific Conductivity	uS/cm	1460				1											
GEN CHEMISTRY	Sulfate	µg/L	160000				2											
GEN CHEMISTRY	Sulfide	µg/L	200	U	U		1											
GEN CHEMISTRY	Total Alkalinity	µg/L	258000				1											
GEN CHEMISTRY	TOTAL DISSOLVED SOLIDS	µg/L																
GEN CHEMISTRY	Total Organic Carbon	µg/L	2000				1											
GEN CHEMISTRY	TOTAL SUSPENDED SOLIDS	µg/L																
METALS	Aluminum	µg/L																
METALS	Antimony	µg/L																
METALS	Arsenic	µg/L																
METALS	Barium	µg/L																
METALS	Beryllium	µg/L																
METALS	Cadmium	µg/L																
METALS	Calcium	µg/L																
METALS	Chromium	µg/L																
METALS	Cobalt	µg/L																
METALS	Copper	µg/L																
METALS	Iron	µg/L																
METALS	Lead	µg/L																
METALS	Magnesium	µg/L																
METALS	Manganese	µg/L																
METALS	Mercury	µg/L																
METALS	Nickel	µg/L																
METALS	Potassium	µg/L																
METALS	Selenium	µg/L																
METALS	Silver	µg/L																
METALS	Sodium	µg/L																
METALS	Thallium	µg/L																
METALS	Vanadium	µg/L																
METALS	Zinc	µg/L																
METALS-DISS	Aluminum	µg/L																
METALS-DISS	Antimony	µg/L																
METALS-DISS	Arsenic	µg/L																
METALS-DISS	Barium	µg/L																
METALS-DISS	Beryllium	µg/L																
METALS-DISS	Cadmium	µg/L																
METALS-DISS	Calcium	µg/L																
METALS-DISS	Chromium	µg/L																
METALS-DISS	Cobalt	µg/L																
METALS-DISS	Copper	µg/L																
METALS-DISS	Iron	µg/L																
METALS-DISS	Lead	µg/L																
METALS-DISS	Magnesium	µg/L																
METALS-DISS	Manganese	µg/L																
METALS-DISS	Mercury	µg/L																
METALS-DISS	Nickel	µg/L																
METALS-DISS	Potassium	µg/L																
METALS-DISS	Selenium	µg/L																
METALS-DISS	Silver	µg/L																
METALS-DISS	Sodium	µg/L																
METALS-DISS	Thallium	µg/L																
METALS-DISS	Vanadium	µg/L																
METALS-DISS	Zinc	µg/L																

00100762 Shaw Environmental, Inc.

Table C-1
Additional Sample Results Not Previously Presented

	Location Code		47WW13				47WW13					47WW14					47WW14					47WW14					47WW14					
	Sample No.		47WW13-021709				47WW13-021709-FD					47WW14-FEB2007					47WW14-FEB2007FD					47WW14-021909					47WW14-021909-FD					
	Sample Date		2/17/09				2/17/09					2/20/07					2/20/07					2/19/09					2/19/09					
	Groundwater Zone		SHALLOW				SHALLOW					SHALLOW/INTERMEDIATE					SHALLOW/INTERMEDIATE					SHALLOW/INTERMEDIATE					SHALLOW/INTERMEDIATE					
	Sample Purpose		REG				FD					REG					FD					REG					REG					
Test Group	Parameter	Units	Qual	ValQual	RC	DF	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	Result
VOLATILES	1,1,1,2-Tetrachloroethane	µg/L	U	U		1	0.25	U	U		1											0.5	U	U		2	0.25	U	U		1	0.25
VOLATILES	1,1,1-Trichloroethane	µg/L	U	U		1	0.25	U	U		1	0.37	U	U		1	0.37	U	U		1	0.5	U	U		2	0.25	U	U		1	0.25
VOLATILES	1,1,2,2-Tetrachloroethane	µg/L	U	U		1	0.125	U	U		1	0.46	U	U		1	0.46	U	UJ	10A	1	0.25	U	U		2	0.125	U	U		1	0.125
VOLATILES	1,1,2-Trichloroethane	µg/L	U	U		1	0.25	U	U		1	0.66	U	U		1	0.66	U	U		1	0.5	U	U		2	0.25	U	U		1	0.25
VOLATILES	1,1-Dichloroethane	µg/L				1	2.43				1	2.2				1	2				1	0.722	J	J	15	2	0.851	J	J	15	1	0.125
VOLATILES	1,1-Dichloroethene	µg/L				1	3.87				1	3.6				1	3.2				1	2.24				2	2.75				1	0.5
VOLATILES	1,1-Dichloropropene	µg/L	U	U		1	0.25	U	U		1											0.5	U	U		2	0.25	U	U		1	0.25
VOLATILES	1,2,3-Trichlorobenzene	µg/L	U	U		1	0.15	U	U		1											0.3	U	U		2	0.15	U	U		1	0.15
VOLATILES	1,2,3-Trichloropropane	µg/L	U	U		1	0.5	U	U		1											1	U	U		2	0.5	U	U		1	0.5
VOLATILES	1,2,4-Trichlorobenzene	µg/L	U	U		1	0.2	U	U		1											0.4	U	U		2	0.2	U	U		1	0.2
VOLATILES	1,2,4-Trimethylbenzene	µg/L	U	U		1	0.25	U	U		1											0.5	U	U		2	0.25	U	U		1	0.25
VOLATILES	1,2-Dibromo-3-chloropropane	µg/L	U	U		1	1	U	U		1											2	U	U		2	1	U	U		1	1
VOLATILES	1,2-Dibromoethane	µg/L	U	U		1	0.25	U	U		1											0.5	U	U		2	0.25	U	U		1	0.25
VOLATILES	1,2-Dichlorobenzene	µg/L	U	U		1	0.125	U	U		1											0.25	U	U		2	0.125	U	U		1	0.125
VOLATILES	1,2-Dichloroethane	µg/L	U	U		1	0.25	U	U		1	0.53	U	U		1	0.53	U	U		1	0.5	U	U		2	0.25	U	U		1	0.25
VOLATILES	1,2-Dichloropropane	µg/L	U	U		1	0.2	U	U		1	0.59	U	U		1	0.59	U	U		1	0.4	U	U		2	0.2	U	U		1	0.2
VOLATILES	1,2-Dimethylbenzene (o-Xylene)	µg/L	U	U		1	0.25	U	U		1											0.5	U	U		2	0.25	U	U		1	0.25
VOLATILES	1,3,5-Trimethylbenzene	µg/L	U	U		1	0.25	U	U		1											0.5	U	U		2	0.25	U	U		1	0.25
VOLATILES	1,3-Dichlorobenzene	µg/L	U	U		1	0.25	U	U		1											0.5	U	U		2	0.25	U	U		1	0.25
VOLATILES	1,3-Dichloropropane	µg/L	U	U		1	0.2	U	U		1											0.4	U	U		2	0.2	U	U		1	0.2
VOLATILES	1,4-Dichlorobenzene	µg/L	U	U		1	0.125	U	U		1											0.25	U	U		2	0.125	U	U		1	0.125
VOLATILES	2,2-Dichloropropane	µg/L	U	U		1	0.25	U	U		1											0.5	U	U		2	0.25	U	U		1	0.25
VOLATILES	2-Butanone	µg/L	U	U		1	2.5	U	U		1	3	U	U		1	3	U	U		1	5	U	U		2	2.5	U	U		1	2.5
VOLATILES	2-Chloroethyl vinyl ether	µg/L	U	U		1	2	U	U		1											4	U	U		2	2	U	U		1	2
VOLATILES	2-Chlorotoluene	µg/L	U	U		1	0.125	U	U		1											0.25	U	U		2	0.125	U	U		1	0.125
VOLATILES	2-Hexanone	µg/L	U	U		1	2.5	U	U		1	1.9	U	U		1	1.9	U	U		1	5	U	U		2	2.5	U	U		1	2.5
VOLATILES	4-Chlorotoluene	µg/L	U	U		1	0.25	U	U		1											0.5	U	U		2	0.25	U	U		1	0.25
VOLATILES	Acetone	µg/L	U	U		1	2.5	U	U		1	2.8	U	U		1	2.8	U	UJ	05B	1	5	U	U		2	2.5	U	U		1	2.5
VOLATILES	Benzene	µg/L	J	J	15	1	0.313	J	J	15	1	0.23	U	U		1	0.23	U	U		1	0.25	U	U		2	0.125	U	U		1	0.125
VOLATILES	Bromobenzene	µg/L	U	U		1	0.125	U	U		1											0.25	U	U		2	0.125	U	U		1	0.125
VOLATILES	Bromochloromethane	µg/L	U	U		1	0.2	U	U		1											0.4	U	U		2	0.2	U	U		1	0.2
VOLATILES	Bromodichloromethane	µg/L	U	U		1	0.25	U	U		1	0.33	U	U		1	0.33	U	U		1	0.5	U	U		2	0.25	U	U		1	0.25
VOLATILES	Bromoform	µg/L	U	U		1	0.5	U	U		1	0.65	U	U		1	0.65	U	U		1	1	U	U		2	0.5	U	U		1	0.5
VOLATILES	Bromomethane	µg/L	U	U		1	0.5	U	U		1	0.47	U	U		1	0.47	U	U		1	1	U	U		2	0.5	U	U		1	0.5
VOLATILES	Carbon disulfide	µg/L	U	U		1	0.5	U	U		1	0.62	U	U		1	0.62	U	U		1	1	U	U		2	0.5	U	U		1	0.5
VOLATILES	Carbon tetrachloride	µg/L	U	U		1	0.25	U	U		1	0.52	U	U		1	0.52	U	U		1	0.5	U	U		2	0.25	U	U		1	0.25
VOLATILES	Chlorobenzene	µg/L	U	U		1	0.125	U	U		1	0.54	U	U		1	0.54	U	U		1	0.25	U	U		2	0.125	U	U		1	0.125
VOLATILES	Chloroethane	µg/L	U	U		1	0.5	U	U		1	0.46	U	U		1	0.46	U	U		1	1	U	U		2	0.5	U	U		1	0.5
VOLATILES	Chloroform	µg/L	U	U		1	0.125	U	U		1	0.66	U	U		1	0.66	U	U		1	0.25	U	U		2	0.125	U	U		1	0.125
VOLATILES	Chloromethane	µg/L	U	U		1	0.25	U	U		1	0.6	U	U		1	0.6	U	U		1	0.5	U	U		2	0.25	U	U		1	0.25
VOLATILES	cis-1,2-Dichloroethene	µg/L				1	1010				1	334				5	359				50	102				2	111				1	0.25
VOLATILES	cis-1,3-Dichloropropene	µg/L	U	U		1	0.25	U	U		1	0.59	U	U		1	0.59	U	U		1	0.5	U	U		2	0.25	U	U		1	0.25
VOLATILES	Cyclohexane	µg/L																														
VOLATILES	Dibromochloromethane	µg/L	U	U		1	0.25	U	U		1	0.68	U	U		1	0.68	U	U		1	0.5	U	U		2	0.25	U	U		1	0.25
VOLATILES	Dibromomethane	µg/L	U	U		1	0.25	U	U		1											0.5	U	U		2	0.25	U	U		1	0.25
VOLATILES	Dichlorodifluoromethane	µg/L	U	U		1	0.25	U	U		1											0.5	U	U		2	0.25	U	U		1	0.25
VOLATILES	Ethylbenzene	µg/L	U	U		1	0.25	U	U		1	0.48	U	U		1	0.48	U	U		1	0.5	U	U		2	0.25	U	U		1	0.25
VOLATILES	Freon 113	µg/L																														
VOLATILES	Hexachlorobutadiene	µg/L	U	U		1	0.25	U	U		1											0.5	U	U		2	0.25	U	U		1	0.25
VOLATILES	Isopropylbenzene	µg/L	U	U		1	0.25	U	U		1											0.5	U	U		2	0.25	U	U		1	0.25
VOLATILES	m,p-Xylenes	µg/L	U	U		1	0.5	U	U		1											1	U	U		2	0.5	U	U		1	0.5
VOLATILES	Methyl Acetate	µg/L																														
VOLATILES	Methyl isobutyl ketone	µg/L	U	U		1	2.5	U	U		1	7.3	U	U		1	7.3	U	U		1	5	U	U		2	2.5	U	U		1	2.5
VOLATILES	Methyl tert-butyl ether	µg/L																														
VOLATILES	Methylcyclohexane	µg/L																														
VOLATILES	Methylene chloride	µg/L	U	U		1	0.25	U	U		1	0.67	U	U		1	0.67	U	U		1	0.5	U	U		2	0.25	U	U		1	0.25
VOLATILES	Naphthalene	µg/L	U	U		1	0.2	U	U		1											0.4	U	U		2	0.2	U	U		1	0.2
VOLATILES	n-BUTYLBENZENE	µg/L	U	U		1	0.25	U	U		1											0.5	U	U		2	0.25	U	U		1	0.25
VOLATILES	n-PROPYLBENZENE	µg/L	U	U		1	0.125	U	U		1											0.25	U	U		2	0.125	U	U		1	0.125
VOLATILES	p-ISOPROPYLTOLUENE	µg/L	U	U		1	0.25	U	U		1											0.5	U	U		2	0.25	U	U		1	0.25
VOLATILES	sec-BUTYLBENZENE	µg/L	U	U		1	0.25	U	U		1											0.5	U	U		2	0.25	U	U		1	0.25
VOLATILES	Styrene	µg/L	U	U		1	0.125	U	U		1	0.5	U	U		1	0.5	U	U		1	0.25	U	U		2	0.125	U	U		1	0.125
VOLATILES	tert-BUTYLBENZENE	µg/L	U	U		1	0.25	U	U		1											0.5	U	U		2	0.25	U	U		1	0.25
VOLATILES	Tetrachloroethene	µg/L	U	U		1	0.25	U	U		1	0.74	U	U		1	0.74	U	U		1	0.5	U	U		2	0.25	U	U		1	0.25
VOLATILES	Toluene	µg/L	J	J	15	1	0.287	J	J	15	1	0.54	U	U		1	0.54	U	U		1	0.5	U	U		2	0.25	U	U		1	0.25
VOLATILES	trans-1,2-Dichloroethene	µg/L				1	13.4				1	31.1				1	24.4				1	0.702	J	J	15	2	0.699	J	J	15	1	0.25
VOLATILES	trans-1,3-Dichloropropene	µg/L	U	U		1	0.5	U	U		1	0.61	U	U		1	0.61	U	U		1	1	U	U		2	0.5	U	U		1	0.5
VOLATILES	Trichloroethene	µg/L				1	473				1	346				5	378				50	196				2	186				1	0.25
VOLATILES	Trichlorofluoromethane	µg/L	U	U		1	0.25	U	U		1											0.5	U	U		2	0.25	U	U		1	0.25
VOLATILES	Vinyl acetate	µg/L	U	U		1	2.5	U	U		1											5	U	U		2	2.5	U	U		1	2.5
VOLATILES	Vinyl chloride	µg/L				1	105				1	28.1				1	20.5				1	11.3		J	17	2	17.1		J	17	1	0.25
VOLATILES	Xylenes, Total	µg/L										1.1	U	U		1	1.1	U	U		1											

Table C-1
Additional Sample Results Not Previously Presented

	Location Code		47WW16				47WW18					47WW18					47WW19					47WW19					47WW19					4	
	Sample No.		47WW16-042209				47WW18-101807					47WW18-101807-DUP					47WW19-101707					47WW19-113007					47WW19-021909					47W	
	Sample Date		4/22/09				10/18/07					10/18/07					10/17/07					11/30/07					2/19/09						
	Groundwater Zone		SHALLOW				SHALLOW					SHALLOW					INTERMEDIATE					INTERMEDIATE					INTERMEDIATE					S	
	Sample Purpose		REG				REG					FD					REG					REG					REG						
Test Group	Parameter	Units	Qual	ValQual	RC	DF	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	Result	Qual
DHE	Dehalococcoides	cells/ml																															
FIELD TESTS	Dissolved Oxygen	µg/L															4110				1	6190				1	500					4030	
FIELD TESTS	Ferrous iron	µg/L																															
FIELD TESTS	Oxygen Reduction Potential	mV															46.4				1	213.2				1	-27.5					141.3	
FIELD TESTS	pH	STD UNIT															6.27				1	6.63				1	6.06					5.15	
FIELD TESTS	Salinity	µg/L																															
FIELD TESTS	Specific Conductivity	uS/cm															2466				1	2710				1	3557					466	
FIELD TESTS	Temperature	Deg C															19.85				1	18.47				1	18.74					25.05	
FIELD TESTS	Turbidity	NTU															65.5				1	9.3				1	130.1					15.6	
GASES	Ethane	µg/L																															
GASES	Ethylene	µg/L																															
GASES	Methane	µg/L																															
GEN CHEMISTRY	Carbon Dioxide	µg/L																															
GEN CHEMISTRY	Chloride	µg/L																															
GEN CHEMISTRY	Fluoride, Total	mg/L																															
GEN CHEMISTRY	Nitrate	µg/L																															
GEN CHEMISTRY	Nitrate / Nitrite	µg/L																															
GEN CHEMISTRY	Nitrite	µg/L																															
GEN CHEMISTRY	Perchlorate	µg/L																															
GEN CHEMISTRY	pH	STD UNIT																															
GEN CHEMISTRY	Specific Conductivity	uS/cm																															
GEN CHEMISTRY	Sulfate	µg/L																															
GEN CHEMISTRY	Sulfide	µg/L																															
GEN CHEMISTRY	Total Alkalinity	µg/L																															
GEN CHEMISTRY	TOTAL DISSOLVED SOLIDS	µg/L															1760000				1	1570000				1							
GEN CHEMISTRY	Total Organic Carbon	µg/L																															
GEN CHEMISTRY	TOTAL SUSPENDED SOLIDS	µg/L															17500				1	4500	J	UJ	17, 06, 06A	1							
METALS	Aluminum	µg/L																				100	U	U		1							
METALS	Antimony	µg/L																				1	U	U		1							
METALS	Arsenic	µg/L																				3.05				1							
METALS	Barium	µg/L																				54.4				1							
METALS	Beryllium	µg/L																				10	U	U		1							
METALS	Cadmium	µg/L																				10	U	U		1							
METALS	Calcium	µg/L																				165000				1							
METALS	Chromium	µg/L																				65.2				1							
METALS	Cobalt	µg/L																				20	U	U		1							
METALS	Copper	µg/L																				20	U	U		1							
METALS	Iron	µg/L																				2130				1							
METALS	Lead	µg/L																				0.275	J	J	15	1							
METALS	Magnesium	µg/L																				92100				1							
METALS	Manganese	µg/L																				871				1							
METALS	Mercury	µg/L																				0.2	U	U		1							
METALS	Nickel	µg/L																				48.4				1							
METALS	Potassium	µg/L																				7390				1							
METALS	Selenium	µg/L																				2.56				1							
METALS	Silver	µg/L																				10	U	U		1							
METALS	Sodium	µg/L																				279000				5							
METALS	Thallium	µg/L																				0.2	U	U		1							
METALS	Vanadium	µg/L																				100	U	U		10							
METALS	Zinc	µg/L																				20	U	U		1							
METALS-DISS	Aluminum	µg/L															100	U	U		1	100	U	U		1							
METALS-DISS	Antimony	µg/L															10	U	U		10	1	U	U		1							
METALS-DISS	Arsenic	µg/L															10	U	U		10	3.26				1							
METALS-DISS	Barium	µg/L															58.4				10	51.1				1							
METALS-DISS	Beryllium	µg/L															2	U	U		1	10	U	U		1							
METALS-DISS	Cadmium	µg/L															5	U	U		10	10	U	U		1							
METALS-DISS	Calcium	µg/L															172000		J	09	1	165000				1							
METALS-DISS	Chromium	µg/L															20	U	UJ	13	10	20	U	U		1							
METALS-DISS	Cobalt	µg/L															5	U	UJ	13	1	20	U	U		1							
METALS-DISS	Copper	µg/L															20	U	U		10	20	U	U		1							
METALS-DISS	Iron	µg/L															2570		J	13	1	100	U	U		1							
METALS-DISS	Lead	µg/L															5	U	U		10	3.31				1							
METALS-DISS	Magnesium	µg/L															95200				1	88700				1							
METALS-DISS	Manganese	µg/L															1100		J	13	10	777				1							
METALS-DISS	Mercury	µg/L															0.2	U	U		1	0.2	U	U		1							
METALS-DISS	Nickel	µg/L															30.8	J	J	15	10	41.1				1							
METALS-DISS	Potassium	µg/L															4670		J	13, 09	1	6420				1							
METALS-DISS	Selenium	µg/L															10.7				10	3.1				1							
METALS-DISS	Silver	µg/L															10	U	U		10	10	U	U		1							
METALS-DISS	Sodium	µg/L															281000		J	13, 09	10	278000				10							
METALS-DISS	Thallium	µg/L															1.69	J	J	15, 13	10	0.2	U	U		1							
METALS-DISS	Vanadium	µg/L															100	U	U		10	100	U	U		10							
METALS-DISS	Zinc	µg/L															20	U	U		1	20	U	U		1							

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Table C-1
Additional Sample Results Not Previously Presented

		Location Code	47WW16				47WW18					47WW18					47WW19					47WW19					47WW19					4	
		Sample No.	47WW16-042209				47WW18-101807					47WW18-101807-DUP					47WW19-101707					47WW19-113007					47WW19-021909					47W	
		Sample Date	4/22/09				10/18/07					10/18/07					10/17/07					11/30/07					2/19/09						
		Groundwater Zone	SHALLOW				SHALLOW					SHALLOW					INTERMEDIATE					INTERMEDIATE					INTERMEDIATE					S	
		Sample Purpose	REG				REG					FD					REG					REG					REG						
Test Group	Parameter	Units	Qual	ValQual	RC	DF	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	Result	Qual
VOLATILES	1,1,1,2-Tetrachloroethane	µg/L	U			1																						0.25	U	U		1		
VOLATILES	1,1,1-Trichloroethane	µg/L	U			1	1	U	U		1	1	U	U		1											0.25	U	U		1	1	U
VOLATILES	1,1,2,2-Tetrachloroethane	µg/L	U			1	1	U	U		1	1	U	U		1											0.125	U	U		1	1	U
VOLATILES	1,1,2-Trichloroethane	µg/L	U			1	1	U	U		1	1	U	U		1											0.25	U	U		1	1	U
VOLATILES	1,1-Dichloroethane	µg/L	U			1	1	U	U		1	1	U	U		1											0.125	U	U		1	0.161	J
VOLATILES	1,1-Dichloroethene	µg/L	U			1	0.756	J	J	15	1	0.68	J	J	15	1											0.5	U	U		1	0.566	J
VOLATILES	1,1-Dichloropropene	µg/L	U			1																					0.25	U	U		1		
VOLATILES	1,2,3-Trichlorobenzene	µg/L	U			1																					0.15	U	U		1		
VOLATILES	1,2,3-Trichloropropane	µg/L	U			1																					0.5	U	U		1		
VOLATILES	1,2,4-Trichlorobenzene	µg/L	U			1	1	U	U		1	1	U	U		1											0.2	U	U		1	1	U
VOLATILES	1,2,4-Trimethylbenzene	µg/L	U			1																					0.25	U	U		1		
VOLATILES	1,2-Dibromo-3-chloropropane	µg/L	U			1	5	U	U		1	5	U	U		1											1	U	U		1	5	U
VOLATILES	1,2-Dibromoethane	µg/L	U			1	1	U	U		1	1	U	U		1											0.25	U	U		1	1	U
VOLATILES	1,2-Dichlorobenzene	µg/L	U			1	1	U	U		1	1	U	U		1											0.125	U	U		1	1	U
VOLATILES	1,2-Dichloroethane	µg/L	U			1	1	U	U		1	1	U	U		1											0.25	U	U		1	1	U
VOLATILES	1,2-Dichloropropane	µg/L	U			1	1	U	U		1	1	U	U		1											0.2	U	U		1	1	U
VOLATILES	1,2-Dimethylbenzene (o-Xylene)	µg/L	U			1																					0.25	U	U		1		
VOLATILES	1,3,5-Trimethylbenzene	µg/L	U			1																					0.25	U	U		1		
VOLATILES	1,3-Dichlorobenzene	µg/L	U			1	1	U	U		1	1	U	U		1											0.25	U	U		1	1	U
VOLATILES	1,3-Dichloropropane	µg/L	U			1																					0.2	U	U		1		
VOLATILES	1,4-Dichlorobenzene	µg/L	U			1	1	U	U		1	1	U	U		1											0.125	U	U		1	1	U
VOLATILES	2,2-Dichloropropane	µg/L	U			1																					0.25	U	U		1		
VOLATILES	2-Butanone	µg/L	U			1	10	U	U		1	10	U	U		1											2.5	U	U		1	10	U
VOLATILES	2-Chloroethyl vinyl ether	µg/L	U			1																					2	U	U		1		
VOLATILES	2-Chlorotoluene	µg/L	U			1																					0.125	U	U		1		
VOLATILES	2-Hexanone	µg/L	U			1	10	U	U		1	10	U	U		1											2.5	U	U		1	10	U
VOLATILES	4-Chlorotoluene	µg/L	U			1																					0.25	U	U		1		
VOLATILES	Acetone	µg/L	U			1	10	U	U		1	10	U	U		1											2.5	U	U		1	10	U
VOLATILES	Benzene	µg/L	U			1	1	U	U		1	1	U	U		1											0.125	U	U		1	1	U
VOLATILES	Bromobenzene	µg/L	U			1																					0.125	U	U		1		
VOLATILES	Bromochloromethane	µg/L	U			1																					0.2	U	U		1		
VOLATILES	Bromodichloromethane	µg/L	U			1	1	U	U		1	1	U	U		1											0.25	U	U		1	1	U
VOLATILES	Bromoform	µg/L	U			1	1	U	U		1	1	U	U		1											0.5	U	U		1	1	U
VOLATILES	Bromomethane	µg/L	U			1	1	U	U		1	1	U	U		1											0.5	U	U		1	1	U
VOLATILES	Carbon disulfide	µg/L	U			1	1	U	U		1	1	U	U		1											0.5	U	U		1	1	U
VOLATILES	Carbon tetrachloride	µg/L	U			1	1	U	U		1	1	U	U		1											0.25	U	U		1	1	U
VOLATILES	Chlorobenzene	µg/L	U			1	1	U	U		1	1	U	U		1											0.125	U	U		1	1	U
VOLATILES	Chloroethane	µg/L	U			1	1	U	U		1	1	U	U		1											0.5	U	U		1	1	U
VOLATILES	Chloroform	µg/L	U			1	1	U	U		1	1	U	U		1											0.125	U	U		1	1	U
VOLATILES	Chloromethane	µg/L	U			1	1	U	U		1	1	U	U		1											0.25	U	U		1	1	U
VOLATILES	cis-1,2-Dichloroethene	µg/L	U			1	5.61				1	5.4				1											0.25	U	U		1	1.99	
VOLATILES	cis-1,3-Dichloropropene	µg/L	U			1	1	U	U		1	1	U	U		1											0.25	U	U		1	1	U
VOLATILES	Cyclohexane	µg/L					5	U	U		1	5	U	U		1																5	U
VOLATILES	Dibromochloromethane	µg/L	U			1	1	U	U		1	1	U	U		1											0.25	U	U		1	1	U
VOLATILES	Dibromomethane	µg/L	U			1																					0.25	U	U		1		
VOLATILES	Dichlorodifluoromethane	µg/L	U			1	1	U	U		1	1	U	U		1											0.25	U	U		1	1	U
VOLATILES	Ethylbenzene	µg/L	U			1	1	U	U		1	1	U	U		1											0.25	U	U		1	1	U
VOLATILES	Freon 113	µg/L					5	U	U		1	5	U	U		1																5	U
VOLATILES	Hexachlorobutadiene	µg/L	U			1																					0.25	U	U		1		
VOLATILES	Isopropylbenzene	µg/L	U			1	1	U	U		1	1	U	U		1											0.25	U	U		1	1	U
VOLATILES	m,p-Xylenes	µg/L	U			1																					0.5	U	U		1		
VOLATILES	Methyl Acetate	µg/L					10	U	U		1	10	U	U		1																10	U
VOLATILES	Methyl isobutyl ketone	µg/L	U			1	10	U	U		1	10	U	U		1											2.5	U	U		1	10	U
VOLATILES	Methyl tert-butyl ether	µg/L					5	U	U		1	5	U	U		1																5	U
VOLATILES	Methylcyclohexane	µg/L					10	U	U		1	10	U	U		1																10	U
VOLATILES	Methylene chloride	µg/L	U			1	2	U	U		1	2	U	U		1											0.25	U	U		1	2	U
VOLATILES	Naphthalene	µg/L	U			1																					0.2	U	U		1		
VOLATILES	n-BUTYLBENZENE	µg/L	U			1																					0.25	U	U		1		
VOLATILES	n-PROPYLBENZENE	µg/L	U			1																					0.125	U	U		1		
VOLATILES	p-ISOPROPYLTOLUENE	µg/L	U			1																					0.25	U	U		1		
VOLATILES	sec-BUTYLBENZENE	µg/L	U			1																					0.25	U	U		1		
VOLATILES	Styrene	µg/L	U			1	1	U	U		1	1	U	U		1											0.125	U	U		1	1	U
VOLATILES	tert-BUTYLBENZENE	µg/L	U			1																					0.25	U	U		1		
VOLATILES	Tetrachloroethene	µg/L	U			1	1	U	U		1	1	U	U		1											0.25	U	U		1	1	U
VOLATILES	Toluene	µg/L	U			1	1	U	U		1	1	U	U		1											0.25	U	U		1	1	U
VOLATILES	trans-1,2-Dichloroethene	µg/L	U			1	1	U	U		1	1	U	U		1											0.25	U	U		1	1	U
VOLATILES	trans-1,3-Dichloropropene	µg/L	U			1	1	U	U		1	1	U	U		1											0.5	U	U		1	1	U
VOLATILES	Trichloroethene	µg/L	U			1	147				1	134				1											2				1	2.61	
VOLATILES	Trichlorofluoromethane	µg/L	U			1	1	U	U		1	1	U	U		1											0.25	U	U		1	1	U
VOLATILES	Vinyl acetate	µg/L	U			1																					2.5	U	U		1		
VOLATILES	Vinyl chloride	µg/L	U			1	0.575	J	J	15	1	0.52	J	J	15	1											0.25	U	U		1	1	U
VOLATILES	Xylenes, Total	µg/L					1	U	U		1	1	U	U		1																1	U

Table C-1
Additional Sample Results Not Previously Presented

	Location Code		7WW21			47WW21					47WW22					47WW22					47WW23					47WW25					4	
	Sample No.		W21-101807			47WW21-101807-QC					47WW22-101807					47WW22-113007					47WW23-101907					47WW25-101607					47W	
	Sample Date		10/18/07			10/18/07					10/18/07					11/29/07					10/19/07					10/18/07						
	Groundwater Zone		HALLOW			SHALLOW					SHALLOW					SHALLOW					SHALLOW/INTERMEDIATE					SHALLOW					S	
	Sample Purpose		REG			FD					REG					REG					REG					REG						
Test Group	**Parameter**	**Units**	**ValQual**	**RC**	**DF**	**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**	**Result**	**Qual**
DHE	Dehalococcoides	cells/ml																														
FIELD TESTS	Dissolved Oxygen	µg/L			1						2290				1						1150				1							
FIELD TESTS	Ferrous iron	µg/L																														
FIELD TESTS	Oxygen Reduction Potential	mV			1						505.3				1						587.1				1							
FIELD TESTS	pH	STD UNIT			1						5.52				1						5.95				1							
FIELD TESTS	Salinity	µg/L																														
FIELD TESTS	Specific Conductivity	uS/cm			1						7762				1						1074				1							
FIELD TESTS	Temperature	Deg C			1						20.48				1						20.84				1							
FIELD TESTS	Turbidity	NTU			1						2007.8				1						1.3				1							
GASES	Ethane	µg/L																														
GASES	Ethylene	µg/L																														
GASES	Methane	µg/L																														
GEN CHEMISTRY	Carbon Dioxide	µg/L																														
GEN CHEMISTRY	Chloride	µg/L																														
GEN CHEMISTRY	Fluoride, Total	mg/L																														
GEN CHEMISTRY	Nitrate	µg/L																														
GEN CHEMISTRY	Nitrate / Nitrite	µg/L																														
GEN CHEMISTRY	Nitrite	µg/L																														
GEN CHEMISTRY	Perchlorate	µg/L																													0.44	U
GEN CHEMISTRY	pH	STD UNIT																														
GEN CHEMISTRY	Specific Conductivity	uS/cm																														
GEN CHEMISTRY	Sulfate	µg/L																														
GEN CHEMISTRY	Sulfide	µg/L																														
GEN CHEMISTRY	Total Alkalinity	µg/L																														
GEN CHEMISTRY	TOTAL DISSOLVED SOLIDS	µg/L									3960000				1	3980000				1												
GEN CHEMISTRY	Total Organic Carbon	µg/L																														
GEN CHEMISTRY	TOTAL SUSPENDED SOLIDS	µg/L									6790000				1	3770000				1												
METALS	Aluminum	µg/L														63000				100												
METALS	Antimony	µg/L														7.5				5												
METALS	Arsenic	µg/L														135				5												
METALS	Barium	µg/L														1040				100												
METALS	Beryllium	µg/L														1000	U	U		100												
METALS	Cadmium	µg/L														1000	U	U		100												
METALS	Calcium	µg/L														333000				100												
METALS	Chromium	µg/L														356000				100												
METALS	Cobalt	µg/L														2000	U	U		100												
METALS	Copper	µg/L														2640				100												
METALS	Iron	µg/L														551000				100												
METALS	Lead	µg/L														45.1				5												
METALS	Magnesium	µg/L														221000				100												
METALS	Manganese	µg/L														3280				100												
METALS	Mercury	µg/L														0.21				1												
METALS	Nickel	µg/L														17500				100												
METALS	Potassium	µg/L														100000	U	U		100												
METALS	Selenium	µg/L														103				5												
METALS	Silver	µg/L														1000	U	U		100												
METALS	Sodium	µg/L														859000				100												
METALS	Thallium	µg/L														0.403	J	J	15	5												
METALS	Vanadium	µg/L														1820				100												
METALS	Zinc	µg/L														2000	U	U		100												
METALS-DISS	Aluminum	µg/L									100	U	U		1	100	U	U		1												
METALS-DISS	Antimony	µg/L									10	U	U		10	1	U	U		1												
METALS-DISS	Arsenic	µg/L									11.5				10	23				1												
METALS-DISS	Barium	µg/L									120				10	44.1				1												
METALS-DISS	Beryllium	µg/L									2	U	U		1	0.611	J	J	15	1												
METALS-DISS	Cadmium	µg/L									2.59	J	J	15	10	5.07	J	J	15	1												
METALS-DISS	Calcium	µg/L									307000		J	13	1	318000				1												
METALS-DISS	Chromium	µg/L									129				10	76.9				1												
METALS-DISS	Cobalt	µg/L									102				1	171				1												
METALS-DISS	Copper	µg/L									15.7	J	J	15	10	20	U	U		1												
METALS-DISS	Iron	µg/L									16700				1	43000				1												
METALS-DISS	Lead	µg/L									8.32				10	0.522				1												
METALS-DISS	Magnesium	µg/L									192000				1	198000				1												
METALS-DISS	Manganese	µg/L									1840				10	2610				1												
METALS-DISS	Mercury	µg/L									0.2	U	U		1	0.2	U	U		1												
METALS-DISS	Nickel	µg/L									9490				100	11700				1												
METALS-DISS	Potassium	µg/L									5290				1	4970				1												
METALS-DISS	Selenium	µg/L									44.6				10	12.7				1												
METALS-DISS	Silver	µg/L									10	U	U		10	10	U	U		1												
METALS-DISS	Sodium	µg/L									873000				10	817000				10												
METALS-DISS	Thallium	µg/L									2	U	U		10	0.0565	J	J	15	1												
METALS-DISS	Vanadium	µg/L									100	U	U		10	10	U	U		1												
METALS-DISS	Zinc	µg/L									12.7	J	J	15	1	22.8				1												

Table C-1
Additional Sample Results Not Previously Presented

	Location Code		7WW21			47WW21					47WW22					47WW22					47WW23					47WW25					4	
	Sample No.		W21-101807			47WW21-101807-QC					47WW22-101807					47WW22-113007					47WW23-101907					47WW25-101607					47W	
	Sample Date		10/18/07			10/18/07					10/18/07					11/29/07					10/19/07					10/18/07						
	Groundwater Zone		HALLOW			SHALLOW					SHALLOW					SHALLOW					SHALLOW/INTERMEDIATE					SHALLOW					S	
	Sample Purpose		REG			FD					REG					REG					REG					REG						
Test Group	Parameter	Units	ValQual	RC	DF	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	Result	Qual
VOLATILES	1,1,1,2-Tetrachloroethane	µg/L																													25	U
VOLATILES	1,1,1-Trichloroethane	µg/L	U		1	1	U	U		1	1	U	U		1						1	U	U		1	1	U	UJ	07A	1	25	U
VOLATILES	1,1,2,2-Tetrachloroethane	µg/L	U		1	1	U	U		1	1	U	U		1						1	U	U		1	1	U	UJ	07A	1	12.5	U
VOLATILES	1,1,2-Trichloroethane	µg/L	U		1	1	U	U		1	1	U	U		1						1	U	U		1	1	U	UJ	07A	1	25	U
VOLATILES	1,1-Dichloroethane	µg/L	J	15	1	0.171	J	J	15	1	1	U	U		1						1	U	U		1	1.81		J	07A	1	12.5	U
VOLATILES	1,1-Dichloroethene	µg/L	J	15	1	1	U	U		1	1	U	U		1						1	U	U		1	19.3		J	07A	1	50	U
VOLATILES	1,1-Dichloropropene	µg/L																													25	U
VOLATILES	1,2,3-Trichlorobenzene	µg/L																													15	U
VOLATILES	1,2,3-Trichloropropane	µg/L																													50	U
VOLATILES	1,2,4-Trichlorobenzene	µg/L	U		1	1	U	U		1	1	U	U		1						1	U	U		1	1	U	UJ	07A	1	20	U
VOLATILES	1,2,4-Trimethylbenzene	µg/L																													25	U
VOLATILES	1,2-Dibromo-3-chloropropane	µg/L	U		1	5	U	U		1	5	U	U		1						5	U	U		1	5	U	UJ	07A	1	100	U
VOLATILES	1,2-Dibromoethane	µg/L	U		1	1	U	U		1	1	U	U		1						1	U	U		1	1	U	UJ	07A	1	25	U
VOLATILES	1,2-Dichlorobenzene	µg/L	U		1	1	U	U		1	1	U	U		1						1	U	U		1	1	U	UJ	07A	1	12.5	U
VOLATILES	1,2-Dichloroethane	µg/L	U		1	1	U	U		1	1	U	U		1						1	U	U		1	1	U	UJ	07A	1	25	U
VOLATILES	1,2-Dichloropropane	µg/L	U		1	1	U	U		1	1	U	U		1						1	U	U		1	1	U	UJ	07A	1	20	U
VOLATILES	1,2-Dimethylbenzene (o-Xylene)	µg/L																													25	U
VOLATILES	1,3,5-Trimethylbenzene	µg/L																													25	U
VOLATILES	1,3-Dichlorobenzene	µg/L	U		1	1	U	U		1	1	U	U		1						1	U	U		1	1	U	UJ	07A	1	25	U
VOLATILES	1,3-Dichloropropane	µg/L																													20	U
VOLATILES	1,4-Dichlorobenzene	µg/L	U		1	1	U	U		1	1	U	U		1						1	U	U		1	1	U	UJ	07A	1	12.5	U
VOLATILES	2,2-Dichloropropane	µg/L																													25	U
VOLATILES	2-Butanone	µg/L	U		1	10	U	U		1	10	U	U		1						10	U	U		1	10	U	UJ	07A	1	250	U
VOLATILES	2-Chloroethyl vinyl ether	µg/L																													200	U
VOLATILES	2-Chlorotoluene	µg/L																													12.5	U
VOLATILES	2-Hexanone	µg/L	U		1	10	U	U		1	10	U	U		1						10	U	U		1	10	U	UJ	07A	1	250	U
VOLATILES	4-Chlorotoluene	µg/L																													25	U
VOLATILES	Acetone	µg/L	U		1	10	U	U		1	10	U	U		1						10	U	U		1	10	U	UJ	07A	1	250	U
VOLATILES	Benzene	µg/L	U		1	1	U	U		1	1	U	U		1						1	U	U		1	0.738	J	J	15, 07A	1	12.5	U
VOLATILES	Bromobenzene	µg/L																													12.5	U
VOLATILES	Bromochloromethane	µg/L																													20	U
VOLATILES	Bromodichloromethane	µg/L	U		1	1	U	U		1	1	U	U		1						1	U	U		1	1	U	UJ	07A	1	25	U
VOLATILES	Bromoform	µg/L	U		1	1	U	U		1	1	U	U		1						1	U	U		1	1	U	UJ	07A	1	50	U
VOLATILES	Bromomethane	µg/L	U		1	1	U	U		1	1	U	U		1						1	U	U		1	1	U	UJ	07A	1	50	U
VOLATILES	Carbon disulfide	µg/L	U		1	1	U	U		1	1.01				1						1	U	U		1	1	U	UJ	07A	1	50	U
VOLATILES	Carbon tetrachloride	µg/L	U		1	1	U	U		1	1	U	U		1						1	U	U		1	1	U	UJ	07A	1	25	U
VOLATILES	Chlorobenzene	µg/L	U		1	1	U	U		1	1	U	U		1						1	U	U		1	1	U	UJ	07A	1	12.5	U
VOLATILES	Chloroethane	µg/L	U		1	1	U	U		1	1	U	U		1						1	U	U		1	1	U	UJ	07A	1	50	U
VOLATILES	Chloroform	µg/L	U		1	1	U	U		1	1	U	U		1						1	U	U		1	0.288	J	J	15, 07A	1	12.5	U
VOLATILES	Chloromethane	µg/L	U		1	1	U	U		1	0.809	J	J	15	1						1	U	U		1	1	U	UJ	07A	1	25	U
VOLATILES	cis-1,2-Dichloroethene	µg/L			1	2.1				1	1	U	U		1						1	U	U		1	1420				100	942	
VOLATILES	cis-1,3-Dichloropropene	µg/L	U		1	1	U	U		1	1	U	U		1						1	U	U		1	1	U	UJ	07A	1	25	U
VOLATILES	Cyclohexane	µg/L	U		1	5	U	U		1	5	U	U		1						5	U	U		1	5	U	UJ	07A	1		
VOLATILES	Dibromochloromethane	µg/L	U		1	1	U	U		1	1	U	U		1						1	U	U		1	1	U	UJ	07A	1	25	U
VOLATILES	Dibromomethane	µg/L																													25	U
VOLATILES	Dichlorodifluoromethane	µg/L	U		1	1	U	U		1	1	U	U		1						1	U	U		1	1	U	UJ	07A	1	25	U
VOLATILES	Ethylbenzene	µg/L	U		1	1	U	U		1	1	U	U		1						1	U	U		1	1	U	UJ	07A	1	25	U
VOLATILES	Freon 113	µg/L	U		1	5	U	U		1	5	U	U		1						5	U	U		1	5	U	UJ	07A	1		
VOLATILES	Hexachlorobutadiene	µg/L																													25	U
VOLATILES	Isopropylbenzene	µg/L	U		1	1	U	U		1	1	U	U		1						1	U	U		1	1	U	UJ	07A	1	25	U
VOLATILES	m,p-Xylenes	µg/L																													50	U
VOLATILES	Methyl Acetate	µg/L	U		1	10	U	U		1	10	U	U		1						10	U	U		1	10	U	UJ	07A	1		
VOLATILES	Methyl isobutyl ketone	µg/L	U		1	10	U	U		1	10	U	U		1						10	U	U		1	10	U	UJ	07A	1	250	U
VOLATILES	Methyl tert-butyl ether	µg/L	U		1	5	U	U		1	5	U	U		1						5	U	U		1	5	U	UJ	07A	1		
VOLATILES	Methylcyclohexane	µg/L	U		1	10	U	U		1	10	U	U		1						10	U	U		1	10	U	UJ	07A	1		
VOLATILES	Methylene chloride	µg/L	U		1	2	U	U		1	2	U	U		1						2	U	U		1	2	U	UJ	07A	1	44.5	J
VOLATILES	Naphthalene	µg/L																													20	U
VOLATILES	n-BUTYLBENZENE	µg/L																													25	U
VOLATILES	n-PROPYLBENZENE	µg/L																													12.5	U
VOLATILES	p-ISOPROPYLTOLUENE	µg/L																													25	U
VOLATILES	sec-BUTYLBENZENE	µg/L																													25	U
VOLATILES	Styrene	µg/L	U		1	1	U	U		1	1	U	U		1						1	U	U		1	1	U	UJ	07A	1	12.5	U
VOLATILES	tert-BUTYLBENZENE	µg/L																													25	U
VOLATILES	Tetrachloroethene	µg/L	U		1	1	U	U		1	1	U	U		1						1	U	U		1	0.343	J	J	15, 07A	1	25	U
VOLATILES	Toluene	µg/L	U		1	1	U	U		1	1	U	U		1						1	U	U		1	0.66	J	J	15, 07A	1	25	U
VOLATILES	trans-1,2-Dichloroethene	µg/L	U		1	1	U	U		1	1	U	U		1						1	U	U		1	3.6		J	07A	1	25	U
VOLATILES	trans-1,3-Dichloropropene	µg/L	U		1	1	U	U		1	1	U	U		1						1	U	U		1	1	U	UJ	07A	1	50	U
VOLATILES	Trichloroethene	µg/L			1	3.06				1	1	U	U		1						1	U	U		1	26700				500	13300	
VOLATILES	Trichlorofluoromethane	µg/L	U		1	1	U	U		1	1	U	U		1						1	U	U		1	1	U	UJ	07A	1	25	U
VOLATILES	Vinyl acetate	µg/L																													250	U
VOLATILES	Vinyl chloride	µg/L	U		1	1	U	U		1	1	U	U		1						1	U	U		1	34.9		J	07A	1	25	U
VOLATILES	Xylenes, Total	µg/L	U		1	1	U	U		1	1	U	U		1						1	U	U		1	1	U	UJ	07A	1		

Table C-1
Additional Sample Results Not Previously Presented

		Location Code	7WW25			47WW27					47WW28					47WW29					47WW30					47WW30					4	
		Sample No.	W25-040309			47WW27-101807					47WW28-101707					47WW29-101707					47WW30-101807					47WW30-FEB2007					47W	
		Sample Date	4/3/09			10/18/07					10/17/07					10/17/07					10/18/07					2/22/07						
		Groundwater Zone	HALLOW			SHALLOW					SHALLOW					INTERMEDIATE					SHALLOW					SHALLOW					SHALLOW	
		Sample Purpose	REG			REG					REG					REG					REG					REG						
Test Group	**Parameter**	**Units**	**ValQual**	**RC**	**DF**	**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**	**Result**	**Qual**
DHE	Dehalococcoides	cells/ml																								10	U	U		1		
FIELD TESTS	Dissolved Oxygen	µg/L				2360				1	1990				1	6710				1	2820				1	1830				1	1900	
FIELD TESTS	Ferrous iron	µg/L																								0				1		
FIELD TESTS	Oxygen Reduction Potential	mV				399.5				1	111.2				1	-9.3				1	144.7				1	205.6				1	141	
FIELD TESTS	pH	STD UNIT				5.51				1	6.44				1	6.61				1	6.75				1	6.69				1	6.91	
FIELD TESTS	Salinity	µg/L																								2490				1		
FIELD TESTS	Specific Conductivity	uS/cm				412				1	2326				1	1337				1	4447				1	4644				1	4762	
FIELD TESTS	Temperature	Deg C				19.68				1	20.14				1	20.24				1	20.25				1	18.08				1	19.15	
FIELD TESTS	Turbidity	NTU				167.8				1	117				1	4.9				1	-4.5				1	0				1	0	
GASES	Ethane	µg/L																								0.6	U	U		1		
GASES	Ethylene	µg/L																								0.8	U	U		1		
GASES	Methane	µg/L																								1.68				1		
GEN CHEMISTRY	Carbon Dioxide	µg/L																								150000				1		
GEN CHEMISTRY	Chloride	µg/L																								726000				20		
GEN CHEMISTRY	Fluoride, Total	mg/L																														
GEN CHEMISTRY	Nitrate	µg/L																								5	U	U		1		
GEN CHEMISTRY	Nitrate / Nitrite	µg/L																								5	U	U		1		
GEN CHEMISTRY	Nitrite	µg/L																								3	U	U		1		
GEN CHEMISTRY	Perchlorate	µg/L	U		1	1170				15	1	U	U		1	1	U	U		1						4	U	U		1		
GEN CHEMISTRY	pH	STD UNIT																								7.1				1		
GEN CHEMISTRY	Specific Conductivity	uS/cm																								4130				1		
GEN CHEMISTRY	Sulfate	µg/L																								637000				4		
GEN CHEMISTRY	Sulfide	µg/L																								200	UB	U		1		
GEN CHEMISTRY	Total Alkalinity	µg/L																								752000				5		
GEN CHEMISTRY	TOTAL DISSOLVED SOLIDS	µg/L																														
GEN CHEMISTRY	Total Organic Carbon	µg/L																								2000				1		
GEN CHEMISTRY	TOTAL SUSPENDED SOLIDS	µg/L																														
METALS	Aluminum	µg/L																														
METALS	Antimony	µg/L																														
METALS	Arsenic	µg/L																														
METALS	Barium	µg/L																														
METALS	Beryllium	µg/L																														
METALS	Cadmium	µg/L																														
METALS	Calcium	µg/L																														
METALS	Chromium	µg/L																														
METALS	Cobalt	µg/L																														
METALS	Copper	µg/L																														
METALS	Iron	µg/L																														
METALS	Lead	µg/L																														
METALS	Magnesium	µg/L																														
METALS	Manganese	µg/L																														
METALS	Mercury	µg/L																														
METALS	Nickel	µg/L																														
METALS	Potassium	µg/L																														
METALS	Selenium	µg/L																														
METALS	Silver	µg/L																														
METALS	Sodium	µg/L																														
METALS	Thallium	µg/L																														
METALS	Vanadium	µg/L																														
METALS	Zinc	µg/L																														
METALS-DISS	Aluminum	µg/L																														
METALS-DISS	Antimony	µg/L																														
METALS-DISS	Arsenic	µg/L																														
METALS-DISS	Barium	µg/L																														
METALS-DISS	Beryllium	µg/L																														
METALS-DISS	Cadmium	µg/L																														
METALS-DISS	Calcium	µg/L																														
METALS-DISS	Chromium	µg/L																														
METALS-DISS	Cobalt	µg/L																														
METALS-DISS	Copper	µg/L																														
METALS-DISS	Iron	µg/L																														
METALS-DISS	Lead	µg/L																														
METALS-DISS	Magnesium	µg/L																														
METALS-DISS	Manganese	µg/L																														
METALS-DISS	Mercury	µg/L																														
METALS-DISS	Nickel	µg/L																														
METALS-DISS	Potassium	µg/L																														
METALS-DISS	Selenium	µg/L																														
METALS-DISS	Silver	µg/L																														
METALS-DISS	Sodium	µg/L																														
METALS-DISS	Thallium	µg/L																														
METALS-DISS	Vanadium	µg/L																														
METALS-DISS	Zinc	µg/L																														

Table C-1
Additional Sample Results Not Previously Presented

	Location Code		7WW25			47WW27					47WW28					47WW29					47WW30					47WW30					4	
	Sample No.		W25-040309			47WW27-101807					47WW28-101707					47WW29-101707					47WW30-101807					47WW30-FEB2007					47W	
	Sample Date		4/3/09			10/18/07					10/17/07					10/17/07					10/18/07					2/22/07						
	Groundwater Zone		HALLOW			SHALLOW					SHALLOW					INTERMEDIATE					SHALLOW					SHALLOW					SHALLOV	
	Sample Purpose		REG			REG					REG					REG					REG					REG						
Test Group	Parameter	Units	ValQual	RC	DF	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	Result	Qual
VOLATILES	1,1,1,2-Tetrachloroethane	µg/L	U		100																											
VOLATILES	1,1,1-Trichloroethane	µg/L	U		100						1	U	U		1	1	U	U		1	1	U	U		1	0.37	U	U		1	1	U
VOLATILES	1,1,2,2-Tetrachloroethane	µg/L	U		100						1	U	U		1	1	U	U		1	1	U	U		1	0.46	U	U		1	1	U
VOLATILES	1,1,2-Trichloroethane	µg/L	U		100						1	U	U		1	1	U	U		1	1	U	U		1	0.66	U	U		1	1	U
VOLATILES	1,1-Dichloroethane	µg/L	U		100						1	U	U		1	1	U	U		1	1	U	U		1	0.52	U	U		1	1	U
VOLATILES	1,1-Dichloroethene	µg/L	U		100						1	U	U		1	1	U	U		1	1.94				1	1.9	J			1	1	U
VOLATILES	1,1-Dichloropropene	µg/L	U		100																											
VOLATILES	1,2,3-Trichlorobenzene	µg/L	U		100																											
VOLATILES	1,2,3-Trichloropropane	µg/L	U		100																											
VOLATILES	1,2,4-Trichlorobenzene	µg/L	U		100						1	U	U		1	1	U	U		1	1	U	U		1						1	U
VOLATILES	1,2,4-Trimethylbenzene	µg/L	U		100																											
VOLATILES	1,2-Dibromo-3-chloropropane	µg/L	U		100						5	U	U		1	5	U	U		1	5	U	U		1						5	U
VOLATILES	1,2-Dibromoethane	µg/L	U		100						1	U	U		1	1	U	U		1	1	U	U		1						1	U
VOLATILES	1,2-Dichlorobenzene	µg/L	U		100						1	U	U		1	1	U	U		1	1	U	U		1						1	U
VOLATILES	1,2-Dichloroethane	µg/L	U		100						1	U	U		1	1	U	U		1	1	U	U		1	0.53	U	U		1	1	U
VOLATILES	1,2-Dichloropropane	µg/L	U		100						1	U	U		1	1	U	U		1	1	U	U		1	0.59	U	U		1	1	U
VOLATILES	1,2-Dimethylbenzene (o-Xylene)	µg/L	U		100																											
VOLATILES	1,3,5-Trimethylbenzene	µg/L	U		100																											
VOLATILES	1,3-Dichlorobenzene	µg/L	U		100						1	U	U		1	1	U	U		1	1	U	U		1						1	U
VOLATILES	1,3-Dichloropropane	µg/L	U		100																											
VOLATILES	1,4-Dichlorobenzene	µg/L	U		100						1	U	U		1	1	U	U		1	1	U	U		1						1	U
VOLATILES	2,2-Dichloropropane	µg/L	U		100																											
VOLATILES	2-Butanone	µg/L	U		100						10	U	U		1	10	U	U		1	10	U	U		1	3	U	U		1	10	U
VOLATILES	2-Chloroethyl vinyl ether	µg/L	U		100																											
VOLATILES	2-Chlorotoluene	µg/L	U		100																											
VOLATILES	2-Hexanone	µg/L	U		100						10	U	U		1	10	U	U		1	10	U	U		1	1.9	U	U		1	10	U
VOLATILES	4-Chlorotoluene	µg/L	U		100																											
VOLATILES	Acetone	µg/L	U		100						10	U	U		1	10	U	U		1	10	U	U		1	2.8	U	U		1	10	U
VOLATILES	Benzene	µg/L	U		100						1	U	U		1	1	U	U		1	1	U	U		1	0.23	U	U		1	1	U
VOLATILES	Bromobenzene	µg/L	U		100																											
VOLATILES	Bromochloromethane	µg/L	U		100																											
VOLATILES	Bromodichloromethane	µg/L	U		100						1	U	U		1	1	U	U		1	1	U	U		1	0.33	U	U		1	1	U
VOLATILES	Bromoform	µg/L	U		100						1	U	U		1	1	U	U		1	1	U	U		1	0.65	U	U		1	1	U
VOLATILES	Bromomethane	µg/L	U		100						1	U	U		1	1	U	U		1	1	U	U		1	0.47	U	U		1	1	U
VOLATILES	Carbon disulfide	µg/L	U		100						1	U	U		1	1	U	U		1	1	U	U		1	0.62	U	U		1	1	U
VOLATILES	Carbon tetrachloride	µg/L	U		100						1	U	U		1	1	U	U		1	1	U	U		1	0.52	U	U		1	1	U
VOLATILES	Chlorobenzene	µg/L	U		100						1	U	U		1	1	U	U		1	1	U	U		1	0.54	U	U		1	1	U
VOLATILES	Chloroethane	µg/L	U		100						1	U	U		1	1	U	U		1	1	U	U		1	0.46	U	U		1	1	U
VOLATILES	Chloroform	µg/L	U		100						1	U	U		1	1	U	U		1	1	U	U		1	0.66	U	U		1	1	U
VOLATILES	Chloromethane	µg/L	U		100						1	U	U		1	1	U	U		1	1	U	U		1	0.6	U	U		1	1	U
VOLATILES	cis-1,2-Dichloroethene	µg/L			100						1	U	U		1	1	U	U		1	10.4				1	6.8				1	1	U
VOLATILES	cis-1,3-Dichloropropene	µg/L	U		100						1	U	U		1	1	U	U		1	1	U	U		1	0.59	U	U		1	1	U
VOLATILES	Cyclohexane	µg/L									4.35	J	J	15	1	4.29	J	J	15	1	5	U	U		1						5	U
VOLATILES	Dibromochloromethane	µg/L	U		100						1	U	U		1	1	U	U		1	1	U	U		1	0.68	U	U		1	1	U
VOLATILES	Dibromomethane	µg/L	U		100																											
VOLATILES	Dichlorodifluoromethane	µg/L	U		100						1	U	U		1	1	U	U		1	1	U	U		1						1	U
VOLATILES	Ethylbenzene	µg/L	U		100						1	U	U		1	1	U	U		1	1	U	U		1	0.48	U	U		1	1	U
VOLATILES	Freon 113	µg/L									5	U	U		1	5	U	U		1	5	U	U		1						5	U
VOLATILES	Hexachlorobutadiene	µg/L	U		100																											
VOLATILES	Isopropylbenzene	µg/L	U		100						1	U	U		1	1	U	U		1	1	U	U		1						1	U
VOLATILES	m,p-Xylenes	µg/L	U		100																											
VOLATILES	Methyl Acetate	µg/L									10	U	U		1	10	U	U		1	10	U	U		1						10	U
VOLATILES	Methyl isobutyl ketone	µg/L	U		100						10	U	U		1	10	U	U		1	10	U	U		1	7.3	U	U		1	10	U
VOLATILES	Methyl tert-butyl ether	µg/L									5	U	U		1	5	U	U		1	5	U	U		1						5	U
VOLATILES	Methylcyclohexane	µg/L									10	U	U		1	10	U	U		1	10	U	U		1						10	U
VOLATILES	Methylene chloride	µg/L	J	15	100						2	U	U		1	2	U	U		1	2	U	U		1	0.67	U	U		1	2	U
VOLATILES	Naphthalene	µg/L	U		100																											
VOLATILES	n-BUTYLBENZENE	µg/L	U		100																											
VOLATILES	n-PROPYLBENZENE	µg/L	U		100																											
VOLATILES	p-ISOPROPYLTOLUENE	µg/L	U		100																											
VOLATILES	sec-BUTYLBENZENE	µg/L	U		100																											
VOLATILES	Styrene	µg/L	U		100						1	U	U		1	1	U	U		1	1	U	U		1	0.5	U	U		1	1	U
VOLATILES	tert-BUTYLBENZENE	µg/L	U		100																											
VOLATILES	Tetrachloroethene	µg/L	U		100						1	U	U		1	1	U	U		1	1	U	U		1	0.74	U	U		1	1	U
VOLATILES	Toluene	µg/L	U		100						1	U	U		1	1	U	U		1	1	U	U		1	0.54	U	U		1	1	U
VOLATILES	trans-1,2-Dichloroethene	µg/L	U		100						1	U	U		1	1	U	U		1	0.336	J	J	15	1	0.75	U	U		1	1	U
VOLATILES	trans-1,3-Dichloropropene	µg/L	U		100						1	U	U		1	1	U	U		1	1	U	U		1	0.61	U	U		1	1	U
VOLATILES	Trichloroethene	µg/L			100						1	U	U		1	1	U	U		1	1370				25	1060				10	0.329	J
VOLATILES	Trichlorofluoromethane	µg/L	U		100						1	U	U		1	1	U	U		1	1	U	U		1						1	U
VOLATILES	Vinyl acetate	µg/L	U		100																											
VOLATILES	Vinyl chloride	µg/L	U		100						1	U	U		1	1	U	U		1	0.747	J	J	15	1	0.32	U	U		1	1	U
VOLATILES	Xylenes, Total	µg/L									1	U	U		1	1	U	U		1	1	U	U		1	1.1	U	U		1	1	U

Table C-1
Additional Sample Results Not Previously Presented

	Location Code		47WW31			47WW32					47WW33					47WW33					47WW33					47WW34					4	
	Sample No.		W31-101807			47WW32-101807					47WW33-022008					47WW33-022008-QC					47WW33-031408					47WW34-021908					47W	
	Sample Date		10/18/07			10/18/07					2/20/08					2/20/08					3/14/08					2/19/08						
	Groundwater Zone		V/INTERMEDIATE			SHALLOW/INTERMEDIATE					SHALLOW/INTERMEDIATE					SHALLOW/INTERMEDIATE					SHALLOW/INTERMEDIATE					INTERMEDIATE					INT	
	Sample Purpose		REG			REG					REG					FD					REG					REG						
Test Group	**Parameter**	**Units**	**ValQual**	**RC**	**DF**	**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**	**Result**	**Qual**
DHE	Dehalococcoides	cells/ml																														
FIELD TESTS	Dissolved Oxygen	µg/L			1	2480				1																						
FIELD TESTS	Ferrous iron	µg/L																														
FIELD TESTS	Oxygen Reduction Potential	mV			1	133.9				1																						
FIELD TESTS	pH	STD UNIT			1	6.73				1																						
FIELD TESTS	Salinity	µg/L																														
FIELD TESTS	Specific Conductivity	uS/cm			1	6501				1																						
FIELD TESTS	Temperature	Deg C			1	15.15				1																						
FIELD TESTS	Turbidity	NTU			1	0				1																						
GASES	Ethane	µg/L																														
GASES	Ethylene	µg/L																														
GASES	Methane	µg/L																														
GEN CHEMISTRY	Carbon Dioxide	µg/L																														
GEN CHEMISTRY	Chloride	µg/L																														
GEN CHEMISTRY	Fluoride, Total	mg/L																														
GEN CHEMISTRY	Nitrate	µg/L																														
GEN CHEMISTRY	Nitrate / Nitrite	µg/L																														
GEN CHEMISTRY	Nitrite	µg/L																														
GEN CHEMISTRY	Perchlorate	µg/L																														
GEN CHEMISTRY	pH	STD UNIT																														
GEN CHEMISTRY	Specific Conductivity	uS/cm																														
GEN CHEMISTRY	Sulfate	µg/L																														
GEN CHEMISTRY	Sulfide	µg/L																														
GEN CHEMISTRY	Total Alkalinity	µg/L																														
GEN CHEMISTRY	TOTAL DISSOLVED SOLIDS	µg/L																														
GEN CHEMISTRY	Total Organic Carbon	µg/L																														
GEN CHEMISTRY	TOTAL SUSPENDED SOLIDS	µg/L																														
METALS	Aluminum	µg/L																														
METALS	Antimony	µg/L																														
METALS	Arsenic	µg/L																														
METALS	Barium	µg/L																														
METALS	Beryllium	µg/L																														
METALS	Cadmium	µg/L																														
METALS	Calcium	µg/L																														
METALS	Chromium	µg/L																														
METALS	Cobalt	µg/L																														
METALS	Copper	µg/L																														
METALS	Iron	µg/L																														
METALS	Lead	µg/L																														
METALS	Magnesium	µg/L																														
METALS	Manganese	µg/L																														
METALS	Mercury	µg/L																														
METALS	Nickel	µg/L																														
METALS	Potassium	µg/L																														
METALS	Selenium	µg/L																														
METALS	Silver	µg/L																														
METALS	Sodium	µg/L																														
METALS	Thallium	µg/L																														
METALS	Vanadium	µg/L																														
METALS	Zinc	µg/L																														
METALS-DISS	Aluminum	µg/L																														
METALS-DISS	Antimony	µg/L																														
METALS-DISS	Arsenic	µg/L																														
METALS-DISS	Barium	µg/L																														
METALS-DISS	Beryllium	µg/L																														
METALS-DISS	Cadmium	µg/L																														
METALS-DISS	Calcium	µg/L																														
METALS-DISS	Chromium	µg/L																														
METALS-DISS	Cobalt	µg/L																														
METALS-DISS	Copper	µg/L																														
METALS-DISS	Iron	µg/L																														
METALS-DISS	Lead	µg/L																														
METALS-DISS	Magnesium	µg/L																														
METALS-DISS	Manganese	µg/L																														
METALS-DISS	Mercury	µg/L																														
METALS-DISS	Nickel	µg/L																														
METALS-DISS	Potassium	µg/L																														
METALS-DISS	Selenium	µg/L																														
METALS-DISS	Silver	µg/L																														
METALS-DISS	Sodium	µg/L																														
METALS-DISS	Thallium	µg/L																														
METALS-DISS	Vanadium	µg/L																														
METALS-DISS	Zinc	µg/L																														

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Shaw Environmental, Inc.

Table C-1
Additional Sample Results Not Previously Presented

	Location Code		7WW31			47WW32					47WW33					47WW33					47WW33					47WW34					4	
	Sample No.		W31-101807			47WW32-101807					47WW33-022008					47WW33-022008-QC					47WW33-031408					47WW34-021908					47W	
	Sample Date		10/18/07			10/18/07					2/20/08					2/20/08					3/14/08					2/19/08						
	Groundwater Zone		/INTERMEDIATE			SHALLOW/INTERMEDIATE					SHALLOW/INTERMEDIATE					SHALLOW/INTERMEDIATE					SHALLOW/INTERMEDIATE					INTERMEDIATE					INTI	
	Sample Purpose		REG			REG					REG					FD					REG					REG						
Test Group	Parameter	Units	ValQual	RC	DF	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	Result	Qual
VOLATILES	1,1,1,2-Tetrachloroethane	µg/L									0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	6.25	U
VOLATILES	1,1,1-Trichloroethane	µg/L	U		1	1	U	U		1	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	6.25	U
VOLATILES	1,1,2,2-Tetrachloroethane	µg/L	U		1	1	U	U		1	0.125	U	U		1	0.125	U	U		1	0.125	U	U		1	0.125	U	U		1	3.13	U
VOLATILES	1,1,2-Trichloroethane	µg/L	U		1	1	U	U		1	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	0.358	J	J	15	1	6.25	U
VOLATILES	1,1-Dichloroethane	µg/L	U		1	1	U	U		1	0.125	U	U		1	0.125	U	U		1	0.125	U	U		1	2.38				1	3.13	U
VOLATILES	1,1-Dichloroethene	µg/L	U		1	0.632	J	J	15	1	0.5	U	U		1	0.5	U	U		1	0.5	U	U		1	16.5				1	12.5	U
VOLATILES	1,1-Dichloropropene	µg/L									0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	6.25	U
VOLATILES	1,2,3-Trichlorobenzene	µg/L									0.125	U	U		1	0.125	U	U		1	0.125	U	U		1	0.125	U	U		1	3.13	U
VOLATILES	1,2,3-Trichloropropane	µg/L									0.5	U	U		1	0.5	U	U		1	0.5	U	U		1	0.5	U	U		1	12.5	U
VOLATILES	1,2,4-Trichlorobenzene	µg/L	U		1	1	U	U		1	0.2	U	U		1	0.2	U	U		1	0.2	U	U		1	0.2	U	U		1	5	U
VOLATILES	1,2,4-Trimethylbenzene	µg/L									0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	6.25	U
VOLATILES	1,2-Dibromo-3-chloropropane	µg/L	U		1	5	U	U		1	1	U	U		1	1	U	U		1	1	U	U		1	1	U	U		1	25	U
VOLATILES	1,2-Dibromoethane	µg/L	U		1	1	U	U		1	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	6.25	U
VOLATILES	1,2-Dichlorobenzene	µg/L	U		1	1	U	U		1	0.125	U	U		1	0.125	U	U		1	0.125	U	U		1	0.125	U	U		1	3.13	U
VOLATILES	1,2-Dichloroethane	µg/L	U		1	1	U	U		1	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	1				1	6.25	U
VOLATILES	1,2-Dichloropropane	µg/L	U		1	1	U	U		1	0.2	U	U		1	0.2	U	U		1	0.2	U	U		1	0.2	U	U		1	5	U
VOLATILES	1,2-Dimethylbenzene (o-Xylene)	µg/L									0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	6.25	U
VOLATILES	1,3,5-Trimethylbenzene	µg/L									0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	6.25	U
VOLATILES	1,3-Dichlorobenzene	µg/L	U		1	1	U	U		1	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	6.25	U
VOLATILES	1,3-Dichloropropane	µg/L									0.2	U	U		1	0.2	U	U		1	0.2	U	U		1	0.2	U	U		1	5	U
VOLATILES	1,4-Dichlorobenzene	µg/L	U		1	1	U	U		1	0.125	U	U		1	0.125	U	U		1	0.125	U	U		1	0.125	U	U		1	3.13	U
VOLATILES	2,2-Dichloropropane	µg/L									0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	6.25	U
VOLATILES	2-Butanone	µg/L	U		1	10	U	U		1	2.5	U	U		1	2.5	U	U		1	2.5	U	U		1	2.5	U	U		1	62.5	U
VOLATILES	2-Chloroethyl vinyl ether	µg/L									2	U	U		1	2	U	U		1	2	U	U		1	2	U	U		1	50	U
VOLATILES	2-Chlorotoluene	µg/L									0.125	U	U		1	0.125	U	U		1	0.125	U	U		1	0.125	U	U		1	3.13	U
VOLATILES	2-Hexanone	µg/L	U		1	10	U	U		1	2.5	U	U		1	2.5	U	U		1	2.5	U	U		1	2.5	U	U		1	62.5	U
VOLATILES	4-Chlorotoluene	µg/L									0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	6.25	U
VOLATILES	Acetone	µg/L	U		1	10	U	U		1	9.12	J	J	15	1	9.59	J	J	15	1	2.5	U	U		1	2.5	U	U		1	62.5	U
VOLATILES	Benzene	µg/L	U		1	1	U	U		1	0.177	J	J	15	1	0.188	J	J	15	1	0.125	U	U		1	0.125	U	U		1	3.13	U
VOLATILES	Bromobenzene	µg/L									0.125	U	U		1	0.125	U	U		1	0.125	U	U		1	0.125	U	U		1	3.13	U
VOLATILES	Bromochloromethane	µg/L									0.2	U	U		1	0.2	U	U		1	0.2	U	U		1	0.2	U	U		1	5	U
VOLATILES	Bromodichloromethane	µg/L	U		1	1	U	U		1	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	6.25	U
VOLATILES	Bromoform	µg/L	U		1	1	U	U		1	0.5	U	U		1	0.5	U	U		1	0.5	U	U		1	0.5	U	U		1	12.5	U
VOLATILES	Bromomethane	µg/L	U		1	1	U	U		1	0.5	U	U		1	0.5	U	U		1	0.5	U	U		1	0.5	U	U		1	12.5	U
VOLATILES	Carbon disulfide	µg/L	U		1	1	U	U		1	0.5	U	U		1	0.5	U	U		1	0.5	U	U		1	0.5	U	U		1	12.5	U
VOLATILES	Carbon tetrachloride	µg/L	U		1	1	U	U		1	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	6.25	U
VOLATILES	Chlorobenzene	µg/L	U		1	1	U	U		1	0.125	U	U		1	0.125	U	U		1	0.125	U	U		1	0.125	U	U		1	3.13	U
VOLATILES	Chloroethane	µg/L	U		1	1	U	U		1	0.5	U	U		1	0.5	U	U		1	0.5	U	U		1	0.5	U	U		1	12.5	U
VOLATILES	Chloroform	µg/L	U		1	1	U	U		1	0.125	U	U		1	0.125	U	U		1	0.125	U	U		1	0.125	U	U		1	3.13	U
VOLATILES	Chloromethane	µg/L	U		1	1	U	U		1	0.25	U	UJ	17	1	0.876	J	J	15, 17	1	0.25	U	U		1	0.25	U	UJ	17	1	6.25	U
VOLATILES	cis-1,2-Dichloroethene	µg/L	U		1	0.698	J	J	15	1	0.735	J	J	15	1	0.628	J	J	15	1	0.25	U	U		1	211				50	183	
VOLATILES	cis-1,3-Dichloropropene	µg/L	U		1	1	U	U		1	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	6.25	U
VOLATILES	Cyclohexane	µg/L	U		1	5	U	U		1																						
VOLATILES	Dibromochloromethane	µg/L	U		1	1	U	U		1	0.538	J	J	15	1	0.537	J	J	15	1	0.25	U	U		1	0.25	U	U		1	6.25	U
VOLATILES	Dibromomethane	µg/L									0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	6.25	U
VOLATILES	Dichlorodifluoromethane	µg/L	U		1	1	U	U		1	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	6.25	U
VOLATILES	Ethylbenzene	µg/L	U		1	1	U	U		1	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	6.25	U
VOLATILES	Freon 113	µg/L	U		1	5	U	U		1																						
VOLATILES	Hexachlorobutadiene	µg/L									0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	6.25	U
VOLATILES	Isopropylbenzene	µg/L	U		1	1	U	U		1	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	6.25	U
VOLATILES	m,p-Xylenes	µg/L									0.5	U	U		1	0.5	U	U		1	0.5	U	U		1	0.5	U	U		1	12.5	U
VOLATILES	Methyl Acetate	µg/L	U		1	10	U	U		1																						
VOLATILES	Methyl isobutyl ketone	µg/L	U		1	10	U	U		1	2.5	U	U		1	2.5	U	U		1	2.5	U	U		1	2.5	U	U		1	62.5	U
VOLATILES	Methyl tert-butyl ether	µg/L	U		1	5	U	U		1																						
VOLATILES	Methylcyclohexane	µg/L	U		1	10	U	U		1																						
VOLATILES	Methylene chloride	µg/L	U		1	2	U	U		1	0.528	J	J	15	1	0.394	J	J	15	1	1.27	J	J	15	1	0.25	U	U		1	6.25	U
VOLATILES	Naphthalene	µg/L									0.2	U	U		1	0.2	U	U		1	0.2	U	U		1	0.2	U	U		1	5	U
VOLATILES	n-BUTYLBENZENE	µg/L									0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	6.25	U
VOLATILES	n-PROPYLBENZENE	µg/L									0.125	U	U		1	0.125	U	U		1	0.125	U	U		1	0.125	U	U		1	3.13	U
VOLATILES	p-ISOPROPYLTOLUENE	µg/L									0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	6.25	U
VOLATILES	sec-BUTYLBENZENE	µg/L									0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	6.25	U
VOLATILES	Styrene	µg/L	U		1	1	U	U		1	0.125	U	U		1	0.125	U	U		1	0.125	U	U		1	0.125	U	U		1	3.13	U
VOLATILES	tert-BUTYLBENZENE	µg/L									0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	6.25	U
VOLATILES	Tetrachloroethene	µg/L	U		1	1	U	U		1	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	6.25	U
VOLATILES	Toluene	µg/L	U		1	1	U	U		1	0.659	J	J	15	1	0.747	J	J	15	1	0.25	U	U		1	0.25	U	U		1	6.25	U
VOLATILES	trans-1,2-Dichloroethene	µg/L	U		1	1	U	U		1	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	2.66				1	6.25	U
VOLATILES	trans-1,3-Dichloropropene	µg/L	U		1	1	U	U		1	0.5	U	U		1	0.5	U	U		1	0.5	U	U		1	0.5	U	U		1	12.5	U
VOLATILES	Trichloroethene	µg/L	J	15	1	34				1	7.09				1	7.65				1	1.44				1	3270				50	2150	
VOLATILES	Trichlorofluoromethane	µg/L	U		1	1	U	U		1	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	6.25	U
VOLATILES	Vinyl acetate	µg/L									2.5	U	U		1	2.5	U	U		1	2.5	U	U		1	2.5	U	U		1	62.5	U
VOLATILES	Vinyl chloride	µg/L	U		1	0.302	J	J	15	1	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	23.4				1	11.1	J
VOLATILES	Xylenes, Total	µg/L	U		1	1	U	U		1																						

00100771

Table C-1
Additional Sample Results Not Previously Presented

	Location Code		7WW34			47WW34					47WW35					47WW35					47WW36					LHSMW34					L	
	Sample No.		W34-031408			47WW34-022309					47WW35-100808					47WW35-100808-QA					47WW36-100808					LHSMW34-101807					47W	
	Sample Date		3/14/08			2/23/09					10/9/08					10/9/08					10/8/08					10/18/07						
	Groundwater Zone		ERMEDIATE			INTERMEDIATE					INTERMEDIATE					INTERMEDIATE					INTERMEDIATE					SHALLOW					S	
	Sample Purpose		REG			REG					REG					FD					REG					REG						
Test Group	**Parameter**	**Units**	**ValQual**	**RC**	**DF**	**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**	**Result**	**Qual**
DHE	Dehalococcoides	cells/ml																														
FIELD TESTS	Dissolved Oxygen	µg/L				530																				2290				1	2300	
FIELD TESTS	Ferrous iron	µg/L																														
FIELD TESTS	Oxygen Reduction Potential	mV				-36.7																				70.9				1	149.1	
FIELD TESTS	pH	STD UNIT				6.9																				6.42				1	6.28	
FIELD TESTS	Salinity	µg/L																														
FIELD TESTS	Specific Conductivity	uS/cm				1239																				2033				1	341	
FIELD TESTS	Temperature	Deg C				17.95																				20.56				1	18.41	
FIELD TESTS	Turbidity	NTU				-19.5																				0				1	48.7	
GASES	Ethane	µg/L																														
GASES	Ethylene	µg/L																														
GASES	Methane	µg/L																														
GEN CHEMISTRY	Carbon Dioxide	µg/L																														
GEN CHEMISTRY	Chloride	µg/L																														
GEN CHEMISTRY	Fluoride, Total	mg/L																														
GEN CHEMISTRY	Nitrate	µg/L																														
GEN CHEMISTRY	Nitrate / Nitrite	µg/L																														
GEN CHEMISTRY	Nitrite	µg/L																														
GEN CHEMISTRY	Perchlorate	µg/L																														
GEN CHEMISTRY	pH	STD UNIT																														
GEN CHEMISTRY	Specific Conductivity	uS/cm																														
GEN CHEMISTRY	Sulfate	µg/L																														
GEN CHEMISTRY	Sulfide	µg/L																														
GEN CHEMISTRY	Total Alkalinity	µg/L																														
GEN CHEMISTRY	TOTAL DISSOLVED SOLIDS	µg/L																														
GEN CHEMISTRY	Total Organic Carbon	µg/L																														
GEN CHEMISTRY	TOTAL SUSPENDED SOLIDS	µg/L																														
METALS	Aluminum	µg/L																														
METALS	Antimony	µg/L																														
METALS	Arsenic	µg/L																														
METALS	Barium	µg/L																														
METALS	Beryllium	µg/L																														
METALS	Cadmium	µg/L																														
METALS	Calcium	µg/L																														
METALS	Chromium	µg/L																														
METALS	Cobalt	µg/L																														
METALS	Copper	µg/L																														
METALS	Iron	µg/L																														
METALS	Lead	µg/L																														
METALS	Magnesium	µg/L																														
METALS	Manganese	µg/L																														
METALS	Mercury	µg/L																														
METALS	Nickel	µg/L																														
METALS	Potassium	µg/L																														
METALS	Selenium	µg/L																														
METALS	Silver	µg/L																														
METALS	Sodium	µg/L																														
METALS	Thallium	µg/L																														
METALS	Vanadium	µg/L																														
METALS	Zinc	µg/L																														
METALS-DISS	Aluminum	µg/L																														
METALS-DISS	Antimony	µg/L																														
METALS-DISS	Arsenic	µg/L																														
METALS-DISS	Barium	µg/L																														
METALS-DISS	Beryllium	µg/L																														
METALS-DISS	Cadmium	µg/L																														
METALS-DISS	Calcium	µg/L																														
METALS-DISS	Chromium	µg/L																														
METALS-DISS	Cobalt	µg/L																														
METALS-DISS	Copper	µg/L																														
METALS-DISS	Iron	µg/L																														
METALS-DISS	Lead	µg/L																														
METALS-DISS	Magnesium	µg/L																														
METALS-DISS	Manganese	µg/L																														
METALS-DISS	Mercury	µg/L																														
METALS-DISS	Nickel	µg/L																														
METALS-DISS	Potassium	µg/L																														
METALS-DISS	Selenium	µg/L																														
METALS-DISS	Silver	µg/L																														
METALS-DISS	Sodium	µg/L																														
METALS-DISS	Thallium	µg/L																														
METALS-DISS	Vanadium	µg/L																														
METALS-DISS	Zinc	µg/L																														

Table C-1
Additional Sample Results Not Previously Presented

	Location Code		7WW34			47WW34					47WW35					47WW35					47WW36					LHSMW34					L	
	Sample No.		W34-031408			47WW34-022309					47WW35-100808					47WW35-100808-QA					47WW36-100808					LHSMW34-101807					47W	
	Sample Date		3/14/08			2/23/09					10/9/08					10/9/08					10/8/08					10/18/07						
	Groundwater Zone		ERMEDIATE			INTERMEDIATE					INTERMEDIATE					INTERMEDIATE					INTERMEDIATE					SHALLOW					S	
	Sample Purpose		REG			REG					REG					FD					REG					REG						
Test Group	Parameter	Units	ValQual	RC	DF	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	Result	Qual
VOLATILES	1,1,1,2-Tetrachloroethane	µg/L	U		25	0.25	U	U		1	0.25	U			1	0.25	U			1	0.25	U			1							
VOLATILES	1,1,1-Trichloroethane	µg/L	U		25	0.25	U	U		1	0.25	U			1	0.25	U			1	0.25	U			1	2	U	U		2	1	U
VOLATILES	1,1,2,2-Tetrachloroethane	µg/L	U		25	0.125	U	U		1	0.125	U			1	0.125	U			1	0.125	U			1	2	U	U		2	1	U
VOLATILES	1,1,2-Trichloroethane	µg/L	U		25	0.299	J	J	15	1	0.25	U			1	0.25	U			1	0.25	U			1	2	U	U		2	1	U
VOLATILES	1,1-Dichloroethane	µg/L	U		25	1.82				1	0.125	U			1	0.125	U			1	0.125	U			1	0.96	J	J	15	2	1	U
VOLATILES	1,1-Dichloroethene	µg/L	U		25	10.9				1	0.5	U			1	0.5	U			1	0.5	U			1	2	U	U		2	1	U
VOLATILES	1,1-Dichloropropene	µg/L	U		25	0.25	U	U		1	0.25	U			1	0.25	U			1	0.25	U			1							
VOLATILES	1,2,3-Trichlorobenzene	µg/L	U		25	0.15	U	U		1	0.15	U			1	0.15	U			1	0.15	U			1							
VOLATILES	1,2,3-Trichloropropane	µg/L	U		25	0.5	U	U		1	0.5	U			1	0.5	U			1	0.5	U			1							
VOLATILES	1,2,4-Trichlorobenzene	µg/L	U		25	0.2	U	U		1	0.2	U			1	0.2	U			1	0.2	U			1	2	U	U		2	1	U
VOLATILES	1,2,4-Trimethylbenzene	µg/L	U		25	0.25	U	U		1	0.25	U			1	0.25	U			1	0.25	U			1							
VOLATILES	1,2-Dibromo-3-chloropropane	µg/L	U		25	1	U	U		1	1	U			1	1	U			1	1	U			1	10	U	U		2	5	U
VOLATILES	1,2-Dibromoethane	µg/L	U		25	0.25	U	U		1	0.25	U			1	0.25	U			1	0.25	U			1	2	U	U		2	1	U
VOLATILES	1,2-Dichlorobenzene	µg/L	U		25	0.125	U	U		1	0.125	U			1	0.125	U			1	0.125	U			1	2	U	U		2	1	U
VOLATILES	1,2-Dichloroethane	µg/L	U		25	0.746	J	J	15	1	0.25	U			1	0.25	U			1	0.25	U			1	2	U	U		2	1	U
VOLATILES	1,2-Dichloropropane	µg/L	U		25	0.2	U	U		1	0.2	U			1	0.2	U			1	0.2	U			1	2	U	U		2	1	U
VOLATILES	1,2-Dimethylbenzene (o-Xylene)	µg/L	U		25	0.25	U	U		1																						
VOLATILES	1,3,5-Trimethylbenzene	µg/L	U		25	0.25	U	U		1	0.25	U			1	0.25	U			1	0.25	U			1							
VOLATILES	1,3-Dichlorobenzene	µg/L	U		25	0.25	U	U		1	0.25	U			1	0.25	U			1	0.25	U			1	2	U	U		2	1	U
VOLATILES	1,3-Dichloropropane	µg/L	U		25	0.2	U	U		1	0.2	U			1	0.2	U			1	0.2	U			1							
VOLATILES	1,4-Dichlorobenzene	µg/L	U		25	0.125	U	U		1	0.125	U			1	0.125	U			1	0.125	U			1	2	U	U		2	1	U
VOLATILES	2,2-Dichloropropane	µg/L	U		25	0.25	U	U		1	0.25	U			1	0.25	U			1	0.25	U			1							
VOLATILES	2-Butanone	µg/L	U		25	2.5	U	U		1	2.5	U			1	2.5	U			1	2.5	U			1	20	U	U		2	10	U
VOLATILES	2-Chloroethyl vinyl ether	µg/L	U		25	2	U	U		1	2	U			1	2	U			1	2	U			1							
VOLATILES	2-Chlorotoluene	µg/L	U		25	0.125	U	U		1	0.125	U			1	0.125	U			1	0.125	U			1							
VOLATILES	2-Hexanone	µg/L	U		25	2.5	U	U		1	2.5	U			1	2.5	U			1	2.5	U			1	20	U	U		2	10	U
VOLATILES	4-Chlorotoluene	µg/L	U		25	0.25	U	U		1	0.25	U			1	0.25	U			1	0.25	U			1							
VOLATILES	Acetone	µg/L	U		25	2.5	U	U		1	5.39	J			1	2.5	U			1	12.5				1	20	U	U		2	10	U
VOLATILES	Benzene	µg/L	U		25	0.188	J	J	15	1	0.125	U			1	0.125	U			1	0.125	U			1	2	U	U		2	1	U
VOLATILES	Bromobenzene	µg/L	U		25	0.125	U	U		1	0.125	U			1	0.125	U			1	0.125	U			1							
VOLATILES	Bromochloromethane	µg/L	U		25	0.2	U	U		1	0.2	U			1	0.2	U			1	0.2	U			1							
VOLATILES	Bromodichloromethane	µg/L	U		25	0.25	U	U		1	0.254	J			1	0.25	U			1	0.25	U			1	2	U	U		2	1	U
VOLATILES	Bromoform	µg/L	U		25	0.5	U	U		1	0.5	U			1	0.5	U			1	0.5	U			1	2	U	U		2	1	U
VOLATILES	Bromomethane	µg/L	U		25	0.5	U	U		1	0.5	U			1	0.5	U			1	0.5	U			1	2	U	U		2	1	U
VOLATILES	Carbon disulfide	µg/L	U		25	0.5	U	U		1	0.5	U			1	0.573	J			1	0.25	U			1	2	U	U		2	1	U
VOLATILES	Carbon tetrachloride	µg/L	U		25	0.25	U	U		1	0.25	U			1	0.25	U			1	0.25	U			1	2	U	U		2	1	U
VOLATILES	Chlorobenzene	µg/L	U		25	0.125	U	U		1	0.125	U			1	0.125	U			1	0.125	U			1	2	U	U		2	1	U
VOLATILES	Chloroethane	µg/L	U		25	0.5	U	U		1	0.5	U			1	0.5	U			1	0.5	U			1	2	U	U		2	1	U
VOLATILES	Chloroform	µg/L	U		25	0.125	U	U		1	1.49				1	1.61				1	0.983	J			1	2	U	U		2	1	U
VOLATILES	Chloromethane	µg/L	U		25	0.25	U	U		1	1.74	B			1	2.03	B			1	1.63	B			1	2	U	U		2	1	U
VOLATILES	cis-1,2-Dichloroethene	µg/L			25	165				1	0.25	U			1	0.25	U			1	0.25	U			1	0.523	J	J	15	2	1	U
VOLATILES	cis-1,3-Dichloropropene	µg/L	U		25	0.25	U	U		1	0.25	U			1	0.25	U			1	0.25	U			1	2	U	U		2	1	U
VOLATILES	Cyclohexane	µg/L																								10	U	U		2	5	U
VOLATILES	Dibromochloromethane	µg/L	U		25	0.25	U	U		1																2	U	U		2	1	U
VOLATILES	Dibromomethane	µg/L	U		25	0.25	U	U		1	0.25	U			1	0.25	U			1	0.25	U			1							
VOLATILES	Dichlorodifluoromethane	µg/L	U		25	0.25	U	U		1	0.25	U			1	0.25	U			1	0.25	U			1	2	U	U		2	1	U
VOLATILES	Ethylbenzene	µg/L	U		25	0.25	U	U		1	0.25	U			1	0.25	U			1	0.25	U			1	2	U	U		2	1	U
VOLATILES	Freon 113	µg/L																								270				2	606	
VOLATILES	Hexachlorobutadiene	µg/L	U		25	0.25	U	U		1																						
VOLATILES	Isopropylbenzene	µg/L	U		25	0.25	U	U		1	0.25	U			1	0.25	U			1	0.25	U			1	2	U	U		2	1	U
VOLATILES	m,p-Xylenes	µg/L	U		25	0.5	U	U		1																						
VOLATILES	Methyl Acetate	µg/L																								20	U	U		2	10	U
VOLATILES	Methyl isobutyl ketone	µg/L	U		25	2.5	U	U		1																20	U	U		2	10	U
VOLATILES	Methyl tert-butyl ether	µg/L																								10	U	U		2	5	U
VOLATILES	Methylcyclohexane	µg/L																								20	U	U		2	10	U
VOLATILES	Methylene chloride	µg/L	U		25	0.25	U	U		1	0.25	U			1	0.25	U			1	0.25	U			1	4	U	U		2	2	U
VOLATILES	Naphthalene	µg/L	U		25	0.2	U	U		1	0.2	U			1	0.2	U			1	1.03				1							
VOLATILES	n-BUTYLBENZENE	µg/L	U		25	0.25	U	U		1	0.25	U			1	0.25	U			1	0.25	U			1							
VOLATILES	n-PROPYLBENZENE	µg/L	U		25	0.125	U	U		1	0.125	U			1	0.125	U			1	0.125	U			1							
VOLATILES	p-ISOPROPYLTOLUENE	µg/L	U		25	0.25	U	U		1	0.25	U			1	0.25	U			1	0.25	U			1							
VOLATILES	sec-BUTYLBENZENE	µg/L	U		25	0.25	U	U		1	0.25	U			1	0.25	U			1	0.25	U			1							
VOLATILES	Styrene	µg/L	U		25	0.125	U	U		1	0.125	U			1	0.125	U			1	0.125	U			1	2	U	U		2	1	U
VOLATILES	tert-BUTYLBENZENE	µg/L	U		25	0.25	U	U		1	0.25	U			1	0.25	U			1	0.25	U			1							
VOLATILES	Tetrachloroethene	µg/L	U		25	0.25	U	U		1	0.25	U			1	0.25	U			1	0.25	U			1	2	U	U		2	1	U
VOLATILES	Toluene	µg/L	U		25	0.25	U	U		1	0.25	U			1	0.25	U			1	0.25	U			1	2	U	U		2	1	U
VOLATILES	trans-1,2-Dichloroethene	µg/L	U		25	1.63				1	0.25	U			1	0.25	U			1	0.25	U			1	2	U	U		2	1	U
VOLATILES	trans-1,3-Dichloropropene	µg/L	U		25	0.5	U	U		1	0.5	U			1	0.5	U			1	0.5	U			1	2	U	U		2	1	U
VOLATILES	Trichloroethene	µg/L			25	1730				1	0.25	U			1	0.25	U			1	0.25	U			1	2	U	U		2	0.799	J
VOLATILES	Trichlorofluoromethane	µg/L	U		25	0.25	U	U		1	0.25	U			1	0.25	U			1	0.25	U			1	2	U	U		2	1	U
VOLATILES	Vinyl acetate	µg/L	U		25	2.5	U	U		1	2.5	U			1	2.5	U			1	2.5	U			1							
VOLATILES	Vinyl chloride	µg/L	J	15	25	4.05				1	0.25	U			1	0.25	U			1	0.25	U			1	2	U	U		2	1	U
VOLATILES	Xylenes, Total	µg/L																								2	U	U		2	1	U

00100773

Table C-1
Additional Sample Results Not Previously Presented

		Location Code	HSMW36			LHSMW41					LHSMW43					LHSMW43					LHSMW45					LHSMW50					L	
		Sample No.	W36-101907			LHSMW41-022309					LHSMW43-FEB2007					LHSMW43-021909					LHSMW45-021909					LHSMW50-021709					LHSN	
		Sample Date	10/19/07			2/23/09					2/22/07					2/19/09					2/19/09					2/17/09						
		Groundwater Zone	HALLOW			SHALLOW/INTERMEDIATE					SHALLOW					SHALLOW					SHALLOW					SHALLOW					INTI	
		Sample Purpose	REG			REG					REG					REG					REG					REG						
Test Group	Parameter	Units	ValQual	RC	DF	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	Result	Qual
DHE	Dehalococcoides	cells/ml									22	U	U		2.2						1600				10	900				10		
FIELD TESTS	Dissolved Oxygen	µg/L			1	600					6030				1						2610					670					220	
FIELD TESTS	Ferrous iron	µg/L									20				1																	
FIELD TESTS	Oxygen Reduction Potential	mV			1	49.2					266.5				1						9.1					49.5					715	
FIELD TESTS	pH	STD UNIT			1	5.93					6.93				1						6.88					6.69					6.31	
FIELD TESTS	Salinity	µg/L									1050				1																	
FIELD TESTS	Specific Conductivity	uS/cm			1	2648					3009				1						2934					3495					1572	
FIELD TESTS	Temperature	Deg C			1	17.29					18.36				1						16.14					16.74					19.5	
FIELD TESTS	Turbidity	NTU			1	130.3					365.2				1						-15.5					6					37	
GASES	Ethane	µg/L									0.62	J	J	15	1	1	U	U		1	1	U	U		1	1	U	U		1		
GASES	Ethylene	µg/L									2.7				1	1	U	U		1	1	U	U		1	1	U	U		1		
GASES	Methane	µg/L									7.07				1	4.28	J	J	15	1	7.84				1	1	U	U		1		
GEN CHEMISTRY	Carbon Dioxide	µg/L									93000				1																	
GEN CHEMISTRY	Chloride	µg/L									290000				33.3	297000				1	377000				1	655000				1		
GEN CHEMISTRY	Fluoride, Total	mg/L														1000	U	U		1	891				1	1000				1		
GEN CHEMISTRY	Nitrate	µg/L									5	U	U		1	1000	U	U		1	300	U	U		1	400	U	U		1		
GEN CHEMISTRY	Nitrate / Nitrite	µg/L									5	U	U		1																	
GEN CHEMISTRY	Nitrite	µg/L									3	U	U		1	1000	U	U		1	300	U	U		1	400	U	U		1		
GEN CHEMISTRY	Perchlorate	µg/L									4	U	U		1																1	U
GEN CHEMISTRY	pH	STD UNIT									6.8				1																	
GEN CHEMISTRY	Specific Conductivity	uS/cm									2920				1																	
GEN CHEMISTRY	Sulfate	µg/L									756000				4	731000				1	379000				1	397000				1		
GEN CHEMISTRY	Sulfide	µg/L									200	UB	U		1																	
GEN CHEMISTRY	Total Alkalinity	µg/L									295000				5																	
GEN CHEMISTRY	TOTAL DISSOLVED SOLIDS	µg/L																														
GEN CHEMISTRY	Total Organic Carbon	µg/L									4000				1	11800				1	10800				1	7500				1		
GEN CHEMISTRY	TOTAL SUSPENDED SOLIDS	µg/L																														
METALS	Aluminum	µg/L																														
METALS	Antimony	µg/L																														
METALS	Arsenic	µg/L																														
METALS	Barium	µg/L																														
METALS	Beryllium	µg/L																														
METALS	Cadmium	µg/L																														
METALS	Calcium	µg/L																														
METALS	Chromium	µg/L																														
METALS	Cobalt	µg/L																														
METALS	Copper	µg/L																														
METALS	Iron	µg/L																														
METALS	Lead	µg/L																														
METALS	Magnesium	µg/L																														
METALS	Manganese	µg/L																														
METALS	Mercury	µg/L																														
METALS	Nickel	µg/L																														
METALS	Potassium	µg/L																														
METALS	Selenium	µg/L																														
METALS	Silver	µg/L																														
METALS	Sodium	µg/L																														
METALS	Thallium	µg/L																														
METALS	Vanadium	µg/L																														
METALS	Zinc	µg/L																														
METALS-DISS	Aluminum	µg/L																														
METALS-DISS	Antimony	µg/L																														
METALS-DISS	Arsenic	µg/L																														
METALS-DISS	Barium	µg/L																														
METALS-DISS	Beryllium	µg/L																														
METALS-DISS	Cadmium	µg/L																														
METALS-DISS	Calcium	µg/L																														
METALS-DISS	Chromium	µg/L																														
METALS-DISS	Cobalt	µg/L																														
METALS-DISS	Copper	µg/L																														
METALS-DISS	Iron	µg/L																														
METALS-DISS	Lead	µg/L																														
METALS-DISS	Magnesium	µg/L																														
METALS-DISS	Manganese	µg/L																														
METALS-DISS	Mercury	µg/L																														
METALS-DISS	Nickel	µg/L																														
METALS-DISS	Potassium	µg/L																														
METALS-DISS	Selenium	µg/L																														
METALS-DISS	Silver	µg/L																														
METALS-DISS	Sodium	µg/L																														
METALS-DISS	Thallium	µg/L																														
METALS-DISS	Vanadium	µg/L																														
METALS-DISS	Zinc	µg/L																														

Table C-1
Additional Sample Results Not Previously Presented

Test Group	Parameter	Units	ValQual	RC	DF	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	Result	Qual
	Location Code		HSMW36			LHSMW41					LHSMW43					LHSMW43					LHSMW45					LHSMW50					L	
	Sample No.		W36-101907			LHSMW41-022309					LHSMW43-FEB2007					LHSMW43-021909					LHSMW45-021909					LHSMW50-021709					LHSI	
	Sample Date		10/19/07			2/23/09					2/22/07					2/19/09					2/19/09					2/17/09						
	Groundwater Zone		HALLOW			SHALLOW/INTERMEDIATE					SHALLOW					SHALLOW					SHALLOW					SHALLOW					INTI	
	Sample Purpose		REG			REG					REG					REG					REG					REG						
VOLATILES	1,1,1,2-Tetrachloroethane	µg/L				0.25	U	U		1						12.5	U	U		50	1.25	U	U		5	0.25	U	U		1		
VOLATILES	1,1,1-Trichloroethane	µg/L	UJ	07A	1	0.25	U	U		1	0.37	U	U		1	12.5	U	U		50	1.25	U	U		5	0.25	U	U		1	1	U
VOLATILES	1,1,2,2-Tetrachloroethane	µg/L	UJ	07A	1	0.125	U	U		1	0.46	U	U		1	6.25	U	U		50	0.625	U	U		5	0.125	U	U		1	1	U
VOLATILES	1,1,2-Trichloroethane	µg/L	UJ	07A	1	0.25	U	U		1	1.8	J	J	15	1	12.5	U	U		50	1.25	U	U		5	0.25	U	U		1	1	U
VOLATILES	1,1-Dichloroethane	µg/L	UJ	07A	1	0.125	U	U		1	1.8	J	J	15	1	6.25	U	U		50	0.625	U	U		5	0.125	U	U		1	1	U
VOLATILES	1,1-Dichloroethene	µg/L	UJ	07A	1	0.5	U	U		1	10.3				1	25	U	U		50	2.63	J	J	15	5	0.5	U	U		1	1	U
VOLATILES	1,1-Dichloropropene	µg/L				0.25	U	U		1						12.5	U	U		50	1.25	U	U		5	0.25	U	U		1		
VOLATILES	1,2,3-Trichlorobenzene	µg/L				0.15	U	U		1						7.5	U	U		50	0.75	U	U		5	0.15	U	U		1		
VOLATILES	1,2,3-Trichloropropane	µg/L				0.5	U	U		1						25	U	U		50	2.5	U	U		5	0.5	U	U		1		
VOLATILES	1,2,4-Trichlorobenzene	µg/L	UJ	07A	1	0.2	U	U		1						10	U	U		50	1	U	U		5	0.2	U	U		1	1	U
VOLATILES	1,2,4-Trimethylbenzene	µg/L				0.25	U	U		1						12.5	U	U		50	1.25	U	U		5	0.25	U	U		1		
VOLATILES	1,2-Dibromo-3-chloropropane	µg/L	UJ	07A	1	1	U	U		1						50	U	U		50	5	U	U		5	1	U	U		1	5	U
VOLATILES	1,2-Dibromoethane	µg/L	UJ	07A	1	0.25	U	U		1						12.5	U	U		50	1.25	U	U		5	0.25	U	U		1	1	U
VOLATILES	1,2-Dichlorobenzene	µg/L	UJ	07A	1	0.125	U	U		1						6.25	U	U		50	0.625	U	U		5	0.125	U	U		1	1	U
VOLATILES	1,2-Dichloroethane	µg/L	UJ	07A	1	0.25	U	U		1	0.53	U	U		1	12.5	U	U		50	1.25	U	U		5	0.25	U	U		1	1	U
VOLATILES	1,2-Dichloropropane	µg/L	UJ	07A	1	0.2	U	U		1	0.59	U	U		1	10	U	U		50	1	U	U		5	0.2	U	U		1	1	U
VOLATILES	1,2-Dimethylbenzene (o-Xylene)	µg/L				0.25	U	U		1						12.5	U	U		50	1.25	U	U		5	0.25	U	U		1		
VOLATILES	1,3,5-Trimethylbenzene	µg/L				0.25	U	U		1						12.5	U	U		50	1.25	U	U		5	0.25	U	U		1		
VOLATILES	1,3-Dichlorobenzene	µg/L	UJ	07A	1	0.25	U	U		1						12.5	U	U		50	1.25	U	U		5	0.25	U	U		1	1	U
VOLATILES	1,3-Dichloropropane	µg/L				0.2	U	U		1						10	U	U		50	1	U	U		5	0.2	U	U		1		
VOLATILES	1,4-Dichlorobenzene	µg/L	UJ	07A	1	0.125	U	U		1						6.25	U	U		50	0.625	U	U		5	0.125	U	U		1	1	U
VOLATILES	2,2-Dichloropropane	µg/L				0.25	U	U		1						12.5	U	U		50	1.25	U	U		5	0.25	U	U		1		
VOLATILES	2-Butanone	µg/L	UJ	07A	1	2.5	U	U		1	3	U	U		1	125	U	U		50	12.5	U	U		5	2.5	U	U		1	10	U
VOLATILES	2-Chloroethyl vinyl ether	µg/L				2	U	U		1						100	U	U		50	10	U	U		5	2	U	U		1		
VOLATILES	2-Chlorotoluene	µg/L				0.125	U	U		1						6.25	U	U		50	0.625	U	U		5	0.125	U	U		1		
VOLATILES	2-Hexanone	µg/L	UJ	07A	1	2.5	U	U		1	1.9	U	U		1	125	U	U		50	12.5	U	U		5	2.5	U	U		1	10	U
VOLATILES	4-Chlorotoluene	µg/L				0.25	U	U		1						12.5	U	U		50	1.25	U	U		5	0.25	U	U		1		
VOLATILES	Acetone	µg/L	UJ	07A	1	2.5	U	U		1	2.8	U	U		1	125	U	U		50	12.5	U	U		5	2.5	U	U		1	10	U
VOLATILES	Benzene	µg/L	UJ	07A	1	0.125	U	U		1	0.23	U	U		1	6.25	U	U		50	0.625	U	U		5	0.125	U	U		1	1	U
VOLATILES	Bromobenzene	µg/L				0.125	U	U		1						6.25	U	U		50	0.625	U	U		5	0.125	U	U		1		
VOLATILES	Bromochloromethane	µg/L				0.2	U	U		1						10	U	U		50	1	U	U		5	0.2	U	U		1		
VOLATILES	Bromodichloromethane	µg/L	UJ	07A	1	0.25	U	U		1	0.33	U	U		1	12.5	U	U		50	1.25	U	U		5	0.25	U	U		1	1	U
VOLATILES	Bromoform	µg/L	UJ	07A	1	0.5	U	U		1	0.65	U	U		1	25	U	U		50	2.5	U	U		5	0.5	U	U		1	1	U
VOLATILES	Bromomethane	µg/L	UJ	07A	1	0.5	U	U		1	0.47	U	U		1	25	U	U		50	2.5	U	U		5	0.5	U	U		1	1	U
VOLATILES	Carbon disulfide	µg/L	UJ	07A	1	0.5	U	U		1	0.62	U	U		1	25	U	U		50	2.5	U	U		5	0.5	U	U		1	1	U
VOLATILES	Carbon tetrachloride	µg/L	UJ	07A	1	0.25	U	U		1	0.52	U	U		1	12.5	U	U		50	1.25	U	U		5	0.25	U	U		1	1	U
VOLATILES	Chlorobenzene	µg/L	UJ	07A	1	0.125	U	U		1	0.54	U	U		1	6.25	U	U		50	0.625	U	U		5	0.125	U	U		1	1	U
VOLATILES	Chloroethane	µg/L	UJ	07A	1	0.5	U	U		1	0.46	U	U		1	25	U	U		50	2.5	U	U		5	0.5	U	U		1	1	U
VOLATILES	Chloroform	µg/L	UJ	07A	1	0.125	U	U		1	0.66	U	U		1	6.25	U	U		50	0.625	U	U		5	0.125	U	U		1	1	U
VOLATILES	Chloromethane	µg/L	UJ	07A	1	0.25	U	U		1	0.6	U	U		1	12.5	U	U		50	1.25	U	U		5	0.25	U	U		1	1	U
VOLATILES	cis-1,2-Dichloroethene	µg/L	UJ	07A	1	0.25	U	U		1	605				100	325				50	869				5	0.25	U	U		1	1.59	
VOLATILES	cis-1,3-Dichloropropene	µg/L	UJ	07A	1	0.25	U	U		1	0.59	U	U		1	12.5	U	U		50	1.25	U	U		5	0.25	U	U		1	1	U
VOLATILES	Cyclohexane	µg/L	UJ	07A	1																										5	U
VOLATILES	Dibromochloromethane	µg/L	UJ	07A	1	0.25	U	U		1	0.68	U	U		1	12.5	U	U		50	1.25	U	U		5	0.25	U	U		1	1	U
VOLATILES	Dibromomethane	µg/L				0.25	U	U		1						12.5	U	U		50	1.25	U	U		5	0.25	U	U		1		
VOLATILES	Dichlorodifluoromethane	µg/L	UJ	07A	1	0.25	U	U		1						12.5	U	U		50	1.25	U	U		5	0.25	U	U		1	1	U
VOLATILES	Ethylbenzene	µg/L	UJ	07A	1	0.25	U	U		1	0.48	U	U		1	12.5	U	U		50	1.25	U	U		5	0.25	U	U		1	1	U
VOLATILES	Freon 113	µg/L	J	07A	5																										5	U
VOLATILES	Hexachlorobutadiene	µg/L				0.25	U	U		1						12.5	U	U		50	1.25	U	U		5	0.25	U	U		1		
VOLATILES	Isopropylbenzene	µg/L	UJ	07A	1	0.25	U	U		1						12.5	U	U		50	1.25	U	U		5	0.25	U	U		1	1	U
VOLATILES	m,p-Xylenes	µg/L				0.5	U	U		1						25	U	U		50	2.5	U	U		5	0.5	U	U		1		
VOLATILES	Methyl Acetate	µg/L	UJ	07A	1																										10	U
VOLATILES	Methyl isobutyl ketone	µg/L	UJ	07A	1	2.5	U	U		1	7.3	U	U		1	125	U	U		50	12.5	U	U		5	2.5	U	U		1	10	U
VOLATILES	Methyl tert-butyl ether	µg/L	UJ	07A	1																										5	U
VOLATILES	Methylcyclohexane	µg/L	UJ	07A	1																										10	U
VOLATILES	Methylene chloride	µg/L	UJ	07A	1	0.25	U	U		1	0.67	U	U		1	12.5	U	U		50	1.25	U	U		5	0.25	U	U		1	2	U
VOLATILES	Naphthalene	µg/L				0.2	U	U		1						10	U	U		50	1	U	U		5	0.2	U	U		1		
VOLATILES	n-BUTYLBENZENE	µg/L				0.25	U	U		1						12.5	U	U		50	1.25	U	U		5	0.25	U	U		1		
VOLATILES	n-PROPYLBENZENE	µg/L				0.125	U	U		1						6.25	U	U		50	0.625	U	U		5	0.125	U	U		1		
VOLATILES	p-ISOPROPYLTOLUENE	µg/L				0.25	U	U		1						12.5	U	U		50	1.25	U	U		5	0.25	U	U		1		
VOLATILES	sec-BUTYLBENZENE	µg/L				0.25	U	U		1						12.5	U	U		50	1.25	U	U		5	0.25	U	U		1		
VOLATILES	Styrene	µg/L	UJ	07A	1	0.125	U	U		1	0.5	U	U		1	9.38	J	J		50	0.625	U	U		5	0.125	U	U		1	1	U
VOLATILES	tert-BUTYLBENZENE	µg/L				0.25	U	U		1						12.5	U	U		50	1.25	U	U		5	0.25	U	U		1		
VOLATILES	Tetrachloroethene	µg/L	UJ	07A	1	0.25	U	U		1	82				1	38.4	J	J		50	1.25	U	U		5	0.25	U	U		1	1	U
VOLATILES	Toluene	µg/L	UJ	07A	1	0.25	U	U		1	0.54	U	U		1	12.5	U	U		50	1.25	U	U		5	0.25	U	U		1	1	U
VOLATILES	trans-1,2-Dichloroethene	µg/L	UJ	07A	1	0.25	U	U		1	1.9	J	J	15	1	12.5	U	U		50	2.35	J	J	15	5	0.25	U	U		1	1	U
VOLATILES	trans-1,3-Dichloropropene	µg/L	UJ	07A	1	0.5	U	U		1	0.61	U	U		1	25	U	U		50	2.5	U	U		5	0.5	U	U		1	1	U
VOLATILES	Trichloroethene	µg/L	J	07A, 15	1	0.957	J	J	15	1	11600				100	6240				50	926				5	0.25	U	U		1	601	
VOLATILES	Trichlorofluoromethane	µg/L	UJ	07A	1	0.25	U	U		1						12.5	U	U		50	1.25	U	U		5	0.25	U	U		1	1	U
VOLATILES	Vinyl acetate	µg/L				2.5	U	U		1						125	U	U		50	12.5	U	U		5	2.5	U	U		1		
VOLATILES	Vinyl chloride	µg/L	UJ	07A	1	0.25	U	U		1	3.7				1	12.5	U	U		50	1.6	J	J	15	5	0.25	U	U		1	1	U
VOLATILES	Xylenes, Total	µg/L	UJ	07A	1						1.1	U	U		1																1	U

Table C-1
Additional Sample Results Not Previously Presented

	Location Code		HSMW54			LHSMW56					LHSMW56					LHSMW57					LHSMW60					LHSMW60				
	Sample No.		MW54-101707			LHSMW56-102007					LHSMW56-040309					LHSMW57-022309					LHSMW60-101807					LHSMW60-101807-QC				
	Sample Date		10/17/07			10/20/07					4/3/09					2/23/09					10/18/07					10/18/07				
	Groundwater Zone		ERMEDIATE			SHALLOW					SHALLOW					SHALLOW					SHALLOW/INTERMEDIATE					SHALLOW/INTERMEDIATE				
	Sample Purpose		REG			REG					REG					REG					REG					FD				
Test Group	**Parameter**	**Units**	**ValQual**	**RC**	**DF**	**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																												
FIELD TESTS	Dissolved Oxygen	µg/L			1	4870				1						7350														
FIELD TESTS	Ferrous iron	µg/L																												
FIELD TESTS	Oxygen Reduction Potential	mV			1	439.5				1						166.5														
FIELD TESTS	pH	STD UNIT			1	6.43				1						5.4														
FIELD TESTS	Salinity	µg/L																												
FIELD TESTS	Specific Conductivity	uS/cm			1	1790				1						168														
FIELD TESTS	Temperature	Deg C			1	22.19				1						13.21														
FIELD TESTS	Turbidity	NTU			1	2000.4				1						231.4														
GASES	Ethane	µg/L																												
GASES	Ethylene	µg/L																												
GASES	Methane	µg/L																												
GEN CHEMISTRY	Carbon Dioxide	µg/L																												
GEN CHEMISTRY	Chloride	µg/L																												
GEN CHEMISTRY	Fluoride, Total	mg/L																												
GEN CHEMISTRY	Nitrate	µg/L																												
GEN CHEMISTRY	Nitrate / Nitrite	µg/L																												
GEN CHEMISTRY	Nitrite	µg/L																												
GEN CHEMISTRY	Perchlorate	µg/L	U		1						0.44	U	U		1						1	U	U		1	1	U	U		1
GEN CHEMISTRY	pH	STD UNIT																												
GEN CHEMISTRY	Specific Conductivity	uS/cm																												
GEN CHEMISTRY	Sulfate	µg/L																												
GEN CHEMISTRY	Sulfide	µg/L																												
GEN CHEMISTRY	Total Alkalinity	µg/L																												
GEN CHEMISTRY	TOTAL DISSOLVED SOLIDS	µg/L																												
GEN CHEMISTRY	Total Organic Carbon	µg/L																												
GEN CHEMISTRY	TOTAL SUSPENDED SOLIDS	µg/L																												
METALS	Aluminum	µg/L																												
METALS	Antimony	µg/L																												
METALS	Arsenic	µg/L																												
METALS	Barium	µg/L																												
METALS	Beryllium	µg/L																												
METALS	Cadmium	µg/L																												
METALS	Calcium	µg/L																												
METALS	Chromium	µg/L																												
METALS	Cobalt	µg/L																												
METALS	Copper	µg/L																												
METALS	Iron	µg/L																												
METALS	Lead	µg/L																												
METALS	Magnesium	µg/L																												
METALS	Manganese	µg/L																												
METALS	Mercury	µg/L																												
METALS	Nickel	µg/L																												
METALS	Potassium	µg/L																												
METALS	Selenium	µg/L																												
METALS	Silver	µg/L																												
METALS	Sodium	µg/L																												
METALS	Thallium	µg/L																												
METALS	Vanadium	µg/L																												
METALS	Zinc	µg/L																												
METALS-DISS	Aluminum	µg/L																												
METALS-DISS	Antimony	µg/L																												
METALS-DISS	Arsenic	µg/L																												
METALS-DISS	Barium	µg/L																												
METALS-DISS	Beryllium	µg/L																												
METALS-DISS	Cadmium	µg/L																												
METALS-DISS	Calcium	µg/L																												
METALS-DISS	Chromium	µg/L																												
METALS-DISS	Cobalt	µg/L																												
METALS-DISS	Copper	µg/L																												
METALS-DISS	Iron	µg/L																												
METALS-DISS	Lead	µg/L																												
METALS-DISS	Magnesium	µg/L																												
METALS-DISS	Manganese	µg/L																												
METALS-DISS	Mercury	µg/L																												
METALS-DISS	Nickel	µg/L																												
METALS-DISS	Potassium	µg/L																												
METALS-DISS	Selenium	µg/L																												
METALS-DISS	Silver	µg/L																												
METALS-DISS	Sodium	µg/L																												
METALS-DISS	Thallium	µg/L																												
METALS-DISS	Vanadium	µg/L																												
METALS-DISS	Zinc	µg/L																												

00100776

Table C-1
Additional Sample Results Not Previously Presented

	Location Code		HSMW54			LHSMW56					LHSMW56					LHSMW57					LHSMW60					LHSMW60				
	Sample No.		MW54-101707			LHSMW56-102007					LHSMW56-040309					LHSMW57-022309					LHSMW60-101807					LHSMW60-101807-QC				
	Sample Date		10/17/07			10/20/07					4/3/09					2/23/09					10/18/07					10/18/07				
	Groundwater Zone		ERMEDIATE			SHALLOW					SHALLOW					SHALLOW					SHALLOW/INTERMEDIATE					SHALLOW/INTERMEDIATE				
	Sample Purpose		REG			REG					REG					REG					REG					FD				
Test Group	Parameter	Units	ValQual	RC	DF	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	1,1,1,2-Tetrachloroethane	µg/L									12.5	U	U		50	0.25	U	U		1										
VOLATILES	1,1,1-Trichloroethane	µg/L	U		1	1	U	UJ	07A	1	12.5	U	U		50	0.25	U	U		1										
VOLATILES	1,1,2,2-Tetrachloroethane	µg/L	U		1	1	U	UJ	07A	1	6.25	U	U		50	0.125	U	U		1										
VOLATILES	1,1,2-Trichloroethane	µg/L	U		1	0.835	J	J	15, 07A	1	12.5	U	U		50	0.25	U	U		1										
VOLATILES	1,1-Dichloroethane	µg/L	U		1	46.2		J	07A	1	63.6				50	0.125	U	U		1										
VOLATILES	1,1-Dichloroethene	µg/L	U		1	184		J	07A	1	108				50	0.5	U	U		1										
VOLATILES	1,1-Dichloropropene	µg/L									12.5	U	U		50	0.25	U	U		1										
VOLATILES	1,2,3-Trichlorobenzene	µg/L									7.5	U	U		50	0.15	U	U		1										
VOLATILES	1,2,3-Trichloropropane	µg/L									25	U	U		50	0.5	U	U		1										
VOLATILES	1,2,4-Trichlorobenzene	µg/L	U		1	1	U	UJ	07A	1	10	U	U		50	0.2	U	U		1										
VOLATILES	1,2,4-Trimethylbenzene	µg/L									12.5	U	U		50	0.25	U	U		1										
VOLATILES	1,2-Dibromo-3-chloropropane	µg/L	U		1	5	U	UJ	07A	1	50	U	U		50	1	U	U		1										
VOLATILES	1,2-Dibromoethane	µg/L	U		1	1	U	UJ	07A	1	12.5	U	U		50	0.25	U	U		1										
VOLATILES	1,2-Dichlorobenzene	µg/L	U		1	1	U	UJ	07A	1	6.25	U	U		50	0.125	U	U		1										
VOLATILES	1,2-Dichloroethane	µg/L	U		1	1	U	UJ	07A	1	12.5	U	U		50	0.25	U	U		1										
VOLATILES	1,2-Dichloropropane	µg/L	U		1	1	U	UJ	07A	1	10	U	U		50	0.2	U	U		1										
VOLATILES	1,2-Dimethylbenzene (o-Xylene)	µg/L									12.5	U	U		50	0.25	U	U		1										
VOLATILES	1,3,5-Trimethylbenzene	µg/L									12.5	U	U		50	0.25	U	U		1										
VOLATILES	1,3-Dichlorobenzene	µg/L	U		1	1	U	UJ	07A	1	12.5	U	U		50	0.25	U	U		1										
VOLATILES	1,3-Dichloropropane	µg/L									10	U	U		50	0.2	U	U		1										
VOLATILES	1,4-Dichlorobenzene	µg/L	U		1	1	U	UJ	07A	1	6.25	U	U		50	0.125	U	U		1										
VOLATILES	2,2-Dichloropropane	µg/L									12.5	U	U		50	0.25	U	U		1										
VOLATILES	2-Butanone	µg/L	U		1	10	U	UJ	07A	1	125	U	U		50	2.5	U	U		1										
VOLATILES	2-Chloroethyl vinyl ether	µg/L									100	U	U		50	2	U	U		1										
VOLATILES	2-Chlorotoluene	µg/L									6.25	U	U		50	0.125	U	U		1										
VOLATILES	2-Hexanone	µg/L	U		1	10	U	UJ	07A	1	125	U	U		50	2.5	U	U		1										
VOLATILES	4-Chlorotoluene	µg/L									12.5	U	U		50	0.25	U	U		1										
VOLATILES	Acetone	µg/L	U		1	10	U	UJ	07A	1	125	U	U		50	2.5	U	U		1										
VOLATILES	Benzene	µg/L	U		1	0.543	J	J	15, 07A	1	6.25	U	U		50	0.125	U	U		1										
VOLATILES	Bromobenzene	µg/L									6.25	U	U		50	0.125	U	U		1										
VOLATILES	Bromochloromethane	µg/L									10	U	U		50	0.2	U	U		1										
VOLATILES	Bromodichloromethane	µg/L	U		1	1	U	UJ	07A	1	12.5	U	U		50	0.25	U	U		1										
VOLATILES	Bromoform	µg/L	U		1	1	U	UJ	07A	1	25	U	U		50	0.5	U	U		1										
VOLATILES	Bromomethane	µg/L	U		1	1	U	UJ	07A	1	25	U	U		50	0.5	U	U		1										
VOLATILES	Carbon disulfide	µg/L	U		1	1	U	UJ	07A	1	25	U	U		50	0.5	U	U		1										
VOLATILES	Carbon tetrachloride	µg/L	U		1	1	U	UJ	07A	1	12.5	U	U		50	0.25	U	U		1										
VOLATILES	Chlorobenzene	µg/L	U		1	1	U	UJ	07A	1	6.25	U	U		50	0.125	U	U		1										
VOLATILES	Chloroethane	µg/L	U		1	1	U	UJ	07A	1	25	U	U		50	0.5	U	U		1										
VOLATILES	Chloroform	µg/L	U		1	1	U	UJ	07A	1	6.25	U	U		50	0.125	U	U		1										
VOLATILES	Chloromethane	µg/L	U		1	1	U	UJ	07A	1	12.5	U	U		50	0.25	U	U		1										
VOLATILES	cis-1,2-Dichloroethene	µg/L			1	171				100	269				50	0.25	U	U		1										
VOLATILES	cis-1,3-Dichloropropene	µg/L	U		1	1	U	UJ	07A	1	12.5	U	U		50	0.25	U	U		1										
VOLATILES	Cyclohexane	µg/L	U		1	5	U	UJ	07A	1																				
VOLATILES	Dibromochloromethane	µg/L	U		1	1	U	UJ	07A	1	12.5	U	U		50	0.25	U	U		1										
VOLATILES	Dibromomethane	µg/L									12.5	U	U		50	0.25	U	U		1										
VOLATILES	Dichlorodifluoromethane	µg/L	U		1	1	U	UJ	07A	1	12.5	U	U		50	0.25	U	U		1										
VOLATILES	Ethylbenzene	µg/L	U		1	1	U	UJ	07A	1	12.5	U	U		50	0.25	U	U		1										
VOLATILES	Freon 113	µg/L	U		1	5	U	UJ	07A	1																				
VOLATILES	Hexachlorobutadiene	µg/L									12.5	U	U		50	0.25	U	U		1										
VOLATILES	Isopropylbenzene	µg/L	U		1	1	U	UJ	07A	1	12.5	U	U		50	0.25	U	U		1										
VOLATILES	m,p-Xylenes	µg/L									25	U	U		50	0.5	U	U		1										
VOLATILES	Methyl Acetate	µg/L	U		1	10	U	UJ	07A	1																				
VOLATILES	Methyl isobutyl ketone	µg/L	U		1	10	U	UJ	07A	1	125	U	U		50	2.5	U	U		1										
VOLATILES	Methyl tert-butyl ether	µg/L	U		1	5	U	UJ	07A	1																				
VOLATILES	Methylcyclohexane	µg/L	U		1	10	U	UJ	07A	1																				
VOLATILES	Methylene chloride	µg/L	U		1	2	U	UJ	07A	1	21.3	J	J	15	50	0.25	U	U		1										
VOLATILES	Naphthalene	µg/L									10	U	U		50	0.2	U	U		1										
VOLATILES	n-BUTYLBENZENE	µg/L									12.5	U	U		50	0.25	U	U		1										
VOLATILES	n-PROPYLBENZENE	µg/L									6.25	U	U		50	0.125	U	U		1										
VOLATILES	p-ISOPROPYLTOLUENE	µg/L									12.5	U	U		50	0.25	U	U		1										
VOLATILES	sec-BUTYLBENZENE	µg/L									12.5	U	U		50	0.25	U	U		1										
VOLATILES	Styrene	µg/L	U		1	1	U	UJ	07A	1	6.25	U	U		50	0.125	U	U		1										
VOLATILES	tert-BUTYLBENZENE	µg/L									12.5	U	U		50	0.25	U	U		1										
VOLATILES	Tetrachloroethene	µg/L	U		1	0.746	J	J	15, 07A	1	12.5	U	U		50	0.25	U	U		1										
VOLATILES	Toluene	µg/L	U		1	1	U	UJ	07A	1	12.5	U	U		50	0.25	U	U		1										
VOLATILES	trans-1,2-Dichloroethene	µg/L	U		1	2.47		J	07A	1	12.5	U	U		50	0.25	U	U		1										
VOLATILES	trans-1,3-Dichloropropene	µg/L	U		1	1	U	UJ	07A	1	25	U	U		50	0.5	U	U		1										
VOLATILES	Trichloroethene	µg/L			10	8740				100	4610				50	0.25	U	U		1										
VOLATILES	Trichlorofluoromethane	µg/L	U		1	1	U	UJ	07A	1	12.5	U	U		50	0.25	U	U		1										
VOLATILES	Vinyl acetate	µg/L									125	U	U		50	2.5	U	U		1										
VOLATILES	Vinyl chloride	µg/L	U		1	33.6		J	07A	1	14.3	J	J	15	50	0.25	U	U		1										
VOLATILES	Xylenes, Total	µg/L	U		1	1	U	UJ	07A	1																				

Table C-1
Additional Sample Results Not Previously Presented

Notes:

cells/ml	cells per milliliter
µg/L	micrograms per liter
mV	millivolts
STD UNIT	standard units
uS/cm	microseconds per centimeter
Deg C	degrees Celsius
NTU	Nepheletic Turbidity Units
DF	Dilution Factor
REG	Regular Sample
FD	Field Duplicate Sample

Qual	Data qualifier applied by the laboratory
ValQual	Data qualifier applied by the data validator

B	The concentration reported was detected in the associated method blank, trip blank, or equipment blank within 5X/10X the blank concentration.
H	Result may be biased high.
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.

RC Reason Code

05B	Compound % deviation QC criteria not met
06A	Method or preparation blank
07A	Sample
09	Post digestion spike outside criteria (GFAA)
10A	Recovery
13	Serial dilution
15	Quantitation
17	Field duplicate RPD criteria is exceeded
19	Professional judgement was used to qualify the data

Table C-2
Additional Sample Results - Groundwater - 2010

		Location Code	105					47DPT01					47DPT02					47DPT03					47DPT04					47DPT05					47DPT06					47DPT07				
		Sample Date	31-Jul-10					13-Aug-10					12-Aug-10					13-Aug-10					12-Aug-10					13-Aug-10					13-Aug-10					20-Aug-10				
		Sample No	105-103107					47DPT01-100813					47DPT02-100812					47DPT03-100813					47DPT04-100812					47DPT05-100813					47DPT06-100813					47DPT07-100820				
		Sample Purpose	REG					REG					REG					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	Result	Qual	ValQual	RC	DF	Result	Qual	ValQual	RC	DF	Result	Qual	ValQual	RC	DF
GASES	Ethane	ug/L																																									
GASES	Ethylene	ug/L																																									
GASES	Methane	ug/L																																									
GEN CHEMISTRY	Chloride	ug/L																																									
GEN CHEMISTRY	Fluoride, Total	ug/L																																									
GEN CHEMISTRY	Nitrate	ug/L																																									
GEN CHEMISTRY	Nitrate / Nitrite	ug/L																																									
GEN CHEMISTRY	Nitrite	ug/L																																									
GEN CHEMISTRY	Perchlorate	ug/L						0.3				1						0.191	J	J		1	1.11				1	0.1	U	U		1	0.1	U	U		1					
GEN CHEMISTRY	Sulfate	ug/L																																									
GEN CHEMISTRY	Total Alkalinity	ug/L																																									
GEN CHEMISTRY	Total Organic Carbon	ug/L																																									
METALS	Aluminum	mg/L																																									
METALS	Antimony	mg/L																																									
METALS	Arsenic	mg/L																																									
METALS	Barium	mg/L																																									
METALS	Beryllium	mg/L																																									
METALS	Cadmium	mg/L																																									
METALS	Calcium	mg/L																																									
METALS	Chromium	mg/L																																									
METALS	Cobalt	mg/L																																									
METALS	Copper	mg/L																																									
METALS	Iron	mg/L																																									
METALS	Lead	mg/L																																									
METALS	Magnesium	mg/L																																									
METALS	Manganese	mg/L																																									
METALS	Mercury	mg/L																																									
METALS	Nickel	mg/L																																									
METALS	Potassium	mg/L																																									
METALS	Selenium	mg/L																																									
METALS	Silver	mg/L																																									
METALS	Sodium	mg/L																																									
METALS	Thallium	mg/L																																									
METALS	Vanadium	mg/L																																									
METALS	Zinc	mg/L																																									
SEMIVOLATILES	1,2,4-Trichlorobenzene	ug/L																																									
SEMIVOLATILES	1,2-Dichlorobenzene	ug/L																																									
SEMIVOLATILES	1,3-Dichlorobenzene	ug/L																																									
SEMIVOLATILES	1,4-Dichlorobenzene	ug/L																																									
SEMIVOLATILES	2,4,5-Trichlorophenol	ug/L																																									
SEMIVOLATILES	2,4,6-Trichlorophenol	ug/L																																									
SEMIVOLATILES	2,4-Dichlorophenol	ug/L																																									
SEMIVOLATILES	2,4-Dimethylphenol	ug/L																																									
SEMIVOLATILES	2,4-Dinitrophenol	ug/L																																									
SEMIVOLATILES	2,4-Dinitrotoluene	ug/L																																									
SEMIVOLATILES	2,6-Dinitrotoluene	ug/L																																									
SEMIVOLATILES	2-Chloronaphthalene	ug/L																																									
SEMIVOLATILES	2-Chlorophenol	ug/L																																									
SEMIVOLATILES	2-Methylnaphthalene	ug/L																																									
SEMIVOLATILES	2-Methylphenol	ug/L																																									
SEMIVOLATILES	2-Nitroaniline	ug/L																																									
SEMIVOLATILES	2-Nitrophenol	ug/L																																									
SEMIVOLATILES	3,3'-Dichlorobenzidine	ug/L																																									
SEMIVOLATILES	3-Nitroaniline	ug/L																																									
SEMIVOLATILES	4,6-Dinitro-2-methylphenol	ug/L																																									
SEMIVOLATILES	4-Bromophenyl phenyl ether	ug/L																																									
SEMIVOLATILES	4-Chloro-3-methylphenol	ug/L																																									
SEMIVOLATILES	4-Chloroaniline	ug/L																																									
SEMIVOLATILES	4-Chlorophenyl phenyl ether	ug/L																																									
SEMIVOLATILES	4-Methylphenol	ug/L																																									
SEMIVOLATILES	4-Nitroaniline	ug/L																																									
SEMIVOLATILES	4-Nitrophenol	ug/L																																									
SEMIVOLATILES	Acenaphthene	ug/L																																									
SEMIVOLATILES	Acenaphthylene	ug/L																																									
SEMIVOLATILES	Anthracene	ug/L																																									
SEMIVOLATILES	Benzo(a)anthracene	ug/L																																									
SEMIVOLATILES	Benzo(a)pyrene	ug/L																																									

Table C-2
Additional Sample Results - Groundwater - 2010

		Location Code	105					47DPT01					47DPT02					47DPT03					47DPT04					47DPT05					47DPT06					47DPT07				
		Sample Date	31-Jul-10					13-Aug-10					12-Aug-10					13-Aug-10					12-Aug-10					13-Aug-10					13-Aug-10					20-Aug-10				
		Sample No	105-103107					47DPT01-100813					47DPT02-100812					47DPT03-100813					47DPT04-100812					47DPT05-100813					47DPT06-100813					47DPT07-100820				
		Sample Purpose	REG					REG					REG					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	Result	Qual	ValQual	RC	DF	Result	Qual	ValQual	RC	DF	Result	Qual	ValQual	RC	DF
SEMIVOLATILES	Benzo(b)fluoranthene	ug/L																																										
SEMIVOLATILES	Benzo(ghi)perylene	ug/L																																										
SEMIVOLATILES	Benzo(k)fluoranthene	ug/L																																										
SEMIVOLATILES	Benzoic Acid	ug/L																																										
SEMIVOLATILES	Benzyl Alcohol	ug/L																																										
SEMIVOLATILES	bis(2-Chloroethoxy)methane	ug/L																																										
SEMIVOLATILES	bis(2-Chloroethyl)ether	ug/L																																										
SEMIVOLATILES	bis(2-Chloroisopropyl)ether	ug/L																																										
SEMIVOLATILES	bis(2-Ethylhexyl)phthalate	ug/L																																										
SEMIVOLATILES	Butyl benzyl phthalate	ug/L																																										
SEMIVOLATILES	Chrysene	ug/L																																										
SEMIVOLATILES	Dibenzo(a,h)anthracene	ug/L																																										
SEMIVOLATILES	Dibenzofuran	ug/L																																										
SEMIVOLATILES	Diethyl phthalate	ug/L																																										
SEMIVOLATILES	Dimethyl phthalate	ug/L																																										
SEMIVOLATILES	di-n-Butyl phthalate	ug/L																																										
SEMIVOLATILES	di-n-Octyl phthalate	ug/L																																										
SEMIVOLATILES	Fluoranthene	ug/L																																										
SEMIVOLATILES	Fluorene	ug/L																																										
SEMIVOLATILES	Hexachlorobenzene	ug/L																																										
SEMIVOLATILES	Hexachlorobutadiene	ug/L																																										
SEMIVOLATILES	Hexachlorocyclopentadiene	ug/L																																										
SEMIVOLATILES	Hexachloroethane	ug/L																																										
SEMIVOLATILES	Indeno(1,2,3-cd)pyrene	ug/L																																										
SEMIVOLATILES	Isophorone	ug/L																																										
SEMIVOLATILES	Naphthalene	ug/L																																										
SEMIVOLATILES	Nitrobenzene	ug/L																																										
SEMIVOLATILES	n-Nitroso-di-n-propylamine	ug/L																																										
SEMIVOLATILES	n-Nitrosodiphenylamine	ug/L																																										
SEMIVOLATILES	Pentachlorophenol	ug/L																																										
SEMIVOLATILES	Phenanthrene	ug/L																																										
SEMIVOLATILES	Phenol	ug/L																																										
SEMIVOLATILES	Pyrene	ug/L																																										
VOLATILES	1,1,1,2-Tetrachloroethane	ug/L	0.25	U	U		1						0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	0.625	U	U		2.5	0.25	U	U		1
VOLATILES	1,1,1-Trichloroethane	ug/L	0.25	U	U		1						0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	0.625	U	U		2.5	0.25	U	U		1
VOLATILES	1,1,2,2-Tetrachloroethane	ug/L	0.2	U	U		1						0.2	U	U		1	0.2	U	U		1	0.2	U	U		1	0.2	U	U		1	0.5	U	U		2.5	0.2	U	U		1
VOLATILES	1,1,2-Trichloroethane	ug/L	0.25	U	U		1						0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	0.625	U	U		2.5	0.25	U	U		1
VOLATILES	1,1-Dichloroethane	ug/L	0.125	U	U		1						0.125	U	U		1	0.125	U	U		1	0.125	U	U		1	0.125	U	U		1	11.2				2.5	0.125	U	U		1
VOLATILES	1,1-Dichloroethene	ug/L	0.5	U	U		1						0.5	U	U		1	0.5	U	U		1	0.5	U	U		1	0.5	U	U		1	20.7				2.5	0.5	U	U		1
VOLATILES	1,1-Dichloropropene	ug/L	0.25	U	U		1						0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	0.625	U	U		2.5	0.25	U	U		1
VOLATILES	1,2,3-Trichlorobenzene	ug/L	0.15	U	U		1						0.15	U	U		1	0.15	U	U		1	0.15	U	U		1	0.15	U	U		1	0.375	U	U		2.5	0.15	U	U		1
VOLATILES	1,2,3-Trichloropropane	ug/L	0.5	U	U		1						0.5	U	U		1	0.5	U	U		1	0.5	U	U		1	0.5	U	U		1	1.25	U	U		2.5	0.5	U	U		1
VOLATILES	1,2,4-Trichlorobenzene	ug/L	0.2	U	U		1						0.2	U	U		1	0.2	U	U		1	0.2	U	U		1	0.2	U	U		1	0.5	U	U		2.5	0.2	U	U		1
VOLATILES	1,2,4-Trimethylbenzene	ug/L	0.25	U	U		1						0.31	J	J		1	0.25	U	U		1	0.489	J	J		1	0.25	U	U		1	0.625	U	U		2.5	0.25	U	U		1
VOLATILES	1,2-Dibromo-3-chloropropane	ug/L	1	U	U		1						1	U	U		1	1	U	U		1	1	U	U		1	1	U	U		1	2.5	U	U		2.5	1	U	U		1
VOLATILES	1,2-Dibromoethane	ug/L	0.25	U	U		1						0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	0.625	U	U		2.5	0.25	U	U		1
VOLATILES	1,2-Dichlorobenzene	ug/L	0.125	U	U		1						0.125	U	U		1	0.125	U	U		1	0.125	U	U		1	0.125	U	U		1	0.313	U	U		2.5	0.125	U	U		1
VOLATILES	1,2-Dichloroethane	ug/L	0.25	U	U		1						0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	0.625	U	U		2.5	0.25	U	U		1
VOLATILES	1,2-Dichloropropane	ug/L	0.2	U	U		1						0.2	U	U		1	0.2	U	U		1	0.2	U	U		1	0.2	U	U		1	0.5	U	U		2.5	0.2	U	U		1
VOLATILES	1,2-Dimethylbenzene (o-Xylene)	ug/L	0.25	U	U		1						0.25	U	U		1	0.25	U	U		1	0.457	J	J		1	0.25	U	U		1	0.625	U	U		2.5	0.25	U	U		1
VOLATILES	1,3,5-Trimethylbenzene	ug/L	0.25	U	U		1						0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	0.625	U	U		2.5	0.25	U	U		1
VOLATILES	1,3-Dichlorobenzene	ug/L	0.25	U	U		1						0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	0.625	U	U		2.5	0.25	U	U		1
VOLATILES	1,3-Dichloropropane	ug/L	0.2	U	U		1						0.2	U	U		1	0.2	U	U		1	0.2	U	U		1	0.2	U	U		1	0.5	U	U		2.5	0.2	U	U		1
VOLATILES	1,4-Dichlorobenzene	ug/L	0.125	U	U		1						0.125	U	U		1	0.125	U	U		1	0.125	U	U		1	0.125	U	U		1	0.313	U	U		2.5	0.125	U	U		1
VOLATILES	2,2-Dichloropropane	ug/L	0.25	U	U		1						0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	0.625	U	U		2.5	0.25	U	U		1
VOLATILES	2-Butanone	ug/L	2.5	U	U		1						10.2				1	3.33	J	J		1	9.55	J	J		1	2.5	U	U		1	6.25	U	U		2.5	2.5	U	U		1
VOLATILES	2-Chloroethyl vinyl ether	ug/L	2	U	U		1						2	U	U		1	2	U	U		1	2	U	U		1	2	U	U		1	5	U	U		2.5	2	U	U		1
VOLATILES	2-Chlorotoluene	ug/L	0.125	U	U		1						0.125	U	U		1	0.125	U	U		1	0.125	U	U		1	0.125	U	U		1	0.313	U	U		2.5	0.125	U	U		1
VOLATILES	2-Hexanone	ug/L	2.5	U	U		1						2.5	U	U		1	2.5	U	U		1	2.5	U	U		1	2.5	U	U		1	6.25	U	U		2.5	2.5	U	U		1
VOLATILES	4-Chlorotoluene	ug/L	0.25	U	U		1						0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	0.625	U	U		2.5	0.25	U	U		1
VOLATILES	Acetone	ug/L	2.5	U	U		1						26				1	19.9				1	21.3				1	6.12	J	J		1	6.25	U	U		2.5	8.75	J	J		1
VOLATILES	Benzene	ug/L	0.125	U	U		1						0.125	U	U		1	0.125	U	U		1	0.125	U	U		1	0.125	U	U		1	0.313	U	U		2.5	0.125	U	U		1
VOLATILES	Bromobenzene	ug/L	0.125	U	U		1						0.125	U	U		1	0.125	U	U		1	0.125	U	U		1	0.125	U	U		1	0.313	U	U		2.5	0.125	U	U		1
VOLATILES	Bromochloromethane	ug/L	0.2	U	U		1						0.2	U	U		1	0.2	U	U		1	0.2	U	U		1	0.2	U	U		1	0.5	U	U		2.5	0.2	U	U		1
VOLATILES	Bromodichloromethane	ug/L	0.25	U	U		1						0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	0.625	U	U		2.5	0.25	U	U		1
VOLATILES	Bromoform	ug/L	0.5	U	U		1						0.5	U	U		1	0.5	U	U		1	0.5	U	U		1	0.5	U	U		1	1.25	U	U		2.5	0.5	U	U		1
VOLATILES	Bromomethane	ug/L	0.5	U	U		1						0.5	U	U		1	0.5	U	U		1	0.5	U	U		1	0.5	U	U		1	1.25	U	U		2.5	0.5	U	U		1

Table C-2
Additional Sample Results - Groundwater - 2010

		Location Code	105					47DPT01					47DPT02					47DPT03				
		Sample Date	31-Jul-10					13-Aug-10					12-Aug-10					13-Aug-10				
		Sample No	105-103107					47DPT01-100813					47DPT02-100812					47DPT03-100813				
		Sample Purpose	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
VOLATILES	Carbon disulfide	ug/L	0.5	U	U		1						0.5	U	U		1	0.5	U	U		1
VOLATILES	Carbon tetrachloride	ug/L	0.25	U	U		1						0.25	U	U		1	0.25	U	U		1
VOLATILES	Chlorobenzene	ug/L	0.125	U	U		1						0.125	U	U		1	0.125	U	U		1
VOLATILES	Chloroethane	ug/L	0.5	U	U		1						0.5	U	U		1	0.5	U	U		1
VOLATILES	Chloroform	ug/L	0.125	U	U		1						0.125	U	U		1	0.125	U	U		1
VOLATILES	Chloromethane	ug/L	0.5	U	U		1						0.5	U	U		1	0.5	U	U		1
VOLATILES	cis-1,2-Dichloroethene	ug/L	0.71	J	J		1						2.91				1	0.25	U	U		1
VOLATILES	cis-1,3-Dichloropropene	ug/L	0.25	U	U		1						0.25	U	U		1	0.25	U	U		1
VOLATILES	Dibromochloromethane	ug/L	0.25	U	U		1						0.25	U	U		1	0.25	U	U		1
VOLATILES	Dibromomethane	ug/L	0.25	U	U		1						0.25	U	U		1	0.25	U	U		1
VOLATILES	Dichlorodifluoromethane	ug/L	0.25	U	U		1						0.25	U	U		1	0.25	U	U		1
VOLATILES	Ethylbenzene	ug/L	0.25	U	U		1						0.25	U	U		1	0.25	U	U		1
VOLATILES	Hexachlorobutadiene	ug/L	0.25	U	U		1						0.25	U	U		1	0.25	U	U		1
VOLATILES	Isopropylbenzene	ug/L	0.25	U	U		1						0.25	U	U		1	0.25	U	U		1
VOLATILES	m,p-Xylenes	ug/L	0.5	U	U		1						0.5	U	U		1	0.5	U	U		1
VOLATILES	Methyl isobutyl ketone	ug/L	2.5	U	U		1						2.5	U	U		1	2.5	U	U		1
VOLATILES	Methylene chloride	ug/L	0.25	U	U		1						0.25	U	U		1	0.25	U	U		1
VOLATILES	Naphthalene	ug/L	0.2	U	U		1						0.313	J	J		1	0.2	U	U		1
VOLATILES	n-BUTYLBENZENE	ug/L	0.25	U	U		1						0.25	U	U		1	0.25	U	U		1
VOLATILES	n-PROPYLBENZENE	ug/L	0.125	U	U		1						0.125	U	U		1	0.125	U	U		1
VOLATILES	p-ISOPROPYLTOLUENE	ug/L	0.25	U	U		1						0.25	U	U		1	0.25	U	U		1
VOLATILES	sec-BUTYLBENZENE	ug/L	0.25	U	U		1						0.25	U	U		1	0.25	U	U		1
VOLATILES	Styrene	ug/L	0.125	U	U		1						0.125	U	U		1	0.125	U	U		1
VOLATILES	tert-BUTYLBENZENE	ug/L	0.25	U	U		1						0.25	U	U		1	0.25	U	U		1
VOLATILES	Tetrachloroethene	ug/L	0.25	U	U		1						0.25	U	U		1	0.25	U	U		1
VOLATILES	Toluene	ug/L	0.25	U	U		1						0.662	J	J		1	0.279	J	J		1
VOLATILES	trans-1,2-Dichloroethene	ug/L	0.25	U	U		1						0.25	U	U		1	0.25	U	U		1
VOLATILES	trans-1,3-Dichloropropene	ug/L	0.5	U	U		1						0.5	U	U		1	0.5	U	U		1
VOLATILES	Trichloroethene	ug/L	25.8				1						84.1				1	0.25	U	U		1
VOLATILES	Trichlorofluoromethane	ug/L	0.25	U	U		1						0.25	U	U		1	0.25	U	U		1
VOLATILES	Vinyl acetate	ug/L	2.5	U	U		1						2.5	U	U		1	2.5	U	U		1
VOLATILES	Vinyl chloride	ug/L	0.25	U	U		1						0.25	U	U		1	0.25	U	U		1

		Location Code	47DPT04					47DPT05					47DPT06					47DPT07				
		Sample Date	12-Aug-10					13-Aug-10					13-Aug-10					20-Aug-10				
		Sample No	47DPT04-100812					47DPT05-100813					47DPT06-100813					47DPT07-100820				
		Sample Purpose	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
VOLATILES	Carbon disulfide	ug/L	0.5	U	U		1	0.5	U	U		1	1.25	U	U		2.5	0.5	U	U		1
VOLATILES	Carbon tetrachloride	ug/L	0.25	U	U		1	0.25	U	U		1	0.625	U	U		2.5	0.25	U	U		1
VOLATILES	Chlorobenzene	ug/L	0.125	U	U		1	0.125	U	U		1	0.313	U	U		2.5	0.125	U	U		1
VOLATILES	Chloroethane	ug/L	0.5	U	U		1	0.5	U	U		1	1.25	U	U		2.5	0.5	U	U		1
VOLATILES	Chloroform	ug/L	0.125	U	U		1	0.125	U	U		1	0.313	U	U		2.5	0.125	U	U		1
VOLATILES	Chloromethane	ug/L	0.633	J	J		1	0.523	J	J		1	1.25	U	U		2.5	0.538	J	J		1
VOLATILES	cis-1,2-Dichloroethene	ug/L	0.25	U	U		1	0.25	U	U		1	20.7				2.5	0.25	U	U		1
VOLATILES	cis-1,3-Dichloropropene	ug/L	0.25	U	U		1	0.25	U	U		1	0.625	U	U		2.5	0.25	U	U		1
VOLATILES	Dibromochloromethane	ug/L	0.25	U	U		1	0.25	U	U		1	0.625	U	U		2.5	0.25	U	U		1
VOLATILES	Dibromomethane	ug/L	0.25	U	U		1	0.25	U	U		1	0.625	U	U		2.5	0.25	U	U		1
VOLATILES	Dichlorodifluoromethane	ug/L	0.25	U	U		1	0.25	U	U		1	0.625	U	U		2.5	0.25	U	U		1
VOLATILES	Ethylbenzene	ug/L	0.25	U	U		1	0.25	U	U		1	0.625	U	U		2.5	0.25	U	U		1
VOLATILES	Hexachlorobutadiene	ug/L	0.25	U	U		1	0.25	U	U		1	0.625	U	U		2.5	0.25	U	U		1
VOLATILES	Isopropylbenzene	ug/L	0.25	U	U		1	0.25	U	U		1	0.625	U	U		2.5	0.25	U	U		1
VOLATILES	m,p-Xylenes	ug/L	0.551	J	J		1	0.5	U	U		1	1.25	U	U		2.5	0.5	U	U		1
VOLATILES	Methyl isobutyl ketone	ug/L	2.5	U	U		1	2.5	U	U		1	6.25	U	U		2.5	2.5	U	U		1
VOLATILES	Methylene chloride	ug/L	0.422	J	U-TB		1	0.25	U	U		1	0.625	U	U		2.5	0.25	U	U		1
VOLATILES	Naphthalene	ug/L	0.647	J	J		1	0.2	U	U		1	0.5	U	U		2.5	0.2	U	U		1
VOLATILES	n-BUTYLBENZENE	ug/L	0.25	U	U		1	0.25	U	U		1	0.625	U	U		2.5	0.25	U	U		1
VOLATILES	n-PROPYLBENZENE	ug/L	0.125	U	U		1	0.125	U	U		1	0.313	U	U		2.5	0.125	U	U		1
VOLATILES	p-ISOPROPYLTOLUENE	ug/L	0.25	U	U		1	0.25	U	U		1	0.625	U	U		2.5	0.25	U	U		1
VOLATILES	sec-BUTYLBENZENE	ug/L	0.25	U	U		1	0.25	U	U		1	0.625	U	U		2.5	0.25	U	U		1
VOLATILES	Styrene	ug/L	0.125	U	U		1	0.125	U	U		1	0.313	U	U		2.5	0.125	U	U		1
VOLATILES	tert-BUTYLBENZENE	ug/L	0.25	U	U		1	0.25	U	U		1	0.625	U	U		2.5	0.25	U	U		1
VOLATILES	Tetrachloroethene	ug/L	0.25	U	U		1	0.25	U	U		1	0.625	U	U		2.5	0.25	U	U		1
VOLATILES	Toluene	ug/L	0.838	J	J		1	0.25	U	U		1	0.625	U	U		2.5	0.263	J	J		1
VOLATILES	trans-1,2-Dichloroethene	ug/L	0.25	U	U		1	0.25	U	U		1	0.625	U	U		2.5	0.25	U	U		1
VOLATILES	trans-1,3-Dichloropropene	ug/L	0.5	U	U		1	0.5	U	U		1	1.25	U	U		2.5	0.5	U	U		1
VOLATILES	Trichloroethene	ug/L	0.25	U	U		1	0.25	U	U		1	526				10	0.25	U	U		1
VOLATILES	Trichlorofluoromethane	ug/L	0.25	U	U		1	0.25	U	U		1	0.625	U	U		2.5	0.25	U	U		1
VOLATILES	Vinyl acetate	ug/L	2.5	U	U		1	2.5	U	U		1	6.25	U	U		2.5	2.5	U	U		1
VOLATILES	Vinyl chloride	ug/L	0.25	U	U		1	0.25	U	U		1	4.47				2.5	0.25	U	U		1

Table C-2
Additional Sample Results - Groundwater - 2010

		Location Code	47DPT08					47DPT09					47DPT10					47DPT10I					47DPT11					47DPT11I					47DPT12					47DPT12I				
		Sample Date	20-Aug-10					20-Aug-10					20-Aug-10					15-Sep-10					20-Aug-10					15-Sep-10					20-Aug-10					15-Sep-10				
		Sample No	47DPT08-100820					47DPT09-100820					47DPT10-100820					47DPT10I-100915					47DPT11-100820					47DPT11I-100915					47DPT12-100820					47DPT12I-100915				
		Sample Purpose	REG					REG					REG					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	Result	Qual	ValQual	RC	DF	Result	Qual	ValQual	RC	DF	Result	Qual	ValQual	RC	DF
GASES	Ethane	ug/L																																									
GASES	Ethylene	ug/L																																									
GASES	Methane	ug/L																																									
GEN CHEMISTRY	Chloride	ug/L																																									
GEN CHEMISTRY	Fluoride, Total	ug/L																																									
GEN CHEMISTRY	Nitrate	ug/L																																									
GEN CHEMISTRY	Nitrate / Nitrite	ug/L																																									
GEN CHEMISTRY	Nitrite	ug/L																																									
GEN CHEMISTRY	Perchlorate	ug/L																																									
GEN CHEMISTRY	Sulfate	ug/L																																									
GEN CHEMISTRY	Total Alkalinity	ug/L																																									
GEN CHEMISTRY	Total Organic Carbon	ug/L																																									
METALS	Aluminum	mg/L																																									
METALS	Antimony	mg/L																																									
METALS	Arsenic	mg/L																																									
METALS	Barium	mg/L																																									
METALS	Beryllium	mg/L																																									
METALS	Cadmium	mg/L																																									
METALS	Calcium	mg/L																																									
METALS	Chromium	mg/L																																									
METALS	Cobalt	mg/L																																									
METALS	Copper	mg/L																																									
METALS	Iron	mg/L																																									
METALS	Lead	mg/L																																									
METALS	Magnesium	mg/L																																									
METALS	Manganese	mg/L																																									
METALS	Mercury	mg/L																																									
METALS	Nickel	mg/L																																									
METALS	Potassium	mg/L																																									
METALS	Selenium	mg/L																																									
METALS	Silver	mg/L																																									
METALS	Sodium	mg/L																																									
METALS	Thallium	mg/L																																									
METALS	Vanadium	mg/L																																									
METALS	Zinc	mg/L																																									
SEMIVOLATILES	1,2,4-Trichlorobenzene	ug/L																																									
SEMIVOLATILES	1,2-Dichlorobenzene	ug/L																																									
SEMIVOLATILES	1,3-Dichlorobenzene	ug/L																																									
SEMIVOLATILES	1,4-Dichlorobenzene	ug/L																																									
SEMIVOLATILES	2,4,5-Trichlorophenol	ug/L																																									
SEMIVOLATILES	2,4,6-Trichlorophenol	ug/L																																									
SEMIVOLATILES	2,4-Dichlorophenol	ug/L																																									
SEMIVOLATILES	2,4-Dimethylphenol	ug/L																																									
SEMIVOLATILES	2,4-Dinitrophenol	ug/L																																									
SEMIVOLATILES	2,4-Dinitrotoluene	ug/L																																									
SEMIVOLATILES	2,6-Dinitrotoluene	ug/L																																									
SEMIVOLATILES	2-Chloronaphthalene	ug/L																																									
SEMIVOLATILES	2-Chlorophenol	ug/L																																									
SEMIVOLATILES	2-Methylnaphthalene	ug/L																																									
SEMIVOLATILES	2-Methylphenol	ug/L																																									
SEMIVOLATILES	2-Nitroaniline	ug/L																																									
SEMIVOLATILES	2-Nitrophenol	ug/L																																									
SEMIVOLATILES	3,3'-Dichlorobenzidine	ug/L																																									
SEMIVOLATILES	3-Nitroaniline	ug/L																																									
SEMIVOLATILES	4,6-Dinitro-2-methylphenol	ug/L																																									
SEMIVOLATILES	4-Bromophenyl phenyl ether	ug/L																																									
SEMIVOLATILES	4-Chloro-3-methylphenol	ug/L																																									
SEMIVOLATILES	4-Chloroaniline	ug/L																																									
SEMIVOLATILES	4-Chlorophenyl phenyl ether	ug/L																																									
SEMIVOLATILES	4-Methylphenol	ug/L																																									
SEMIVOLATILES	4-Nitroaniline	ug/L																																									
SEMIVOLATILES	4-Nitrophenol	ug/L																																									
SEMIVOLATILES	Acenaphthene	ug/L																																									
SEMIVOLATILES	Acenaphthylene	ug/L																																									
SEMIVOLATILES	Anthracene	ug/L																																									
SEMIVOLATILES	Benzo(a)anthracene	ug/L																																									
SEMIVOLATILES	Benzo(a)pyrene	ug/L																																									

Table C-2
Additional Sample Results - Groundwater - 2010

		Location Code	47DPT08					47DPT09					47DPT10					47DPT10I					47DPT11					47DPT11I					47DPT12					47DPT12I				
		Sample Date	20-Aug-10					20-Aug-10					20-Aug-10					15-Sep-10					20-Aug-10					15-Sep-10					20-Aug-10					15-Sep-10				
		Sample No	47DPT08-100820					47DPT09-100820					47DPT10-100820					47DPT10I-100915					47DPT11-100820					47DPT11I-100915					47DPT12-100820					47DPT12I-100915				
		Sample Purpose	REG					REG					REG					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	Result	Qual	ValQual	RC	DF	Result	Qual	ValQual	RC	DF	Result	Qual	ValQual	RC	DF
SEMIVOLATILES	Benzo(b)fluoranthene	ug/L																																									
SEMIVOLATILES	Benzo(ghi)perylene	ug/L																																									
SEMIVOLATILES	Benzo(k)fluoranthene	ug/L																																									
SEMIVOLATILES	Benzoic Acid	ug/L																																									
SEMIVOLATILES	Benzyl Alcohol	ug/L																																									
SEMIVOLATILES	bis(2-Chloroethoxy)methane	ug/L																																									
SEMIVOLATILES	bis(2-Chloroethyl)ether	ug/L																																									
SEMIVOLATILES	bis(2-Chloroisopropyl)ether	ug/L																																									
SEMIVOLATILES	bis(2-Ethylhexyl)phthalate	ug/L																																									
SEMIVOLATILES	Butyl benzyl phthalate	ug/L																																									
SEMIVOLATILES	Chrysene	ug/L																																									
SEMIVOLATILES	Dibenzo(a,h)anthracene	ug/L																																									
SEMIVOLATILES	Dibenzofuran	ug/L																																									
SEMIVOLATILES	Diethyl phthalate	ug/L																																									
SEMIVOLATILES	Dimethyl phthalate	ug/L																																									
SEMIVOLATILES	di-n-Butyl phthalate	ug/L																																									
SEMIVOLATILES	di-n-Octyl phthalate	ug/L																																									
SEMIVOLATILES	Fluoranthene	ug/L																																									
SEMIVOLATILES	Fluorene	ug/L																																									
SEMIVOLATILES	Hexachlorobenzene	ug/L																																									
SEMIVOLATILES	Hexachlorobutadiene	ug/L																																									
SEMIVOLATILES	Hexachlorocyclopentadiene	ug/L																																									
SEMIVOLATILES	Hexachloroethane	ug/L																																									
SEMIVOLATILES	Indeno(1,2,3-cd)pyrene	ug/L																																									
SEMIVOLATILES	Isophorone	ug/L																																									
SEMIVOLATILES	Naphthalene	ug/L																																									
SEMIVOLATILES	Nitrobenzene	ug/L																																									
SEMIVOLATILES	n-Nitroso-di-n-propylamine	ug/L																																									
SEMIVOLATILES	n-Nitrosodiphenylamine	ug/L																																									
SEMIVOLATILES	Pentachlorophenol	ug/L																																									
SEMIVOLATILES	Phenanthrene	ug/L																																									
SEMIVOLATILES	Phenol	ug/L																																									
SEMIVOLATILES	Pyrene	ug/L																																									
VOLATILES	1,1,1,2-Tetrachloroethane	ug/L	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1
VOLATILES	1,1,1-Trichloroethane	ug/L	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1
VOLATILES	1,1,2,2-Tetrachloroethane	ug/L	0.2	U	U		1	0.2	U	U		1	0.2	U	U		1	0.2	U	U		1	0.2	U	U		1	0.2	U	U		1	0.2	U	U		1	0.2	U	U		1
VOLATILES	1,1,2-Trichloroethane	ug/L	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1
VOLATILES	1,1-Dichloroethane	ug/L	0.125	U	U		1	0.125	U	U		1	0.125	U	U		1	0.125	U	U		1	0.125	U	U		1	0.125	U	U		1	0.125	U	U		1	0.125	U	U		1
VOLATILES	1,1-Dichloroethene	ug/L	0.5	U	U		1	0.5	U	U		1	0.5	U	U		1	0.5	U	U		1	0.5	U	U		1	0.5	U	U		1	0.5	U	U		1	0.5	U	U		1
VOLATILES	1,1-Dichloropropene	ug/L	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1
VOLATILES	1,2,3-Trichlorobenzene	ug/L	0.15	U	U		1	0.15	U	U		1	0.15	U	U		1	0.15	U	U		1	0.15	U	U		1	0.15	U	U		1	0.15	U	U		1	0.15	U	U		1
VOLATILES	1,2,3-Trichloropropane	ug/L	0.5	U	U		1	0.5	U	U		1	0.5	U	U		1	0.5	U	U		1	0.5	U	U		1	0.5	U	U		1	0.5	U	U		1	0.5	U	U		1
VOLATILES	1,2,4-Trichlorobenzene	ug/L	0.2	U	U		1	0.2	U	U		1	0.2	U	U		1	0.2	U	U		1	0.2	U	U		1	0.2	U	U		1	0.2	U	U		1	0.2	U	U		1
VOLATILES	1,2,4-Trimethylbenzene	ug/L	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1
VOLATILES	1,2-Dibromo-3-chloropropane	ug/L	1	U	U		1	1	U	U		1	1	U	U		1	1	U	U		1	1	U	U		1	1	U	U		1	1	U	U		1	1	U	U		1
VOLATILES	1,2-Dibromoethane	ug/L	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1
VOLATILES	1,2-Dichlorobenzene	ug/L	0.125	U	U		1	0.125	U	U		1	0.125	U	U		1	0.125	U	U		1	0.125	U	U		1	0.125	U	U		1	0.125	U	U		1	0.125	U	U		1
VOLATILES	1,2-Dichloroethane	ug/L	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1
VOLATILES	1,2-Dichloropropane	ug/L	0.2	U	U		1	0.2	U	U		1	0.2	U	U		1	0.2	U	U		1	0.2	U	U		1	0.2	U	U		1	0.2	U	U		1	0.2	U	U		1
VOLATILES	1,2-Dimethylbenzene (o-Xylene)	ug/L	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1
VOLATILES	1,3,5-Trimethylbenzene	ug/L	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1
VOLATILES	1,3-Dichlorobenzene	ug/L	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1
VOLATILES	1,3-Dichloropropane	ug/L	0.2	U	U		1	0.2	U	U		1	0.2	U	U		1	0.2	U	U		1	0.2	U	U		1	0.2	U	U		1	0.2	U	U		1	0.2	U	U		1
VOLATILES	1,4-Dichlorobenzene	ug/L	0.125	U	U		1	0.125	U	U		1	0.125	U	U		1	0.125	U	U		1	0.125	U	U		1	0.125	U	U		1	0.125	U	U		1	0.125	U	U		1
VOLATILES	2,2-Dichloropropane	ug/L	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1
VOLATILES	2-Butanone	ug/L	2.5	U	U		1	2.5	U	U		1	2.86	J	J		1	2.5	U	U		1	2.5	U	U		1	2.5	U	U		1	2.5	U	U		1	2.5	U	U		1
VOLATILES	2-Chloroethyl vinyl ether	ug/L	2	U	U		1	2	U	U		1	2	U	U		1	2	U	U		1	2	U	U		1	2	U	U		1	2	U	U		1	2	U	U		1
VOLATILES	2-Chlorotoluene	ug/L	0.125	U	U		1	0.125	U	U		1	0.125	U	U		1	0.125	U	U		1	0.125	U	U		1	0.125	U	U		1	0.125	U	U		1	0.125	U	U		1
VOLATILES	2-Hexanone	ug/L	2.5	U	U		1	2.5	U	U		1	2.5	U	U		1	2.5	U	U		1	2.5	U	U		1	2.5	U	U		1	2.5	U	U		1	2.5	U	U		1
VOLATILES	4-Chlorotoluene	ug/L	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1
VOLATILES	Acetone	ug/L	2.5	U	U		1	6.34	J	J		1	20				1	2.5	U	U		1	3.83	J	J		1	2.66	J	J		1	4.44	J	J		1	2.5	U	U		1
VOLATILES	Benzene	ug/L	0.125	U	U		1	0.125	U	U		1	0.125	U	U		1	0.125	U	U		1	0.125	U	U		1	0.125	U	U		1	0.125	U	U		1	0.125	U	U		1
VOLATILES	Bromobenzene	ug/L	0.125	U	U		1	0.125	U	U		1	0.125	U	U		1	0.125	U	U		1	0.125	U	U		1	0.125	U	U		1	0.125	U	U		1	0.125	U	U		1
VOLATILES	Bromochloromethane	ug/L	0.2	U	U		1	0.2	U	U		1	0.2	U	U		1	0.2	U	U		1	0.2	U	U		1	0.2	U	U		1	0.2	U	U		1	0.2	U	U		1
VOLATILES	Bromodichloromethane	ug/L	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1
VOLATILES	Bromoform	ug/L	0.5	U	U		1	0.5	U	U		1	0.5	U	U		1	0.5	U	U		1	0.5	U	U		1	0.5	U	U		1	0.5	U	U		1	0.5	U	U		1
VOLATILES	Bromomethane	ug/L	0.5	U	U		1	0.5	U	U		1	0.5	U	U		1	0.5	U	U		1	0.5	U	U		1	0.5	U	U		1	0.5	U	U		1	0.5	U	U		1

Table C-2
Additional Sample Results - Groundwater - 2010

		Location Code	47DPT08					47DPT09					47DPT10					47DPT10I				
		Sample Date	20-Aug-10					20-Aug-10					20-Aug-10					15-Sep-10				
		Sample No	47DPT08-100820					47DPT09-100820					47DPT10-100820					47DPT10I-100915				
		Sample Purpose	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
VOLATILES	Carbon disulfide	ug/L	0.5	U	U		1	0.5	U	U		1	0.5	U	U		1	0.5	U	U		1
VOLATILES	Carbon tetrachloride	ug/L	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1
VOLATILES	Chlorobenzene	ug/L	0.125	U	U		1	0.125	U	U		1	0.125	U	U		1	0.125	U	U		1
VOLATILES	Chloroethane	ug/L	0.5	U	U		1	0.5	U	U		1	0.5	U	U		1	0.5	U	U		1
VOLATILES	Chloroform	ug/L	0.125	U	U		1	0.125	U	U		1	0.125	U	U		1	0.125	U	U		1
VOLATILES	Chloromethane	ug/L	0.5	U	U		1	0.5	U	U		1	1.13				1	0.5	U	U		1
VOLATILES	cis-1,2-Dichloroethene	ug/L	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1
VOLATILES	cis-1,3-Dichloropropene	ug/L	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1
VOLATILES	Dibromochloromethane	ug/L	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1
VOLATILES	Dibromomethane	ug/L	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1
VOLATILES	Dichlorodifluoromethane	ug/L	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1
VOLATILES	Ethylbenzene	ug/L	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1
VOLATILES	Hexachlorobutadiene	ug/L	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1
VOLATILES	Isopropylbenzene	ug/L	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1
VOLATILES	m,p-Xylenes	ug/L	0.5	U	U		1	0.5	U	U		1	0.5	U	U		1	0.5	U	U		1
VOLATILES	Methyl isobutyl ketone	ug/L	2.5	U	U		1	2.5	U	U		1	2.5	U	U		1	2.5	U	U		1
VOLATILES	Methylene chloride	ug/L	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1
VOLATILES	Naphthalene	ug/L	0.2	U	U		1	0.2	U	U		1	0.2	U	U		1	0.2	U	U		1
VOLATILES	n-BUTYLBENZENE	ug/L	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1
VOLATILES	n-PROPYLBENZENE	ug/L	0.125	U	U		1	0.125	U	U		1	0.125	U	U		1	0.125	U	U		1
VOLATILES	p-ISOPROPYLTOLUENE	ug/L	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1
VOLATILES	sec-BUTYLBENZENE	ug/L	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1
VOLATILES	Styrene	ug/L	0.125	U	U		1	0.125	U	U		1	0.125	U	U		1	0.125	U	U		1
VOLATILES	tert-BUTYLBENZENE	ug/L	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1
VOLATILES	Tetrachloroethene	ug/L	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1
VOLATILES	Toluene	ug/L	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1
VOLATILES	trans-1,2-Dichloroethene	ug/L	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1
VOLATILES	trans-1,3-Dichloropropene	ug/L	0.5	U	U		1	0.5	U	U		1	0.5	U	U		1	0.5	U	U		1
VOLATILES	Trichloroethene	ug/L	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1
VOLATILES	Trichlorofluoromethane	ug/L	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1
VOLATILES	Vinyl acetate	ug/L	2.5	U	U		1	2.5	U	U		1	2.5	U	U		1	2.5	U	U		1
VOLATILES	Vinyl chloride	ug/L	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1

		Location Code	47DPT11					47DPT11I					47DPT12					47DPT12I				
		Sample Date	20-Aug-10					15-Sep-10					20-Aug-10					15-Sep-10				
		Sample No	47DPT11-100820					47DPT11I-100915					47DPT12-100820					47DPT12I-100915				
		Sample Purpose	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
VOLATILES	Carbon disulfide	ug/L	0.5	U	U		1	0.5	U	U		1	0.5	U	U		1	0.5	U	U		1
VOLATILES	Carbon tetrachloride	ug/L	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1
VOLATILES	Chlorobenzene	ug/L	0.125	U	U		1	0.125	U	U		1	0.125	U	U		1	0.125	U	U		1
VOLATILES	Chloroethane	ug/L	0.5	U	U		1	0.5	U	U		1	0.5	U	U		1	0.5	U	U		1
VOLATILES	Chloroform	ug/L	0.125	U	U		1	0.125	U	U		1	0.125	U	U		1	0.125	U	U		1
VOLATILES	Chloromethane	ug/L	0.5	U	U		1	0.5	U	U		1	0.5	U	U		1	0.5	U	U		1
VOLATILES	cis-1,2-Dichloroethene	ug/L	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1
VOLATILES	cis-1,3-Dichloropropene	ug/L	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1
VOLATILES	Dibromochloromethane	ug/L	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1
VOLATILES	Dibromomethane	ug/L	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1
VOLATILES	Dichlorodifluoromethane	ug/L	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1
VOLATILES	Ethylbenzene	ug/L	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1
VOLATILES	Hexachlorobutadiene	ug/L	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1
VOLATILES	Isopropylbenzene	ug/L	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1
VOLATILES	m,p-Xylenes	ug/L	0.5	U	U		1	0.5	U	U		1	0.5	U	U		1	0.5	U	U		1
VOLATILES	Methyl isobutyl ketone	ug/L	2.5	U	U		1	2.5	U	U		1	2.5	U	U		1	2.5	U	U		1
VOLATILES	Methylene chloride	ug/L	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1
VOLATILES	Naphthalene	ug/L	0.2	U	U		1	0.2	U	U		1	0.2	U	U		1	0.2	U	U		1
VOLATILES	n-BUTYLBENZENE	ug/L	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1
VOLATILES	n-PROPYLBENZENE	ug/L	0.125	U	U		1	0.125	U	U		1	0.125	U	U		1	0.125	U	U		1
VOLATILES	p-ISOPROPYLTOLUENE	ug/L	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1
VOLATILES	sec-BUTYLBENZENE	ug/L	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1
VOLATILES	Styrene	ug/L	0.125	U	U		1	0.125	U	U		1	0.125	U	U		1	0.125	U	U		1
VOLATILES	tert-BUTYLBENZENE	ug/L	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1
VOLATILES	Tetrachloroethene	ug/L	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1
VOLATILES	Toluene	ug/L	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1
VOLATILES	trans-1,2-Dichloroethene	ug/L	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1
VOLATILES	trans-1,3-Dichloropropene	ug/L	0.5	U	U		1	0.5	U	U		1	0.5	U	U		1	0.5	U	U		1
VOLATILES	Trichloroethene	ug/L	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1
VOLATILES	Trichlorofluoromethane	ug/L	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1
VOLATILES	Vinyl acetate	ug/L	2.5	U	U		1	2.5	U	U		1	2.5	U	U		1	2.5	U	U		1
VOLATILES	Vinyl chloride	ug/L	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1

Table C-2
Additional Sample Results - Groundwater - 2010

		Location Code	47DPT13					47DPT14					47DPT15					47WW04					47WW09					47WW13					47WW14					47WW14				
		Sample Date	20-Aug-10					15-Sep-10					15-Sep-10					6-Aug-10					3-Aug-10					4-Aug-10					4-Aug-10					4-Aug-10				
		Sample No	47DPT13-100820					47DPT14-100915					47DPT15-100915					47WW04-100806					47WW09-100803					47WW13-100804					47WW14-100804					47WW14-100804-FD				
		Sample Purpose	REG					REG					REG					REG					REG					REG					REG					FD				
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	Result	Qual	ValQual	RC	DF	Result	Qual	ValQual	RC	DF	Result	Qual	ValQual	RC	DF
GASES	Ethane	ug/L																					1	U	U		1	1	U	U		1	1	U	U		1	1	U	U		1
GASES	Ethylene	ug/L																					1	U	U		1	27.4				1	1	U	U		1	1	U	U		1
GASES	Methane	ug/L																					2.5	J	J		1	271				1	53.3				1	55.8				1
GEN CHEMISTRY	Chloride	ug/L																					497000				20	9370				1	322000				10	312000				10
GEN CHEMISTRY	Fluoride, Total	ug/L																					1000	U	U		10	230				1	408	J	J		3	420	J	J		3
GEN CHEMISTRY	Nitrate	ug/L																					1000	U	U		10	119	J	J		1	327	J	J		3	300	U	U		3
GEN CHEMISTRY	Nitrate / Nitrite	ug/L																																								
GEN CHEMISTRY	Nitrite	ug/L																					1000	U	U		10	100	U	U		1	300	U	U		3	300	U	U		3
GEN CHEMISTRY	Perchlorate	ug/L	1.09				1	0.1	U	U		1	1580				1000	0.1	U	U		1	0.1	U	U		1	0.1	U	U		1	0.1	U	U		1	0.1	U	U		1
GEN CHEMISTRY	Sulfate	ug/L																					949000				10	35800				1	313000				3	301000				3
GEN CHEMISTRY	Total Alkalinity	ug/L																					372000				2	56500		JH-EB		1	322000				2	307000				2
GEN CHEMISTRY	Total Organic Carbon	ug/L																					13200				2	11900				2	8940				2	9840				2
METALS	Aluminum	mg/L																					0.05	U	U		1	13.4				1	0.05	U	U		1	0.05	U	U		1
METALS	Antimony	mg/L																					0.00125	U	U		5	0.00426	J	J		5	0.00125	U	U		5	0.00125	U	U		5
METALS	Arsenic	mg/L																					0.00366	J	J		5	0.113				5	0.00215	J	J		5	0.00195	J	J		5
METALS	Barium	mg/L																					0.0107	J	J		5	0.119				5	0.0546				5	0.0523				5
METALS	Beryllium	mg/L																					0.0005	U	U		1	0.000879	J	J		1	0.0005	U	U		1	0.0005	U	U		1
METALS	Cadmium	mg/L																					0.000625	U	U		5	0.000625	U	U		5	0.000625	U	U		5	0.000625	U	U		5
METALS	Calcium	mg/L																					91.3				1	3.12				1	71.6				1	68.7				1
METALS	Chromium	mg/L																					0.0615				5	0.0387				5	0.0736				5	0.0562				5
METALS	Cobalt	mg/L																					0.0025	U	U		1	0.0147				1	0.0025	U	U		1	0.0025	U	U		1
METALS	Copper	mg/L																					0.0025	U	U		5	0.0178				5	0.00265	J	J		5	0.0025	U	U		5
METALS	Iron	mg/L																					0.474				1	11.4				1	0.321				1	0.268				1
METALS	Lead	mg/L																					0.00125	U	U		5	0.00471				5	0.00304				5	0.00125	U	U		5
METALS	Magnesium	mg/L																					106				1	1.92				1	46.9				1	44.8				1
METALS	Manganese	mg/L																					0.0224				5	0.23				5	0.112				5	0.0957				5
METALS	Mercury	mg/L																					0.0001	U	U		1	0.0001	U	U		1	0.0001	U	U		1	0.0001	U	U		1
METALS	Nickel	mg/L																					0.005	U	U		5	0.0284				5	0.037				5	0.0391				5
METALS	Potassium	mg/L																					3.71				1	1.17				1	1.61				1	1.52				1
METALS	Selenium	mg/L																					0.0106				5	0.0034	J	J		5	0.0077				5	0.00873				5
METALS	Silver	mg/L																					0.00125	U	U		5	0.00125	U	U		5	0.00125	U	U		5	0.00125	U	U		5
METALS	Sodium	mg/L																					657				5	27.6				1	365				10	346				10
METALS	Thallium	mg/L																					0.00025	U	U		5	0.00025	U	U		5	0.00025	U	U		5	0.00025	U	U		5
METALS	Vanadium	mg/L																					0.005	U	U		1	0.0186				1	0.005	U	U		1	0.005	U	U		1
METALS	Zinc	mg/L																					0.005	U	U		1	0.0317				1	0.005	U	U		1	0.005	U	U		1
SEMIVOLATILES	1,2,4-Trichlorobenzene	ug/L																					2.5	U	U		1	2.5	U	U		1	2.5	U	U		1					
SEMIVOLATILES	1,2-Dichlorobenzene	ug/L																					2.5	U	U		1	2.5	U	U		1	2.5	U	U		1					
SEMIVOLATILES	1,3-Dichlorobenzene	ug/L																					2.5	U	U		1	2.5	U	U		1	2.5	U	U		1					
SEMIVOLATILES	1,4-Dichlorobenzene	ug/L																					2.5	U	U		1	2.5	U	U		1	2.5	U	U		1					
SEMIVOLATILES	2,4,5-Trichlorophenol	ug/L																					2.5	U	U		1	2.5	U	U		1	2.5	U	U		1					
SEMIVOLATILES	2,4,6-Trichlorophenol	ug/L																					2.5	U	U		1	2.5	U	U		1	2.5	U	U		1					
SEMIVOLATILES	2,4-Dichlorophenol	ug/L																					2.5	U	U		1	2.5	U	U		1	2.5	U	U		1					
SEMIVOLATILES	2,4-Dimethylphenol	ug/L																					2.5	U	U		1	2.5	U	U		1	2.5	U	U		1					
SEMIVOLATILES	2,4-Dinitrophenol	ug/L																					12.5	U	U		1	12.5	U	U		1	12.5	U	U		1					
SEMIVOLATILES	2,4-Dinitrotoluene	ug/L																					2.5	U	U		1	2.5	U	U		1	2.5	U	U		1					
SEMIVOLATILES	2,6-Dinitrotoluene	ug/L																					2.5	U	U		1	2.5	U	U		1	2.5	U	U		1					
SEMIVOLATILES	2-Chloronaphthalene	ug/L																					2.5	U	U		1	2.5	U	U		1	2.5	U	U		1					
SEMIVOLATILES	2-Chlorophenol	ug/L																					2.5	U	U		1	2.5	U	U		1	2.5	U	U		1					
SEMIVOLATILES	2-Methylnaphthalene	ug/L																					2.5	U	U		1	2.5	U	U		1	2.5	U	U		1					
SEMIVOLATILES	2-Methylphenol	ug/L																					2.5	U	U		1	2.5	U	U		1	2.5	U	U		1					
SEMIVOLATILES	2-Nitroaniline	ug/L																					12.5	U	U		1	12.5	U	U		1	12.5	U	U		1					
SEMIVOLATILES	2-Nitrophenol	ug/L																					2.5	U	U		1	2.5	U	U		1	2.5	U	U		1					
SEMIVOLATILES	3,3'-Dichlorobenzidine	ug/L																					2.5	U	U		1	2.5	U	U		1	2.5	U	U		1					
SEMIVOLATILES	3-Nitroaniline	ug/L																					12.5	U	U		1	12.5	U	U		1	12.5	U	U		1					
SEMIVOLATILES	4,6-Dinitro-2-methylphenol	ug/L																					12.5	U	U		1	12.5	U	U		1	12.5	U	U		1					
SEMIVOLATILES	4-Bromophenyl phenyl ether	ug/L																					2.5	U	U		1	2.5	U	U		1	2.5	U	U		1					
SEMIVOLATILES	4-Chloro-3-methylphenol	ug/L																					2.5	U	U		1	2.5	U	U		1	2.5	U	U		1					
SEMIVOLATILES	4-Chloroaniline	ug/L																					2.5	U	U		1	2.5	U	U		1	2.5	U	U		1					
SEMIVOLATILES	4-Chlorophenyl phenyl ether	ug/L																					2.5	U	U		1	2.5	U	U		1	2.5	U	U		1					
SEMIVOLATILES	4-Methylphenol	ug/L																					2.5	U	U		1	2.5	U	U		1	2.5	U	U		1					
SEMIVOLATILES	4-Nitroaniline	ug/L																					12.5	U	U		1	12.5	U	U		1	12.5	U	U		1					
SEMIVOLATILES	4-Nitrophenol	ug/L																					12.5	U	U		1	12.5	U	U		1	12.5	U	U		1					
SEMIVOLATILES	Acenaphthene	ug/L																					2.5	U	U		1	2.5	U	U		1	2.5	U	U		1					
SEMIVOLATILES	Acenaphthylene	ug/L																					2.5	U	U		1	2.5	U	U		1	2.5	U	U		1					
SEMIVOLATILES	Anthracene	ug/L																					2.5	U	U		1	2.5	U	U		1	2.5	U	U		1					
SEMIVOLATILES	Benzo(a)anthracene	ug/L																					2.5	U	U		1	2.5	U	U		1	2.5	U	U		1					
SEMIVOLATILES	Benzo(a)pyrene	ug/L																					2.5	U	U		1	2.5	U	U		1	2.5	U	U		1					

Table C-2
Additional Sample Results - Groundwater - 2010

		Location Code	47DPT13					47DPT14					47DPT15					47WW04				
		Sample Date	20-Aug-10					15-Sep-10					15-Sep-10					6-Aug-10				
		Sample No	47DPT13-100820					47DPT14-100915					47DPT15-100915					47WW04-100806				
		Sample Purpose	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
SEMIVOLATILES	Benzo(b)fluoranthene	ug/L																				
SEMIVOLATILES	Benzo(ghi)perylene	ug/L																				
SEMIVOLATILES	Benzo(k)fluoranthene	ug/L																				
SEMIVOLATILES	Benzoic Acid	ug/L																				
SEMIVOLATILES	Benzyl Alcohol	ug/L																				
SEMIVOLATILES	bis(2-Chloroethoxy)methane	ug/L																				
SEMIVOLATILES	bis(2-Chloroethyl)ether	ug/L																				
SEMIVOLATILES	bis(2-Chloroisopropyl)ether	ug/L																				
SEMIVOLATILES	bis(2-Ethylhexyl)phthalate	ug/L																				
SEMIVOLATILES	Butyl benzyl phthalate	ug/L																				
SEMIVOLATILES	Chrysene	ug/L																				
SEMIVOLATILES	Dibenzo(a,h)anthracene	ug/L																				
SEMIVOLATILES	Dibenzofuran	ug/L																				
SEMIVOLATILES	Diethyl phthalate	ug/L																				
SEMIVOLATILES	Dimethyl phthalate	ug/L																				
SEMIVOLATILES	di-n-Butyl phthalate	ug/L																				
SEMIVOLATILES	di-n-Octyl phthalate	ug/L																				
SEMIVOLATILES	Fluoranthene	ug/L																				
SEMIVOLATILES	Fluorene	ug/L																				
SEMIVOLATILES	Hexachlorobenzene	ug/L																				
SEMIVOLATILES	Hexachlorobutadiene	ug/L																				
SEMIVOLATILES	Hexachlorocyclopentadiene	ug/L																				
SEMIVOLATILES	Hexachloroethane	ug/L																				
SEMIVOLATILES	Indeno(1,2,3-cd)pyrene	ug/L																				
SEMIVOLATILES	Isophorone	ug/L																				
SEMIVOLATILES	Naphthalene	ug/L																				
SEMIVOLATILES	Nitrobenzene	ug/L																				
SEMIVOLATILES	n-Nitroso-di-n-propylamine	ug/L																				
SEMIVOLATILES	n-Nitrosodiphenylamine	ug/L																				
SEMIVOLATILES	Pentachlorophenol	ug/L																				
SEMIVOLATILES	Phenanthrene	ug/L																				
SEMIVOLATILES	Phenol	ug/L																				
SEMIVOLATILES	Pyrene	ug/L																				
VOLATILES	1,1,1,2-Tetrachloroethane	ug/L						0.25	U	U		1	0.25	U	U		1	0.25	U	U		1
VOLATILES	1,1,1-Trichloroethane	ug/L						0.25	U	U		1	0.25	U	U		1	0.25	U	U		1
VOLATILES	1,1,2,2-Tetrachloroethane	ug/L						0.2	U	U		1	0.2	U	U		1	0.2	U	U		1
VOLATILES	1,1,2-Trichloroethane	ug/L						0.25	U	U		1	0.25	U	U		1	0.25	U	U		1
VOLATILES	1,1-Dichloroethane	ug/L						3.92				1	0.125	U	U		1	0.125	U	U		1
VOLATILES	1,1-Dichloroethene	ug/L						14				1	0.5	U	U		1	0.5	U	U		1
VOLATILES	1,1-Dichloropropene	ug/L						0.25	U	U		1	0.25	U	U		1	0.25	U	U		1
VOLATILES	1,2,3-Trichlorobenzene	ug/L						0.15	U	U		1	0.15	U	U		1	0.15	U	U		1
VOLATILES	1,2,3-Trichloropropane	ug/L						0.5	U	U		1	0.5	U	U		1	0.5	U	U		1
VOLATILES	1,2,4-Trichlorobenzene	ug/L						0.2	U	U		1	0.2	U	U		1	0.2	U	U		1
VOLATILES	1,2,4-Trimethylbenzene	ug/L						0.25	U	U		1	0.25	U	U		1	0.25	U	U		1
VOLATILES	1,2-Dibromo-3-chloropropane	ug/L						1	U	U		1	1	U	U		1	1	U	U		1
VOLATILES	1,2-Dibromoethane	ug/L						0.25	U	U		1	0.25	U	U		1	0.25	U	U		1
VOLATILES	1,2-Dichlorobenzene	ug/L						0.125	U	U		1	0.125	U	U		1	0.125	U	U		1
VOLATILES	1,2-Dichloroethane	ug/L						0.25	U	U		1	0.25	U	U		1	0.25	U	U		1
VOLATILES	1,2-Dichloropropane	ug/L						0.2	U	U		1	0.2	U	U		1	0.2	U	U		1
VOLATILES	1,2-Dimethylbenzene (o-Xylene)	ug/L						0.25	U	U		1	0.25	U	U		1	0.25	U	U		1
VOLATILES	1,3,5-Trimethylbenzene	ug/L						0.25	U	U		1	0.25	U	U		1	0.25	U	U		1
VOLATILES	1,3-Dichlorobenzene	ug/L						0.25	U	U		1	0.25	U	U		1	0.25	U	U		1
VOLATILES	1,3-Dichloropropane	ug/L						0.2	U	U		1	0.2	U	U		1	0.2	U	U		1
VOLATILES	1,4-Dichlorobenzene	ug/L						0.125	U	U		1	0.125	U	U		1	0.125	U	U		1
VOLATILES	2,2-Dichloropropane	ug/L						0.25	U	U		1	0.25	U	U		1	0.25	U	U		1
VOLATILES	2-Butanone	ug/L						2.5	U	U		1	2.5	U	U		1	2.5	U	U		1
VOLATILES	2-Chloroethyl vinyl ether	ug/L						2	U	U		1	2	U	U		1	2	U	U		1
VOLATILES	2-Chlorotoluene	ug/L						0.125	U	U		1	0.125	U	U		1	0.125	U	U		1
VOLATILES	2-Hexanone	ug/L						2.5	U	U		1	2.5	U	U		1	2.5	U	U		1
VOLATILES	4-Chlorotoluene	ug/L						0.25	U	U		1	0.25	U	U		1	0.25	U	U		1
VOLATILES	Acetone	ug/L						3.31	J	J		1	2.65	J	J		1	2.5	U	U		1
VOLATILES	Benzene	ug/L						0.59	J	J		1	0.125	U	U		1	0.125	U	U		1
VOLATILES	Bromobenzene	ug/L						0.125	U	U		1	0.125	U	U		1	0.125	U	U		1
VOLATILES	Bromochloromethane	ug/L						0.2	U	U		1	0.2	U	U		1	0.2	U	U		1
VOLATILES	Bromodichloromethane	ug/L						0.25	U	U		1	0.25	U	U		1	0.25	U	U		1
VOLATILES	Bromoform	ug/L						0.5	U	U		1	0.5	U	U		1	0.5	U	U		1
VOLATILES	Bromomethane	ug/L						0.5	U	U		1	0.5	U	U		1	0.5	U	U		1

		Location Code	47WW09					47WW13					47WW14					47WW14				
		Sample Date	3-Aug-10					4-Aug-10					4-Aug-10					4-Aug-10				
		Sample No	47WW09-100803					47WW13-100804					47WW14-100804					47WW14-100804-FD				
		Sample Purpose	REG					REG					REG					FD				
Test Group	Parameter	Units	Result	Qual	ValQual	RC	DF	Result	Qual	ValQual	RC	DF	Result	Qual	ValQual	RC	DF	Result	Qual	ValQual	RC	DF
SEMIVOLATILES	Benzo(b)fluoranthene	ug/L	2.5	U	U		1	2.5	U	U		1	2.5	U	U		1					
SEMIVOLATILES	Benzo(ghi)perylene	ug/L	2.5	U	U		1	2.5	U	U		1	2.5	U	U		1					
SEMIVOLATILES	Benzo(k)fluoranthene	ug/L	2.5	U	U		1	2.5	U	U		1	2.5	U	U		1					
SEMIVOLATILES	Benzoic Acid	ug/L	12.5	U	U		1	12.5	U	U		1	12.5	U	U		1					
SEMIVOLATILES	Benzyl Alcohol	ug/L	2.5	U	U		1	2.5	U	U		1	2.5	U	U		1					
SEMIVOLATILES	bis(2-Chloroethoxy)methane	ug/L	2.5	U	U		1	2.5	U	U		1	2.5	U	U		1					
SEMIVOLATILES	bis(2-Chloroethyl)ether	ug/L	2.5	U	U		1	2.5	U	U		1	2.5	U	U		1					
SEMIVOLATILES	bis(2-Chloroisopropyl)ether	ug/L	2.5	U	U		1	2.5	U	U		1	2.5	U	U		1					
SEMIVOLATILES	bis(2-Ethylhexyl)phthalate	ug/L	3	U	U		1	37.8		U-EB		1	14.2		U-EB		1					
SEMIVOLATILES	Butyl benzyl phthalate	ug/L	2.5	U	U		1	2.5	U	U		1	2.5	U	U		1					
SEMIVOLATILES	Chrysene	ug/L	2.5	U	U		1	2.5	U	U		1	2.5	U	U		1					
SEMIVOLATILES	Dibenzo(a,h)anthracene	ug/L	2.5	U	U		1	2.5	U	U		1	2.5	U	U		1					
SEMIVOLATILES	Dibenzofuran	ug/L	2.5	U	U		1	2.5	U	U		1	2.5	U	U		1					
SEMIVOLATILES	Diethyl phthalate	ug/L	2.5	U	U		1	2.5	U	U		1	2.5	U	U		1					
SEMIVOLATILES	Dimethyl phthalate	ug/L	2.5	U	U		1	2.5	U	U		1	2.5	U	U		1					
SEMIVOLATILES	di-n-Butyl phthalate	ug/L	2.5	U	U		1	2.5	U	U		1	2.5	U	U		1					
SEMIVOLATILES	di-n-Octyl phthalate	ug/L	2.5	U	U		1	2.5	U	U		1	2.5	U	U		1					
SEMIVOLATILES	Fluoranthene	ug/L	2.5	U	U		1	2.5	U	U		1	2.5	U	U		1					
SEMIVOLATILES	Fluorene	ug/L	2.5	U	U		1	2.5	U	U		1	2.5	U	U		1					
SEMIVOLATILES	Hexachlorobenzene	ug/L	2.5	U	U		1	2.5	U	U		1	2.5	U	U		1					
SEMIVOLATILES	Hexachlorobutadiene	ug/L	2.5	U	U		1	2.5	U	U		1	2.5	U	U		1					
SEMIVOLATILES	Hexachlorocyclopentadiene	ug/L	2.5	U	U		1	2.5	U	U		1	2.5	U	U		1					
SEMIVOLATILES	Hexachloroethane	ug/L	2.5	U	U		1	2.5	U	U		1	2.5	U	U		1					
SEMIVOLATILES	Indeno(1,2,3-cd)pyrene	ug/L	2.5	U	U		1	2.5	U	U		1	2.5	U	U		1					
SEMIVOLATILES	Isophorone	ug/L	2.5	U	U		1	2.5	U	U		1	2.5	U	U		1					
SEMIVOLATILES	Naphthalene	ug/L	2.5	U	U		1	2.5	U	U		1	2.5	U	U		1					
SEMIVOLATILES	Nitrobenzene	ug/L	2.5	U	U		1	2.5	U	U		1	2.5	U	U		1					
SEMIVOLATILES	n-Nitroso-di-n-propylamine	ug/L	2.5	U	U		1	2.5	U	U		1	2.5	U	U		1					
SEMIVOLATILES	n-Nitrosodiphenylamine	ug/L	2.5	U	U		1	2.5	U	U		1	2.5	U	U		1					
SEMIVOLATILES	Pentachlorophenol	ug/L	12.5	U	U		1	12.5	U	U		1	12.5	U	U		1					
SEMIVOLATILES	Phenanthrene	ug/L	2.5	U	U		1	2.5	U	U		1	2.5	U	U		1					
SEMIVOLATILES	Phenol	ug/L	2.5	U	U		1	2.5	U	U		1	2.5	U	U		1					
SEMIVOLATILES	Pyrene	ug/L	2.5	U	U		1	2.5	U	U		1	2.5	U	U		1					
VOLATILES	1,1,1,2-Tetrachloroethane	ug/L	2.5	U	U		10	1.25	U	U		5	0.25	U	U		1	0.25	U	U		1
VOLATILES	1,1,1-Trichloroethane	ug/L	2.5	U	U		10	1.25	U	U		5	0.25	U	U		1	0.25	U	U		1
VOLATILES	1,1,2,2-Tetrachloroethane	ug/L	2	U	U		10	1	U	U		5	0.2	U	U		1	0.2	U	U		1
VOLATILES	1,1,2-Trichloroethane	ug/L	2.5	U	U		10	1.25	U	U		5	0.25	U	U		1	0.25	U	U		1
VOLATILES	1,1-Dichloroethane	ug/L	1.25	U	U		10	3.4	J	J		5	0.784	J	J		1	0.755	J	J		1
VOLATILES	1,1-Dichloroethene	ug/L	5	U	U		10	5.51				5	2.77				1	2.73				1
VOLATILES	1,1-Dichloropropene	ug/L	2.5	U	U		10	1.25	U	U		5	0.25	U	U		1	0.25	U	U		1
VOLATILES	1,2,3-Trichlorobenzene	ug/L	1.5	U	U		10	0.75	U	U		5	0.15	U	U		1	0.15	U	U		1
VOLATILES	1,2,3-Trichloropropane	ug/L	5	U	U		10	2.5	U	U		5	0.5	U	U		1	0.5	U	U		1
VOLATILES	1,2,4-Trichlorobenzene	ug/L	2	U	U		10	1	U	U		5	0.2	U	U		1	0.2	U	U		1
VOLATILES	1,2,4-Trimethylbenzene	ug/L	2.5	U	U		10	1.25	U	U		5	0.25	U	U		1	0.25	U	U		1
VOLATILES	1,2-Dibromo-3-chloropropane	ug/L	10	U	U		10	5	U	U		5	1	U	U		1	1	U	U		1
VOLATILES	1,2-Dibromoethane	ug/L	2.5	U	U		10	1.25	U	U		5	0.25	U	U		1	0.25	U	U		1
VOLATILES	1,2-Dichlorobenzene	ug/L	1.25	U	U		10	0.625	U	U		5	0.125	U	U		1	0.125	U	U		1
VOLATILES	1,2-Dichloroethane	ug/L	2.5	U	U		10	1.25	U	U		5	0.25	U	U		1	0.25	U	U		1
VOLATILES	1,2-Dichloropropane	ug/L	2	U	U		10	1	U	U		5	0.2	U	U		1	0.2	U	U		1
VOLATILES	1,2-Dimethylbenzene (o-Xylene)	ug/L	2.5	U	U		10	1.25	U	U		5	0.25	U	U		1	0.25	U	U		1
VOLATILES	1,3,5-Trimethylbenzene	ug/L	2.5	U	U		10	1.25	U	U		5	0.25	U	U		1	0.25	U	U		1
VOLATILES	1,3-Dichlorobenzene	ug/L	2.5	U	U		10	1.25	U	U		5	0.25	U	U		1	0.25	U	U		1
VOLATILES	1,3-Dichloropropane	ug/L	2	U	U		10	1	U	U		5	0.2	U	U		1	0.2	U	U		1
VOLATILES	1,4-Dichlorobenzene	ug/L	1.25	U	U		10	0.625	U	U		5	0.125	U	U		1	0.125	U	U		1
VOLATILES	2,2-Dichloropropane	ug/L	2.5	U	U		10	1.25	U	U		5	0.25	U	U		1	0.25	U	U		1
VOLATILES	2-Butanone	ug/L	25	U	U		10	12.5	U	U		5	2.5	U	U		1	2.5	U	U		1
VOLATILES	2-Chloroethyl vinyl ether	ug/L	20	U	U		10	10	U	U		5	2	U	U		1	2	U	U		1
VOLATILES	2-Chlorotoluene	ug/L	1.25	U	U		10	0.625	U	U		5	0.125	U	U		1	0.125	U	U		1
VOLATILES	2-Hexanone	ug/L	25	U	U		10	12.5	U	U		5	2.5	U	U		1	2.5	U	U		1
VOLATILES	4-Chlorotoluene	ug/L	2.5	U	U		10	1.25	U	U		5	0.25	U	U		1	0.25	U	U		1
VOLATILES	Acetone	ug/L	25	U	U		10	12.5	U	U		5	2.5	U	U		1	2.5	U	U		1
VOLATILES	Benzene	ug/L	1.25	U	U		10	0.625	U	U		5	0.125	U	U		1	0.125	U	U		1
VOLATILES	Bromobenzene	ug/L	1.25	U	U		10	0.625	U	U		5	0.125	U	U		1	0.125	U	U		1
VOLATILES	Bromochloromethane	ug/L	2	U	U		10	1	U	U		5	0.2	U	U		1	0.2	U	U		1
VOLATILES	Bromodichloromethane	ug/L	2.5	U	U		10	1.25	U	U		5	0.25	U	U		1	0.25	U	U		1
VOLATILES	Bromoform	ug/L	5	U	U		10	2.5	U	U		5	0.5	U	U		1	0.5	U	U		1
VOLATILES	Bromomethane	ug/L	5	U	U		10	2.5	U	U		5	0.5	U	U		1	0.5	U	U		1

Table C-2
Additional Sample Results - Groundwater - 2010

		Location Code	47DPT13					47DPT14					47DPT15					47WW04				
		Sample Date	20-Aug-10					15-Sep-10					15-Sep-10					6-Aug-10				
		Sample No	47DPT13-100820					47DPT14-100915					47DPT15-100915					47WW04-100806				
		Sample Purpose	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
VOLATILES	Carbon disulfide	ug/L						0.5	U	U		1	0.5	U	U		1	0.5	U	U		1
VOLATILES	Carbon tetrachloride	ug/L						0.25	U	U		1	0.25	U	U		1	0.25	U	U		1
VOLATILES	Chlorobenzene	ug/L						0.125	U	U		1	0.125	U	U		1	0.125	U	U		1
VOLATILES	Chloroethane	ug/L						0.5	U	U		1	0.5	U	U		1	0.5	U	U		1
VOLATILES	Chloroform	ug/L						0.125	U	U		1	0.125	U	U		1	0.125	U	U		1
VOLATILES	Chloromethane	ug/L						0.5	U	U		1	0.5	U	U		1	0.5	U	U		1
VOLATILES	cis-1,2-Dichloroethene	ug/L						825				50	0.378	J	J		1	0.25	U	U		1
VOLATILES	cis-1,3-Dichloropropene	ug/L						0.25	U	U		1	0.25	U	U		1	0.25	U	U		1
VOLATILES	Dibromochloromethane	ug/L						0.25	U	U		1	0.25	U	U		1	0.25	U	U		1
VOLATILES	Dibromomethane	ug/L						0.25	U	U		1	0.25	U	U		1	0.25	U	U		1
VOLATILES	Dichlorodifluoromethane	ug/L						0.25	U	U		1	0.25	U	U		1	0.25	U	U		1
VOLATILES	Ethylbenzene	ug/L						0.25	U	U		1	0.25	U	U		1	0.25	U	U		1
VOLATILES	Hexachlorobutadiene	ug/L						0.25	U	U		1	0.25	U	U		1	0.25	U	U		1
VOLATILES	Isopropylbenzene	ug/L						0.355	J	J		1	0.25	U	U		1	0.25	U	U		1
VOLATILES	m,p-Xylenes	ug/L						0.5	U	U		1	0.5	U	U		1	0.5	U	U		1
VOLATILES	Methyl isobutyl ketone	ug/L						2.5	U	U		1	2.5	U	U		1	2.5	U	U		1
VOLATILES	Methylene chloride	ug/L						0.25	U	U		1	0.25	U	U		1	0.25	U	U		1
VOLATILES	Naphthalene	ug/L						0.2	U	U		1	0.2	U	U		1	0.2	U	U		1
VOLATILES	n-BUTYLBENZENE	ug/L						0.25	U	U		1	0.25	U	U		1	0.25	U	U		1
VOLATILES	n-PROPYLBENZENE	ug/L						0.125	U	U		1	0.125	U	U		1	0.125	U	U		1
VOLATILES	p-ISOPROPYLTOLUENE	ug/L						0.25	U	U		1	0.25	U	U		1	0.25	U	U		1
VOLATILES	sec-BUTYLBENZENE	ug/L						0.25	U	U		1	0.25	U	U		1	0.25	U	U		1
VOLATILES	Styrene	ug/L						0.125	U	U		1	0.125	U	U		1	0.125	U	U		1
VOLATILES	tert-BUTYLBENZENE	ug/L						0.25	U	U		1	0.25	U	U		1	0.25	U	U		1
VOLATILES	Tetrachloroethene	ug/L						0.25	U	U		1	0.25	U	U		1	0.25	U	U		1
VOLATILES	Toluene	ug/L						0.357	J	J		1	0.25	U	U		1	0.25	U	U		1
VOLATILES	trans-1,2-Dichloroethene	ug/L						2.3				1	0.25	U	U		1	0.25	U	U		1
VOLATILES	trans-1,3-Dichloropropene	ug/L						0.5	U	U		1	0.5	U	U		1	0.5	U	U		1
VOLATILES	Trichloroethene	ug/L						13900				100	2.07				1	0.25	U	U		1
VOLATILES	Trichlorofluoromethane	ug/L						0.25	U	U		1	0.25	U	U		1	0.25	U	U		1
VOLATILES	Vinyl acetate	ug/L						2.5	U	U		1	2.5	U	U		1	2.5	U	U		1
VOLATILES	Vinyl chloride	ug/L						67.5				1	0.25	U	U		1	0.25	U	U		1

		Location Code	47WW09					47WW13					47WW14					47WW14				
		Sample Date	3-Aug-10					4-Aug-10					4-Aug-10					4-Aug-10				
		Sample No	47WW09-100803					47WW13-100804					47WW14-100804					47WW14-100804-FD				
		Sample Purpose	REG					REG					REG					FD				
Test Group	Parameter	Units	Result	Qual	ValQual	RC	DF	Result	Qual	ValQual	RC	DF	Result	Qual	ValQual	RC	DF	Result	Qual	ValQual	RC	DF
VOLATILES	Carbon disulfide	ug/L	5	U	U		10	20.4				5	0.5	U	U		1	0.5	U	U		1
VOLATILES	Carbon tetrachloride	ug/L	2.5	U	U		10	1.25	U	U		5	0.25	U	U		1	0.25	U	U		1
VOLATILES	Chlorobenzene	ug/L	1.25	U	U		10	0.625	U	U		5	0.125	U	U		1	0.125	U	U		1
VOLATILES	Chloroethane	ug/L	5	U	U		10	2.5	U	U		5	0.5	U	U		1	0.5	U	U		1
VOLATILES	Chloroform	ug/L	1.25	U	U		10	0.625	U	U		5	0.125	U	U		1	0.125	U	U		1
VOLATILES	Chloromethane	ug/L	5	U	U		10	2.5	U	U		5	0.5	U	U		1	0.5	U	U		1
VOLATILES	cis-1,2-Dichloroethene	ug/L	86.5				10	1440				10	140				1	133				1
VOLATILES	cis-1,3-Dichloropropene	ug/L	2.5	U	U		10	1.25	U	U		5	0.25	U	U		1	0.25	U	U		1
VOLATILES	Dibromochloromethane	ug/L	2.5	U	U		10	1.25	U	U		5	0.25	U	U		1	0.25	U	U		1
VOLATILES	Dibromomethane	ug/L	2.5	U	U		10	1.25	U	U		5	0.25	U	U		1	0.25	U	U		1
VOLATILES	Dichlorodifluoromethane	ug/L	2.5	U	U		10	1.25	U	U		5	0.25	U	U		1	0.25	U	U		1
VOLATILES	Ethylbenzene	ug/L	2.5	U	U		10	1.25	U	U		5	0.25	U	U		1	0.25	U	U		1
VOLATILES	Hexachlorobutadiene	ug/L	2.5	U	U		10	1.25	U	U		5	0.25	U	U		1	0.25	U	U		1
VOLATILES	Isopropylbenzene	ug/L	2.5	U	U		10	1.25	U	U		5	0.25	U	U		1	0.25	U	U		1
VOLATILES	m,p-Xylenes	ug/L	5	U	U		10	2.5	U	U		5	0.5	U	U		1	0.5	U	U		1
VOLATILES	Methyl isobutyl ketone	ug/L	25	U	U		10	12.5	U	U		5	2.5	U	U		1	2.5	U	U		1
VOLATILES	Methylene chloride	ug/L	9.94	J	J		10	1.25	U	U		5	0.25	U	U		1	0.25	U	U		1
VOLATILES	Naphthalene	ug/L	2	U	U		10	1	U	U		5	0.2	U	U		1	0.2	U	U		1
VOLATILES	n-BUTYLBENZENE	ug/L	2.5	U	U		10	1.25	U	U		5	0.25	U	U		1	0.25	U	U		1
VOLATILES	n-PROPYLBENZENE	ug/L	1.25	U	U		10	0.625	U	U		5	0.125	U	U		1	0.125	U	U		1
VOLATILES	p-ISOPROPYLTOLUENE	ug/L	2.5	U	U		10	1.25	U	U		5	0.25	U	U		1	0.25	U	U		1
VOLATILES	sec-BUTYLBENZENE	ug/L	2.5	U	U		10	1.25	U	U		5	0.25	U	U		1	0.25	U	U		1
VOLATILES	Styrene	ug/L	1.25	U	U		10	0.625	U	U		5	0.125	U	U		1	0.125	U	U		1
VOLATILES	tert-BUTYLBENZENE	ug/L	2.5	U	U		10	1.25	U	U		5	0.25	U	U		1	0.25	U	U		1
VOLATILES	Tetrachloroethene	ug/L	9.08	J	J		10	1.25	U	U		5	0.25	U	U		1	0.25	U	U		1
VOLATILES	Toluene	ug/L	2.5	U	U		10	1.25	U	U		5	0.25	U	U		1	0.25	U	U		1
VOLATILES	trans-1,2-Dichloroethene	ug/L	2.5	U	U		10	18.8				5	0.972	J	J		1	1.01				1
VOLATILES	trans-1,3-Dichloropropene	ug/L	5	U	U		10	2.5	U	U		5	0.5	U	U		1	0.5	U	U		1
VOLATILES	Trichloroethene	ug/L	1720				10	647				5	353				10	351				5
VOLATILES	Trichlorofluoromethane	ug/L	2.5	U	U		10	1.25	U	U		5	0.25	U	U		1	0.25	U	U		1
VOLATILES	Vinyl acetate	ug/L	25	U	U		10	12.5	U	U		5	2.5	U	U		1	2.5	U	U		1
VOLATILES	Vinyl chloride	ug/L	2.5	U	U		10	249				5	15.2				1	14.1				1

Table C-2
Additional Sample Results - Groundwater - 2010

		Location Code	47WW21					47WW23					47WW27					47WW28					47WW29					47WW29					47WW30					47WW32				
		Sample Date	31-Jul-10					6-Aug-10					31-Jul-10					31-Jul-10					31-Jul-10					31-Jul-10					4-Aug-10					31-Jul-10				
		Sample No	47WW21-103107 *					47WW23-100806					47WW27-103107 *					47WW28-103107 *					47WW29-103107 *					47WW29-103107-FD *					47WW30-100804					47WW32-103107 *				
		Sample Purpose	REG					REG					REG					REG					REG					FD					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	Result	Qual	ValQual	RC	DF	Result	Qual	ValQual	RC	DF	Result	Qual	ValQual	RC	DF
GASES	Ethane	ug/L																															1	U	U		1					
GASES	Ethylene	ug/L																															1	U	U		1					
GASES	Methane	ug/L																															30.1				1					
GEN CHEMISTRY	Chloride	ug/L																															674000				20					
GEN CHEMISTRY	Fluoride, Total	ug/L																															1000	U	U		10					
GEN CHEMISTRY	Nitrate	ug/L																															1000	U	U		10					
GEN CHEMISTRY	Nitrate / Nitrite	ug/L																																								
GEN CHEMISTRY	Nitrite	ug/L																															1000	U	U		10					
GEN CHEMISTRY	Perchlorate	ug/L	0.1	U	U		1	0.1	U	U		1	168				50	0.302				1	0.1	U	U		1	0.1	U	U		1	1.47				1					
GEN CHEMISTRY	Sulfate	ug/L																															1540000				10					
GEN CHEMISTRY	Total Alkalinity	ug/L																															613000				3					
GEN CHEMISTRY	Total Organic Carbon	ug/L																															20300				4					
METALS	Aluminum	mg/L																															3.61				1					
METALS	Antimony	mg/L																															0.00238	J	J		5					
METALS	Arsenic	mg/L																															0.0731				5					
METALS	Barium	mg/L																															0.0582				5					
METALS	Beryllium	mg/L																															0.0005	U	U		1					
METALS	Cadmium	mg/L																															0.000625	U	U		5					
METALS	Calcium	mg/L																															188				1					
METALS	Chromium	mg/L																															0.0122				5					
METALS	Cobalt	mg/L																															0.00615				1					
METALS	Copper	mg/L																															0.00707	J	J		5					
METALS	Iron	mg/L																															4.69				1					
METALS	Lead	mg/L																															0.00359				5					
METALS	Magnesium	mg/L																															96.9				1					
METALS	Manganese	mg/L																															0.171				5					
METALS	Mercury	mg/L																															0.0001	U	U		1					
METALS	Nickel	mg/L																															0.0175	J	J		5					
METALS	Potassium	mg/L																															2.79				1					
METALS	Selenium	mg/L																															0.0146				5					
METALS	Silver	mg/L																															0.00125	U	U		5					
METALS	Sodium	mg/L																															673				10					
METALS	Thallium	mg/L																															0.00025	U	U		5					
METALS	Vanadium	mg/L																															0.00818	J	J		1					
METALS	Zinc	mg/L																															0.0139	J	J		1					
SEMIVOLATILES	1,2,4-Trichlorobenzene	ug/L																															2.5	U	U		1					
SEMIVOLATILES	1,2-Dichlorobenzene	ug/L																															2.5	U	U		1					
SEMIVOLATILES	1,3-Dichlorobenzene	ug/L																															2.5	U	U		1					
SEMIVOLATILES	1,4-Dichlorobenzene	ug/L																															2.5	U	U		1					
SEMIVOLATILES	2,4,5-Trichlorophenol	ug/L																															2.5	U	U		1					
SEMIVOLATILES	2,4,6-Trichlorophenol	ug/L																															2.5	U	U		1					
SEMIVOLATILES	2,4-Dichlorophenol	ug/L																															2.5	U	U		1					
SEMIVOLATILES	2,4-Dimethylphenol	ug/L																															2.5	U	U		1					
SEMIVOLATILES	2,4-Dinitrophenol	ug/L																															12.5	U	U		1					
SEMIVOLATILES	2,4-Dinitrotoluene	ug/L																															2.5	U	U		1					
SEMIVOLATILES	2,6-Dinitrotoluene	ug/L																															2.5	U	U		1					
SEMIVOLATILES	2-Chloronaphthalene	ug/L																															2.5	U	U		1					
SEMIVOLATILES	2-Chlorophenol	ug/L																															2.5	U	U		1					
SEMIVOLATILES	2-Methylnaphthalene	ug/L																															2.5	U	U		1					
SEMIVOLATILES	2-Methylphenol	ug/L																															2.5	U	U		1					
SEMIVOLATILES	2-Nitroaniline	ug/L																															12.5	U	U		1					
SEMIVOLATILES	2-Nitrophenol	ug/L																															2.5	U	U		1					
SEMIVOLATILES	3,3'-Dichlorobenzidine	ug/L																															2.5	U	U		1					
SEMIVOLATILES	3-Nitroaniline	ug/L																															12.5	U	U		1					
SEMIVOLATILES	4,6-Dinitro-2-methylphenol	ug/L																															12.5	U	U		1					
SEMIVOLATILES	4-Bromophenyl phenyl ether	ug/L																															2.5	U	U		1					
SEMIVOLATILES	4-Chloro-3-methylphenol	ug/L																															2.5	U	U		1					
SEMIVOLATILES	4-Chloroaniline	ug/L																															2.5	U	U		1					
SEMIVOLATILES	4-Chlorophenyl phenyl ether	ug/L																															2.5	U	U		1					
SEMIVOLATILES	4-Methylphenol	ug/L																															2.5	U	U		1					
SEMIVOLATILES	4-Nitroaniline	ug/L																															12.5	U	U		1					
SEMIVOLATILES	4-Nitrophenol	ug/L																															12.5	U	U		1					
SEMIVOLATILES	Acenaphthene	ug/L																															2.5	U	U		1					
SEMIVOLATILES	Acenaphthylene	ug/L																															2.5	U	U		1					
SEMIVOLATILES	Anthracene	ug/L																															2.5	U	U		1					
SEMIVOLATILES	Benzo(a)anthracene	ug/L																															2.5	U	U		1					
SEMIVOLATILES	Benzo(a)pyrene	ug/L																															2.5	U	U		1					

Table C-2
Additional Sample Results - Groundwater - 2010

		Location Code	47WW21					47WW23					47WW27					47WW28					47WW29					47WW29					47WW30					47WW32				
		Sample Date	31-Jul-10					6-Aug-10					31-Jul-10					31-Jul-10					31-Jul-10					31-Jul-10					4-Aug-10					31-Jul-10				
		Sample No	47WW21-103107 *					47WW23-100806					47WW27-103107 *					47WW28-103107 *					47WW29-103107 *					47WW29-103107-FD *					47WW30-100804					47WW32-103107 *				
		Sample Purpose	REG					REG					REG					REG					REG					FD					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	Result	Qual	ValQual	RC	DF	Result	Qual	ValQual	RC	DF	Result	Qual	ValQual	RC	DF
SEMIVOLATILES	Benzo(b)fluoranthene	ug/L																															2.5	U	U		1					
SEMIVOLATILES	Benzo(ghi)perylene	ug/L																															2.5	U	U		1					
SEMIVOLATILES	Benzo(k)fluoranthene	ug/L																															2.5	U	U		1					
SEMIVOLATILES	Benzoic Acid	ug/L																															12.5	U	U		1					
SEMIVOLATILES	Benzyl Alcohol	ug/L																															2.5	U	U		1					
SEMIVOLATILES	bis(2-Chloroethoxy)methane	ug/L																															2.5	U	U		1					
SEMIVOLATILES	bis(2-Chloroethyl)ether	ug/L																															2.5	U	U		1					
SEMIVOLATILES	bis(2-Chloroisopropyl)ether	ug/L																															2.5	U	U		1					
SEMIVOLATILES	bis(2-Ethylhexyl)phthalate	ug/L																															3.92	J	U-EB		1					
SEMIVOLATILES	Butyl benzyl phthalate	ug/L																															2.5	U	U		1					
SEMIVOLATILES	Chrysene	ug/L																															2.5	U	U		1					
SEMIVOLATILES	Dibenzo(a,h)anthracene	ug/L																															2.5	U	U		1					
SEMIVOLATILES	Dibenzofuran	ug/L																															2.5	U	U		1					
SEMIVOLATILES	Diethyl phthalate	ug/L																															2.5	U	U		1					
SEMIVOLATILES	Dimethyl phthalate	ug/L																															2.5	U	U		1					
SEMIVOLATILES	di-n-Butyl phthalate	ug/L																															2.5	U	U		1					
SEMIVOLATILES	di-n-Octyl phthalate	ug/L																															2.5	U	U		1					
SEMIVOLATILES	Fluoranthene	ug/L																															2.5	U	U		1					
SEMIVOLATILES	Fluorene	ug/L																															2.5	U	U		1					
SEMIVOLATILES	Hexachlorobenzene	ug/L																															2.5	U	U		1					
SEMIVOLATILES	Hexachlorobutadiene	ug/L																															2.5	U	U		1					
SEMIVOLATILES	Hexachlorocyclopentadiene	ug/L																															2.5	U	U		1					
SEMIVOLATILES	Hexachloroethane	ug/L																															2.5	U	U		1					
SEMIVOLATILES	Indeno(1,2,3-cd)pyrene	ug/L																															2.5	U	U		1					
SEMIVOLATILES	Isophorone	ug/L																															2.5	U	U		1					
SEMIVOLATILES	Naphthalene	ug/L																															2.5	U	U		1					
SEMIVOLATILES	Nitrobenzene	ug/L																															2.5	U	U		1					
SEMIVOLATILES	n-Nitroso-di-n-propylamine	ug/L																															2.5	U	U		1					
SEMIVOLATILES	n-Nitrosodiphenylamine	ug/L																															2.5	U	U		1					
SEMIVOLATILES	Pentachlorophenol	ug/L																															12.5	U	U		1					
SEMIVOLATILES	Phenanthrene	ug/L																															2.5	U	U		1					
SEMIVOLATILES	Phenol	ug/L																															2.5	U	U		1					
SEMIVOLATILES	Pyrene	ug/L																															2.5	U	U		1					
VOLATILES	1,1,1,2-Tetrachloroethane	ug/L	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	2.5	U	U		10	0.25	U	U		1
VOLATILES	1,1,1-Trichloroethane	ug/L	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	2.5	U	U		10	0.25	U	U		1
VOLATILES	1,1,2,2-Tetrachloroethane	ug/L	0.2	U	U		1	0.2	U	U		1	0.2	U	U		1	0.2	U	U		1	0.2	U	U		1	0.2	U	U		1	2	U	U		10	0.2	U	U		1
VOLATILES	1,1,2-Trichloroethane	ug/L	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	2.5	U	U		10	0.25	U	U		1
VOLATILES	1,1-Dichloroethane	ug/L	0.125	U	U		1	0.125	U	U		1	0.125	U	U		1	0.125	U	U		1	0.125	U	U		1	0.125	U	U		1	1.25	U	U		10	0.125	U	U		1
VOLATILES	1,1-Dichloroethene	ug/L	0.5	U	U		1	0.5	U	U		1	0.5	U	U		1	0.5	U	U		1	0.5	U	U		1	0.5	U	U		1	5	U	U		10	0.5	U	U		1
VOLATILES	1,1-Dichloropropene	ug/L	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	2.5	U	U		10	0.25	U	U		1
VOLATILES	1,2,3-Trichlorobenzene	ug/L	0.15	U	U		1	0.15	U	U		1	0.15	U	U		1	0.15	U	U		1	0.15	U	U		1	0.15	U	U		1	1.5	U	U		10	0.15	U	U		1
VOLATILES	1,2,3-Trichloropropane	ug/L	0.5	U	U		1	0.5	U	U		1	0.5	U	U		1	0.5	U	U		1	0.5	U	U		1	0.5	U	U		1	5	U	U		10	0.5	U	U		1
VOLATILES	1,2,4-Trichlorobenzene	ug/L	0.2	U	U		1	0.2	U	U		1	0.2	U	U		1	0.2	U	U		1	0.2	U	U		1	0.2	U	U		1	2	U	U		10	0.2	U	U		1
VOLATILES	1,2,4-Trimethylbenzene	ug/L	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	2.5	U	U		10	0.25	U	U		1
VOLATILES	1,2-Dibromo-3-chloropropane	ug/L	1	U	U		1	1	U	U		1	1	U	U		1	1	U	U		1	1	U	U		1	1	U	U		1	10	U	U		10	1	U	U		1
VOLATILES	1,2-Dibromoethane	ug/L	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	2.5	U	U		10	0.25	U	U		1
VOLATILES	1,2-Dichlorobenzene	ug/L	0.125	U	U		1	0.125	U	U		1	0.125	U	U		1	0.125	U	U		1	0.125	U	U		1	0.125	U	U		1	1.25	U	U		10	0.125	U	U		1
VOLATILES	1,2-Dichloroethane	ug/L	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	2.5	U	U		10	0.25	U	U		1
VOLATILES	1,2-Dichloropropane	ug/L	0.2	U	U		1	0.2	U	U		1	0.2	U	U		1	0.2	U	U		1	0.2	U	U		1	0.2	U	U		1	2	U	U		10	0.2	U	U		1
VOLATILES	1,2-Dimethylbenzene (o-Xylene)	ug/L	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	2.5	U	U		10	0.25	U	U		1
VOLATILES	1,3,5-Trimethylbenzene	ug/L	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	2.5	U	U		10	0.25	U	U		1
VOLATILES	1,3-Dichlorobenzene	ug/L	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	2.5	U	U		10	0.25	U	U		1
VOLATILES	1,3-Dichloropropane	ug/L	0.2	U	U		1	0.2	U	U		1	0.2	U	U		1	0.2	U	U		1	0.2	U	U		1	0.2	U	U		1	2	U	U		10	0.2	U	U		1
VOLATILES	1,4-Dichlorobenzene	ug/L	0.125	U	U		1	0.125	U	U		1	0.125	U	U		1	0.125	U	U		1	0.125	U	U		1	0.125	U	U		1	1.25	U	U		10	0.125	U	U		1
VOLATILES	2,2-Dichloropropane	ug/L	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	2.5	U	U		10	0.25	U	U		1
VOLATILES	2-Butanone	ug/L	2.5	U	U		1	2.5	U	U		1	2.5	U	U		1	2.5	U	U		1	2.5	U	U		1	2.5	U	U		1	25	U	U		10	2.5	U	U		1
VOLATILES	2-Chloroethyl vinyl ether	ug/L	2	U	U		1	2	U	U		1	2	U	U		1	2	U	U		1	2	U	U		1	2	U	U		1	20	U	U		10	2	U	U		1
VOLATILES	2-Chlorotoluene	ug/L	0.125	U	U		1	0.125	U	U		1	0.125	U	U		1	0.125	U	U		1	0.125	U	U		1	0.125	U	U		1	1.25	U	U		10	0.125	U	U		1
VOLATILES	2-Hexanone	ug/L	2.5	U	U		1	2.5	U	U		1	2.5	U	U		1	2.5	U	U		1	2.5	U	U		1	2.5	U	U		1	25	U	U		10	2.5	U	U		1
VOLATILES	4-Chlorotoluene	ug/L	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	2.5	U	U		10	0.25	U	U		1
VOLATILES	Acetone	ug/L	2.5	U	U		1	2.5	U	U		1	2.5	U	U		1	2.5	U	U		1	2.5	U	U		1	2.5	U	U		1	25	U	U		10	2.5	U	U		1
VOLATILES	Benzene	ug/L	0.125	U	U		1	0.125	U	U		1	0.125	U	U		1	0.125	U	U		1	0.125	U	U		1	0.125	U	U		1	1.25	U	U		10	0.125	U	U		1
VOLATILES	Bromobenzene	ug/L	0.125	U	U		1	0.125	U	U		1	0.125	U	U		1	0.125	U	U		1	0.125	U	U		1	0.125	U	U		1	1.25	U	U		10	0.125	U	U		1
VOLATILES	Bromochloromethane	ug/L	0.2	U	U		1	0.2	U	U		1	0.2	U	U		1	0.2	U	U		1	0.2	U	U		1	0.2	U	U		1	2	U	U		10	0.2	U	U		1
VOLATILES	Bromodichloromethane	ug/L	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	2.5	U	U		10	0.25	U	U		1
VOLATILES	Bromoform	ug/L	0.5	U	U		1	0.5	U	U		1	0.5	U	U		1	0.5	U	U		1	0.5	U	U		1	0.5	U	U		1	5	U	U		10	0.5	U	U		1
VOLATILES	Bromomethane	ug/L	0.5	U	U		1	0.5	U	U		1	0.5	U	U		1	0.5	U	U		1	0.5	U	U		1	0.5	U	U		1	5	U	U		10	0.5	U	U		1

Table C-2
Additional Sample Results - Groundwater - 2010

		Location Code	47WW21					47WW23					47WW27					47WW28					47WW29					47WW29					47WW30					47WW32				
		Sample Date	31-Jul-10					6-Aug-10					31-Jul-10					31-Jul-10					31-Jul-10					31-Jul-10					4-Aug-10					31-Jul-10				
		Sample No	47WW21-103107 *					47WW23-100806					47WW27-103107 *					47WW28-103107 *					47WW29-103107 *					47WW29-103107-FD *					47WW30-100804					47WW32-103107 *				
		Sample Purpose	REG					REG					REG					REG					REG					FD					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	Result	Qual	ValQual	RC	DF	Result	Qual	ValQual	RC	DF	Result	Qual	ValQual	RC	DF
VOLATILES	Carbon disulfide	ug/L	0.5	U	U		1	0.5	U	U		1	0.5	U	U		1	0.5	U	U		1	0.5	U	U		1	0.5	U	U		1	5	U	U		10	0.5	U	U		1
VOLATILES	Carbon tetrachloride	ug/L	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	2.5	U	U		10	0.25	U	U		1
VOLATILES	Chlorobenzene	ug/L	0.125	U	U		1	0.125	U	U		1	0.125	U	U		1	0.125	U	U		1	0.125	U	U		1	0.125	U	U		1	1.25	U	U		10	0.125	U	U		1
VOLATILES	Chloroethane	ug/L	0.5	U	U		1	0.5	U	U		1	0.5	U	U		1	0.5	U	U		1	0.5	U	U		1	0.5	U	U		1	5	U	U		10	0.5	U	U		1
VOLATILES	Chloroform	ug/L	0.125	U	U		1	0.125	U	U		1	0.125	U	U		1	0.125	U	U		1	0.125	U	U		1	0.125	U	U		1	1.25	U	U		10	0.125	U	U		1
VOLATILES	Chloromethane	ug/L	0.5	U	U		1	0.571	J	J		1	0.5	U	U		1	0.5	U	U		1	0.5	U	U		1	0.5	U	U		1	5	U	U		10	0.5	U	U		1
VOLATILES	cis-1,2-Dichloroethene	ug/L	0.33	J	J		1	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	6.97	J	J		10	0.929	J	J		1
VOLATILES	cis-1,3-Dichloropropene	ug/L	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	2.5	U	U		10	0.25	U	U		1
VOLATILES	Dibromochloromethane	ug/L	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	2.5	U	U		10	0.25	U	U		1
VOLATILES	Dibromomethane	ug/L	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	2.5	U	U		10	0.25	U	U		1
VOLATILES	Dichlorodifluoromethane	ug/L	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	2.5	U	U		10	0.25	U	U		1
VOLATILES	Ethylbenzene	ug/L	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	2.5	U	U		10	0.25	U	U		1
VOLATILES	Hexachlorobutadiene	ug/L	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	2.5	U	U		10	0.25	U	U		1
VOLATILES	Isopropylbenzene	ug/L	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	2.5	U	U		10	0.25	U	U		1
VOLATILES	m,p-Xylenes	ug/L	0.5	U	U		1	0.5	U	U		1	0.5	U	U		1	0.5	U	U		1	0.5	U	U		1	0.5	U	U		1	5	U	U		10	0.5	U	U		1
VOLATILES	Methyl isobutyl ketone	ug/L	2.5	U	U		1	2.5	U	U		1	2.5	U	U		1	2.5	U	U		1	2.5	U	U		1	2.5	U	U		1	25	U	U		10	2.5	U	U		1
VOLATILES	Methylene chloride	ug/L	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	2.5	U	U		10	0.25	U	U		1
VOLATILES	Naphthalene	ug/L	0.2	U	U		1	0.2	U	U		1	0.2	U	U		1	0.2	U	U		1	0.2	U	U		1	0.2	U	U		1	2	U	U		10	0.2	U	U		1
VOLATILES	n-BUTYLBENZENE	ug/L	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	2.5	U	U		10	0.25	U	U		1
VOLATILES	n-PROPYLBENZENE	ug/L	0.125	U	U		1	0.125	U	U		1	0.125	U	U		1	0.125	U	U		1	0.125	U	U		1	0.125	U	U		1	1.25	U	U		10	0.125	U	U		1
VOLATILES	p-ISOPROPYLTOLUENE	ug/L	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	2.5	U	U		10	0.25	U	U		1
VOLATILES	sec-BUTYLBENZENE	ug/L	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	2.5	U	U		10	0.25	U	U		1
VOLATILES	Styrene	ug/L	0.125	U	U		1	0.125	U	U		1	0.125	U	U		1	0.125	U	U		1	0.125	U	U		1	0.125	U	U		1	1.25	U	U		10	0.125	U	U		1
VOLATILES	tert-BUTYLBENZENE	ug/L	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	2.5	U	U		10	0.25	U	U		1
VOLATILES	Tetrachloroethene	ug/L	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	2.5	U	U		10	0.25	U	U		1
VOLATILES	Toluene	ug/L	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	2.5	U	U		10	0.25	U	U		1
VOLATILES	trans-1,2-Dichloroethene	ug/L	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	2.5	U	U		10	0.25	U	U		1
VOLATILES	trans-1,3-Dichloropropene	ug/L	0.5	U	U		1	0.5	U	U		1	0.5	U	U		1	0.5	U	U		1	0.5	U	U		1	0.5	U	U		1	5	U	U		10	0.5	U	U		1
VOLATILES	Trichloroethene	ug/L	0.495	J	J		1	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	1100				10	30.8				1
VOLATILES	Trichlorofluoromethane	ug/L	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	2.5	U	U		10	0.25	U	U		1
VOLATILES	Vinyl acetate	ug/L	2.5	U	U		1	2.5	U	U		1	2.5	U	U		1	2.5	U	U		1	2.5	U	U		1	2.5	U	U		1	25	U	U		10	2.5	U	U		1
VOLATILES	Vinyl chloride	ug/L	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	2.5	U	U		10	0.25	U	U		1

Table C-2
Additional Sample Results - Groundwater - 2010

		Location Code	47WW33					47WW34					47WW37					47WW38					47WW38					47DPT10					LHSMW38					LHSMW44				
		Sample Date	30-Jul-10					3-Aug-10					1-Sep-10					1-Sep-10					1-Sep-10					20-Aug-10					30-Jul-10					30-Jul-10				
		Sample No	47WW33-103007 *					47WW34-100803					47WW37-100901					47WW38-100901					47WW38-100901-FD					DUP1-100820					LHSMW38-103007 *					LHSMW44-103007 *				
		Sample Purpose	REG					REG					REG					REG					REG					FD					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	Result	Qual	ValQual	RC	DF	Result	Qual	ValQual	RC	DF	Result	Qual	ValQual	RC	DF
GASES	Ethane	ug/L						1	U	U		1																														
GASES	Ethylene	ug/L						1	U	U		1																														
GASES	Methane	ug/L						1.23	J	J		1																														
GEN CHEMISTRY	Chloride	ug/L						184000				10																														
GEN CHEMISTRY	Fluoride, Total	ug/L						278				1																														
GEN CHEMISTRY	Nitrate	ug/L						174	J	J		1																														
GEN CHEMISTRY	Nitrate / Nitrite	ug/L																																								
GEN CHEMISTRY	Nitrite	ug/L						100	U	U		1																														
GEN CHEMISTRY	Perchlorate	ug/L						0.1	U	U		1	6.42				1	4110				1000	4520				1000															
GEN CHEMISTRY	Sulfate	ug/L						66400				1																														
GEN CHEMISTRY	Total Alkalinity	ug/L						303000				2																														
GEN CHEMISTRY	Total Organic Carbon	ug/L						5940				2																														
METALS	Aluminum	mg/L						0.0565	J	J		1	0.768				1	2.66		JI-FD		1	3.83		JI-FD		1															
METALS	Antimony	mg/L						0.00125	U	U		5	0.00125	U	U		5	0.00509				5	0.00477	J	J		5															
METALS	Arsenic	mg/L						0.00182	J	J		5	0.00445	J	J		5	0.108				5	0.0965				5															
METALS	Barium	mg/L						0.076				5	0.0596				5	0.0555		JI-FD		5	0.0621		JI-FD		5															
METALS	Beryllium	mg/L						0.0005	U	U		1	0.0005	U	U		1	0.0005	U	U		1	0.0005	U	U		1															
METALS	Cadmium	mg/L						0.000625	U	U		5	0.000625	U	U		5	0.000625	U	U		5	0.000625	U	U		5															
METALS	Calcium	mg/L						38.4				1	135				1	26.4				1	30.7				1															
METALS	Chromium	mg/L						0.00553	J	JH-EB		5	0.0053	J	J		5	0.00966	J	J		5	0.0121				5															
METALS	Cobalt	mg/L						0.0025	U	U		1	0.0025	U	U		1	0.0025	U	U		1	0.00331	J	J		1															
METALS	Copper	mg/L						0.0025	U	U		5	0.00294	J	J		5	0.00626	J	J		5	0.00629	J	J		5															
METALS	Iron	mg/L						0.0705	J	J		1	0.717				1	2.43		JI-FD		1	4.15		JI-FD		1															
METALS	Lead	mg/L						0.00125	U	U		5	0.00125	U	U		5	0.00454				5	0.00466				5															
METALS	Magnesium	mg/L						18.3				1	27.2				1	6				1	6.5				1															
METALS	Manganese	mg/L						0.0172				5	0.0357				5	0.0539		JI-FD		5	0.0865		JI-FD		5															
METALS	Mercury	mg/L						0.0001	U	U		1	0.0001	U	U		1	0.0001	U	U		1	0.0001	U	U		1															
METALS	Nickel	mg/L						0.005	U	U		5	0.00603	J	J		5	0.00564	J	J		5	0.00709	J	J		5															
METALS	Potassium	mg/L						20.8				1	19.4				1	6.01				1	6.33				1															
METALS	Selenium	mg/L						0.00532				5	0.0115				5	0.00661		JI-FD		5	0.00374	J	JI-FD		5															
METALS	Silver	mg/L						0.00125	U	U		5	0.00125	U	U		5	0.00125	U	U		5	0.00125	U	U		5															
METALS	Sodium	mg/L						220				2	198				100	121				1	125				1															
METALS	Thallium	mg/L						0.00025	U	U		5	0.00025	U	U		5	0.00025	U	U		5	0.00025	U	U		5															
METALS	Vanadium	mg/L						0.005	U	U		1	0.00794	J	J		1	0.0326				1	0.0372				1															
METALS	Zinc	mg/L						0.005	U	U		1	0.00735	J	J		1	0.0205				1	0.0237				1															
SEMIVOLATILES	1,2,4-Trichlorobenzene	ug/L						2.55	U	U		1	2.5	U	U		1	2.5	U	U		1	2.5	U	U		1															
SEMIVOLATILES	1,2-Dichlorobenzene	ug/L						2.55	U	U		1	2.5	U	U		1	2.5	U	U		1	2.5	U	U		1															
SEMIVOLATILES	1,3-Dichlorobenzene	ug/L						2.55	U	U		1	2.5	U	U		1	2.5	U	U		1	2.5	U	U		1															
SEMIVOLATILES	1,4-Dichlorobenzene	ug/L						2.55	U	U		1	2.5	U	U		1	2.5	U	U		1	2.5	U	U		1															
SEMIVOLATILES	2,4,5-Trichlorophenol	ug/L						2.55	U	U		1	2.5	U	U		1	2.5	U	U		1	2.5	U	U		1															
SEMIVOLATILES	2,4,6-Trichlorophenol	ug/L						2.55	U	U		1	2.5	U	U		1	2.5	U	U		1	2.5	U	U		1															
SEMIVOLATILES	2,4-Dichlorophenol	ug/L						2.55	U	U		1	2.5	U	U		1	2.5	U	U		1	2.5	U	U		1															
SEMIVOLATILES	2,4-Dimethylphenol	ug/L						2.55	U	U		1	2.5	U	U		1	2.5	U	U		1	2.5	U	U		1															
SEMIVOLATILES	2,4-Dinitrophenol	ug/L						12.8	U	U		1	12.5	U	U		1	12.5	U	U		1	12.5	U	U		1															
SEMIVOLATILES	2,4-Dinitrotoluene	ug/L						2.55	U	U		1	2.5	U	U		1	2.5	U	U		1	2.5	U	U		1															
SEMIVOLATILES	2,6-Dinitrotoluene	ug/L						2.55	U	U		1	2.5	U	U		1	2.5	U	U		1	2.5	U	U		1															
SEMIVOLATILES	2-Chloronaphthalene	ug/L						2.55	U	U		1	2.5	U	U		1	2.5	U	U		1	2.5	U	U		1															
SEMIVOLATILES	2-Chlorophenol	ug/L						2.55	U	U		1	2.5	U	U		1	2.5	U	U		1	2.5	U	U		1															
SEMIVOLATILES	2-Methylnaphthalene	ug/L						2.55	U	U		1	2.5	U	U		1	2.5	U	U		1	2.5	U	U		1															
SEMIVOLATILES	2-Methylphenol	ug/L						2.55	U	U		1	2.5	U	U		1	2.5	U	U		1	2.5	U	U		1															
SEMIVOLATILES	2-Nitroaniline	ug/L						12.8	U	U		1	12.5	U	U		1	12.5	U	U		1	12.5	U	U		1															
SEMIVOLATILES	2-Nitrophenol	ug/L						2.55	U	U		1	2.5	U	U		1	2.5	U	U		1	2.5	U	U		1															
SEMIVOLATILES	3,3'-Dichlorobenzidine	ug/L						2.55	U	U		1	2.5	U	U		1	2.5	U	U		1	2.5	U	U		1															
SEMIVOLATILES	3-Nitroaniline	ug/L						12.8	U	U		1	12.5	U	U		1	12.5	U	U		1	12.5	U	U		1															
SEMIVOLATILES	4,6-Dinitro-2-methylphenol	ug/L						12.8	U	U		1	12.5	U	U		1	12.5	U	U		1	12.5	U	U		1															
SEMIVOLATILES	4-Bromophenyl phenyl ether	ug/L						2.55	U	U		1	2.5	U	U		1	2.5	U	U		1	2.5	U	U		1															
SEMIVOLATILES	4-Chloro-3-methylphenol	ug/L						2.55	U	U		1	2.5	U	U		1	2.5	U	U		1	2.5	U	U		1															
SEMIVOLATILES	4-Chloroaniline	ug/L						2.55	U	U		1	2.5	U	U		1	2.5	U	U		1	2.5	U	U		1															
SEMIVOLATILES	4-Chlorophenyl phenyl ether	ug/L						2.55	U	U		1	2.5	U	U		1	2.5	U	U		1	2.5	U	U		1															
SEMIVOLATILES	4-Methylphenol	ug/L						2.55	U	U		1	2.5	U	U		1	2.5	U	U		1	2.5	U	U		1															
SEMIVOLATILES	4-Nitroaniline	ug/L						12.8	U	U		1	12.5	U	U		1	12.5	U	U		1	12.5	U	U		1															
SEMIVOLATILES	4-Nitrophenol	ug/L						12.8	U	U		1	12.5	U	U		1	12.5	U	U		1	12.5	U	U		1															
SEMIVOLATILES	Acenaphthene	ug/L						2.55	U	U		1	2.5	U	U		1	2.5	U	U		1	2.5	U	U		1															
SEMIVOLATILES	Acenaphthylene	ug/L						2.55	U	U		1	2.5	U	U		1	2.5	U	U		1	2.5	U	U		1															
SEMIVOLATILES	Anthracene	ug/L						2.55	U	U		1	2.5	U	U		1	2.5	U	U		1	2.5	U	U		1															
SEMIVOLATILES	Benzo(a)anthracene	ug/L						2.55	U	U		1	2.5	U	U		1	2.5	U	U		1	2.5	U	U		1															
SEMIVOLATILES	Benzo(a)pyrene	ug/L						2.55	U	U		1	2.5	U	U		1	2.5	U	U		1	2.5	U	U		1															

Table C-2
Additional Sample Results - Groundwater - 2010

		Location Code	47WW33					47WW34					47WW37					47WW38					47WW38					47DPT10					LHSMW38					LHSMW44				
		Sample Date	30-Jul-10					3-Aug-10					1-Sep-10					1-Sep-10					1-Sep-10					20-Aug-10					30-Jul-10					30-Jul-10				
		Sample No	47WW33-103007 *					47WW34-100803					47WW37-100901					47WW38-100901					47WW38-100901-FD					DUP1-100820					LHSMW38-103007 *					LHSMW44-103007 *				
		Sample Purpose	REG					REG					REG					REG					REG					FD					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	Result	Qual	ValQual	RC	DF	Result	Qual	ValQual	RC	DF	Result	Qual	ValQual	RC	DF
SEMIVOLATILES	Benzo(b)fluoranthene	ug/L						2.55	U	U		1	2.5	U	U		1	2.5	U	U		1	2.5	U	U		1															
SEMIVOLATILES	Benzo(ghi)perylene	ug/L						2.55	U	U		1	2.5	U	U		1	2.5	U	U		1	2.5	U	U		1															
SEMIVOLATILES	Benzo(k)fluoranthene	ug/L						2.55	U	U		1	2.5	U	U		1	2.5	U	U		1	2.5	U	U		1															
SEMIVOLATILES	Benzoic Acid	ug/L						12.8	U	U		1	12.5	U	R-LCS		1	12.5	U	R-LCS		1	12.5	U	R-LCS		1															
SEMIVOLATILES	Benzyl Alcohol	ug/L						2.55	U	U		1	2.5	U	U		1	2.5	U	U		1	2.5	U	U		1															
SEMIVOLATILES	bis(2-Chloroethoxy)methane	ug/L						2.55	U	U		1	2.5	U	U		1	2.5	U	U		1	2.5	U	U		1															
SEMIVOLATILES	bis(2-Chloroethyl)ether	ug/L						2.55	U	U		1	2.5	U	U		1	2.5	U	U		1	2.5	U	U		1															
SEMIVOLATILES	bis(2-Chloroisopropyl)ether	ug/L						2.55	U	U		1	2.5	U	U		1	2.5	U	U		1	2.5	U	U		1															
SEMIVOLATILES	bis(2-Ethylhexyl)phthalate	ug/L						3.06	U	U		1	3	U	U		1	21		U-MB		1	3.92	J	U-MB		1															
SEMIVOLATILES	Butyl benzyl phthalate	ug/L						2.55	U	U		1	2.5	U	U		1	2.5	U	U		1	2.5	U	U		1															
SEMIVOLATILES	Chrysene	ug/L						2.55	U	U		1	2.5	U	U		1	2.5	U	U		1	2.5	U	U		1															
SEMIVOLATILES	Dibenzo(a,h)anthracene	ug/L						2.55	U	U		1	2.5	U	U		1	2.5	U	U		1	2.5	U	U		1															
SEMIVOLATILES	Dibenzofuran	ug/L						2.55	U	U		1	2.5	U	U		1	2.5	U	U		1	2.5	U	U		1															
SEMIVOLATILES	Diethyl phthalate	ug/L						2.55	U	U		1	2.5	U	U		1	2.5	U	U		1	2.5	U	U		1															
SEMIVOLATILES	Dimethyl phthalate	ug/L						2.55	U	U		1	2.5	U	U		1	2.5	U	U		1	2.5	U	U		1															
SEMIVOLATILES	di-n-Butyl phthalate	ug/L						2.55	U	U		1	2.5	U	U		1	2.5	U	U		1	2.5	U	U		1															
SEMIVOLATILES	di-n-Octyl phthalate	ug/L						2.55	U	U		1	2.5	U	U		1	2.5	U	U		1	2.5	U	U		1															
SEMIVOLATILES	Fluoranthene	ug/L						2.55	U	U		1	2.5	U	U		1	2.5	U	U		1	2.5	U	U		1															
SEMIVOLATILES	Fluorene	ug/L						2.55	U	U		1	2.5	U	U		1	2.5	U	U		1	2.5	U	U		1															
SEMIVOLATILES	Hexachlorobenzene	ug/L						2.55	U	U		1	2.5	U	U		1	2.5	U	U		1	2.5	U	U		1															
SEMIVOLATILES	Hexachlorobutadiene	ug/L						2.55	U	U		1	2.5	U	U		1	2.5	U	U		1	2.5	U	U		1															
SEMIVOLATILES	Hexachlorocyclopentadiene	ug/L						2.55	U	U		1	2.5	U	U		1	2.5	U	U		1	2.5	U	U		1															
SEMIVOLATILES	Hexachloroethane	ug/L						2.55	U	U		1	2.5	U	U		1	2.5	U	U		1	2.5	U	U		1															
SEMIVOLATILES	Indeno(1,2,3-cd)pyrene	ug/L						2.55	U	U		1	2.5	U	U		1	2.5	U	U		1	2.5	U	U		1															
SEMIVOLATILES	Isophorone	ug/L						2.55	U	U		1	2.5	U	U		1	2.5	U	U		1	2.5	U	U		1															
SEMIVOLATILES	Naphthalene	ug/L						2.55	U	U		1	2.5	U	U		1	2.5	U	U		1	2.5	U	U		1															
SEMIVOLATILES	Nitrobenzene	ug/L						2.55	U	U		1	2.5	U	U		1	2.5	U	U		1	2.5	U	U		1															
SEMIVOLATILES	n-Nitroso-di-n-propylamine	ug/L						2.55	U	U		1	2.5	U	U		1	2.5	U	U		1	2.5	U	U		1															
SEMIVOLATILES	n-Nitrosodiphenylamine	ug/L						2.55	U	U		1	2.5	U	U		1	2.5	U	U		1	2.5	U	U		1															
SEMIVOLATILES	Pentachlorophenol	ug/L						12.8	U	U		1	12.5	U	U		1	12.5	U	U		1	12.5	U	U		1															
SEMIVOLATILES	Phenanthrene	ug/L						2.55	U	U		1	2.5	U	U		1	2.5	U	U		1	2.5	U	U		1															
SEMIVOLATILES	Phenol	ug/L						2.55	U	U		1	2.5	U	U		1	2.5	U	U		1	2.5	U	U		1															
SEMIVOLATILES	Pyrene	ug/L						2.55	U	U		1	2.5	U	U		1	2.5	U	U		1	2.5	U	U		1															
VOLATILES	1,1,1,2-Tetrachloroethane	ug/L	0.25	U	U		1	2.5	U	U		10	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1
VOLATILES	1,1,1-Trichloroethane	ug/L	0.25	U	U		1	2.5	U	U		10	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1
VOLATILES	1,1,2,2-Tetrachloroethane	ug/L	0.2	U	U		1	2	U	U		10	0.2	U	U		1	0.2	U	U		1	0.2	U	U		1	0.2	U	U		1	0.2	U	U		1	0.2	U	U		1
VOLATILES	1,1,2-Trichloroethane	ug/L	0.25	U	U		1	2.5	U	U		10	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1
VOLATILES	1,1-Dichloroethane	ug/L	0.24	J	J		1	1.25	U	U		10	0.125	U	U		1	0.125	U	U		1	0.125	U	U		1	0.125	U	U		1	0.125	U	U		1	0.125	U	U		1
VOLATILES	1,1-Dichloroethene	ug/L	0.5	U	U		1	5	U	U		10	0.5	U	U		1	0.5	U	U		1	0.5	U	U		1	0.5	U	U		1	0.5	U	U		1	0.526	J	J		1
VOLATILES	1,1-Dichloropropene	ug/L	0.25	U	U		1	2.5	U	U		10	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1
VOLATILES	1,2,3-Trichlorobenzene	ug/L	0.15	U	U		1	1.5	U	U		10	0.15	U	U		1	0.15	U	U		1	0.15	U	U		1	0.15	U	U		1	0.15	U	U		1	0.15	U	U		1
VOLATILES	1,2,3-Trichloropropane	ug/L	0.5	U	U		1	5	U	U		10	0.5	U	U		1	0.5	U	U		1	0.5	U	U		1	0.5	U	U		1	0.5	U	U		1	0.5	U	U		1
VOLATILES	1,2,4-Trichlorobenzene	ug/L	0.2	U	U		1	2	U	U		10	0.2	U	U		1	0.2	U	U		1	0.2	U	U		1	0.2	U	U		1	0.2	U	U		1	0.2	U	U		1
VOLATILES	1,2,4-Trimethylbenzene	ug/L	0.25	U	U		1	2.5	U	U		10	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1
VOLATILES	1,2-Dibromo-3-chloropropane	ug/L	1	U	U		1	10	U	U		10	1	U	U		1	1	U	U		1	1	U	U		1	1	U	U		1	1	U	U		1	1	U	U		1
VOLATILES	1,2-Dibromoethane	ug/L	0.25	U	U		1	2.5	U	U		10	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1
VOLATILES	1,2-Dichlorobenzene	ug/L	0.125	U	U		1	1.25	U	U		10	0.125	U	U		1	0.125	U	U		1	0.125	U	U		1	0.125	U	U		1	0.125	U	U		1	0.125	U	U		1
VOLATILES	1,2-Dichloroethane	ug/L	0.25	U	U		1	2.5	U	U		10	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1
VOLATILES	1,2-Dichloropropane	ug/L	0.2	U	U		1	2	U	U		10	0.2	U	U		1	0.2	U	U		1	0.2	U	U		1	0.2	U	U		1	0.2	U	U		1	0.2	U	U		1
VOLATILES	1,2-Dimethylbenzene (o-Xylene)	ug/L	0.25	U	U		1	2.5	U	U		10	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1
VOLATILES	1,3,5-Trimethylbenzene	ug/L	0.25	U	U		1	2.5	U	U		10	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1
VOLATILES	1,3-Dichlorobenzene	ug/L	0.25	U	U		1	2.5	U	U		10	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1
VOLATILES	1,3-Dichloropropane	ug/L	0.2	U	U		1	2	U	U		10	0.2	U	U		1	0.2	U	U		1	0.2	U	U		1	0.2	U	U		1	0.2	U	U		1	0.2	U	U		1
VOLATILES	1,4-Dichlorobenzene	ug/L	0.125	U	U		1	1.25	U	U		10	0.125	U	U		1	0.125	U	U		1	0.125	U	U		1	0.125	U	U		1	0.125	U	U		1	0.125	U	U		1
VOLATILES	2,2-Dichloropropane	ug/L	0.25	U	U		1	2.5	U	U		10	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1
VOLATILES	2-Butanone	ug/L	2.5	U	U		1	25	U	U		10	2.5	U	U		1	2.5	U	U		1	2.5	U	U		1	2.87	J	J		1	2.5	U	U		1	2.5	U	U		1
VOLATILES	2-Chloroethyl vinyl ether	ug/L	2	U	U		1	20	U	U		10	2	U	U		1	2	U	U		1	2	U	U		1	2	U	U		1	2	U	U		1	2	U	U		1
VOLATILES	2-Chlorotoluene	ug/L	0.125	U	U		1	1.25	U	U		10	0.125	U	U		1	0.125	U	U		1	0.125	U	U		1	0.125	U	U		1	0.125	U	U		1	0.125	U	U		1
VOLATILES	2-Hexanone	ug/L	2.5	U	U		1	25	U	U		10	2.5	U	U		1	2.5	U	U		1	2.5	U	U		1	2.5	U	U		1	2.5	U	U		1	2.5	U	U		1
VOLATILES	4-Chlorotoluene	ug/L	0.25	U	U		1	2.5	U	U		10	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1
VOLATILES	Acetone	ug/L	2.5	U	U		1	25	U	U		10	10.5				1	3.42	J	J		1	3.36	J	J		1	18.5				1	2.5	U	U		1	2.5	U	U		1
VOLATILES	Benzene	ug/L	0.125	U	U		1	1.25	U	U		10	0.125	U	U		1	0.125	U	U		1	0.125	U	U		1	0.125	U	U		1	0.125	U	U		1	0.125	U	U		1
VOLATILES	Bromobenzene	ug/L	0.125	U	U		1	1.25	U	U		10	0.125	U	U		1	0.125	U	U		1	0.125	U	U		1	0.125	U	U		1	0.125	U	U		1	0.125	U	U		1
VOLATILES	Bromochloromethane	ug/L	0.2	U	U		1	2	U	U		10	0.2	U	U		1	0.2	U	U		1	0.2	U	U		1	0.2	U	U		1	0.2	U	U		1	0.2	U	U		1
VOLATILES	Bromodichloromethane	ug/L	0.25	U	U		1	2.5	U	U		10	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1
VOLATILES	Bromoform	ug/L	0.5	U	U		1	5	U	U		10	0.5	U	U		1	0.5	U	U		1	0.5	U	U		1	0.5	U	U		1	0.5	U	U		1	0.5	U	U		1
VOLATILES	Bromomethane	ug/L	0.5	U	U		1	5	U	U		10	0.5	U	U		1	0.5	U	U		1	0.5	U	U		1	0.5	U	U		1	0.5	U	U		1	0.5	U	U		1

Table C-2
Additional Sample Results - Groundwater - 2010

		Location Code	47WW33					47WW34					47WW37					47WW38					47WW38					47DPT10					LHSMW38					LHSMW44				
		Sample Date	30-Jul-10					3-Aug-10					1-Sep-10					1-Sep-10					1-Sep-10					20-Aug-10					30-Jul-10					30-Jul-10				
		Sample No	47WW33-103007 *					47WW34-100803					47WW37-100901					47WW38-100901					47WW38-100901-FD					DUP1-100820					LHSMW38-103007 *					LHSMW44-103007 *				
		Sample Purpose	REG					REG					REG					REG					REG					FD					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	Result	Qual	ValQual	RC	DF	Result	Qual	ValQual	RC	DF	Result	Qual	ValQual	RC	DF
VOLATILES	Carbon disulfide	ug/L	0.5	U	U		1	21.8				10	0.5	U	U		1	0.5	U	U		1	0.5	U	U		1	0.5	U	U		1	0.5	U	U		1	0.5	U	U		1
VOLATILES	Carbon tetrachloride	ug/L	0.25	U	U		1	2.5	U	U		10	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1
VOLATILES	Chlorobenzene	ug/L	0.125	U	U		1	1.25	U	U		10	0.125	U	U		1	0.125	U	U		1	0.125	U	U		1	0.125	U	U		1	0.125	U	U		1	0.125	U	U		1
VOLATILES	Chloroethane	ug/L	0.5	U	U		1	5	U	U		10	0.5	U	U		1	0.5	U	U		1	0.5	U	U		1	0.5	U	U		1	0.5	U	U		1	0.5	U	U		1
VOLATILES	Chloroform	ug/L	0.125	U	U		1	1.25	U	U		10	2.23				1	0.125	U	U		1	0.125	U	U		1	0.125	U	U		1	0.125	U	U		1	0.125	U	U		1
VOLATILES	Chloromethane	ug/L	0.5	U	U		1	5	U	U		10	0.5	U	U		1	0.5	U	U		1	0.5	U	U		1	0.5	U	U		1	0.5	U	U		1	0.5	U	U		1
VOLATILES	cis-1,2-Dichloroethene	ug/L	1.35				1	136				10	1.62				1	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	5.93				1
VOLATILES	cis-1,3-Dichloropropene	ug/L	0.25	U	U		1	2.5	U	U		10	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1
VOLATILES	Dibromochloromethane	ug/L	0.25	U	U		1	2.5	U	U		10	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1
VOLATILES	Dibromomethane	ug/L	0.25	U	U		1	2.5	U	U		10	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1
VOLATILES	Dichlorodifluoromethane	ug/L	0.25	U	U		1	2.5	U	U		10	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1
VOLATILES	Ethylbenzene	ug/L	0.25	U	U		1	2.5	U	U		10	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1
VOLATILES	Hexachlorobutadiene	ug/L	0.25	U	U		1	2.5	U	U		10	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1
VOLATILES	Isopropylbenzene	ug/L	0.25	U	U		1	2.5	U	U		10	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1
VOLATILES	m,p-Xylenes	ug/L	0.5	U	U		1	5	U	U		10	0.5	U	U		1	0.5	U	U		1	0.5	U	U		1	0.5	U	U		1	0.5	U	U		1	0.5	U	U		1
VOLATILES	Methyl isobutyl ketone	ug/L	2.5	U	U		1	25	U	U		10	2.5	U	U		1	2.5	U	U		1	2.5	U	U		1	2.5	U	U		1	2.5	U	U		1	2.5	U	U		1
VOLATILES	Methylene chloride	ug/L	0.25	U	U		1	2.63	J	U-MB		10	1.05	J	J		1	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1
VOLATILES	Naphthalene	ug/L	0.2	U	U		1	2	U	U		10	0.2	U	U		1	0.2	U	U		1	0.2	U	U		1	0.2	U	U		1	0.2	U	U		1	0.2	U	U		1
VOLATILES	n-BUTYLBENZENE	ug/L	0.25	U	U		1	2.5	U	U		10	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1
VOLATILES	n-PROPYLBENZENE	ug/L	0.125	U	U		1	1.25	U	U		10	0.125	U	U		1	0.125	U	U		1	0.125	U	U		1	0.125	U	U		1	0.125	U	U		1	0.125	U	U		1
VOLATILES	p-ISOPROPYLTOLUENE	ug/L	0.25	U	U		1	2.5	U	U		10	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1
VOLATILES	sec-BUTYLBENZENE	ug/L	0.25	U	U		1	2.5	U	U		10	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1
VOLATILES	Styrene	ug/L	0.125	U	U		1	1.25	U	U		10	0.125	U	U		1	0.125	U	U		1	0.125	U	U		1	0.125	U	U		1	0.125	U	U		1	0.125	U	U		1
VOLATILES	tert-BUTYLBENZENE	ug/L	0.25	U	U		1	2.5	U	U		10	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1
VOLATILES	Tetrachloroethene	ug/L	0.25	U	U		1	2.5	U	U		10	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1
VOLATILES	Toluene	ug/L	0.25	U	U		1	2.5	U	U		10	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1
VOLATILES	trans-1,2-Dichloroethene	ug/L	0.25	U	U		1	2.5	U	U		10	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1
VOLATILES	trans-1,3-Dichloropropene	ug/L	0.5	U	U		1	5	U	U		10	0.5	U	U		1	0.5	U	U		1	0.5	U	U		1	0.5	U	U		1	0.5	U	U		1	0.5	U	U		1
VOLATILES	Trichloroethene	ug/L	2.21				1	1340				10	29.4				1	0.565	J	J		1	0.605	J	J		1	0.25	U	U		1	0.25	U	U		1	26.4				1
VOLATILES	Trichlorofluoromethane	ug/L	0.25	U	U		1	2.5	U	U		10	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1
VOLATILES	Vinyl acetate	ug/L	2.5	U	U		1	25	U	U		10	2.5	U	U		1	2.5	U	U		1	2.5	U	U		1	2.5	U	U		1	2.5	U	U		1	2.5	U	U		1
VOLATILES	Vinyl chloride	ug/L	0.25	U	U		1	2.5	U	U		10	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1	0.25	U	U		1

Table C-2
Additional Sample Results - Groundwater - 2010

		Location Code	LHSMW54					LHSMW60					LHSMW60					48WW01					67WW06					LHSMW61				
		Sample Date	6-Aug-10					22-Jun-10					30-Aug-10					7-Aug-10					6-Aug-10					6-Aug-10				
		Sample No	LHSMW54-100806					47-LHSMW60-102206					LHSMW60-100830					48WW01-100807					67WW06-100806					LHSMW61-100806				
		Sample Purpose	REG					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	Result	Qual	ValQual	RC	DF
GASES	Ethane	ug/L											1	U	U		1															
GASES	Ethylene	ug/L											1	U	U		1															
GASES	Methane	ug/L											1	U	U		1															
GEN CHEMISTRY	Chloride	ug/L											128000				5															
GEN CHEMISTRY	Fluoride, Total	ug/L											280	J	J		2															
GEN CHEMISTRY	Nitrate	ug/L											570	J	J		2															
GEN CHEMISTRY	Nitrate / Nitrite	ug/L											567				1															
GEN CHEMISTRY	Nitrite	ug/L											200	U	U		2															
GEN CHEMISTRY	Perchlorate	ug/L	0.1	U	U		1	63600				10000	56600				100000						0.1	U	U							
GEN CHEMISTRY	Sulfate	ug/L											257000				2															
GEN CHEMISTRY	Total Alkalinity	ug/L											109000				1															
GEN CHEMISTRY	Total Organic Carbon	ug/L											5850				2															
METALS	Aluminum	mg/L											0.0634	J	J		1															
METALS	Antimony	mg/L											0.00162	J	J		5															
METALS	Arsenic	mg/L											0.00125	U	U		5															
METALS	Barium	mg/L											0.0184				5															
METALS	Beryllium	mg/L											0.0005	U	U		1															
METALS	Cadmium	mg/L											0.000625	U	U		5															
METALS	Calcium	mg/L											26.2				1															
METALS	Chromium	mg/L											0.00597	J	J		5															
METALS	Cobalt	mg/L											0.0025	U	U		1															
METALS	Copper	mg/L											0.0025	U	U		5															
METALS	Iron	mg/L											0.144				1															
METALS	Lead	mg/L											0.00125	U	U		5															
METALS	Magnesium	mg/L											16.7				1															
METALS	Manganese	mg/L											0.00579	J	J		5															
METALS	Mercury	mg/L											0.0001	U	U		1															
METALS	Nickel	mg/L											0.0371				5															
METALS	Potassium	mg/L											0.856	J	J		1															
METALS	Selenium	mg/L											0.00296	J	J		5															
METALS	Silver	mg/L											0.00125	U	U		5															
METALS	Sodium	mg/L											213				2															
METALS	Thallium	mg/L											0.00025	U	U		5															
METALS	Vanadium	mg/L											0.005	U	U		1															
METALS	Zinc	mg/L											0.005	U	U		1															
SEMIVOLATILES	1,2,4-Trichlorobenzene	ug/L											2.5	U	U		1															
SEMIVOLATILES	1,2-Dichlorobenzene	ug/L											2.5	U	U		1															
SEMIVOLATILES	1,3-Dichlorobenzene	ug/L											2.5	U	U		1															
SEMIVOLATILES	1,4-Dichlorobenzene	ug/L											2.5	U	U		1															
SEMIVOLATILES	2,4,5-Trichlorophenol	ug/L											2.5	U	U		1															
SEMIVOLATILES	2,4,6-Trichlorophenol	ug/L											2.5	U	U		1															
SEMIVOLATILES	2,4-Dichlorophenol	ug/L											2.5	U	U		1															
SEMIVOLATILES	2,4-Dimethylphenol	ug/L											2.5	U	U		1															
SEMIVOLATILES	2,4-Dinitrophenol	ug/L											12.5	U	U		1															
SEMIVOLATILES	2,4-Dinitrotoluene	ug/L											2.5	U	U		1															
SEMIVOLATILES	2,6-Dinitrotoluene	ug/L											2.5	U	U		1															
SEMIVOLATILES	2-Chloronaphthalene	ug/L											2.5	U	U		1															
SEMIVOLATILES	2-Chlorophenol	ug/L											2.5	U	U		1															
SEMIVOLATILES	2-Methylnaphthalene	ug/L											2.5	U	U		1															
SEMIVOLATILES	2-Methylphenol	ug/L											2.5	U	U		1															
SEMIVOLATILES	2-Nitroaniline	ug/L											12.5	U	U		1															
SEMIVOLATILES	2-Nitrophenol	ug/L											2.5	U	U		1															
SEMIVOLATILES	3,3'-Dichlorobenzidine	ug/L											2.5	U	U		1															
SEMIVOLATILES	3-Nitroaniline	ug/L											12.5	U	U		1															
SEMIVOLATILES	4,6-Dinitro-2-methylphenol	ug/L											12.5	U	U		1															
SEMIVOLATILES	4-Bromophenyl phenyl ether	ug/L											2.5	U	U		1															
SEMIVOLATILES	4-Chloro-3-methylphenol	ug/L											2.5	U	U		1															
SEMIVOLATILES	4-Chloroaniline	ug/L											2.5	U	U		1															
SEMIVOLATILES	4-Chlorophenyl phenyl ether	ug/L											2.5	U	U		1															
SEMIVOLATILES	4-Methylphenol	ug/L											2.5	U	U		1															
SEMIVOLATILES	4-Nitroaniline	ug/L											12.5	U	U		1															
SEMIVOLATILES	4-Nitrophenol	ug/L											12.5	U	U		1															
SEMIVOLATILES	Acenaphthene	ug/L											2.5	U	U		1															
SEMIVOLATILES	Acenaphthylene	ug/L											2.5	U	U		1															
SEMIVOLATILES	Anthracene	ug/L											2.5	U	U		1															
SEMIVOLATILES	Benzo(a)anthracene	ug/L											2.5	U	U		1															
SEMIVOLATILES	Benzo(a)pyrene	ug/L											2.5	U	U		1															

Table C-2
Additional Sample Results - Groundwater - 2010

		Location Code	LHSMW54					LHSMW60					LHSMW60					48WW01					67WW06					LHSMW61				
		Sample Date	6-Aug-10					22-Jun-10					30-Aug-10					7-Aug-10					6-Aug-10					6-Aug-10				
		Sample No	LHSMW54-100806					47-LHSMW60-102206					LHSMW60-100830					48WW01-100807					67WW06-100806					LHSMW61-100806				
		Sample Purpose	REG					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	Result	Qual	ValQual	RC	DF
SEMIVOLATILES	Benzo(b)fluoranthene	ug/L											2.5	U	U		1															
SEMIVOLATILES	Benzo(ghi)perylene	ug/L											2.5	U	U		1															
SEMIVOLATILES	Benzo(k)fluoranthene	ug/L											2.5	U	U		1															
SEMIVOLATILES	Benzoic Acid	ug/L											12.5	U	UJL-LCS		1															
SEMIVOLATILES	Benzyl Alcohol	ug/L											2.5	U	U		1															
SEMIVOLATILES	bis(2-Chloroethoxy)methane	ug/L											2.5	U	U		1															
SEMIVOLATILES	bis(2-Chloroethyl)ether	ug/L											2.5	U	U		1															
SEMIVOLATILES	bis(2-Chloroisopropyl)ether	ug/L											2.5	U	U		1															
SEMIVOLATILES	bis(2-Ethylhexyl)phthalate	ug/L											3	U	U		1															
SEMIVOLATILES	Butyl benzyl phthalate	ug/L											2.5	U	U		1															
SEMIVOLATILES	Chrysene	ug/L											2.5	U	U		1															
SEMIVOLATILES	Dibenzo(a,h)anthracene	ug/L											2.5	U	U		1															
SEMIVOLATILES	Dibenzofuran	ug/L											2.5	U	U		1															
SEMIVOLATILES	Diethyl phthalate	ug/L											2.5	U	U		1															
SEMIVOLATILES	Dimethyl phthalate	ug/L											2.5	U	U		1															
SEMIVOLATILES	di-n-Butyl phthalate	ug/L											2.5	U	U		1															
SEMIVOLATILES	di-n-Octyl phthalate	ug/L											2.5	U	U		1															
SEMIVOLATILES	Fluoranthene	ug/L											2.5	U	U		1															
SEMIVOLATILES	Fluorene	ug/L											2.5	U	U		1															
SEMIVOLATILES	Hexachlorobenzene	ug/L											2.5	U	U		1															
SEMIVOLATILES	Hexachlorobutadiene	ug/L											2.5	U	U		1															
SEMIVOLATILES	Hexachlorocyclopentadiene	ug/L											2.5	U	U		1															
SEMIVOLATILES	Hexachloroethane	ug/L											2.5	U	U		1															
SEMIVOLATILES	Indeno(1,2,3-cd)pyrene	ug/L											2.5	U	U		1															
SEMIVOLATILES	Isophorone	ug/L											2.5	U	U		1															
SEMIVOLATILES	Naphthalene	ug/L											2.5	U	U		1															
SEMIVOLATILES	Nitrobenzene	ug/L											2.5	U	U		1															
SEMIVOLATILES	n-Nitroso-di-n-propylamine	ug/L											2.5	U	U		1															
SEMIVOLATILES	n-Nitrosodiphenylamine	ug/L											2.5	U	U		1															
SEMIVOLATILES	Pentachlorophenol	ug/L											12.5	U	U		1															
SEMIVOLATILES	Phenanthrene	ug/L											2.5	U	U		1															
SEMIVOLATILES	Phenol	ug/L											2.5	U	U		1															
SEMIVOLATILES	Pyrene	ug/L											2.5	U	U		1															
VOLATILES	1,1,1,2-Tetrachloroethane	ug/L	0.625	U	U		2.5						0.25	U	U		1	0.25	U	U			0.25	U	U			0.25	U	U		
VOLATILES	1,1,1-Trichloroethane	ug/L	0.625	U	U		2.5						0.25	U	U		1	0.25	U	U			0.25	U	U			0.25	U	U		
VOLATILES	1,1,2,2-Tetrachloroethane	ug/L	0.5	U	U		2.5						0.2	U	U		1	0.2	U	U			0.2	U	U			0.2	U	U		
VOLATILES	1,1,2-Trichloroethane	ug/L	0.625	U	U		2.5						0.25	U	U		1	0.25	U	U			0.25	U	U			0.25	U	U		
VOLATILES	1,1-Dichloroethane	ug/L	0.313	U	U		2.5						0.125	U	U		1	0.125	U	U			0.177	J	J			0.125	U	U		
VOLATILES	1,1-Dichloroethene	ug/L	1.25	U	U		2.5						0.5	U	U		1	0.5	U	U			0.5	U	U			0.5	U	U		
VOLATILES	1,1-Dichloropropene	ug/L	0.625	U	U		2.5						0.25	U	U		1	0.25	U	U			0.25	U	U			0.25	U	U		
VOLATILES	1,2,3-Trichlorobenzene	ug/L	0.375	U	U		2.5						0.15	U	U		1	0.15	U	U			0.15	U	U			0.15	U	U		
VOLATILES	1,2,3-Trichloropropane	ug/L	1.25	U	U		2.5						0.5	U	U		1	0.5	U	U			0.5	U	U			0.5	U	U		
VOLATILES	1,2,4-Trichlorobenzene	ug/L	0.5	U	U		2.5						0.2	U	U		1	0.2	U	U			0.2	U	U			0.2	U	U		
VOLATILES	1,2,4-Trimethylbenzene	ug/L	0.625	U	U		2.5						0.25	U	U		1	0.25	U	U			0.25	U	U			0.25	U	U		
VOLATILES	1,2-Dibromo-3-chloropropane	ug/L	2.5	U	U		2.5						1	U	U		1	1	U	U			1	U	U			1	U	U		
VOLATILES	1,2-Dibromoethane	ug/L	0.625	U	U		2.5						0.25	U	U		1	0.25	U	U			0.25	U	U			0.25	U	U		
VOLATILES	1,2-Dichlorobenzene	ug/L	0.313	U	U		2.5						0.125	U	U		1	0.125	U	U			0.125	U	U			0.125	U	U		
VOLATILES	1,2-Dichloroethane	ug/L	0.625	U	U		2.5						0.25	U	U		1	0.25	U	U			2.39					0.25	U	U		
VOLATILES	1,2-Dichloropropane	ug/L	0.5	U	U		2.5						0.2	U	U		1	0.2	U	U			0.2	U	U			0.2	U	U		
VOLATILES	1,2-Dimethylbenzene (o-Xylene)	ug/L	0.625	U	U		2.5						0.25	U	U		1	0.25	U	U			0.25	U	U			0.25	U	U		
VOLATILES	1,3,5-Trimethylbenzene	ug/L	0.625	U	U		2.5						0.25	U	U		1	0.25	U	U			0.25	U	U			0.25	U	U		
VOLATILES	1,3-Dichlorobenzene	ug/L	0.625	U	U		2.5						0.25	U	U		1	0.25	U	U			0.25	U	U			0.25	U	U		
VOLATILES	1,3-Dichloropropane	ug/L	0.5	U	U		2.5						0.2	U	U		1	0.2	U	U			0.2	U	U			0.2	U	U		
VOLATILES	1,4-Dichlorobenzene	ug/L	0.313	U	U		2.5						0.125	U	U		1	0.125	U	U			0.125	U	U			0.125	U	U		
VOLATILES	2,2-Dichloropropane	ug/L	0.625	U	U		2.5						0.25	U	U		1	0.25	U	U			0.25	U	U			0.25	U	U		
VOLATILES	2-Butanone	ug/L	6.25	U	U		2.5						2.5	U	U		1	2.5	U	U			2.5	U	U			2.5	U	U		
VOLATILES	2-Chloroethyl vinyl ether	ug/L	5	U	U		2.5						2	U	U		1	2	U	U			2	U	U			2	U	U		
VOLATILES	2-Chlorotoluene	ug/L	0.313	U	U		2.5						0.125	U	U		1	0.125	U	U			0.125	U	U			0.125	U	U		
VOLATILES	2-Hexanone	ug/L	6.25	U	U		2.5						2.5	U	U		1	2.5	U	U			2.5	U	U			2.5	U	U		
VOLATILES	4-Chlorotoluene	ug/L	0.625	U	U		2.5						0.25	U	U		0	0.25	U	U			0.25	U	U			0.25	U	U		
VOLATILES	Acetone	ug/L	6.25	U	U		2.5						2.5	U	U		1	2.5	U	U			2.5	U	U			2.5	U	U		
VOLATILES	Benzene	ug/L	0.313	U	U		2.5						0.125	U	U		1	0.125	U	U			0.125	U	U			0.125	U	U		
VOLATILES	Bromobenzene	ug/L	0.313	U	U		2.5						0.125	U	U		1	0.125	U	U			0.125	U	U			0.125	U	U		
VOLATILES	Bromochloromethane	ug/L	0.5	U	U		2.5						0.2	U	U		1	0.2	U	U			0.2	U	U			0.2	U	U		
VOLATILES	Bromodichloromethane	ug/L	0.625	U	U		2.5						0.25	U	U		1	0.25	U	U			0.25	U	U			0.25	U	U		
VOLATILES	Bromoform	ug/L	1.25	U	U		2.5						0.5	U	U		1	0.5	U	U			0.5	U	U			0.5	U	U		
VOLATILES	Bromomethane	ug/L	1.25	U	U		2.5						0.5	U	U		1	0.5	U	U			0.5	U	U			0.5	U	U		

Table C-2
Additional Sample Results - Groundwater - 2010

		Location Code	LHSMW54					LHSMW60					LHSMW60					48WW01					67WW06					LHSMW61				
		Sample Date	6-Aug-10					22-Jun-10					30-Aug-10					7-Aug-10					6-Aug-10					6-Aug-10				
		Sample No	LHSMW54-100806					47-LHSMW60-102206					LHSMW60-100830					48WW01-100807					67WW06-100806					LHSMW61-100806				
		Sample Purpose	REG					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	Result	Qual	ValQual	RC	DF
VOLATILES	Carbon disulfide	ug/L	1.25	U	U		2.5						0.5	U	U		1	0.5	U	U			0.5	U	U			0.5	U	U		
VOLATILES	Carbon tetrachloride	ug/L	0.625	U	U		2.5						0.25	U	U		1	0.25	U	U			0.25	U	U			0.25	U	U		
VOLATILES	Chlorobenzene	ug/L	0.313	U	U		2.5						0.125	U	U		1	0.125	U	U			0.125	U	U			0.125	U	U		
VOLATILES	Chloroethane	ug/L	1.25	U	U		2.5						0.5	U	U		1	0.5	U	U			0.5	U	U			0.5	U	U		
VOLATILES	Chloroform	ug/L	0.313	U	U		2.5						0.125	U	U		1	0.125	U	U			0.125	U	U			0.125	U	U		
VOLATILES	Chloromethane	ug/L	1.25	U	U		2.5						0.5	U	U		1	0.5	U	U			0.5	U	U			0.5	U	U		
VOLATILES	cis-1,2-Dichloroethene	ug/L	0.657	J	J		2.5						0.25	U	U		1	0.25	U	U			0.25	U	U			0.25	U	U		
VOLATILES	cis-1,3-Dichloropropene	ug/L	0.625	U	U		2.5						0.25	U	U		1	0.25	U	U			0.25	U	U			0.25	U	U		
VOLATILES	Dibromochloromethane	ug/L	0.625	U	U		2.5						0.25	U	U		1	0.25	U	U			0.25	U	U			0.25	U	U		
VOLATILES	Dibromomethane	ug/L	0.625	U	U		2.5						0.25	U	U		1	0.25	U	U			0.25	U	U			0.25	U	U		
VOLATILES	Dichlorodifluoromethane	ug/L	0.625	U	U		2.5						0.25	U	U		1	0.25	U	U			0.25	U	U			0.25	U	U		
VOLATILES	Ethylbenzene	ug/L	0.625	U	U		2.5						0.25	U	U		1	0.25	U	U			0.25	U	U			0.25	U	U		
VOLATILES	Hexachlorobutadiene	ug/L	0.625	U	U		2.5						0.25	U	U		1	0.25	U	U			0.25	U	U			0.25	U	U		
VOLATILES	Isopropylbenzene	ug/L	0.625	U	U		2.5						0.25	U	U		1	0.25	U	U			0.25	U	U			0.25	U	U		
VOLATILES	m,p-Xylenes	ug/L	1.25	U	U		2.5						0.5	U	U		1	0.5	U	U			0.5	U	U			0.5	U	U		
VOLATILES	Methyl isobutyl ketone	ug/L	6.25	U	U		2.5						2.5	U	U		1	2.5	U	U			2.5	U	U			2.5	U	U		
VOLATILES	Methylene chloride	ug/L	0.876	J	U-EB		2.5						0.25	U	U		1	0.25	U	U			0.25	U	U			0.25	U	U		
VOLATILES	Naphthalene	ug/L	0.5	U	U		2.5						0.2	U	U		1	0.2	U	U			0.2	U	U			0.2	U	U		
VOLATILES	n-BUTYLBENZENE	ug/L	0.625	U	U		2.5						0.25	U	U		1	0.25	U	U			0.25	U	U			0.25	U	U		
VOLATILES	n-PROPYLBENZENE	ug/L	0.313	U	U		2.5						0.125	U	U		1	0.125	U	U			0.125	U	U			0.125	U	U		
VOLATILES	p-ISOPROPYLTOLUENE	ug/L	0.625	U	U		2.5						0.25	U	U		1	0.25	U	U			0.25	U	U			0.25	U	U		
VOLATILES	sec-BUTYLBENZENE	ug/L	0.625	U	U		2.5						0.25	U	U		1	0.25	U	U			0.25	U	U			0.25	U	U		
VOLATILES	Styrene	ug/L	0.313	U	U		2.5						0.125	U	U		1	0.125	U	U			0.125	U	U			0.125	U	U		
VOLATILES	tert-BUTYLBENZENE	ug/L	0.625	U	U		2.5						0.25	U	U		1	0.25	U	U			0.25	U	U			0.25	U	U		
VOLATILES	Tetrachloroethene	ug/L	0.625	U	U		2.5						0.25	U	U		1	0.25	U	U			0.25	U	U			0.25	U	U		
VOLATILES	Toluene	ug/L	0.625	U	U		2.5						0.25	U	U		1	0.25	U	U			0.25	U	U			0.25	U	U		
VOLATILES	trans-1,2-Dichloroethene	ug/L	0.625	U	U		2.5						0.25	U	U		1	0.25	U	U			0.25	U	U			0.25	U	U		
VOLATILES	trans-1,3-Dichloropropene	ug/L	1.25	U	U		2.5						0.5	U	U		1	0.5	U	U			0.5	U	U			0.5	U	U		
VOLATILES	Trichloroethene	ug/L	369				2.5						0.25	U	U		1	0.25	U	U			0.25	U	U			0.25	U	U		
VOLATILES	Trichlorofluoromethane	ug/L	0.625	U	U		2.5						0.664	J	J		1	0.25	U	U			0.25	U	U			0.25	U	U		
VOLATILES	Vinyl acetate	ug/L	6.25	U	U		2.5						2.5	U	U		1	2.5	U	U			2.5	U	U			2.5	U	U		
VOLATILES	Vinyl chloride	ug/L	0.625	U	U		2.5						0.25	U	U		1	0.25	U	U			0.25	U	U			0.25	U	U		

Table C-2
Additional Sample Results - Groundwater - 2010

Notes:

* Sample Number reads yy/dd/mm

µg/L	micrograms per liter
DF	Dilution Factor
FD	Field Duplicate Sample
mg/L	milligrams per liter
RC	Reason Code
REG	Regular Sample

Qual	Data qualifier applied by the laboratory
ValQual	Data qualifier applied by the data validator

EB	Equipment blank contamination
H	Bias in sample result likely to be high
I	Indeterminate
J	The analyte was positively identified; the reported value is the estimated concentration of the constituent detected in the sample analyzed.
L	Bias in sample result likely to be low
LCS	Laboratory control sample evaluation criteria not met
M	Matrix spike/matrix spike duplicate accuracy and/or precision criteria not met
MB	Method blank or preparation blank contamination
R	Rejected: The data are unusable.
TB	Trip blank contamination
U	Not detected. The analyte was analyzed for, but not detected above the associated reporting limit.

Table C-3
Additional Sample Results – Soil – 2010

Location Code	Sample Date	Sample No	Sample Purpose	Sample Depth	Perchlorate (mg/kg)	Qual	ValQual	RC	DF
47SB-25D-01	16-Aug-10	47SB-25D-01(0-2)	REG	0-2 FT	0.127				2
47SB-25D-01	16-Aug-10	47SB-25D-01(4-6)	REG	4-6 FT	0.0976				1
47SB-25D-01	13-Aug-10	47SB-25D-01(9-11)	REG	9-11 FT	0.0135				1
47SB-25D-01	16-Aug-10	47SB-25D-01(GWVZ)	REG	23-25 FT	2.76				100
47SB-25D-02	13-Aug-10	47SB-25D-02(0-2)	REG	0-2 FT	0.00399				1
47SB-25D-02	13-Aug-10	47SB-25D-02(4-6)	REG	4-6 FT	0.00117	U	U		1
47SB-25D-02	13-Aug-10	47SB-25D-02(9-11)	REG	9-11 FT	0.00245				1
47SB-25D-02	13-Aug-10	47-SB-25D-02(GWVZ)	REG	20-22 FT	0.0225				1
47SB-25D-03	16-Aug-10	47SB-25D-03(0-2)	REG	0-2 FT	0.00115	U	U		1
47SB-25D-03	16-Aug-10	47SB-25D-03(4-6)	REG	4-6 FT	0.00118	U	U		1
47SB-25D-03	13-Aug-10	47SB-25D-03(9-11)	REG	9-11 FT	0.00113	U	U		1
47SB-25D-03	16-Aug-10	47SB-25D-03(GWVZ)	REG	17-19 FT	0.00115	U	U		1
47SB-25D-04	16-Aug-10	47SB-25D-04(0-2)	REG	0-2 FT	0.0121				1
47SB-25D-04	16-Aug-10	47SB-25D-04(4-6)	REG	4-6 FT	0.0184				1
47SB-25D-04	13-Aug-10	47SB-25D-04(9-11)	REG	9-11 FT	0.0289				1
47SB-25D-04	16-Aug-10	47SB-25D-04(GWVZ)	REG	13-15 FT	2.57				100
47SB-25D-05	16-Aug-10	47SB-25D-05(0-2)	REG	0-2 FT	0.139				2
47SB-25D-05	16-Aug-10	47SB-25D-05(4-6)	REG	4-6 FT	0.00109	U	U		1
47SB-25D-05	13-Aug-10	47SB-25D-05(9-11)	REG	9-11 FT	0.00175	J	J		1
47SB-25D-05	16-Aug-10	47SB-25D-05(GWVZ)	REG	11-13 FT	4.61				100
47SB-A01	24-Aug-10	47SB-A01(0-2)	REG	0-2 FT	0.00125	U	U		1
47SB-A01	24-Aug-10	47SB-A01(4-6)	REG	4-6 FT	0.00107	U	U		1
47SB-A01	24-Aug-10	47SB-A01(9-11)	REG	9-11 FT	0.00119	U	U		1
47SB-A01	24-Aug-10	47SB-A01(GWVZ)	REG	13-14 FT	0.00317				1
47SB-A03	24-Aug-10	47SB-A03(0-2)	REG	0-2 FT	0.00106	U	U		1
47SB-A03	24-Aug-10	47SB-A03(4-6)	REG	4-6 FT	0.00109	U	U		1
47SB-A03	24-Aug-10	47SB-A03(9-11)	REG	9-11 FT	0.00125	U	U		1
47SB-A03	24-Aug-10	47SB-A03(GWVZ)	REG	14-15 FT	0.00118	U	U		1
47SB-A05	25-Aug-10	47SB-A05(0-2)	REG	0-2 FT	0.00102	U	U		1
47SB-A05	25-Aug-10	47SB-A05(4-6)	REG	4-6 FT	0.00108	U	U		1
47SB-A05	25-Aug-10	47SB-A05(9-11)	REG	9-11 FT	0.00119	U	U		1
47SB-A05	25-Aug-10	47SB-A05(GWVZ)	REG	12.5-13.5 FT	0.00122	U	U		1
47SB-A07	25-Aug-10	47SB-A07(0-2)	REG	0-2 FT	0.00109	U	U		1
47SB-A07	25-Aug-10	47SB-A07(GWVZ)	REG	4-6 FT	0.00122	U	U		1
47SB-A09	25-Aug-10	47SB-A09(0-2)	REG	0-2 FT	0.00107	U	U		1
47SB-A09	25-Aug-10	47SB-A09(4-6)	REG	4-6 FT	0.00106	U	U		1
47SB-A09	25-Aug-10	47SB-A09(GWVZ)	REG	9-11 FT	0.00114	U	U		1
47SB-B10	21-Sep-10	47SB-B10(12-13)	REG	12-13 FT	17.1				1000
47SB-C01	20-Aug-10	47SB-C01(0-2)	REG	0-2 FT	0.00112	U	U		1
47SB-C01	20-Aug-10	DUP-02-100820	FD	0-2 FT	0.00117	U	U		1
47SB-C01	20-Aug-10	47SB-C01(4-6)	REG	4-6 FT	0.0392				1
47SB-C01	20-Aug-10	47SB-C01(GWVZ)	REG	9-10 FT	0.00115	U	U		1
47SB-C02	20-Sep-10	47SB-C02 [0-2]	REG	0-2 FT	0.00456				1
47SB-C02	20-Sep-10	47SB-C02 [4-6]	REG	4-6 FT	0.00136	J	J		1
47SB-C02	20-Sep-10	47SB-C02 [6-7]	REG	6-7 FT	0.00112	U	U		1
47SB-C03	20-Aug-10	47SB-C03(0-2)	REG	0-2 FT	0.0184				1
47SB-C03	20-Aug-10	47SB-C03(4-6)	REG	4-6 FT	0.0642				1
47SB-C03	20-Aug-10	47SB-C03(9-11)	REG	9-11 FT	0.00121	U	U		1
47SB-C03	20-Aug-10	47SB-C03(GWVZ)	REG	13-14 FT	0.0207				1
47SB-C05	20-Aug-10	47SB-C05(0-2)	REG	0-2 FT	0.00105	U	U		1
47SB-C05	20-Aug-10	DUP-03-100820	FD	0-2 FT	0.00107	U	U		1
47SB-C05	20-Aug-10	47SB-C05(4-6)	REG	4-6 FT	0.00112	U	U		1
47SB-C05	20-Aug-10	47SB-C05(9-11)	REG	9-11 FT	0.0011	U	U		1
47SB-C07	25-Aug-10	47SB-C07(0-2)	REG	0-2 FT	0.00131	U	U		1
47SB-C07	25-Aug-10	47SB-C07(4-6)	REG	4-6 FT	0.00119	U	U		1
47SB-C07	25-Aug-10	47SB-C07(9-11)	REG	9-11 FT	0.00117	U	U		1
47SB-C07	25-Aug-10	47SB-C07(GWVZ)	REG	13-14 FT	0.00111	U	U		1

Table C-3
Additional Sample Results – Soil – 2010

Location Code	Sample Date	Sample No	Sample Purpose	Sample Depth	Perchlorate (mg/kg)	Qual	ValQual	RC	DF
47SB-C09	26-Aug-10	47SB-C09(0-2)	REG	0-2 FT	0.00108	U	U		1
47SB-C09	26-Aug-10	47SB-C09(4-6)	REG	4-6 FT	0.00201				1
47SB-C09	26-Aug-10	47SB-C09(GWVZ)	REG	9-11 FT	0.00336		JI	M	1
47SB-C09	27-Aug-10	DUP-05-100827	FD	9-11 FT	0.00512				1
47SB-C11	26-Aug-10	47SB-C11(0-2)	REG	0-2 FT	0.00132	J	J		1
47SB-C11	26-Aug-10	47SB-C11(4-6)	REG	4-6 FT	0.00104	U	U		1
47SB-C11	26-Aug-10	47SB-C11(9-11)	REG	9-11 FT	0.00832				1
47SB-C11	26-Aug-10	47SB-C11(GWVZ)	REG	12.5-13.5 FT	3.55				1000
47SB-C11	27-Aug-10	DUP-06-100827	FD	12.5-13.5 FT	5.59				100
47SB-D08	21-Sep-10	47SB-D08(0-2)	REG	0-2 FT	0.0133				1
47SB-D08	21-Sep-10	47SB-D08(4-6)	REG	4-6 FT	0.00109	U	U		1
47SB-D08	21-Sep-10	47SB-D08(6-7)	REG	6-7 FT	0.0011	U	U		1
47SB-D09	21-Sep-10	47SB-D09(0-2)	REG	0-2 FT	0.00104	U	U		1
47SB-D09	21-Sep-10	47SB-D09(4-6)	REG	4-6 FT	0.00119	U	U		1
47SB-E01	20-Aug-10	47SB-E01(0-2)	REG	0-2 FT	0.0072				1
47SB-E01	20-Aug-10	47SB-E01(4-6)	REG	4-6 FT	0.00121	U	U		1
47SB-E01	20-Aug-10	47SB-E01(GWVZ)	REG	9-10 FT	0.00176	J	J		1
47SB-E02	20-Sep-10	47SB-E02 (0-2)	REG	0-2 FT	0.0183				1
47SB-E02	20-Sep-10	47SB-E02 (4-6)	REG	4-6 FT	0.00123	U	U		1
47SB-E02	20-Sep-10	47SB-E02 (8-9)	REG	8-9 FT	1.65				1
47SB-E03	20-Aug-10	47SB-E03(0-2)	REG	0-2 FT	0.00109	U	U		1
47SB-E03	20-Aug-10	47SB-E03(4-6)	REG	4-6 FT	0.00115	U	U		1
47SB-E03	20-Aug-10	47SB-E03(GWVZ)	REG	9-10 FT	0.00118	U	U		1
47SB-E05	20-Aug-10	47SB-E05(0-2)	REG	0-2 FT	0.00108	U	U		1
47SB-E05	20-Aug-10	DUP-04-100820	FD	0-2 FT	0.00107	J	J		1
47SB-E05	20-Aug-10	47SB-E05(4-6)	REG	4-6 FT	0.00111	U	U		1
47SB-E05	20-Aug-10	47SB-E05(GWVZ)	REG	8-9 FT	0.00292				1
47SB-E06	20-Sep-10	47SB-E06 (0-2)	REG	0-2 FT	0.00392				1
47SB-E06	20-Sep-10	47SB-E06 (4-6)	REG	4-6 FT	0.00177	J	J		1
47SB-E06	20-Sep-10	47SB-E06 (8-10)	REG	8-10 FT	0.00122	U	U		1
47SB-E07	26-Aug-10	47SB-E07(0-2)	REG	0-2 FT	0.0011	U	U		1
47SB-E07	26-Aug-10	47SB-E07(GWVZ)	REG	4-6 FT	0.00114	U	U		1
47SB-E07	27-Aug-10	DUP-08-100827	FD	4-6 FT	0.00114	U	U		1
47SB-E08	20-Sep-10	47SB-E08 (0-2)	REG	0-2 FT	0.0011	U	U		1
47SB-E08	20-Sep-10	47SB-E08 (4-6)	REG	4-6 FT	0.00111	U	U		1
47SB-E09	26-Aug-10	47SB-E09(0-2)	REG	0-2 FT	0.00122	U	U		1
47SB-E09	26-Aug-10	47SB-E09(4-6)	REG	4-6 FT	0.00109	U	U		1
47SB-E09	26-Aug-10	47SB-E09(GWVZ)	REG	11-12 FT	0.00117	U	U		1
47SB-E09	27-Aug-10	DUP-07-100827	FD	11-12 FT	0.00412				1
47SB-F03	20-Sep-10	47SB-F03 (0-2)	REG	0-2 FT	0.00617				1
47SB-F03	20-Sep-10	47SB-F03 (4-6)	REG	4-6 FT	0.00115	U	U		1
47SB-F03	20-Sep-10	47SB-F03 (9-11)	REG	9-11 FT	0.00142	J	J		1
47SB-F03	20-Sep-10	47SB-F03 (12-13)	REG	12-13 FT	0.108				1
47SB-F04	20-Sep-10	47SB-F04 (0-2)	REG	0-2 FT	1.45				1
47SB-F04	20-Sep-10	47SB-F04 (4-6)	REG	4-6 FT	20.9				1
47SB-F04	20-Sep-10	47SB-F04 (9-11)	REG	9-11 FT	0.00946				1
47SB-F06	20-Sep-10	47SB-F06 (0-2)	REG	0-2 FT	0.0011	U	U		1
47SB-F06	20-Sep-10	47SB-F06 (4-6)	REG	4-6 FT	0.00567				1
47SB-F06	20-Sep-10	47SB-F06 (8-10)	REG	8-10 FT	0.00115	U	U		1
47SB-F07	20-Sep-10	47SB-F07 (0-2)	REG	0-2 FT	0.00267				1
47SB-F07	20-Sep-10	47SB-F07 (4-6)	REG	4-6 FT	0.0017	J	J		1
47SB-G05	26-Aug-10	47SB-G05(0-2)	REG	0-2 FT	0.00178	J	J		1
47SB-G05	26-Aug-10	47SB-G05(4-6)	REG	4-6 FT	0.0022				1
47SB-G05	26-Aug-10	47SB-G05(9-11)	REG	9-11 FT	0.00112	U			1
47SB-G05	26-Aug-10	47SB-G05(GWVZ)	REG	11-12 FT	0.00121	U	U		1
47SB-G07	26-Aug-10	47SB-G07(0-2)	REG	0-2 FT	0.00111	U	U		1
47SB-G07	26-Aug-10	47SB-G07(4-6)	REG	4-6 FT	0.00119	U	U		1

Table C-3
Additional Sample Results – Soil – 2010

Location Code	Sample Date	Sample No	Sample Purpose	Sample Depth	Perchlorate (mg/kg)	Qual	ValQual	RC	DF
47SB-G07	26-Aug-10	47SB-G07(9-11)	REG	9-11 FT	0.0012	U			1
47SB-G07	27-Aug-10	DUP-09-100827	FD	9-11 FT	0.00121	U	U		1
47SB-G07	26-Aug-10	47SB-G07(GWVZ)	REG	14-15 FT	0.00118	U	U		1
47SB-H04	17-Sep-10	47SB-H04 (0-2)	REG	0-2 FT	0.0133				1
47SB-H04	17-Sep-10	47SB-H04 (4-6)	REG	4-6 FT	0.00116	U	U		1
47SB-H04	17-Sep-10	47SB-H04 (9-11)	REG	9-11 FT	0.00111	U	U		1
47SB-H04	17-Sep-10	47SB-H04 (12-13)	REG	12-13 FT	0.603				1
47SB-H04	17-Sep-10	DUP02-100917	FD	12-13 FT	0.451				1
47SB-H06	17-Sep-10	47SB-H06 (4-6)	REG	4-6 FT	0.157				1
47SB-H06	17-Sep-10	47SB-H06 (9-11)	REG	9-11 FT	7.28				1
47SB-H06	17-Sep-10	47SB-H06 (20-21)	REG	20-21 FT	2.74				1
47SB-H06	17-Sep-10	DUP03-100917	FD	20-21 FT	2.62				1
47SB-H07	17-Sep-10	47SB-H07 (0-2)	REG	0-2 FT	0.00119	J			1
47SB-H07	17-Sep-10	47SB-H07 (4-6)	REG	4-6 FT	0.00119	U	U		1
47SB-H07	17-Sep-10	47SB-H07 (9-11)	REG	9-11 FT	0.00111	U	U		1
47SB-H07	17-Sep-10	47SB-H07 (18-19)	REG	18-19 FT	3.06		JI	FD	1
47SB-H07	17-Sep-10	DUP04-100917	FD	18-19 FT	0.91		JI	FD	1
47SB-H08	17-Sep-10	47SB-H08 (0-2)	REG	0-2 FT	0.00115	U			1
47SB-H08	17-Sep-10	47SB-H08 (4-6)	REG	4-6 FT	0.00117	U	U		1
47SB-H08	17-Sep-10	47SB-H08 (9-11)	REG	9-11 FT	0.00114	U	U		1
47SB-H08	17-Sep-10	47SB-H08 (14-15)	REG	14-15 FT	0.221				1
47SB-H08	17-Sep-10	DUP05-100917	FD	14-15 FT	0.324				1
47SB-I03	27-Aug-10	47SB-I03(0-2)	REG	0-2 FT	0.00703				1
47SB-I03	27-Aug-10	47SB-I03(4-6)	REG	4-6 FT	1.31				100
47SB-I05	26-Aug-10	47SB-I05(0-2)	REG	0-2 FT	0.00111	U	U		1
47SB-I05	26-Aug-10	47SB-I05(4-6)	REG	4-6 FT	0.00105	U	U		1
47SB-I05	26-Aug-10	47SB-I05(GWVZ)	REG	9-10 FT	0.00108	U	U		1
47SB-I05	27-Aug-10	DUP-10-100827	FD	9-10 FT	0.00185	J	J		1
47SB-I07	26-Aug-10	47SB-I07(0-2)	REG	0-2 FT	0.00104	U	U		1
47SB-I07	26-Aug-10	47SB-I07(4-6)	REG	4-6 FT	0.202				10
47SB-I07	26-Aug-10	47SB-I07(GWVZ)	REG	13.5-14.5 FT	1.2				100
47SB-J03	20-Sep-10	47SB-J03 (0-2)	REG	0-2 FT	0.0928				1
47SB-J03	20-Sep-10	47SB-J03 (4.5-6.5)	REG	4.5-6.5 FT	0.00112	U	U		1
47SB-J05	17-Sep-10	47SB-J05 (0-2)	REG	0-2 FT	0.0212				1
47SB-J05	17-Sep-10	47SB-J05 (4-6)	REG	4-6 FT	0.00119	U	U		1
47SB-J05	17-Sep-10	47SB-J05 (9-11)	REG	9-11 FT	0.00274				1
47SB-J05	17-Sep-10	47SB-J05 (17.5-18.5)	REG	17.5-18.5 FT	0.521				10
47SB-J05	17-Sep-10	DUP01-100917	FD	17.5-18.5 FT	0.459				10
47SB-J06	20-Sep-10	47SB-J06 (0-2)	REG	0-2 FT	0.00945				1
47SB-J06	20-Sep-10	47SB-J06 (4-6)	REG	4-6 FT	0.00389				1
47SB-J06	20-Sep-10	47SB-J06 (9-11)	REG	9-11 FT	0.0111				1
47SB-J06	20-Sep-10	47SB-J06 (11-12)	REG	11-12 FT	0.00688		JI	M	1
47SB-K03	26-Aug-10	47SB-K03(0-2)	REG	0-2 FT	0.0367				1
47SB-K03	26-Aug-10	47SB-K03(4-6)	REG	4-6 FT	0.00713				1
47SB-K03	26-Aug-10	47SB-K03(9-11)	REG	9-11 FT	0.0253				1
47SB-K03	26-Aug-10	47SB-K03(GWVZ)	REG	20.5-21.5 FT	2.29				100
47SB-K05	26-Aug-10	47SB-K05(0-2)	REG	0-2 FT	0.00119	J	J		1
47SB-K05	26-Aug-10	47SB-K05(4-6)	REG	4-6 FT	0.00118	U	U		1
47SB-K05	26-Aug-10	47SB-K05(9-11)	REG	9-11 FT	0.0437				1
47SB-K05	26-Aug-10	47SB-K05(GWVZ)	REG	21.5-22.5 FT	0.573				10
47SB-K07	26-Aug-10	47SB-K07(0-2)	REG	0-2 FT	0.0023				1
47SB-K07	26-Aug-10	47SB-K07(4-6)	REG	4-6 FT	0.00613				1
47SB-K07	26-Aug-10	47SB-K07(9-11)	REG	9-11 FT	0.00923				1
47SB-K07	26-Aug-10	47SB-K07(GWVZ)	REG	18-19 FT	0.00903				1

Table C-3
Additional Sample Results – Soil – 2010

Notes:

* Duplicate Sample Number reads yy/dd/mm

DF	Dilution Factor
FD	Field Duplicate Sample
FT	Foot
GWVZ	Groundwater/Vadose Zone
mg/kg	milligrams per kilogram
RC	Reason Code
REG	Regular Sample
Qual	Data qualifier applied by the laboratory
ValQual	Data qualifier applied by the data validator

J	The analyte was positively identified; the reported value is the estimated concentration of the constituent detected in the sample analyzed.
I	Indeterminate
M	Matrix spike/matrix spike duplicate accuracy and/or precision criteria not met
U	Not detected. The analyte was analyzed for, but not detected above the associated reporting limit.

Table C-4
Construction Information for New Wells Since 2007

Zone	Location	Coordinates		Elevations		Boring	Well Screen		Date	Material	Description
		Northing	Easting	Ground	TOC	Depth	Top	Bottom			
Shallow - Intermediate	47WW32	6961495	3311346	191.1	193.82	35.0	25.0	35.0	13-Sep-07	2" PVC	Monitoring Well
Shallow - Intermediate	47WW33	6961743	3312137	178.9	181.58	35.0	25.0	35.0	9-Feb-08	4" PVC	Monitoring Well
Shallow	47DPT01	6957622	3308920	198.4	199.21	19.5	9.5	19.5	13-Aug-10	1" PVC	Temporary Well
Shallow	47DPT02	6959302	3308305	203.0	204.00	25.0	15.0	25.0	11-Aug-10	1" PVC	Temporary Well
Shallow	47DPT03	6959072	3309327	199.5	204.68	26.0	16.0	26.0	10-Aug-10	1" PVC	Temporary Well
Shallow	47DPT04	6959535	3309587	199.0	200.00	30.0	20.0	30.0	11-Aug-10	1" PVC	Temporary Well
Shallow	47DPT05	6958903	3310210	196.7	198.13	25.0	15.0	25.0	12-Aug-10	1" PVC	Temporary Well
Shallow	47DPT06	6959022	3310491	195.0	196.00	24.0	14.0	24.0	12-Aug-10	1" PVC	Temporary Well
Shallow	47DPT07	6961880	3311515	187.2	188.16	20.0	10.0	20.0	19-Aug-10	1" PVC	Temporary Well
Shallow	47DPT08	6961234	3311818	181.0	181.81	20.0	10.0	20.0	19-Aug-10	1" PVC	Temporary Well
Shallow	47DPT09	6960529	3311599	185.2	185.84	20.0	10.0	20.0	19-Aug-10	1" PVC	Temporary Well
Shallow	47DPT10	6960388	3312591	186.8	187.31	25.0	15.0	25.0	17-Aug-10	1" PVC	Temporary Well
Shallow	47DPT11	6959529	3312920	192.2	192.80	25.0	15.0	25.0	18-Aug-10	1" PVC	Temporary Well
Shallow	47DPT12	6959001	3312900	192.3	193.13	25.0	15.0	25.0	17-Aug-10	1" PVC	Temporary Well
Shallow	47DPT13	6957898	3309868	193.8	194.54	25.0	15.0	25.0	19-Aug-10	1" PVC	Temporary Well
Shallow	47DPT14	6959163	3307814	204.4	208.21	31.0	21.0	31.0	14-Sep-10	1" PVC	Temporary Well
Shallow	47DPT15	6959773	3310253	196.3	197.31	44.0	34.0	44.0	15-Sep-10	1" PVC	Temporary Well
Intermediate	47DPT10I	6960382	3312598	186.7	187.73	55.0	45.0	55.0	2-Sep-10	1" PVC	Temporary Well
Intermediate	47DPT11I	6959521	3312918	192.3	193.89	55.0	45.0	55.0	13-Sep-10	1" PVC	Temporary Well
Intermediate	47DPT12I	6959001	3312910	192.3	194.05	52.0	30.0	40.0	14-Sep-10	1" PVC	Temporary Well
Intermediate	47WW34	6959209	3311731	188.9	191.43	43.0	33.0	43.0	13-Feb-08	4" PVC	Monitoring Well
Intermediate	47WW35	6961283	3313119	187.1	189.90	47.0	37.0	47.0	26-Sep-08	4" PVC	Monitoring Well
Intermediate	47WW36	6960256	3314190	193.8	196.46	49.0	39.0	49.0	29-Sep-08	4" PVC	Monitoring Well
Intermediate	47WW37	6959208	3307829	204.9	207.87	66.0	56.0	66.0	25-Aug-10	2" PVC	Monitoring Well
Intermediate	47WW38	6957976	3309428	195.3	198.91	57.0	47.0	57.0	25-Aug-10	2" PVC	Monitoring Well

Notes:

TOC - top of casing

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

ANALYTICAL REPORT

Job Number: 680-46134-1

Job Description: Shaw Longhorn

For:
Microbac Laboratories, Inc.
158 Starlite Drive
Marietta, OH 45750

Attention: Ms. Stephanie Mossburg

Approved for release.
Bernard Kirkland
Project Manager I
4/8/2009 5:13 PM

Designee for
Sheila Hoffman
Project Manager I
sheila.hoffman@testamericainc.com
04/08/2009

The test results in this report meet NELAP requirements for parameters for which accreditation is required or available. Any exceptions to the NELAP requirements are noted. Results pertain only to samples listed in this report. This report may not be reproduced, except in full, without the written approval of the laboratory. Questions should be directed to the person who signed this report.

Savannah Certifications and ID #s: A2LA: 0399.01; AL: 41450; ARDEQ: 88-0692; ARDOH; CA: 03217CA; CO; CT: PH0161; DE; FL: E87052; GA: 803; Guam; HI; IL: 200022; IN; IA: 353; KS: E-10322; KY EPPC: 90084; KY UST; LA DEQ: 30690; LA DHH: LA080008; ME: 2008022; MD: 250; MA: M-GA006; MI: 9925; MS; NFESC: 249; NV: GA00006; NJ: GA769; NM; NY: 10842; NC DWQ: 269; NC DHHS: 13701; PA: 68-00474; PR: GA00006; RI: LAO00244; SC: 98001001; TN: TN0296; TX: T104704185; USEPA: GA00006; VT: VT-87052; VA: 00302; WA; WV DEP: 094; WV DHHR: 9950 C; WI DNR: 999819810; WY/EPAR8: 8TMS-Q

TestAmerica Laboratories, Inc.
TestAmerica Savannah 5102 LaRoche Avenue, Savannah, GA 31404
Tel (912) 354-7858 Fax (912) 352-0165 www.testamericainc.com

ACCREDITED IN ACCORDANCE WITH nelac

Job Narrative
680-J46134-1

Receipt
All samples were received in good condition within temperature requirements.

General Chemistry
Method(s) 314.0: Samples 680-46134-1, -2, -4, and -5 were analyzed at a dilutions of 1:4 due to the Matrix Conductivity Threshold of the instrument. The reporting limits have been adjusted accordingly

No other analytical or quality issues were noted.

METHOD / ANALYST SUMMARY

Client: Microbac Laboratories, Inc. Job Number: 680-46134-1

Method	Analyst	Analyst ID
EPA 314.0	Brazell, Connie	CB

SAMPLE SUMMARY

Client: Microbac Laboratories, Inc. Job Number: 680-46134-1

Lab Sample ID	Client Sample ID	Client Matrix	Date/Time Sampled	Date/Time Received
680-46134-1	47WW25-040309	Water	04/03/2009 1055	04/07/2009 1020
680-46134-2	LHSMW56-040309	Water	04/03/2009 1250	04/07/2009 1020
680-46134-3	50WW02-040309	Water	04/03/2009 1445	04/07/2009 1020
680-46134-4	50WW05-040409	Water	04/04/2009 0935	04/07/2009 1020
680-46134-5	50WW07-040409	Water	04/04/2009 1145	04/07/2009 1020

Analytical Data

Microbac Laboratories, Inc.
ATTN: Ms. Stephanie Mossburg

Job Number: 680-46134-1
Project: Shaw Longhorn
SDG Number: Shaw Longhorn

Client Sample ID: 47WW25-040309

Lab Sample ID: 680-46134-1
Client Matrix: Water

Date Sampled: 04/03/2009 10:55
Date Received: 04/07/2009 10:20

Test Method	CAS Number	Result	Q	Flag	MDL	MQL	SDL	Unit	Batch	Analysis Date/Time	D.F.	Analyst
Method: EPA 314.0,Water												
Perchlorate	14797-73-0	0.44	U		0.11	1.0	0.44	ug/L	134731	04/08/2009 14:20	4	CB

Analytical Data

Microbac Laboratories, Inc.
ATTN: Ms. Stephanie Mossburg

Job Number: 680-46134-1
Project: Shaw Longhorn
SDG Number: Shaw Longhorn

Client Sample ID: LHSMW56-040309

Lab Sample ID: 680-46134-2
Client Matrix: Water

Date Sampled: 04/03/2009 12:50
Date Received: 04/07/2009 10:20

Test Method	CAS Number	Result	Q	Flag	MDL	MQL	SDL	Unit	Batch	Analysis Date/Time	D.F.	Analyst
Method: EPA 314.0,Water												
Perchlorate	14797-73-0	0.44	U		0.11	1.0	0.44	ug/L	134731	04/08/2009 14:50	4	CB

Analytical Data

Microbac Laboratories, Inc.
ATTN: Ms. Stephanie Mossburg

Job Number: 680-46134-1
Project: Shaw Longhorn
SDG Number: Shaw Longhorn

Client Sample ID: 50WW02-040309

Lab Sample ID: 680-46134-3
Client Matrix: Water

Date Sampled: 04/03/2009 14:45
Date Received: 04/07/2009 10:20

Test Method	CAS Number	Result	Q	Flag	MDL	MQL	SDL	Unit	Batch	Analysis Date/Time	D.F.	Analyst
Method: EPA 314.0,Water												
Perchlorate	14797-73-0	110			0.11	1.0	0.22	ug/L	134731	04/08/2009 15:05	2	CB

Analytical Data

Microbac Laboratories, Inc.
ATTN: Ms. Stephanie Mossburg

Job Number: 680-46134-1
Project: Shaw Longhorn
SDG Number: Shaw Longhorn

Client Sample ID: 50WW05-040409

Lab Sample ID: 680-46134-4
Client Matrix: Water

Date Sampled: 04/04/2009 09:35
Date Received: 04/07/2009 10:20

Test Method	CAS Number	Result	Q	Flag	MDL	MQL	SDL	Unit	Batch	Analysis Date/Time	D.F.	Analyst
Method: EPA 314.0,Water												
Perchlorate	14797-73-0	0.44	U		0.11	1.0	0.44	ug/L	134731	04/08/2009 15:35	4	CB

Analytical Data

Microbac Laboratories, Inc.
ATTN: Ms. Stephanie Mossburg

Job Number: 680-46134-1
Project: Shaw Longhorn
SDG Number: Shaw Longhorn

Client Sample ID: 50WW07-040409

Lab Sample ID: 680-46134-5
Client Matrix: Water

Date Sampled: 04/04/2009 11:45
Date Received: 04/07/2009 10:20

Test Method	CAS Number	Result	Q	Flag	MDL	MQL	SDL	Unit	Batch	Analysis Date/Time	D.F.	Analyst
Method: EPA 314.0,Water												
Perchlorate	14797-73-0	0.44	U		0.11	1.0	0.44	ug/L	134731	04/08/2009 15:50	4	CB

DATA REPORTING QUALIFIERS

Client: Microbac Laboratories, Inc. Job Number: 680-46134-1

Lab Section	Qualifier	Description
HPLC		
	U	Indicates the analyte was analyzed for but not detected.

Quality Control Results

Client: Microbac Laboratories, Inc. Job Number: 680-46134-1

Method Blank - Batch: 680-134731

Method: 314.0
Preparation: N/A

Lab Sample ID: MB 680-134731/8	Analysis Batch: 680-134731	Instrument ID:	ICCS200 - H
Client Matrix: Water	Prep Batch: N/A	Lab File ID:	0011.d
Dilution: 1.0	Units: ug/L	Initial Weight/Volume:	
Date Analyzed: 04/08/2009 1235		Final Weight/Volume:	5 mL
Date Prepared: N/A		Injection Volume:	0.25 uL

Analyte	Result	Qual	MDL	RL
Perchlorate	0.11	U	0.11	1.0

Lab Control Spike/
Lab Control Spike Duplicate Recovery Report - Batch: 680-134731

Method: 314.0
Preparation: N/A

LCS Lab Sample ID: LCS 680-134731/11	Analysis Batch: 680-134731	Instrument ID:	ICCS200 - H
Client Matrix: Water	Prep Batch: N/A	Lab File ID:	0014.d
Dilution: 1.0	Units: ug/L	Initial Weight/Volume:	
Date Analyzed: 04/08/2009 1320		Final Weight/Volume:	5 mL
Date Prepared: N/A		Injection Volume:	0.25 uL

LCSD Lab Sample ID: LCSD 680-134731/19	Analysis Batch: 680-134731	Instrument ID:	ICCS200 - H
Client Matrix: Water	Prep Batch: N/A	Lab File ID:	0015.d
Dilution: 1.0	Units: ug/L	Initial Weight/Volume:	
Date Analyzed: 04/08/2009 1335		Final Weight/Volume:	5 mL
Date Prepared: N/A		Injection Volume:	0.25 uL

	% Rec.						
Analyte	LCS	LCSD	Limit	RPD	RPD Limit	LCS Qual	LCSD Qual
Perchlorate	98	95	85 - 115	3	15		

Calculations are performed before rounding to avoid round-off errors in calculated results.

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TestAmerica Savannah
TRRP Laboratory Data Package Cover Page
SDG / Log #: 68046134
Fraction: 314.0

This data package consists of this signature page, the Laboratory Review Checklist, and the following reportable data:

- ☑ Field chain-of-custody documentation
- ☑ Sample identification cross-reference
- ☑ Test reports (analytical data sheets) for each environmental sample that includes:
  - Items consistent with NELAC 5.13 or ISO/IEC 17025 Section 5.10
  - Dilution factors
  - Preparation methods
  - Clean-up methods
  - TICs (if required for the project)
- ☐ Surrogate recovery data including:
  - Calculated %R
  - Laboratory surrogate QC limits
- ☑ Test reports / Summary forms for blank samples
- ☑ Test reports / Summary forms for laboratory control samples (LCSs) including:
  - LCS spiking amounts
  - Calculated %R for each analyte
  - Laboratory LCS QC limits
- ☐ Test reports for project matrix spike/matrix spike duplicates (MS/MSD) including:
  - Samples associated with MS/MSD clearly identified
  - MS/MSD spiking amounts
  - Concentration of each MS/MSD analyte measured in the parent and spiked samples
  - Calculated %Rs and relative percent differences (RPD)
  - Laboratory MS/MSD QC limits
- ☐ Laboratory analytical duplicate (if applicable) recovery and precision
  - Amount of analyte measured in the duplicate
  - Calculated RPD
  - Laboratory QC limits for analytical duplicates
- ☑ List of method quantitation limits for each analyte for each method and matrix
- ☑ Other problems and anomalies
- ☑ The Exception Report for every "No" or "Not Reviewed (NR)" item in the 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 my signature below, I affirm to the best of my knowledge that all problems/anomalies observed by the laboratory as having 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.*

Bernard Kirkland	Bernard Kirkland	Director of Project Management	4/8/2009
Name (Printed)	Signature	Official Title	Date

FRP048:07.30.08:2

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

TestAmerica Savannah

TRRP Laboratory Review Checklist

SDG / Log #: 68046134/ 680-46134

Fraction: 314.0

Date: 04.08.09
Reviewer Name: C. Brazell
Prep Batch Numbers: 134731
Instrument ID: ICH

#[1]	A[2]	Description	Yes	No	NA[3]	NR[4]	ER#[5]
R1	OI (QA/PM)	**Chain-of-Custody (COC)**					
		Did each sample meet the laboratory's sample acceptance policy upon receipt? (This includes cooler temperatures, sample IDs, correct COC, etc.)	X				
		Are all sample receipt issues described in an exception report and noted in the case narrative?	X				
R2	OI (QA/PM)	**Sample and Quality Control (QC) Identification**					
		Are all field sample ID numbers cross-referenced to the laboratory ID numbers? (This information is included in the case narrative table and/or LIMS report.)	X				
		Are all laboratory ID numbers cross-referenced to the corresponding QC data? (This information is included on the forms and/or LIMS report.)	X				
R3	OI	**Test Reports**					
		Were all samples prepared within holding times?	X				
		Were all samples analyzed within holding times?	X				
		Were all hits >MQL (RL) within the instrument's calibration range?	X				
		If hits are not within the calibration range, have the data been flagged with the appropriate qualifiers and additional runs reported?			X		
		Were calculations reviewed by a peer or supervisor?	X				
		Were analyte identifications reviewed by a peer or supervisor?	X				
		Were sample quantitation limits reported for all undetected analytes? (This information is included on the forms and/or LIMS report.)	X				
		Were the 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, were TICs reported?			X		
R4	O	**Surrogate Recovery Data**					
		Were surrogates added prior to extraction, as required by the method?			X		
		Were all surrogate percent recoveries within the laboratory QC limits? (Note ANY failing surrogate in the Exception Report.)			X		
R5	OI	**Test Reports / Summary Forms for Blanks**					
		Were the 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 (RL)?	X				
R6	OI	**Laboratory Control Samples (LCS):**					
		Were all COCs included in the LCS? (Were full-list spikes used?)	X				
		Was each LCS taken through the entire analytical procedure, including preparation and, if applicable, cleanup steps?	X				
		Were LCSs analyzed at the required frequency?	X				
		Were LCS (and LCSD, if applicable) % Rs within laboratory QC limits? (Note ANY failing spike analyte in the Exception Report.)	X				
		If performed, was the LCSD %RPD within QC limits? (Note ANY failing spike analyte in the Exception Report.)			X		
R7	OI	**Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Datax**					
		Were the project/method specified analytes included in the MS and MSD?	X				
		Were the MS/MSD analyzed at the appropriate frequency?	X				
		Were MS/MSD %Rs within the laboratory QC limits? (Note ANY failing spike analyte in the Exception Report.)	X				
		Were MS/MSD RPDs within laboratory QC limits? (Note ANY failing spike analyte in the Exception Report.)	X				

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

TestAmerica Savannah
TRRP Laboratory Review Checklist

SDG / Log #: 68046134/ 680-46134
Fraction: 314.0

Date: 04.08.09
Reviewer Name: C. Brazell
Prep Batch Numbers: 134731
Instrument ID: ICH

#[1]	A[2]	Description	Yes	No	NA[3]	NR[4]	ER#[5]
R8	I	**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 (RLs) for each analyte included in the laboratory data package? (This information is included on the forms and/or LIMS report.)	X				
		Do the MQLs (RLs) correspond to the concentration of the lowest non-zero calibration standard, where applicable?	X				
		Have the unadjusted MQLs (RLs) been included in the laboratory data package? (This information is included on the forms and/or LIMS report.)	X				
R10	OI	**Other Problems/Anomalies**					
		Are all known problems, anomalies, and/or special conditions noted in the Laboratory Review Checklist and the Exception Report?	X				
		Were all necessary corrective actions performed for the reported data?	X				
		Was applicable and available technology used to lower the SQL (RL) to minimize the matrix interference effects on the sample results, as applicable?	X				
S1	OI	**Initial Calibration (ICAL)**					
		Were response factors and/or relative response factors for each analyte within QC limits?	X				
		Were percent RSD or correlation coefficient criteria met? (Note ANY use of Grand Mean in the Exception Report.)	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? (Note any ICV outliers in the Exception Report.)	X				
S2	OI	**Initial & Continuing Calibration Verification (ICCV & CCV)**					
		Was the CCV analyzed at the method-required frequency?	X				
		Were percent differences for each analyte within the method-required QC limits? (Note ANY use of Grand Mean in the Exception Report.)	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	OI	**Internal Standards (IS):**					
		Were IS area counts within the method-required QC limits?			X		
		Were IS retention times within the method-required QC limits?			X		
S5	OI	**Raw Data**					
		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				1
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				
S9	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		2

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

TestAmerica Savannah
TRRP Laboratory Review Checklist

SDG / Log #: 68046134/ 680-46134
Fraction: 314.0

Date: 04.08.09
Reviewer Name: C. Brazell
Prep Batch Numbers: 134731
Instrument ID: ICH

#[1]	A[2]	Description	Yes	No	NA[3]	NR[4]	ER#[5]
S10	OI	**Method Detection Limit (MDL) Studies**					
		Has an MDL study been performed for each analyte?	X				
		Has a DCS been performed for each analyte within the last 3 months? (If not, then list the estimated completion date in the Exception Report.)	X				
		Does the DCS meet the acceptance criteria and support the MDL?	X				
		If the DCS does not meet criteria, has the associated MDL been raised to the appropriate level?	X				
S11	OI	**Proficiency Test Reports:**					
		Has the laboratory participated in the applicable proficiency tests or evaluation studies?	X				
S12	OI	**Standards Documentation**					
		Are all standards used 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)**					
		Has a DOC been performed as is consistent with NELAC Chapter 5C or ISO/IEC 4 for each analyst and analyte associated with this analysis?	X				
		Is documentation of the analyst's competency up-to-date and on file?	X				
S15	OI	**Verification / Validation Documentation for Methods**					
		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; PM = Project Management; QA = Quality Assurance
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).

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

TestAmerica Savannah
TRRP Laboratory Review Checklist

SDG / Log #: **68046134/ 680-46134**
Fraction: **314.0**

Date: 04.08.09
Reviewer Name: C. Brazell
Prep Batch Numbers: 134731
Instrument ID: ICH

Exception Reports

ER #[1]	DESCRIPTION
1	Samples 680-46134-3- required a manual integration due to an unresolved baseline.
2	Samples 680-46134-1, 2, 3 ,4, and 5 required a dilution due to the matrix conductivity threshold of the instrument. The reporting limit has been adjusted accordingly.
3	
4	

1. ER# = Exception Report identification number (an Exception Report should be completed for an item if "NR" or "No" is checked on the LCR).

Shaw Environmental & Infrastructure, Inc.
3010 Briarpark Drive, Suite 400
Houston, TX 77042

Laboratory Name: TestAmerica
Address : 5102 LaRoche Ave., Savannah, GA 31404
Contact : Sheila Hoffman

Results To: Stephanie Mossburg (Microbac)

PM: Praveen Svrivastav (713.996.4588)
Project Contact: Jennifer Hoang
Project Name: LHAAP
Project #: 117591-0009A130

TAT: RUSH
Phone No: 713-996-4408
Site: 47/50
Location: Karnack, TX

RUSH 24 48 HOUR TAT

Sampler Print: ALLEN WILLMORE

Sampler Sign: [signature]

Sample Number	Grab	Date	Time	Matrix	# of Containers	PERCHLORATE (314.0)	Comments
47WW25 - 040309	X	4/3/09	10:35	Water	1	X	
LHSMW56 - 040309	X	4/3/09	12:50	Water	1	X	
50WW02 - 040309	X	4/3/09	14:45	Water	1	X	
50WW05 - 040409	X	4/4/09	09:35	Water	1	X	
50WW07 - 040409	X	4/4/09	11:45	Water	1	X	

Relinquished By: [signature]
Date/Time 4/6/09

Received By:
Date/Time

Special Instructions: 24-hour TAT

680-46134
0.8°C

Relinquished By:
Date/Time

Received for Laboratory By: Beth A Doughtey
Date/Time 4-7-9 @ 1020

Remarks:

00100818

KEMRON ENVIRONMENTAL SERVICES

156 Starlite Drive, Marietta, OH 45750 • TEL 740-373-4071 • FAX 740-373-4835 • http://www.kemron.com

Laboratory Report Number: L0709400

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.

Debra Elliott - Team Leader
delliott@kemron-lab.com

Amanda Fickiesen - Client Services Specialist
afickiesen@kemron-lab.com

Kathy Albertson - Team Chemist/Data Specialist
kalbertson@kemron-lab.com

Annie Bock - Client Services Specialist
abock@kemron-lab.com

Stephanie Mossburg - Team Chemist/Data Specialist
smossburg@kemron-lab.com

Katie Barnes - Team Assistant
kbarnes@kemron-lab.com

Brenda Gregory - Client Services Specialist
bgregory@kemron-lab.com

Jacqueline Parsons - Team Assistant
jparsons@kemron-lab.com

This report was reviewed on October 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 October 02, 2007.

David E. Vandenberg

David Vandenberg - Vice President

FL DOH NELAP ID: E8755
This report contains a total of 293 pages.

Protecting Our Environmental Future

00100820

KEMRON REPORT L0709400
PREPARED FOR Shaw E I, Inc.
WORK ID: LONGHORN AAP KARNACK TX

1.0 Introduction

KEMRON ENVIRONMENTAL SERVICES
REPORT NARRATIVE

KEMRON Login No.: L0709400

CHAIN OF CUSTODY: The chain of custody number was 10721.

SHIPMENT CONDITIONS: The chain of custody forms were received sealed in a cooler. The cooler temperature was 1 and 2 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: 20-SEP-07
Stephanie Mossburg

Laboratory Data Package Cover Page

00100823

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	October 2, 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:	L0709400
Project Name:	798-LONGHORN
Method:	7471
Prep Batch Number(s):	WG250449
Reviewer Name:	SHERI L. PFALZGRAF
LRC Date:	October 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?			✓		

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?	✓				

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:	L0709400
Project Name:	798-LONGHORN
Method:	7471
Prep Batch Number(s):	WG250449
Reviewer Name:	SHERI L. PFALZGRAF
LRC Date:	October 02, 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

00100828

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	October 2, 2007
Name (Printed)	Signature	Official Title (printed)	DATE

KEMRON Environmental Services
Laboratory Review Checklist

Laboratory Name:	KEMRON
Laboratory Log Number:	L0709400
Project Name:	798-LONGHORN
Method:	6010
Prep Batch Number(s):	WG250447
Reviewer Name:	SHERI L. PFALZGRAF
LRC Date:	October 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?			✓		1
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?	✓				

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:	L0709400
Project Name:	798-LONGHORN
Method:	6010
Prep Batch Number(s):	WG250447
Reviewer Name:	SHERI L. PFALZGRAF
LRC Date:	October 02, 2007

EXCEPTIONS REPORT
ER# - Description
ER1 - Due to results that exceeded the linear range of the instrument, client samples 01 and 03 were reported from dilution analyses for sodium.
Footnotes:
(1) NA = Not applicable to method or project
(2) NR = Not reviewed
(3) ER# = Exception report number

Laboratory Data Package Cover Page

00100833

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	September 28, 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:	L0709400
Project Name:	798-LONGHORN
Method:	TDS
Prep Batch Number(s):	WG250453
Reviewer Name:	DEANNA I. HESSON
LRC Date:	September 28, 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?			✓		

00100835

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:	L0709400
Project Name:	798-LONGHORN
Method:	TDS
Prep Batch Number(s):	WG250453
Reviewer Name:	DEANNA I. HESSON
LRC Date:	September 28, 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

00100838

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	September 28, 2007
Name (Printed)	Signature	Official Title (printed)	DATE

KEMRON Environmental Services
Laboratory Review Checklist

Laboratory Name:	KEMRON
Laboratory Log Number:	L0709400
Project Name:	798-LONGHORN
Method:	TSS
Prep Batch Number(s):	WG250451
Reviewer Name:	DEANNA I. HESSON
LRC Date:	September 28, 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:	L0709400
Project Name:	798-LONGHORN
Method:	TSS
Prep Batch Number(s):	WG250451
Reviewer Name:	DEANNA I. HESSON
LRC Date:	September 28, 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

00100843

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	September 25, 2007
Name (Printed)	Signature	Official Title (printed)	DATE

KEMRON Environmental Services
Laboratory Review Checklist

Laboratory Name:	KEMRON
Laboratory Log Number:	L0709400
Project Name:	798-LONGHORN
Method:	6010
Prep Batch Number(s):	WG250653
Reviewer Name:	MAREN M. BEERY
LRC Date:	September 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?			✓		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?	✓				
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?		✓			ER2
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:	L0709400
Project Name:	798-LONGHORN
Method:	6010
Prep Batch Number(s):	WG250653
Reviewer Name:	MAREN M. BEERY
LRC Date:	September 25, 2007

EXCEPTIONS REPORT
ER#1 -Due to results that exceeded the linear range of the instrument, client samples 02 and 04 were reported from dilution analyses for sodium.
ER2 - Due to continuing calibration verification failure for zinc on 24-SEP-2007 at 16:16, client samples 02 and 04 were reanalyzed on a later calibration which was compliant for zinc.
Footnotes:
(1) NA = Not applicable to method or project
(2) NR = Not reviewed
(3) ER# = Exception report number

Laboratory Data Package Cover Page

00100848

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.

Name (Printed)	Signature	Official Title (printed)	DATE
MAREN M. BEERY	Maren Beery	Metals Supervisor	September 25, 2007

KEMRON Environmental Services
Laboratory Review Checklist

Laboratory Name:	KEMRON
Laboratory Log Number:	L0709400
Project Name:	798-LONGHORN
Method:	6020
Prep Batch Number(s):	WG250665
Reviewer Name:	MAREN M. BEERY
LRC Date:	September 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?	✓				ER1
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?		✓			ER2
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?	✓				

00100851

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:	L0709400
Project Name:	798-LONGHORN
Method:	6020
Prep Batch Number(s):	WG250665
Reviewer Name:	MAREN M. BEERY
LRC Date:	September 25, 2007

EXCEPTIONS REPORT
ER#1 - Due to high levels of nontarget analytes, samples 02 and 04 were analyzed at dilutions.
ER2 - Due to continuing calibration verification failure for chromium on 24-Sep-2007 at 13:20, client sample 04 was reanalyzed on 24-Sep-2007 at 14:24 for chromium.
Footnotes:
(1) NA = Not applicable to method or project
(2) NR = Not reviewed
(3) ER# = Exception report number

Laboratory Data Package Cover Page

00100853

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	September 21, 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:	L0709400
Project Name:	798-LONGHORN
Method:	6020
Prep Batch Number(s):	WG250508
Reviewer Name:	MAREN M. BEERY
LRC Date:	September 21, 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?	✓				ER1
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:	L0709400
Project Name:	798-LONGHORN
Method:	6020
Prep Batch Number(s):	WG250508
Reviewer Name:	MAREN M. BEERY
LRC Date:	September 21, 2007

EXCEPTIONS REPORT

ER#1 - Due to high levels of nontarget analytes, samples 01 and 03 were analyzed at dilutions.

Footnotes:

(1) NA = Not applicable to method or project

(2) NR = Not reviewed

(3) ER# = Exception report number

Laboratory Data Package Cover Page

00100858

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	September 24, 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:	L0709400
Project Name:	798-LONGHORN
Method:	7471
Prep Batch Number(s):	WG250550
Reviewer Name:	MAREN M. BEERY
LRC Date:	September 24, 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?	✓				

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:	L0709400
Project Name:	798-LONGHORN
Method:	7471
Prep Batch Number(s):	WG250550
Reviewer Name:	MAREN M. BEERY
LRC Date:	September 24, 2007

EXCEPTIONS REPORT
ER# - Description
Footnotes:
(1) NA = Not applicable to method or project
(2) NR = Not reviewed
(3) ER# = Exception report number

2.1 Metals Data

2.1.1 Metals I C P Data

2.1.1.1 Summary Data

LABORATORY REPORT

L0709400

10/02/07 10:28

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: LONGHORN-PBC

P.O. Number: 322255 OP

Sample Analysis Summary

Client ID	Lab ID	Method	Dilution	Date Received
47WW06-091307	L0709400-01	6010B	1	18-SEP-07
47WW06-091307	L0709400-01	6010B	20	18-SEP-07
47WW06-091307	L0709400-02	6010B	1	18-SEP-07
47WW06-091307	L0709400-02	6010B	1	18-SEP-07
47WW06-091307	L0709400-02	6010B	20	18-SEP-07
47WW07-091307	L0709400-03	6010B	1	18-SEP-07
47WW07-091307	L0709400-03	6010B	20	18-SEP-07
47WW07-091307	L0709400-04	6010B	1	18-SEP-07
47WW07-091307	L0709400-04	6010B	1	18-SEP-07
47WW07-091307	L0709400-04	6010B	20	18-SEP-07

Sample Number:**L0709400-01**
Client ID:**47WW06-091307**
Matrix:**Water**
Workgroup Number:**WG251133**
Collect Date:**09/13/2007 16:01**
Sample Tag:**01**

PrePrep Method:**NONE**
Prep Method:**3005A**
Analytical Method:**6010B**
Analyst:**KRV**
Dilution:**1**
Units:**mg/L**

Instrument:**PE-ICP2**
Prep Date:**09/19/2007 07:20**
Cal Date:**09/26/2007 09:42**
Run Date:**09/26/2007 19:36**
File ID:**P2.092607.193601**

Analyte	CAS. Number	Result	Qual	PQL	SQL
Aluminum, Total	7429-90-5	0.310		0.100	0.0500
Beryllium, Total	7440-41-7		U	0.00200	0.000500
Calcium, Total	7440-70-2	27.2		0.200	0.100
Cobalt, Total	7440-48-4	0.0144		0.00500	0.00250
Iron, Total	7439-89-6	5.25		0.100	0.0250
Potassium, Total	7440-09-7	2.99		1.00	0.250
Magnesium, Total	7439-95-4	17.3		0.500	0.250
Vanadium, Total	7440-62-2		U	0.0100	0.00500
Zinc, Total	7440-66-6	0.0279		0.0200	0.00500

U Not detected at or above adjusted sample detection limit

Sample Number:	**L0709400-01**	PrePrep Method:	**NONE**	Instrument:	**PE-ICP2**
Client ID:	**47WW06-091307**	Prep Method:	**3005A**	Prep Date:	**09/19/2007 07:20**
Matrix:	**Water**	Analytical Method:	**6010B**	Cal Date:	**09/27/2007 14:44**
Workgroup Number:	**WG251133**	Analyst:	**KRV**	Run Date:	**09/27/2007 18:13**
Collect Date:	**09/13/2007 16:01**	Dilution:	**20**	File ID:	**P2.092707.181322**
Sample Tag:	**DL01**	Units:	**mg/L**		

Analyte	CAS. Number	Result	Qual	PQL	SQL
Sodium, Total	**7440-23-5**	**292**		**10.0**	**5.00**

Sample Number:	L0709400-02	PrePrep Method:	NONE	Instrument:	PE-ICP2
Client ID:	47WW06-091307	Prep Method:	3005A	Prep Date:	09/21/2007 06:30
Matrix:	Water	Analytical Method:	6010B	Cal Date:	09/24/2007 08:39
Workgroup Number:	WG250687	Analyst:	KHR	Run Date:	09/24/2007 15:57
Collect Date:	09/13/2007 16:01	Dilution:	1	File ID:	P2.092407.155709
Sample Tag:	01	Units:	mg/L		

Analyte	CAS. Number	Result	Qual	PQL	SQL
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	28.7		0.200	0.100
Cobalt, Dissolved	7440-48-4	0.0106		0.00500	0.00250
Iron, Dissolved	7439-89-6	0.361		0.100	0.0250
Potassium, Dissolved	7440-09-7	3.01		1.00	0.250
Magnesium, Dissolved	7439-95-4	14.9		0.500	0.250
Vanadium, Dissolved	7440-62-2		U	0.0100	0.00500

U Not detected at or above adjusted sample detection limit

Sample Number: **L0709400-02**
Client ID: **47WW06-091307**
Matrix: **Water**
Workgroup Number: **WG250687**
Collect Date: **09/13/2007 16:01**
Sample Tag: **02**

PrePrep Method: **NONE**
Prep Method: **3005A**
Analytical Method: **6010B**
Analyst: **KRV**
Dilution: **1**
Units: **mg/L**

Instrument: **PE-ICP2**
Prep Date: **09/21/2007 06:30**
Cal Date: **09/26/2007 09:42**
Run Date: **09/26/2007 11:11**
File ID: **P2.092607.111131**

Analyte	CAS. Number	Result	Qual	PQL	SQL
Zinc, Dissolved	7440-66-6	0.0205		0.0200	0.00500

Sample Number:	L0709400-02	PrePrep Method:	NONE	Instrument:	PE-ICP2
Client ID:	47WW06-091307	Prep Method:	3005A	Prep Date:	09/21/2007 06:30
Matrix:	Water	Analytical Method:	6010B	Cal Date:	09/26/2007 09:42
Workgroup Number:	WG250687	Analyst:	KRV	Run Date:	09/26/2007 11:17
Collect Date:	09/13/2007 16:01	Dilution:	20	File ID:	P2.092607.111755
Sample Tag:	DL01	Units:	mg/L		

Analyte	CAS. Number	Result	Qual	PQL	SQL
Sodium, Dissolved	7440-23-5	331		10.0	5.00

Sample Number:L0709400-03
Client ID:47WW07-091307
Matrix:Water
Workgroup Number:WG251133
Collect Date:09/13/2007 17:24
Sample Tag:01

PrePrep Method:NONE
Prep Method:3005A
Analytical Method:6010B
Analyst:KRV
Dilution:1
Units:mg/L

Instrument:PE-ICP2
Prep Date:09/19/2007 07:20
Cal Date:09/26/2007 09:42
Run Date:09/26/2007 19:24
File ID:P2.092607.192410

Analyte	CAS. Number	Result	Qual	PQL	SQL
Aluminum, Total	7429-90-5	0.0694	J	0.100	0.0500
Beryllium, Total	7440-41-7		U	0.00200	0.000500
Calcium, Total	7440-70-2	11.3		0.200	0.100
Cobalt, Total	7440-48-4	0.00463	J	0.00500	0.00250
Iron, Total	7439-89-6	3.60		0.100	0.0250
Potassium, Total	7440-09-7	3.63		1.00	0.250
Magnesium, Total	7439-95-4	4.27		0.500	0.250
Vanadium, Total	7440-62-2	0.00675	J	0.0100	0.00500
Zinc, Total	7440-66-6		U	0.0200	0.00500

J The analyte was positively identified, but the quantitation was below the RL
U Not detected at or above adjusted sample detection limit

Sample Number:L0709400-03
Client ID:47WW07-091307
Matrix:Water
Workgroup Number:WG251133
Collect Date:09/13/2007 17:24
Sample Tag:DL01

PrePrep Method:NONE
Prep Method:3005A
Analytical Method:6010B
Analyst:KRV
Dilution:20
Units:mg/L

Instrument:PE-ICP2
Prep Date:09/19/2007 07:20
Cal Date:09/27/2007 14:44
Run Date:09/27/2007 18:25
File ID:P2.092707.182551

Analyte	CAS. Number	Result	Qual	PQL	SQL
Sodium, Total	7440-23-5		U	10.0	5.00

U Not detected at or above adjusted sample detection limit

Sample Number:	L0709400-04	PrePrep Method:	NONE	Instrument:	PE-ICP2
Client ID:	47WW07-091307	Prep Method:	3005A	Prep Date:	09/21/2007 06:30
Matrix:	Water	Analytical Method:	6010B	Cal Date:	09/26/2007 09:42
Workgroup Number:	WG250687	Analyst:	KRV	Run Date:	09/26/2007 11:24
Collect Date:	09/13/2007 17:24	Dilution:	1	File ID:	P2.092607.112412
Sample Tag:	02	Units:	mg/L		

Analyte	CAS. Number	Result	Qual	PQL	SQL
Zinc, Dissolved	7440-66-6		U	0.0200	0.00500

U Not detected at or above adjusted sample detection limit

Sample Number:L0709400-04
Client ID:47WW07-091307
Matrix:Water
Workgroup Number:WG250687
Collect Date:09/13/2007 17:24
Sample Tag:01

PrePrep Method:NONE
Prep Method:3005A
Analytical Method:6010B
Analyst:KHR
Dilution:1
Units:mg/L

Instrument:PE-ICP2
Prep Date:09/21/2007 06:30
Cal Date:09/24/2007 08:39
Run Date:09/24/2007 16:03
File ID:P2.092407.160333

Analyte	CAS. Number	Result	Qual	PQL	SQL
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	12.0		0.200	0.100
Cobalt, Dissolved	7440-48-4		U	0.00500	0.00250
Iron, Dissolved	7439-89-6	0.302		0.100	0.0250
Potassium, Dissolved	7440-09-7	3.75		1.00	0.250
Magnesium, Dissolved	7439-95-4	4.19		0.500	0.250
Vanadium, Dissolved	7440-62-2		U	0.0100	0.00500

U Not detected at or above adjusted sample detection limit

Sample Number:L0709400-04
Client ID:47WW07-091307
Matrix:Water
Workgroup Number:WG250687
Collect Date:09/13/2007 17:24
Sample Tag:DL01

PrePrep Method:NONE
Prep Method:3005A
Analytical Method:6010B
Analyst:KRV
Dilution:20
Units:mg/L

Instrument:PE-ICP2
Prep Date:09/21/2007 06:30
Cal Date:09/26/2007 09:42
Run Date:09/26/2007 11:30
File ID:P2.092607.113027

Analyte	CAS. Number	Result	Qual	PQL	SQL
Sodium, Dissolved	7440-23-5	367		10.0	5.00

2.1.1.2 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

Analyst(s): RDK
Date: 9/19/07
LCS: 5ml SSO 21660
MS/MSD: 5ml SSO21660
Witness: ND
HNO_3 Lot #: ~~C2021660~~ ~~[illegible]~~ avo 12522
1:1HNO_3: NP
HCl Lot #: avo 12527
H_2O_2 Lot #: NP
Earliest Sample Due Date: 9/28
Digest Tube Lot #: avo 12400
Hotblock #: 6
Hotblock Temp - Start: 94.6°C 0720
Hotblock Temp - End: 95.1°C 1120

Box: AO
Digestion Work Group: WG250447

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: RDK
Digest Received By: Ed Date: 09-19-07

	KEMRON #	Initial WT/Vol	Final Volume	Comments	Due Date
1	PBW	50ml	50ml	-02	
2	LCSW			-03	
3	09-346-01			Level 4 price	10/1
4	-02				
5	-03				
6	-04				
7	-05				
8	-06 REP			-01	
9	-07 MS			-04	
10	-08 MSD			-05	
11	-09				
12	-11				
13	-12				
14	-13				
15	09-347-01				9/28
16	-02				
17	-03				
18	-04				
19	-05				
20	09-400-01				9/28
21	-03				
22					
23					
24					
25					
26	RDK 9/19/07				
27					
28					

Comments: ______

Primary Review: [signature] 9/19/07
Secondary Review: Vicki Collins 9/19/07

KEMRON ENVIRONMENTAL SERVICES

00100881

Metals Digest Log

Analyst(s): pat
Date: 9/21/07
LCS: 5ml STD 21660
MS/MSD: 5ml STD 21660
Witness: NO
HNO_3 Lot #: Cm 12526
1:1HNO_3: N/A
HCl Lot #: Cm 12527
H_2O_2 Lot #: NA
Earliest Sample Due Date: 9/25/07
Digest Tube Lot #: Cm 12460
Hotblock #: 6
Hotblock Temp - Start: 94.4 °C 0630
Hotblock Temp - End: 94.9 °C 1030

Box: 46
Digestion Work Group: WG 250653

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: pat
Digest Received By: KV Date: 9/21/07

	KEMRON #	Initial WT/Vol	Final Volume	Comments	Due Date
1	PBW	50ml	50ml	LAB FILTER -02	
2	LCSW			-03	
3	09-372-02			Lead 4 NPDES	9/28
4	-03				
5	-06			*	
6	-07				
7	09-400-02				9/28
8	-04				
9	09-404-02			NPDES	9/28
10	09-435-02			Lead 4	9/28
11	09-451-02			-01	10/4
12	-02 MS			-04	
13	-02 MSD			-05	
14	-04				
15	09-455-02				9/25
16					
17					
18					
19					
20					
21					
22					
23					
24					
25	pat 9/21/07				
26					
27					
28					

Comments: * 09-372-06; use caution, sulfur smell *

Primary Review: [signature] 9/21/07

Secondary Review: Vicki Collier 9/21/07

KEMRON Environmental Services

Instrument Run Log

Instrument: PE-ICP2 Dataset: 092407HR.CSV
Analyst1: KRV Analyst2: N/A
Method: 6010B SOP: ME600E Rev: 6
Maintenance Log ID: 20938

Calibration Std: STD21870 ICV/CCV Std: STD21638 Post Spike: STD21659
ICSA: STD21758 ICSAB: STD21616

Workgroups: 250293, 250382, 250653, 250688

Comments:

Seq.	File ID	Sample	ID	Prep	Dil	Reference	Date/Time
1	P2.092407.081425	WG250856-01	Calibration Point		1		09/24/07 08:14
2	P2.092407.082037	WG250856-02	Calibration Point		1		09/24/07 08:20
3	P2.092407.082653	WG250856-03	Calibration Point		1		09/24/07 08:26
4	P2.092407.083305	WG250856-04	Calibration Point		1		09/24/07 08:33
5	P2.092407.083922	WG250856-05	Calibration Point		1		09/24/07 08:39
6	P2.092407.084448	WG250856-06	Initial Calibration Verification		1		09/24/07 08:44
7	P2.092407.085106	WG250856-07	Initial Calib Blank		1		09/24/07 08:51
8	P2.092407.085720	WG250856-08	Interference Check		1		09/24/07 08:57
9	P2.092407.090247	WG250856-09	Interference Check		1		09/24/07 09:02
10	P2.092407.090809	WG250856-10	CCV		1		09/24/07 09:08
11	P2.092407.091428	WG250856-11	CCB		1		09/24/07 09:14
12	P2.092407.092530	WG250198-01	Fluid Blank		1		09/24/07 09:25
13	P2.092407.093151	L0709312-06	LTL-G-MWL9-DIS	50/50	20		09/24/07 09:31
14	P2.092407.093815	WG250346-01	Reference Sample		20	L0709345-05	09/24/07 09:38
15	P2.092407.094436	WG250346-04	Matrix Spike	50/50	20		09/24/07 09:44
16	P2.092407.095051	WG250346-05	Matrix Spike Duplica	50/50	20		09/24/07 09:50
17	P2.092407.095712	L0709345-01	WWTP HEADWORKS	50/50	5		09/24/07 09:57
18	P2.092407.100332	WG250382-01	Post Digestion Spike		5	L0709345-01	09/24/07 10:03
19	P2.092407.100956	L0709335-02	EOL-01	50/50	20		09/24/07 10:09
20	P2.092407.101627	L0709336-02	OHD-01	50/50	20		09/24/07 10:16
21	P2.092407.102251	L0709336-04	OHD-01D	50/50	20		09/24/07 10:22
22	P2.092407.102915	WG250856-12	CCV		1		09/24/07 10:29
23	P2.092407.103534	WG250856-13	CCB		1		09/24/07 10:35
24	P2.092407.104151	L0709336-06	OHD-02	50/50	20		09/24/07 10:41
25	P2.092407.104809	L0709280-03	PMW92-02-EBT-4	50/50	2		09/24/07 10:48
25.1	P2.092407.105331	WG250856-14	CCV		1		09/24/07 10:53
25.2	P2.092407.105948	WG250856-15	CCB		1		09/24/07 10:59
26	P2.092407.110507	WG250654-02	Method/Prep Blank	50/50	1		09/24/07 11:05
27	P2.092407.111121	WG250654-03	Laboratory Control S	50/50	1		09/24/07 11:11
28	P2.092407.111748	WG250654-01	Reference Sample		1	L0709413-03	09/24/07 11:17
29	P2.092407.112406	WG250654-04	Matrix Spike	50/50	1	L0709413-05	09/24/07 11:24
30	P2.092407.113035	WG250654-05	Matrix Spike Duplica	50/50	1	L0709413-06	09/24/07 11:30
31	P2.092407.113703	L0709413-04	ST105-GW-0516-99	50/50	1		09/24/07 11:37
32	P2.092407.114327	L0709459-01	PRWW01-091807	50/50	1		09/24/07 11:43
33	P2.092407.114950	L0709473-02	EFFLUENT	50/50	1		09/24/07 11:49
34	P2.092407.115611	WG250688-01	Post Digestion Spike		1	L0709473-02	09/24/07 11:56
35	P2.092407.120233	WG250688-02	Serial Dilution		5	L0709473-02	09/24/07 12:02

Approved: September 25, 2007

Maren Beery

KEMRON Environmental Services

Instrument Run Log

Instrument: PE-ICP2 Dataset: 092407HR.CSV

Analyst1: KRV Analyst2: N/A

Method: 6010B SOP: ME600E Rev: 6

Maintenance Log ID: 20938

Calibration Std: STD21870 ICV/CCV Std: STD21638 Post Spike: STD21659

ICSA: STD21758 ICSAB: STD21616

Workgroups: 250293, 250382, 250653, 250688

Comments:

Seq.	File ID	Sample	ID	Prep	Dil	Reference	Date/Time
36	P2.092407.120853	WG250856-16	CCV		1		09/24/07 12:08
37	P2.092407.121512	WG250856-17	CCB		1		09/24/07 12:15
38	P2.092407.122128	L0709413-01	ST105-GW-0510-01	50/50	1		09/24/07 12:21
39	P2.092407.122752	L0709413-02	ST105-GW-0517-01	50/50	1		09/24/07 12:27
40	P2.092407.123410	L0709413-07	ST105-GW-0520-01	50/50	1		09/24/07 12:34
41	P2.092407.124034	L0709430-03	OT018-GW-LH2-2	50/50	1		09/24/07 12:40
42	P2.092407.124657	L0709430-04	OT018-GW-MW11	50/50	1		09/24/07 12:46
43	P2.092407.125322	L0709430-05	OT018-GW-MW33	50/50	1	WG250665-01	09/24/07 12:53
44	P2.092407.125936	L0709430-06	OT018-GW-MW13	50/50	1		09/24/07 12:59
45	P2.092407.130556	L0709430-07	OT018-GW-TY10LH	50/50	1		09/24/07 13:05
46	P2.092407.131121	L0709430-08	OT018-GW-DUPE	50/50	1		09/24/07 13:11
47	P2.092407.131739	L0709435-01	PORT \#1	50/50	1		09/24/07 13:17
48	P2.092407.132406	WG250856-18	CCV		1		09/24/07 13:24
49	P2.092407.133036	WG250856-19	CCB		1		09/24/07 13:30
50	P2.092407.133656	L0709446-02	MW-11	50/50	1		09/24/07 13:36
51	P2.092407.134328	L0709446-03	MW-11-LF	50/50	1	WG250659-01	09/24/07 13:43
52	P2.092407.134959	L0709446-04	MW-11-HP	50/50	1		09/24/07 13:49
53	P2.092407.135617	L0709446-06	MW-38	50/50	1		09/24/07 13:56
54	P2.092407.140248	WG250856-20	CCV		1		09/24/07 14:02
55	P2.092407.140907	WG250856-21	CCB		1		09/24/07 14:09
56	P2.092407.141555	WG250653-02	Method/Prep Blank	50/50	1		09/24/07 14:15
57	P2.092407.142221	WG250653-03	Laboratory Control S	50/50	1		09/24/07 14:22
58	P2.092407.142919	WG250653-01	Reference Sample		1	L0709451-02	09/24/07 14:29
59	P2.092407.143615	WG250653-04	Matrix Spike	50/50	1		09/24/07 14:36
60	P2.092407.144245	WG250653-05	Matrix Spike Duplica	50/50	1		09/24/07 14:42
61	P2.092407.144913	L0709451-04	FD-09182007W	50/50	1		09/24/07 14:49
62	P2.092407.145538	L0709435-02	PORT \#1	50/50	1		09/24/07 14:55
63	P2.092407.150155	L0709459-02	PRWW01-091807	50/50	1		09/24/07 15:01
64	P2.092407.150818	WG250687-01	Post Digestion Spike		1	L0709459-02	09/24/07 15:08
65	P2.092407.151440	WG250687-02	Serial Dilution		5	L0709459-02	09/24/07 15:14
66	P2.092407.152101	WG250856-22	CCV		1		09/24/07 15:21
67	P2.092407.152718	WG250856-23	CCB		1		09/24/07 15:27
68	P2.092407.153331	L0709372-02	GOVVWR-W	50/50	1		09/24/07 15:33
69	P2.092407.153954	L0709372-03	450AGEWR-W	50/50	1		09/24/07 15:39
70	P2.092407.154620	L0709372-06	HMS-W	50/50	1		09/24/07 15:46
71	P2.092407.155150	L0709372-07	HBV-W	50/50	1		09/24/07 15:51
72	P2.092407.155709	L0709400-02	47WW06-091307	50/50	1		09/24/07 15:57

Approved: September 25, 2007

Maren Beery

KEMRON Environmental Services

Instrument Run Log

Instrument: PE-ICP2
Dataset: 092407HR.CSV
Analyst1: KRV
Analyst2: N/A
Method: 6010B
SOP: ME600E
Rev: 6
Maintenance Log ID: 20938

Calibration Std: STD21870
ICV/CCV Std: STD21638
Post Spike: STD21659
ICSA: STD21758
ICSAB: STD21616

Workgroups: 250293, 250382, 250653, 250688

Comments:

Seq.	File ID	Sample	ID	Prep	Dil	Reference	Date/Time
73	P2.092407.160333	L0709400-04	47WW07-091307	50/50	1		09/24/07 16:03
74	P2.092407.161000	L0709404-02	C-004	50/50	1		09/24/07 16:10
75	P2.092407.161620	WG250856-24	CCV		1		09/24/07 16:16
76	P2.092407.162241	WG250856-25	CCB		1		09/24/07 16:22

Page: 3

Approved: September 25, 2007

Maren Beery

KEMRON Environmental Services
Instrument Run Log

Instrument: PE-ICP2 Dataset: 092607HR.CSV
Analyst1: KRV Analyst2: N/A
Method: 6010B SOP: ME600E Rev: 6
Maintenance Log ID: 21009

Calibration Std: STD21870 ICV/CCV Std: STD21884 Post Spike: STD21659
ICSA: STD21758 ICSAB: STD22071

Workgroups: 250687, 251073, 251075, 251133, 250572

Comments:

Seq.	File ID	Sample	ID	Prep	Dil	Reference	Date/Time
1	P2.092607.091357	WG251121-01	Calibration Point		1		09/26/07 09:13
2	P2.092607.092114	WG251121-02	Calibration Point		1		09/26/07 09:21
3	P2.092607.092808	WG251121-03	Calibration Point		1		09/26/07 09:28
4	P2.092607.093554	WG251121-04	Calibration Point		1		09/26/07 09:35
5	P2.092607.094220	WG251121-05	Calibration Point		1		09/26/07 09:42
6	P2.092607.094912	WG251121-06	Initial Calibration Verification		1		09/26/07 09:49
7	P2.092607.095538	WG251121-07	Initial Calib Blank		1		09/26/07 09:55
8	P2.092607.100203	WG251121-08	Interference Check		1		09/26/07 10:02
9	P2.092607.100728	WG251121-09	Interference Check		1		09/26/07 10:07
10	P2.092607.101252	WG251121-10	CCV		1		09/26/07 10:12
11	P2.092607.101918	WG251121-11	CCB		1		09/26/07 10:19
12	P2.092607.104626	WG250653-01	Reference Sample		5	L0709451-02	09/26/07 10:46
13	P2.092607.105240	WG250653-04	Matrix Spike	50/50	5		09/26/07 10:52
14	P2.092607.105858	WG250653-05	Matrix Spike Duplica	50/50	5		09/26/07 10:58
15	P2.092607.110521	L0709372-03	450AGEWR-W	50/50	5		09/26/07 11:05
16	P2.092607.111131	L0709400-02	47WW06-091307	50/50	1		09/26/07 11:11
17	P2.092607.111755	L0709400-02	47WW06-091307	50/50	20		09/26/07 11:17
18	P2.092607.112412	L0709400-04	47WW07-091307	50/50	1		09/26/07 11:24
19	P2.092607.113027	L0709400-04	47WW07-091307	50/50	20		09/26/07 11:30
20	P2.092607.113647	L0709372-06	HMS-W	50/50	1		09/26/07 11:36
21	P2.092607.114213	L0709372-06	HMS-W	50/50	20		09/26/07 11:42
22	P2.092607.114833	WG251121-12	CCV		1		09/26/07 11:48
23	P2.092607.115449	WG251121-13	CCB		1		09/26/07 11:54
24	P2.092607.120104	L0709372-02	GOVVWR-W	50/50	1		09/26/07 12:01
25	P2.092607.120721	L0709372-03	450AGEWR-W	50/50	1		09/26/07 12:07
26	P2.092607.121338	L0709372-07	HBV-W	50/50	1		09/26/07 12:13
27	P2.092607.121859	L0709372-07	HBV-W	50/50	20		09/26/07 12:18
28	P2.092607.122511	WG251121-14	CCV		1		09/26/07 12:25
29	P2.092607.123138	WG251121-15	CCB		1		09/26/07 12:31
30	P2.092607.123753	WG250443-03	Method/Prep Blank	50/50	1		09/26/07 12:37
31	P2.092607.124405	WG250443-04	Laboratory Control S	50/50	1		09/26/07 12:44
32	P2.092607.125023	WG250443-01	Reference Sample		1	L0709322-02	09/26/07 12:50
33	P2.092607.125644	WG250443-05	Matrix Spike	50/50	1	L0709322-03	09/26/07 12:56
34	P2.092607.130303	WG250443-06	Matrix Spike Duplica	50/50	1	L0709322-04	09/26/07 13:03
35	P2.092607.130826	L0709322-05	IW101-07B-EBT-4	50/50	1		09/26/07 13:08
36	P2.092607.131446	L0709322-06	IW101-07C-EBT-4	50/50	1		09/26/07 13:14
37	P2.092607.132105	L0709322-01	RB1-EBT-4	50/50	1		09/26/07 13:21

Page: 1 Approved: September 27, 2007

Maren Beery

KEMRON Environmental Services

Instrument Run Log

Instrument: PE-ICP2 Dataset: 092607HR.CSV

Analyst1: KRV Analyst2: N/A

Method: 6010B SOP: ME600E Rev: 6

Maintenance Log ID: 21009

Calibration Std: STD21870 ICV/CCV Std: STD21884 Post Spike: STD21659

ICSA: STD21758 ICSAB: STD22071

Workgroups: 250687, 251073, 251075, 251133, 250572

Comments:

Seq.	File ID	Sample	ID	Prep	Dil	Reference	Date/Time
38	P2.092607.132728	WG251073-01	Post Digestion Spike		1	L0709322-01	09/26/07 13:27
39	P2.092607.133349	WG251073-02	Serial Dilution		5	L0709322-01	09/26/07 13:33
40	P2.092607.134016	WG251121-16	CCV		1		09/26/07 13:40
41	P2.092607.134636	WG251121-17	CCB		1		09/26/07 13:46
42	P2.092607.135258	WG250443-02	Reference Sample		1	L0709354-01	09/26/07 13:52
43	P2.092607.135824	WG250443-07	Matrix Spike	50/50	1	L0709354-02	09/26/07 13:58
44	P2.092607.140358	WG250443-08	Matrix Spike Duplica	50/50	1	L0709354-03	09/26/07 14:03
45	P2.092607.141007	L0709354-04	FT023-MW5R	50/50	1		09/26/07 14:10
46	P2.092607.141528	L0709354-05	FT023-MW5R-D	50/50	1		09/26/07 14:15
47	P2.092607.142045	L0709322-07	IW101-09A-EBT-4	50/50	1		09/26/07 14:20
48	P2.092607.142708	L0709322-08	IW101-09B-EBT-4	50/50	1		09/26/07 14:27
49	P2.092607.143331	L0709322-10	PMW101-01A-EBT-4	50/50	1		09/26/07 14:33
50	P2.092607.143851	L0709322-11	PMW101-01B-EBT-4	50/50	1		09/26/07 14:38
51	P2.092607.144414	L0709322-12	PMW101-02A-EBT-4	50/50	1		09/26/07 14:44
52	P2.092607.144934	WG251121-18	CCV		1		09/26/07 14:49
53	P2.092607.145551	WG251121-19	CCB		1		09/26/07 14:55
54	P2.092607.150206	L0709322-13	PMW101-02B-EBT-4	50/50	1		09/26/07 15:02
55	P2.092607.150730	L0709322-14	IW85-01-EBT-4	50/50	1		09/26/07 15:07
56	P2.092607.151345	L0709322-15	IW85-06-EBT-4	50/50	1	WG250335-07	09/26/07 15:13
57	P2.092607.151914	L0709322-16	DR2-5-EBT-4	50/50	1		09/26/07 15:19
58	P2.092607.152542	WG251121-20	CCV		1		09/26/07 15:25
59	P2.092607.153202	WG251121-21	CCB		1		09/26/07 15:32
60	P2.092607.153816	WG250548-02	Method/Prep Blank	50/50	1		09/26/07 15:38
61	P2.092607.154438	WG250548-03	Laboratory Control S	50/50	1		09/26/07 15:44
62	P2.092607.155112	WG250548-01	Reference Sample		1	L0709407-08	09/26/07 15:51
63	P2.092607.155732	WG250548-04	Matrix Spike	50/50	1		09/26/07 15:57
64	P2.092607.160429	WG250548-05	Matrix Spike Duplica	50/50	1		09/26/07 16:04
65	P2.092607.161056	L0709407-02	MW-2D	50/50	1	WG250549-01	09/26/07 16:10
66	P2.092607.161614	L0709407-04	MW-2D-HP	50/50	1		09/26/07 16:16
67	P2.092607.162139	L0709407-03	MW-2D-LF	50/50	1		09/26/07 16:21
68	P2.092607.162704	WG251075-01	Post Digestion Spike		1	L0709407-03	09/26/07 16:27
69	P2.092607.163231	WG251075-02	Serial Dilution		5	L0709407-03	09/26/07 16:32
70	P2.092607.163851	WG251121-22	CCV		1		09/26/07 16:38
71	P2.092607.164509	WG251121-23	CCB		1		09/26/07 16:45
72	P2.092607.165126	L0709407-06	MW-5	50/50	1		09/26/07 16:51
73	P2.092607.165747	L0709407-07	MW-5-LF	50/50	1		09/26/07 16:57
74	P2.092607.170408	L0709407-10	MW-6	50/50	1		09/26/07 17:04

Approved: September 27, 2007

Maren Beery

KEMRON Environmental Services
Instrument Run Log

Instrument: PE-ICP2 Dataset: 092607HR.CSV
Analyst1: KRV Analyst2: N/A
Method: 6010B SOP: ME600E Rev: 6
Maintenance Log ID: 21009

Calibration Std: STD21870 ICV/CCV Std: STD21884 Post Spike: STD21659
ICSA: STD21758 ICSAB: STD22071

Workgroups: 250687, 251073, 251075, 251133, 250572

Comments:

Seq.	File ID	Sample	ID	Prep	Dil	Reference	Date/Time
75	P2.092607.171026	L0709407-11	MW-6-LF	50/50	1		09/26/07 17:10
76	P2.092607.171651	L0709407-12	MW-6-HP	50/50	1		09/26/07 17:16
77	P2.092607.172315	L0709407-14	MW-8	50/50	1		09/26/07 17:23
78	P2.092607.172935	L0709407-15	MW-8-LF	50/50	1		09/26/07 17:29
79	P2.092607.173549	L0709407-16	MW-8-HP	50/50	1		09/26/07 17:35
80	P2.092607.174207	L0709407-18	MW-9	50/50	1		09/26/07 17:42
81	P2.092607.174832	WG251121-24	CCV		1		09/26/07 17:48
82	P2.092607.175450	WG251121-25	CCB		1		09/26/07 17:54
83	P2.092607.180107	L0709407-19	MW-9LF		1		09/26/07 18:01
84	P2.092607.180724	L0709407-20	MW-9HP		1		09/26/07 18:07
85	P2.092607.181348	WG251121-26	CCV		1		09/26/07 18:13
86	P2.092607.182006	WG251121-27	CCB		1		09/26/07 18:20
87	P2.092607.183944	WG251121-28	CCV		1		09/26/07 18:39
88	P2.092607.184601	WG251121-29	CCB		1		09/26/07 18:46
89	P2.092607.185217	WG250447-02	Method/Prep Blank	50/50	1		09/26/07 18:52
90	P2.092607.185838	WG250447-03	Laboratory Control S	50/50	1		09/26/07 18:58
91	P2.092607.190459	WG250447-01	Reference Sample		1	L0709346-06	09/26/07 19:04
92	P2.092607.191114	WG250447-04	Matrix Spike	50/50	1	L0709346-07	09/26/07 19:11
93	P2.092607.191747	WG250447-05	Matrix Spike Duplica	50/50	1	L0709346-08	09/26/07 19:17
94	P2.092607.192410	L0709400-02	47WW06-091307	50/50	1		09/26/07 19:24
95	P2.092607.193028	L0709346-03	IW92-07-EBT-4	50/50	1		09/26/07 19:30
96	P2.092607.193601	L0709400-01	47WW06-091307	50/50	1	WG250449-01	09/26/07 19:36
97	P2.092607.194227	WG251133-01	Post Digestion Spike		1	L0709400-01	09/26/07 19:42
98	P2.092607.194851	WG251133-02	Serial Dilution		5	L0709400-01	09/26/07 19:48
99	P2.092607.195513	WG251121-30	CCV		1		09/26/07 19:55
100	P2.092607.200133	WG251121-31	CCB		1		09/26/07 20:01
101	P2.092607.200750	L0709347-02	ST105-GW-KAFB7-01	50/50	1		09/26/07 20:07
102	P2.092607.201414	L0709347-03	ST105-GW-KAFB7-99	50/50	1	WG250375-03	09/26/07 20:14
103	P2.092607.202040	L0709347-04	ST105-SW-GCMP-01	50/50	1		09/26/07 20:20
104	P2.092607.202700	L0709347-05	ST105-GW-0506-01	50/50	1	WG250518-03	09/26/07 20:27
105	P2.092607.203322	L0709347-01	ST105-GW-KAFB16-01	50/50	1	WG250245-04	09/26/07 20:33
106	P2.092607.203947	WG251121-32	CCV		1		09/26/07 20:39
107	P2.092607.204606	WG251121-33	CCB		1		09/26/07 20:46
108	P2.092607.205222	L0709346-01	DUP7-EBT-4	50/50	1		09/26/07 20:52
109	P2.092607.205844	L0709346-02	IW92-06-EBT-4	50/50	1		09/26/07 20:58
110	P2.092607.210403	L0709346-04	IW85-02-EBT-4	50/50	1		09/26/07 21:04
111	P2.092607.211028	L0709346-05	IW85-05-EBT-4	50/50	1		09/26/07 21:10

Page: 3 Approved: September 27, 2007

Maren Beery

KEMRON Environmental Services
Instrument Run Log

Instrument: PE-ICP2 Dataset: 092607HR.CSV
Analyst1: KRV Analyst2: N/A
Method: 6010B SOP: ME600E Rev: 6
Maintenance Log ID: 21009

Calibration Std: STD21870 ICV/CCV Std: STD21884 Post Spike: STD21659
ICSA: STD21758 ICSAB: STD22071

Workgroups: 250687, 251073, 251075, 251133, 250572

Comments:

Seq.	File ID	Sample	ID	Prep	Dil	Reference	Date/Time
112	P2.092607.211650	L0709346-09	IW21-01A-EBT-4	50/50	1		09/26/07 21:16
113	P2.092607.212310	L0709346-11	IW101-04B-EBT-4	50/50	1		09/26/07 21:23
114	P2.092607.212834	L0709346-12	IW101-04C-EBT-4	50/50	1		09/26/07 21:28
115	P2.092607.213457	L0709346-13	IW101-09C-EBT-4	50/50	1		09/26/07 21:34
116	P2.092607.214113	WG251121-34	CCV		1		09/26/07 21:41
117	P2.092607.214736	WG251121-35	CCB		1		09/26/07 21:47
118	P2.092607.215404	WG250446-02	Method/Prep Blank	50/50	1		09/26/07 21:54
119	P2.092607.220019	WG250446-03	Laboratory Control S	50/50	1		09/26/07 22:00
120	P2.092607.220640	WG250446-01	Reference Sample		1	L0709342-07	09/26/07 22:06
121	P2.092607.221302	WG250446-04	Matrix Spike	50/50	1	L0709342-08	09/26/07 22:13
122	P2.092607.222022	WG250446-05	Matrix Spike Duplica	50/50	1	L0709342-09	09/26/07 22:20
123	P2.092607.222643	L0709405-01	JACKSON \#4	50/50	1		09/26/07 22:26
124	P2.092607.223215	L0709406-02	TW-73	50/50	1		09/26/07 22:32
125	P2.092607.223846	L0709342-02	MW2B-217-14	50/50	1		09/26/07 22:38
126	P2.092607.224502	WG250572-01	Post Digestion Spike		1	L0709342-02	09/26/07 22:45
127	P2.092607.225130	WG250572-02	Serial Dilution		5	L0709342-02	09/26/07 22:51
128	P2.092607.225751	WG251121-36	CCV		1		09/26/07 22:57
129	P2.092607.230410	WG251121-37	CCB		1		09/26/07 23:04
130	P2.092607.231025	L0709342-14	MW4B-217-14		1		09/26/07 23:10
131	P2.092607.231646	L0709342-17	MW4B2-217-14		1		09/26/07 23:16
132	P2.092607.232302	L0709342-20	MW5A-217-14		1		09/26/07 23:23
133	P2.092607.232927	L0709342-23	OW1B-217-14		1		09/26/07 23:29
134	P2.092607.233548	L0709342-26	OW2A-217-14		1		09/26/07 23:35
135	P2.092607.234204	L0709342-29	OW3A-217-14		1		09/26/07 23:42
136	P2.092607.234826	L0709406-04	EQUIP RINSE #1	50/50	1		09/26/07 23:48
137	P2.092607.235447	L0709406-06	BW-01	50/50	1		09/26/07 23:54
138	P2.092707.000112	L0709406-08	TW-45	50/50	1		09/27/07 00:01
139	P2.092707.000739	WG251121-38	CCV		1		09/27/07 00:07
140	P2.092707.001357	WG251121-39	CCB		1		09/27/07 00:13
141	P2.092707.002013	L0709335-01	EOL-01		1	WG250368-04	09/27/07 00:20
142	P2.092707.002645	L0709336-01	OHD-01		1	WG250228-04	09/27/07 00:26
143	P2.092707.003312	L0709336-03	OHD-01D		1		09/27/07 00:33
144	P2.092707.003933	L0709336-05	OHD-02		1		09/27/07 00:39
145	P2.092707.004605	WG251121-40	CCV		1		09/27/07 00:46
146	P2.092707.005223	WG251121-41	CCB		1		09/27/07 00:52

Approved: September 27, 2007
Maren Beery

KEMRON Environmental Services

Instrument Run Log

Instrument: PE-ICP2 | Dataset: 092707H3R.CSV
Analyst1: KRV | Analyst2: N/A
Method: 6010B | SOP: ME600E | Rev: 6
Maintenance Log ID: 21043

Calibration Std: STD21870 | ICV/CCV Std: STD22138 | Post Spike: STD21659
ICSA: STD22139 | ICSAB: STD22071

Workgroups: 250572,251075,251133,251291,251222,251220

Comments:

Seq.	File ID	Sample	ID	Prep	Dil	Reference	Date/Time
4	P2.092707.141842	WG251313-01	Calibration Point		1		09/27/07 14:18
5	P2.092707.142453	WG251313-02	Calibration Point		1		09/27/07 14:24
6	P2.092707.143111	WG251313-03	Calibration Point		1		09/27/07 14:31
7	P2.092707.143728	WG251313-04	Calibration Point		1		09/27/07 14:37
8	P2.092707.144410	WG251313-05	Calibration Point		1		09/27/07 14:44
9	P2.092707.144945	WG251313-06	Initial Calibration Verification		1		09/27/07 14:49
10	P2.092707.145602	WG251313-07	Initial Calib Blank		1		09/27/07 14:56
11	P2.092707.150214	WG251313-08	Interference Check		1		09/27/07 15:02
12	P2.092707.150730	WG251313-09	Interference Check		1		09/27/07 15:07
13	P2.092707.151249	WG251313-10	CCV		1		09/27/07 15:12
14	P2.092707.151906	WG251313-11	CCB		1		09/27/07 15:19
15	P2.092707.153551	WG250446-02	Method/Prep Blank	50/50	1		09/27/07 15:35
16	P2.092707.154202	WG250446-03	Laboratory Control S	50/50	1		09/27/07 15:42
17	P2.092707.154826	WG250446-01	Reference Sample		1	L0709342-07	09/27/07 15:48
18	P2.092707.155436	WG250446-04	Matrix Spike	50/50	1	L0709342-08	09/27/07 15:54
19	P2.092707.160051	WG250446-05	Matrix Spike Duplica	50/50	1	L0709342-09	09/27/07 16:00
20	P2.092707.160709	L0709342-02	MW2B-217-14	50/50	1		09/27/07 16:07
21	P2.092707.161324	WG250572-01	Post Digestion Spike		1	L0709342-02	09/27/07 16:13
22	P2.092707.161941	WG250572-02	Serial Dilution		5	L0709342-02	09/27/07 16:19
23	P2.092707.162558	WG251313-12	CCV		1		09/27/07 16:25
24	P2.092707.163212	WG251313-13	CCB		1		09/27/07 16:32
25	P2.092707.163827	L0709342-14	MW4B-217-14	50/50	1		09/27/07 16:38
26	P2.092707.164439	L0709342-17	MW4B2-217-14	50/50	1		09/27/07 16:44
27	P2.092707.165054	L0709342-20	MW5A-217-14	50/50	1		09/27/07 16:50
28	P2.092707.165711	L0709342-23	OW1B-217-14	50/50	1		09/27/07 16:57
29	P2.092707.170325	L0709342-26	OW2A-217-14	50/50	1		09/27/07 17:03
30	P2.092707.170941	L0709342-29	OW3A-217-14	50/50	1		09/27/07 17:09
31	P2.092707.171557	L0709335-01	EOL-01	50/50	20		09/27/07 17:15
32	P2.092707.172217	L0709336-01	OHD-01	50/50	20		09/27/07 17:22
33	P2.092707.172833	L0709336-03	OHD-01D	50/50	20		09/27/07 17:28
34	P2.092707.173450	L0709336-05	OHD-02	50/50	20		09/27/07 17:34
35	P2.092707.174110	WG251313-14	CCV		1		09/27/07 17:41
36	P2.092707.174725	WG251313-15	CCB		1		09/27/07 17:47
37	P2.092707.180043	L0709407-19	MW-9LF	50/50	1		09/27/07 18:00
38	P2.092707.180658	L0709407-20	MW-9HP	50/50	1		09/27/07 18:06
39	P2.092707.181322	L0709400-01	47WW06-091307	50/50	20		09/27/07 18:13
40	P2.092707.181938	WG251133-01	Post Digestion Spike		20	L0709400-01	09/27/07 18:19

Approved: September 28, 2007

Maren Beery

KEMRON Environmental Services

Instrument Run Log

Instrument: PE-ICP2 Dataset: 092707H3R.CSV

Analyst1: KRV Analyst2: N/A

Method: 6010B SOP: ME600E Rev: 6

Maintenance Log ID: 21043

Calibration Std: STD21870 ICV/CCV Std: STD22138 Post Spike: STD21659

ICSA: STD22139 ICSAB: STD22071

Workgroups: 250572,251075,251133,251291,251222,251220

Comments:

Seq.	File ID	Sample	ID	Prep	Dil	Reference	Date/Time
41	P2.092707.182551	L0709400-03	47WW07-091307	50/50	20		09/27/07 18:25
42	P2.092707.183207	L0709346-02	IW92-06-EBT-4	50/50	2		09/27/07 18:32
43	P2.092707.183732	WG251313-16	CCV		1		09/27/07 18:37
44	P2.092707.184347	WG251313-17	CCB		1		09/27/07 18:43
45	P2.092707.184959	WG251197-02	Method/Prep Blank	50/50	1		09/27/07 18:49
46	P2.092707.185615	WG251197-03	Laboratory Control S	50/50	1		09/27/07 18:56
47	P2.092707.190230	WG251197-01	Reference Sample		1	L0709599-02	09/27/07 19:02
48	P2.092707.190843	WG251197-04	Matrix Spike	50/50	1		09/27/07 19:08
49	P2.092707.191508	WG251197-05	Matrix Spike Duplica	50/50	1		09/27/07 19:15
50	P2.092707.192129	L0709650-01	OUTFALL 002/COMP	50/50	1	WG251227-01	09/27/07 19:21
51	P2.092707.192749	WG251291-01	Post Digestion Spike		1	L0709650-01	09/27/07 19:27
52	P2.092707.193409	WG251291-02	Serial Dilution		5	L0709650-01	09/27/07 19:34
53	P2.092707.194024	WG251313-18	CCV		1		09/27/07 19:40
54	P2.092707.194638	WG251313-19	CCB		1		09/27/07 19:46
55	P2.092707.195534	WG250655-02	Method/Prep Blank	50/50	1		09/27/07 19:55
56	P2.092707.200147	WG250655-03	Laboratory Control S	50/50	1		09/27/07 20:01
57	P2.092707.200808	WG250655-01	Reference Sample		1	L0709446-19	09/27/07 20:08
58	P2.092707.201424	WG250655-04	Matrix Spike	50/50	1		09/27/07 20:14
59	P2.092707.202045	WG250655-05	Matrix Spike Duplica	50/50	1		09/27/07 20:20
60	P2.092707.202709	L0709446-08	MW-38-HP	50/50	1		09/27/07 20:27
61	P2.092707.203327	L0709446-10	MW-32D	50/50	1		09/27/07 20:33
62	P2.092707.203948	L0709446-07	MW-38-LF	50/50	1		09/27/07 20:39
63	P2.092707.204609	WG251220-01	Post Digestion Spike		1	L0709446-07	09/27/07 20:46
64	P2.092707.205228	WG251220-02	Serial Dilution		5	L0709446-07	09/27/07 20:52
65	P2.092707.205845	WG251313-20	CCV		1		09/27/07 20:58
66	P2.092707.210459	WG251313-21	CCB		1		09/27/07 21:04
67	P2.092707.211114	L0709446-11	MW-32D-LF	50/50	1		09/27/07 21:11
68	P2.092707.211731	L0709446-12	MW-32D-HP	50/50	1		09/27/07 21:17
69	P2.092707.212344	L0709446-14	MW-32S	50/50	1		09/27/07 21:23
70	P2.092707.213007	L0709446-15	MW-32S-LF	50/50	1		09/27/07 21:30
71	P2.092707.213627	L0709446-16	MW-32S-HP	50/50	1		09/27/07 21:36
72	P2.092707.214245	L0709446-18	MW-23D	50/50	1		09/27/07 21:42
73	P2.092707.214905	L0709446-20	MW-23D-HP	50/50	1		09/27/07 21:49
74	P2.092707.215525	L0709446-22	MW-23S	50/50	1		09/27/07 21:55
75	P2.092707.220146	L0709446-23	MW-23S-LF	50/50	1		09/27/07 22:01
76	P2.092707.220803	L0709446-24	MW-23S-HP	50/50	1		09/27/07 22:08
77	P2.092707.221423	WG251313-22	CCV		1		09/27/07 22:14

Approved: September 28, 2007

Maren Beery

KEMRON Environmental Services

Instrument Run Log

Instrument: PE-ICP2 Dataset: 092707H3R.CSV

Analyst1: KRV Analyst2: N/A

Method: 6010B SOP: ME600E Rev: 6

Maintenance Log ID: 21043

Calibration Std: STD21870 ICV/CCV Std: STD22138 Post Spike: STD21659

ICSA: STD22139 ICSAB: STD22071

Workgroups: 250572,251075,251133,251291,251222,251220

Comments:

Seq.	File ID	Sample	ID	Prep	Dil	Reference	Date/Time
78	P2.092707.222040	WG251313-23	CCB		1		09/27/07 22:20
79	P2.092707.222655	L0709446-26	MW-21D	50/50	1		09/27/07 22:26
80	P2.092707.223315	L0709446-27	MW-21D-LF	50/50	1		09/27/07 22:33
81	P2.092707.223936	L0709446-28	MW-21D-HP	50/50	1		09/27/07 22:39
82	P2.092707.224554	L0709446-30	MW-21S	50/50	1		09/27/07 22:45
83	P2.092707.225214	L0709446-31	MW-21S-LF	50/50	1		09/27/07 22:52
84	P2.092707.225835	L0709446-32	MW-21S-HP	50/50	1		09/27/07 22:58
85	P2.092707.230453	WG251313-24	CCV		1		09/27/07 23:04
86	P2.092707.231110	WG251313-25	CCB		1		09/27/07 23:11
87	P2.092707.231728	WG250656-02	Method/Prep Blank	50/50	1		09/27/07 23:17
88	P2.092707.232346	WG250656-03	Laboratory Control S	50/50	1		09/27/07 23:23
89	P2.092707.233004	WG250656-01	Reference Sample		1	L0709433-13	09/27/07 23:30
90	P2.092707.233621	WG250656-04	Matrix Spike	50/50	1	L0709433-14	09/27/07 23:36
91	P2.092707.234239	WG250656-05	Matrix Spike Duplica	50/50	1	L0709433-15	09/27/07 23:42
92	P2.092707.234857	L0709433-02	SW1A-217A-14	50/50	1		09/27/07 23:48
93	P2.092707.235514	L0709433-05	SW1B-217A-14	50/50	1		09/27/07 23:55
94	P2.092807.000132	L0709484-14	N7666E1037-A-3	50/50	1		09/28/07 00:01
95	P2.092807.000746	WG251222-01	Post Digestion Spike		1	L0709484-14	09/28/07 00:07
96	P2.092807.001404	WG251222-02	Serial Dilution		5	L0709484-14	09/28/07 00:14
97	P2.092807.002024	WG251313-26	CCV		1		09/28/07 00:20
98	P2.092807.002638	WG251313-27	CCB		1		09/28/07 00:26
99	P2.092807.003251	L0709446-34	MW-36	50/50	1		09/28/07 00:32
100	P2.092807.003912	L0709446-35	MW-36-LF	50/50	1		09/28/07 00:39
101	P2.092807.004526	L0709446-36	MW-36-HP	50/50	1		09/28/07 00:45
102	P2.092807.005144	L0709484-15	N7622E1273-A-3	50/50	1		09/28/07 00:51
103	P2.092807.005802	L0709484-16	N7666E1037-B-3	50/50	1		09/28/07 00:58
104	P2.092807.010416	L0709484-17	N7184E1675-B-3	50/50	1		09/28/07 01:04
105	P2.092807.011033	L0709484-18	N6854E0476-B-3	50/50	1		09/28/07 01:10
106	P2.092807.011651	L0709484-19	N7184E1675-A-3	50/50	1		09/28/07 01:16
107	P2.092807.012305	L0709433-08	SW2A-217A-14	50/50	1		09/28/07 01:23
108	P2.092807.012922	L0709433-20	SW4A-217A-14	50/50	1		09/28/07 01:29
109	P2.092807.013540	WG251316-28	CCV		1		09/28/07 01:35
110	P2.092807.014154	WG251316-29	CCB		1		09/28/07 01:41
111	P2.092807.014809	L0709433-23	SW5A-217A-14	50/50	1		09/28/07 01:48
112	P2.092807.015426	WG251316-30	CCV		1		09/28/07 01:54
113	P2.092807.020040	WG251316-31	CCB		1		09/28/07 02:00

Approved: September 28, 2007

Maren Beery

KEMRON Environmental Services
Data Checklist

Date: 24-SEP-2007
Analyst: KRV
Analyst: NA
Method: 6010
Instrument: PE-ICP2
Curve Workgroup: WG250856
Runlog ID: 18352
Analytical Workgroups: 250293,250382,250653,250688

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	335,336
Level 3	400,459
Level 4	280,345,372,413,430,435,446,451
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	KRV
Secondary Reviewer	MMB
Comments	

Primary Reviewer: 24-SEP-2007 Katie Vickers

Secondary Reviewer: 25-SEP-2007 Maren Beery

Generated: SEP-25-2007 10:49:27

KEMRON Environmental Services
Data Checklist

Date: 26-SEP-2007
Analyst: KRV
Analyst: NA
Method: 6010
Instrument: PE-ICP2
Curve Workgroup: WG251121
Runlog ID: 18434
Analytical Workgroups: 250687,251073,251075,251133,250572

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	335,336
Level 3	
Level 4	322,342,346,347,354,372,400,405,406,407
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	KRV
Secondary Reviewer	MMB
Comments	

Primary Reviewer:
26-SEP-2007
Katie Vickers

Secondary Reviewer:
27-SEP-2007
Maren Beery

Generated: SEP-27-2007 21:02:24

KEMRON Environmental Services
Data Checklist

Date: 27-SEP-2007
Analyst: KRV
Analyst: NA
Method: 6010
Instrument: PE-ICP2
Curve Workgroup: WG251316
Runlog ID: 18471
Analytical Workgroups: 250572,251075,251133,251291,251222,251220

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	335,336
Level 3	
Level 4	346,400,407,446,484
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	KRV
Secondary Reviewer	MMB
Comments	

Primary Reviewer:
28-SEP-2007
Katie Vickers

Secondary Reviewer:
28-SEP-2007
Maren Beery

Generated: SEP-28-2007 15:25:10

KEMRON Environmental Services
HOLDING TIMES
EQUIVALENT TO AFCEE FORM 9

00100895

Analytical Method: 6010B

AAB#: WG250687

Login Number: L0709400

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
47WW07-091307	09/13/07	09/18/07	09/21/07	180	7.55	09/26/07	180	5.20	
47WW06-091307	09/13/07	09/18/07	09/21/07	180	7.60	09/24/07	180	3.39	
47WW06-091307	09/13/07	09/18/07	09/21/07	180	7.60	09/26/07	180	5.20	
47WW06-091307	09/13/07	09/18/07	09/21/07	180	7.60	09/26/07	180	5.20	
47WW07-091307	09/13/07	09/18/07	09/21/07	180	7.55	09/26/07	180	5.21	
47WW07-091307	09/13/07	09/18/07	09/21/07	180	7.55	09/24/07	180	3.40	

* EXT = SEE PROJECT QAPP REQUIREMENTS
*ANAL = SEE PROJECT QAPP REQUIREMENTS

KEMRON FORMS - Modified 11/20/2006
Version 1.5 PDF File ID: 883068
Report generated 09/28/2007 11:00

Analytical Method: 6010B

AAB#: WG251133

Login Number: L0709400

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
47WW07-091307	09/13/07	09/18/07	09/19/07	180	5.58	09/26/07	180	7.50	
47WW07-091307	09/13/07	09/18/07	09/19/07	180	5.58	09/27/07	180	8.46	
47WW06-091307	09/13/07	09/18/07	09/19/07	180	5.64	09/26/07	180	7.51	
47WW06-091307	09/13/07	09/18/07	09/19/07	180	5.64	09/27/07	180	8.45	

* EXT = SEE PROJECT QAPP REQUIREMENTS

*ANAL = SEE PROJECT QAPP REQUIREMENTS

KEMRON FORMS - Modified 11/20/2006
Version 1.5 PDF File ID: 883068
Report generated 09/28/2007 11:00

METHOD BLANK SUMMARY

Login Number: L0709400
Work Group: WG250687
Blank File ID: P2.092407.141555
Blank Sample ID: WG250653-02
Prep Date: 09/21/07 06:30
Instrument ID: PE-ICP2
Analyzed Date: 09/24/07 14:15
Method: 6010B
Analyst: KHR

This Method Blank Applies To The Following Samples:

Client ID	Lab Sample ID	Lab File ID	Time Analyzed	TAG
LCS	WG250653-03	P2.092407.142221	09/24/07 14:22	01
47WW06-091307	L0709400-02	P2.092407.155709	09/24/07 15:57	01
47WW07-091307	L0709400-04	P2.092407.160333	09/24/07 16:03	01
47WW06-091307	L0709400-02	P2.092607.111131	09/26/07 11:11	02
47WW06-091307	L0709400-02	P2.092607.111755	09/26/07 11:17	DL01
47WW07-091307	L0709400-04	P2.092607.112412	09/26/07 11:24	02
47WW07-091307	L0709400-04	P2.092607.113027	09/26/07 11:30	DL01

KEMRON FORMS - Modified 01/31/2007
Version 1.5 PDF File ID: 883069
Report generated 09/28/2007 11:00

00100898

METHOD BLANK SUMMARY

Login Number: L0709400
Work Group: WG251133
Blank File ID: P2.092607.185217
Blank Sample ID: WG250447-02
Prep Date: 09/19/07 07:20
Instrument ID: PE-ICP2
Analyzed Date: 09/26/07 18:52
Method: 6010B
Analyst: KRV

This Method Blank Applies To The Following Samples:

Client ID	Lab Sample ID	Lab File ID	Time Analyzed	TAG
LCS	WG250447-03	P2.092607.185838	09/26/07 18:58	01
47WW07-091307	L0709400-03	P2.092607.192410	09/26/07 19:24	01
47WW06-091307	L0709400-01	P2.092607.193601	09/26/07 19:36	01
47WW06-091307	L0709400-01	P2.092707.181322	09/27/07 18:13	DL01
47WW07-091307	L0709400-03	P2.092707.182551	09/27/07 18:25	DL01

KEMRON FORMS - Modified 01/31/2007
Version 1.5 PDF File ID: 883069
Report generated 09/28/2007 11:00

METHOD BLANK REPORT

00100899

Login Number: L0709400 Prep Date: 09/21/07 06:30 Sample ID: WG250653-02
Instrument ID: PE-ICP2 Run Date: 09/24/07 14:15 Prep Method: 3005A
File ID: P2.092407.141555 Analyst: KHR Method: 6010B
Workgroup (AAB#): WG250687 Matrix: Water Units: mg/L
Contract #: DACA56-94-D-0020 Cal ID: PE-ICP - 24-SEP-07

Analytes	SQL	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

SQL 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: 883070
Report generated 09/28/2007 11:00

METHOD BLANK REPORT

Login Number: L0709400 | Prep Date: 09/19/07 07:20 | Sample ID: WG250447-02
Instrument ID: PE-ICP2 | Run Date: 09/26/07 18:52 | Prep Method: 3005A
File ID: P2.092607.185217 | Analyst: KRV | Method: 6010B
Workgroup (AAB#): WG251133 | Matrix: Water | Units: mg/L
Contract #: DACA56-94-D-0020 | Cal ID: PE-ICP - 26-SEP-07

Analytes	SQL	PQL	Concentration	Dilution	Qualifier
Aluminum, Total	0.0500	0.100	0.0500	1	U
Beryllium, Total	0.000500	0.00200	0.000500	1	U
Calcium, Total	0.100	0.200	0.100	1	U
Cobalt, Total	0.00250	0.00500	0.00250	1	U
Iron, Total	0.0250	0.100	0.0250	1	U
Potassium, Total	0.250	1.00	0.250	1	U
Magnesium, Total	0.250	0.500	0.250	1	U
Sodium, Total	0.250	0.500	0.250	1	U
Vanadium, Total	0.00500	0.0100	0.00583	1	J
Zinc, Total	0.00500	0.0200	0.00500	1	U

SQL Method Detection Limit
PQL Reporting/Practical Quantitation Limit
ND Analyte Not detected at or above reporting limit
* Analyte concentration > RL

LABORATORY CONTROL SAMPLE (LCS)

00100901

Login Number: L0709400 | Run Date: 09/24/2007 | Sample ID: WG250653-03
Instrument ID: PE-ICP2 | Run Time: 14:22 | Prep Method: 3005A
File ID: P2.092407.142221 | Analyst: KHR | Method: 6010B
Workgroup (AAB#): WG250687 | Matrix: Water | Units: mg/L
QC Key: STD | Lot#: MI0058-81 | Cal ID: PE-ICP - 24-SEP-07

Analytes	Expected	Found	% Rec	LCS Limits	Q
Aluminum, Dissolved	5.00	5.20	104	85 - 115	
Beryllium, Dissolved	0.0250	0.0262	105	85 - 115	
Calcium, Dissolved	5.00	5.39	108	85 - 115	
Cobalt, Dissolved	0.100	0.108	108	85 - 115	
Iron, Dissolved	2.00	2.02	101	85 - 115	
Potassium, Dissolved	25.0	26.6	106	85 - 115	
Magnesium, Dissolved	5.00	4.91	98.1	85 - 115	
Sodium, Dissolved	25.0	26.3	105	85 - 115	
Vanadium, Dissolved	0.500	0.523	105	85 - 115	
Zinc, Dissolved	0.500	0.539	108	85 - 115	

KEMRON FORMS - Modified 09/06/2007
Version 1.5 PDF File ID: 883071
Report generated 09/28/2007 11:00

LABORATORY CONTROL SAMPLE (LCS)

00100902

Login Number: L0709400
Run Date: 09/26/2007
Sample ID: WG250447-03
Instrument ID: PE-ICP2
Run Time: 18:58
Prep Method: 3005A
File ID: P2.092607.185838
Analyst: KRV
Method: 6010B
Workgroup (AAB#): WG251133
Matrix: Water
Units: mg/L
QC Key: STD
Lot#: MI0058-81
Cal ID: PE-ICP - 26-SEP-07

Analytes	Expected	Found	% Rec	LCS Limits	Q
Aluminum, Total	5.00	4.92	98.5	85 - 115	
Beryllium, Total	0.0250	0.0252	101	85 - 115	
Calcium, Total	5.00	5.07	101	85 - 115	
Cobalt, Total	0.100	0.104	104	85 - 115	
Iron, Total	2.00	2.10	105	85 - 115	
Potassium, Total	25.0	25.7	103	85 - 115	
Magnesium, Total	5.00	5.17	103	85 - 115	
Sodium, Total	25.0	26.0	104	85 - 115	
Vanadium, Total	0.500	0.518	104	85 - 115	
Zinc, Total	0.500	0.524	105	85 - 115	

KEMRON FORMS - Modified 09/06/2007
Version 1.5 PDF File ID: 883071
Report generated 09/28/2007 11:00

MATRIX SPIKE AND MATRIX SPIKE DUP (MS/MSD)

00100903

Loginnum:L0709400 Cal ID: PE-ICP2 - Worknum:WG251133
Instrument ID:PE-ICP2 Contract #:DACA56-94-D-0020 Method:6010B
Parent ID:WG250447-01 File ID:P2.092607.190459 Dil:1 Matrix:WATER
Sample ID:WG250447-04 MS File ID:P2.092607.191114 Dil:1 Units:mg/L
Sample ID:WG250447-05 MSD File ID:P2.092607.191747 Dil:1

Analyte	Parent	MS Spiked	MS Found	MS %Rec	MSD Spiked	MSD Found	MSD %Rec	%RPD	%Rec Limits	RPD Limit	Q
Aluminum, Total	0.0510	5.00	4.99	98.7	5.00	4.98	98.6	0.0953	80 - 120	20	
Beryllium, Total	ND	0.0250	0.0274	109	0.0250	0.0246	98.3	10.8	80 - 120	20	
Calcium, Total	10.8	5.00	17.4	133	5.00	16.3	110	6.80	80 - 120	20	*
Cobalt, Total	0.0144	0.100	0.126	111	0.100	0.114	99.5	9.79	80 - 120	20	
Iron, Total	2.53	2.00	4.64	106	2.00	4.65	106	0.111	80 - 120	20	
Magnesium, Total	4.99	5.00	10.2	105	5.00	10.2	103	0.626	80 - 120	20	
Potassium, Total	1.33	25.0	27.5	105	25.0	27.4	104	0.454	80 - 120	20	
Sodium, Total	28.9	25.0	54.4	102	25.0	54.7	103	0.481	80 - 120	20	
Vanadium, Total	ND	0.500	0.571	114	0.500	0.505	101	12.3	80 - 120	20	
Zinc, Total	0.0161	0.500	0.591	115	0.500	0.536	104	9.69	80 - 120	20	

* FAILS %REC LIMIT

FAILS RPD LIMIT

NOTE: This is an internal quality control sample.

MATRIX SPIKE AND MATRIX SPIKE DUP (MS/MSD)

00100904

Loginnum:L0709400 Cal ID: PE-ICP2 - Worknum:WG250687
Instrument ID:PE-ICP2 Contract #:DACA56-94-D-0020 Method:6010B
Parent ID:WG250653-01 File ID:P2.092407.142919 Dil:1 Matrix:WATER
Sample ID:WG250653-04 MS File ID:P2.092407.143615 Dil:1 Units:mg/L
Sample ID:WG250653-05 MSD File ID:P2.092407.144245 Dil:1

Analyte	Parent	MS Spiked	MS Found	MS %Rec	MSD Spiked	MSD Found	MSD %Rec	%RPD	%Rec Limits	RPD Limit	Q
Aluminum	ND	5.00	5.01	100	5.00	5.13	103	2.39	80 - 120	20	
Beryllium	ND	0.0250	0.0264	105	0.0250	0.0266	106	0.854	80 - 120	20	
Calcium	177	5.00	184	151	5.00	188	222	1.93	80 - 120	20	*
Cobalt	ND	0.100	0.101	101	0.100	0.103	103	2.14	80 - 120	20	
Iron, Dissolved	0.386	2.00	2.34	97.5	2.00	2.33	97.1	0.319	80 - 120	20	
Magnesium	49.5	5.00	53.5	79.5	5.00	55.2	114	3.17	80 - 120	20	*
Potassium	8.14	25.0	34.3	105	25.0	35.4	109	3.14	80 - 120	20	
Sodium	50.4	25.0	75.4	100	25.0	75.6	101	0.292	80 - 120	20	
Zinc	0.165	0.500	0.694	106	0.500	0.700	107	0.960	80 - 120	20	

* FAILS %REC LIMIT

FAILS RPD LIMIT

NOTE: This is an internal quality control sample.

MATRIX SPIKE AND MATRIX SPIKE DUP (MS/MSD)

00100905

Loginnum:L0709400 Cal ID: PE-ICP2 - Worknum:WG250687
Instrument ID:PE-ICP2 Contract #:DACA56-94-D-0020 Method:6010B
Parent ID:WG250653-01 File ID:P2.092607.104626 Dil:5 Matrix:WATER
Sample ID:WG250653-04 MS File ID:P2.092607.105240 Dil:5 Units:mg/L
Sample ID:WG250653-05 MSD File ID:P2.092607.105858 Dil:5

Analyte	Parent	MS Spiked	MS Found	MS %Rec	MSD Spiked	MSD Found	MSD %Rec	%RPD	%Rec Limits	RPD Limit	Q
Vanadium	ND	0.500	0.515	103	0.500	0.541	108	4.98	80 - 120	20	

* FAILS %REC LIMIT

FAILS RPD LIMIT

NOTE: This is an internal quality control sample.

Sample Login ID: L0709400 Worknum: WG251133
Instrument ID: PE-ICP2 Method: 6010B
Sample ID: L0709400-01 File ID: P2.092607.193601 Dil: 1 Units: mg/L
Serial Dilution ID: WG251133-02 File ID: P2.092607.194851 Dil: 5

Analyte	Sample	C	Serial Dilution	C	% Difference	Q
Aluminum	0.310	X	0.511	X	64.8	E
Beryllium	0	U	0	U		
Calcium	27.2		25.2		7.35	
Cobalt	0.0144	X	0.0163	F	13.2	E
Iron	5.25		4.96	X	5.52	
Magnesium	17.3		16.5	X	4.62	
Potassium	2.99	X	3.06	F	2.34	
Sodium	281		304		8.19	
Vanadium	0	U	0	U		
Zinc	0.0279	X	0.0382	F	36.9	E

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: 883066
Report generated 09/28/2007 11:01

Sample Login ID: L0709400
Worknum: WG250687
Instrument ID: PE-ICP2
Method: 6010B
Sample ID: L0709459-02 File ID: P2.092407.150155 Dil: 1
Units: mg/L
Serial Dilution ID: WG250687-02 File ID: P2.092407.151440 Dil: 5

Analyte	Sample	C	Serial Dilution	C	% Difference	Q
Aluminum	0	U	0	U		
Beryllium	0	U	0	U		
Calcium	24.6		24.3	X	1.22	
Cobalt	0	U	0	U		
Iron	0.129	X	0.210	F	62.8	E
Magnesium	13.5		14.0	X	3.70	
Potassium	2.74	X	2.99	F	9.12	
Sodium	95.4		98.6		3.35	
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 ENVIRONMENTAL SERVICES
POST SPIKE REPORT

Sample Login ID: L0709400 **Worknum:** WG250687
Instrument ID: PE-ICP2 **Method:** 6010B
Post Spike ID: WG250687-01 **File ID:** P2.092407.150818 **Dil:** 1 **Units:** mg/L
Sample ID: L0709459-02 **File ID:** P2.092407.150155 **Dil:** 1 **Matrix:** Water

Analyte	Post Spike Result	C	Sample Result	C	Spike Added(SA)	% R	Control Limit %R	Q
ALUMINUM	5.10		0	U	5	102.1	75 - 125	
BERYLLIUM	0.0261		0	U	.025	104.3	75 - 125	
CALCIUM	27.7		24.6		5	111.4	75 - 125	
COBALT	0.107		0	U	.1	107.0	75 - 125	
IRON	2.08		0.129		2	98.0	75 - 125	
MAGNESIUM	17.2		13.5		5	101.6	75 - 125	
POTASSIUM	29.0		2.74		25	106.3	75 - 125	
SODIUM	112		95.4		25	102.9	75 - 125	
VANADIUM	0.522		0	U	.5	104.4	75 - 125	
ZINC	0.542		0	U	.5	108.5	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 ENVIRONMENTAL SERVICES
POST SPIKE REPORT

Sample Login ID: L0709400 **Worknum:** WG251133
Instrument ID: PE-ICP2 **Method:** 6010B
Post Spike ID: WG251133-01 **File ID:** P2.092607.194227 **Dil:** 1 **Units:** mg/L
Sample ID: L0709400-01 **File ID:** P2.092607.193601 **Dil:** 1 **Matrix:** Water

Analyte	Post Spike Result	C	Sample Result	C	Spike Added(SA)	% R	Control Limit %R	Q
ALUMINUM	5.11		0.310		5	96.6	75 - 125	
BERYLLIUM	0.0279		0	U	.025	111.5	75 - 125	
CALCIUM	32.0		27.2		5	151.3	75 - 125	N
COBALT	0.123		0.0144	F	.1	110.0	75 - 125	
IRON	6.38		5.25		2	82.7	75 - 125	
MAGNESIUM	19.3		17.3		5	75.5	75 - 125	
POTASSIUM	29.3		2.99		25	106.4	75 - 125	
SODIUM	264		281		25	45.1	75 - 125	N
VANADIUM	0.566		0	U	.5	113.2	75 - 125	
ZINC	0.596		0.0279		.5	114.1	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 ENVIRONMENTAL SERVICES
POST SPIKE REPORT

Sample Login ID: L0709400 **Worknum:** WG251133
Instrument ID: PE-ICP2 **Method:** 6010B
Post Spike ID: WG251133-01 **File ID:** P2.092707.181938 **Dil:** 20 **Units:** mg/L
Sample ID: L0709400-01 **File ID:** P2.092707.181322 **Dil:** 20 **Matrix:** Water

Analyte	Post Spike Result	C	Sample Result	C	Spike Added(SA)	% R	Control Limit %R	Q
ALUMINUM	4.93		0	U	5	98.6	75 - 125	
BERYLLIUM	0.0241		0	U	.025	96.5	75 - 125	
CALCIUM	6.12		1.23		5	97.9	75 - 125	
COBALT	0.0995		0	U	.1	99.5	75 - 125	
IRON	2.17		0.214		2	97.8	75 - 125	
MAGNESIUM	5.55		0.716		5	96.7	75 - 125	
POTASSIUM	24.5		0	U	25	97.9	75 - 125	
SODIUM	39.1		14.6		25	98.0	75 - 125	
VANADIUM	0.484		0	U	.5	96.8	75 - 125	
ZINC	0.516		0	U	.5	103.2	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: 883067
Report generated 09/28/2007 11:01

INITIAL CALIBRATION SUMMARY

00100911

Login Number:L0709400 Workgroup (AAB#):WG250687

Analytical Method:6010B Instrument ID:PE-ICP2

ICAL Worknum:WG250856 Initial Calibration Date:24-SEP-2007 08:39

Analyte	WG250856-01		WG250856-02		WG250856-03		WG250856-04		WG250856-05			
	STD	INT	STD	INT	STD	INT	STD	INT	STD	INT	R	Q
Aluminum	0	-162.087278	.1	911.1040955	.2	1645.438239	5	75557.36239	10	152591.6425	0.999987	
Beryllium	0	-1081.41983	.0005	349.051869	.001	691.1910012	.025	31509.07428	.05	62845.69214	0.999999	
Calcium	0	-91.3715028	.1	24.04577276	.2	40.04033242	5	1735.637899	10	3520.628117	0.999972	
Cobalt	0	-82.4944249	.002	86.20309857	.004	172.442846	.1	8375.065358	.2	16622.79999	0.999993	
Iron	0	-1.19350466	.04	27.28947323	.08	51.51499584	2	2512.66421	4	5145.82929	0.999934	
Magnesium	0	25.03514955	.1	68.70030561	.2	138.503311	5	6607.888185	10	13594.10281	0.999907	
Potassium	0	-459.278148	.5	1462.488209	1	2964.268021	25	146968.6227	50	302561.2603	1.00000	
Sodium	0	1537.430317	.5	4816.555035	1	9294.849048	25	442873.7651	50	898498.6751	1.00000	
Vanadium	0	5280.759236	.01	1387.880264	.02	2702.950716	.5	129349.4075	1	257561.6841	0.999998	
Zinc	0	12.93495212	.01	332.6821141	.02	542.2071095	.5	23983.74032	1	47462.42366	0.999988	

INT = Instrument intensity
R = Coefficient of correlation
Q = Data Qualifier
*** = Out of Compliance; R < 0.995**

INITIAL CALIBRATION SUMMARY

Login Number: L0709400 Workgroup (AAB#): WG250687
Analytical Method: 6010B Instrument ID: PE-ICP2
ICAL Worknum: WG251121 Initial Calibration Date: 26-SEP-2007 09:42

Analyte	WG251121-01		WG251121-02		WG251121-03		WG251121-04		WG251121-05			
	STD	INT	STD	INT	STD	INT	STD	INT	STD	INT	R	Q
Aluminum	0	-46.8337914	.1	652.9317271	.2	1378.226597	5	66685.11921	10	137610.3364	0.999887	
Beryllium	0	-1065.68945	.0005	284.2483558	.001	592.5805408	.025	29374.81241	.05	60198.27875	0.999932	
Calcium	0	-86.2930863	.1	12.17348252	.2	28.24920717	5	1465.431324	10	3095.536761	0.999668	
Cobalt	0	-90.2600290	.002	75.92065752	.004	136.2566385	.1	6843.567287	.2	13861.65881	0.999981	
Iron	0	.4031927882	.04	19.1365441	.08	37.93344181	2	1904.300234	4	3936.783328	0.999875	
Magnesium	0	21.65895296	.1	51.18332498	.2	103.6290693	5	5025.09819	10	10333.87336	0.999910	
Potassium	0	-547.421795	.5	1274.530874	1	2624.975504	25	127396.2169	50	267170.1665	1.00000	
Sodium	0	1143.15434	.5	4100.713836	1	8290.662954	25	381066.0498	50	789266.6301	1.00000	
Vanadium	0	5211.95959	.01	1139.336983	.02	2258.847292	.5	105403.5527	1	214726.2794	0.999959	
Zinc	0	5.731785762	.01	244.5648731	.02	520.4176785	.5	19790.92841	1	39861.92325	0.999988	

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: 883075
Report generated 09/28/2007 11:01

INITIAL CALIBRATION SUMMARY

Login Number: L0709400 Workgroup (AAB#): WG251133
Analytical Method: 6010B Instrument ID: PE-ICP2
ICAL Worknum: WG251121 Initial Calibration Date: 26-SEP-2007 09:42

Analyte	WG251121-01		WG251121-02		WG251121-03		WG251121-04		WG251121-05			
	STD	INT	STD	INT	STD	INT	STD	INT	STD	INT	R	Q
Aluminum	0	-46.8337914	.1	652.9317271	.2	1378.226597	5	66685.11921	10	137610.3364	0.999887	
Beryllium	0	-1065.68945	.0005	284.2483558	.001	592.5805408	.025	29374.81241	.05	60198.27875	0.999932	
Calcium	0	-86.2930863	.1	12.17348252	.2	28.24920717	5	1465.431324	10	3095.536761	0.999668	
Cobalt	0	-90.2600290	.002	75.92065752	.004	136.2566385	.1	6843.567287	.2	13861.65881	0.999981	
Iron	0	.4031927882	.04	19.1365441	.08	37.93344181	2	1904.300234	4	3936.783328	0.999875	
Magnesium	0	21.65895296	.1	51.18332498	.2	103.6290693	5	5025.09819	10	10333.87336	0.999910	
Potassium	0	-547.421795	.5	1274.530874	1	2624.975504	25	127396.2169	50	267170.1665	1.00000	
Sodium	0	1143.15434	.5	4100.713836	1	8290.662954	25	381066.0498	50	789266.6301	1.00000	
Vanadium	0	5211.95959	.01	1139.336983	.02	2258.847292	.5	105403.5527	1	214726.2794	0.999959	
Zinc	0	5.731785762	.01	244.5648731	.02	520.4176785	.5	19790.92841	1	39861.92325	0.999988	

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: 883075
Report generated 09/28/2007 11:01

INITIAL CALIBRATION SUMMARY

00100914

Login Number: L0709400 Workgroup (AAB#): WG251133
Analytical Method: 6010B Instrument ID: PE-ICP2
ICAL Worknum: WG251316 Initial Calibration Date: 27-SEP-2007 14:44

Analyte	WG251316-01		WG251316-02		WG251316-03		WG251316-04		WG251316-05			
	STD	INT	STD	INT	STD	INT	STD	INT	STD	INT	R	Q
Aluminum	0	-181.141357	.1	609.663719	.2	1291.860848	5	62950.34643	10	124130.2619	0.999976	
Beryllium	0	-1092.84906	.0005	281.0973853	.001	543.7609678	.025	28718.92511	.05	56217.46684	0.999944	
Calcium	0	-79.9146076	.1	14.67683339	.2	31.66680307	5	1392.39394	10	2871.873463	0.999887	
Cobalt	0	-73.5516454	.002	63.92936917	.004	117.6274469	.1	6326.494232	.2	12426.5299	0.999960	
Iron	0	-1.09432278	.04	25.18185495	.08	42.56252782	2	2369.946138	4	4461.093264	0.999544	
Magnesium	0	29.06356799	.1	66.53164291	.2	108.2032712	5	6170.498941	10	11598.5786	0.999521	
Potassium	0	-602.114481	.5	1189.802913	1	2484.378023	25	119969.4132	50	239494.7425	1.00000	
Sodium	0	928.8264417	.5	3766.401674	1	7644.983036	25	362089.0233	50	717191.8867	1.00000	
Vanadium	0	5668.138549	.01	906.5132143	.02	1924.67848	.5	102496.9773	1	200770.2161	0.999946	
Zinc	0	-1.24111200	.01	204.3470061	.02	405.8457968	.5	18259.82546	1	35614.26885	0.999927	

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: 883075
Report generated 09/28/2007 11:01

INITIAL CALIBRATION BLANK (ICB)

Login Number: L0709400 Run Date: 09/24/2007 Sample ID: WG250856-07
Instrument ID: PE-ICP2 Run Time: 08:51 Method: 6010B
File ID: P2.092407.085106 Analyst: KHR Units: mg/L
Workgroup (AAB#): WG250687 Cal ID: PE-ICP - 24-SEP-07

Analytes	MDL	RDL	Concentration	Dilution	Qualifier
Aluminum	0.0500	0.100	.00693	1	U
Beryllium	0.000500	0.00200	-.000019	1	U
Calcium	0.100	0.200	-.0308	1	U
Cobalt	0.00250	0.00500	-.0000943	1	U
Iron	0.0250	0.100	.0146	1	U
Potassium	0.250	1.00	.0411	1	U
Magnesium	0.250	0.500	.0298	1	U
Sodium	0.250	0.500	-.038	1	U
Vanadium	0.00500	0.0100	-.0000623	1	U
Zinc	0.00500	0.0200	-.0035	1	U

U = Result is less than MDL
F = Result is between MDL and RL
* = Result is above RL

INITIAL CALIBRATION BLANK (ICB)

00100916

Login Number: L0709400
Instrument ID: PE-ICP2
File ID: P2.092607.095538
Workgroup (AAB#): WG250687

Run Date: 09/26/2007
Run Time: 09:55
Analyst: KRV
Cal ID: PE-ICP - 26-SEP-07

Sample ID: WG251121-07
Method: 6010B
Units: mg/L

Analytes	MDL	RDL	Concentration	Dilution	Qualifier
Aluminum	0.0500	0.100	.0234	1	U
Beryllium	0.000500	0.00200	.000174	1	U
Calcium	0.100	0.200	-.00635	1	U
Cobalt	0.00250	0.00500	.000312	1	U
Iron	0.0250	0.100	.0136	1	U
Potassium	0.250	1.00	.0338	1	U
Magnesium	0.250	0.500	.0383	1	U
Sodium	0.250	0.500	-.0191	1	U
Vanadium	0.00500	0.0100	.00411	1	U
Zinc	0.00500	0.0200	-.00178	1	U

U = Result is less than MDL
F = Result is between MDL and RL
* = Result is above RL

KEMRON FORMS - Modified 10/02/2006
Version 1.5 PDF File ID: 883077
Report generated 09/28/2007 11:00

INITIAL CALIBRATION BLANK (ICB)

00100917

Login Number: L0709400
Instrument ID: PE-ICP2
File ID: P2.092707.145602
Workgroup (AAB#): WG251133

Run Date: 09/27/2007
Run Time: 14:56
Analyst: KRV
Cal ID: PE-ICP - 27-SEP-07

Sample ID: WG251316-07
Method: 6010B
Units: mg/L

Analytes	MDL	RDL	Concentration	Dilution	Qualifier
Aluminum	0.0500	0.100	-.0138	1	U
Beryllium	0.000500	0.00200	-.000107	1	U
Calcium	0.100	0.200	.0173	1	U
Cobalt	0.00250	0.00500	-.000349	1	U
Iron	0.0250	0.100	-.027	1	F
Potassium	0.250	1.00	.0843	1	U
Magnesium	0.250	0.500	-.0918	1	U
Sodium	0.250	0.500	.00658	1	U
Vanadium	0.00500	0.0100	-.00276	1	U
Zinc	0.00500	0.0200	-.00416	1	U

U = Result is less than MDL
F = Result is between MDL and RL
* = Result is above RL

INITIAL CALIBRATION BLANK (ICB)

00100918

Login Number: L0709400
Instrument ID: PE-ICP2
File ID: P2.092607.095538
Workgroup (AAB#): WG251133

Run Date: 09/26/2007
Run Time: 09:55
Analyst: KRV
Cal ID: PE-ICP - 26-SEP-07

Sample ID: WG251121-07
Method: 6010B
Units: mg/L

Analytes	MDL	RDL	Concentration	Dilution	Qualifier
Aluminum	0.0500	0.100	.0234	1	U
Beryllium	0.000500	0.00200	.000174	1	U
Calcium	0.100	0.200	-.00635	1	U
Cobalt	0.00250	0.00500	.000312	1	U
Iron	0.0250	0.100	.0136	1	U
Potassium	0.250	1.00	.0338	1	U
Magnesium	0.250	0.500	.0383	1	U
Sodium	0.250	0.500	-.0191	1	U
Vanadium	0.00500	0.0100	.00411	1	U
Zinc	0.00500	0.0200	-.00178	1	U

U = Result is less than MDL
F = Result is between MDL and RL
* = Result is above RL

KEMRON FORMS - Modified 10/02/2006
Version 1.5 PDF File ID: 883077
Report generated 09/28/2007 11:00

CONTINUING CALIBRATION BLANK (CCB)

00100919

Login Number: L0709400
Run Date: 09/24/2007
Sample ID: WG250856-11
Instrument ID: PE-ICP2
Run Time: 09:14
Method: 6010B
File ID: P2.092407.091428
Analyst: KHR
Units: mg/L
Workgroup (AAB#): WG250687
Cal ID: PE-ICP - 24-SEP-07

Analytes	MDL	RDL	Concentration	Dilution	Qualifier
Aluminum	0.0500	0.100	0.0185	1	U
Beryllium	0.000500	0.00200	-0.00000744	1	U
Calcium	0.100	0.200	0.0432	1	U
Cobalt	0.00250	0.00500	-0.000234	1	U
Iron	0.0250	0.100	0.0139	1	U
Potassium	0.250	1.00	-0.00649	1	U
Magnesium	0.250	0.500	0.0333	1	U
Sodium	0.250	0.500	-0.0611	1	U
Vanadium	0.00500	0.0100	-0.000882	1	U
Zinc	0.00500	0.0200	-0.00362	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: 883080
Report generated 09/28/2007 11:00

CONTINUING CALIBRATION BLANK (CCB)

00100920

Login Number: L0709400
Run Date: 09/24/2007
Sample ID: WG250856-21
Instrument ID: PE-ICP2
Run Time: 14:09
Method: 6010B
File ID: P2.092407.140907
Analyst: KHR
Units: mg/L
Workgroup (AAB#): WG250687
Cal ID: PE-ICP - 24-SEP-07

Analytes	MDL	RDL	Concentration	Dilution	Qualifier
Aluminum	0.0500	0.100	0.00449	1	U
Beryllium	0.000500	0.00200	-0.0000344	1	U
Calcium	0.100	0.200	0.0219	1	U
Cobalt	0.00250	0.00500	-0.000372	1	U
Iron	0.0250	0.100	0.0139	1	U
Potassium	0.250	1.00	0.00491	1	U
Magnesium	0.250	0.500	0.0307	1	U
Sodium	0.250	0.500	-0.0422	1	U
Vanadium	0.00500	0.0100	-0.0000743	1	U
Zinc	0.00500	0.0200	-0.00389	1	U

U = Result is less than MDL
F = Result is between MDL and RL
* = Result is above RL

CONTINUING CALIBRATION BLANK (CCB)

Login Number: L0709400
Run Date: 09/24/2007
Sample ID: WG250856-23
Instrument ID: PE-ICP2
Run Time: 15:27
Method: 6010B
File ID: P2.092407.152718
Analyst: KHR
Units: mg/L
Workgroup (AAB#): WG250687
Cal ID: PE-ICP - 24-SEP-07

Analytes	MDL	RDL	Concentration	Dilution	Qualifier
Aluminum	0.0500	0.100	0.00356	1	U
Beryllium	0.000500	0.00200	-0.0000184	1	U
Calcium	0.100	0.200	0.0282	1	U
Cobalt	0.00250	0.00500	-0.000331	1	U
Iron	0.0250	0.100	0.0153	1	U
Potassium	0.250	1.00	-0.00337	1	U
Magnesium	0.250	0.500	0.0254	1	U
Sodium	0.250	0.500	-0.0307	1	U
Vanadium	0.00500	0.0100	-0.000241	1	U
Zinc	0.00500	0.0200	-0.00348	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: 883080
Report generated 09/28/2007 11:00

CONTINUING CALIBRATION BLANK (CCB)

00100922

Login Number: L0709400
Run Date: 09/24/2007
Sample ID: WG250856-25
Instrument ID: PE-ICP2
Run Time: 16:22
Method: 6010B
File ID: P2.092407.162241
Analyst: KHR
Units: mg/L
Workgroup (AAB#): WG250687
Cal ID: PE-ICP - 24-SEP-07

Analytes	MDL	RDL	Concentration	Dilution	Qualifier
Aluminum	0.0500	0.100	0.00772	1	U
Beryllium	0.000500	0.00200	-0.00000920	1	U
Calcium	0.100	0.200	0.0291	1	U
Cobalt	0.00250	0.00500	-0.000211	1	U
Iron	0.0250	0.100	0.0137	1	U
Potassium	0.250	1.00	0.0484	1	U
Magnesium	0.250	0.500	0.0310	1	U
Sodium	0.250	0.500	0.0729	1	U
Vanadium	0.00500	0.0100	-0.00116	1	U
Zinc	0.00500	0.0200	-0.00390	1	U

U = Result is less than MDL
F = Result is between MDL and RL
* = Result is above RL

CONTINUING CALIBRATION BLANK (CCB)

00100923

Login Number: L0709400 Run Date: 09/26/2007 Sample ID: WG251121-11
Instrument ID: PE-ICP2 Run Time: 10:19 Method: 6010B
File ID: P2.092607.101918 Analyst: KRV Units: mg/L
Workgroup (AAB#): WG250687 Cal ID: PE-ICP - 26-SEP-07

Analytes	MDL	RDL	Concentration	Dilution	Qualifier
Aluminum	0.0500	0.100	0.0361	1	U
Beryllium	0.000500	0.00200	0.000133	1	U
Calcium	0.100	0.200	0.0463	1	U
Cobalt	0.00250	0.00500	0.000443	1	U
Iron	0.0250	0.100	0.0191	1	U
Potassium	0.250	1.00	-0.0427	1	U
Magnesium	0.250	0.500	0.0346	1	U
Sodium	0.250	0.500	-0.0492	1	U
Vanadium	0.00500	0.0100	0.00478	1	U
Zinc	0.00500	0.0200	-0.00178	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: 883080
Report generated 09/28/2007 11:00

CONTINUING CALIBRATION BLANK (CCB)

00100924

Login Number: L0709400 Run Date: 09/26/2007 Sample ID: WG251121-13
Instrument ID: PE-ICP2 Run Time: 11:54 Method: 6010B
File ID: P2.092607.115449 Analyst: KRV Units: mg/L
Workgroup (AAB#): WG250687 Cal ID: PE-ICP - 26-SEP-07

Analytes	MDL	RDL	Concentration	Dilution	Qualifier
Aluminum	0.0500	0.100	0.0338	1	U
Beryllium	0.000500	0.00200	-0.0000201	1	U
Calcium	0.100	0.200	-0.00468	1	U
Cobalt	0.00250	0.00500	0.000366	1	U
Iron	0.0250	0.100	0.0185	1	U
Potassium	0.250	1.00	0.0109	1	U
Magnesium	0.250	0.500	0.0373	1	U
Sodium	0.250	0.500	0.0429	1	U
Vanadium	0.00500	0.0100	0.00973	1	F
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
Version 2.0 PDF File ID: 883080
Report generated 09/28/2007 11:00

CONTINUING CALIBRATION BLANK (CCB)

00100925

Login Number: L0709400
Run Date: 09/26/2007
Sample ID: WG251121-11
Instrument ID: PE-ICP2
Run Time: 10:19
Method: 6010B
File ID: P2.092607.101918
Analyst: KRV
Units: mg/L
Workgroup (AAB#): WG251133
Cal ID: PE-ICP - 26-SEP-07

Analytes	MDL	RDL	Concentration	Dilution	Qualifier
Aluminum	0.0500	0.100	0.0361	1	U
Beryllium	0.000500	0.00200	0.000133	1	U
Calcium	0.100	0.200	0.0463	1	U
Cobalt	0.00250	0.00500	0.000443	1	U
Iron	0.0250	0.100	0.0191	1	U
Potassium	0.250	1.00	-0.0427	1	U
Magnesium	0.250	0.500	0.0346	1	U
Sodium	0.250	0.500	-0.0492	1	U
Vanadium	0.00500	0.0100	0.00478	1	U
Zinc	0.00500	0.0200	-0.00178	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: 883080
Report generated 09/28/2007 11:00

CONTINUING CALIBRATION BLANK (CCB)

00100926

Login Number: L0709400
Run Date: 09/26/2007
Sample ID: WG251121-29
Instrument ID: PE-ICP2
Run Time: 18:46
Method: 6010B
File ID: P2.092607.184601
Analyst: KRV
Units: mg/L
Workgroup (AAB#): WG251133
Cal ID: PE-ICP - 26-SEP-07

Analytes	MDL	RDL	Concentration	Dilution	Qualifier
Aluminum	0.0500	0.100	0.0436	1	U
Beryllium	0.000500	0.00200	0.000147	1	U
Calcium	0.100	0.200	0.107	1	F
Cobalt	0.00250	0.00500	0.000252	1	U
Iron	0.0250	0.100	0.0195	1	U
Potassium	0.250	1.00	0.00382	1	U
Magnesium	0.250	0.500	0.0385	1	U
Sodium	0.250	0.500	-0.0351	1	U
Vanadium	0.00500	0.0100	0.00350	1	U
Zinc	0.00500	0.0200	-0.00236	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: 883080
Report generated 09/28/2007 11:00

CONTINUING CALIBRATION BLANK (CCB)

00100927

Login Number: L0709400 Run Date: 09/26/2007 Sample ID: WG251121-31
Instrument ID: PE-ICP2 Run Time: 20:01 Method: 6010B
File ID: P2.092607.200133 Analyst: KRV Units: mg/L
Workgroup (AAB#): WG251133 Cal ID: PE-ICP - 26-SEP-07

Analytes	MDL	RDL	Concentration	Dilution	Qualifier
Aluminum	0.0500	0.100	0.0386	1	U
Beryllium	0.000500	0.00200	0.000103	1	U
Calcium	0.100	0.200	0.0685	1	U
Cobalt	0.00250	0.00500	0.000325	1	U
Iron	0.0250	0.100	0.0188	1	U
Potassium	0.250	1.00	0.0506	1	U
Magnesium	0.250	0.500	0.0290	1	U
Sodium	0.250	0.500	0.0811	1	U
Vanadium	0.00500	0.0100	0.00425	1	U
Zinc	0.00500	0.0200	-0.00235	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: 883080
Report generated 09/28/2007 11:00

CONTINUING CALIBRATION BLANK (CCB)

00100928

Login Number: L0709400
Run Date: 09/27/2007
Sample ID: WG251316-11
Instrument ID: PE-ICP2
Run Time: 15:19
Method: 6010B
File ID: P2.092707.151906
Analyst: KRV
Units: mg/L
Workgroup (AAB#): WG251133
Cal ID: PE-ICP - 27-SEP-07

Analytes	MDL	RDL	Concentration	Dilution	Qualifier
Aluminum	0.0500	0.100	-0.0187	1	U
Beryllium	0.000500	0.00200	-0.0000831	1	U
Calcium	0.100	0.200	-0.00241	1	U
Cobalt	0.00250	0.00500	-0.000718	1	U
Iron	0.0250	0.100	-0.0267	1	F
Potassium	0.250	1.00	0.00255	1	U
Magnesium	0.250	0.500	-0.0738	1	U
Sodium	0.250	0.500	0.0122	1	U
Vanadium	0.00500	0.0100	-0.00313	1	U
Zinc	0.00500	0.0200	-0.00416	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: 883080
Report generated 09/28/2007 11:00

CONTINUING CALIBRATION BLANK (CCB)

00100929

Login Number: L0709400
Run Date: 09/27/2007
Sample ID: WG251316-15
Instrument ID: PE-ICP2
Run Time: 17:47
Method: 6010B
File ID: P2.092707.174725
Analyst: KRV
Units: mg/L
Workgroup (AAB#): WG251133
Cal ID: PE-ICP - 27-SEP-07

Analytes	MDL	RDL	Concentration	Dilution	Qualifier
Aluminum	0.0500	0.100	-0.0230	1	U
Beryllium	0.000500	0.00200	-0.000106	1	U
Calcium	0.100	0.200	-0.000348	1	U
Cobalt	0.00250	0.00500	-0.000661	1	U
Iron	0.0250	0.100	-0.0311	1	F
Potassium	0.250	1.00	0.0218	1	U
Magnesium	0.250	0.500	-0.0820	1	U
Sodium	0.250	0.500	0.00679	1	U
Vanadium	0.00500	0.0100	-0.00155	1	U
Zinc	0.00500	0.0200	-0.00354	1	U

U = Result is less than MDL
F = Result is between MDL and RL
* = Result is above RL

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Version 2.0 PDF File ID: 883080
Report generated 09/28/2007 11:00

CONTINUING CALIBRATION BLANK (CCB)

00100930

Login Number: L0709400
Run Date: 09/27/2007
Sample ID: WG251316-17
Instrument ID: PE-ICP2
Run Time: 18:43
Method: 6010B
File ID: P2.092707.184347
Analyst: KRV
Units: mg/L
Workgroup (AAB#): WG251133
Cal ID: PE-ICP - 27-SEP-07

Analytes	MDL	RDL	Concentration	Dilution	Qualifier
Aluminum	0.0500	0.100	-0.0317	1	U
Beryllium	0.000500	0.00200	-0.000129	1	U
Calcium	0.100	0.200	0.0252	1	U
Cobalt	0.00250	0.00500	-0.000437	1	U
Iron	0.0250	0.100	-0.0277	1	F
Potassium	0.250	1.00	0.0950	1	U
Magnesium	0.250	0.500	-0.0931	1	U
Sodium	0.250	0.500	0.113	1	U
Vanadium	0.00500	0.0100	-0.00260	1	U
Zinc	0.00500	0.0200	-0.00346	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: 883080
Report generated 09/28/2007 11:00

INITIAL CALIBRATION VERIFICATION (ICV)

00100931

Login Number: L0709400
Run Date: 09/24/2007
Sample ID: WG250856-06
Instrument ID: PE-ICP2
Run Time: 08:44
Method: 6010B
File ID: P2.092407.084448
Analyst: KHR
Units: mg/L
Workgroup (AAB#): WG250687
Cal ID: PE-ICP - 24-SEP-07
QC Key: STD

Analyte		Expected	Found	%REC	LIMITS	Q
Aluminum		10	10.0	100	90 - 110	
Beryllium		.05	0.0498	99.6	90 - 110	
Calcium		10	10.3	103	90 - 110	
Cobalt		.2	0.202	101	90 - 110	
Iron		4	4.11	103	90 - 110	
Potassium		50	50.6	101	90 - 110	
Magnesium		10	10.0	100	90 - 110	
Sodium		50	50.2	100	90 - 110	
Vanadium		1	0.984	98.4	90 - 110	
Zinc		1	1.03	103	90 - 110	

* Exceeds LIMITS Limit

KEMRON FORMS - Modified 09/06/2007 (ICV)
Version 1.5 PDF File ID: 883076
Report generated 09/28/2007 11:00

INITIAL CALIBRATION VERIFICATION (ICV)

00100932

Login Number: L0709400
Run Date: 09/26/2007
Sample ID: WG251121-06
Instrument ID: PE-ICP2
Run Time: 09:49
Method: 6010B
File ID: P2.092607.094912
Analyst: KRV
Units: mg/L
Workgroup (AAB#): WG250687
Cal ID: PE-ICP - 26-SEP-07
QC Key: STD

Analyte		Expected	Found	%REC	LIMITS	Q
Aluminum		10	9.77	97.7	90 - 110	
Beryllium		.05	0.0489	97.8	90 - 110	
Calcium		10	9.96	99.6	90 - 110	
Cobalt		.2	0.197	98.4	90 - 110	
Iron		4	4.02	100	90 - 110	
Potassium		50	49.9	99.8	90 - 110	
Magnesium		10	9.91	99.1	90 - 110	
Sodium		50	49.7	99.4	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: 883076
Report generated 09/28/2007 11:00

INITIAL CALIBRATION VERIFICATION (ICV)

00100933

Login Number: L0709400
Instrument ID: PE-ICP2
File ID: P2.092607.094912
Workgroup (AAB#): WG251133
QC Key: STD

Run Date: 09/26/2007
Run Time: 09:49
Analyst: KRV
Cal ID: PE-ICP - 26-SEP-07

Sample ID: WG251121-06
Method: 6010B
Units: mg/L

Analyte		Expected	Found	%REC	LIMITS	Q
Aluminum		10	9.77	97.7	90 - 110	
Beryllium		.05	0.0489	97.8	90 - 110	
Calcium		10	9.96	99.6	90 - 110	
Cobalt		.2	0.197	98.4	90 - 110	
Iron		4	4.02	100	90 - 110	
Potassium		50	49.9	99.8	90 - 110	
Magnesium		10	9.91	99.1	90 - 110	
Sodium		50	49.7	99.4	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: 883076
Report generated 09/28/2007 11:00

INITIAL CALIBRATION VERIFICATION (ICV)

00100934

Login Number: L0709400
Run Date: 09/27/2007
Sample ID: WG251316-06
Instrument ID: PE-ICP2
Run Time: 14:49
Method: 6010B
File ID: P2.092707.144945
Analyst: KRV
Units: mg/L
Workgroup (AAB#): WG251133
Cal ID: PE-ICP - 27-SEP-07
QC Key: STD

Analyte		Expected	Found	%REC	LIMITS	Q
Aluminum		10	9.99	99.9	90 - 110	
Beryllium		.05	0.0488	97.5	90 - 110	
Calcium		10	9.94	99.4	90 - 110	
Cobalt		.2	0.196	98.0	90 - 110	
Iron		4	3.99	99.8	90 - 110	
Potassium		50	49.1	98.3	90 - 110	
Magnesium		10	9.81	98.1	90 - 110	
Sodium		50	48.9	97.8	90 - 110	
Vanadium		1	0.979	97.9	90 - 110	
Zinc		1	1.02	102	90 - 110	

* Exceeds LIMITS Limit

CONTINUING CALIBRATION VERIFICATION (CCV)

00100935

Login Number: L0709400 Run Date: 09/24/2007 Sample ID: WG250856-10
Instrument ID: PE-ICP2 Run Time: 09:08 Method: 6010B
File ID: P2.092407.090809 Analyst: KHR QC Key: STD
Workgroup (AAB#): WG250687 Cal ID: PE-ICP - 24-SEP-07

Analyte		Expected	Found	UNITS	%REC	LIMITS		Q
Aluminum		10.0	10.2	mg/L	102	90 - 110		
Beryllium		0.0500	0.0515	mg/L	103	90 - 110		
Calcium		10.0	10.5	mg/L	105	90 - 110		
Cobalt		0.200	0.207	mg/L	104	90 - 110		
Iron		4.00	4.04	mg/L	101	90 - 110		
Potassium		50.0	51.3	mg/L	103	90 - 110		
Magnesium		10.0	9.89	mg/L	98.9	90 - 110		
Sodium		50.0	50.7	mg/L	101	90 - 110		
Vanadium		1.00	1.02	mg/L	102	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: 883079
Report generated 09/28/2007 11:00

CONTINUING CALIBRATION VERIFICATION (CCV)

00100936

Login Number: L0709400
Run Date: 09/24/2007
Sample ID: WG250856-20
Instrument ID: PE-ICP2
Run Time: 14:02
Method: 6010B
File ID: P2.092407.140248
Analvst: KHR
QC Key: STD
Workgroup (AAB#): WG250687
Cal ID: PE-ICP - 24-SEP-07

Analyte		Expected	Found	UNITS	%REC	LIMITS		Q
Aluminum		10.0	10.2	mg/L	102	90 - 110		
Beryllium		0.0500	0.0525	mg/L	105	90 - 110		
Calcium		10.0	10.6	mg/L	106	90 - 110		
Cobalt		0.200	0.213	mg/L	106	90 - 110		
Iron		4.00	4.03	mg/L	101	90 - 110		
Potassium		50.0	51.7	mg/L	103	90 - 110		
Magnesium		10.0	9.83	mg/L	98.3	90 - 110		
Sodium		50.0	51.0	mg/L	102	90 - 110		
Vanadium		1.00	1.03	mg/L	103	90 - 110		
Zinc		1.00	1.10	mg/L	110	90 - 110		

* Exceeds LIMITS Criteria

KEMRON FORMS - Modified 09/06/2007 - (CCV)
Version 1.5 PDF File ID: 883079
Report generated 09/28/2007 11:00

CONTINUING CALIBRATION VERIFICATION (CCV)

00100937

Login Number: L0709400 | Run Date: 09/24/2007 | Sample ID: WG250856-22
Instrument ID: PE-ICP2 | Run Time: 15:21 | Method: 6010B
File ID: P2.092407.152101 | Analyst: KHR | QC Key: STD
Workgroup (AAB#): WG250687 | Cal ID: PE-ICP - 24-SEP-07

Analyte		Expected	Found	UNITS	%REC	LIMITS		Q
Aluminum		10.0	10.4	mg/L	104	90 - 110		
Beryllium		0.0500	0.0528	mg/L	106	90 - 110		
Calcium		10.0	10.7	mg/L	107	90 - 110		
Cobalt		0.200	0.214	mg/L	107	90 - 110		
Iron		4.00	3.94	mg/L	98.6	90 - 110		
Potassium		50.0	52.5	mg/L	105	90 - 110		
Magnesium		10.0	9.67	mg/L	96.7	90 - 110		
Sodium		50.0	51.4	mg/L	103	90 - 110		
Vanadium		1.00	1.03	mg/L	103	90 - 110		
Zinc		1.00	1.10	mg/L	110	90 - 110		

* Exceeds LIMITS Criteria

KEMRON FORMS - Modified 09/06/2007 - (CCV)
Version 1.5 PDF File ID: 883079
Report generated 09/28/2007 11:00

CONTINUING CALIBRATION VERIFICATION (CCV)

00100938

Login Number: L0709400 Run Date: 09/24/2007 Sample ID: WG250856-24
Instrument ID: PE-ICP2 Run Time: 16:16 Method: 6010B
File ID: P2.092407.161620 Analyst: KHR QC Key: STD
Workgroup (AAB#): WG250687 Cal ID: PE-ICP - 24-SEP-07

Analyte		Expected	Found	UNITS	%REC	LIMITS		Q
Aluminum		10.0	10.4	mg/L	104	90 - 110		
Beryllium		0.0500	0.0528	mg/L	106	90 - 110		
Calcium		10.0	10.8	mg/L	108	90 - 110		
Cobalt		0.200	0.214	mg/L	107	90 - 110		
Iron		4.00	4.01	mg/L	100	90 - 110		
Potassium		50.0	52.2	mg/L	104	90 - 110		
Magnesium		10.0	9.83	mg/L	98.3	90 - 110		
Sodium		50.0	51.1	mg/L	102	90 - 110		
Vanadium		1.00	1.04	mg/L	104	90 - 110		
Zinc		1.00	1.10	mg/L	110	90 - 110		*

* Exceeds LIMITS Criteria

KEMRON FORMS - Modified 09/06/2007 - (CCV)
Version 1.5 PDF File ID: 883079
Report generated 09/28/2007 11:00

CONTINUING CALIBRATION VERIFICATION (CCV)

00100939

Login Number: L0709400 Run Date: 09/26/2007 Sample ID: WG251121-10
Instrument ID: PE-ICP2 Run Time: 10:12 Method: 6010B
File ID: P2.092607.101252 Analyst: KRV QC Key: STD
Workgroup (AAB#): WG250687 Cal ID: PE-ICP - 26-SEP-07

Analyte		Expected	Found	UNITS	%REC	LIMITS		Q
Aluminum		10.0	9.93	mg/L	99.3	90 - 110		
Beryllium		0.0500	0.0484	mg/L	96.9	90 - 110		
Calcium		10.0	9.98	mg/L	99.8	90 - 110		
Cobalt		0.200	0.197	mg/L	98.7	90 - 110		
Iron		4.00	4.07	mg/L	102	90 - 110		
Potassium		50.0	50.5	mg/L	101	90 - 110		
Magnesium		10.0	10.0	mg/L	100	90 - 110		
Sodium		50.0	50.7	mg/L	101	90 - 110		
Vanadium		1.00	0.972	mg/L	97.2	90 - 110		
Zinc		1.00	1.01	mg/L	101	90 - 110		

* Exceeds LIMITS Criteria

KEMRON FORMS - Modified 09/06/2007 - (CCV)
Version 1.5 PDF File ID: 883079
Report generated 09/28/2007 11:00

CONTINUING CALIBRATION VERIFICATION (CCV)

00100940

Login Number: L0709400 Run Date: 09/26/2007 Sample ID: WG251121-10
Instrument ID: PE-ICP2 Run Time: 10:12 Method: 6010B
File ID: P2.092607.101252 Analyst: KRV QC Key: STD
Workgroup (AAB#): WG251133 Cal ID: PE-ICP - 26-SEP-07

Analyte		Expected	Found	UNITS	%REC	LIMITS		Q
Aluminum		10.0	9.93	mg/L	99.3	90 - 110		
Beryllium		0.0500	0.0484	mg/L	96.9	90 - 110		
Calcium		10.0	9.98	mg/L	99.8	90 - 110		
Cobalt		0.200	0.197	mg/L	98.7	90 - 110		
Iron		4.00	4.07	mg/L	102	90 - 110		
Potassium		50.0	50.5	mg/L	101	90 - 110		
Magnesium		10.0	10.0	mg/L	100	90 - 110		
Sodium		50.0	50.7	mg/L	101	90 - 110		
Vanadium		1.00	0.972	mg/L	97.2	90 - 110		
Zinc		1.00	1.01	mg/L	101	90 - 110		

* Exceeds LIMITS Criteria

KEMRON FORMS - Modified 09/06/2007 - (CCV)
Version 1.5 PDF File ID: 883079
Report generated 09/28/2007 11:00

CONTINUING CALIBRATION VERIFICATION (CCV)

00100941

Login Number: L0709400 | Run Date: 09/26/2007 | Sample ID: WG251121-12
Instrument ID: PE-ICP2 | Run Time: 11:48 | Method: 6010B
File ID: P2.092607.114833 | Analyst: KRV | QC Key: STD
Workgroup (AAB#): WG250687 | Cal ID: PE-ICP - 26-SEP-07

Analyte		Expected	Found	UNITS	%REC	LIMITS		Q
Aluminum		10.0	9.99	mg/L	99.9	90 - 110		
Beryllium		0.0500	0.0504	mg/L	101	90 - 110		
Calcium		10.0	10.3	mg/L	103	90 - 110		
Cobalt		0.200	0.203	mg/L	101	90 - 110		
Iron		4.00	4.14	mg/L	103	90 - 110		
Potassium		50.0	51.0	mg/L	102	90 - 110		
Magnesium		10.0	10.2	mg/L	102	90 - 110		
Sodium		50.0	51.2	mg/L	102	90 - 110		
Vanadium		1.00	0.995	mg/L	99.5	90 - 110		
Zinc		1.00	1.03	mg/L	103	90 - 110		

* Exceeds LIMITS Criteria

KEMRON FORMS - Modified 09/06/2007 - (CCV)
Version 1.5 PDF File ID: 883079
Report generated 09/28/2007 11:00

CONTINUING CALIBRATION VERIFICATION (CCV)

00100942

Login Number: L0709400
Run Date: 09/26/2007
Sample ID: WG251121-28
Instrument ID: PE-ICP2
Run Time: 18:39
Method: 6010B
File ID: P2.092607.183944
Analyst: KRV
QC Key: STD
Workgroup (AAB#): WG251133
Cal ID: PE-ICP - 26-SEP-07

Analyte		Expected	Found	UNITS	%REC	LIMITS		Q
Aluminum		10.0	10.0	mg/L	100	90 - 110		
Beryllium		0.0500	0.0507	mg/L	101	90 - 110		
Calcium		10.0	10.3	mg/L	103	90 - 110		
Cobalt		0.200	0.203	mg/L	101	90 - 110		
Iron		4.00	4.30	mg/L	107	90 - 110		
Potassium		50.0	51.0	mg/L	102	90 - 110		
Magnesium		10.0	10.5	mg/L	105	90 - 110		
Sodium		50.0	51.4	mg/L	103	90 - 110		
Vanadium		1.00	1.00	mg/L	100	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: 883079
Report generated 09/28/2007 11:00

CONTINUING CALIBRATION VERIFICATION (CCV)

00100943

Login Number: L0709400
Run Date: 09/26/2007
Sample ID: WG251121-30
Instrument ID: PE-ICP2
Run Time: 19:55
Method: 6010B
File ID: P2.092607.195513
Analvst: KRV
QC Key: STD
Workgroup (AAB#): WG251133
Cal ID: PE-ICP - 26-SEP-07

Analyte		Expected	Found	UNITS	%REC	LIMITS		Q
Aluminum		10.0	10.3	mg/L	103	90 - 110		
Beryllium		0.0500	0.0506	mg/L	101	90 - 110		
Calcium		10.0	10.4	mg/L	104	90 - 110		
Cobalt		0.200	0.207	mg/L	104	90 - 110		
Iron		4.00	4.36	mg/L	109	90 - 110		
Potassium		50.0	52.2	mg/L	104	90 - 110		
Magnesium		10.0	10.6	mg/L	106	90 - 110		
Sodium		50.0	52.5	mg/L	105	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: 883079
Report generated 09/28/2007 11:00

CONTINUING CALIBRATION VERIFICATION (CCV)

00100944

Login Number: L0709400 Run Date: 09/27/2007 Sample ID: WG251316-10
Instrument ID: PE-ICP2 Run Time: 15:12 Method: 6010B
File ID: P2.092707.151249 Analyst: KRV QC Key: STD
Workgroup (AAB#): WG251133 Cal ID: PE-ICP - 27-SEP-07

Analyte		Expected	Found	UNITS	%REC	LIMITS		Q
Aluminum		10.0	10.0	mg/L	100	90 - 110		
Beryllium		0.0500	0.0485	mg/L	97.1	90 - 110		
Calcium		10.0	9.91	mg/L	99.1	90 - 110		
Cobalt		0.200	0.195	mg/L	97.5	90 - 110		
Iron		4.00	3.81	mg/L	95.1	90 - 110		
Potassium		50.0	48.9	mg/L	97.8	90 - 110		
Magnesium		10.0	9.38	mg/L	93.8	90 - 110		
Sodium		50.0	48.8	mg/L	97.6	90 - 110		
Vanadium		1.00	0.964	mg/L	96.4	90 - 110		
Zinc		1.00	1.01	mg/L	101	90 - 110		

* Exceeds LIMITS Criteria

KEMRON FORMS - Modified 09/06/2007 - (CCV)
Version 1.5 PDF File ID: 883079
Report generated 09/28/2007 11:00

CONTINUING CALIBRATION VERIFICATION (CCV)

00100945

Login Number: L0709400
Run Date: 09/27/2007
Sample ID: WG251316-14
Instrument ID: PE-ICP2
Run Time: 17:41
Method: 6010B
File ID: P2.092707.174110
Analyst: KRV
QC Key: STD
Workgroup (AAB#): WG251133
Cal ID: PE-ICP - 27-SEP-07

Analyte		Expected	Found	UNITS	%REC	LIMITS		Q
Aluminum		10.0	9.89	mg/L	98.9	90 - 110		
Beryllium		0.0500	0.0487	mg/L	97.5	90 - 110		
Calcium		10.0	9.90	mg/L	99.0	90 - 110		
Cobalt		0.200	0.196	mg/L	97.9	90 - 110		
Iron		4.00	3.93	mg/L	98.3	90 - 110		
Potassium		50.0	48.5	mg/L	97.0	90 - 110		
Magnesium		10.0	9.62	mg/L	96.2	90 - 110		
Sodium		50.0	48.5	mg/L	96.9	90 - 110		
Vanadium		1.00	0.961	mg/L	96.1	90 - 110		
Zinc		1.00	1.03	mg/L	103	90 - 110		

* Exceeds LIMITS Criteria

KEMRON FORMS - Modified 09/06/2007 - (CCV)
Version 1.5 PDF File ID: 883079
Report generated 09/28/2007 11:00

CONTINUING CALIBRATION VERIFICATION (CCV)

00100946

Login Number: L0709400
Run Date: 09/27/2007
Sample ID: WG251316-16
Instrument ID: PE-ICP2
Run Time: 18:37
Method: 6010B
File ID: P2.092707.183732
Analyst: KRV
QC Key: STD
Workgroup (AAB#): WG251133
Cal ID: PE-ICP - 27-SEP-07

Analyte		Expected	Found	UNITS	%REC	LIMITS		Q
Aluminum		10.0	9.99	mg/L	99.9	90 - 110		
Beryllium		0.0500	0.0487	mg/L	97.4	90 - 110		
Calcium		10.0	9.95	mg/L	99.5	90 - 110		
Cobalt		0.200	0.199	mg/L	99.7	90 - 110		
Iron		4.00	3.65	mg/L	91.2	90 - 110		
Potassium		50.0	48.8	mg/L	97.6	90 - 110		
Magnesium		10.0	8.99	mg/L	89.9	90 - 110		*
Sodium		50.0	49.0	mg/L	98.0	90 - 110		
Vanadium		1.00	0.958	mg/L	95.8	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: 883079
Report generated 09/28/2007 11:00

Login number: L0709400 **Workgroup (AAB#):** WG251133
Instrument ID: PE-ICP2 **Method:** 6010B
Sol. A : WG251121-08 **File ID:** P2.092607.100203 **Units:** mg/L
Sol. AB : WG251121-09 **File ID:** P2.092607.100728

	Sol. A			Sol. AB			
ANALYTE	True	Found	%Recovery	True	Found	%Recovery	Q
Aluminum	250	238	95.2	250	238	95.2	
Beryllium	NS	0	NS	0.250	0.251	100	
Calcium	250	261	104	250	262	105	
Cobalt	NS	0.000860	NS	0.250	0.236	94.4	
Iron	100	99.8	99.8	100	97.7	97.7	
Magnesium	250	252	101	250	247	98.8	
Potassium	NS	-0.0528	NS	5.00	5.44	109	
Sodium	NS	0.0177	NS	5.00	5.43	109	
Vanadium	NS	0.00231	NS	0.250	0.255	102	
Zinc	NS	0.00555	NS	0.500	0.487	97.4	

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).

Login number: L0709400 **Workgroup (AAB#):** WG251133
Instrument ID: PE-ICP2 **Method:** 6010B
Sol. A : WG251316-08 **File ID:** P2.092707.150214 **Units:** mg/L
Sol. AB : WG251316-09 **File ID:** P2.092707.150730

	Sol. A			Sol. AB			
ANALYTE	True	Found	%Recovery	True	Found	%Recovery	Q
Aluminum	250	249	99.6	250	239	95.6	
Beryllium	NS	0	NS	0.250	0.249	99.6	
Calcium	250	255	102	250	254	102	
Cobalt	NS	-0.000310	NS	0.250	0.231	92.4	
Iron	100	102	102	100	90.9	90.9	
Magnesium	250	256	102	250	230	92.0	
Potassium	NS	-0.0854	NS	5.00	4.96	99.2	
Sodium	NS	0.0150	NS	5.00	5.01	100	
Vanadium	NS	-0.0000200	NS	0.250	0.246	98.4	
Zinc	NS	0.00268	NS	0.500	0.476	95.2	

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: 883078
Report generated 09/28/2007 11:00

Login number: L0709400
Instrument ID: PE-ICP2
Sol. A : WG250856-08 **File ID:** P2.092407.085720
Sol. AB : WG250856-09 **File ID:** P2.092407.090247

Workgroup (AAB#): WG250687
Method: 6010B
Units: mg/L

	Sol. A			**Sol. AB**			
ANALYTE	True	Found	%Recovery	True	Found	%Recovery	Q
Aluminum	250	245	98.0	250	244	97.6	
Beryllium	NS	0	NS	0.250	0.259	104	
Calcium	250	264	106	250	270	108	
Cobalt	NS	0.000350	NS	0.250	0.245	98.0	
Iron	100	95.5	95.5	100	97.5	97.5	
Magnesium	250	241	96.4	250	245	98.0	
Potassium	NS	-0.0585	NS	5.00	5.52	110	
Sodium	NS	-0.00336	NS	5.00	5.42	108	
Vanadium	NS	-0.000120	NS	0.250	0.261	104	
Zinc	NS	0.00329	NS	0.500	0.507	101	

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: 883078
Report generated 09/28/2007 11:00

INTERFERENCE CHECK SAMPLES

Login number: L0709400
Workgroup (AAB#): WG250687
Instrument ID: PE-ICP2
Method: 6010B
Sol. A : WG251121-08 **File ID:** P2.092607.100203
Units: mg/L
Sol. AB : WG251121-09 **File ID:** P2.092607.100728

	Sol. A			Sol. AB			
ANALYTE	True	Found	%Recovery	True	Found	%Recovery	Q
Aluminum	250	238	95.2	250	238	95.2	
Beryllium	NS	0	NS	0.250	0.251	100	
Calcium	250	261	104	250	262	105	
Cobalt	NS	0.000860	NS	0.250	0.236	94.4	
Iron	100	99.8	99.8	100	97.7	97.7	
Magnesium	250	252	101	250	247	98.8	
Potassium	NS	-0.0528	NS	5.00	5.44	109	
Sodium	NS	0.0177	NS	5.00	5.43	109	
Vanadium	NS	0.00231	NS	0.250	0.255	102	
Zinc	NS	0.00555	NS	0.500	0.487	97.4	

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).

INTERELEMENT CORRECTION FACTORS (ANNUALLY)

00100951

Login Number: L0709400 **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

INTERELEMENT CORRECTION FACTORS (ANNUALLY)

00100952

Login Number: L0709400 **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

INTERELEMENT CORRECTION FACTORS (ANNUALLY)

00100953

Login Number: L0709400 **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

KEMRON FORMS - Modified 02/14/2006
Version 1.5 PDF File ID: 883074
Report generated 09/28/2007 11:00

INTERELEMENT CORRECTION FACTORS (ANNUALLY)

00100954

Login Number: L0709400 **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

KEMRON FORMS - Modified 02/14/2006
Version 1.5 PDF File ID: 883074
Report generated 09/28/2007 11:00

INTERELEMENT CORRECTION FACTORS (ANNUALLY)

Login Number: L0709400 **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

INTERELEMENT CORRECTION FACTORS (ANNUALLY)

00100956

Login Number: L0709400 **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)

00100957

Login Number: L0709400 **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:

2.1.2 Metals ICP-MS Data

2.1.2.1 Summary Data

LABORATORY REPORT

00100960

L0709400

10/02/07 10:28

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: LONGHORN-PBC

P.O. Number: 322255 OP

Sample Analysis Summary

Client ID	Lab ID	Method	Dilution	Date Received
47WW06-091307	L0709400-01	6020	10	18-SEP-07
47WW06-091307	L0709400-02	6020	10	18-SEP-07
47WW07-091307	L0709400-03	6020	10	18-SEP-07
47WW07-091307	L0709400-04	6020	10	18-SEP-07
47WW07-091307	L0709400-04	6020	10	18-SEP-07

Sample Number:L0709400-01
Client ID:47WW06-091307
Matrix:Water
Workgroup Number:WG250540
Collect Date:09/13/2007 16:01
Sample Tag:DL01

PrePrep Method:NONE
Prep Method:3015
Analytical Method:6020
Analyst:JYH
Dilution:10
Units:mg/L

Instrument:ELAN-ICP
Prep Date:09/19/2007 14:00
Cal Date:09/20/2007 10:28
Run Date:09/20/2007 12:01
File ID:EL.092007.120105

Analyte	CAS. Number	Result	Qual	PQL	SQL
Silver, Total	7440-22-4		U	0.0100	0.00250
Arsenic, Total	7440-38-2	0.0578		0.0100	0.00250
Barium, Total	7440-39-3	0.0817		0.0300	0.00500
Cadmium, Total	7440-43-9		U	0.00500	0.00125
Chromium, Total	7440-47-3	0.114		0.0200	0.00500
Copper, Total	7440-50-8	0.00592	J	0.0200	0.00500
Lead, Total	7439-92-1		U	0.00500	0.00250
Manganese, Total	7439-96-5	0.239		0.0200	0.00500
Nickel, Total	7440-02-0	0.0346	J	0.0400	0.0100
Antimony, Total	7440-36-0		U	0.0100	0.00250
Selenium, Total	7782-49-2	0.00992	J	0.0100	0.00500
Thallium, Total	7440-28-0	0.00290		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

Sample Number:	L0709400-02	PrePrep Method:	NONE	Instrument:	ELAN-ICP
Client ID:	47WW06-091307	Prep Method:	3015	Prep Date:	09/21/2007 08:00
Matrix:	Water	Analytical Method:	6020	Cal Date:	09/24/2007 09:57
Workgroup Number:	WG250784	Analyst:	JYH	Run Date:	09/24/2007 11:42
Collect Date:	09/13/2007 16:01	Dilution:	10	File ID:	EL.092407.114236
Sample Tag:	DL01	Units:	mg/L		

Analyte	CAS. Number	Result	Qual	PQL	SQL
Silver, Dissolved	7440-22-4		U	0.0100	0.00250
Arsenic, Dissolved	7440-38-2	0.0206		0.0100	0.00250
Barium, Dissolved	7440-39-3	0.0494		0.0300	0.00500
Cadmium, Dissolved	7440-43-9		U	0.00500	0.00125
Chromium, Dissolved	7440-47-3	0.0110	J	0.0200	0.00500
Copper, Dissolved	7440-50-8		U	0.0200	0.00500
Lead, Dissolved	7439-92-1		U	0.00500	0.00250
Manganese, Dissolved	7439-96-5	0.196		0.0200	0.00500
Nickel, Dissolved	7440-02-0	0.0224	J	0.0400	0.0100
Antimony, Dissolved	7440-36-0		U	0.0100	0.00250
Selenium, Dissolved	7782-49-2		U	0.0100	0.00500
Thallium, Dissolved	7440-28-0	0.00441		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

Sample Number: L0709400-03
Client ID: 47WW07-091307
Matrix: Water
Workgroup Number: WG250540
Collect Date: 09/13/2007 17:24
Sample Tag: DL01

PrePrep Method: NONE
Prep Method: 3015
Analytical Method: 6020
Analyst: JYH
Dilution: 10
Units: mg/L

Instrument: ELAN-ICP
Prep Date: 09/19/2007 14:00
Cal Date: 09/20/2007 10:28
Run Date: 09/20/2007 12:07
File ID: EL.092007.120737

Analyte	CAS. Number	Result	Qual	PQL	SQL
Silver, Total	7440-22-4		U	0.0100	0.00250
Arsenic, Total	7440-38-2	0.00389	J	0.0100	0.00250
Barium, Total	7440-39-3	0.0886		0.0300	0.00500
Cadmium, Total	7440-43-9		U	0.00500	0.00125
Chromium, Total	7440-47-3	0.139		0.0200	0.00500
Copper, Total	7440-50-8	0.0146	J	0.0200	0.00500
Lead, Total	7439-92-1		U	0.00500	0.00250
Manganese, Total	7439-96-5	0.0956		0.0200	0.00500
Nickel, Total	7440-02-0	0.356		0.0400	0.0100
Antimony, Total	7440-36-0		U	0.0100	0.00250
Selenium, Total	7782-49-2	0.0115		0.0100	0.00500
Thallium, Total	7440-28-0	0.00421		0.00200	0.000500

J The analyte was positively identified, but the quantitation was below the RL
U Not detected at or above adjusted sample detection limit

Sample Number:	L0709400-04	PrePrep Method:	NONE	Instrument:	ELAN-ICP
Client ID:	47WW07-091307	Prep Method:	3015	Prep Date:	09/21/2007 08:00
Matrix:	Water	Analytical Method:	6020	Cal Date:	09/24/2007 09:57
Workgroup Number:	WG250784	Analyst:	JYH	Run Date:	09/24/2007 12:15
Collect Date:	09/13/2007 17:24	Dilution:	10	File ID:	EL.092407.121538
Sample Tag:	DL01	Units:	mg/L		

Analyte	CAS. Number	Result	Qual	PQL	SQL
Silver, Dissolved	7440-22-4		U	0.0100	0.00250
Arsenic, Dissolved	7440-38-2		U	0.0100	0.00250
Barium, Dissolved	7440-39-3	0.0439		0.0300	0.00500
Cadmium, Dissolved	7440-43-9		U	0.00500	0.00125
Copper, Dissolved	7440-50-8		U	0.0200	0.00500
Lead, Dissolved	7439-92-1		U	0.00500	0.00250
Manganese, Dissolved	7439-96-5	0.00725	J	0.0200	0.00500
Nickel, Dissolved	7440-02-0	0.0803		0.0400	0.0100
Antimony, Dissolved	7440-36-0		U	0.0100	0.00250
Selenium, Dissolved	7782-49-2		U	0.0100	0.00500
Thallium, Dissolved	7440-28-0	0.00462		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

Sample Number: **L0709400-04**	PrePrep Method: **NONE**	Instrument: **ELAN-ICP**
Client ID: **47WW07-091307**	Prep Method: **3015**	Prep Date: **09/21/2007 08:00**
Matrix: **Water**	Analytical Method: **6020**	Cal Date: **09/24/2007 09:57**
Workgroup Number: **WG250784**	Analyst: **JYH**	Run Date: **09/24/2007 14:24**
Collect Date: **09/13/2007 17:24**	Dilution: **10**	File ID: **EL.092407.142421**
Sample Tag: **DL02**	Units: **mg/L**	

Analyte	CAS. Number	Result	Qual	PQL	SQL
Chromium, Dissolved	7440-47-3		U	0.0200	0.00500

U Not detected at or above adjusted sample detection limit

2.1.2.2 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

Microwave Digestion Log

Analyst(s): VC
Date: 9/21/07 08:00
LCS: .25 mL STD 2171
MS/MSD: .25 mL STD 2171
Witness: Ed
HNO_3 Lot #: Lot 12524
HCl Lot #:
Digest Tube Lot #: COA D400
Earliest Sample Due Date: 9/25
Microwave #: MW 2

Box: N
Digestion Work Group: WG 250465
ME407 Revision # 8 Method 3015-Water
ME406 Revision # Method 3051-Soil-Oil

Relinquished By: VC
Digest Received By: SRP Date: 9/21/07

	KEMRON #	Initial Wt/Vol	Final Volume	Initial Weight	Final Weight	Comments	Due Date
1	PBW	40 mL	100 mL	208.16 g	208.14 g	02	
2	LCS			206.56	206.53	03	
3	09-400-02			209.05	209.03	Lab Filtered	9/28
4	04			207.86	207.82		
5	430-03 *			207.65	207.60	AFLEE	9/28
6	04			205.64	205.61		
7	05			208.40	208.38	01	
8	05MS			208.27	208.25	04	
9	05MSD			206.30	206.29	05	
10	06			209.14	209.12		
11	07			208.01	207.97		
12	08			204.59	204.57		
13	459-01			207.52	207.50		9/25
14	02			207.77	207.72	Lab Filtered	
15	484-14 *			208.00	208.01	AFLEE	9/28
16	15			205.43	205.41		
17	16			205.00	205.00		
18	17			206.05	206.03		
19	18			207.03	206.97		
20	19			208.26	208.23		
21							
22							
23							
24							
25							
26			Ed 09-21-07				
27							
28							
29							
30							

Comments: * Lvl 4

Primary Review: Vicki Collins 9/21/07 Secondary Review: Emily Decker 09-21-07

Microwave Digestion Log

Analyst(s): VC
Date: 9/15/07 14:00
LCS: .25 mL STD 21717
MS/MSD: .25 mL S D21717
Witness: [illegible]
HNO_3 Lot #: 6412536
HCl Lot #: ~~6A1352?~~ VC 9/15/07
Digest Tube Lot #: 6AD40
Earliest Sample Due Date: 9/21
Microwave #: MW2

Box: B7 127306S
Digestion Work Group: WG 250508
ME407 Revision # 8 Method 3015-Water
ME406 Revision # ____ Method 3051-Soil-Oil

Relinquished By: VC
Digest Received By: El Date: 09-19-07

	KEMRON #	Initial Wt/Vol	Final Volume	Initial Weight	Final Weight	Comments	Due Date
1	PBW	40mL	100 mL	206.84	206.84	02	
2	LCS			207.24	207.23	03	
3	09-334-01 *			207.34	207.35		9/25
4	03			208.09	208.07		
5	05			208.04	208.02		
6	07			207.79	207.77		
7	09			206.16	206.13		
8	342 63			207.86	207.83		9/28
9	04			207.86	207.85		
10	325 63 *			207.38	207.36	01	9/21
11	03MS			207.52	207.50	04	
12	03MSD			209.13	209.11	05	
13	400-01			206.17	206.14		9/28
14	03			206.44	206.42		
15	SPLP BLK 9/18			206.15	206.12	WG 250396 14:30	
16	09 348 02 *			209.21	209.20		9/24
17	04			206.63	206.60		
18	05			206.42	206.40		
19	06			208.44	208.43		
20	07			208.58	208.56		
21							
22							
23							
24							
25				VC 9/15/07			
26							
27							
28							
29							
30							

Comments: * level 4

Primary Review: Vicki Collins 9/15/07 Secondary Review: [illegible] 9/19/07

KEMRON Environmental Services

Instrument Run Log

Instrument: ELAN-ICP   Dataset: 092007A.REP
Analyst1: JYH   Analyst2: N/A
Method: 6020   SOP: ME700   Rev: 4
Maintenance Log ID: 19692

Calibration Std: STD21454   ICV/CCV Std: STD21905   Post Spike: STD21680
ICSA: STD21872   ICSAB: STD21873

Workgroups: 250540,250557

Comments:

Seq.	File ID	Sample	ID	Prep	Dil	Reference	Date/Time
1	EL.092007.100251	Blank	Blank		1		09/20/07 10:02
2	EL.092007.100921	WG250607-01	Calibration Point		1		09/20/07 10:09
3	EL.092007.101551	WG250607-02	Calibration Point		1		09/20/07 10:15
4	EL.092007.102222	WG250607-03	Calibration Point		1		09/20/07 10:22
5	EL.092007.102854	WG250607-04	Calibration Point		1		09/20/07 10:28
6	EL.092007.103527	WG250607-05	Initial Calibration Verification		1		09/20/07 10:35
7	EL.092007.104208	WG250607-06	Initial Calib Blank		1		09/20/07 10:42
8	EL.092007.104851	WG250607-07	CRQL Check Solid		1		09/20/07 10:48
9	EL.092007.105527	WG250607-08	CRQL Check Water		1		09/20/07 10:55
10	EL.092007.110202	WG250607-09	Interference Check		1		09/20/07 11:02
11	EL.092007.110836	WG250607-10	Interference Check		1		09/20/07 11:08
12	EL.092007.111510	WG250607-11	CCV		1		09/20/07 11:15
13	EL.092007.112152	WG250607-12	CCB		1		09/20/07 11:21
14	EL.092007.112832	WG250508-02	Method/Prep Blank	40/100	1		09/20/07 11:28
15	EL.092007.113502	WG250508-03	Laboratory Control S	40/100	1		09/20/07 11:35
16	EL.092007.114132	WG250508-01	Reference Sample		1	L0709375-03	09/20/07 11:41
17	EL.092007.114803	WG250508-04	Matrix Spike	40/100	1		09/20/07 11:48
18	EL.092007.115434	WG250508-05	Matrix Spike Duplica	40/100	1		09/20/07 11:54
19	EL.092007.120105	L0709400-01	47WW06-091307	40/100	10	WG250449-01	09/20/07 12:01
20	EL.092007.120737	L0709400-03	47WW07-091307	40/100	10		09/20/07 12:07
21	EL.092007.121409	WG250540-01	Post Digestion Spike		10	L0709400-03	09/20/07 12:14
22	EL.092007.122042	WG250540-02	Serial Dilution		50	L0709400-03	09/20/07 12:20
23	EL.092007.122714	WG250607-13	CCV		1		09/20/07 12:27
24	EL.092007.123356	WG250607-14	CCB		1		09/20/07 12:33
25	EL.092007.124037	L0709334-01	MW-03-06	40/100	1	WG250387-03	09/20/07 12:40
26	EL.092007.124711	L0709334-03	MW-03-05	40/100	1		09/20/07 12:47
27	EL.092007.125344	L0709334-05	MW-03-04	40/100	1		09/20/07 12:53
28	EL.092007.130016	L0709334-07	MW-01-10	40/100	1	WG250276-04	09/20/07 13:00
29	EL.092007.130647	L0709334-09	MW-01-01	40/100	1	WG250345-01	09/20/07 13:06
30	EL.092007.131318	L0709362-03	SB-01	40/100	1		09/20/07 13:13
31	EL.092007.131949	L0709362-04	SB-01	40/100	1		09/20/07 13:19
32	EL.092007.132620	WG250396-01	Fluid Blank		1		09/20/07 13:26
33	EL.092007.133253	WG250607-15	CCV		1		09/20/07 13:32
34	EL.092007.133934	WG250607-16	CCB		1		09/20/07 13:39
35	EL.092007.135230	L0709348-02	AV-NCB-PE-AC1-32-C1-0	40/100	1	WG250502-01	09/20/07 13:52
36	EL.092007.135902	L0709348-04	AV-NCB-AS-AC1-2-09140	40/100	1		09/20/07 13:59
37	EL.092007.140535	L0709348-05	AV-NCB-PE-MUL-32-C1-0	40/100	1		09/20/07 14:05

Page: 1   Approved: September 21, 2007

Maren Beery

KEMRON Environmental Services

Instrument Run Log

Instrument: ELAN-ICP
Dataset: 092007A.REP
Analyst1: JYH
Analyst2: N/A
Method: 6020
SOP: ME700
Rev: 4
Maintenance Log ID: 19692

Calibration Std: STD21454
ICV/CCV Std: STD21905
Post Spike: STD21680
ICSA: STD21872
ICSAB: STD21873

Workgroups: 250540,250557

Comments:

Seq.	File ID	Sample	ID	Prep	Dil	Reference	Date/Time
38	EL.092007.141207	L0709348-06	AV-NCB-AS-MUL-1--0914	40/100	1	WG250359-01	09/20/07 14:12
39	EL.092007.141841	L0709348-07	AV-NCB-AS-STO-G-55-09	40/100	1		09/20/07 14:18
40	EL.092007.142514	L0709348-07	AV-NCB-AS-STO-G-55-09	40/100	5		09/20/07 14:25
41	EL.092007.143147	L0709348-02	AV-NCB-PE-AC1-32-C1-0	40/100	5	WG250502-01	09/20/07 14:31
42	EL.092007.143819	L0709348-04	AV-NCB-AS-AC1-2-09140	40/100	5		09/20/07 14:38
43	EL.092007.144452	WG250607-17	CCV		1		09/20/07 14:44
44	EL.092007.145133	WG250607-18	CCB		1		09/20/07 14:51
45	EL.092007.145934	L0709334-03	MW-03-05	40/100	5		09/20/07 14:59
46	EL.092007.150608	L0709334-05	MW-03-04	40/100	5		09/20/07 15:06
47	EL.092007.151240	L0709334-07	MW-01-10	40/100	5	WG250276-04	09/20/07 15:12
48	EL.092007.151910	L0709334-09	MW-01-01	40/100	5	WG250345-01	09/20/07 15:19
49	EL.092007.152541	L0709362-04	SB-01	40/100	5		09/20/07 15:25
50	EL.092007.153213	WG250607-19	CCV		1		09/20/07 15:32
51	EL.092007.153855	WG250607-20	CCB		1		09/20/07 15:38
52	EL.092007.154537	WG250533-04	Method/Prep Blank	40/100	1		09/20/07 15:45
53	EL.092007.155211	WG250533-05	Laboratory Control S	40/100	1		09/20/07 15:52
54	EL.092007.155843	L0709419-01	OUTFALL 002/COMP	40/100	4	WG250533-03	09/20/07 15:58
55	EL.092007.160514	WG250533-10	Duplicate	40/100	4		09/20/07 16:05
56	EL.092007.161145	WG250533-01	Reference Sample		1	L0709385-06	09/20/07 16:11
57	EL.092007.161817	WG250533-06	Matrix Spike	40/100	1	L0709385-07	09/20/07 16:18
58	EL.092007.162449	WG250533-07	Matrix Spike Duplica	40/100	1	L0709385-08	09/20/07 16:24
59	EL.092007.163121	L0709385-02	CN0355	40/100	1		09/20/07 16:31
60	EL.092007.163753	WG250557-01	Post Digestion Spike		1	L0709385-02	09/20/07 16:37
61	EL.092007.164426	WG250557-02	Serial Dilution		5	L0709385-02	09/20/07 16:44
62	EL.092007.165059	WG250607-21	CCV		1		09/20/07 16:50
63	EL.092007.165741	WG250607-22	CCB		1		09/20/07 16:57
64	EL.092007.170422	L0709385-03	CN0356	40/100	1		09/20/07 17:04
65	EL.092007.171056	L0709385-04	CN0358	40/100	1		09/20/07 17:10
66	EL.092007.171730	L0709385-05	CN0359	40/100	1		09/20/07 17:17
67	EL.092007.172404	WG250533-02	Reference Sample		1	L0709412-02	09/20/07 17:24
68	EL.092007.173037	WG250533-08	Matrix Spike	40/100	1	L0709412-03	09/20/07 17:30
69	EL.092007.173708	WG250533-09	Matrix Spike Duplica	40/100	1	L0709412-04	09/20/07 17:37
70	EL.092007.174340	L0709412-05	CN0340	40/100	1		09/20/07 17:43
71	EL.092007.175012	L0709412-06	CN0352	40/100	1		09/20/07 17:50
72	EL.092007.175644	L0709412-07	CN0361	40/100	1		09/20/07 17:56
73	EL.092007.180317	WG250607-23	CCV		1		09/20/07 18:03
74	EL.092007.180958	WG250607-24	CCB		1		09/20/07 18:09

Approved: September 21, 2007

Maren Beery

KEMRON Environmental Services
Instrument Run Log

Instrument: ELAN-ICP Dataset: 092007A.REP
Analyst1: JYH Analyst2: N/A
Method: 6020 SOP: ME700 Rev: 4
Maintenance Log ID: 19692

Calibration Std: STD21454 ICV/CCV Std: STD21905 Post Spike: STD21680
ICSA: STD21872 ICSAB: STD21873

Workgroups: 250540,250557

Comments:

Seq.	File ID	Sample	ID	Prep	Dil	Reference	Date/Time
75	EL.092007.181639	L0709335-02	EOL-01	40/100	5		09/20/07 18:16
76	EL.092007.182312	L0709336-02	OHD-01	40/100	5		09/20/07 18:23
77	EL.092007.182946	L0709336-04	OHD-01D	40/100	5		09/20/07 18:29
78	EL.092007.183620	L0709336-06	OHD-02	40/100	5		09/20/07 18:36
79	EL.092007.184253	WG250607-25	CCV		1		09/20/07 18:42
80	EL.092007.184934	WG250607-26	CCB		1		09/20/07 18:49

Page: 3 Approved: September 21, 2007

Maren Beery

KEMRON Environmental Services

Instrument Run Log

Instrument: ELAN-ICP
Dataset: 092407A.REP
Analyst1: JYH
Analyst2: N/A
Method: 6020
SOP: ME700
Rev: 4
Maintenance Log ID: 19692

Calibration Std: STD21454
ICV/CCV Std: STD21905
Post Spike: STD21680
ICSA: STD21872
ICSAB: STD21873

Workgroups: 250784,250790,250879

Comments:

Seq.	File ID	Sample	ID	Prep	Dil	Reference	Date/Time
1	EL.092407.093118	Blank	Blank		1		09/24/07 09:31
2	EL.092407.093748	WG250868-01	Calibration Point		1		09/24/07 09:37
3	EL.092407.094418	WG250868-02	Calibration Point		1		09/24/07 09:44
4	EL.092407.095050	WG250868-03	Calibration Point		1		09/24/07 09:50
5	EL.092407.095721	WG250868-04	Calibration Point		1		09/24/07 09:57
6	EL.092407.100354	WG250868-05	Initial Calibration Verification		1		09/24/07 10:03
7	EL.092407.101036	WG250868-06	Initial Calib Blank		1		09/24/07 10:10
8	EL.092407.101719	WG250868-07	CRQL Check Solid		1		09/24/07 10:17
9	EL.092407.102355	WG250868-08	CRQL Check Water		1		09/24/07 10:23
10	EL.092407.103030	WG250868-09	Interference Check		1		09/24/07 10:30
11	EL.092407.103704	WG250868-10	Interference Check		1		09/24/07 10:37
12	EL.092407.104337	WG250868-11	CCV		1		09/24/07 10:43
13	EL.092407.105019	WG250868-12	CCB		1		09/24/07 10:50
14	EL.092407.105659	WG250665-02	Method/Prep Blank	40/100	1		09/24/07 10:56
15	EL.092407.110329	WG250665-03	Laboratory Control S	40/100	1		09/24/07 11:03
16	EL.092407.110959	L0709459-01	PRWW01-091807	40/100	1		09/24/07 11:09
17	EL.092407.111630	L0709459-02	PRWW01-091807	40/100	1		09/24/07 11:16
18	EL.092407.112301	WG250665-01	Reference Sample		1	L0709430-05	09/24/07 11:23
19	EL.092407.112932	WG250665-04	Matrix Spike	40/100	1		09/24/07 11:29
20	EL.092407.113604	WG250665-05	Matrix Spike Duplica	40/100	1		09/24/07 11:36
21	EL.092407.114236	L0709400-02	47WW06-091307	40/100	10		09/24/07 11:42
22	EL.092407.114909	WG250784-01	Post Digestion Spike		10	L0709400-02	09/24/07 11:49
23	EL.092407.115541	WG250784-02	Serial Dilution		50	L0709400-02	09/24/07 11:55
24	EL.092407.120214	WG250868-13	CCV		1		09/24/07 12:02
25	EL.092407.120856	WG250868-14	CCB		1		09/24/07 12:08
26	EL.092407.121538	L0709400-04	47WW07-091307	40/100	10		09/24/07 12:15
27	EL.092407.122211	L0709430-03	OT018-GW-LH2-2	40/100	1		09/24/07 12:22
28	EL.092407.122843	L0709430-04	OT018-GW-MW11	40/100	1		09/24/07 12:28
29	EL.092407.123514	L0709430-06	OT018-GW-MW13	40/100	1		09/24/07 12:35
30	EL.092407.124145	L0709430-07	OT018-GW-TY10LH	40/100	1		09/24/07 12:41
31	EL.092407.124816	L0709430-08	OT018-GW-DUPE	40/100	1		09/24/07 12:48
32	EL.092407.125447	L0709484-14	N7666E1037-A-3	40/100	1		09/24/07 12:54
33	EL.092407.130119	L0709484-15	N7622E1273-A-3	40/100	1		09/24/07 13:01
34	EL.092407.130752	L0709484-16	N7666E1037-B-3	40/100	1		09/24/07 13:07
35	EL.092407.131424	L0709484-17	N7184E1675-B-3	40/100	1		09/24/07 13:14
36	EL.092407.132057	WG250868-15	CCV		1		09/24/07 13:20
37	EL.092407.132739	WG250868-16	CCB		1		09/24/07 13:27

Page: 1

Approved: September 25, 2007

Maren Berry

KEMRON Environmental Services
Instrument Run Log

Instrument: ELAN-ICP　Dataset: 092407A.REP
Analyst1: JYH　Analyst2: N/A
Method: 6020　SOP: ME700　Rev: 4
Maintenance Log ID: 19692

Calibration Std: STD21454　ICV/CCV Std: STD21905　Post Spike: STD21680
ICSA: STD21872　ICSAB: STD21873

Workgroups: 250784,250790,250879

Comments:

Seq.	File ID	Sample	ID	Prep	Dil	Reference	Date/Time
38	EL.092407.133420	L0709484-18	N6854E0476-B-3	40/100	1		09/24/07 13:34
39	EL.092407.134103	L0709484-19	N7184E1675-A-3	40/100	1		09/24/07 13:41
40	EL.092407.134736	WG250868-17	Interference Check		1		09/24/07 13:47
41	EL.092407.135410	WG250868-18	Interference Check		1		09/24/07 13:54
42	EL.092407.140044	WG250868-19	CCV		1		09/24/07 14:00
43	EL.092407.140726	WG250868-20	CCB		1		09/24/07 14:07
44	EL.092407.141407	BLANK	BLANK		10		09/24/07 14:14
45	EL.092407.142421	L0709400-04	47WW07-091307	40/100	10		09/24/07 14:24
46	EL.092407.143126	WG250667-02	Method/Prep Blank	.5/200	1		09/24/07 14:31
47	EL.092407.143800	WG250667-03	Laboratory Control S	.5/200	1		09/24/07 14:38
48	EL.092407.144433	WG250667-01	Reference Sample		1	L0709457-02	09/24/07 14:44
49	EL.092407.145104	WG250667-04	Matrix Spike	.5/200	1		09/24/07 14:51
50	EL.092407.145735	WG250667-05	Matrix Spike Duplica	.5/200	1		09/24/07 14:57
51	EL.092407.150406	L0709457-01	BGA030	.5/200	1	WG250749-01	09/24/07 15:04
52	EL.092407.151038	WG250790-01	Post Digestion Spike		1	L0709457-01	09/24/07 15:10
53	EL.092407.151710	WG250790-02	Serial Dilution		5	L0709457-01	09/24/07 15:17
54	EL.092407.152343	WG250868-21	CCV		1		09/24/07 15:23
55	EL.092407.153024	WG250868-22	CCB		1		09/24/07 15:30
56	EL.092407.153706	L0709457-03	BGA032	.503/200	1		09/24/07 15:37
57	EL.092407.154338	L0709457-04	BGA034	.5/200	1		09/24/07 15:43
58	EL.092407.155012	L0709457-05	BGA035	.503/200	1		09/24/07 15:50
59	EL.092407.155758	L0709457-06	BGA036	.504/200	1		09/24/07 15:57
60	EL.092407.160432	L0709457-07	BGA037	.502/200	1		09/24/07 16:04
61	EL.092407.161106	L0709460-01	E-20-SD-091907		1		09/24/07 16:11
62	EL.092407.161739	L0709460-02	E-25-SD-091907		1		09/24/07 16:17
63	EL.092407.162410	L0709474-01	T-20 PACKING RESIDUE		5		09/24/07 16:24
64	EL.092407.164015	BLANK	BLANK		1		09/24/07 16:40
65	EL.092407.165539	BLANK	BLANK		1		09/24/07 16:55
66	EL.092407.170213	WG250868-23	CCV		1		09/24/07 17:02
67	EL.092407.170854	WG250868-24	CCB		1		09/24/07 17:08
68	EL.092407.171536	L0709460-01	E-20-SD-091907	.5/200	10		09/24/07 17:15
69	EL.092407.172209	L0709460-02	E-25-SD-091907	.508/200	20		09/24/07 17:22
70	EL.092407.172841	WG250868-25	CCV		1		09/24/07 17:28
71	EL.092407.173523	WG250868-26	CCB		1		09/24/07 17:35
72	EL.092407.174204	WG250839-03	Method/Prep Blank	40/100	1		09/24/07 17:42
73	EL.092407.174835	WG250839-04	Laboratory Control S	40/100	1		09/24/07 17:48
74	EL.092407.175508	L0709525-01	LH18/24-SP650-6957/GRAB	40/100	1		09/24/07 17:55

Approved: September 25, 2007
Maren Beery

KEMRON Environmental Services

Instrument Run Log

Instrument: ELAN-ICP Dataset: 092407A.REP

Analyst1: JYH Analyst2: N/A

Method: 6020 SOP: ME700 Rev: 4

Maintenance Log ID: 19692

Calibration Std: STD21454 ICV/CCV Std: STD21905 Post Spike: STD21680

ICSA: STD21872 ICSAB: STD21873

Workgroups: 250784,250790,250879

Comments:

Seq.	File ID	Sample	ID	Prep	Dil	Reference	Date/Time
75	EL.092407.180140	L0709525-02	LH18/24-SP650-6957/COMP	40/100	1		09/24/07 18:01
76	EL.092407.180813	WG250839-02	Reference Sample		1	L0709545-02	09/24/07 18:08
77	EL.092407.181447	WG250839-06	Matrix Spike	40/100	1		09/24/07 18:14
78	EL.092407.182120	WG250839-07	Matrix Spike Duplica	40/100	1		09/24/07 18:21
79	EL.092407.182754	L0709545-04	EEF0907	40/100	1		09/24/07 18:27
80	EL.092407.183429	WG250879-01	Post Digestion Spike		1	L0709545-04	09/24/07 18:34
81	EL.092407.184103	WG250879-02	Serial Dilution		5	L0709545-04	09/24/07 18:41
82	EL.092407.184737	WG250868-27	CCV		1		09/24/07 18:47
83	EL.092407.185419	WG250868-28	CCB		1		09/24/07 18:54
84	EL.092407.190059	L0709461-01	DRL-Z-OUTLET 006	40/100	4		09/24/07 19:00
85	EL.092407.190731	WG250839-05	Duplicate	40/100	4		09/24/07 19:07
86	EL.092407.191403	L0709520-02	AV-NCB-EB-1-092007	40/100	1		09/24/07 19:14
87	EL.092407.192035	L0709540-01	BGA018	40/100	1		09/24/07 19:20
88	EL.092407.192708	L0709540-02	BGA024	40/100	1		09/24/07 19:27
89	EL.092407.193341	L0709540-03	BGA025	40/100	1		09/24/07 19:33
90	EL.092407.194014	L0709540-04	BGA026	40/100	1		09/24/07 19:40
91	EL.092407.194648	L0709540-05	BGA027	40/100	1		09/24/07 19:46
92	EL.092407.195322	L0709540-06	BGA028	40/100	1		09/24/07 19:53
93	EL.092407.195956	L0709540-07	BGA029	40/100	1		09/24/07 19:59
94	EL.092407.200631	L0709474-01	T-20 PACKING RESIDUE	.5/200	100		09/24/07 20:06
95	EL.092407.201306	BLANK	BLANK		1		09/24/07 20:13
96	EL.092407.201940	WG250868-29	CCV		1		09/24/07 20:19
97	EL.092407.202621	WG250868-30	CCB		1		09/24/07 20:26

Page: 3 Approved: September 25, 2007

Maren Beery

Checklist ID: 21421

00100977

KEMRON Environmental Services
Data Checklist

Date: 20-SEP-2007

Analyst: JYH

Analyst: NA

Method: 6020

Instrument: ELAN

Curve Workgroup: 250607

Runlog ID: 18325

Analytical Workgroups: 250540,250557

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	334,362,375,400,348,335,336,385,412,419
Client Forms	X
Level X	335,336
Level 3	400
Level 4	334,375,348,385,412
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: Ji-Yu Hu

Secondary Reviewer: 21-SEP-2007 Maren Beery

Generated: SEP-21-2007 10:49:48

Checklist ID: 21490

00100978

KEMRON Environmental Services
Data Checklist

Date: 24-SEP-2007

Analyst: JYH

Analyst: NA

Method: 6020

Instrument: ELAN

Curve Workgroup: 250868

Runlog ID: 18357

Analytical Workgroups: 250784,250790,250879

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	400,430,459,484,457,460,474,461,525,545,540
Client Forms	X
Level X	
Level 3	400,459,460,525,545
Level 4	430,484,457,540
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: Ji-Yu Hu

Secondary Reviewer: 25-SEP-2007 Maren Beery

Generated: SEP-25-2007 14:50:24

Analytical Method: 6020

AAB#: WG250784

Login Number: L0709400

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
47WW07-091307	09/13/07	09/18/07	09/21/07	180	7.61	09/24/07	180	3.27	
47WW06-091307	09/13/07	09/18/07	09/21/07	180	7.67	09/24/07	180	3.15	
47WW07-091307	09/13/07	09/18/07	09/21/07	180	7.61	09/24/07	180	3.18	

* EXT = SEE PROJECT QAPP REQUIREMENTS
*ANAL = SEE PROJECT QAPP REQUIREMENTS

KEMRON FORMS - Modified 11/20/2006
Version 1.5 PDF File ID: 880420
Report generated 09/24/2007 14:53

00100980

Analytical Method: 6020

AAB#: WG250540

Login Number: L0709400

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
47WW07-091307	09/13/07	09/18/07	09/19/07	180	5.86	09/20/07	180	0.922	
47WW06-091307	09/13/07	09/18/07	09/19/07	180	5.92	09/20/07	180	0.917	

* EXT = SEE PROJECT QAPP REQUIREMENTS

*ANAL = SEE PROJECT QAPP REQUIREMENTS

KEMRON FORMS - Modified 11/20/2006
Version 1.5 PDF File ID: 880420
Report generated 09/24/2007 14:53

METHOD BLANK SUMMARY

Login Number: L0709400
Work Group: WG250540
Blank File ID: EL.092007.112832
Blank Sample ID: WG250508-02
Prep Date: 09/19/07 14:00
Instrument ID: ELAN-ICP
Analyzed Date: 09/20/07 11:28
Method: 6020
Analyst: JYH

This Method Blank Applies To The Following Samples:

Client ID	Lab Sample ID	Lab File ID	Time Analyzed	TAG
LCS	WG250508-03	EL.092007.113502	09/20/07 11:35	01
47WW06-091307	L0709400-01	EL.092007.120105	09/20/07 12:01	DL01
47WW07-091307	L0709400-03	EL.092007.120737	09/20/07 12:07	DL01

KEMRON FORMS - Modified 01/31/2007
Version 1.5 PDF File ID: 880421
Report generated 09/24/2007 14:54

METHOD BLANK SUMMARY

Login Number: L0709400
Blank File ID: EL.092407.105659
Prep Date: 09/21/07 08:00
Analyzed Date: 09/24/07 10:56
Analyst: JYH

Work Group: WG250784
Blank Sample ID: WG250665-02
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	WG250665-03	EL.092407.110329	09/24/07 11:03	01
47WW06-091307	L0709400-02	EL.092407.114236	09/24/07 11:42	DL01
47WW07-091307	L0709400-04	EL.092407.121538	09/24/07 12:15	DL01
47WW07-091307	L0709400-04	EL.092407.142421	09/24/07 14:24	DL02

METHOD BLANK REPORT

00100983

Login Number: L0709400 Prep Date: 09/19/07 14:00 Sample ID: WG250508-02
Instrument ID: ELAN-ICP Run Date: 09/20/07 11:28 Prep Method: 3015
File ID: EL.092007.112832 Analyst: JYH Method: 6020
Workgroup (AAB#): WG250540 Matrix: Water Units: mg/L
Contract #: DACA56-94-D-0020 Cal ID: ELAN-I-20-SEP-07

Analytes	SQL	PQL	Concentration	Dilution	Qualifier
Silver, Total	0.000250	0.00100	0.000250	1	U
Arsenic, Total	0.000250	0.00100	0.000250	1	U
Barium, Total	0.000500	0.00300	0.000500	1	U
Cadmium, Total	0.000125	0.000500	0.000125	1	U
Chromium, Total	0.000500	0.00200	0.000500	1	U
Copper, Total	0.000500	0.00200	0.000500	1	U
Lead, Total	0.000250	0.000500	0.000250	1	U
Manganese, Total	0.000500	0.00200	0.000500	1	U
Nickel, Total	0.00100	0.00400	0.00100	1	U
Antimony, Total	0.000250	0.00100	0.000250	1	U
Selenium, Total	0.000500	0.00100	0.000500	1	U
Thallium, Total	0.0000500	0.000200	0.0000500	1	U

SQL Method Detection Limit
PQL Reporting/Practical Quantitation Limit
ND Analyte Not detected at or above reporting limit
* Analyte concentration > RL

METHOD BLANK REPORT

Login Number: L0709400 | Prep Date: 09/21/07 08:00 | Sample ID: WG250665-02
Instrument ID: ELAN-ICP | Run Date: 09/24/07 10:56 | Prep Method: 3015
File ID: EL.092407.105659 | Analvst: JYH | Method: 6020
Workgroup (AAB#): WG250784 | Matrix: Water | Units: mg/L
Contract #: DACA56-94-D-0020 | Cal ID: ELAN-I - 24-SEP-07

Analytes	SQL	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

SQL 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: 880422
Report generated 09/24/2007 14:54

LABORATORY CONTROL SAMPLE (LCS)

00100985

Login Number: L0709400 Run Date: 09/20/2007 Sample ID: WG250508-03
Instrument ID: ELAN-ICP Run Time: 11:35 Prep Method: 3015
File ID: EL.092007.113502 Analyst: JYH Method: 6020
Workgroup (AAB#): WG250540 Matrix: Water Units: mg/L
QC Key: STD Lot#: STD21680 Cal ID: ELAN-I - 20-SEP-07

Analytes	Expected	Found	% Rec	LCS Limits	Q
Silver, Total	0.0625	0.0600	95.9	80 - 120	
Arsenic, Total	0.0625	0.0596	95.3	80 - 120	
Barium, Total	0.0625	0.0612	98.0	80 - 120	
Cadmium, Total	0.0625	0.0619	99.1	80 - 120	
Chromium, Total	0.0625	0.0599	95.9	80 - 120	
Copper, Total	0.0625	0.0622	99.5	80 - 120	
Lead, Total	0.0625	0.0629	101	80 - 120	
Manganese, Total	0.0625	0.0602	96.3	80 - 120	
Nickel, Total	0.0625	0.0615	98.3	80 - 120	
Antimony, Total	0.0625	0.0618	98.9	80 - 120	
Selenium, Total	0.0625	0.0604	96.7	80 - 120	
Thallium, Total	0.0625	0.0615	98.5	80 - 120	

LABORATORY CONTROL SAMPLE (LCS)

Login Number: L0709400
Run Date: 09/24/2007
Sample ID: WG250665-03
Instrument ID: ELAN-ICP
Run Time: 11:03
Prep Method: 3015
File ID: EL.092407.110329
Analyst: JYH
Method: 6020
Workgroup (AAB#): WG250784
Matrix: Water
Units: mg/L
QC Key: STD
Lot#: STD21680
Cal ID: ELAN-I - 24-SEP-07

Analytes	Expected	Found	% Rec	LCS Limits	Q
Silver, Dissolved	0.0625	0.0613	98.1	80 - 120	
Arsenic, Dissolved	0.0625	0.0626	100	80 - 120	
Barium, Dissolved	0.0625	0.0626	100	80 - 120	
Cadmium, Dissolved	0.0625	0.0636	102	80 - 120	
Chromium, Dissolved	0.0625	0.0618	98.8	80 - 120	
Copper, Dissolved	0.0625	0.0638	102	80 - 120	
Lead, Dissolved	0.0625	0.0633	101	80 - 120	
Manganese, Dissolved	0.0625	0.0612	97.9	80 - 120	
Nickel, Dissolved	0.0625	0.0639	102	80 - 120	
Antimony, Dissolved	0.0625	0.0624	99.9	80 - 120	
Selenium, Dissolved	0.0625	0.0620	99.1	80 - 120	
Thallium, Dissolved	0.0625	0.0622	99.5	80 - 120	

KEMRON FORMS - Modified 09/06/2007
Version 1.5 PDF File ID: 880423
Report generated 09/24/2007 14:54

MATRIX SPIKE AND MATRIX SPIKE DUP (MS/MSD)

00100987

Loginnum: L0709400 Cal ID: ELAN-ICP- Worknum: WG250540
Instrument ID: ELAN-ICP Contract #: DACA56-94-D-0020 Method: 6020
Parent ID: WG250508-01 File ID: EL.092007.114132 Dil: 1 Matrix: WATER
Sample ID: WG250508-04 MS File ID: EL.092007.114803 Dil: 1 Units: mg/L
Sample ID: WG250508-05 MSD File ID: EL.092007.115434 Dil: 1

Analyte	Parent	MS Spiked	MS Found	MS %Rec	MSD Spiked	MSD Found	MSD %Rec	%RPD	%Rec Limits	RPD Limit	Q
Antimony	ND	0.0625	0.0619	99.0	0.0625	0.0632	101	2.06	75 - 125	20	
Arsenic	ND	0.0625	0.0581	93.0	0.0625	0.0570	91.2	1.94	75 - 125	20	
Barium	ND	0.0625	0.0636	102	0.0625	0.0638	102	0.403	75 - 125	20	
Cadmium	ND	0.0625	0.0579	92.6	0.0625	0.0601	96.2	3.81	75 - 125	20	
Chromium	0.00189	0.0625	0.0668	104	0.0625	0.0639	99.2	4.50	75 - 125	20	
Copper	ND	0.0625	0.0662	106	0.0625	0.0645	103	2.58	75 - 125	20	
Lead	ND	0.0625	0.0661	106	0.0625	0.0652	104	1.33	75 - 125	20	
Manganese	ND	0.0625	0.0649	104	0.0625	0.0613	98.1	5.74	75 - 125	20	
Nickel	ND	0.0625	0.0653	104	0.0625	0.0626	100	4.22	75 - 125	20	
Selenium	ND	0.0625	0.0550	88.0	0.0625	0.0512	81.8	7.26	75 - 125	20	
Silver	ND	0.0625	0.0605	96.7	0.0625	0.0605	96.9	0.137	75 - 125	20	
Thallium	0.000286	0.0625	0.0642	102	0.0625	0.0642	102	0.0514	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)

00100988

Loginnum:L0709400 Cal ID: ELAN-ICP- Worknum:WG250784
Instrument ID:ELAN-ICP Contract #:DACA56-94-D-0020 Method:6020
Parent ID:WG250665-01 File ID:EL.092407.112301 Dil:1 Matrix:WATER
Sample ID:WG250665-04 MS File ID:EL.092407.112932 Dil:1 Units:mg/L
Sample ID:WG250665-05 MSD File ID:EL.092407.113604 Dil:1

Analyte	Parent	MS Spiked	MS Found	MS %Rec	MSD Spiked	MSD Found	MSD %Rec	%RPD	%Rec Limits	RPD Limit	Q
Antimony	0.000299	0.0625	0.0594	94.5	0.0625	0.0564	89.7	5.19	75 - 125	20	
Arsenic	0.00300	0.0625	0.0582	88.4	0.0625	0.0598	90.8	2.62	75 - 125	20	
Barium	0.00901	0.0625	0.0711	99.4	0.0625	0.0709	99.1	0.301	75 - 125	20	
Cadmium	ND	0.0625	0.0562	89.9	0.0625	0.0560	89.5	0.407	75 - 125	20	
Chromium	0.00381	0.0625	0.0633	95.2	0.0625	0.0633	95.1	0.0873	75 - 125	20	
Copper	0.00181	0.0625	0.0625	97.1	0.0625	0.0627	97.5	0.395	75 - 125	20	
Lead	ND	0.0625	0.0623	99.6	0.0625	0.0617	98.6	1.00	75 - 125	20	
Manganese	0.00206	0.0625	0.0620	96.0	0.0625	0.0622	96.2	0.219	75 - 125	20	
Nickel	0.00184	0.0625	0.0626	97.2	0.0625	0.0630	97.8	0.634	75 - 125	20	
Selenium	0.000578	0.0625	0.0518	82.0	0.0625	0.0532	84.2	2.60	75 - 125	20	
Silver	ND	0.0625	0.0548	87.7	0.0625	0.0533	85.2	2.87	75 - 125	20	
Thallium	0.000431	0.0625	0.0610	96.9	0.0625	0.0616	97.9	1.02	75 - 125	20	

* FAILS %REC LIMIT

FAILS RPD LIMIT

NOTE: This is an internal quality control sample.

KEMRON FORMS - Modified 12/08/2006
Version 1.5 PDF File ID: 880424
Report generated 09/24/2007 14:54

Sample Login ID: L0709400
Worknum: WG250540
Instrument ID: ELAN-ICP
Method: 6020
Sample ID: L0709400-03 File ID: EL.092007.120737 Dil: 10
Units: ug/L
Serial Dilution ID: WG250540-02 File ID: EL.092007.122042 Dil: 50

Analyte	Sample	C	Serial Dilution	C	% Difference	Q
Antimony	ND	U	ND	U		
Arsenic	1.56	F	ND	U	100	E
Barium	35.4	X	38.1	F	7.63	
Cadmium	0	U	0	U		
Chromium	55.7	X	58.7	X	5.39	
Copper	5.85	F	0	U	100	E
Lead	0	U	0	U		
Manganese	38.2	X	44.2	X	15.7	E
Nickel	143	X	152	X	6.29	
Selenium	4.60	X	0	U	100	E
Silver	ND	U	0	U		
Thallium	1.69	X	8.54	X	405	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: 880418
Report generated 09/24/2007 14:54

Sample Login ID: L0709400 Worknum: WG250784
Instrument ID: ELAN-ICP Method: 6020
Sample ID: L0709400-02 File ID: EL.092407.114236 Dil: 10 Units: ug/L
Serial Dilution ID: WG250784-02 File ID: EL.092407.115541 Dil: 50

Analyte	Sample	C	Serial Dilution	C	% Difference	Q
Antimony	ND	U	0	U		
Arsenic	8.26	X	6.60	F	20.1	E
Barium	19.8	X	18.4	F	7.07	
Cadmium	0	U	0	U		
Chromium	4.39	F	ND	U	100	E
Copper	0	U	ND	U		
Lead	0	U	ND	U		
Manganese	78.6	X	75.0	X	4.58	
Nickel	8.98	F	0	U	100	E
Selenium	0	U	ND	U		
Silver	ND	U	ND	U		
Thallium	1.76	X	1.59	F	9.66	

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: 880418
Report generated 09/24/2007 14:54

KEMRON ENVIRONMENTAL SERVICES
POST SPIKE REPORT

Sample Login ID: L0709400 **Worknum:** WG250784
Instrument ID: ELAN-ICP **Method:** 6020
Post Spike ID: WG250784-01 **File ID:** EL.092407.114909 **Dil:** 10 **Units:** ug/L
Sample ID: L0709400-02 **File ID:** EL.092407.114236 **Dil:** 10 **Matrix:** Water

Analyte	Post Spike Result	C	Sample Result	C	Spike Added(SA)	% R	Control Limit %R	Q
ANTIMONY	55.1		0	U	50	110.1	75 - 125	
ARSENIC	54.6		0.826		50	107.5	75 - 125	
BARIUM	58.7		1.98		50	113.5	75 - 125	
CADMIUM	55.7		0	U	50	111.4	75 - 125	
CHROMIUM	51.9		0.439	F	50	102.9	75 - 125	
COPPER	54.3		0	U	50	108.6	75 - 125	
LEAD	56.6		0	U	50	113.2	75 - 125	
MANGANESE	59.7		7.86		50	103.7	75 - 125	
NICKEL	54.2		0.898	F	50	106.7	75 - 125	
SELENIUM	54.2		0	U	50	108.5	75 - 125	
SILVER	53.4		0	U	50	106.8	75 - 125	
THALLIUM	55.8		0.176		50	111.2	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: 880419
Report generated 09/24/2007 14:54

KEMRON ENVIRONMENTAL SERVICES
POST SPIKE REPORT

Sample Login ID: L0709400 **Worknum:** WG250540
Instrument ID: ELAN-ICP **Method:** 6020
Post Spike ID: WG250540-01 **File ID:** EL.092007.121409 **Dil:** 10 **Units:** ug/L
Sample ID: L0709400-03 **File ID:** EL.092007.120737 **Dil:** 10 **Matrix:** Water

Analyte	Post Spike Result	C	Sample Result	C	Spike Added(SA)	% R	Control Limit %R	Q
ANTIMONY	55.9		0	U	50	111.7	75 - 125	
ARSENIC	54.5		0.156	F	50	108.7	75 - 125	
BARIUM	57.8		3.54		50	108.5	75 - 125	
CADMIUM	54.2		0	U	50	108.5	75 - 125	
CHROMIUM	57.8		5.57		50	104.4	75 - 125	
COPPER	55.5		0.585	F	50	109.8	75 - 125	
LEAD	56.0		0	U	50	112.0	75 - 125	
MANGANESE	56.7		3.82		50	105.9	75 - 125	
NICKEL	68.3		14.3		50	108.1	75 - 125	
SELENIUM	54.2		0.460		50	107.6	75 - 125	
SILVER	52.2		0	U	50	104.4	75 - 125	
THALLIUM	55.3		0.169		50	110.3	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

INITIAL CALIBRATION SUMMARY

Login Number: L0709400 Workgroup (AAB#): WG250540

Analytical Method: 6020 Instrument ID: ELAN-ICP

ICAL Worknum: WG250607 Initial Calibration Date: 20-SEP-2007 10:28

Analyte	WG250607-01		WG250607-02		WG250607-03		WG250607-04			
	STD	INT	STD	INT	STD	INT	STD	INT	R	Q
Antimony	0	19.988	.4	2045.556	50	216678.37	100	451659.264	0.999986	
Arsenic	0	-404.329	.4	327.134	50	79369.389	100	166469.501	0.999951	
Barium	0	32.334	.4	793.385	50	98767.225	100	203347.787	0.999924	
Cadmium	0	20.499	.4	599.456	50	71978.37	100	153795.1	0.999979	
Chromium	0	15990.706	.4	19567.301	50	445667.308	100	940339.042	0.999994	
Copper	0	108.002	.4	1050.755	50	118476.293	100	242559.912	0.999783	
Lead	0	257.671	.4	9339.154	50	1132555.026	100	2357071.845	0.999932	
Manganese	0	505.023	.4	5569.56	50	619931.448	100	1358838.939	0.999910	
Nickel	0	41.334	.4	962.408	50	106488.561	100	225797.299	0.999995	
Selenium	0	4.235	.4	71.654	50	6910.131	100	14014.104	0.999683	
Silver	0	23.667	.4	3130.384	50	379132.444	100	794706.468	0.999996	
Thallium	0	24.667	.4	2799.911	50	346988.72	100	729705.639	0.999979	

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: 880427
Report generated 09/24/2007 14:53

Login Number: L0709400 Workgroup (AAB#): WG250784
Analytical Method: 6020 Instrument ID: ELAN-ICP
ICAL Worknum: WG250868 Initial Calibration Date: 24-SEP-2007 09:57

Analyte	WG250868-01		WG250868-02		WG250868-03		WG250868-04			
	STD	INT	STD	INT	STD	INT	STD	INT	R	Q
Antimony	0	33.613	.4	2413.09	50	242948.938	100	481549.647	0.999845	
Arsenic	0	-435.135	.4	382.041	50	92053.973	100	180078.513	0.999996	
Barium	0	70.001	.4	963.741	50	108072.909	100	209022.944	0.999979	
Cadmium	0	17.505	.4	688.42	50	82076.316	100	161460.422	0.999912	
Chromium	0	19094.35	.4	22745.055	50	533250.683	100	1035267.275	0.999954	
Copper	0	199.671	.4	1382.148	50	136646.354	100	266418.34	0.999996	
Lead	0	484.011	.4	10797.287	50	1263633.887	100	2497624.394	0.999994	
Manganese	0	1746.564	.4	7974.866	50	736558.567	100	1467337.957	0.999903	
Nickel	0	74.334	.4	1126.767	50	125024.695	100	241320.3	0.999997	
Selenium	0	15.458	.4	88.246	50	7905.817	100	15464.294	0.999990	
Silver	0	31.667	.4	3657.639	50	441297.271	100	860024.034	0.999962	
Thallium	0	31.667	.4	3184.408	50	391685.679	100	770710.121	1.00000	

INT = Instrument intensity
R = Coefficient of correlation
Q = Data Qualifier
*** = Out of Compliance; R < 0.995**

INITIAL CALIBRATION BLANK (ICB)

Login Number: L0709400
Instrument ID: ELAN-ICP
File ID: EL.092407.101036
Workgroup (AAB#): WG250784

Run Date: 09/24/2007
Run Time: 10:10
Analvst: JYH
Cal ID: ELAN-I - 24-SEP-07

Sample ID: WG250868-06
Method: 6020
Units: ug/L

Analytes	MDL	RDL	Concentration	Dilution	Qualifier
Silver	0.100	0.400	-.0123	1	U
Arsenic	0.100	0.400	-.0623	1	U
Barium	0.200	1.20	-.0197	1	U
Cadmium	0.0500	0.200	-.0071	1	U
Chromium	0.200	0.800	-.0347	1	U
Copper	0.200	0.800	-.0441	1	U
Lead	0.100	0.200	-.0143	1	U
Manganese	0.200	0.800	-.0533	1	U
Nickel	0.400	1.60	-.0235	1	U
Antimony	0.100	0.400	.113	1	F
Selenium	0.200	0.400	-.142	1	U
Thallium	0.0200	0.0800	-.0076	1	U

U = Result is less than MDL
F = Result is between MDL and RL
* = Result is above RL

INITIAL CALIBRATION BLANK (ICB)

00100996

Login Number: L0709400
Run Date: 09/20/2007
Sample ID: WG250607-06
Instrument ID: ELAN-ICP
Run Time: 10:42
Method: 6020
File ID: EL.092007.104208
Analyst: JYH
Units: ug/L
Workgroup (AAB#): WG250540
Cal ID: ELAN-I - 20-SEP-07

Analytes	MDL	RDL	Concentration	Dilution	Qualifier
Silver	0.100	0.400	-.0032	1	U
Arsenic	0.100	0.400	-.037	1	U
Barium	0.200	1.20	.0145	1	U
Cadmium	0.0500	0.200	.0115	1	U
Chromium	0.200	0.800	.0699	1	U
Copper	0.200	0.800	-.0007	1	U
Lead	0.100	0.200	-.0066	1	U
Manganese	0.200	0.800	.0039	1	U
Nickel	0.400	1.60	-.0304	1	U
Antimony	0.100	0.400	.205	1	F
Selenium	0.200	0.400	.0147	1	U
Thallium	0.0200	0.0800	-.0037	1	U

U = Result is less than MDL
F = Result is between MDL and RL
* = Result is above RL

CONTINUING CALIBRATION BLANK (CCB)

Login Number: L0709400
Run Date: 09/20/2007
Sample ID: WG250607-12
Instrument ID: ELAN-ICP
Run Time: 11:21
Method: 6020
File ID: EL.092007.112152
Analyst: JYH
Units: ug/L
Workgroup (AAB#): WG250540
Cal ID: ELAN-I - 20-SEP-07

Analytes	MDL	RDL	Concentration	Dilution	Qualifier
Silver	0.100	0.400	-0.00300	1	U
Arsenic	0.100	0.400	-0.00750	1	U
Barium	0.200	1.20	0.0141	1	U
Cadmium	0.0500	0.200	0.0145	1	U
Chromium	0.200	0.800	0.0942	1	U
Copper	0.200	0.800	-0.00560	1	U
Lead	0.100	0.200	-0.00630	1	U
Manganese	0.200	0.800	0.00510	1	U
Nickel	0.400	1.60	-0.0316	1	U
Antimony	0.100	0.400	0.191	1	F
Selenium	0.200	0.400	-0.0226	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

CONTINUING CALIBRATION BLANK (CCB)

00100998

Login Number: L0709400
Run Date: 09/20/2007
Sample ID: WG250607-14
Instrument ID: ELAN-ICP
Run Time: 12:33
Method: 6020
File ID: EL.092007.123356
Analyst: JYH
Units: ug/L
Workgroup (AAB#): WG250540
Cal ID: ELAN-I - 20-SEP-07

Analytes	MDL	RDL	Concentration	Dilution	Qualifier
Silver	0.100	0.400	-0.000800	1	U
Arsenic	0.100	0.400	-0.0349	1	U
Barium	0.200	1.20	0.0102	1	U
Cadmium	0.0500	0.200	0.0163	1	U
Chromium	0.200	0.800	0.0642	1	U
Copper	0.200	0.800	-0.000700	1	U
Lead	0.100	0.200	-0.00590	1	U
Manganese	0.200	0.800	0.000900	1	U
Nickel	0.400	1.60	-0.0294	1	U
Antimony	0.100	0.400	0.172	1	F
Selenium	0.200	0.400	-0.0383	1	U
Thallium	0.0200	0.0800	-0.00360	1	U

U = Result is less than MDL
F = Result is between MDL and RL
* = Result is above RL

CONTINUING CALIBRATION BLANK (CCB)

Login Number: L0709400
Run Date: 09/24/2007
Sample ID: WG250868-12
Instrument ID: ELAN-ICP
Run Time: 10:50
Method: 6020
File ID: EL.092407.105019
Analyst: JYH
Units: ug/L
Workgroup (AAB#): WG250784
Cal ID: ELAN-I - 24-SEP-07

Analytes	MDL	RDL	Concentration	Dilution	Qualifier
Silver	0.100	0.400	-0.0113	1	U
Arsenic	0.100	0.400	-0.0793	1	U
Barium	0.200	1.20	-0.0246	1	U
Cadmium	0.0500	0.200	-0.00580	1	U
Chromium	0.200	0.800	-0.0502	1	U
Copper	0.200	0.800	-0.0463	1	U
Lead	0.100	0.200	-0.0138	1	U
Manganese	0.200	0.800	-0.0647	1	U
Nickel	0.400	1.60	-0.0279	1	U
Antimony	0.100	0.400	0.100	1	F
Selenium	0.200	0.400	-0.108	1	U
Thallium	0.0200	0.0800	-0.00800	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: 880432
Report generated 10/02/2007 09:42

CONTINUING CALIBRATION BLANK (CCB)

00101000

Login Number: L0709400
Run Date: 09/24/2007
Sample ID: WG250868-14
Instrument ID: ELAN-ICP
Run Time: 12:08
Method: 6020
File ID: EL.092407.120856
Analyst: JYH
Units: ug/L
Workgroup (AAB#): WG250784
Cal ID: ELAN-I - 24-SEP-07

Analytes	MDL	RDL	Concentration	Dilution	Qualifier
Silver	0.100	0.400	-0.0107	1	U
Arsenic	0.100	0.400	-0.0485	1	U
Barium	0.200	1.20	-0.0227	1	U
Cadmium	0.0500	0.200	-0.00280	1	U
Chromium	0.200	0.800	-0.0913	1	U
Copper	0.200	0.800	-0.0425	1	U
Lead	0.100	0.200	-0.0141	1	U
Manganese	0.200	0.800	-0.0808	1	U
Nickel	0.400	1.60	-0.0311	1	U
Antimony	0.100	0.400	0.0811	1	U
Selenium	0.200	0.400	-0.0944	1	U
Thallium	0.0200	0.0800	-0.00810	1	U

U = Result is less than MDL
F = Result is between MDL and RL
* = Result is above RL

CONTINUING CALIBRATION BLANK (CCB)

00101001

Login Number: L0709400
Run Date: 09/24/2007
Sample ID: WG250868-16
Instrument ID: ELAN-ICP
Run Time: 13:27
Method: 6020
File ID: EL.092407.132739
Analyst: JYH
Units: ug/L
Workgroup (AAB#): WG250784
Cal ID: ELAN-I - 24-SEP-07

Analytes	MDL	RDL	Concentration	Dilution	Qualifier
Silver	0.100	0.400	-0.0106	1	U
Arsenic	0.100	0.400	-0.0357	1	U
Barium	0.200	1.20	-0.0209	1	U
Cadmium	0.0500	0.200	0.0174	1	U
Chromium	0.200	0.800	-0.224	1	F
Copper	0.200	0.800	-0.0411	1	U
Lead	0.100	0.200	-0.0127	1	U
Manganese	0.200	0.800	-0.0958	1	U
Nickel	0.400	1.60	-0.0327	1	U
Antimony	0.100	0.400	0.0573	1	U
Selenium	0.200	0.400	0.0195	1	U
Thallium	0.0200	0.0800	-0.00760	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: 880432
Report generated 10/02/2007 09:42

CONTINUING CALIBRATION BLANK (CCB)

00101002

Login Number: L0709400
Run Date: 09/24/2007
Sample ID: WG250868-20
Instrument ID: ELAN-ICP
Run Time: 14:07
Method: 6020
File ID: EL.092407.140726
Analyst: JYH
Units: ug/L
Workgroup (AAB#): WG250784
Cal ID: ELAN-I - 24-SEP-07

Analytes	MDL	RDL	Concentration	Dilution	Qualifier
Silver	0.100	0.400	-0.0113	1	U
Arsenic	0.100	0.400	-0.0173	1	U
Barium	0.200	1.20	-0.0228	1	U
Cadmium	0.0500	0.200	0.0143	1	U
Chromium	0.200	0.800	-0.149	1	U
Copper	0.200	0.800	-0.0372	1	U
Lead	0.100	0.200	-0.0112	1	U
Manganese	0.200	0.800	-0.0911	1	U
Nickel	0.400	1.60	-0.0301	1	U
Antimony	0.100	0.400	0.106	1	F
Selenium	0.200	0.400	-0.0219	1	U
Thallium	0.0200	0.0800	-0.00700	1	U

U = Result is less than MDL
F = Result is between MDL and RL
* = Result is above RL

CONTINUING CALIBRATION BLANK (CCB)

00101003

Login Number: L0709400
Run Date: 09/24/2007
Sample ID: WG250868-22
Instrument ID: ELAN-ICP
Run Time: 15:30
Method: 6020
File ID: EL.092407.153024
Analyst: JYH
Units: ug/L
Workgroup (AAB#): WG250784
Cal ID: ELAN-I - 24-SEP-07

Analytes	MDL	RDL	Concentration	Dilution	Qualifier
Silver	0.100	0.400	-0.0107	1	U
Arsenic	0.100	0.400	-0.0629	1	U
Barium	0.200	1.20	-0.0150	1	U
Cadmium	0.0500	0.200	0.00410	1	U
Chromium	0.200	0.800	-0.180	1	U
Copper	0.200	0.800	-0.0376	1	U
Lead	0.100	0.200	-0.0105	1	U
Manganese	0.200	0.800	-0.0874	1	U
Nickel	0.400	1.60	-0.0272	1	U
Antimony	0.100	0.400	0.0802	1	U
Selenium	0.200	0.400	-0.0943	1	U
Thallium	0.0200	0.0800	-0.00720	1	U

U = Result is less than MDL
F = Result is between MDL and RL
* = Result is above RL

INITIAL CALIBRATION VERIFICATION (ICV)

Login Number: L0709400
Run Date: 09/20/2007
Sample ID: WG250607-05
Instrument ID: ELAN-ICP
Run Time: 10:35
Method: 6020
File ID: EL.092007.103527
Analyst: JYH
Units: ug/L
Workgroup (AAB#): WG250540
Cal ID: ELAN-I - 20-SEP-07
QC Key: STD

Analyte		Expected	Found	%REC	LIMITS	Q
Silver		50	47.4	94.8	90 - 110	
Arsenic		50	49.4	98.8	90 - 110	
Barium		50	48.4	96.8	90 - 110	
Cadmium		50	50.4	101	90 - 110	
Chromium		50	49.8	99.6	90 - 110	
Copper		50	49.6	99.1	90 - 110	
Lead		50	50.7	101	90 - 110	
Manganese		50	50.2	100	90 - 110	
Nickel		50	49.2	98.5	90 - 110	
Antimony		50	49.3	98.6	90 - 110	
Selenium		50	50.0	100	90 - 110	
Thallium		50	49.5	99.1	90 - 110	

* Exceeds LIMITS Limit

KEMRON FORMS - Modified 09/06/2007 (ICV)
Version 1.5 PDF File ID: 880428
Report generated 09/24/2007 14:53

INITIAL CALIBRATION VERIFICATION (ICV)

Login Number: L0709400
Run Date: 09/24/2007
Sample ID: WG250868-05
Instrument ID: ELAN-ICP
Run Time: 10:03
Method: 6020
File ID: EL.092407.100354
Analyst: JYH
Units: ug/L
Workgroup (AAB#): WG250784
Cal ID: ELAN-I - 24-SEP-07
QC Key: STD

Analyte		Expected	Found	%REC	LIMITS	Q
Silver		50	50.9	102	90 - 110	
Arsenic		50	51.2	102	90 - 110	
Barium		50	52.4	105	90 - 110	
Cadmium		50	52.8	106	90 - 110	
Chromium		50	53.6	107	90 - 110	
Copper		50	52.7	105	90 - 110	
Lead		50	52.7	105	90 - 110	
Manganese		50	51.9	104	90 - 110	
Nickel		50	52.6	105	90 - 110	
Antimony		50	51.7	103	90 - 110	
Selenium		50	52.6	105	90 - 110	
Thallium		50	50.9	102	90 - 110	

* Exceeds LIMITS Limit

KEMRON FORMS - Modified 09/06/2007 (ICV)
Version 1.5 PDF File ID: 880428
Report generated 09/24/2007 14:53

CONTINUING CALIBRATION VERIFICATION (CCV)

00101006

Login Number: L0709400
Instrument ID: ELAN-ICP
File ID: EL.092007.111510
Workgroup (AAB#): WG250540

Run Date: 09/20/2007
Run Time: 11:15
Analyst: JYH
Cal ID: ELAN-I - 20-SEP-07

Sample ID: WG250607-11
Method: 6020
QC Key: STD

Analyte		Expected	Found	UNITS	%REC	LIMITS		Q
Silver		50.0	46.6	ug/L	93.2	90 - 110		
Arsenic		50.0	48.8	ug/L	97.6	90 - 110		
Barium		50.0	48.7	ug/L	97.3	90 - 110		
Cadmium		50.0	46.8	ug/L	93.5	90 - 110		
Chromium		50.0	49.7	ug/L	99.4	90 - 110		
Copper		50.0	48.8	ug/L	97.6	90 - 110		
Lead		50.0	49.4	ug/L	98.9	90 - 110		
Manganese		50.0	50.1	ug/L	100	90 - 110		
Nickel		50.0	49.1	ug/L	98.2	90 - 110		
Antimony		50.0	48.3	ug/L	96.5	90 - 110		
Selenium		50.0	50.5	ug/L	101	90 - 110		
Thallium		50.0	48.6	ug/L	97.1	90 - 110		

* Exceeds LIMITS Criteria

KEMRON FORMS - Modified 09/06/2007 - (CCV)
Version 1.5 PDF File ID: 880431
Report generated 10/02/2007 09:42

CONTINUING CALIBRATION VERIFICATION (CCV)

00101007

Login Number: L0709400 Run Date: 09/20/2007 Sample ID: WG250607-13
Instrument ID: ELAN-ICP Run Time: 12:27 Method: 6020
File ID: EL.092007.122714 Analyst: JYH QC Key: STD
Workgroup (AAB#): WG250540 Cal ID: ELAN-I - 20-SEP-07

Analyte		Expected	Found	UNITS	%REC	LIMITS		Q
Silver		50.0	49.3	ug/L	98.7	90 - 110		
Arsenic		50.0	49.2	ug/L	98.4	90 - 110		
Barium		50.0	49.3	ug/L	98.6	90 - 110		
Cadmium		50.0	52.6	ug/L	105	90 - 110		
Chromium		50.0	49.2	ug/L	98.4	90 - 110		
Copper		50.0	49.7	ug/L	99.5	90 - 110		
Lead		50.0	50.7	ug/L	101	90 - 110		
Manganese		50.0	48.8	ug/L	97.6	90 - 110		
Nickel		50.0	49.2	ug/L	98.4	90 - 110		
Antimony		50.0	49.4	ug/L	98.9	90 - 110		
Selenium		50.0	50.9	ug/L	102	90 - 110		
Thallium		50.0	48.9	ug/L	97.8	90 - 110		

* Exceeds LIMITS Criteria

KEMRON FORMS - Modified 09/06/2007 - (CCV)
Version 1.5 PDF File ID: 880431
Report generated 10/02/2007 09:42

CONTINUING CALIBRATION VERIFICATION (CCV)

Login Number: L0709400
Run Date: 09/24/2007
Sample ID: WG250868-11
Instrument ID: ELAN-ICP
Run Time: 10:43
Method: 6020
File ID: EL.092407.104337
Analyst: JYH
QC Key: STD
Workgroup (AAB#): WG250784
Cal ID: ELAN-I - 24-SEP-07

Analyte		Expected	Found	UNITS	%REC	LIMITS		Q
Silver		50.0	47.5	ug/L	95.1	90 - 110		
Arsenic		50.0	50.1	ug/L	100	90 - 110		
Barium		50.0	48.6	ug/L	97.1	90 - 110		
Cadmium		50.0	49.3	ug/L	98.6	90 - 110		
Chromium		50.0	51.0	ug/L	102	90 - 110		
Copper		50.0	50.7	ug/L	101	90 - 110		
Lead		50.0	50.5	ug/L	101	90 - 110		
Manganese		50.0	49.8	ug/L	99.7	90 - 110		
Nickel		50.0	50.9	ug/L	102	90 - 110		
Antimony		50.0	49.9	ug/L	99.8	90 - 110		
Selenium		50.0	50.8	ug/L	102	90 - 110		
Thallium		50.0	49.4	ug/L	98.8	90 - 110		

* Exceeds LIMITS Criteria

KEMRON FORMS - Modified 09/06/2007 - (CCV)
Version 1.5 PDF File ID: 880431
Report generated 10/02/2007 09:42

CONTINUING CALIBRATION VERIFICATION (CCV)

00101009

Login Number: L0709400
Run Date: 09/24/2007
Sample ID: WG250868-13
Instrument ID: ELAN-ICP
Run Time: 12:02
Method: 6020
File ID: EL.092407.120214
Analyst: JYH
QC Key: STD
Workgroup (AAB#): WG250784
Cal ID: ELAN-I - 24-SEP-07

Analyte		Expected	Found	UNITS	%REC	LIMITS		Q
Silver		50.0	49.6	ug/L	99.2	90 - 110		
Arsenic		50.0	50.4	ug/L	101	90 - 110		
Barium		50.0	50.4	ug/L	101	90 - 110		
Cadmium		50.0	50.9	ug/L	102	90 - 110		
Chromium		50.0	49.4	ug/L	98.8	90 - 110		
Copper		50.0	49.9	ug/L	99.7	90 - 110		
Lead		50.0	50.2	ug/L	100	90 - 110		
Manganese		50.0	48.6	ug/L	97.2	90 - 110		
Nickel		50.0	50.5	ug/L	101	90 - 110		
Antimony		50.0	49.7	ug/L	99.5	90 - 110		
Selenium		50.0	51.7	ug/L	103	90 - 110		
Thallium		50.0	49.1	ug/L	98.1	90 - 110		

* Exceeds LIMITS Criteria

KEMRON FORMS - Modified 09/06/2007 - (CCV)
Version 1.5 PDF File ID: 880431
Report generated 10/02/2007 09:42

CONTINUING CALIBRATION VERIFICATION (CCV)

00101010

Login Number: L0709400
Run Date: 09/24/2007
Sample ID: WG250868-15
Instrument ID: ELAN-ICP
Run Time: 13:20
Method: 6020
File ID: EL.092407.132057
Analyst: JYH
QC Key: STD
Workgroup (AAB#): WG250784
Cal ID: ELAN-I - 24-SEP-07

Analyte		Expected	Found	UNITS	%REC	LIMITS		Q
Silver		50.0	48.6	ug/L	97.1	90 - 110		
Arsenic		50.0	49.2	ug/L	98.5	90 - 110		
Barium		50.0	50.8	ug/L	102	90 - 110		
Cadmium		50.0	50.7	ug/L	101	90 - 110		
Chromium		50.0	43.3	ug/L	86.6	90 - 110		*
Copper		50.0	48.0	ug/L	95.9	90 - 110		
Lead		50.0	50.4	ug/L	101	90 - 110		
Manganese		50.0	45.3	ug/L	90.6	90 - 110		
Nickel		50.0	47.4	ug/L	94.9	90 - 110		
Antimony		50.0	50.5	ug/L	101	90 - 110		
Selenium		50.0	49.9	ug/L	99.8	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: 880431
Report generated 10/02/2007 09:42

CONTINUING CALIBRATION VERIFICATION (CCV)

00101011

Login Number: L0709400
Run Date: 09/24/2007
Sample ID: WG250868-19
Instrument ID: ELAN-ICP
Run Time: 14:00
Method: 6020
File ID: EL.092407.140044
Analyst: JYH
QC Key: STD
Workgroup (AAB#): WG250784
Cal ID: ELAN-I - 24-SEP-07

Analyte		Expected	Found	UNITS	%REC	LIMITS		Q
Silver		50.0	48.8	ug/L	97.5	90 - 110		
Arsenic		50.0	50.1	ug/L	100	90 - 110		
Barium		50.0	50.1	ug/L	100	90 - 110		
Cadmium		50.0	51.5	ug/L	103	90 - 110		
Chromium		50.0	47.8	ug/L	95.5	90 - 110		
Copper		50.0	49.1	ug/L	98.2	90 - 110		
Lead		50.0	50.0	ug/L	100	90 - 110		
Manganese		50.0	48.5	ug/L	97.1	90 - 110		
Nickel		50.0	48.9	ug/L	97.8	90 - 110		
Antimony		50.0	50.9	ug/L	102	90 - 110		
Selenium		50.0	51.1	ug/L	102	90 - 110		
Thallium		50.0	49.1	ug/L	98.2	90 - 110		

* Exceeds LIMITS Criteria

KEMRON FORMS - Modified 09/06/2007 - (CCV)
Version 1.5 PDF File ID: 880431
Report generated 10/02/2007 09:42

CONTINUING CALIBRATION VERIFICATION (CCV)

00101012

Login Number: L0709400
Run Date: 09/24/2007
Sample ID: WG250868-21
Instrument ID: ELAN-ICP
Run Time: 15:23
Method: 6020
File ID: EL.092407.152343
Analyst: JYH
QC Key: STD
Workgroup (AAB#): WG250784
Cal ID: ELAN-I - 24-SEP-07

Analyte		Expected	Found	UNITS	%REC	LIMITS		Q
Silver		50.0	48.9	ug/L	97.9	90 - 110		
Arsenic		50.0	50.8	ug/L	102	90 - 110		
Barium		50.0	51.4	ug/L	103	90 - 110		
Cadmium		50.0	51.2	ug/L	102	90 - 110		
Chromium		50.0	49.1	ug/L	98.1	90 - 110		
Copper		50.0	50.5	ug/L	101	90 - 110		
Lead		50.0	51.5	ug/L	103	90 - 110		
Manganese		50.0	49.4	ug/L	98.8	90 - 110		
Nickel		50.0	49.7	ug/L	99.3	90 - 110		
Antimony		50.0	51.0	ug/L	102	90 - 110		
Selenium		50.0	52.1	ug/L	104	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: 880431
Report generated 10/02/2007 09:42

Login number: L0709400
Instrument ID: ELAN-ICP
Sol. A : WG250607-09 **File ID:** EL.092007.110202
Sol. AB : WG250607-10 **File ID:** EL.092007.110836

Workgroup (AAB#): WG250540
Method: 6020
Units: ug/L

	Sol. A			Sol. AB			
ANALYTE	True	Found	%Recovery	True	Found	%Recovery	Q
Antimony	NS	0.0235	NS	100	102	102	
Arsenic	NS	-0.0450	NS	100	100	100	
Barium	NS	0.0326	NS	100	99.7	99.7	
Cadmium	NS	0.0652	NS	100	103	103	
Chromium	NS	0.0850	NS	100	103	103	
Copper	NS	0.266	NS	100	97.5	97.5	
Lead	NS	0.0586	NS	100	103	103	
Manganese	NS	0.367	NS	100	101	101	
Nickel	NS	0.768	NS	100	98.2	98.2	
Selenium	NS	-0.0986	NS	100	99.9	99.9	
Silver	NS	0.00160	NS	100	96.3	96.3	
Thallium	NS	0.0127	NS	100	102	102	

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).

Login number: L0709400 **Workgroup (AAB#):** WG250784
Instrument ID: ELAN-ICP **Method:** 6020
Sol. A : WG250868-09 **File ID:** EL.092407.103030 **Units:** ug/L
Sol. AB : WG250868-10 **File ID:** EL.092407.103704

	Sol. A			Sol. AB			
ANALYTE	True	Found	%Recovery	True	Found	%Recovery	Q
Antimony	NS	-0.0212	NS	100	106	106	
Arsenic	NS	-0.0420	NS	100	104	104	
Barium	NS	-0.00350	NS	100	103	103	
Cadmium	NS	0.0734	NS	100	107	107	
Chromium	NS	0.0346	NS	100	107	107	
Copper	NS	0.228	NS	100	103	103	
Lead	NS	0.0504	NS	100	106	106	
Manganese	NS	0.315	NS	100	104	104	
Nickel	NS	0.862	NS	100	104	104	
Selenium	NS	-0.182	NS	100	102	102	
Silver	NS	-0.00630	NS	100	101	101	
Thallium	NS	0.0451	NS	100	104	104	

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: 880430
Report generated 09/24/2007 14:53

KEMRON ENVIRONMENTAL SERVICES
INTERFERENCE CHECK SAMPLES

Login number: L0709400
Instrument ID: ELAN-ICP
Sol. A : WG250868-17 **File ID:** EL.092407.134736
Sol. AB : WG250868-18 **File ID:** EL.092407.135410

Workgroup (AAB#): WG250784
Method: 6020
Units: ug/L

	Sol. A			Sol. AB			
ANALYTE	True	Found	%Recovery	True	Found	%Recovery	Q
Antimony	NS	-0.0354	NS	100	107	107	
Arsenic	NS	-0.0561	NS	100	105	105	
Barium	NS	-0.0134	NS	100	106	106	
Cadmium	NS	0.0716	NS	100	109	109	
Chromium	NS	-0.167	NS	100	95.6	95.6	
Copper	NS	0.233	NS	100	98.4	98.4	
Lead	NS	0.0497	NS	100	105	105	
Manganese	NS	0.265	NS	100	95.6	95.6	
Nickel	NS	0.785	NS	100	99.4	99.4	
Selenium	NS	-0.142	NS	100	104	104	
Silver	NS	-0.00530	NS	100	101	101	
Thallium	NS	0.00720	NS	100	103	103	

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).

CRI SAMPLE

00101016

Login Number: L0709400 | Run Date: 09/24/2007 | Sample ID: WG250868-08
Instrument ID: ELAN-ICP | Run Time: 10:23 | Prep Method: 3015
File ID: EL.092407.102355 | Analyst: JYH | Method: 6020
Workgroup (AAB#): WG250868 | Matrix: Water | Units: ug/L
Contract #: DACA56-94-D-0020 | Cal ID: ELAN-ICP - 24-SEP-2007 09:57

Analytes	Expected	Found	% Rec	Limits	Q
Cadmium	0.200	0.223	112	50 - 150	
Thallium	0.0800	0.0791	98.9	50 - 150	

KEMRON FORMS - Modified 02/14/2006
Version 1.5 PDF File ID: 880426
Report generated 09/24/2007 14:54

CRI SAMPLE

Login Number: L0709400
Run Date: 09/20/2007
Sample ID: WG250607-08
Instrument ID: ELAN-ICP
Run Time: 10:55
Prep Method: 3015
File ID: EL.092007.105527
Analyst: JYH
Method: 6020
Workgroup (AAB#): WG250607
Matrix: Water
Units: ug/L
Contract #: DACA56-94-D-0020
Cal ID: ELAN-ICP - 20-SEP-2007 10:28

Analytes	Expected	Found	% Rec	Limits	Q
Cadmium	0.200	0.206	103	50 - 150	
Thallium	0.0800	0.0816	102	50 - 150	

KEMRON FORMS - Modified 02/14/2006
Version 1.5 PDF File ID: 880426
Report generated 09/24/2007 14:54

LINEAR RANGE (QUARTERLY)

Login Number: L0709400 **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:

2.1.3 Metals CVAA Data (Mercury)

2.1.3.1 Summary Data

LABORATORY REPORT

00101021

L0709400

10/02/07 10:28

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: LONGHORN-PBC

P.O. Number: 322255 OP

Sample Analysis Summary

Client ID	Lab ID	Method	Dilution	Date Received
47WW06-091307	L0709400-01	7470A	1	18-SEP-07
47WW06-091307	L0709400-02	7470A	1	18-SEP-07
47WW07-091307	L0709400-03	7470A	1	18-SEP-07
47WW07-091307	L0709400-04	7470A	1	18-SEP-07

Sample Number:	L0709400-01	PrePrep Method:	NONE	Instrument:	HYDRA
Client ID:	47WW06-091307	Prep Method:	METHOD	Prep Date:	09/19/2007 08:35
Matrix:	Water	Analytical Method:	7470A	Cal Date:	09/20/2007 08:29
Workgroup Number:	WG250526	Analyst:	ED	Run Date:	09/20/2007 10:17
Collect Date:	09/13/2007 16:01	Dilution:	1	File ID:	HY.092007.101705
Sample Tag:	01	Units:	mg/L		

Analyte	CAS. Number	Result	Qual	PQL	SQL
Mercury	7439-97-6		U	0.000200	0.000100

U Not detected at or above adjusted sample detection limit

Sample Number:L0709400-02
Client ID:47WW06-091307
Matrix:Water
Workgroup Number:WG250584
Collect Date:09/13/2007 16:01
Sample Tag:01

PrePrep Method:NONE
Prep Method:METHOD
Analytical Method:7470A
Analyst:ED
Dilution:1
Units:mg/L

Instrument:HYDRA
Prep Date:09/20/2007 09:00
Cal Date:09/21/2007 09:05
Run Date:09/21/2007 09:30
File ID:HY.092107.093058

Analyte	CAS. Number	Result	Qual	PQL	SQL
Mercury, Dissolved	7439-97-6		U	0.000200	0.000100

U Not detected at or above adjusted sample detection limit

Sample Number:	**L0709400-03**	PrePrep Method:	**NONE**	Instrument:	**HYDRA**
Client ID:	**47WW07-091307**	Prep Method:	**METHOD**	Prep Date:	**09/19/2007 08:35**
Matrix:	**Water**	Analytical Method:	**7470A**	Cal Date:	**09/20/2007 08:29**
Workgroup Number:	**WG250526**	Analyst:	**ED**	Run Date:	**09/20/2007 10:22**
Collect Date:	**09/13/2007 17:24**	Dilution:	**1**	File ID:	**HY.092007.102217**
Sample Tag:	**01**	Units:	**mg/L**		

Analyte	CAS. Number	Result	Qual	PQL	SQL
Mercury	**7439-97-6**		**U**	**0.000200**	**0.000100**

U Not detected at or above adjusted sample detection limit

Sample Number:L0709400-04
Client ID:47WW07-091307
Matrix:Water
Workgroup Number:WG250584
Collect Date:09/13/2007 17:24
Sample Tag:01

PrePrep Method:NONE
Prep Method:METHOD
Analytical Method:7470A
Analyst:ED
Dilution:1
Units:mg/L

Instrument:HYDRA
Prep Date:09/20/2007 09:00
Cal Date:09/21/2007 09:05
Run Date:09/21/2007 09:33
File ID:HY.092107.093318

Analyte	CAS. Number	Result	Qual	PQL	SQL
Mercury, Dissolved	7439-97-6		U	0.000200	0.000100

U Not detected at or above adjusted sample detection limit

2.1.3.2 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): [illegible]
Date: 9/20/07
LCS: 4ml STD 21990
MS/MSD: 4ml STD 21990
Witness: VC
H_2SO_4 Lot #: CWO 12284
$K2S_2O_8$ Lot #: RGT 11993
$KMNO_4$ Lot #: RGT 12067
HNO_3 Lot #: CWO 12526
Digest Tube Lot #: CWO 12400
Aqua Regia: NA
Earliest Sample Due Date: 9/28
ICV / CCV: STD 21992
Stds: 0, 0.2, 1, 2, 5, 10: STD 21993 & 21998

Box: 74

Digestion Work Group: WG 250550

ME404 Revision # 10 - Method 7470A-Water
ME405 Revision # ____ - Method 7471A-Soil

Hot Block Temperature at start: 94.5°C @ 0900

Hot Block Temperature at end: 94.2°C @ 1100

Relinquished By: [illegible]
Digest Received By: KVS Date: 9/20/07

	KEMRON #	Initial Wt/Vol	Final Volume	Comments	Due Date
1	PBW	40ml	40ml	-02	
2	LCW			-03	
3	09-372-02			LAB FILT 9/18 Level 4	9/28
4	-03				
5	-06				
6	-07				
7	09-400-02			LAB FILT 9/19	9/28
8	-04				
9	09-431-04			NPDES	9/28
10	09-385-02			Level 4	10/2
11	-03				
12	-04				
13	-05				
14	-06 PDF			-01	
15	-07 MS	36ml		-04	
16	-08 MSD			-08	
17	09-430-03	40ml		Level 4 PFLOC "	9/28
18	-04				
19	-05				
20	-06				
21	-07				
22	-08				
23					
24		[illegible] 9/20/07			
25					

Comments: ______

Primary Review: [illegible] 9/20/07 Secondary Review: Vicki Colley 9/28/07

Mercury Digestion Log

Analyst(s): pal
Date: 9/19/07
LCS: 4ml STD 21963
MS/MSD: 4ml STD 21963
Witness: VC
H_2SO_4 Lot #: Col 12284
$K_2S_2O_8$ Lot #: RCT 11993
$KMNO_4$ Lot #: RCT 12044
HNO_3 Lot #: Col 12526
Digest Tube Lot #: Col 12400
Aqua Regia: NA
Earliest Sample Due Date: 9/24/07
ICV / CCV: STD 21965
Stds: 0, 0.2, 1, 2, 5, 10: STD 21966(+21971)

Box: DE
Digestion Work Group: WG 250449
ME404 Revision # 10 - Method 7470A-Water
ME405 Revision # ____ - Method 7471A-Soil
Hot Block Temperature at start: 92.8°C @ 0835
Hot Block Temperature at end: 94.5°C @ 1038
Relinquished By: [signature]
Digest Received By: Ed Date: 09-19-07

	KEMRON #	Initial Wt/Vol	Final Volume	Comments	Due Date
1	PBW	40ml	40ml	-02	
2	LCSW			-03	
3	TCBLK 9/17	4ml		WG250198 @0630	
4	09-272-01				9/24
5	-02				
6	09-335-01	40ml			9/28
7	09-336-01				9/28
8	-03				
9	-05				
10	SPLP BLK 9/18			WG250356 @1430	
11	09-348-02			Loc 4	9/24
12	-04				
13	-05				
14	-06				
15	-07				
16	09-362-03				9/28
17	-04				
18	09-400-01			-01	9/28
19	-01MS	36ml		-04	
20	-01MSD			-05	
21	-03	40ml			
22					
23	pal 9/19/07				
24					
~~25~~					

Comments: ______

Primary Review: [signature] 9/19/07 Secondary Review: [signature] 9/19/07

KEMRON Environmental Services
Instrument Run Log

Instrument: HYDRA
Dataset: 092007A.PRN
Analyst1: ED
Analyst2: NA
Method: 7470A
SOP: 404
Rev: 10
Maintenance Log ID: 20905

Calibration Std: STD21971
ICV/CCV Std: STD21963
Post Spike: STD21971
ICSA: N/A
ICSAB: N/A

Workgroups: WG250525, WG250526

Comments:

Seq.	File ID	Sample	ID	Prep	Dil	Reference	Date/Time
1	HY.092007.082102	WG250564-01	Calibration Point		1		09/20/07 08:21
2	HY.092007.082240	WG250564-02	Calibration Point		1		09/20/07 08:22
3	HY.092007.082418	WG250564-03	Calibration Point		1		09/20/07 08:24
4	HY.092007.082555	WG250564-04	Calibration Point		1		09/20/07 08:25
5	HY.092007.082755	WG250564-05	Calibration Point		1		09/20/07 08:27
6	HY.092007.082938	WG250564-06	Calibration Point		1		09/20/07 08:29
7	HY.092007.083136	WG250564-07	Initial Calibration Verification		1		09/20/07 08:31
8	HY.092007.083315	WG250564-08	Initial Calib Blank		1		09/20/07 08:33
9	HY.092007.083453	WG250564-09	CCV		1		09/20/07 08:34
10	HY.092007.083630	WG250564-10	CCB		1		09/20/07 08:36
11	HY.092007.083811	WG250448-02	Method/Prep Blank	40/40	1		09/20/07 08:38
12	HY.092007.083951	WG250448-03	Laboratory Control S	40/40	1		09/20/07 08:39
13	HY.092007.084129	L0709335-02	EOL-01	40/40	1		09/20/07 08:41
14	HY.092007.084309	WG250525-01	Post Digestion Spike		1	L0709335-02	09/20/07 08:43
15	HY.092007.084511	L0709336-02	OHD-01	40/40	1		09/20/07 08:45
16	HY.092007.084712	L0709336-04	OHD-01D	40/40	1		09/20/07 08:47
17	HY.092007.084903	L0709336-06	OHD-02	40/40	1		09/20/07 08:49
18	HY.092007.085041	L0709345-01	WWTP HEADWORKS	40/40	1		09/20/07 08:50
19	HY.092007.085218	L0709345-02	LS 34408	40/40	1		09/20/07 08:52
20	HY.092007.085357	L0709345-03	LS 4015	40/40	1		09/20/07 08:53
21	HY.092007.085539	WG250564-11	CCV		1		09/20/07 08:55
22	HY.092007.085726	WG250564-12	CCB		1		09/20/07 08:57
23	HY.092007.085904	L0709345-04	LS 857	40/40	1		09/20/07 08:59
24	HY.092007.090102	WG250448-01	Reference Sample		1	L0709345-05	09/20/07 09:01
25	HY.092007.090239	WG250448-04	Matrix Spike	36/40	1		09/20/07 09:02
26	HY.092007.090437	WG250448-05	Matrix Spike Duplica	36/40	1		09/20/07 09:04
27	HY.092007.090617	L0709345-06	LS 232	40/40	1		09/20/07 09:06
28	HY.092007.090754	L0709345-11	LS 168	40/40	1		09/20/07 09:07
29	HY.092007.091004	L0709345-12	5022 NOI	40/40	1		09/20/07 09:10
30	HY.092007.091143	L0709345-13	LS 551	40/40	1		09/20/07 09:11
31	HY.092007.091345	L0709345-14	LS 3905	40/40	1		09/20/07 09:13
32	HY.092007.091528	L0709345-15	LS 6399	40/40	1		09/20/07 09:15
33	HY.092007.091726	WG250564-13	CCV		1		09/20/07 09:17
34	HY.092007.091924	WG250564-14	CCB		1		09/20/07 09:19
35	HY.092007.092102	L0709345-16	LS 5040	40/40	1		09/20/07 09:21
36	HY.092007.092241	L0709375-03	LTA16-CS-EB	40/40	1	WG250508-01	09/20/07 09:22
37	HY.092007.092429	L0709365-04	COL-OIL	1/40	1		09/20/07 09:24

Page: 1

Approved: September 20, 2007

Sheri L. Pfalzgraf

KEMRON Environmental Services

Instrument Run Log

Instrument:	HYDRA	Dataset:	092007A.PRN		
Analyst1:	ED	Analyst2:	NA		
Method:	7470A	SOP:	404	Rev:	10
Maintenance Log ID:	20905				

Calibration Std:	STD21971	ICV/CCV Std:	STD21963	Post Spike:	STD21971
ICSA:	N/A	ICSAB:	N/A		

Workgroups: WG250525, WG250526

Comments:

Seq.	File ID	Sample	ID	Prep	Dil	Reference	Date/Time
38	HY.092007.092616	WG250525-02	Post Digestion Spike		1	L0709365-04	09/20/07 09:26
39	HY.092007.092807	WG250564-15	CCV		1		09/20/07 09:28
40	HY.092007.093005	WG250564-16	CCB		1		09/20/07 09:30
41	HY.092007.093231	WG250449-02	Method/Prep Blank	40/40	1		09/20/07 09:32
42	HY.092007.093419	WG250449-03	Laboratory Control S	40/40	1		09/20/07 09:34
43	HY.092007.093611	WG250198-01	Fluid Blank		1		09/20/07 09:36
44	HY.092007.093807	L0709232-01	S0709177-01A/CS070031	4/40	1		09/20/07 09:38
45	HY.092007.094004	WG250526-01	Post Digestion Spike		1	L0709232-01	09/20/07 09:40
46	HY.092007.094201	L0709232-02	S0709177-02A/CS070034	4/40	1		09/20/07 09:42
47	HY.092007.094348	L0709335-01	EOL-01	40/40	1	WG250368-04	09/20/07 09:43
48	HY.092007.094526	WG250526-02	Post Digestion Spike		1	L0709335-01	09/20/07 09:45
49	HY.092007.094728	L0709336-01	OHD-01	40/40	1	WG250228-04	09/20/07 09:47
50	HY.092007.094925	L0709336-03	OHD-01D	40/40	1		09/20/07 09:49
51	HY.092007.095112	WG250564-17	CCV		1		09/20/07 09:51
52	HY.092007.095253	WG250564-18	CCB		1		09/20/07 09:52
53	HY.092007.095451	L0709336-05	OHD-02	40/40	1		09/20/07 09:54
54	HY.092007.095700	WG250396-01	Fluid Blank		1		09/20/07 09:57
55	HY.092007.095846	L0709348-02	AV-NCB-PE-AC1-32-C2-0	40/40	1	WG250502-01	09/20/07 09:58
56	HY.092007.100024	WG250526-03	Post Digestion Spike		1	L0709348-02	09/20/07 10:00
57	HY.092007.100210	L0709348-04	AV-NCB-AS-AC1-3-09140	40/40	1		09/20/07 10:02
58	HY.092007.100407	L0709348-05	AV-NCB-PE-AC1-32-C1-0	40/40	1		09/20/07 10:04
59	HY.092007.100548	L0709348-06	AV-NCB-AS-AC1-2-09140	40/40	1	WG250359-01	09/20/07 10:05
60	HY.092007.100725	L0709348-07	AV-NCB-AS-STO-G-55-09	40/40	1		09/20/07 10:07
61	HY.092007.100907	L0709362-03	SB-01	40/40	1		09/20/07 10:09
62	HY.092007.101056	L0709362-04	SB-01	40/40	1		09/20/07 10:10
63	HY.092007.101308	WG250564-19	CCV		1		09/20/07 10:13
64	HY.092007.101528	WG250564-20	CCB		1		09/20/07 10:15
65	HY.092007.101705	WG250449-01	Reference Sample		1	L0709400-01	09/20/07 10:17
66	HY.092007.101854	WG250449-04	Matrix Spike	36/40	1		09/20/07 10:18
67	HY.092007.102031	WG250449-05	Matrix Spike Duplica	36/40	1		09/20/07 10:20
68	HY.092007.102217	L0709400-03	47WW07-091307	40/40	1	WG250453-04	09/20/07 10:22
69	HY.092007.102424	WG250526-04	Post Digestion Spike		1	L0709232-02	09/20/07 10:24
70	HY.092007.102641	WG250564-21	CCV		1		09/20/07 10:26
71	HY.092007.102829	WG250564-22	CCB		1		09/20/07 10:28

Approved: September 20, 2007

Sheri L. Pfalzgraf

KEMRON Environmental Services
Instrument Run Log

Instrument: HYDRA Dataset: 092107B.PRN
Analyst1: ED Analyst2: SLP
Method: 7470A SOP: 404 Rev: 10
Maintenance Log ID: 20929

Calibration Std: STD21998 ICV/CCV Std: STD21992 Post Spike: STD21998
ICSA: N/A ICSAB: N/A

Workgroups: 250584, 250583

Comments:

Seq.	File ID	Sample	ID	Prep	Dil	Reference	Date/Time
1	HY.092107.085614	WG250668-01	Calibration Point		1		09/21/07 08:56
2	HY.092107.085803	WG250668-02	Calibration Point		1		09/21/07 08:58
3	HY.092107.090011	WG250668-03	Calibration Point		1		09/21/07 09:00
4	HY.092107.090203	WG250668-04	Calibration Point		1		09/21/07 09:02
5	HY.092107.090342	WG250668-05	Calibration Point		1		09/21/07 09:03
6	HY.092107.090521	WG250668-06	Calibration Point		1		09/21/07 09:05
7	HY.092107.090724	WG250668-07	Initial Calibration Verification		1		09/21/07 09:07
8	HY.092107.090904	WG250668-08	Initial Calib Blank		1		09/21/07 09:09
9	HY.092107.091101	WG250668-09	CCV		1		09/21/07 09:11
10	HY.092107.091237	WG250668-10	CCB		1		09/21/07 09:12
11	HY.092107.091437	WG250550-02	Method/Prep Blank	40/40	1		09/21/07 09:14
12	HY.092107.091646	WG250550-03	Laboratory Control S	40/40	1		09/21/07 09:16
13	HY.092107.091825	L0709431-04	OUTFALL 002/COMP	40/40	1	WG250634-04	09/21/07 09:18
14	HY.092107.092002	WG250668-11	CCV		1		09/21/07 09:20
15	HY.092107.092153	WG250668-12	CCB		1		09/21/07 09:21
16	HY.092107.092353	L0709372-02	GOVVWR-W	40/40	1		09/21/07 09:23
17	HY.092107.092533	L0709372-03	450AGEWR-W	40/40	1		09/21/07 09:25
18	HY.092107.092709	L0709372-06	HMS-W	40/40	1		09/21/07 09:27
19	HY.092107.092920	L0709372-07	HBV-W	40/40	1		09/21/07 09:29
20	HY.092107.093058	L0709400-02	47WW06-091307	40/40	1		09/21/07 09:30
21	HY.092107.093318	L0709400-04	47WW07-091307	40/40	1		09/21/07 09:33
22	HY.092107.093516	L0709385-02	CN0355	40/40	1		09/21/07 09:35
23	HY.092107.093703	WG250584-01	Post Digestion Spike		1	L0709385-02	09/21/07 09:37
24	HY.092107.093953	L0709385-03	CN0356	40/40	1		09/21/07 09:39
25	HY.092107.094141	L0709385-04	CN0358	40/40	1		09/21/07 09:41
26	HY.092107.094328	WG250668-13	CCV		1		09/21/07 09:43
27	HY.092107.094528	WG250668-14	CCB		1		09/21/07 09:45
28	HY.092107.094706	L0709385-05	CN0359	40/40	1		09/21/07 09:47
29	HY.092107.094906	WG250550-01	Reference Sample		1	L0709385-06	09/21/07 09:49
30	HY.092107.095123	WG250550-04	Matrix Spike	36/40	1	L0709385-07	09/21/07 09:51
31	HY.092107.095305	WG250550-05	Matrix Spike Duplica	36/40	1	L0709385-08	09/21/07 09:53
32	HY.092107.095446	L0709430-03	OT018-GW-LH2-2	40/40	1		09/21/07 09:54
33	HY.092107.095625	L0709430-04	OT018-GW-MW11	40/40	1		09/21/07 09:56
34	HY.092107.095803	L0709430-05	OT018-GW-MW33	40/40	1	WG250665-01	09/21/07 09:58
35	HY.092107.095942	L0709430-06	OT018-GW-MW13	40/40	1		09/21/07 09:59
36	HY.092107.100211	L0709430-07	OT018-GW-TY10LH	40/40	1		09/21/07 10:02
37	HY.092107.100348	L0709430-08	OT018-GW-DUPE	40/40	1		09/21/07 10:03

Approved: September 24, 2007

Maren Beery

KEMRON Environmental Services

Instrument Run Log

Instrument: HYDRA
Dataset: 092107B.PRN
Analyst1: ED
Analyst2: SLP
Method: 7470A
SOP: 404
Rev: 10
Maintenance Log ID: 20929

Calibration Std: STD21998
ICV/CCV Std: STD21992
Post Spike: STD21998
ICSA: N/A
ICSAB: N/A

Workgroups: 250584, 250583

Comments:

Seq.	File ID	Sample	ID	Prep	Dil	Reference	Date/Time
38	HY.092107.100538	WG250668-15	CCV		1		09/21/07 10:05
39	HY.092107.100720	WG250668-16	CCB		1		09/21/07 10:07
40	HY.092107.101240	WG250549-02	Method/Prep Blank	40/40	1		09/21/07 10:12
41	HY.092107.101415	WG250549-03	Laboratory Control S	40/40	1		09/21/07 10:14
42	HY.092107.101632	WG250549-01	Reference Sample		1	L0709407-02	09/21/07 10:16
43	HY.092107.101830	WG250549-04	Matrix Spike	36/40	1		09/21/07 10:18
44	HY.092107.102021	WG250549-05	Matrix Spike Duplica	36/40	1		09/21/07 10:20
45	HY.092107.102222	L0709407-03	MW-2D-LF	40/40	1		09/21/07 10:22
46	HY.092107.102401	WG250583-01	Post Digestion Spike		1	L0709407-03	09/21/07 10:24
47	HY.092107.102554	L0709407-04	MW-2D-HP	40/40	1		09/21/07 10:25
48	HY.092107.102737	L0709407-06	MW-5	40/40	1		09/21/07 10:27
49	HY.092107.102920	L0709407-07	MW-5-LF	40/40	1		09/21/07 10:29
50	HY.092107.103059	WG250668-17	CCV		1		09/21/07 10:30
51	HY.092107.103235	WG250668-18	CCB		1		09/21/07 10:32
52	HY.092107.103414	L0709407-08	MW-5-HP	40/40	1	WG250548-01	09/21/07 10:34
53	HY.092107.103606	L0709407-10	MW-6	40/40	1		09/21/07 10:36
54	HY.092107.103803	L0709407-11	MW-6-LF	40/40	1		09/21/07 10:38
55	HY.092107.103940	L0709407-12	MW-6-HP	40/40	1		09/21/07 10:39
56	HY.092107.104240	L0709407-14	MW-8	40/40	1		09/21/07 10:42
57	HY.092107.104440	L0709407-15	MW-8-LF	40/40	1		09/21/07 10:44
58	HY.092107.104641	L0709407-16	MW-8-HP	40/40	1		09/21/07 10:46
59	HY.092107.104819	L0709407-18	MW-9	40/40	1		09/21/07 10:48
60	HY.092107.105001	L0709407-19	MW-9LF	40/40	1		09/21/07 10:50
61	HY.092107.105140	L0709407-20	MW-9HP	40/40	1		09/21/07 10:51
62	HY.092107.105331	WG250668-19	CCV		1		09/21/07 10:53
63	HY.092107.105512	WG250668-20	CCB		1		09/21/07 10:55
64	HY.092107.105652	WG250477-01	Fluid Blank		1		09/21/07 10:56
65	HY.092107.105840	L0709365-01	CAR-SLUDGE	4/40	1	WG250555-01	09/21/07 10:58
66	HY.092107.110100	WG250583-02	Post Digestion Spike		1	L0709365-01	09/21/07 11:01
67	HY.092107.110242	L0709365-03	COL-SLUDGE	4/40	1		09/21/07 11:02
68	HY.092107.110438	L0709365-05	JEF-SLUDGE	4/40	1		09/21/07 11:04
69	HY.092107.110624	L0709365-07	HOL-SLUDGE	4/40	1		09/21/07 11:06
70	HY.092107.110801	WG250668-21	CCV		1		09/21/07 11:08
71	HY.092107.111001	WG250668-22	CCB		1		09/21/07 11:10

Page: 2

Approved: September 24, 2007

Maren Beery

KEMRON Environmental Services
Data Checklist

Date: 20-SEP-2007
Analyst: ED
Analyst: NA
Method: 7470A
Instrument: HYDRA
Curve Workgroup: WG250564
Runlog ID: 18315
Analytical Workgroups: WG250525, WG250526

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	X
Generate PDF Instrument Data	X
Sign/Annotate PDF Data	X
Upload Curve Data	X
Workgroup Forms	X
Case Narrative	335,336,345,375,365,232,348,400
Client Forms	
Level X	335,336,365
Level 3	400
Level 4	345,375,348
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	SLP
Comments	

Primary Reviewer:
20-SEP-2007
Emily Decker

Secondary Reviewer:
20-SEP-2007
Sheri L. Pfalzgraf

Generated: SEP-20-2007 13:58:11

KEMRON Environmental Services
Data Checklist

Date: 21-SEP-2007
Analyst: ED
Analyst: SLP
Method: 7470A
Instrument: HYDRA
Curve Workgroup: 250668
Runlog ID: 18341
Analytical Workgroups: 250584, 250583

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	372, 400, 385, 430, 407, 365
Client Forms	X
Level X	365
Level 3	400
Level 4	372, 385, 430, 407
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	SLP
Secondary Reviewer	MMB
Comments	

Primary Reviewer:
21-SEP-2007
Sheri L. Pfalzgraf

Secondary Reviewer:
24-SEP-2007
Maren Beery

Generated: SEP-24-2007 15:55:55

Analytical Method: 7470A

AAB#: WG250526

Login Number: L0709400

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
47WW06-091307	09/13/07	09/18/07	09/19/07	28	5.69	09/20/07	28	1.07	
47WW07-091307	09/13/07	09/18/07	09/19/07	28	5.63	09/20/07	28	1.07	

* EXT = SEE PROJECT QAPP REQUIREMENTS
*ANAL = SEE PROJECT QAPP REQUIREMENTS

Analytical Method: 7470A

Login Number: L0709400

AAB#: WG250584

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
47WW06-091307	09/13/07	09/18/07	09/20/07	28	6.71	09/21/07	28	1.02	
47WW07-091307	09/13/07	09/18/07	09/20/07	28	6.65	09/21/07	28	1.02	

* EXT = SEE PROJECT QAPP REQUIREMENTS
*ANAL = SEE PROJECT QAPP REQUIREMENTS

KEMRON FORMS - Modified 11/20/2006
Version 1.5 PDF File ID: 881117
Report generated 09/21/2007 12:18

METHOD BLANK SUMMARY

Login Number: L0709400
Work Group: WG250526
Blank File ID: HY.092007.093231
Blank Sample ID: WG250449-02
Prep Date: 09/19/07 08:35
Instrument ID: HYDRA
Analyzed Date: 09/20/07 09:32
Method: 7470A
Analyst: ED

This Method Blank Applies To The Following Samples:

Client ID	Lab Sample ID	Lab File ID	Time Analyzed	TAG
LCS	WG250449-03	HY.092007.093419	09/20/07 09:34	01
47WW06-091307	L0709400-01	HY.092007.101705	09/20/07 10:17	01
47WW07-091307	L0709400-03	HY.092007.102217	09/20/07 10:22	01

KEMRON FORMS - Modified 01/31/2007
Version 1.5 PDF File ID: 879987
Report generated 09/20/2007 11:21

METHOD BLANK SUMMARY

Login Number: L0709400
Blank File ID: HY.092107.091437
Prep Date: 09/20/07 09:00
Analyzed Date: 09/21/07 09:14
Analyst: ED

Work Group: WG250584
Blank Sample ID: WG250550-02
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	WG250550-03	HY.092107.091646	09/21/07 09:16	01
47WW06-091307	L0709400-02	HY.092107.093058	09/21/07 09:30	01
47WW07-091307	L0709400-04	HY.092107.093318	09/21/07 09:33	01

KEMRON FORMS - Modified 01/31/2007
Version 1.5 PDF File ID: 881118
Report generated 09/21/2007 12:18

METHOD BLANK REPORT

00101040

Login Number: L0709400 Prep Date: 09/19/07 08:35 Sample ID: WG250449-02
Instrument ID: HYDRA Run Date: 09/20/07 09:32 Prep Method: METHOD
File ID: HY.092007.093231 Analyst: ED Method: 7470A
Workgroup (AAB#): WG250526 Matrix: Water Units: mg/L
Contract #: DACA56-94-D-0020 Cal ID: HYDRA-20-SEP-07

Analytes	SQL	PQL	Concentration	Dilution	Qualifier
Mercury	0.000100	0.000200	0.000100	1	U

SQL 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: 879988
Report generated 09/20/2007 11:21

METHOD BLANK REPORT

Login Number: L0709400 Prep Date: 09/20/07 09:00 Sample ID: WG250550-02
Instrument ID: HYDRA Run Date: 09/21/07 09:14 Prep Method: METHOD
File ID: HY.092107.091437 Analyst: ED Method: 7470A
Workgroup (AAB#): WG250584 Matrix: Water Units: mg/L
Contract #: DACA56-94-D-0020 Cal ID: HYDRA-21-SEP-07

Analytes	SQL	PQL	Concentration	Dilution	Qualifier
Mercury, Dissolved	0.000100	0.000200	0.000100	1	U

SQL 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: 881119
Report generated 09/21/2007 12:18

LABORATORY CONTROL SAMPLE (LCS)

00101042

Login Number: L0709400
Run Date: 09/20/2007
Sample ID: WG250449-03
Instrument ID: HYDRA
Run Time: 09:34
Prep Method: METHOD
File ID: HY.092007.093419
Analyst: ED
Method: 7470A
Workgroup (AAB#): WG250526
Matrix: Water
Units: mg/L
QC Key: STD
Lot#: MI-7470-01
Cal ID: HYDRA - 20-SEP-07

Analytes	Expected	Found	% Rec	LCS Limits	Q
Mercury	0.00400	0.00413	103	85 - 115	

KEMRON FORMS - Modified 09/06/2007
Version 1.5 PDF File ID: 879989
Report generated 09/20/2007 11:21

LABORATORY CONTROL SAMPLE (LCS)

Login Number: L0709400 | Run Date: 09/21/2007 | Sample ID: WG250550-03
Instrument ID: HYDRA | Run Time: 09:16 | Prep Method: METHOD
File ID: HY.092107.091646 | Analyst: ED | Method: 7470A
Workgroup (AAB#): WG250584 | Matrix: Water | Units: mg/L
QC Key: STD | Lot#: MI-7470-01 | Cal ID: HYDRA - 21-SEP-07

Analytes	Expected	Found	% Rec	LCS Limits	Q
Mercury, Dissolved	0.00400	0.00427	107	85 - 115	

MATRIX SPIKE AND MATRIX SPIKE DUP (MS/MSD)

Loginnum:L0709400 Cal ID: HYDRA - Worknum:WG250526
Instrument ID:HYDRA Contract #:DACA56-94-D-0020 Method:7470A
Parent ID:WG250449-01 File ID:HY.092007.101705 Dil:1 Matrix:WATER
Sample ID:WG250449-04 MS File ID:HY.092007.101854 Dil:1 Units:mg/L
Sample ID:WG250449-05 MSD File ID:HY.092007.102031 Dil:1

Analyte	Parent	MS Spiked	MS Found	MS %Rec	MSD Spiked	MSD Found	MSD %Rec	%RPD	%Rec Limits	RPD Limit	Q
Mercury	ND	0.00444	0.00470	106	0.00444	0.00459	103	2.39	85 - 115	20	

* FAILS %REC LIMIT

FAILS RPD LIMIT

NOTE: This is an internal quality control sample.

KEMRON FORMS - Modified 12/08/2006
Version 1.5 PDF File ID: 879990
Report generated 09/20/2007 11:21

MATRIX SPIKE AND MATRIX SPIKE DUP (MS/MSD)

00101045

Loginnum: L0709400 Cal ID: HYDRA - Worknum: WG250584
Instrument ID: HYDRA Contract #: DACA56-94-D-0020 Method: 7470A
Parent ID: WG250550-01 File ID: HY.092107.094906 Dil: 1 Matrix: WATER
Sample ID: WG250550-04 MS File ID: HY.092107.095123 Dil: 1 Units: mg/L
Sample ID: WG250550-05 MSD File ID: HY.092107.095305 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	0.00471	106	0.00444	0.00463	104	1.66	85 - 115	20	

* FAILS %REC LIMIT

FAILS RPD LIMIT

NOTE: This is an internal quality control sample.

KEMRON ENVIRONMENTAL SERVICES
POST SPIKE REPORT

Sample Login ID: L0709400 **Worknum:** WG250526
Instrument ID: HYDRA **Method:** 7470A
Post Spike ID: WG250526-02 **File ID:** HY.092007.094526 **Dil:** 1 **Units:** ug/L
Sample ID: L0709335-01 **File ID:** HY.092007.094348 **Dil:** 1 **Matrix:** Water

Analyte	Post Spike Result	C	Sample Result	C	Spike Added(SA)	% R	Control Limit %R	Q
MERCURY	0.865		0	U	1	86.5	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: 879985
Report generated 09/20/2007 11:21

KEMRON ENVIRONMENTAL SERVICES
POST SPIKE REPORT

Sample Login ID: L0709400 **Worknum:** WG250584
Instrument ID: HYDRA **Method:** 7470A
Post Spike ID: WG250584-01 **File ID:** HY.092107.093703 **Dil:** 1 **Units:** ug/L
Sample ID: L0709385-02 **File ID:** HY.092107.093516 **Dil:** 1 **Matrix:** Water

Analyte	Post Spike Result	C	Sample Result	C	Spike Added(SA)	% R	Control Limit %R	Q
MERCURY	0.924		0	U	1	92.4	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

INITIAL CALIBRATION SUMMARY

00101048

Login Number: L0709400
Analytical Method: 7470A
ICAL Worknum: WG250564

Workgroup (AAB#): WG250526
Instrument ID: HYDRA
Initial Calibration Date: 09/20/2007 08:29

Analyte	WG250564-01		WG250564-02		WG250564-03		WG250564-04		WG250564-05		WG250564-06	
	STD	INT	STD	INT	STD	INT	STD	INT	STD	INT	STD	INT
Mercury	0	3717	0.200	19714	1.00	77247	2.00	155806	5.00	379694	10.0	745829

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: 879991
Report generated 09/20/2007 11:21

INITIAL CALIBRATION SUMMARY

Login Number: L0709400
Analytical Method: 7470A
ICAL Worknum: WG250564

Workgroup (AAB#): WG250526
Instrument ID: HYDRA
Initial Calibration Date: 09/20/2007 08:29

Analyte	R	Q
Mercury	1.000	

INT = Instrument intensity
R = Coefficient of correlation
Q = Data Qualifier
* = Out of Compliance; R < 0.995

INITIAL CALIBRATION SUMMARY

Login Number: L0709400
Analytical Method: 7470A
ICAL Worknum: WG250668

Workgroup (AAB#): WG250584
Instrument ID: HYDRA
Initial Calibration Date: 09/21/2007 09:05

Analyte	WG250668-01		WG250668-02		WG250668-03		WG250668-04		WG250668-05		WG250668-06	
	STD	INT	STD	INT	STD	INT	STD	INT	STD	INT	STD	INT
Mercury	0	2477	0.200	13729	1.00	63028	2.00	140817	5.00	314000	10.0	603663

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: 881122
Report generated 09/21/2007 12:18

INITIAL CALIBRATION SUMMARY

Login Number: L0709400
Analytical Method: 7470A
ICAL Worknum: WG250668

Workgroup (AAB#): WG250584
Instrument ID: HYDRA
Initial Calibration Date: 09/21/2007 09:05

Analyte	R	Q
Mercury	0.9994	

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: 881122
Report generated 09/21/2007 12:18

INITIAL CALIBRATION BLANK (ICB)

00101052

Login Number: L0709400
Run Date: 09/20/2007
Sample ID: WG250564-08
Instrument ID: HYDRA
Run Time: 08:33
Method: 7470A
File ID: HY.092007.083315
Analyst: ED
Units: ug/L
Workgroup (AAB#): WG250526
Cal ID: HYDRA - 20-SEP-07

Analytes	MDL	RDL	Concentration	Dilution	Qualifier
Mercury	0.100	0.200	-.08	1	U

U = Result is less than MDL
F = Result is between MDL and RL
* = Result is above RL

INITIAL CALIBRATION BLANK (ICB)

Login Number: L0709400
Run Date: 09/21/2007
Sample ID: WG250668-08
Instrument ID: HYDRA
Run Time: 09:09
Method: 7470A
File ID: HY.092107.090904
Analvst: ED
Units: ug/L
Workgroup (AAB#): WG250584
Cal ID: HYDRA - 21-SEP-07

Analytes	MDL	RDL	Concentration	Dilution	Qualifier
Mercury	0.100	0.200	-.127	1	F

U = Result is less than MDL
F = Result is between MDL and RL
* = Result is above RL

CONTINUING CALIBRATION BLANK (CCB)

Login Number: L0709400
Run Date: 09/20/2007
Sample ID: WG250564-10
Instrument ID: HYDRA
Run Time: 08:36
Method: 7470A
File ID: HY.092007.083630
Analyst: ED
Units: ug/L
Workgroup (AAB#): WG250526
Cal ID: HYDRA - 20-SEP-07

Analytes	MDL	RDL	Concentration	Dilution	Qualifier
Mercury	0.100	0.200	-0.0620	1	U

U = Result is less than MDL
F = Result is between MDL and RL
* = Result is above RL

CONTINUING CALIBRATION BLANK (CCB)

00101055

Login Number: L0709400
Run Date: 09/20/2007
Sample ID: WG250564-16
Instrument ID: HYDRA
Run Time: 09:30
Method: 7470A
File ID: HY.092007.093005
Analyst: ED
Units: ug/L
Workgroup (AAB#): WG250526
Cal ID: HYDRA - 20-SEP-07

Analytes	MDL	RDL	Concentration	Dilution	Qualifier
Mercury	0.100	0.200	-0.0350	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: 879995
Report generated 09/20/2007 11:21

CONTINUING CALIBRATION BLANK (CCB)

00101056

Login Number: L0709400
Run Date: 09/20/2007
Sample ID: WG250564-18
Instrument ID: HYDRA
Run Time: 09:52
Method: 7470A
File ID: HY.092007.095253
Analyst: ED
Units: ug/L
Workgroup (AAB#): WG250526
Cal ID: HYDRA - 20-SEP-07

Analytes	MDL	RDL	Concentration	Dilution	Qualifier
Mercury	0.100	0.200	-0.0940	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: 879995
Report generated 09/20/2007 11:21

CONTINUING CALIBRATION BLANK (CCB)

00101057

Login Number: L0709400 | Run Date: 09/20/2007 | Sample ID: WG250564-20
Instrument ID: HYDRA | Run Time: 10:15 | Method: 7470A
File ID: HY.092007.101528 | Analyst: ED | Units: ug/L
Workgroup (AAB#): WG250526 | Cal ID: HYDRA - 20-SEP-07

Analytes	MDL	RDL	Concentration	Dilution	Qualifier
Mercury	0.100	0.200	-0.0120	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: 879995
Report generated 09/20/2007 11:21

CONTINUING CALIBRATION BLANK (CCB)

Login Number: L0709400
Run Date: 09/20/2007
Sample ID: WG250564-22
Instrument ID: HYDRA
Run Time: 10:28
Method: 7470A
File ID: HY.092007.102829
Analyst: ED
Units: ug/L
Workgroup (AAB#): WG250526
Cal ID: HYDRA - 20-SEP-07

Analytes	MDL	RDL	Concentration	Dilution	Qualifier
Mercury	0.100	0.200	0.0200	1	U

U = Result is less than MDL
F = Result is between MDL and RL
* = Result is above RL

CONTINUING CALIBRATION BLANK (CCB)

Login Number: L0709400
Run Date: 09/21/2007
Sample ID: WG250668-10
Instrument ID: HYDRA
Run Time: 09:12
Method: 7470A
File ID: HY.092107.091237
Analyst: ED
Units: ug/L
Workgroup (AAB#): WG250584
Cal ID: HYDRA - 21-SEP-07

Analytes	MDL	RDL	Concentration	Dilution	Qualifier
Mercury	0.100	0.200	-0.154	1	F

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: 881126
Report generated 09/21/2007 12:18

CONTINUING CALIBRATION BLANK (CCB)

00101060

Login Number: L0709400
Run Date: 09/21/2007
Sample ID: WG250668-12
Instrument ID: HYDRA
Run Time: 09:21
Method: 7470A
File ID: HY.092107.092153
Analyst: ED
Units: ug/L
Workgroup (AAB#): WG250584
Cal ID: HYDRA - 21-SEP-07

Analytes	MDL	RDL	Concentration	Dilution	Qualifier
Mercury	0.100	0.200	-0.108	1	F

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: 881126
Report generated 09/21/2007 12:18

KEMRON Environmental Services

CONTINUING CALIBRATION BLANK (CCB)

00101061

Login Number: L0709400
Run Date: 09/21/2007
Sample ID: WG250668-14
Instrument ID: HYDRA
Run Time: 09:45
Method: 7470A
File ID: HY.092107.094528
Analyst: ED
Units: ug/L
Workgroup (AAB#): WG250584
Cal ID: HYDRA - 21-SEP-07

Analytes	MDL	RDL	Concentration	Dilution	Qualifier
Mercury	0.100	0.200	-0.0870	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: 881126
Report generated 09/21/2007 12:18

CONTINUING CALIBRATION BLANK (CCB)

Login Number: L0709400
Run Date: 09/21/2007
Sample ID: WG250668-16
Instrument ID: HYDRA
Run Time: 10:07
Method: 7470A
File ID: HY.092107.100720
Analyst: ED
Units: ug/L
Workgroup (AAB#): WG250584
Cal ID: HYDRA - 21-SEP-07

Analytes	MDL	RDL	Concentration	Dilution	Qualifier
Mercury	0.100	0.200	-0.136	1	F

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: 881126
Report generated 09/21/2007 12:18

INITIAL CALIBRATION VERIFICATION (ICV)

00101063

Login Number: L0709400
Run Date: 09/20/2007
Sample ID: WG250564-07
Instrument ID: HYDRA
Run Time: 08:31
Method: 7470A
File ID: HY.092007.083136
Analyst: ED
Units: ug/L
Workgroup (AAB#): WG250526
Cal ID: HYDRA - 20-SEP-07
QC Key: STD

Analyte		Expected	Found	%REC	LIMITS	Q
Mercury		2	1.94	97.0	90 - 110	

* Exceeds LIMITS Limit

KEMRON FORMS - Modified 09/06/2007 (ICV)
Version 1.5 PDF File ID: 879992
Report generated 09/20/2007 11:21

INITIAL CALIBRATION VERIFICATION (ICV)

00101064

Login Number:	L0709400	Run Date:	09/21/2007	Sample ID:	WG250668-07
Instrument ID:	HYDRA	Run Time:	09:07	Method:	7470A
File ID:	HY.092107.090724	Analyst:	ED	Units:	ug/L
Workgroup (AAB#):	WG250584	Cal ID:	HYDRA - 21-SEP-07		
QC Key:	STD				

Analyte		Expected	Found	%REC	LIMITS	Q
Mercury		2	1.98	99.0	90 - 110	

* Exceeds LIMITS Limit

KEMRON FORMS - Modified 09/06/2007 (ICV)
Version 1.5 PDF File ID: 881123
Report generated 09/21/2007 12:18

CONTINUING CALIBRATION VERIFICATION (CCV)

Login Number: L0709400
Run Date: 09/20/2007
Sample ID: WG250564-09
Instrument ID: HYDRA
Run Time: 08:34
Method: 7470A
File ID: HY.092007.083453
Analyst: ED
QC Key: STD
Workgroup (AAB#): WG250526
Cal ID: HYDRA - 20-SEP-07

Analyte		Expected	Found	UNITS	%REC	LIMITS		Q
Mercury, Total		0.00200	0.00202	mg/L	101	80 - 120		

* Exceeds LIMITS Criteria

KEMRON FORMS - Modified 09/06/2007 - (CCV)
Version 1.5 PDF File ID: 879994
Report generated 09/20/2007 11:21

CONTINUING CALIBRATION VERIFICATION (CCV)

00101066

Login Number: L0709400 Run Date: 09/20/2007 Sample ID: WG250564-15
Instrument ID: HYDRA Run Time: 09:28 Method: 7470A
File ID: HY.092007.092807 Analyst: ED QC Key: STD
Workgroup (AAB#): WG250526 Cal ID: HYDRA - 20-SEP-07

Analyte		Expected	Found	UNITS	%REC	LIMITS		Q
Mercury, Total		0.00200	0.00197	mg/L	98.5	80 - 120		

* Exceeds LIMITS Criteria

KEMRON FORMS - Modified 09/06/2007 - (CCV)
Version 1.5 PDF File ID: 879994
Report generated 09/20/2007 11:21

CONTINUING CALIBRATION VERIFICATION (CCV)

00101067

Login Number: L0709400 | Run Date: 09/20/2007 | Sample ID: WG250564-17
Instrument ID: HYDRA | Run Time: 09:51 | Method: 7470A
File ID: HY.092007.095112 | Analyst: ED | QC Key: STD
Workgroup (AAB#): WG250526 | Cal ID: HYDRA - 20-SEP-07

Analyte		Expected	Found	UNITS	%REC	LIMITS		Q
Mercury, Total		0.00200	0.00177	mg/L	88.5	80 - 120		

* Exceeds LIMITS Criteria

KEMRON FORMS - Modified 09/06/2007 - (CCV)
Version 1.5 PDF File ID: 879994
Report generated 09/20/2007 11:21

CONTINUING CALIBRATION VERIFICATION (CCV)

00101068

Login Number: L0709400
Run Date: 09/20/2007
Sample ID: WG250564-19
Instrument ID: HYDRA
Run Time: 10:13
Method: 7470A
File ID: HY.092007.101308
Analvst: ED
QC Key: STD
Workgroup (AAB#): WG250526
Cal ID: HYDRA - 20-SEP-07

Analyte		Expected	Found	UNITS	%REC	LIMITS		Q
Mercury, Total		0.00200	0.00198	mg/L	99.0	80 - 120		

* Exceeds LIMITS Criteria

KEMRON FORMS - Modified 09/06/2007 - (CCV)
Version 1.5 PDF File ID: 879994
Report generated 09/20/2007 11:21

CONTINUING CALIBRATION VERIFICATION (CCV)

00101069

Login Number: L0709400
Instrument ID: HYDRA
File ID: HY.092007.102641
Workgroup (AAB#): WG250526

Run Date: 09/20/2007
Run Time: 10:26
Analvst: ED
Cal ID: HYDRA - 20-SEP-07

Sample ID: WG250564-21
Method: 7470A
QC Key: STD

Analyte		Expected	Found	UNITS	%REC	LIMITS		Q
Mercury, Total		0.00200	0.00185	mg/L	92.5	80 - 120		

* Exceeds LIMITS Criteria

KEMRON FORMS - Modified 09/06/2007 - (CCV)
Version 1.5 PDF File ID: 879994
Report generated 09/20/2007 11:21

CONTINUING CALIBRATION VERIFICATION (CCV)

00101070

Login Number: L0709400
Instrument ID: HYDRA
File ID: HY.092107.091101
Workgroup (AAB#): WG250584

Run Date: 09/21/2007
Run Time: 09:11
Analyst: ED
Cal ID: HYDRA - 21-SEP-07

Sample ID: WG250668-09
Method: 7470A
QC Key: STD

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: 881125
Report generated 09/21/2007 12:18

CONTINUING CALIBRATION VERIFICATION (CCV)

00101071

Login Number: L0709400
Run Date: 09/21/2007
Sample ID: WG250668-11
Instrument ID: HYDRA
Run Time: 09:20
Method: 7470A
File ID: HY.092107.092002
Analyst: ED
QC Key: STD
Workgroup (AAB#): WG250584
Cal ID: HYDRA - 21-SEP-07

Analyte		Expected	Found	UNITS	%REC	LIMITS		Q
Mercury, Total		0.00200	0.00199	mg/L	99.5	80 - 120		

* Exceeds LIMITS Criteria

KEMRON FORMS - Modified 09/06/2007 - (CCV)
Version 1.5 PDF File ID: 881125
Report generated 09/21/2007 12:18

CONTINUING CALIBRATION VERIFICATION (CCV)

00101072

Login Number: L0709400 Run Date: 09/21/2007 Sample ID: WG250668-13
Instrument ID: HYDRA Run Time: 09:43 Method: 7470A
File ID: HY.092107.094328 Analyst: ED QC Key: STD
Workgroup (AAB#): WG250584 Cal ID: HYDRA - 21-SEP-07

Analyte		Expected	Found	UNITS	%REC	LIMITS		Q
Mercury, Total		0.00200	0.00199	mg/L	99.5	80 - 120		

* Exceeds LIMITS Criteria

KEMRON FORMS - Modified 09/06/2007 - (CCV)
Version 1.5 PDF File ID: 881125
Report generated 09/21/2007 12:18

CONTINUING CALIBRATION VERIFICATION (CCV)

Login Number: L0709400
Run Date: 09/21/2007
Sample ID: WG250668-15
Instrument ID: HYDRA
Run Time: 10:05
Method: 7470A
File ID: HY.092107.100538
Analyst: ED
QC Key: STD
Workgroup (AAB#): WG250584
Cal ID: HYDRA - 21-SEP-07

Analyte		Expected	Found	UNITS	%REC	LIMITS		Q
Mercury, Total		0.00200	0.00193	mg/L	96.5	80 - 120		

* Exceeds LIMITS Criteria

KEMRON FORMS - Modified 09/06/2007 - (CCV)
Version 1.5 PDF File ID: 881125
Report generated 09/21/2007 12:18

2.2 General Chemistry Data

2.2.1 Total Dissolved Solids Data

2.2.1.1 Summary Data

LABORATORY REPORT

00101077

L0709400

10/02/07 10:28

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:	LONGHORN-PBC
P.O. Number:	322255 OP

Sample Analysis Summary

Client ID	Lab ID	Method	Dilution	Date Received
47WW06-091307	L0709400-01	160.1	1	18-SEP-07
47WW07-091307	L0709400-03	160.1	1	18-SEP-07

Sample Number:	L0709400-01	PrePrep Method:	NONE	Instrument:	OVEN
Client ID:	47WW06-091307	Prep Method:	160.1	Prep Date:	09/19/2007 13:30
Matrix:	Water	Analytical Method:	160.1	Cal Date:	
Workgroup Number:	WG250453	Analyst:	TMM	Run Date:	09/19/2007 13:30
Collect Date:	09/13/2007 16:01	Dilution:	1	File ID:	EN.0709191330-04
		Units:	mg/L		

Analyte	CAS. Number	Result	Qual	PQL	SQL
Total Dissolved Solids		892		20.0	10.0

Sample Number:**L0709400-03**
Client ID:**47WW07-091307**
Matrix:**Water**
Workgroup Number:**WG250453**
Collect Date:**09/13/2007 17:24**

PrePrep Method:**NONE**
Prep Method:**160.1**
Analytical Method:**160.1**
Analyst:**TMM**
Dilution:**1**
Units:**mg/L**

Instrument:**OVEN**
Prep Date:**09/19/2007 13:30**
Cal Date:
Run Date:**09/19/2007 13:30**
File ID:**EN.0709191330-05**

Analyte	CAS. Number	Result	Qual	PQL	SQL
Total Dissolved Solids		**848**		**20.0**	**10.0**

2.2.1.2 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: 19-SEP-2007
Analyst: TMM
Analyst: HJR
Method: TDS
Instrument: OVEN
Curve Workgroup: NA
Runlog ID:
Analytical Workgroups: WG250453

Calibration/Linearity	9/19/07
Second Source Check	
ICV/CCV (std)	
ICB/CCB	
Blank	X
LCS/LCS Dup	X
MS/MSD	X
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:
27-SEP-2007
H J Reed

Secondary Reviewer:
29-SEP-2007
Donna Hesson

Generated: SEP-29-2007 12:46:40

KEMRON Environmental Services
HOLDING TIMES
EQUIVALENT TO AFCEE FORM 9

Analytical Method: 160.1

Login Number: L0709400

AAB#: WG250453

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
47WW06-091307	09/13/07	09/18/07	09/19/07	7	5.90	09/19/07	7	5.90	
47WW07-091307	09/13/07	09/18/07	09/19/07	7	5.84	09/19/07	7	5.84	

* EXT = SEE PROJECT QAPP REQUIREMENTS

*ANAL = SEE PROJECT QAPP REQUIREMENTS

KEMRON FORMS - Modified 11/20/2006
Version 1.5 PDF File ID: 887401
Report generated 09/28/2007 10:03

METHOD BLANK SUMMARY

Login Number: L0709400
Work Group: WG250453
Blank File ID: EN.0709191330-01
Blank Sample ID: WG250453-01
Prep Date: 09/19/07 13:30
Instrument ID: OVEN
Analyzed Date: 09/19/07 13:30
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	WG250453-02	EN.0709191330-02	09/19/07 13:30	
LCS2	WG250453-03	EN.0709191330-03	09/19/07 13:30	
47WW06-091307	L0709400-01	EN.0709191330-04	09/19/07 13:30	
47WW07-091307	L0709400-03	EN.0709191330-05	09/19/07 13:30	
DUP	WG250453-05	EN.0709191330-13	09/19/07 13:30	

METHOD BLANK REPORT

00101085

Login Number:	L0709400	Prep Date:	09/19/07 13:30	Sample ID:	WG250453-01
Instrument ID:	OVEN	Run Date:	09/19/07 13:30	Prep Method:	160.1
File ID:	EN.0709191330-01	Analyst:	TMM	Method:	160.1
Workgroup (AAB#):	WG250453	Matrix:	Water	Units:	mg/L
Contract #:	DACA56-94-D-0020	Cal ID:	OVEN -		

Analytes	SQL	PQL	Concentration	Dilution	Qualifier
Total Dissolved Solids	5.00	10.0	5.00	1	U

SQL 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: 887403
Report generated 09/28/2007 10:04

LABORATORY CONTROL SAMPLE (LCS)

Login Number: L0709400 Analyst: TMM Prep Method: 160.1
Instrument ID: OVEN Matrix: Water Method: 160.1
Workgroup (AAB#): WG250453 Units: mg/L
QC Key: STD Lot #: STD19758

Sample ID: WG250453-02 LCS File ID: EN.0709191330-02 Run Date: 09/19/2007 13:30
Sample ID: WG250453-03 LCS2 File ID: EN.0709191330-03 Run Date: 09/19/2007 13:30

Analytes	LCS			LCS2			%RPD	%Rec Limits	RPD Lmt	Q
	Known	Found	% REC	Known	Found	% REC				
Total Dissolved Solids	500	498	99.6	500	492	98.4	1.21	80 - 120	25	

KEMRON FORMS - Modified 02/08/2007
Version 1.5 PDF File ID: 887404
Report generated 09/28/2007 10:04

2.2.1.3 Raw Data

KEMRON
ENVIRONMENTAL SERVICES

WORKGROUP: WG250453

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: Std 19758
Daily Dilution: 5(5000)/50 = 500

SAMPLE	#	VOLUME (mL)	INITIAL WEIGHT WT1 (g)	DRY WEIGHT WT2A (g)	DRY WEIGHT WT2B (g)	DRY WEIGHT WT2C (g)
BLANK W1	BK	100	76.4254	76.4256	~~76.4256~~	76.4256
LCS: 500 mg/L	~~LCS~~ P1	50	78.8021	78.8270	78.8270	
LCSDUP: 500 mg/L	~~LCS2~~ K5	50	79.4954	79.5201	79.5200	
09-400-01	W7	↓	82.0926	82.1373	82.1372	
-03	A7		66.0432	66.0856	66.0856	
09-413-01	L17		77.9258	77.9395	77.9393	
-02	L7		80.5187	80.5274	80.5273	
-04	W8		77.6423	77.6718	~~77.6702~~	77.6717
-07	~~516~~ L5		80.1015	80.1183	80.1181	
R -03	158		73.4204	73.4506	73.4505	
MS -05	K3		79.6832	79.7394	79.7393	
SD -06	51	↓	113.4227	113.4783	113.4781	
DUP: 09-400-03	D2	50	75.5212	75.5644	75.5643	

ANALYST: [signature]
Tammy Morris

DATE/TIME: (on) 9-19-07 1330
DATE/TIME: (off) 9-20-07 1340
DATE/TIME: (off) 9-20-07 1615
DATE/TIME: (off)

DCN#71041

Donna Hesson
Approved: September 29, 2007

KEMRON ENVIRONMENTAL SERVICES
GRAVIMETRIC REPORT

Workgroup (AAB#): WG250453 Analyst: TMM
Product: 160.1 Run Date: 09/19/2007 13:30
Analyte: TOTAL DISSOLVED SOLIDS

SAMPLE NUMBER	INITIAL VOL	INITIAL WT	FINAL WT	Anal. Conc	Rep. Conc.	Units
WG250453-01	100	76.4254	76.4256	2.000	2.000	mg/L
WG250453-02	50	78.8021	78.827	498.0	498.0	mg/L
WG250453-03	50	79.4954	79.52	492.0	492.0	mg/L
L0709400-01	50	82.0926	82.1372	892.0	892.0	mg/L
L0709400-03	50	66.0432	66.0856	848.0	848.0	mg/L
WG250453-04	50	66.0432	66.0856	848.0	848.0	mg/L
L0709413-01	50	77.9258	77.9393	270.0	270.0	mg/L
L0709413-02	50	80.5187	80.5273	172.0	172.0	mg/L
L0709413-04	50	77.6423	77.6717	588.0	588.0	mg/L
L0709413-07	50	80.1015	80.1181	332.0	332.0	mg/L
L0709413-03	50	73.4204	73.4505	602.0	602.0	mg/L
WG250453-06	50	73.4204	73.4505	602.0	602.0	mg/L
L0709413-05	50	79.6832	79.7393	1122	1122	mg/L
WG250453-07	50	79.6832	79.7393	1122	1122	mg/L
L0709413-06	50	113.4227	113.4781	1108	1108	mg/L
WG250453-08	50	113.4227	113.4781	1108	1108	mg/L
WG250453-05	50	75.5212	75.5643	862.0	862.0	mg/L

KEMRON FORMS - Modified 02/26/2007
Version 1.3
Report generated 09/27/2007 11:10

Donna Eisson

Approved: September 29, 2007

2.2.2 Total Suspended Solids Data

2.2.2.1 Summary Data

LABORATORY REPORT

00101092

L0709400

10/02/07 10:28

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: LONGHORN-PBC

P.O. Number: 322255 OP

Sample Analysis Summary

Client ID	Lab ID	Method	Dilution	Date Received
47WW06-091307	L0709400-01	160.2	1	18-SEP-07
47WW07-091307	L0709400-03	160.2	1	18-SEP-07

Report Number: **L0709400**
Report Date : **October 2, 2007**

00101093

Sample Number:	**L0709400-01**	PrePrep Method:	**NONE**	Instrument:	**OVEN**
Client ID:	**47WW06-091307**	Prep Method:	**160.2**	Prep Date:	**09/19/2007 11:30**
Matrix:	**Water**	Analytical Method:	**160.2**	Cal Date:	
Workgroup Number:	**WG250451**	Analyst:	**TMM**	Run Date:	**09/19/2007 11:30**
Collect Date:	**09/13/2007 16:01**	Dilution:	**1**	File ID:	**EN.0709191130-06**
		Units:	**mg/L**		

Analyte	CAS. Number	Result	Qual	PQL	SQL
Total Suspended Solids		**17.0**		**5.00**	**2.50**

Sample Number: L0709400-03
Client ID: 47WW07-091307
Matrix: Water
Workgroup Number: WG250451
Collect Date: 09/13/2007 17:24

PrePrep Method: NONE
Prep Method: 160.2
Analytical Method: 160.2
Analyst: TMM
Dilution: 1
Units: mg/L

Instrument: OVEN
Prep Date: 09/19/2007 11:30
Cal Date:
Run Date: 09/19/2007 11:30
File ID: EN.0709191130-05

Analyte	CAS. Number	Result	Qual	PQL	SQL
Total Suspended Solids		4.00	J	5.00	2.50

J The analyte was positively identified, but the quantitation was below the RL

2.2.2.2 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.

Checklist ID: 21393

00101097

KEMRON Environmental Services
Data Checklist

Date: 19-SEP-2007
Analyst: TMM
Analyst: HJR
Method: TSS
Instrument: OVEN
Curve Workgroup: NA
Runlog ID:
Analytical Workgroups: WG250451

Calibration/Linearity	9/19/07
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:
20-SEP-2007

Secondary Reviewer:
20-SEP-2007

Generated: SEP-20-2007 14:52:19

Analytical Method: 160.2

AAB#: WG250451

Login Number: L0709400

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
47WW07-091307	09/13/07	09/18/07	09/19/07	7	5.75	09/19/07	7	5.75	
47WW06-091307	09/13/07	09/18/07	09/19/07	7	5.81	09/19/07	7	5.81	

* EXT = SEE PROJECT QAPP REQUIREMENTS
*ANAL = SEE PROJECT QAPP REQUIREMENTS

KEMRON FORMS - Modified 11/20/2006
Version 1.5 PDF File ID: 880128
Report generated 09/20/2007 14:38

METHOD BLANK SUMMARY

Login Number: L0709400
Work Group: WG250451
Blank File ID: EN.0709191130-01
Blank Sample ID: WG250451-01
Prep Date: 09/19/07 11:30
Instrument ID: OVEN
Analyzed Date: 09/19/07 11:30
Method: 160.2
Analyst: TMM

This Method Blank Applies To The Following Samples:

Client ID	Lab Sample ID	Lab File ID	Time Analyzed	TAG
LCS	WG250451-02	EN.0709191130-02	09/19/07 11:30	
LCS2	WG250451-03	EN.0709191130-03	09/19/07 11:30	
47WW07-091307	L0709400-03	EN.0709191130-05	09/19/07 11:30	
47WW06-091307	L0709400-01	EN.0709191130-06	09/19/07 11:30	
DUP	WG250451-05	EN.0709191130-16	09/19/07 11:30	

METHOD BLANK REPORT

00101100

Login Number: L0709400 Prep Date: 09/19/07 11:30 Sample ID: WG250451-01
Instrument ID: OVEN Run Date: 09/19/07 11:30 Prep Method: 160.2
File ID: EN.0709191130-01 Analyst: TMM Method: 160.2
Workgroup (AAB#): WG250451 Matrix: Water Units: mg/L
Contract #: DACA56-94-D-0020 Cal ID: OVEN-

Analytes	SQL	PQL	Concentration	Dilution	Qualifier
Total Suspended Solids	2.50	5.00	2.50	1	U

SQL 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: 880130
Report generated 09/20/2007 14:38

LABORATORY CONTROL SAMPLE (LCS)

00101101

Login Number: L0709400   Analyst: TMM   Prep Method: 160.2
Instrument ID: OVEN   Matrix: Water   Method: 160.2
Workgroup (AAB#): WG250451   Units: mg/L
QC Key: STD   Lot #: STD21832

Sample ID: WG250451-02 LCS   File ID: EN.0709191130-02   Run Date: 09/19/2007 11:30
Sample ID: WG250451-03 LCS2   File ID: EN.0709191130-03   Run Date: 09/19/2007 11:30

Analytes	LCS			LCS2			%RPD	%Rec Limits	RPD Lmt	Q
	Known	Found	% REC	Known	Found	% REC				
Total Suspended Solids	50.0	48.0	96.0	50.0	58.0	116	18.9	75 - 125	25	

KEMRON FORMS - Modified 02/08/2007
Version 1.5   PDF File ID: 880131
Report generated 09/20/2007 14:38

2.2.2.3 Raw Data

KEMRON ENVIRONMENTAL SERVICES

Tray 2

WORKGROUP: WG250451

TOTAL SUSPENDED SOLIDS

LCS: Std. 21832
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	0.0927	0.0926	0.0928	
LCS: ________mg/L	LCS	106	0.0924	0.0971	0.0972	
LCSDUP: _____mg/L	LCS2	100	0.0912	0.0968	0.0970	
09-377-01	1	200	0.0922	0.0923	0.0923	
09-400-03	2	↓	0.0918	0.0925	0.0926	
-01	3	↓	0.0918	0.0953	0.0952	
09-397-01	4	100	0.0918	0.1632	0.1031	
-02	5	↓	0.093	0.1030	0.1029	
~~09-368-01~~ 9-19-07	~~6~~		~~0.0914~~			
09-405-01	7	200	0.0931	0.1051	0.1050	
09-397-04	8	150	0.0920	0.1010	0.1009	
-05	9	160	0.0910	0.1001	0.1000	
09-395-01	10	↓	0.0930	0.1231	0.1230	
-02	11	↓	0.0934	0.1639	0.1636	
09-396-01	12	200	0.0908	0.0927	0.0926	
09-403-01	13	↓	0.0920	0.0922	0.0921	
	14		0.0914			
	15		0.0924			
	16		0.0916			
	17		0.0897			
	18		0.0904			
	19		~~0.0910~~ 0.0901 9-19-07			
Dup 09-400-03	20	200	0.0918	0.0926 9-19-07	0.0926	
DUP: ~~09-400-03~~	~~Dup~~	~~200~~	~~0.0918~~			

ANALYST: [signature] Reed
Tammy Morris

DATE/TIME: (on) 9-19-07 1130
DATE/TIME: (off) 9-20-07 0920
DATE/TIME: (off) 9-20-07 1130
DATE/TIME: (off) ____________

DCN#71040

Donna Hesson
Approved: September 20, 2007

KEMRON ENVIRONMENTAL SERVICES
GRAVIMETRIC REPORT

Workgroup (AAB#): WG250451
Analyst: TMM
Product: 160.2
Run Date: 09/19/2007 11:30
Analyte: TOTAL SUSPENDED SOLIDS

SAMPLE NUMBER	INITIAL VOL	INITIAL WT	FINAL WT	Anal. Conc	Rep. Conc.	Units
WG250451-01	200	0.0927	0.0928	0.5000	0.5000	mg/L
WG250451-02	100	0.0924	0.0972	48.00	48.00	mg/L
WG250451-03	100	0.0912	0.097	58.00	58.00	mg/L
L0709377-01	200	0.0922	0.0923	0.5000	ND	mg/L
L0709400-03	200	0.0918	0.0926	4.000	4.000 F	mg/L
WG250451-04	200	0.0918	0.0926	4.000	4.000	mg/L
L0709400-01	200	0.0918	0.0952	17.00	17.00	mg/L
L0709397-01	100	0.0918	0.1031	113.0	113.0	mg/L
L0709397-02	100	0.0913	0.1029	116.0	116.0	mg/L
L0709405-01	200	0.0931	0.105	59.50	59.50	mg/L
L0709397-04	150	0.092	0.1009	59.33	59.33	mg/L
L0709397-05	100	0.091	0.1	90.00	90.00	mg/L
L0709395-01	100	0.093	0.123	300.0	300.0	mg/L
L0709395-02	100	0.0934	0.1636	702.0	702.0	mg/L
L0709396-01	200	0.0908	0.0926	9.000	9.000	mg/L
L0709403-01	200	0.092	0.0921	0.5000	ND	mg/L
WG250451-05	200	0.0918	0.0926	4.000	4.000	mg/L

KEMRON FORMS - Modified 02/26/2007
Version 1.3
Report generated 09/20/2007 11:46

Donna Eisson

Approved: September 20, 2007

3.0 Attachments

Kemron Environmental Services
Analyst Listing
October 2, 2007

AJF - AMANDA J. FICKIESEN	ALB - ANNIE L. BOCK	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

October 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.

00101108 2
B-8767

pcard

Shaw® Shaw Environmental, Inc.

3010 Briarpark Drive, Suite 4N
Houston, TX 77042 (713) 996-4400

CHAIN-OF-CUSTODY

No. 10721

Laboratory Name: Kemron
Address: 156 Starlite Drive Marrietta, Ohio
Contact: Stephanie Messburg

Project Name: Longhorn - PBC
Project Location: Karnack, Texas
Project No.: 117591
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)

Item No.	Sample Number	Date	Time	Comp	Grab	Matrix	Sample Description, Location	Number of Containers	TAL Metals To Be Filtered	TAL Metals HNO3 Unfiltered	TSS	TDS				Remarks
																Please filter Dissolved metals in lab
1	47WW06-091307	9/13/07	16:01		✓	W	47WW06	4	1	1	1	1				
2	47WW0~~8~~-091307	9/13/07	17:24		✓	W	47WW07	4	1	1	1	1				47WW07-091307
3																
4																
5																
6																
7																
8																
9																
10																

Transfers Relinquished By (Signature)	Date/Time	Transfers Accepted By (Signature)	Date/Time	
M. Allen	9/14/04 18:00			Special Instructions
				FedEx Airbill No.:
		Laboratory [signature]	9/18/07 0930	Sampler's Signature M. Allen

TAT: ____ Standard ____ Rush Due: ___ Seals Intact? ✓ Y ____ N Received Good Condition ✓ Y ____ N 1 Cold

White - Lab Copy Canary - Field Copy Pink - File Copy

KEMRON Environmental Services

SAMPLE RECEIPT FORM

00101109

156 Starlite Drive
Marietta, OH 45750
(740) 373-4071

Client: Shaw - TX	
Workorder Number: B ~~8872~~, B8767	
Date Received: 9-18-07	
Delivered by: ( ) Fedx (✓) UPS ( ) Client ( ) Courier	Time: 0930
Opened by: RLK	
IR Temp Gun: (✓) D ( ) G	
Logged by: VBG	L 9400

Cooler information

Cooler ID	Temp C	Airbill#	COC#	Other
~~283~~	~~2~~	~~12 66V 725 01 94762192~~	~~10215~~	~~water~~ put on other CFR-1
1831	1	12 66V 725 0190085387	10487, 10721	water
~~84~~	~~1~~	~~12 66V 725 0192581604~~	~~10216~~	~~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/dated?		✓		2
Were sample containers and labels intact?		✓		~~1~~ 1
Were correct containers used?	✓			
Were correct preservatives used (water only)?	✓			
Were pH ranges acceptable?	✓			
Were VOA samples free of headspace?	✓			
Were samples received within EPA hold times?	✓			

Discrepancy/Comments/Other Problems

~~1 Chain 10216 - Recd 2 vials TRIP's NOT on chain~~

1 TRIPS - 2 vials not on chain 10487

2 Chain 10487 time not on chain ID: 35BWW08 bottle @ 1718

35BWW08-FD @ 1718

Note - Special Inst. on Dis-Metals (Lab Filter)

Distribution

Name of KEMRON representative	
Client/Company:	
Person Contacted:	
Date contacted:	

Resolution/other comments:

KEMRON Environmental Services

00101110

Internal Chain of Custody Report

Login: L0709400
Account: 2773
Project: 2773.025
Samples: 4
Due Date: 28-SEP-2007

Samplenum	Container ID	Products
L0709400-03	375221	TSS

Bottle: 1

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish
1	LOGIN	COOLER	WET	18-SEP-2007 15:00	BRG	
2	STORE	WET	A1	20-SEP-2007 09:53	ERE	HJR

Samplenum	Container ID	Products
L0709400-02	375219	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	18-SEP-2007 15:00	BRG	
2	PREP	W1	DIG	19-SEP-2007 07:03	REK	JKT
3	STORE	DIG	A1	21-SEP-2007 11:50	ERE	REK

Samplenum	Container ID	Products
L0709400-03	375220	TDS

Bottle: 1

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish
1	LOGIN	COOLER	WET	18-SEP-2007 15:00	BRG	
2	STORE	WET	A1	20-SEP-2007 09:53	ERE	HJR

Samplenum	Container ID	Products
L0709400-03	375222	HG FE MG K NA ZN AL CA V BE-AX CO-AX AS-MS BA-

Bottle: 1

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish
1	LOGIN	COOLER	W1	18-SEP-2007 15:01	BRG	
2	PREP	W1	DIG	19-SEP-2007 06:37	REK	JKT
3	STORE	DIG	A1	20-SEP-2007 09:46	ERE	REK

Samplenum	Container ID	Products
L0709400-01	375216	TDS

Bottle: 1

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish
1	LOGIN	COOLER	WET	18-SEP-2007 15:00	BRG	
2	STORE	WET	A1	20-SEP-2007 09:53	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 00101111
Internal Chain of Custody Report

Login: L0709400
Account: 2773
Project: 2773.025
Samples: 4
Due Date: 28-SEP-2007

Samplenum	Container ID	Products
L0709400-01	375218	HG FE MG K NA ZN AL CA V BE-AX CO-AX AS-MS BA-

Bottle: 1

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish
1	LOGIN	COOLER	W1	18-SEP-2007 15:00	BRG	
2	PREP	W1	DIG	19-SEP-2007 06:37	REK	JKT
3	STORE	DIG	A1	20-SEP-2007 09:46	ERE	REK

Samplenum	Container ID	Products
L0709400-01	375217	TSS

Bottle: 1

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish
1	LOGIN	COOLER	WET	18-SEP-2007 15:00	BRG	
2	STORE	WET	A1	20-SEP-2007 09:53	ERE	HJR

Samplenum	Container ID	Products
L0709400-04	375223	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	18-SEP-2007 15:01	BRG	
2	PREP	W1	DIG	19-SEP-2007 07:03	REK	JKT
3	STORE	DIG	A1	21-SEP-2007 11:50	ERE	REK

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: L0710557

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.

Debra Elliott - Team Leader
delliott@kemron-lab.com

Kathy Albertson - Team Chemist/Data Specialist
kalbertson@kemron-lab.com

Stephanie Mossburg - Team Chemist/Data Specialist
smossburg@kemron-lab.com

Brenda Gregory - Client Services Specialist
bgregory@kemron-lab.com

Amanda Fickiesen - Client Services Specialist
afickiesen@kemron-lab.com

Annie Brown - Client Services Specialist
abrown@kemron-lab.com

Katie Barnes - Team Assistant
kbarnes@kemron-lab.com

Jacqueline Parsons - Team Assistant
jparsons@kemron-lab.com

This report was reviewed on October 29, 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 October 29, 2007.

David E. Vandenberg

David Vandenberg - Vice President

FL DOH NELAP ID: E8755
This report contains a total of 381 pages.

Protecting Our Environmental Future

KEMRON REPORT L0710557
PREPARED FOR Shaw E I, Inc.
WORK ID: LONGHORN AAP KARNACK TX

1.0 Introduction

KEMRON ENVIRONMENTAL SERVICES
REPORT NARRATIVE

KEMRON Login No.: L0710557

CHAIN OF CUSTODY: The chain of custody number was 10345.

SHIPMENT CONDITIONS: The chain of custody forms were received sealed in a cooler. The cooler temperature was 1 degree 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: 22-OCT-07
Stephanie Mossburg

Laboratory Data Package Cover Page

00101116

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 24, 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:	L0710557
Project Name:	798-LONGHORN
Method:	6010
Prep Batch Number(s):	WG253556
Reviewer Name:	MAREN M. BEERY
LRC Date:	October 24, 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?	✓				ER3
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:	L0710557
Project Name:	798-LONGHORN
Method:	6010
Prep Batch Number(s):	WG253556
Reviewer Name:	MAREN M. BEERY
LRC Date:	October 24, 2007

EXCEPTIONS REPORT
ER#1 -Due to results that exceeded the linear range of the instrument, client samples 01, 04 (reference sample to the MS/MSD), 06, 09, the MS, and the MSD were reported from dilution analyses for sodium.
ER2 - Due to results that were noncompliant on the negative side, client samples 01, 04 (reference sample to the MS/MSD), 06, 09, the MS, and the MSD were reported from dilution analyses for vanadium. ER3 - Due to a result that exceeded the linear range of the instrument in client sample 01, the reference sample to the post spike, the post spike was reported from a dilution for sodium. Due to a result that was noncompliant on the negative side in the client sample 01, the reference sample to the post spike, the post spike was reported from a dilution 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

00101121

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 26, 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:	L0710557
Project Name:	798-LONGHORN
Method:	TDS
Prep Batch Number(s):	WG253611, WG253547
Reviewer Name:	DEANNA I. HESSON
LRC Date:	October 26, 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:	L0710557
Project Name:	798-LONGHORN
Method:	TDS
Prep Batch Number(s):	WG253611, WG253547
Reviewer Name:	DEANNA I. HESSON
LRC Date:	October 26, 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

00101126

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 26, 2007
Name (Printed)	Signature	Official Title (printed)	DATE

KEMRON Environmental Services
Laboratory Review Checklist

Laboratory Name:	KEMRON
Laboratory Log Number:	L0710557
Project Name:	798-LONGHORN
Method:	TSS
Prep Batch Number(s):	WG253298
Reviewer Name:	DEANNA I. HESSON
LRC Date:	October 26, 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?	✓				

00101129

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:	L0710557
Project Name:	798-LONGHORN
Method:	TSS
Prep Batch Number(s):	WG253298
Reviewer Name:	DEANNA I. HESSON
LRC Date:	October 26, 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

00101131

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 26, 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:	L0710557
Project Name:	798-LONGHORN
Method:	7471
Prep Batch Number(s):	WG253478
Reviewer Name:	MAREN M. BEERY
LRC Date:	October 26, 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?			✓		

00101133

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?	✓				

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:	L0710557
Project Name:	798-LONGHORN
Method:	7471
Prep Batch Number(s):	WG253478
Reviewer Name:	MAREN M. BEERY
LRC Date:	October 26, 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

00101136

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 26, 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:	L0710557
Project Name:	798-LONGHORN
Method:	6020
Prep Batch Number(s):	WG253512
Reviewer Name:	MAREN M. BEERY
LRC Date:	October 26, 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?	✓				ER1
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:	L0710557
Project Name:	798-LONGHORN
Method:	6020
Prep Batch Number(s):	WG253512
Reviewer Name:	MAREN M. BEERY
LRC Date:	October 26, 2007

EXCEPTIONS REPORT
ER#1 - Due to high levels of nontarget analytes, samples 01,04,05,06, and 09 were analyzed at dilutions. Sample fraction 01 required further dilution analysis in order to obtain a result for nickel within the linear range.
Footnotes:
(1) NA = Not applicable to method or project
(2) NR = Not reviewed
(3) ER# = Exception report number

Laboratory Data Package Cover Page

00101141

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 29, 2007
Name (Printed)	Signature	Official Title (printed)	DATE

KEMRON Environmental Services
Laboratory Review Checklist

Laboratory Name:	KEMRON
Laboratory Log Number:	L0710557
Project Name:	798-LONGHORN
Method:	8260B
Prep Batch Number(s):	253817, 253794, 253671
Reviewer Name:	MIKE D. ALBERTSON
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?		✓			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: MTBE exceeded the upper advisory limit in the LCS analyzed 10/24/07 on HPMS-8 and LCS/LCSDs analyzed 10/25/07 on HPMS-8 and HPMS-10.

Footnotes:
(1) NA = Not applicable to method or project
(2) NR = Not reviewed
(3) ER# = Exception report number

Laboratory Data Package Cover Page

00101145

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 23, 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:	L0710557
Project Name:	798-LONGHORN
Method:	314
Prep Batch Number(s):	WG253613
Reviewer Name:	MICHAEL D. COCHRAN
LRC Date:	October 22, 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?	✓				1
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?	✓				

00101148

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:	L0710557
Project Name:	798-LONGHORN
Method:	314
Prep Batch Number(s):	WG253613
Reviewer Name:	MICHAEL D. COCHRAN
LRC Date:	October 22, 2007

EXCEPTIONS REPORT
ER# - Description
1. All samples 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

2.1 Volatiles Data

2.1.1 Volatiles GCMS Data (8260)

2.1.1.1 Summary Data

LABORATORY REPORT

00101153

L0710557

10/29/07 13:41

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: LHAAP

P.O. Number: 322255 OP

Sample Analysis Summary

Client ID	Lab ID	Method	Dilution	Date Received
LHSMW54-101707	L0710557-02	8260B	1	19-OCT-07
LHSMW54-101707	L0710557-02	8260B	10	19-OCT-07
47WW03-101707	L0710557-03	8260B	1	19-OCT-07
47WW28-101707	L0710557-07	8260B	1	19-OCT-07
47WW29-101707	L0710557-08	8260B	1	19-OCT-07
TRIP BLANK	L0710557-10	8260B	1	19-OCT-07

Sample Number:L0710557-02
Client ID:LHSMW54-101707
Matrix:Water
Workgroup Number:WG253671
Collect Date:10/17/2007 12:40
Sample Tag:01

PrePrep Method:NONE
Prep Method:5030B
Analytical Method:8260B
Analyst:CMS
Dilution:1
Units:ug/L

Instrument:HPMS8
Prep Date:10/24/2007 17:19
Cal Date:10/22/2007 15:58
Run Date:10/24/2007 17:19
File ID:8M340923

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	1.59		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	462	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:	L0710557-02	PrePrep Method:	NONE	Instrument:	HPMS8
Client ID:	LHSMW54-101707	Prep Method:	5030B	Prep Date:	10/24/2007 17:19
Matrix:	Water	Analytical Method:	8260B	Cal Date:	10/22/2007 15:58
Workgroup Number:	WG253671	Analyst:	CMS	Run Date:	10/24/2007 17:19
Collect Date:	10/17/2007 12:40	Dilution:	1	File ID:	8M340923
Sample Tag:	01	Units:	ug/L		

Surrogate	% Recovery	Lower	Upper	Qual
1,2-Dichloroethane-d4	98.2	80	120	
Dibromofluoromethane	103	86	118	
p-Bromofluorobenzene	99.0	86	115	
Toluene-d8	102	88	110	

U Not detected at or above adjusted sample detection limit
I Semiquantitative result (out of instrument calibration range)

Sample Number:L0710557-02
Client ID:LHSMW54-101707
Matrix:Water
Workgroup Number:WG253817
Collect Date:10/17/2007 12:40
Sample Tag:DL01

PrePrep Method:NONE
Prep Method:5030B
Analytical Method:8260B
Analyst:MES
Dilution:10
Units:ug/L

Instrument:HPMS8
Prep Date:10/25/2007 13:00
Cal Date:10/22/2007 15:58
Run Date:10/25/2007 13:00
File ID:8M340935

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		U	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		U	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	601		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

00101157

Sample Number:L0710557-02
Client ID:LHSMW54-101707
Matrix:Water
Workgroup Number:WG253817
Collect Date:10/17/2007 12:40
Sample Tag:DL01

PrePrep Method:NONE
Prep Method:5030B
Analytical Method:8260B
Analyst:MES
Dilution:10
Units:ug/L

Instrument:HPMS8
Prep Date:10/25/2007 13:00
Cal Date:10/22/2007 15:58
Run Date:10/25/2007 13:00
File ID:8M340935

Surrogate	% Recovery	Lower	Upper	Qual
1,2-Dichloroethane-d4	99.2	80	120	
Dibromofluoromethane	100	86	118	
p-Bromofluorobenzene	101	86	115	
Toluene-d8	103	88	110	

U Not detected at or above adjusted sample detection limit

Sample Number:L0710557-03
Client ID:47WW03-101707
Matrix:Water
Workgroup Number:WG253794
Collect Date:10/17/2007 16:30
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 12:08
Cal Date:10/18/2007 16:51
Run Date:10/25/2007 12:08
File ID:10M59858

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	0.602	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		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:L0710557-03
Client ID:47WW03-101707
Matrix:Water
Workgroup Number:WG253794
Collect Date:10/17/2007 16:30
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 12:08
Cal Date:10/18/2007 16:51
Run Date:10/25/2007 12:08
File ID:10M59858

Surrogate	% Recovery	Lower	Upper	Qual
1,2-Dichloroethane-d4	96.4	80	120	
Dibromofluoromethane	97.7	86	118	
p-Bromofluorobenzene	96.3	86	115	
Toluene-d8	93.2	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:L0710557-07	PrePrep Method:NONE	Instrument:HPMS8
Client ID:47WW28-101707	Prep Method:5030B	Prep Date:10/24/2007 18:19
Matrix:Water	Analytical Method:8260B	Cal Date:10/22/2007 15:58
Workgroup Number:WG253671	Analyst:CMS	Run Date:10/24/2007 18:19
Collect Date:10/17/2007 13:55	Dilution:1	File ID:8M340925
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		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	4.35	J	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:L0710557-07
Client ID:47WW28-101707
Matrix:Water
Workgroup Number:WG253671
Collect Date:10/17/2007 13:55
Sample Tag:01

PrePrep Method:NONE
Prep Method:5030B
Analytical Method:8260B
Analyst:CMS
Dilution:1
Units:ug/L

Instrument:HPMS8
Prep Date:10/24/2007 18:19
Cal Date:10/22/2007 15:58
Run Date:10/24/2007 18:19
File ID:8M340925

Surrogate	% Recovery	Lower	Upper	Qual
1,2-Dichloroethane-d4	97.7	80	120	
Dibromofluoromethane	101	86	118	
p-Bromofluorobenzene	98.1	86	115	
Toluene-d8	102	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:L0710557-08
Client ID:47WW29-101707
Matrix:Water
Workgroup Number:WG253671
Collect Date:10/17/2007 13:30
Sample Tag:01

PrePrep Method:NONE
Prep Method:5030B
Analytical Method:8260B
Analyst:CMS
Dilution:1
Units:ug/L

Instrument:HPMS8
Prep Date:10/24/2007 18:50
Cal Date:10/22/2007 15:58
Run Date:10/24/2007 18:50
File ID:8M340926

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	4.29	J	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: L0710557-08
Client ID: 47WW29-101707
Matrix: Water
Workgroup Number: WG253671
Collect Date: 10/17/2007 13:30
Sample Tag: 01

PrePrep Method: NONE
Prep Method: 5030B
Analytical Method: 8260B
Analyst: CMS
Dilution: 1
Units: ug/L

Instrument: HPMS8
Prep Date: 10/24/2007 18:50
Cal Date: 10/22/2007 15:58
Run Date: 10/24/2007 18:50
File ID: 8M340926

Surrogate	% Recovery	Lower	Upper	Qual
1,2-Dichloroethane-d4	96.8	80	120	
Dibromofluoromethane	101	86	118	
p-Bromofluorobenzene	99.4	86	115	
Toluene-d8	102	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: L0710557-10
Client ID: TRIP BLANK
Matrix: Water
Workgroup Number: WG253671
Collect Date: 10/17/2007 00:01
Sample Tag: 01

PrePrep Method: NONE
Prep Method: 5030B
Analytical Method: 8260B
Analyst: CMS
Dilution: 1
Units: ug/L

Instrument: HPMS8
Prep Date: 10/24/2007 09:49
Cal Date: 10/22/2007 15:58
Run Date: 10/24/2007 09:49
File ID: 8M340908

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:L0710557-10
Client ID:TRIP BLANK
Matrix:Water
Workgroup Number:WG253671
Collect Date:10/17/2007 00:01
Sample Tag:01

PrePrep Method:NONE
Prep Method:5030B
Analytical Method:8260B
Analyst:CMS
Dilution:1
Units:ug/L

Instrument:HPMS8
Prep Date:10/24/2007 09:49
Cal Date:10/22/2007 15:58
Run Date:10/24/2007 09:49
File ID:8M340908

Surrogate	% Recovery	Lower	Upper	Qual
1,2-Dichloroethane-d4	101	80	120	
Dibromofluoromethane	101	86	118	
p-Bromofluorobenzene	101	86	115	
Toluene-d8	102	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: 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:	HPMS8	Dataset:	102207		
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:	21419				

Internal Standard: STD22561 Surrogate Standard: STD22637

CCV: STD22616 LCS: STD22622 MS/MSD: NA

Column 1 ID: RTX502.2 Column 2 ID: NA

Workgroups: WG253480

Comments:

Seq.	File ID	Sample Information	pH	Mat	Dil	Reference	Date/Time
1	8M340855	SYSTEM BLANK	NA	1	1		10/22/07 08:24
2	8M340856	50ug/L STD CHK	NA	1	1	STD22560	10/22/07 09:04
3	8M340857	SYSTEM BLANK	NA	1	1		10/22/07 09:36
4	8M340858	WG253480-01 BFB 50ng STD 8260	NA	1	1	STD22252	10/22/07 10:02
5	8M340859	WG253480-01 BFB 50ng STD 8260	NA	1	1	STD22252	10/22/07 10:16
6	8M340860	WG253480-01 BFB 50ng STD 8260	NA	1	1	STD22252	10/22/07 11:00
7	8M340861	WG253480-02 0.30ug/L STD 8260	NA	1	1	STD22616	10/22/07 11:30
8	8M340862	WG253480-03 0.40ug/L STD 8260	NA	1	1	STD22616	10/22/07 12:00
9	8M340863	WG253480-04 1ug/L STD 8260	NA	1	1	STD22616	10/22/07 12:29
10	8M340864	WG253480-05 2ug/L STD 8260	NA	1	1	STD22616	10/22/07 12:59
11	8M340865	WG253480-06 5ug/L STD 8260	NA	1	1	STD22616	10/22/07 13:30
12	8M340866	WG253480-07 20ug/L STD 8260	NA	1	1	STD22616	10/22/07 14:00
13	8M340867	WG253480-08 50ug/L STD 8260	NA	1	1	STD22616	10/22/07 14:29
14	8M340868	WG253480-09 100ug/L STD 8260	NA	1	1	STD22616	10/22/07 14:59
15	8M340869	WG253480-10 200ug/L STD 8260	NA	1	1	STD22616	10/22/07 15:28
16	8M340870	WG253480-11 300ug/L STD 8260	NA	1	1	STD22616	10/22/07 15:58
17	8M340871	SYSTEM BLANK	NA	1	1		10/22/07 16:27
18	8M340872	SYSTEM BLANK	NA	1	1		10/22/07 16:57
19	8M340873	WG253480-12 20ug/L ALT SOURCE STD 8	NA	1	1	STD22622	10/22/07 17:26
20	8M340874	SYSTEM BLANK	NA	1	1		10/22/07 17:56
21	8M340875	SYSTEM BLANK	NA	1	1		10/22/07 18:25

Comments

Seq.	Rerun	Dil.	Reason	Analytes
4	X			
File ID: 8M340858				
	Tune failed/DNR			
5	X			
File ID: 8M340859				
	Tune failed/DNR-Baked system out and replaced septa			
19	X		Surrogate standard failure	
File ID: 8M340873				
	DNR			

Approved: October 24, 2007

KEMRON Environmental Services

Instrument Run Log

Instrument: HPMS8 Dataset: 102307

Analyst1: CMS Analyst2: NA

Method: 8260B SOP: MSV01 Rev: 10

Method: 5030B SOP: PAT01 Rev: 10

Maintenance Log ID: 21424

Internal Standard: STD22561 Surrogate Standard: STD22637

CCV: STD22616;STD22513 LCS: STD22622;STD22514 MS/MSD: STD22622

Column 1 ID: RTX502.2 Column 2 ID: NA

Workgroups: WG253480;WG253579

Comments:

Seq.	File ID	Sample Information	pH	Mat	Dil	Reference	Date/Time
1	8M340877	WG253578-01 BFB 50ng STD 8260	NA	1	1	STD22252	10/23/07 08:29
2	8M340878	WG253578-02 50ug/L STD 8260	NA	1	1	STD22616	10/23/07 08:57
3	8M340879	WG253578-02 50ug/L STD 8260	NA	1	1	STD22616	10/23/07 09:34
4	8M340880	WG253580-01 100ug/L A9FOO STD 8260	NA	1	1	STD22513	10/23/07 10:07
5	8M340881	WG253579-01 VBLK1023 BLANK 8260	NA	1	1		10/23/07 10:37
6	8M340882	WG253480-12 20ug/L ALT SOURCE STD 8	NA	1	1	STD22622	10/23/07 11:07
7	8M340883	WG253579-02 20ug/L LCS STD 8260	NA	1	1	STD22622	10/23/07 11:36
8	8M340884	WG253579-03 100ug/L A9FOOLCS STD 82	NA	1	1	STD22514	10/23/07 12:06
9	8M340885	L0710575-01 B 826-SPE2	=7	1	1		10/23/07 12:36
10	8M340886	L0710574-03 B 20X 826-SPE2 D1	=7	1	20		10/23/07 13:05
11	8M340887	L0710577-01 A 826-SPE1	<2	1	1		10/23/07 13:35
12	8M340888	L0710577-02 A 826-SPE1	<2	1	1		10/23/07 14:05
13	8M340889	L0710526-05 A 826-SPE	<2	1	1		10/23/07 14:34
14	8M340890	L0710526-01 A 826-SPE	<2	1	1		10/23/07 15:04
15	8M340891	L0710526-02 A 826-SPE	<2	1	1		10/23/07 15:34
16	8M340892	L0710526-03 A 826-SPE	<2	1	1		10/23/07 16:03
17	8M340893	L0710526-04 A 826-SPE	<2	1	1		10/23/07 16:33
18	8M340894	WG253579-04 L0710527-03 A 826-SPE1	<2	1	1		10/23/07 17:03
19	8M340895	WG253579-05 L0710527-04 MS A 826-SP	<2	1	1	STD22622	10/23/07 17:33
20	8M340896	WG253579-06 L0710527-05 MSD A 826-S	<2	1	1	STD22622	10/23/07 18:03
21	8M340897	L0710556-01 A 10X 826-TC	NA	17	10		10/23/07 18:33
22	8M340898	L0710556-03 A 10X 826-TC	NA	17	10		10/23/07 19:03
23	8M340899	L0710556-05 A 10X 826-TC	NA	17	10		10/23/07 19:33
24	8M340900	L0710556-07 A 10X 826-TC	NA	17	10		10/23/07 20:03
25	8M340901	SYSTEM BLANK	NA	1	1		10/23/07 20:33

Comments

Seq.	Rerun	Dil.	Reason	Analytes
2	X		Check Standard Failure	
File ID: 8M340878				
	DNR			
17	X	10	Over Calibration Range	TCE
File ID: 8M340893				

Approved: October 24, 2007

Page: 1

KEMRON Environmental Services

Instrument Run Log

Instrument:	HPMS8	Dataset:	102307		
Analyst1:	CMS	Analyst2:	NA		
Method:	8260B	SOP:	MSV01	Rev:	10
Method:	5030B	SOP:	PAT01	Rev:	10

Maintenance Log ID: 21424

Internal Standard:	STD22561	Surrogate Standard:	STD22637		
CCV:	STD22616;STD22513	LCS:	STD22622;STD22514	MS/MSD:	STD22622

Column 1 ID: RTX502.2 Column 2 ID: NA

Workgroups: WG253480;WG253579

Comments

Seq.	Rerun	Dil.	Reason	Analytes
18	X		Carry-over contamination	
File ID: 8M340894				
QC ONLY				
19	X			
File ID: 8M340895				
QC ONLY				
20	X			
File ID: 8M340896				
QC ONLY				

Approved: October 24, 2007

KEMRON Environmental Services

Instrument Run Log

Instrument:	HPMS8	Dataset:	102407		
Analyst1:	MES	Analyst2:	NA		
Method:	8260B	SOP:	MSV01	Rev:	10
Method:	5030/5035	SOP:	PAT01	Rev:	10

Maintenance Log ID: 21445

Internal Standard:	STD22561	Surrogate Standard:	STD22637		
CCV:	STD22616	LCS:	STD22622	MS/MSD:	STD22622

Column 1 ID: RTX502.2 Column 2 ID: NA

Workgroups: WG253671

Comments:

Seq.	File ID	Sample Information	pH	Mat	Dil	Reference	Date/Time
1	8M340903	WG253670-01 BFB 50ng STD 8260	NA	1	1	STD22252	10/24/07 07:18
2	8M340904	WG253670-02 50ug/L STD 8260	NA	1	1	STD22616	10/24/07 07:44
3	8M340905	WG253671-01 VBLK1024 BLANK 8260	NA	1	1		10/24/07 08:18
4	8M340906	WG253671-02 20ug/L LCS STD 8260	NA	1	1	STD22622	10/24/07 08:48
5	8M340907	L0710526-04 B D1 10X 826-SPE	<2	1	10		10/24/07 09:19
6	8M340908	L0710557-10 A 826-SPE	<2	1	1		10/24/07 09:49
7	8M340909	L0710527-11 A 826-SPE1	<2	1	1		10/24/07 10:19
8	8M340910	L0710527-03 B 826-SPE1	<2	1	1		10/24/07 10:49
9	8M340911	L0710527-04 MS B 826-SPE1	<2	1	1	STD22622	10/24/07 11:19
10	8M340912	L0710527-05 MSD B 826-SPE1	<2	1	1	STD22622	10/24/07 11:49
11	8M340913	L0710527-02 A 826-SPE1	<2	1	1		10/24/07 12:19
12	8M340914	L0710527-06 A 826-SPE1	<2	1	1		10/24/07 12:49
13	8M340915	L0710527-08 A 2X 826-SPE1	<2	1	2		10/24/07 13:19
14	8M340916	L0710527-09 A 5X 826-SPE1	<2	1	5		10/24/07 13:50
15	8M340917	L0710527-10 A 5X 826-SPE1	<2	1	5		10/24/07 14:19
16	8M340918	L0710527-12 A 826-SPE1	<2	1	1		10/24/07 14:49
17	8M340919	L0710527-14 A 826-SPE1	<2	1	1		10/24/07 15:19
18	8M340920	L0710527-15 A 5X 826-SPE1	<2	1	5		10/24/07 15:49
19	8M340921	L0710527-07 A 826-SPE1	<2	1	1		10/24/07 16:19
20	8M340922	L0710603-01 A 826-BETX	<2	1	1		10/24/07 16:49
21	8M340923	L0710557-02 A 826-SPE	<2	1	1		10/24/07 17:19
22	8M340924	L0710557-03 A 826-SPE	<2	1	1		10/24/07 17:49
23	8M340925	L0710557-07 A 826-SPE	<2	1	1		10/24/07 18:19
24	8M340926	L0710557-08 A 826-SPE	<2	1	1		10/24/07 18:50
25	8M340927	SYSTEM BLANK	NA	1	1		10/24/07 19:20

Comments

Seq.	Rerun	Dil.	Reason	Analytes
19	X	10	Over Calibration Range	CIS-12-DCE
File ID: 8M340921				
21	X	10	Over Calibration Range	TCE
File ID: 8M340923				

Approved: October 25, 2007

Page: 1

KEMRON Environmental Services

Instrument Run Log

Instrument:	HPMS8	Dataset:	102407		
Analyst1:	MES	Analyst2:	NA		
Method:	8260B	SOP:	MSV01	Rev:	10
Method:	5030/5035	SOP:	PAT01	Rev:	10

Maintenance Log ID: 21445

Internal Standard:	STD22561	Surrogate Standard:	STD22637		
CCV:	STD22616	LCS:	STD22622	MS/MSD:	STD22622

Column 1 ID: RTX502.2   Column 2 ID: NA

Workgroups: WG253671

Comments

Seq.	Rerun	Dil.	Reason	Analytes
22	X	1	Carry-over contamination	
File ID: 8M340924				
	Do not report.			

Approved: October 25, 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

RR, BFB failed.

Seq.	Rerun	Dil.	Reason	Analytes
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

KEMRON Environmental Services

Instrument Run Log

Instrument: HPMS8 Dataset: 102507
Analyst1: MES Analyst2: NA
Method: 8260B SOP: MSV01 Rev: 10
Method: 5030/5035 SOP: PAT01 Rev: 10

Maintenance Log ID: 21460

Internal Standard: STD22561 Surrogate Standard: STD22637
CCV: STD22616 LCS: STD22622 MS/MSD: NA

Column 1 ID: RTX502.2 Column 2 ID: NA
Workgroups: WG253817

Comments:

Seq.	File ID	Sample Information	pH	Mat	Dil	Reference	Date/Time
1	8M340928	WG253816-01 BFB 50ng STD 8260	NA	1	1	STD22252	10/25/07 09:29
2	8M340929	WG253816-02 50ug/L STD 8260	NA	1	1	STD22616	10/25/07 09:52
3	8M340930	WG253817-01 VBLK1025 BLANK 8260	NA	1	1		10/25/07 10:29
4	8M340931	WG253817-02 20ug/L LCS 8260	NA	1	1	STD22622	10/25/07 10:59
5	8M340932	WG253817-03 20ug/L LCSDUP 8260	NA	1	1	STD22622	10/25/07 11:29
6	8M340933	WG253817-02 20ug/L LCS 8260	NA	1	1	STD22622	10/25/07 12:00
7	8M340934	L0710527-07 B D1 10X 826-SPE1	<2	1	10		10/25/07 12:30
8	8M340935	L0710557-02 B D1 10X 826-SPE	<2	1	10		10/25/07 13:00
9	8M340936	L0710536-16 A 8260	<2	1	1		10/25/07 13:30
10	8M340937	L0710536-11 A 8260	<2	1	1		10/25/07 14:00
11	8M340938	L0710587-04 A 826-SPE	<2	1	1		10/25/07 14:30
12	8M340939	L0710695-02 A 826-SPE	<2	1	1		10/25/07 15:00
13	8M340940	L0710610-04 B 826-SPE	<2	1	1		10/25/07 15:30
14	8M340941	L0710620-01 A 826-SPE1	<2	1	1		10/25/07 16:00
15	8M340942	L0710620-02 A 826-SPE1	<2	1	1		10/25/07 16:30
16	8M340943	L0710620-03 A 826-SPE1	<2	1	1		10/25/07 16:59
17	8M340944	L0710695-01 A 826-SPE	<2	1	1		10/25/07 17:29
18	8M340945	L0710578-03 A 826-SPE1	<2	1	1		10/25/07 17:59
19	8M340946	L0710578-04 A 826-SPE1	<2	1	1		10/25/07 18:28
20	8M340947	L0710578-07 A 826-SPE1	<2	1	1		10/25/07 18:58
21	8M340948	L0710578-08 A 826-SPE1	<2	1	1		10/25/07 19:28
22	8M340949	L0710703-03 A 826-SPE	<2	1	1		10/25/07 19:58
23	8M340950	L0710703-01 A 826-SPE	<2	1	1		10/25/07 20:28
24	8M340951	L0710703-02 A 826-SPE	<2	1	1		10/25/07 20:58
25	8M340952	L0710578-01 A 826-SPE1	<2	1	1		10/25/07 21:28
26	8M340953	SYSTEM BLANK	NA	1	1		10/25/07 21:58
27	8M340954	SYSTEM BLANK	NA	1	1		10/25/07 22:28
28	8M340955	SYSTEM BLANK	NA	1	1		10/25/07 22:58

Comments

Seq.	Rerun	Dil.	Reason	Analytes
9 File ID: 8M340936				

Approved: October 26, 2007

KEMRON Environmental Services
Instrument Run Log

Instrument:	HPMS8	Dataset:	102507		
Analyst1:	MES	Analyst2:	NA		
Method:	8260B	SOP:	MSV01	Rev:	10
Method:	5030/5035	SOP:	PAT01	Rev:	10

Maintenance Log ID: 21460

Internal Standard:	STD22561	Surrogate Standard:	STD22637		
CCV:	STD22616	LCS:	STD22622	MS/MSD:	NA

Column 1 ID: RTX502.2 Column 2 ID: NA
Workgroups: WG253817

Comments

Seq.	Rerun	Dil.	Reason	Analytes
Dioxane is carrying over-do not report.				
10	X	1		
File ID: 8M340937				
Dioxane is carrying over-do not report.				
11	X	1	Analyzed too dilute	
File ID: 8M340938				
Dioxane is carrying over-do not report.				
15	X	25	Over Calibration Range	TCE
File ID: 8M340942				
16	X	50	Over Calibration Range	TCE and cis-1,2
File ID: 8M340943				
17	X	1	Analyzed too dilute	
File ID: 8M340944				
Do not report.				
18	X	1	Analyzed too dilute	
File ID: 8M340945				
Do not report.				
19	X	1	Analyzed too dilute	
File ID: 8M340946				
Do not report.				
20	X	1	Analyzed too dilute	
File ID: 8M340947				
Do not report.				
21	X	25	Over Calibration Range	TCE
File ID: 8M340948				
25	X	10	Over Calibration Range	cis-1,2 and TCE
File ID: 8M340952				

Approved: October 26, 2007

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: 22-OCT-2007
Analyst: CMS
Analyst: NA
Method: 8260B/624
Instrument: HPMS8
Curve Workgroup: NA
Runlog ID: 18926
Analytical Workgroups: WG253480

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	X
Dilutions Run	NA
Reruns	X
Manual Integrations	NA
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:
23-OCT-2007

Crystal Stephens

Secondary Reviewer:
24-OCT-2007

Generated: OCT-24-2007 12:18:27

KEMRON Environmental Services
Data Checklist

Date: 23-OCT-2007
Analyst: CMS
Analyst: NA
Method: 8260B
Instrument: HPMS8
Curve Workgroup: NA
Runlog ID: 18933
Analytical Workgroups: WG253480;WG253579

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	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
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	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:
24-OCT-2007

Secondary Reviewer:
24-OCT-2007

Generated: OCT-24-2007 11:20:01

KEMRON Environmental Services
Data Checklist

Date: 24-OCT-2007
Analyst: CMS
Analyst: NA
Method: 8260
Instrument: HPMS8
Curve Workgroup: NA
Runlog ID: 18960
Analytical Workgroups: WG253671

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	X
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: 25-OCT-2007

Secondary Reviewer: 25-OCT-2007

Mary Schilling

Generated: OCT-25-2007 15:02:00

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
Mary Schilling

Secondary Reviewer:
29-OCT-2007
[signature]

Generated: OCT-29-2007 09:10:40

KEMRON Environmental Services
Data Checklist

Date: 25-OCT-2007
Analyst: MES
Analyst: NA
Method: 8260
Instrument: HPMS8
Curve Workgroup: NA
Runlog ID: 18978
Analytical Workgroups: WG253817

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 Mary Schilling

Secondary Reviewer: 26-OCT-2007

Generated: OCT-26-2007 13:21:40

KEMRON Environmental Services
HOLDING TIMES
EQUIVALENT TO AFCEE FORM 9

Analytical Method: 8260B

AAB#: WG253817

Login Number: L0710557

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
LHSMW54-101707	10/17/07	10/19/07	10/25/07	14	8.01	10/25/07	14	8.01	

* EXT = SEE PROJECT QAPP REQUIREMENTS

*ANAL = SEE PROJECT QAPP REQUIREMENTS

KEMRON FORMS - Modified 11/20/2006
Version 1.5 PDF File ID: 919620
Report generated 10/29/2007 10:14

KEMRON Environmental Services
HOLDING TIMES
EQUIVALENT TO AFCEE FORM 9

Analytical Method: 8260B

Login Number: L0710557

AAB#: WG253671

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
LHSMW54-101707	10/17/07	10/19/07	10/24/07	14	7.19	10/24/07	14	7.19	
TRIP BLANK	10/17/07	10/19/07	10/24/07	14	7.41	10/24/07	14	7.41	
47WW29-101707	10/17/07	10/19/07	10/24/07	14	7.22	10/24/07	14	7.22	
47WW28-101707	10/17/07	10/19/07	10/24/07	14	7.18	10/24/07	14	7.18	

* EXT = SEE PROJECT QAPP REQUIREMENTS

*ANAL = SEE PROJECT QAPP REQUIREMENTS

KEMRON FORMS - Modified 11/20/2006
Version 1.5 PDF File ID: 919620
Report generated 10/29/2007 10:14

KEMRON Environmental Services
HOLDING TIMES
EQUIVALENT TO AFCEE FORM 9

Analytical Method: 8260B
AAB#: WG253794
Login Number: L0710557

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
47WW03-101707	10/17/07	10/19/07	10/25/07	14	7.82	10/25/07	14	7.82	

* EXT = SEE PROJECT QAPP REQUIREMENTS
*ANAL = SEE PROJECT QAPP REQUIREMENTS

KEMRON FORMS - Modified 11/20/2006
Version 1.5 PDF File ID: 919620
Report generated 10/29/2007 10:14

SURROGATE STANDARDS

00101188

Login Number: L0710557
Instrument Id: HPMS8
Workgroup (AAB#): WG253817

Method: 8260
CAL ID: HPMS8 - 22-OCT-07
Matrix: Water

Sample Number	Dilution	Tag	1	2	3	4
L0710557-02	10.0	DL01	99.2	100	101	103
WG253817-01	1.00	01	99.1	101	99.4	103
WG253817-02	1.00	01	100	102	101	103
WG253817-03	1.00	01	101	103	102	102

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

SURROGATE STANDARDS

00101189

Login Number: L0710557
Instrument Id: HPMS10
Workgroup (AAB#): WG253794

Method: 8260
CAL ID: HPMS10 - 18-OCT-07
Matrix: Water

Sample Number	Dilution	Tag	1	2	3	4
L0710557-03	1.00	01	96.4	97.7	96.3	93.2
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

SURROGATE STANDARDS

Login Number: L0710557
Instrument Id: HPMS8
Workgroup (AAB#): WG253671

Method: 8260
CAL ID: HPMS8 - 22-OCT-07
Matrix: Water

Sample Number	Dilution	Tag	1	2	3	4
L0710557-02	1.00	01	98.2	103	99.0	102
L0710557-07	1.00	01	97.7	101	98.1	102
L0710557-08	1.00	01	96.8	101	99.4	102
L0710557-10	1.00	01	101	101	101	102
WG253671-01	1.00	01	99.4	101	100	102
WG253671-02	1.00	01	100	102	101	103

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

METHOD BLANK SUMMARY

Login Number: L0710557
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
47WW03-101707	L0710557-03	10M59858	10/25/07 12:08	01

KEMRON FORMS - Modified 01/31/2007
Version 1.5 PDF File ID: 919621
Report generated 10/29/2007 10:14

METHOD BLANK SUMMARY

Login Number: L0710557
Blank File ID: 8M340905
Prep Date: 10/24/07 08:18
Analyzed Date: 10/24/07 08:18
Analyst: CMS

Work Group: WG253671
Blank Sample ID: WG253671-01
Instrument ID: HPMS8
Method: 8260B

This Method Blank Applies To The Following Samples:

Client ID	Lab Sample ID	Lab File ID	Time Analyzed	TAG
LCS	WG253671-02	8M340906	10/24/07 08:48	01
TRIP BLANK	L0710557-10	8M340908	10/24/07 09:49	01
LHSMW54-101707	L0710557-02	8M340923	10/24/07 17:19	01
47WW28-101707	L0710557-07	8M340925	10/24/07 18:19	01
47WW29-101707	L0710557-08	8M340926	10/24/07 18:50	01

KEMRON FORMS - Modified 01/31/2007
Version 1.5 PDF File ID: 919621
Report generated 10/29/2007 10:14

METHOD BLANK SUMMARY

Login Number: L0710557
Blank File ID: 8M340930
Prep Date: 10/25/07 10:29
Analyzed Date: 10/25/07 10:29
Analyst: MES

Work Group: WG253817
Blank Sample ID: WG253817-01
Instrument ID: HPMS8
Method: 8260B

This Method Blank Applies To The Following Samples:

Client ID	Lab Sample ID	Lab File ID	Time Analyzed	TAG
LCS2	WG253817-03	8M340932	10/25/07 11:29	01
LCS	WG253817-02	8M340933	10/25/07 12:00	01
LHSMW54-101707	L0710557-02	8M340935	10/25/07 13:00	DL01

KEMRON FORMS - Modified 01/31/2007
Version 1.5 PDF File ID: 919621
Report generated 10/29/2007 10:14

METHOD BLANK REPORT

00101194

Login Number: L0710557 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: 919622
Report generated 10/29/2007 10:14

METHOD BLANK REPORT

Login Number: L0710557 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: 919622
Report generated 10/29/2007 10:14

METHOD BLANK REPORT

00101196

Login Number: L0710557 | Prep Date: 10/24/07 08:18 | Sample ID: WG253671-01
Instrument ID: HPMS8 | Run Date: 10/24/07 08:18 | Prep Method: 5030B
File ID: 8M340905 | Analyst: CMS | Method: 8260B
Workgroup (AAB#): WG253671 | Matrix: Water | Units: ug/L
Contract #: DACA56-94-D-0020 | Cal ID: HPMS8 - 22-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: 919622
Report generated 10/29/2007 10:14

METHOD BLANK REPORT

00101197

Login Number: L0710557 | Prep Date: 10/24/07 08:18 | Sample ID: WG253671-01
Instrument ID: HPMS8 | Run Date: 10/24/07 08:18 | Prep Method: 5030B
File ID: 8M340905 | Analyst: CMS | Method: 8260B
Workgroup (AAB#): WG253671 | Matrix: Water | Units: ug/L
Contract #: DACA56-94-D-0020 | Cal ID: HPMS8 - 22-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	99.4	80 - 120	PASS
Dibromofluoromethane	101	86 - 118	PASS
p-Bromofluorobenzene	100	86 - 115	PASS
Toluene-d8	102	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: 919622
Report generated 10/29/2007 10:14

METHOD BLANK REPORT

00101198

Login Number: L0710557
Prep Date: 10/25/07 10:29
Sample ID: WG253817-01
Instrument ID: HPMS8
Run Date: 10/25/07 10:29
Prep Method: 5030B
File ID: 8M340930
Analyst: MES
Method: 8260B
Workgroup (AAB#): WG253817
Matrix: Water
Units: ug/L
Contract #: DACA56-94-D-0020
Cal ID: HPMS8 - 22-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: 919622
Report generated 10/29/2007 10:14

METHOD BLANK REPORT

Login Number: L0710557
Prep Date: 10/25/07 10:29
Sample ID: WG253817-01
Instrument ID: HPMS8
Run Date: 10/25/07 10:29
Prep Method: 5030B
File ID: 8M340930
Analyst: MES
Method: 8260B
Workgroup (AAB#): WG253817
Matrix: Water
Units: ug/L
Contract #: DACA56-94-D-0020
Cal ID: HPMS8 - 22-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	99.1	80 - 120	PASS
Dibromofluoromethane	101	86 - 118	PASS
p-Bromofluorobenzene	99.4	86 - 115	PASS
Toluene-d8	103	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: 919622
Report generated 10/29/2007 10:14

LABORATORY CONTROL SAMPLE (LCS)

00101200

Login Number: L0710557 | Run Date: 10/24/2007 | Sample ID: WG253671-02
Instrument ID: HPMS8 | Run Time: 08:48 | Prep Method: 5030B
File ID: 8M340906 | Analyst: CMS | Method: 8260B
Workgroup (AAB#): WG253671 | Matrix: Water | Units: ug/L
QC Key: STD | Lot#: STD22622 | Cal ID: HPMS8 - 22-OCT-07

Analytes	Expected	Found	% Rec	LCS Limits	Q
1,1,1-Trichloroethane	20.0	22.5	113	80 - 134	
1,1,2,2-Tetrachloroethane	20.0	21.7	109	79 - 125	
1,1,2-Trichloro-1,2,2-Trifluoroethane	20.0	20.8	104	80 - 130	
1,1,2-Trichloroethane	20.0	22.1	111	80 - 125	
1,1-Dichloroethane	20.0	20.8	104	80 - 125	
1,1-Dichloroethene	20.0	22.1	111	80 - 132	
1,2,4-Trichlorobenzene	20.0	20.7	103	65 - 135	
1,2-Dibromo-3-chloropropane	20.0	20.8	104	50 - 130	
1,2-Dibromoethane	20.0	22.5	112	80 - 125	
1,2-Dichlorobenzene	20.0	20.3	102	80 - 125	
1,2-Dichloroethane	20.0	21.8	109	80 - 129	
cis-1,2-Dichloroethene	20.0	22.1	110	70 - 125	
trans-1,2-Dichloroethene	20.0	20.9	104	80 - 127	
1,2-Dichloropropane	20.0	21.1	105	80 - 120	
1,3-Dichlorobenzene	20.0	20.5	102	80 - 120	
1,4-Dichlorobenzene	20.0	19.7	98.4	80 - 120	
2-Butanone	20.0	17.9	89.7	30 - 150	
2-Hexanone	20.0	18.5	92.3	55 - 130	
4-Methyl-2-pentanone	20.0	19.8	98.9	64 - 140	
Acetone	20.0	18.7	93.3	40 - 142	
Benzene	20.0	18.9	94.7	80 - 121	
Bromodichloromethane	20.0	22.6	113	80 - 131	
Bromoform	20.0	22.4	112	70 - 130	
Bromomethane	20.0	19.8	98.8	30 - 145	
Carbon disulfide	20.0	18.8	94.2	58 - 138	
Carbon tetrachloride	20.0	23.1	115	65 - 140	
Chlorobenzene	20.0	20.2	101	80 - 120	
Chloroethane	20.0	21.5	108	60 - 135	
Chloroform	20.0	20.7	104	80 - 125	
Chloromethane	20.0	19.1	95.6	40 - 125	
cis-1,3-Dichloropropene	20.0	21.9	109	70 - 130	
Cyclohexane	20.0	21.1	105	80 - 130	
Dibromochloromethane	20.0	22.3	111	60 - 135	
Dichlorodifluoromethane	20.0	24.9	125	50 - 133	
Ethyl benzene	20.0	21.8	109	80 - 122	
Isopropylbenzene	20.0	20.2	101	80 - 122	
Methyl acetate	20.0	22.4	112	80 - 130	
Methyl tert-butyl ether	20.0	25.7	128	65 - 125	*
Methylcyclohexane	20.0	21.3	107	80 - 130	
Methylene chloride	20.0	20.1	100	80 - 123	
Styrene	20.0	23.3	116	80 - 123	

KEMRON FORMS - Modified 09/06/2007
Version 1.5 PDF File ID: 916787
Report generated 10/25/2007 14:37

LABORATORY CONTROL SAMPLE (LCS)

Login Number: L0710557 | Run Date: 10/24/2007 | Sample ID: WG253671-02
Instrument ID: HPMS8 | Run Time: 08:48 | Prep Method: 5030B
File ID: 8M340906 | Analyst: CMS | Method: 8260B
Workgroup (AAB#): WG253671 | Matrix: Water | Units: ug/L
QC Key: STD | Lot#: STD22622 | Cal ID: HPMS8 - 22-OCT-07

Analytes	Expected	Found	% Rec	LCS Limits	Q
Tetrachloroethene	20.0	21.7	109	80 - 124	
Toluene	20.0	21.4	107	80 - 124	
trans-1,3-Dichloropropene	20.0	20.8	104	80 - 130	
Trichloroethene	20.0	21.6	108	80 - 122	
Trichlorofluoromethane	20.0	17.9	89.6	62 - 151	
Vinyl chloride	20.0	23.1	116	65 - 140	
Xylenes, Total	60.0	64.9	108	80 - 121	

Surrogates	% Recovery	Surrogate Limits	Qualifier
1,2-Dichloroethane-d4	100	80 - 120	PASS
Dibromofluoromethane	102	86 - 118	PASS
p-Bromofluorobenzene	101	86 - 115	PASS
Toluene-d8	103	88 - 110	PASS

* FAILS %REC LIMIT

KEMRON FORMS - Modified 09/06/2007
Version 1.5 PDF File ID: 916787
Report generated 10/25/2007 14:37

LABORATORY CONTROL SAMPLE (LCS)

00101202

Login Number: L0710557 Analyst: MES Prep Method: 5030B
Instrument ID: HPMS8 Matrix: Water Method: 8260B
Workgroup (AAB#): WG253817 Units: ug/L
QC Key: STD Lot #: STD22622

Sample ID: WG253817-02 LCS File ID: 8M340933 Run Date: 10/25/2007 12:00
Sample ID: WG253817-03 LCS2 File ID: 8M340932 Run Date: 10/25/2007 11:29

Analytes	LCS			LCS2			%RPD	%Rec Limits	RPD Lmt	Q
	Known	Found	% REC	Known	Found	% REC				
1,1,1-Trichloroethane	20.0	23.1	115	20.0	22.3	111	3.54	80 - 134	20	
1,1,2,2-Tetrachloroethane	20.0	22.0	110	20.0	21.8	109	0.931	79 - 125	20	
1,1,2-Trichloro-1,2,2-Trifluoroethane	20.0	20.4	102	20.0	19.8	98.9	3.11	80 - 130	20	
1,1,2-Trichloroethane	20.0	22.8	114	20.0	22.2	111	2.77	80 - 125	20	
1,1-Dichloroethane	20.0	21.6	108	20.0	20.7	103	4.26	80 - 125	20	
1,1-Dichloroethene	20.0	22.7	113	20.0	21.9	109	3.68	80 - 132	20	
1,2,4-Trichlorobenzene	20.0	21.4	107	20.0	20.9	105	2.09	65 - 135	20	
1,2-Dibromo-3-chloropropane	20.0	21.4	107	20.0	21.1	106	1.03	50 - 130	20	
1,2-Dibromoethane	20.0	22.1	110	20.0	22.2	111	0.731	80 - 125	20	
1,2-Dichlorobenzene	20.0	20.5	103	20.0	20.2	101	1.46	80 - 125	20	
1,2-Dichloroethane	20.0	21.8	109	20.0	21.7	108	0.293	80 - 129	20	
cis-1,2-Dichloroethene	20.0	22.3	112	20.0	21.9	109	1.85	70 - 125	20	
trans-1,2-Dichloroethene	20.0	21.3	107	20.0	20.6	103	3.38	80 - 127	20	
1,2-Dichloropropane	20.0	21.8	109	20.0	21.1	105	3.60	80 - 120	20	
1,3-Dichlorobenzene	20.0	20.7	103	20.0	20.4	102	1.05	80 - 120	20	
1,4-Dichlorobenzene	20.0	19.9	99.3	20.0	19.8	99.0	0.258	80 - 120	20	
2-Butanone	20.0	20.7	104	20.0	20.0	99.9	3.59	30 - 150	20	
2-Hexanone	20.0	18.3	91.3	20.0	18.4	91.9	0.658	55 - 130	20	
4-Methyl-2-pentanone	20.0	19.9	99.6	20.0	19.5	97.6	2.05	64 - 140	20	
Acetone	20.0	19.6	98.2	20.0	17.8	89.0	9.80	40 - 142	20	
Benzene	20.0	19.5	97.5	20.0	19.0	94.8	2.81	80 - 121	20	
Bromodichloromethane	20.0	22.9	115	20.0	22.5	113	1.70	80 - 131	20	
Bromoform	20.0	22.4	112	20.0	22.5	112	0.433	70 - 130	20	
Bromomethane	20.0	21.2	106	20.0	20.8	104	1.96	30 - 145	20	
Carbon disulfide	20.0	18.4	92.2	20.0	17.7	88.4	4.18	58 - 138	20	
Carbon tetrachloride	20.0	22.4	112	20.0	21.9	110	1.97	65 - 140	20	
Chlorobenzene	20.0	20.7	103	20.0	20.4	102	1.23	80 - 120	20	
Chloroethane	20.0	22.7	114	20.0	21.7	109	4.60	60 - 135	20	
Chloroform	20.0	21.0	105	20.0	20.3	101	3.40	80 - 125	20	
Chloromethane	20.0	19.9	99.4	20.0	18.5	92.6	7.06	40 - 125	20	
cis-1,3-Dichloropropene	20.0	22.2	111	20.0	21.7	108	2.52	70 - 130	20	
Cyclohexane	20.0	20.7	104	20.0	20.1	100	3.28	80 - 130	20	
Dibromochloromethane	20.0	22.2	111	20.0	21.9	110	1.18	60 - 135	20	
Dichlorodifluoromethane	20.0	25.0	125	20.0	24.2	121	3.18	50 - 133	20	
Ethyl benzene	20.0	21.8	109	20.0	21.4	107	2.04	80 - 122	20	
Isopropylbenzene	20.0	20.5	103	20.0	20.0	100	2.45	80 - 122	20	
Methyl acetate	20.0	25.2	126	20.0	23.9	120	5.35	80 - 130	20	
Methyl tert-butyl ether	20.0	26.0	130	20.0	22.6	113	13.8	65 - 125	20	*
Methylcyclohexane	20.0	21.1	106	20.0	20.3	102	3.67	80 - 130	20	
Methylene chloride	20.0	20.6	103	20.0	19.8	98.8	4.20	80 - 123	20	

KEMRON FORMS - Modified 02/08/2007
Version 1.5 PDF File ID: 918252
Report generated 10/29/2007 10:14

LABORATORY CONTROL SAMPLE (LCS)

00101203

Login Number: L0710557 Analvst: MES Prep Method: 5030B
Instrument ID: HPMS8 Matrix: Water Method: 8260B
Workgroup (AAB#): WG253817 Units: ug/L
QC Key: STD Lot #: STD22622

Sample ID: WG253817-02 LCS File ID: 8M340933 Run Date: 10/25/2007 12:00
Sample ID: WG253817-03 LCS2 File ID: 8M340932 Run Date: 10/25/2007 11:29

Analytes	LCS			LCS2			%RPD	%Rec Limits	RPD Lmt	Q
	Known	Found	% REC	Known	Found	% REC				
Styrene	20.0	23.3	117	20.0	22.8	114	2.19	80 - 123	20	
Tetrachloroethene	20.0	21.9	109	20.0	21.3	107	2.53	80 - 124	20	
Toluene	20.0	21.7	108	20.0	21.1	105	2.99	80 - 124	20	
trans-1,3-Dichloropropene	20.0	20.9	105	20.0	20.7	103	1.05	80 - 130	20	
Trichloroethene	20.0	22.1	110	20.0	21.8	109	1.39	80 - 122	20	
Trichlorofluoromethane	20.0	18.2	91.1	20.0	17.7	88.6	2.81	62 - 151	20	
Vinyl chloride	20.0	23.2	116	20.0	22.8	114	1.77	65 - 140	20	
Xylenes, Total	60.0	65.9	110	60.0	64.7	108	1.80	80 - 121	20	

Surogates	LCS	LCS2	Surrogate Limits	Qualifier
	% Recovery	% Recovery		
Dibromofluoromethane	102	103	86 - 118	PASS
1,2-Dichloroethane-d4	100	101	80 - 120	PASS
Toluene-d8	103	102	88 - 110	PASS
p-Bromofluorobenzene	101	102	86 - 115	PASS

* FAILS %REC LIMIT

FAILS RPD LIMIT

LABORATORY CONTROL SAMPLE (LCS)

00101204

Login Number:L0710557 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: 918252
Report generated 10/29/2007 10:14

LABORATORY CONTROL SAMPLE (LCS)

00101205

Login Number: L0710557 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

KEMRON FORMS - Modified 02/08/2007
Version 1.5 PDF File ID: 918252
Report generated 10/29/2007 10:14

KEMRON ENVIRONMENTAL SERVICES
ORGANIC INSTRUMENT CHECK

BFB

Login Number: L0710557
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: 919625
Report generated 10/29/2007 10:14

KEMRON ENVIRONMENTAL SERVICES
ORGANIC INSTRUMENT CHECK

BFB

Login Number: L0710557
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	
L0710557-03	47WW03-101707	01	10/25/2007 12:08	

* Sample past 12 hour tune limit

KEMRON FORMS - Modified 03/12/2007
Version 1.3 PDF File ID: 919625
Report generated 10/29/2007 10:14

KEMRON ENVIRONMENTAL SERVICES
ORGANIC INSTRUMENT CHECK

BFB

Login Number: L0710557
Instrument: HPMS8
Analyst: CMS
Workgroup: WG253480

Tune ID: WG253480-01
Run Date: 10/22/2007
Run Time: 11:00
File ID: 8M340860
Cal ID: HPMS8 - 22-OCT-07

Target	Rel. to	Lower	Upper	Rel.	Raw	Result
50.0	95.0	15.0	40.0	19.9	16568	PASS
75.0	95.0	30.0	60.0	42.6	35464	PASS
95.0	95.0	100	100	100	83184	PASS
96.0	95.0	5.00	9.00	6.80	5656	PASS
173	174	0	2.00	0.233	168	PASS
174	95.0	50.0	100	86.8	72224	PASS
175	174	5.00	9.00	7.43	5364	PASS
176	174	95.0	101	96.0	69306	PASS
177	176	5.00	9.00	6.87	4761	PASS

This check relates to the following samples:

Lab ID	Client ID	Tag	Date Analyzed	Q
WG253480-02	STD	01	10/22/2007 11:30	
WG253480-03	STD	01	10/22/2007 12:00	
WG253480-04	STD	01	10/22/2007 12:29	
WG253480-05	STD	01	10/22/2007 12:59	
WG253480-06	STD	01	10/22/2007 13:30	
WG253480-07	STD	01	10/22/2007 14:00	
WG253480-08	STD-CCV	01	10/22/2007 14:29	
WG253480-09	STD	01	10/22/2007 14:59	
WG253480-10	STD	01	10/22/2007 15:28	
WG253480-11	STD	01	10/22/2007 15:58	

* Sample past 12 hour tune limit

KEMRON FORMS - Modified 03/12/2007
Version 1.3 PDF File ID: 919625
Report generated 10/29/2007 10:14

KEMRON ENVIRONMENTAL SERVICES
ORGANIC INSTRUMENT CHECK

BFB

Login Number: L0710557
Instrument: HPMS8
Analyst: CMS
Workgroup: WG253578

Tune ID: WG253578-01
Run Date: 10/23/2007
Run Time: 08:29
File ID: 8M340877
Cal ID: HPMS8 - 22-OCT-07

Target	Rel. to	Lower	Upper	Rel.	Raw	Result
50.0	95.0	15.0	40.0	20.4	8950	PASS
75.0	95.0	30.0	60.0	41.7	18280	PASS
95.0	95.0	100	100	100	43874	PASS
96.0	95.0	5.00	9.00	7.12	3124	PASS
173	174	0	2.00	0.305	110	PASS
174	95.0	50.0	100	82.1	36021	PASS
175	174	5.00	9.00	6.79	2445	PASS
176	174	95.0	101	96.4	34733	PASS
177	176	5.00	9.00	6.51	2261	PASS

This check relates to the following samples:

Lab ID	Client ID	Tag	Date Analyzed	Q
WG253480-12	SSCV	01	10/23/2007 11:07	

* Sample past 12 hour tune limit

KEMRON FORMS - Modified 03/12/2007
Version 1.3 PDF File ID: 919625
Report generated 10/29/2007 10:14

KEMRON ENVIRONMENTAL SERVICES
ORGANIC INSTRUMENT CHECK

BFB

Login Number: L0710557
Instrument: HPMS8
Analyst: CMS
Workgroup: WG253670

Tune ID: WG253670-01
Run Date: 10/24/2007
Run Time: 07:18
File ID: 8M340903
Cal ID: HPMS8 - 22-OCT-07

Target	Rel. to	Lower	Upper	Rel.	Raw	Result
50.0	95.0	15.0	40.0	20.7	12575	PASS
75.0	95.0	30.0	60.0	41.6	25330	PASS
95.0	95.0	100	100	100	60840	PASS
96.0	95.0	5.00	9.00	6.71	4084	PASS
173	174	0	2.00	0.417	224	PASS
174	95.0	50.0	100	88.4	53776	PASS
175	174	5.00	9.00	6.70	3604	PASS
176	174	95.0	101	98.6	53048	PASS
177	176	5.00	9.00	6.81	3615	PASS

This check relates to the following samples:

Lab ID	Client ID	Tag	Date Analyzed	Q
WG253670-02	CCV	01	10/24/2007 07:44	
WG253671-01	BLANK	01	10/24/2007 08:18	
WG253671-02	LCS	01	10/24/2007 08:48	
L0710557-10	TRIP BLANK	01	10/24/2007 09:49	
WG253671-03	REF	01	10/24/2007 10:49	
WG253671-04	MS	01	10/24/2007 11:19	
WG253671-05	MSD	01	10/24/2007 11:49	
L0710557-02	LHSMW54-101707	01	10/24/2007 17:19	
L0710557-07	47WW28-101707	01	10/24/2007 18:19	
L0710557-08	47WW29-101707	01	10/24/2007 18:50	

* Sample past 12 hour tune limit

KEMRON FORMS - Modified 03/12/2007
Version 1.3 PDF File ID: 919625
Report generated 10/29/2007 10:14

KEMRON ENVIRONMENTAL SERVICES
ORGANIC INSTRUMENT CHECK

BFB

Login Number: L0710557
Instrument: HPMS8
Analyst: MES
Workgroup: WG253816

Tune ID: WG253816-01
Run Date: 10/25/2007
Run Time: 09:29
File ID: 8M340928
Cal ID: HPMS8 - 22-OCT-07

Target	Rel. to	Lower	Upper	Rel.	Raw	Result
50.0	95.0	15.0	40.0	20.5	15030	PASS
75.0	95.0	30.0	60.0	40.3	29477	PASS
95.0	95.0	100	100	100	73208	PASS
96.0	95.0	5.00	9.00	6.89	5044	PASS
173	174	0	2.00	0.387	243	PASS
174	95.0	50.0	100	85.9	62850	PASS
175	174	5.00	9.00	7.05	4432	PASS
176	174	95.0	101	96.7	60746	PASS
177	176	5.00	9.00	6.44	3915	PASS

This check relates to the following samples:

Lab ID	Client ID	Tag	Date Analyzed	Q
WG253816-02	CCV	01	10/25/2007 09:52	
WG253817-01	BLANK	01	10/25/2007 10:29	
WG253817-03	LCS2	01	10/25/2007 11:29	
WG253817-02	LCS	01	10/25/2007 12:00	
L0710557-02	LHSMW54-101707	DL01	10/25/2007 13:00	

* Sample past 12 hour tune limit

KEMRON FORMS - Modified 03/12/2007
Version 1.3 PDF File ID: 919625
Report generated 10/29/2007 10:14

INITIAL CALIBRATION SUMMARY

Login Number: L0710557
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: 919623
Report generated 10/29/2007 10:14

INITIAL CALIBRATION SUMMARY

Login Number: L0710557
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

INITIAL CALIBRATION SUMMARY

Login Number: L0710557
Analytical Method: 8260B
ICAL Workgroup: WG253480

Instrument ID: HPMS8
Initial Calibration Date: 22-OCT-07 15:58
Column ID: F

Analyte		AVG RF	% RSD	LINEAR (R)	QUAD(R^2)
1,1-Dichloroethene	CCC	0.3365	10.1		
1,2-Dichloropropane	CCC	0.1995	7.19		
Chloroform	CCC	0.3965	7.33		
Ethylbenzene	CCC	0.3970	11.6		
Toluene	CCC	1.088	8.47		
Vinyl Chloride	CCC	0.1241	8.75		
1,1,2,2-Tetrachloroethane	SPCC	0.3049	5.16		
1,1-Dichloroethane	SPCC	0.4057	4.41		
Bromoform	SPCC	0.1306	14.2		
Chlorobenzene	SPCC	0.7965	14.4		
Chloromethane	SPCC	0.2233	12.0		
1,1,1-Trichloroethane		0.3525	7.90		
1,1,2-Trichloro-1,2,2-Trifluoroethane		0.2244	7.06		
1,1,2-Trichloroethane		0.1688	5.88		
1,2,4-Trichlorobenzene		0.7808	11.7		
1,2-Dibromo-3-Chloropropane		0.05440	14.0		
1,2-Dibromoethane		0.1732	6.09		
1,2-Dichlorobenzene		1.134	12.3		
1,2-Dichloroethane		0.2735	5.44		
1,3-Dichlorobenzene		1.244	11.2		
1,4-Dichlorobenzene		1.285	13.5		
2-Butanone		0.05067	5.18		
2-Hexanone		0.04843	6.72		
4-Methyl-2-Pentanone		0.04135	6.11		
Acetone		0.03688	7.91		
Benzene		0.8675	9.69		
Bromodichloromethane		0.2600	6.64		
Bromomethane		0.1561	11.0		
Carbon Disulfide		0.6216	6.39		
Carbon Tetrachloride		0.3216	8.50		
Chloroethane		0.1618	5.82		
Cyclohexane		0.3705	8.59		
Dibromochloromethane		0.2367	6.13		
Dichlorodifluoromethane		0.2818	7.46		
Isopropylbenzene		1.180	9.36		
Methyl Tert Butyl Ether		0.3786	4.66		
Methyl acetate		0.1003	0.770		
Methylcyclohexane		0.3092	9.01		
Methylene Chloride		0.3171	56.0		1.00
Styrene		0.7425	10.3		
Tetrachloroethene		0.2394	8.01		
Trichloroethene		0.2328	8.28		
Trichlorofluoromethane		0.4141	3.18		
cis-1,2-Dichloroethene		0.2255	7.17		
cis-1,3-Dichloropropene		0.2973	7.43		

KEMRON FORMS - Modified 01/18/2007
Version 1.5 PDF File ID: 919623
Report generated 10/29/2007 10:14

INITIAL CALIBRATION SUMMARY

Login Number: L0710557
Analytical Method: 8260B
ICAL Workgroup: WG253480

Instrument ID: HPMS8
Initial Calibration Date: 22-OCT-07 15:58
Column ID: F

Analyte		AVG RF	% RSD	LINEAR (R)	QUAD(R^2)
m-,p-Xylene		0.4830	12.6		
o-Xylene		0.4739	9.58		
trans-1,2-Dichloroethene		0.3325	6.08		
trans-1,3-Dichloropropene		0.3277	6.52		

R = Correlation coefficient; 0.995 minimum
R^2 = Coefficient of determination; 0.99 minimum

INITIAL CALIBRATION DATA

Login Number: L0710557
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: 919623
Report generated 10/29/2007 10:14

INITIAL CALIBRATION DATA

00101217

Login Number:L0710557
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: 919623
Report generated 10/29/2007 10:14

INITIAL CALIBRATION DATA

00101218

Login Number: L0710557
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

KEMRON FORMS - Modified 10/13/2006
Version 1.6 PDF File ID: 919623
Report generated 10/29/2007 10:14

INITIAL CALIBRATION DATA

00101219

Login Number: L0710557
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: 919623
Report generated 10/29/2007 10:14

INITIAL CALIBRATION DATA

00101220

Login Number: L0710557
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

KEMRON FORMS - Modified 10/13/2006
Version 1.6 PDF File ID: 919623
Report generated 10/29/2007 10:14

INITIAL CALIBRATION DATA

Login Number: L0710557
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

KEMRON FORMS - Modified 10/13/2006
Version 1.6 PDF File ID: 919623
Report generated 10/29/2007 10:14

INITIAL CALIBRATION DATA

Login Number: L0710557
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

KEMRON FORMS - Modified 10/13/2006
Version 1.6 PDF File ID: 919623
Report generated 10/29/2007 10:14

INITIAL CALIBRATION DATA

Login Number: L0710557
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

KEMRON FORMS - Modified 10/13/2006
Version 1.6 PDF File ID: 919623
Report generated 10/29/2007 10:14

KEMRON Environmental Services

INITIAL CALIBRATION DATA

00101224

Login Number: L0710557

Analytical Method: 8260B

Instrument ID: HPMS8

Initial Calibration Date: 22-OCT-07 15:58

Column ID: F

Analyte	WG253480-02			WG253480-03			WG253480-04		
	CONC	RESP	RF	CONC	RESP	RF	CONC	RESP	RF
1,1-Dichloroethene	NA	NA	NA	0.400	2767.00000	0.3003	1.00	6427.00000	0.2774
1,2-Dichloropropane	NA	NA	NA	0.400	1558.00000	0.1691	1.00	4492.00000	0.1939
Chloroform	0.300	3175.00000	0.4372	0.400	4012.00000	0.4354	1.00	8840.00000	0.3815
Ethylbenzene	NA	NA	NA	0.400	3035.00000	0.4178	1.00	7172.00000	0.3929
Toluene	NA	NA	NA	0.400	8306.00000	1.144	1.00	19181.0000	1.051
Vinyl Chloride	NA	NA	NA	NA	NA	NA	1.00	3085.00000	0.1331
1,1,2,2-Tetrachloroethane	NA	NA	NA	0.400	1110.00000	0.2740	1.00	3069.00000	0.2998
1,1-Dichloroethane	NA	NA	NA	0.400	3685.00000	0.3999	1.00	8953.00000	0.3864
Bromoform	NA	NA	NA	NA	NA	NA	1.00	1765.00000	0.09670
Chlorobenzene	NA	NA	NA	0.400	7162.00000	0.9860	1.00	15277.0000	0.8370
Chloromethane	NA	NA	NA	NA	NA	NA	1.00	6447.00000	0.2782
1,1,1-Trichloroethane	NA	NA	NA	0.400	3118.00000	0.3384	1.00	7179.00000	0.3098
1,1,2-Trichloro-1,2,2-Trifluoroethane	NA	NA	NA	NA	NA	NA	1.00	4665.00000	0.2013
1,1,2-Trichloroethane	NA	NA	NA	0.400	1139.00000	0.1568	1.00	2900.00000	0.1589
1,2,4-Trichlorobenzene	NA	NA	NA	0.400	3393.00000	0.8377	1.00	8612.00000	0.8414
1,2-Dibromo-3-Chloropropane	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dibromoethane	NA	NA	NA	0.400	1154.00000	0.1589	1.00	2863.00000	0.1569
1,2-Dichlorobenzene	0.300	3738.00000	1.208	0.400	5659.00000	1.397	1.00	12001.0000	1.173
1,2-Dichloroethane	NA	NA	NA	0.400	2371.00000	0.2573	1.00	6532.00000	0.2819
1,3-Dichlorobenzene	NA	NA	NA	0.400	5940.00000	1.467	1.00	12876.0000	1.258
1,4-Dichlorobenzene	0.300	4679.00000	1.512	0.400	6182.00000	1.526	1.00	13020.0000	1.272
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	8281.00000	0.8987	1.00	20960.0000	0.9046
Bromodichloromethane	NA	NA	NA	0.400	2191.00000	0.2378	1.00	5437.00000	0.2346
Bromomethane	NA	NA	NA	NA	NA	NA	1.00	2915.00000	0.1258
Carbon Disulfide	NA	NA	NA	NA	NA	NA	1.00	13504.0000	0.5828
Carbon Tetrachloride	NA	NA	NA	0.400	2990.00000	0.3245	1.00	6617.00000	0.2856
Chloroethane	NA	NA	NA	NA	NA	NA	1.00	3405.00000	0.1470
Cyclohexane	NA	NA	NA	NA	NA	NA	1.00	7156.00000	0.3088
Dibromochloromethane	NA	NA	NA	0.400	1670.00000	0.2299	1.00	3953.00000	0.2166
Dichlorodifluoromethane	NA	NA	NA	NA	NA	NA	1.00	6010.00000	0.2594
Isopropylbenzene	NA	NA	NA	0.400	9143.00000	1.259	1.00	19117.0000	1.047
Methyl Tert Butyl Ether	NA	NA	NA	NA	NA	NA	1.00	8053.00000	0.3475
Methyl acetate	NA	NA	NA	NA	NA	NA	NA	NA	NA
Methylcyclohexane	NA	NA	NA	NA	NA	NA	1.00	5947.00000	0.2567
Methylene Chloride	NA	NA	NA	0.400	6548.00000	0.7106	1.00	9682.00000	0.4179
Styrene	NA	NA	NA	0.400	4877.00000	0.6714	1.00	12039.0000	0.6596
Tetrachloroethene	NA	NA	NA	0.400	1821.00000	0.2507	1.00	3963.00000	0.2171
Trichloroethene	NA	NA	NA	0.400	2158.00000	0.2342	1.00	4609.00000	0.1989

KEMRON FORMS - Modified 10/13/2006
Version 1.6 PDF File ID: 919623
Report generated 10/29/2007 10:14

KEMRON Environmental Services

INITIAL CALIBRATION DATA

00101225

Login Number: L0710557
Analytical Method: 8260B

Instrument ID: HPMS8
Initial Calibration Date: 22-OCT-07 15:58
Column ID: F

Analyte	WG253480-05			WG253480-06			WG253480-07		
	CONC	RESP	RF	CONC	RESP	RF	CONC	RESP	RF
1,1-Dichloroethene	2.00	15199.0000	0.3187	5.00	44874.0000	0.3655	20.0	178454.000	0.3663
1,2-Dichloropropane	2.00	9753.00000	0.2045	5.00	26098.0000	0.2126	20.0	102753.000	0.2109
Chloroform	2.00	18853.0000	0.3953	5.00	49767.0000	0.4054	20.0	196312.000	0.4029
Ethylbenzene	2.00	16151.0000	0.4254	5.00	42940.0000	0.4431	20.0	164781.000	0.4311
Toluene	2.00	41654.0000	1.097	5.00	116765.000	1.205	20.0	445250.000	1.165
Vinyl Chloride	2.00	6297.00000	0.1320	5.00	15745.0000	0.1283	20.0	64342.0000	0.1321
1,1,2,2-Tetrachloroethane	2.00	6250.00000	0.2923	5.00	16873.0000	0.3156	20.0	68113.0000	0.3187
1,1-Dichloroethane	2.00	19326.0000	0.4053	5.00	52282.0000	0.4259	20.0	208256.000	0.4274
Bromoform	2.00	4352.00000	0.1146	5.00	12844.0000	0.1325	20.0	53713.0000	0.1405
Chlorobenzene	2.00	31583.0000	0.8319	5.00	81557.0000	0.8417	20.0	312804.000	0.8183
Chloromethane	2.00	10953.0000	0.2297	5.00	24963.0000	0.2033	20.0	104448.000	0.2144
1,1,1-Trichloroethane	2.00	16415.0000	0.3442	5.00	46833.0000	0.3815	20.0	185555.000	0.3808
1,1,2-Trichloro-1,2,2-Trifluoroethane	2.00	10713.0000	0.2246	5.00	27969.0000	0.2278	20.0	119789.000	0.2458
1,1,2-Trichloroethane	2.00	6390.00000	0.1683	5.00	17840.0000	0.1841	20.0	68828.0000	0.1801
1,2,4-Trichlorobenzene	2.00	17817.0000	0.8333	5.00	46461.0000	0.8691	20.0	172321.000	0.8064
1,2-Dibromo-3-Chloropropane	2.00	935.000000	0.04370	5.00	2464.00000	0.04610	20.0	11960.0000	0.05600
1,2-Dibromoethane	2.00	6563.00000	0.1729	5.00	17675.0000	0.1824	20.0	70374.0000	0.1841
1,2-Dichlorobenzene	2.00	24617.0000	1.151	5.00	62907.0000	1.177	20.0	238774.000	1.117
1,2-Dichloroethane	2.00	13457.0000	0.2822	5.00	35476.0000	0.2890	20.0	137367.000	0.2819
1,3-Dichlorobenzene	2.00	27035.0000	1.264	5.00	71011.0000	1.328	20.0	273026.000	1.278
1,4-Dichlorobenzene	2.00	28260.0000	1.322	5.00	71911.0000	1.345	20.0	271448.000	1.270
2-Butanone	NA	NA	NA	5.00	5639.00000	0.04590	20.0	24264.0000	0.04980
2-Hexanone	NA	NA	NA	5.00	4278.00000	0.04410	20.0	17200.0000	0.04500
4-Methyl-2-Pentanone	NA	NA	NA	5.00	4516.00000	0.03680	20.0	19568.0000	0.04020
Acetone	NA	NA	NA	5.00	5147.00000	0.04190	20.0	17988.0000	0.03690
Benzene	2.00	44667.0000	0.9366	5.00	118103.000	0.9621	20.0	434400.000	0.8915
Bromodichloromethane	2.00	12404.0000	0.2601	5.00	32514.0000	0.2649	20.0	135372.000	0.2778
Bromomethane	2.00	6802.00000	0.1426	5.00	18584.0000	0.1514	20.0	83168.0000	0.1707
Carbon Disulfide	2.00	31869.0000	0.6683	5.00	76436.0000	0.6226	20.0	320240.000	0.6572
Carbon Tetrachloride	2.00	14780.0000	0.3099	5.00	42905.0000	0.3495	20.0	170961.000	0.3509
Chloroethane	2.00	7379.00000	0.1547	5.00	20419.0000	0.1663	20.0	85007.0000	0.1745
Cyclohexane	2.00	18286.0000	0.3834	5.00	44911.0000	0.3658	20.0	194487.000	0.3992
Dibromochloromethane	2.00	8267.00000	0.2178	5.00	23177.0000	0.2392	20.0	95485.0000	0.2498
Dichlorodifluoromethane	2.00	14420.0000	0.3024	5.00	34810.0000	0.2836	20.0	149149.000	0.3061
Isopropylbenzene	2.00	43758.0000	1.153	5.00	124709.000	1.287	20.0	491862.000	1.287
Methyl Tert Butyl Ether	2.00	17802.0000	0.3733	5.00	45928.0000	0.3741	20.0	190428.000	0.3908
Methyl acetate	NA	NA	NA	5.00	12360.0000	0.1007	20.0	48887.0000	0.1003
Methylcyclohexane	2.00	14950.0000	0.3135	5.00	37086.0000	0.3021	20.0	163967.000	0.3365
Methylene Chloride	2.00	15583.0000	0.3268	5.00	32893.0000	0.2679	20.0	109984.000	0.2257
Styrene	2.00	27368.0000	0.7209	5.00	79229.0000	0.8176	20.0	321795.000	0.8418
Tetrachloroethene	2.00	8975.00000	0.2364	5.00	25119.0000	0.2592	20.0	99655.0000	0.2607
Trichloroethene	2.00	11407.0000	0.2392	5.00	31202.0000	0.2542	20.0	122016.000	0.2504

KEMRON FORMS - Modified 10/13/2006
Version 1.6 PDF File ID: 919623
Report generated 10/29/2007 10:14

INITIAL CALIBRATION DATA

00101226

Login Number: L0710557
Analytical Method: 8260B
Instrument ID: HPMS8
Initial Calibration Date: 22-OCT-07 15:58
Column ID: F

Analyte	WG253480-08			WG253480-09			WG253480-10		
	CONC	RESP	RF	CONC	RESP	RF	CONC	RESP	RF
1,1-Dichloroethene	50.0	436729.000	0.3660	100	853773.000	0.3552	200	1674980.00	0.3424
1,2-Dichloropropane	50.0	250262.000	0.2097	100	486196.000	0.2023	200	943768.000	0.1929
Chloroform	50.0	469044.000	0.3931	100	898125.000	0.3736	200	1685157.00	0.3445
Ethylbenzene	50.0	381802.000	0.4008	100	688187.000	0.3642	200	1165925.00	0.3007
Toluene	50.0	1048650.00	1.101	100	1956235.00	1.035	200	3519709.00	0.9079
Vinyl Chloride	50.0	149433.000	0.1252	100	270409.000	0.1125	200	516016.000	0.1055
1,1,2,2-Tetrachloroethane	50.0	171929.000	0.3197	100	339548.000	0.3135	200	667645.000	0.3057
1,1-Dichloroethane	50.0	499619.000	0.4187	100	971119.000	0.4040	200	1847730.00	0.3777
Bromoform	50.0	140503.000	0.1475	100	275098.000	0.1456	200	531265.000	0.1370
Chlorobenzene	50.0	723684.000	0.7598	100	1325220.00	0.7012	200	2311553.00	0.5962
Chloromethane	50.0	238679.000	0.2000	100	500938.000	0.2084	200	1119864.00	0.2289
1,1,1-Trichloroethane	50.0	454822.000	0.3812	100	864997.000	0.3598	200	1584617.00	0.3239
1,1,2-Trichloro-1,2,2-Trifluoroethane	50.0	283351.000	0.2375	100	545994.000	0.2271	200	1009673.00	0.2064
1,1,2-Trichloroethane	50.0	164296.000	0.1725	100	320047.000	0.1694	200	621274.000	0.1603
1,2,4-Trichlorobenzene	50.0	409029.000	0.7605	100	757365.000	0.6993	200	1307932.00	0.5990
1,2-Dibromo-3-Chloropropane	50.0	31678.0000	0.05890	100	65416.0000	0.06040	200	133756.000	0.06130
1,2-Dibromoethane	50.0	172233.000	0.1808	100	338662.000	0.1792	200	659603.000	0.1701
1,2-Dichlorobenzene	50.0	583980.000	1.086	100	1093129.00	1.009	200	1945225.00	0.8908
1,2-Dichloroethane	50.0	335148.000	0.2809	100	644984.000	0.2683	200	1204165.00	0.2462
1,3-Dichlorobenzene	50.0	661983.000	1.231	100	1226057.00	1.132	200	2164702.00	0.9913
1,4-Dichlorobenzene	50.0	652428.000	1.213	100	1221440.00	1.128	200	2133750.00	0.9771
2-Butanone	50.0	61189.0000	0.05130	100	126631.000	0.05270	200	260510.000	0.05330
2-Hexanone	50.0	45759.0000	0.04800	100	97265.0000	0.05150	200	199037.000	0.05130
4-Methyl-2-Pentanone	50.0	50722.0000	0.04250	100	103689.000	0.04310	200	212990.000	0.04350
Acetone	50.0	44512.0000	0.03730	100	88752.0000	0.03690	200	171815.000	0.03510
Benzene	50.0	1012299.00	0.8483	100	1915161.00	0.7967	200	3433282.00	0.7018
Bromodichloromethane	50.0	334930.000	0.2807	100	652740.000	0.2715	200	1237301.00	0.2529
Bromomethane	50.0	204348.000	0.1713	100	405603.000	0.1687	200	794211.000	0.1624
Carbon Disulfide	50.0	763523.000	0.6399	100	1498177.00	0.6233	200	2724389.00	0.5569
Carbon Tetrachloride	50.0	415004.000	0.3478	100	771823.000	0.3211	200	1385697.00	0.2833
Chloroethane	50.0	201380.000	0.1688	100	395622.000	0.1646	200	767049.000	0.1568
Cyclohexane	50.0	470592.000	0.3944	100	936857.000	0.3897	200	1724529.00	0.3525
Dibromochloromethane	50.0	241897.000	0.2540	100	473314.000	0.2505	200	914909.000	0.2360
Dichlorodifluoromethane	50.0	350499.000	0.2937	100	664174.000	0.2763	200	1227000.00	0.2508
Isopropylbenzene	50.0	1187956.00	1.247	100	2202107.00	1.165	200	3866804.00	0.9974
Methyl Tert Butyl Ether	50.0	473957.000	0.3972	100	952444.000	0.3962	200	1816401.00	0.3713
Methyl acetate	50.0	120528.000	0.1010	100	242083.000	0.1007	200	484486.000	0.09900
Methylcyclohexane	50.0	400516.000	0.3356	100	777884.000	0.3236	200	1448570.00	0.2961
Methylene Chloride	50.0	250158.000	0.2096	100	474558.000	0.1974	200	883623.000	0.1806
Styrene	50.0	776327.000	0.8150	100	1436108.00	0.7599	200	2535619.00	0.6540
Tetrachloroethene	50.0	236806.000	0.2486	100	443529.000	0.2347	200	806249.000	0.2080
Trichloroethene	50.0	292312.000	0.2450	100	552863.000	0.2300	200	1030736.00	0.2107

KEMRON FORMS - Modified 10/13/2006
Version 1.6 PDF File ID: 919623
Report generated 10/29/2007 10:14

INITIAL CALIBRATION DATA

Login Number: L0710557
Analytical Method: 8260B

Instrument ID: HPMS8
Initial Calibration Date: 22-OCT-07 15:58
Column ID: F

Analyte	WG253480-11		
	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	376659.000	0.05100
2-Hexanone	300	294556.000	0.05070
4-Methyl-2-Pentanone	300	309872.000	0.04200
Acetone	300	244884.000	0.03320
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: 919623
Report generated 10/29/2007 10:14

Login Number: L0710557
Instrument ID: HPMS8
Analytical Method: 8260B
Initial Calibration Date: 22-OCT-07 15:58
Column ID: F

Analyte	WG253480-02			WG253480-03			WG253480-04		
	CONC	RESP	RF	CONC	RESP	RF	CONC	RESP	RF
Trichlorofluoromethane	NA	NA	NA	0.400	3727.00000	0.4045	1.00	9439.00000	0.4074
cis-1,2-Dichloroethene	NA	NA	NA	0.400	1822.00000	0.1977	1.00	5174.00000	0.2233
cis-1,3-Dichloropropene	NA	NA	NA	0.400	2437.00000	0.2645	1.00	6299.00000	0.2719
m-,p-Xylene	NA	NA	NA	0.800	7701.00000	0.5301	2.00	17408.0000	0.4769
o-Xylene	NA	NA	NA	0.400	3512.00000	0.4835	1.00	7512.00000	0.4116
trans-1,2-Dichloroethene	NA	NA	NA	0.400	3134.00000	0.3401	1.00	7021.00000	0.3030
trans-1,3-Dichloropropene	NA	NA	NA	0.400	2202.00000	0.3031	1.00	5458.00000	0.2990

KEMRON FORMS - Modified 10/13/2006
Version 1.6 PDF File ID: 919623
Report generated 10/29/2007 10:14

INITIAL CALIBRATION DATA

Login Number: L0710557
Analytical Method: 8260B
Instrument ID: HPMS8
Initial Calibration Date: 22-OCT-07 15:58
Column ID: F

Analyte	WG253480-05			WG253480-06			WG253480-07		
	CONC	RESP	RF	CONC	RESP	RF	CONC	RESP	RF
Trichlorofluoromethane	2.00	20030.0000	0.4200	5.00	50562.0000	0.4119	20.0	213587.000	0.4384
cis-1,2-Dichloroethene	2.00	10789.0000	0.2262	5.00	29274.0000	0.2385	20.0	120493.000	0.2473
cis-1,3-Dichloropropene	2.00	13698.0000	0.2872	5.00	38603.0000	0.3145	20.0	155275.000	0.3187
m-,p-Xylene	4.00	39165.0000	0.5158	10.0	105077.000	0.5422	40.0	395913.000	0.5179
o-Xylene	2.00	18384.0000	0.4842	5.00	50501.0000	0.5212	20.0	200008.000	0.5232
trans-1,2-Dichloroethene	2.00	15269.0000	0.3202	5.00	43529.0000	0.3546	20.0	172166.000	0.3533
trans-1,3-Dichloropropene	2.00	11873.0000	0.3127	5.00	33316.0000	0.3438	20.0	134173.000	0.3510

KEMRON FORMS - Modified 10/13/2006
Version 1.6 PDF File ID: 919623
Report generated 10/29/2007 10:14

INITIAL CALIBRATION DATA

Login Number: L0710557
Analytical Method: 8260B
Instrument ID: HPMS8
Initial Calibration Date: 22-OCT-07 15:58
Column ID: F

Analyte	WG253480-08			WG253480-09			WG253480-10		
	CONC	RESP	RF	CONC	RESP	RF	CONC	RESP	RF
Trichlorofluoromethane	50.0	504892.000	0.4231	100	991144.000	0.4123	200	1932059.00	0.3950
cis-1,2-Dichloroethene	50.0	282932.000	0.2371	100	541649.000	0.2253	200	1022003.00	0.2089
cis-1,3-Dichloropropene	50.0	384343.000	0.3221	100	745106.000	0.3100	200	1415220.00	0.2893
m-,p-Xylene	100	924531.000	0.4853	200	1655723.00	0.4381	400	2772456.00	0.3576
o-Xylene	50.0	473948.000	0.4976	100	883339.000	0.4674	200	1560958.00	0.4026
trans-1,2-Dichloroethene	50.0	414623.000	0.3475	100	802775.000	0.3340	200	1503248.00	0.3073
trans-1,3-Dichloropropene	50.0	332032.000	0.3486	100	649006.000	0.3434	200	1239578.00	0.3197

KEMRON FORMS - Modified 10/13/2006
Version 1.6 PDF File ID: 919623
Report generated 10/29/2007 10:14

INITIAL CALIBRATION DATA

00101231

Login Number: L0710557
Analytical Method: 8260B

Instrument ID: HPMS8
Initial Calibration Date: 22-OCT-07 15:58
Column ID: F

Analyte	WG253480-11		
	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

KEMRON FORMS - Modified 10/13/2006
Version 1.6 PDF File ID: 919623
Report generated 10/29/2007 10:14

ALTERNATE SOURCE CALIBRATION REPORT

00101232

Login Number: L0710557 | Run Date: 10/18/2007 | Sample ID: WG253187-12
Instrument ID: HPMS10 | Run Time: 18:23 | Method: 8260B
File ID: 10M59732 | Analyst: 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: 919624
Report generated 10/29/2007 10:14

ALTERNATE SOURCE CALIBRATION REPORT

Login Number: L0710557
Run Date: 10/18/2007
Sample ID: WG253187-12
Instrument ID: HPMS10
Run Time: 18:23
Method: 8260B
File ID: 10M59732
Analyst: 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: 919624
Report generated 10/29/2007 10:14

ALTERNATE SOURCE CALIBRATION REPORT

00101234

Login Number: L0710557
Run Date: 10/23/2007
Sample ID: WG253480-12
Instrument ID: HPMS8
Run Time: 11:07
Method: 8260B
File ID: 8M340882
Analvst: CMS
QC Key: STD
ICal Workgroup: WG253480
Cal ID: HPMS8 - 22-OCT-07

Analyte		Expected	Found	Units	RF	%D	UCL	Q
1,1-Dichloroethene	CCC	20.0	21.6	ug/L	0.363	7.90	30	
1,2-Dichloropropane	CCC	20.0	21.7	ug/L	0.217	8.70	30	
Chloroform	CCC	20.0	20.5	ug/L	0.407	2.70	30	
Ethylbenzene	CCC	20.0	22.1	ug/L	0.439	10.6	30	
Toluene	CCC	20.0	21.5	ug/L	1.17	7.60	30	
Vinyl Chloride	CCC	20.0	22.2	ug/L	0.138	11.1	30	
1,1,2,2-Tetrachloroethane	SPCC	20.0	21.4	ug/L	0.326	6.90	30	
1,1-Dichloroethane	SPCC	20.0	21.0	ug/L	0.425	4.90	30	
Bromoform	SPCC	20.0	21.9	ug/L	0.143	9.30	30	
Chlorobenzene	SPCC	20.0	20.7	ug/L	0.823	3.30	30	
Chloromethane	SPCC	20.0	20.8	ug/L	0.232	3.80	30	
1,1,1-Trichloroethane		20.0	21.8	ug/L	0.385	9.20	30	
1,1,2-Trichloro-1,2,2-Trifluoroethane		20.0	19.8	ug/L	0.222	1.00	30	
1,1,2-Trichloroethane		20.0	22.1	ug/L	0.187	10.6	30	
1,2,4-Trichlorobenzene		20.0	20.9	ug/L	0.817	4.60	30	
1,2-Dibromo-3-Chloropropane		20.0	21.9	ug/L	0.0594	9.30	30	
1,2-Dibromoethane		20.0	21.7	ug/L	0.188	8.70	30	
1,2-Dichlorobenzene		20.0	20.2	ug/L	1.15	1.00	30	
1,2-Dichloroethane		20.0	21.3	ug/L	0.292	6.60	30	
cis-1,2-Dichloroethene		20.0	21.8	ug/L	0.246	8.90	30	
trans-1,2-Dichloroethene		20.0	21.0	ug/L	0.349	4.90	30	
1,3-Dichlorobenzene		20.0	20.5	ug/L	1.27	2.50	30	
1,4-Dichlorobenzene		20.0	19.9	ug/L	1.28	0.300	30	
2-Butanone		20.0	21.3	ug/L	0.0538	6.30	30	
2-Hexanone		20.0	19.7	ug/L	0.0477	1.50	30	
4-Methyl-2-Pentanone		20.0	20.0	ug/L	0.0413	0.100	30	
Acetone		20.0	22.3	ug/L	0.0412	11.5	30	
Benzene		20.0	19.4	ug/L	0.840	3.20	30	
Bromodichloromethane		20.0	22.6	ug/L	0.294	13.0	30	
Bromomethane		20.0	23.1	ug/L	0.180	15.6	30	
Carbon Disulfide		20.0	18.7	ug/L	0.580	6.70	30	
Carbon Tetrachloride		20.0	21.6	ug/L	0.348	8.20	30	
Chloroethane		20.0	22.3	ug/L	0.181	11.7	30	
cis-1,3-Dichloropropene		20.0	22.2	ug/L	0.330	11.0	30	
Cyclohexane		20.0	21.0	ug/L	0.388	4.80	30	
Dibromochloromethane		20.0	21.5	ug/L	0.255	7.60	30	
Dichlorodifluoromethane		20.0	24.5	ug/L	0.346	22.6	30	
Isopropylbenzene		20.0	20.7	ug/L	1.22	3.70	30	
Methyl acetate		20.0	23.4	ug/L	0.118	17.2	30	
Methyl Tert Butyl Ether		20.0	25.3	ug/L	0.478	26.3	30	
Methylcyclohexane		20.0	21.7	ug/L	0.336	8.50	30	
Methylene Chloride		20.0	20.8	ug/L	0.229	4.00	30	

KEMRON FORMS - Modified 09/06/2007 - (ALT)
Version 1.5 PDF File ID: 919624
Report generated 10/29/2007 10:14

ALTERNATE SOURCE CALIBRATION REPORT

00101235

Login Number: L0710557 | Run Date: 10/23/2007 | Sample ID: WG253480-12
Instrument ID: HPMS8 | Run Time: 11:07 | Method: 8260B
File ID: 8M340882 | Analvst: CMS | QC Key: STD
ICal Workgroup: WG253480 | Cal ID: HPMS8 - 22-OCT-07

Analyte		Expected	Found	Units	RF	%D	UCL	Q
Styrene		20.0	23.5	ug/L	0.872	17.4	30	
Tetrachloroethene		20.0	21.3	ug/L	0.255	6.50	30	
trans-1,3-Dichloropropene		20.0	20.7	ug/L	0.339	3.30	30	
Trichloroethene		20.0	21.9	ug/L	0.255	9.40	30	
Trichlorofluoromethane		20.0	17.3	ug/L	0.359	13.3	30	
Xylenes		60.0	66.3	ug/L	0.531	10.6	30	
m-,p-Xylene		40.0	43.9	ug/L	0.530	9.60	30	
1,2-Dichloroethene		40.0	42.8	ug/L	0.297	6.90	30	
o-Xylene		20.0	22.5	ug/L	0.533	12.5	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: 919624
Report generated 10/29/2007 10:14

CONTINUING CALIBRATION VERIFICATION (CCV)

00101236

Login Number: L0710557 | 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: 919626
Report generated 10/29/2007 10:14

CONTINUING CALIBRATION VERIFICATION (CCV)

00101237

Login Number: L0710557
Instrument ID: HPMS10
File ID: 10M59851
Workgroup (AAB#): WG253794
Run Date: 10/25/2007
Run Time: 08:27
Analyst: MES
Cal ID: HPMS10 - 18-OCT-07
Sample ID: WG253793-02
Method: 8260B
QC Key: STD

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: 919626
Report generated 10/29/2007 10:14

CONTINUING CALIBRATION VERIFICATION (CCV)

00101238

Login Number: L0710557 | Run Date: 10/24/2007 | Sample ID: WG253670-02
Instrument ID: HPMS8 | Run Time: 07:44 | Method: 8260B
File ID: 8M340904 | Analyst: CMS | QC Key: STD
Workgroup (AAB#): WG253671 | Cal ID: HPMS8 - 22-OCT-07

Analyte		Expected	Found	UNITS	RF	%D	UCL	Q
1,1-Dichloroethene	CCC	50.0	55.3	ug/L	0.372	10.6	20	
1,2-Dichloropropane	CCC	50.0	51.4	ug/L	0.205	2.84	20	
Chloroform	CCC	50.0	49.8	ug/L	0.395	0.438	20	
Ethylbenzene	CCC	50.0	50.1	ug/L	0.398	0.110	20	
Toluene	CCC	50.0	51.9	ug/L	1.13	3.79	20	
Vinyl Chloride	CCC	50.0	54.0	ug/L	0.134	7.95	20	
1,1,2,2-Tetrachloroethane	SPCC	50.0	53.1	ug/L	0.324	6.14	40	
1,1-Dichloroethane	SPCC	50.0	51.7	ug/L	0.419	3.30	40	
Bromoform	SPCC	50.0	57.3	ug/L	0.150	14.7	40	
Chlorobenzene	SPCC	50.0	48.0	ug/L	0.764	4.09	40	
Chloromethane	SPCC	50.0	44.7	ug/L	0.200	10.6	40	
1,1,1-Trichloroethane		50.0	54.4	ug/L	0.384	8.81	40	
1,1,2-Trichloro-1,2,2-Trifluoroethane		50.0	53.4	ug/L	0.240	6.83	40	
1,1,2-Trichloroethane		50.0	52.2	ug/L	0.176	4.45	40	
1,2,4-Trichlorobenzene		50.0	48.1	ug/L	0.751	3.88	40	
1,2-Dibromo-3-Chloropropane		50.0	51.3	ug/L	0.0558	2.59	40	
1,2-Dibromoethane		50.0	52.8	ug/L	0.183	5.64	40	
1,2-Dichlorobenzene		50.0	47.9	ug/L	1.09	4.24	40	
1,2-Dichloroethane		50.0	50.3	ug/L	0.275	0.652	40	
cis-1,2-Dichloroethene		50.0	53.6	ug/L	0.242	7.15	40	
trans-1,2-Dichloroethene		50.0	52.8	ug/L	0.351	5.51	40	
1,3-Dichlorobenzene		50.0	50.0	ug/L	1.24	0.0732	40	
1,4-Dichlorobenzene		50.0	48.1	ug/L	1.24	3.88	40	
2-Butanone		50.0	48.7	ug/L	0.0493	2.64	40	
2-Hexanone		50.0	46.9	ug/L	0.0454	6.25	40	
4-Methyl-2-Pentanone		50.0	48.0	ug/L	0.0397	4.01	40	
Acetone		50.0	50.9	ug/L	0.0376	1.79	40	
Benzene		50.0	49.0	ug/L	0.850	1.98	40	
Bromodichloromethane		50.0	53.1	ug/L	0.276	6.21	40	
Bromomethane		50.0	48.5	ug/L	0.151	3.10	40	
Carbon Disulfide		50.0	52.7	ug/L	0.655	5.41	40	
Carbon Tetrachloride		50.0	54.8	ug/L	0.352	9.52	40	
Chloroethane		50.0	52.5	ug/L	0.170	5.07	40	
cis-1,3-Dichloropropene		50.0	52.6	ug/L	0.313	5.24	40	
Cyclohexane		50.0	53.5	ug/L	0.396	6.94	40	
Dibromochloromethane		50.0	54.2	ug/L	0.257	8.41	40	
Dichlorodifluoromethane		50.0	56.1	ug/L	0.316	12.2	40	
Isopropylbenzene		50.0	53.1	ug/L	1.25	6.20	40	
Methyl acetate		50.0	52.1	ug/L	0.105	4.30	40	
Methyl Tert Butyl Ether		50.0	53.4	ug/L	0.405	6.90	40	
Methylcyclohexane		50.0	52.9	ug/L	0.327	5.88	40	
Methylene Chloride		50.0	50.3	ug/L	0.210	0.531	40	

KEMRON FORMS - Modified 09/06/2007 - (CCV)
Version 1.5 PDF File ID: 919626
Report generated 10/29/2007 10:14

CONTINUING CALIBRATION VERIFICATION (CCV)

00101239

Login Number: L0710557 | Run Date: 10/24/2007 | Sample ID: WG253670-02
Instrument ID: HPMS8 | Run Time: 07:44 | Method: 8260B
File ID: 8M340904 | Analvst: CMS | QC Key: STD
Workgroup (AAB#): WG253671 | Cal ID: HPMS8 - 22-OCT-07

Analyte		Expected	Found	UNITS	RF	%D	UCL	Q
Styrene		50.0	54.8	ug/L	0.813	9.53	40	
Tetrachloroethene		50.0	53.7	ug/L	0.257	7.33	40	
trans-1,3-Dichloropropene		50.0	53.5	ug/L	0.351	7.00	40	
Trichloroethene		50.0	53.2	ug/L	0.248	6.43	40	
Trichlorofluoromethane		50.0	52.0	ug/L	0.431	3.99	40	
Xylenes		150	152	ug/L	0.491	1.67	40	
1,2-Dichloroethene		100	106	ug/L	0.296	6.33	40	
m-,p-Xylene		100	99.6	ug/L	0.481	0.357	40	
o-Xylene		50.0	52.9	ug/L	0.501	5.71	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: 919626
Report generated 10/29/2007 10:14

CONTINUING CALIBRATION VERIFICATION (CCV)

00101240

Login Number: L0710557 Run Date: 10/25/2007 Sample ID: WG253816-02
Instrument ID: HPMS8 Run Time: 09:52 Method: 8260B
File ID: 8M340929 Analyst: MES QC Key: STD
Workgroup (AAB#): WG253817 Cal ID: HPMS8 - 22-OCT-07

Analyte		Expected	Found	UNITS	RF	%D	UCL	Q
1,1-Dichloroethene	CCC	50.0	53.5	ug/L	0.360	6.92	20	
1,2-Dichloropropane	CCC	50.0	49.2	ug/L	0.196	1.68	20	
Chloroform	CCC	50.0	47.9	ug/L	0.380	4.14	20	
Ethylbenzene	CCC	50.0	50.0	ug/L	0.397	0.0560	20	
Toluene	CCC	50.0	50.8	ug/L	1.10	1.53	20	
Vinyl Chloride	CCC	50.0	50.8	ug/L	0.126	1.62	20	
1,1,2,2-Tetrachloroethane	SPCC	50.0	49.5	ug/L	0.302	1.05	40	
1,1-Dichloroethane	SPCC	50.0	50.2	ug/L	0.407	0.421	40	
Bromoform	SPCC	50.0	53.9	ug/L	0.141	7.72	40	
Chlorobenzene	SPCC	50.0	46.9	ug/L	0.747	6.20	40	
Chloromethane	SPCC	50.0	44.7	ug/L	0.200	10.5	40	
1,1,1-Trichloroethane		50.0	52.1	ug/L	0.367	4.22	40	
1,1,2-Trichloro-1,2,2-Trifluoroethane		50.0	52.8	ug/L	0.237	5.69	40	
1,1,2-Trichloroethane		50.0	48.8	ug/L	0.165	2.34	40	
1,2,4-Trichlorobenzene		50.0	47.5	ug/L	0.741	5.09	40	
1,2-Dibromo-3-Chloropropane		50.0	48.4	ug/L	0.0526	3.27	40	
1,2-Dibromoethane		50.0	49.5	ug/L	0.171	0.992	40	
1,2-Dichlorobenzene		50.0	46.4	ug/L	1.05	7.20	40	
1,2-Dichloroethane		50.0	46.0	ug/L	0.252	7.95	40	
cis-1,2-Dichloroethene		50.0	52.5	ug/L	0.237	4.96	40	
trans-1,2-Dichloroethene		50.0	51.4	ug/L	0.342	2.87	40	
1,3-Dichlorobenzene		50.0	48.9	ug/L	1.22	2.25	40	
1,4-Dichlorobenzene		50.0	46.6	ug/L	1.20	6.75	40	
2-Butanone		50.0	46.9	ug/L	0.0476	6.13	40	
2-Hexanone		50.0	44.8	ug/L	0.0434	10.4	40	
4-Methyl-2-Pentanone		50.0	45.6	ug/L	0.0377	8.73	40	
Acetone		50.0	49.4	ug/L	0.0364	1.24	40	
Benzene		50.0	47.7	ug/L	0.827	4.63	40	
Bromodichloromethane		50.0	50.0	ug/L	0.260	0.0428	40	
Bromomethane		50.0	49.0	ug/L	0.153	1.96	40	
Carbon Disulfide		50.0	51.1	ug/L	0.636	2.29	40	
Carbon Tetrachloride		50.0	52.7	ug/L	0.339	5.44	40	
Chloroethane		50.0	52.4	ug/L	0.170	4.86	40	
cis-1,3-Dichloropropene		50.0	49.2	ug/L	0.292	1.69	40	
Cyclohexane		50.0	51.7	ug/L	0.383	3.47	40	
Dibromochloromethane		50.0	51.3	ug/L	0.243	2.68	40	
Dichlorodifluoromethane		50.0	52.5	ug/L	0.296	5.08	40	
Isopropylbenzene		50.0	51.8	ug/L	1.22	3.54	40	
Methyl acetate		50.0	48.7	ug/L	0.0977	2.66	40	
Methyl Tert Butyl Ether		50.0	48.6	ug/L	0.368	2.71	40	
Methylcyclohexane		50.0	51.6	ug/L	0.319	3.11	40	
Methylene Chloride		50.0	49.4	ug/L	0.206	1.22	40	

KEMRON FORMS - Modified 09/06/2007 - (CCV)
Version 1.5 PDF File ID: 919626
Report generated 10/29/2007 10:14

CONTINUING CALIBRATION VERIFICATION (CCV)

00101241

Login Number: L0710557 Run Date: 10/25/2007 Sample ID: WG253816-02
Instrument ID: HPMS8 Run Time: 09:52 Method: 8260B
File ID: 8M340929 Analyst: MES QC Key: STD
Workgroup (AAB#): WG253817 Cal ID: HPMS8 - 22-OCT-07

Analyte		Expected	Found	UNITS	RF	%D	UCL	Q
Styrene		50.0	53.5	ug/L	0.794	6.92	40	
Tetrachloroethene		50.0	52.4	ug/L	0.251	4.82	40	
trans-1,3-Dichloropropene		50.0	50.3	ug/L	0.330	0.594	40	
Trichloroethene		50.0	51.6	ug/L	0.240	3.21	40	
Trichlorofluoromethane		50.0	49.8	ug/L	0.412	0.405	40	
Xylenes		150	150	ug/L	0.481	0.246	40	
1,2-Dichloroethene		100	104	ug/L	0.289	3.91	40	
m-,p-Xylene		100	98.1	ug/L	0.474	1.88	40	
o-Xylene		50.0	51.5	ug/L	0.488	3.03	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: 919626
Report generated 10/29/2007 10:14

KEMRON ENVIRONMENTAL SERVICES
INTERNAL STANDARD AREA SUMMARY
(COMPARED TO CCV)

Login Number: L0710557
Instrument ID: HPMS8
Workgroup (AAB#): WG253671

CCV Number: WG253670-02
CAL ID: HPMS8 - 22-OCT-07
Matrix: WATER

Sample Number	Dilution	Tag	IS-1	IS-2	IS-3
WG253670-02	NA	NA	266180	490300	635811
Upper Limit	NA	NA	532360	980600	1271622
Lower Limit	NA	NA	133090	245150	317906
L0710557-02	1.00	01	237334	428390	560972
L0710557-07	1.00	01	240016	429381	560023
L0710557-08	1.00	01	234783	426116	551698
L0710557-10	1.00	01	247297	444785	570300
WG253671-01	1.00	01	255600	457286	586045
WG253671-02	1.00	01	252526	452488	575112
WG253671-03	1.00	01	243883	438777	573925
WG253671-04	1.00	01	250855	452468	573819
WG253671-05	1.00	01	254559	454314	581790

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: 919627
Report generated 10/29/2007 10:14

KEMRON ENVIRONMENTAL SERVICES
INTERNAL STANDARD AREA SUMMARY
(COMPARED TO CCV)

Login Number: L0710557
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
L0710557-03	1.00	01	329083	596224	716083
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: 919627
Report generated 10/29/2007 10:14

KEMRON ENVIRONMENTAL SERVICES
INTERNAL STANDARD AREA SUMMARY
(COMPARED TO CCV)

Login Number: L0710557
Instrument ID: HPMS8
Workgroup (AAB#): WG253817

CCV Number: WG253816-02
CAL ID: HPMS8 - 22-OCT-07
Matrix: WATER

Sample Number	Dilution	Tag	IS-1	IS-2	IS-3
WG253816-02	NA	NA	268663	494114	648153
Upper Limit	NA	NA	537326	988228	1296306
Lower Limit	NA	NA	134332	247057	324077
L0710557-02	10.0	DL01	249712	449470	583525
WG253817-01	1.00	01	255824	457059	597340
WG253817-02	1.00	01	262200	467421	588545
WG253817-03	1.00	01	262802	468794	592011

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: 919627
Report generated 10/29/2007 10:14

KEMRON ENVIRONMENTAL SERVICES
INTERNAL STANDARD RETENTION TIME SUMMARY
(COMPARED TO CCV)

Login Number: L0710557
Instrument ID: HPMS8
Workgroup (AAB#): WG253671

CCV Number: WG253670-02
CAL ID: HPMS8 - 22-OCT-07
Matrix: WATER

Sample Number	Dilution	Tag	IS-1	IS-2	IS-3
WG253670-02	NA	NA	17.61	14.59	10.71
Upper Limit	NA	NA	18.11	15.09	11.21
Lower Limit	NA	NA	17.11	14.09	10.21
L0710557-02	1.00	01	17.6	14.59	10.71
L0710557-07	1.00	01	17.6	14.58	10.71
L0710557-08	1.00	01	17.61	14.59	10.72
L0710557-10	1.00	01	17.6	14.58	10.71
WG253671-01	1.00	01	17.6	14.59	10.71
WG253671-02	1.00	01	17.6	14.59	10.71
WG253671-03	1.00	01	17.6	14.58	10.71
WG253671-04	1.00	01	17.6	14.58	10.71
WG253671-05	1.00	01	17.6	14.59	10.71

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: 919629
Report generated 10/29/2007 10:14

KEMRON ENVIRONMENTAL SERVICES
INTERNAL STANDARD RETENTION TIME SUMMARY
(COMPARED TO CCV)

00101246

Login Number: L0710557
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
L0710557-03	1.00	01	17.75	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: 919629
Report generated 10/29/2007 10:14

KEMRON ENVIRONMENTAL SERVICES
INTERNAL STANDARD RETENTION TIME SUMMARY
(COMPARED TO CCV)

Login Number: L0710557
Instrument ID: HPMS8
Workgroup (AAB#): WG253817

CCV Number: WG253816-02
CAL ID: HPMS8 - 22-OCT-07
Matrix: WATER

Sample Number	Dilution	Tag	IS-1	IS-2	IS-3
WG253816-02	NA	NA	17.6	14.59	10.71
Upper Limit	NA	NA	18.1	15.09	11.21
Lower Limit	NA	NA	17.1	14.09	10.21
L0710557-02	10.0	DL01	17.6	14.59	10.72
WG253817-01	1.00	01	17.6	14.58	10.71
WG253817-02	1.00	01	17.6	14.58	10.71
WG253817-03	1.00	01	17.6	14.59	10.71

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: 919629
Report generated 10/29/2007 10:14

2.2 Metals Data

2.2.1 Metals I C P Data

2.2.1.1 Summary Data

LABORATORY REPORT

00101251

L0710557

10/29/07 13:41

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: LHAAP

P.O. Number: 322255 OP

Sample Analysis Summary

Client ID	Lab ID	Method	Dilution	Date Received
47WW08-101707	L0710557-01	6010B	1	19-OCT-07
47WW08-101707	L0710557-01	6010B	10	19-OCT-07
47WW08-101707	L0710557-01	6010B	10	19-OCT-07
47WW09-101607	L0710557-04	6010B	1	19-OCT-07
47WW09-101607	L0710557-04	6010B	10	19-OCT-07
47WW13-101607	L0710557-05	6010B	1	19-OCT-07
47WW19-101707	L0710557-06	6010B	1	19-OCT-07
47WW19-101707	L0710557-06	6010B	10	19-OCT-07
47WW09-101607-FD	L0710557-09	6010B	1	19-OCT-07
47WW09-101607-FD	L0710557-09	6010B	10	19-OCT-07

Sample Number:L0710557-01
Client ID:47WW08-101707
Matrix:Water
Workgroup Number:WG253625
Collect Date:10/17/2007 08:10
Sample Tag:01

PrePrep Method:NONE
Prep Method:3005A
Analytical Method:6010B
Analyst:KRV
Dilution:1
Units:mg/L

Instrument:PE-ICP2
Prep Date:10/23/2007 05:50
Cal Date:10/23/2007 14:23
Run Date:10/23/2007 22:32
File ID:P2.102307.223258

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	179		0.200	0.100
Cobalt, Dissolved	7440-48-4	0.0510		0.00500	0.00250
Iron, Dissolved	7439-89-6	1.51		0.100	0.0250
Potassium, Dissolved	7440-09-7	7.13		1.00	0.250
Magnesium, Dissolved	7439-95-4	91.9		0.500	0.250
Zinc, Dissolved	7440-66-6		U	0.0200	0.00500

U Not detected at or above adjusted sample detection limit

Sample Number:	L0710557-01	PrePrep Method:	NONE	Instrument:	PE-ICP2
Client ID:	47WW08-101707	Prep Method:	3005A	Prep Date:	10/23/2007 05:50
Matrix:	Water	Analytical Method:	6010B	Cal Date:	10/24/2007 08:09
Workgroup Number:	WG253625	Analyst:	KRV	Run Date:	10/24/2007 17:22
Collect Date:	10/17/2007 08:10	Dilution:	10	File ID:	P2.102407.172235
Sample Tag:	DL01	Units:	mg/L		

Analyte	CAS. Number	Result	Qual	PQL	SDL
Vanadium, Dissolved	7440-62-2		U	0.100	0.0500

U Not detected at or above adjusted sample detection limit

Sample Number:L0710557-01
Client ID:47WW08-101707
Matrix:Water
Workgroup Number:WG253625
Collect Date:10/17/2007 08:10
Sample Tag:DL02

PrePrep Method:NONE
Prep Method:3005A
Analytical Method:6010B
Analyst:SLP
Dilution:10
Units:mg/L

Instrument:PE-ICP2
Prep Date:10/23/2007 05:50
Cal Date:10/25/2007 10:45
Run Date:10/25/2007 14:01
File ID:P2.102507.140152

Analyte	CAS. Number	Result	Qual	PQL	SDL
Sodium, Dissolved	7440-23-5	1010		5.00	2.50

Sample Number:	L0710557-04	PrePrep Method:	NONE	Instrument:	PE-ICP2
Client ID:	47WW09-101607	Prep Method:	3005A	Prep Date:	10/23/2007 05:50
Matrix:	Water	Analytical Method:	6010B	Cal Date:	10/23/2007 14:23
Workgroup Number:	WG253625	Analyst:	KRV	Run Date:	10/23/2007 22:01
Collect Date:	10/16/2007 15:50	Dilution:	1	File ID:	P2.102307.220101
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	176		0.200	0.100
Cobalt, Dissolved	7440-48-4		U	0.00500	0.00250
Iron, Dissolved	7439-89-6	0.196		0.100	0.0250
Potassium, Dissolved	7440-09-7	6.68		1.00	0.250
Magnesium, Dissolved	7439-95-4	124		0.500	0.250
Zinc, Dissolved	7440-66-6		U	0.0200	0.00500

U Not detected at or above adjusted sample detection limit

Sample Number:	L0710557-04	PrePrep Method:	NONE	Instrument:	PE-ICP2
Client ID:	47WW09-101607	Prep Method:	3005A	Prep Date:	10/23/2007 05:50
Matrix:	Water	Analytical Method:	6010B	Cal Date:	10/24/2007 08:09
Workgroup Number:	WG253625	Analyst:	KRV	Run Date:	10/24/2007 17:03
Collect Date:	10/16/2007 15:50	Dilution:	10	File ID:	P2.102407.170338
Sample Tag:	DL01	Units:	mg/L		

Analyte	CAS. Number	Result	Qual	PQL	SDL
Sodium, Dissolved	7440-23-5	633		5.00	2.50
Vanadium, Dissolved	7440-62-2		U	0.100	0.0500

U Not detected at or above adjusted sample detection limit

Report Number: **L0710557**
Report Date : **October 29, 2007**

00101257

Sample Number: **L0710557-05**	PrePrep Method: **NONE**	Instrument: **PE-ICP2**
Client ID: **47WW13-101607**	Prep Method: **3005A**	Prep Date: **10/23/2007 05:50**
Matrix: **Water**	Analytical Method: **6010B**	Cal Date: **10/23/2007 14:23**
Workgroup Number: **WG253625**	Analyst: **KRV**	Run Date: **10/23/2007 22:20**
Collect Date: **10/16/2007 16:20**	Dilution: **1**	File ID: **P2.102307.222018**
Sample Tag: **01**	Units: **mg/L**	

Analyte	CAS. Number	Result	Qual	PQL	SDL
Aluminum, Dissolved	7429-90-5	22.0		0.100	0.0500
Beryllium, Dissolved	7440-41-7	0.00116	J	0.00200	0.000500
Calcium, Dissolved	7440-70-2	10.2		0.200	0.100
Cobalt, Dissolved	7440-48-4	0.0388		0.00500	0.00250
Iron, Dissolved	7439-89-6	17.5		0.100	0.0250
Potassium, Dissolved	7440-09-7	2.25		1.00	0.250
Magnesium, Dissolved	7439-95-4	4.25		0.500	0.250
Sodium, Dissolved	7440-23-5	60.3		0.500	0.250
Vanadium, Dissolved	7440-62-2	0.0343		0.0100	0.00500
Zinc, Dissolved	7440-66-6	0.0570		0.0200	0.00500

J The analyte was positively identified, but the quantitation was below the RL

Sample Number:	L0710557-06	PrePrep Method:	NONE	Instrument:	PE-ICP2
Client ID:	47WW19-101707	Prep Method:	3005A	Prep Date:	10/23/2007 05:50
Matrix:	Water	Analytical Method:	6010B	Cal Date:	10/23/2007 14:23
Workgroup Number:	WG253625	Analyst:	KRV	Run Date:	10/23/2007 22:26
Collect Date:	10/17/2007 10:08	Dilution:	1	File ID:	P2.102307.222639
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	172		0.200	0.100
Cobalt, Dissolved	7440-48-4		U	0.00500	0.00250
Iron, Dissolved	7439-89-6	2.57		0.100	0.0250
Potassium, Dissolved	7440-09-7	4.67		1.00	0.250
Magnesium, Dissolved	7439-95-4	95.2		0.500	0.250
Zinc, Dissolved	7440-66-6		U	0.0200	0.00500

U Not detected at or above adjusted sample detection limit

Sample Number:L0710557-06
Client ID:47WW19-101707
Matrix:Water
Workgroup Number:WG253625
Collect Date:10/17/2007 10:08
Sample Tag:DL01

PrePrep Method:NONE
Prep Method:3005A
Analytical Method:6010B
Analyst:KRV
Dilution:10
Units:mg/L

Instrument:PE-ICP2
Prep Date:10/23/2007 05:50
Cal Date:10/24/2007 08:09
Run Date:10/24/2007 17:35
File ID:P2.102407.173513

Analyte	CAS. Number	Result	Qual	PQL	SDL
Sodium, Dissolved	7440-23-5	281		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:	L0710557-09	PrePrep Method:	NONE	Instrument:	PE-ICP2
Client ID:	47WW09-101607-FD	Prep Method:	3005A	Prep Date:	10/23/2007 05:50
Matrix:	Water	Analytical Method:	6010B	Cal Date:	10/23/2007 14:23
Workgroup Number:	WG253625	Analyst:	KRV	Run Date:	10/23/2007 23:04
Collect Date:	10/16/2007 15:50	Dilution:	1	File ID:	P2.102307.230458
Sample Tag:	01	Units:	mg/L		

Analyte	CAS. Number	Result	Qual	PQL	SDL
Aluminum, Dissolved	7429-90-5	0.384		0.100	0.0500
Beryllium, Dissolved	7440-41-7		U	0.00200	0.000500
Calcium, Dissolved	7440-70-2	171		0.200	0.100
Cobalt, Dissolved	7440-48-4		U	0.00500	0.00250
Iron, Dissolved	7439-89-6	0.348		0.100	0.0250
Potassium, Dissolved	7440-09-7	6.29		1.00	0.250
Magnesium, Dissolved	7439-95-4	120		0.500	0.250
Zinc, Dissolved	7440-66-6		U	0.0200	0.00500

U Not detected at or above adjusted sample detection limit

Sample Number:	L0710557-09	PrePrep Method:	NONE	Instrument:	PE-ICP2
Client ID:	47WW09-101607-FD	Prep Method:	3005A	Prep Date:	10/23/2007 05:50
Matrix:	Water	Analytical Method:	6010B	Cal Date:	10/24/2007 08:09
Workgroup Number:	WG253625	Analyst:	KRV	Run Date:	10/24/2007 17:41
Collect Date:	10/16/2007 15:50	Dilution:	10	File ID:	P2.102407.174132
Sample Tag:	DL01	Units:	mg/L		

Analyte	CAS. Number	Result	Qual	PQL	SDL
Sodium, Dissolved	7440-23-5	618		5.00	2.50
Vanadium, Dissolved	7440-62-2		U	0.100	0.0500

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

Analyst(s): pom
Date: 10/23/07
LCS: 5ml STD 22494
MS/MSD: 5ml STD 22494
Witness: no
HNO_3 Lot #: COA 12617
$1:1HNO_3$: N/A
HCl Lot #: COA 12527
H_2O_2 Lot #: N/A
Earliest Sample Due Date: 10/26
Digest Tube Lot #: COA 12607
Hotblock #: 6
Hotblock Temp - Start: 94.8 °C 0550
Hotblock Temp - End: 94.9 °C 0950

Box: 61
Digestion Work Group: WG 253556

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: [signature]
Digest Received By: [signature] Date: 10/23/07

	KEMRON #	Initial WT/Vol	Final Volume	Comments	Due Date
1	PBW	50ml	50ml	LAB FILT 10/22 -02	
2	LCSW			-03	
3	10-557-01				10/26
4	-04			-01	
5	-04 MS			-04	
6	-04 MD			-05	
7	-05				
8	-06				
9	-09				
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27					
28					

pom 10/23/07

Comments: ______

Primary Review: [signature] 10/23/07
Secondary Review: [signature] 10/23/07

KEMRON Environmental Services

Instrument Run Log

Instrument: PE-ICP2 Dataset: 102307H2.CSV
Analyst1: KRV Analyst2: N/A
Method: 6010B SOP: ME600E Rev: 6
Maintenance Log ID: 21420

Calibration Std: STD22439 ICV/CCV Std: STD22609 Post Spike: STD22493
ICSA: STD22610 ICSAB: STD22567

Workgroups: 252879,253535,253625

Comments:

Seq.	File ID	Sample	ID	Prep	Dil	Reference	Date/Time
1	P2.102307.135835	WG253698-01	Calibration Point		1		10/23/07 13:58
2	P2.102307.140446	WG253698-02	Calibration Point		1		10/23/07 14:04
3	P2.102307.141059	WG253698-03	Calibration Point		1		10/23/07 14:10
4	P2.102307.141713	WG253698-04	Calibration Point		1		10/23/07 14:17
5	P2.102307.142330	WG253698-05	Calibration Point		1		10/23/07 14:23
6	P2.102307.142958	WG253698-06	Initial Calibration Verification		1		10/23/07 14:29
7	P2.102307.143614	WG253698-07	Initial Calib Blank		1		10/23/07 14:36
8	P2.102307.144249	WG253698-08	Interference Check		1		10/23/07 14:42
9	P2.102307.144813	WG253698-09	Interference Check		1		10/23/07 14:48
10	P2.102307.145336	WG253698-10	CCV		1		10/23/07 14:53
11	P2.102307.150000	WG253698-11	CCB		1		10/23/07 15:00
12	P2.102307.150618	L0710345-01	IDL1-ICP-PE2	50/50	1		10/23/07 15:06
13	P2.102307.151236	L0710345-02	IDL2-ICP-PE2	50/50	1		10/23/07 15:12
14	P2.102307.151909	L0710345-03	IDL3-ICP-PE2	50/50	1		10/23/07 15:19
15	P2.102307.152531	L0710345-04	IDL4-ICP-PE2	50/50	1		10/23/07 15:25
16	P2.102307.153144	L0710345-05	IDL5-ICP-PE2	50/50	1		10/23/07 15:31
17	P2.102307.153804	L0710345-06	IDL6-ICP-PE2	50/50	1		10/23/07 15:38
18	P2.102307.154429	L0710345-07	IDL7-ICP-PE2	50/50	1		10/23/07 15:44
19	P2.102307.155042	WG253698-12	CCV		1		10/23/07 15:50
20	P2.102307.155712	WG253698-13	CCB		1		10/23/07 15:57
21	P2.102307.160333	WG252662-02	Method/Prep Blank	50/50	1		10/23/07 16:03
22	P2.102307.160947	WG252662-03	Laboratory Control S	50/50	1		10/23/07 16:09
23	P2.102307.161604	WG252662-01	Reference Sample		10	L0710298-02	10/23/07 16:16
24	P2.102307.162228	WG252662-04	Matrix Spike	50/50	10		10/23/07 16:22
25	P2.102307.162852	WG252662-05	Matrix Spike Duplica	50/50	10		10/23/07 16:28
26	P2.102307.163516	L0710298-01	8002	50/50	10		10/23/07 16:35
27	P2.102307.164137	L0710299-02	8910 P-R	50/50	1		10/23/07 16:41
28	P2.102307.164800	L0710300-01	RIVER \#1	50/50	1		10/23/07 16:48
29	P2.102307.165422	WG252879-01	Post Digestion Spike		1	L0710300-01	10/23/07 16:54
30	P2.102307.170047	WG252879-02	Serial Dilution		5	L0710300-01	10/23/07 17:00
31	P2.102307.170707	WG253698-14	CCV		1		10/23/07 17:07
32	P2.102307.171328	WG253698-15	CCB		1		10/23/07 17:13
33	P2.102307.171943	L0710298-03	8714P	50/50	10		10/23/07 17:19
34	P2.102307.172606	L0710298-04	8716P	50/50	10		10/23/07 17:26
35	P2.102307.173223	L0710298-07	8908L	50/50	10		10/23/07 17:32
36	P2.102307.173847	L0710298-05	8906L	50/50	1		10/23/07 17:38
37	P2.102307.174505	L0710298-06	8907U	50/50	1		10/23/07 17:45

Page: 1 Approved: October 24, 2007

Maren Beery

KEMRON Environmental Services

Instrument Run Log

Instrument: PE-ICP2　　Dataset: 102307H2.CSV

Analyst1: KRV　　Analyst2: N/A

Method: 6010B　　SOP: ME600E　　Rev: 6

Maintenance Log ID: 21420

Calibration Std: STD22439　　ICV/CCV Std: STD22609　　Post Spike: STD22493

ICSA: STD22610　　ICSAB: STD22567

Workgroups: 252879,253535,253625

Comments:

Seq.	File ID	Sample	ID	Prep	Dil	Reference	Date/Time
38	P2.102307.175126	L0710300-04	8902U	50/50	1		10/23/07 17:51
39	P2.102307.175744	L0710300-05	8902L	50/50	1		10/23/07 17:57
40	P2.102307.180405	L0710300-08	DUPLICATE 1	50/50	1		10/23/07 18:04
41	P2.102307.181030	L0710300-09	8912U	50/50	1		10/23/07 18:10
42	P2.102307.181647	WG253698-16	CCV		1		10/23/07 18:16
43	P2.102307.182308	WG253698-17	CCB		1		10/23/07 18:23
44	P2.102307.182929	L0710300-06	8905U		1		10/23/07 18:29
45	P2.102307.183553	L0710300-07	8905L		1		10/23/07 18:35
46	P2.102307.184308	L0710300-02	LEACHATE	50/50	50	WG252858-04	10/23/07 18:43
47	P2.102307.184926	L0710300-10	8912L	50/50	1		10/23/07 18:49
48	P2.102307.185550	L0710300-11	RIVER \#2	50/50	1		10/23/07 18:55
49	P2.102307.190211	L0710300-12	RIVER \#4	50/50	1		10/23/07 19:02
50	P2.102307.190836	WG253698-18	CCV		1		10/23/07 19:08
51	P2.102307.191456	WG253698-19	CCB		1		10/23/07 19:14
71	P2.102307.192114	WG253479-02	Method/Prep Blank	50/50	1		10/23/07 19:21
72	P2.102307.192727	WG253479-03	Laboratory Control S	50/50	1		10/23/07 19:27
73	P2.102307.193358	WG253217-01	Fluid Blank		1		10/23/07 19:33
74	P2.102307.194012	WG253479-01	Reference Sample		1	L0710572-01	10/23/07 19:40
75	P2.102307.194635	WG253479-04	Matrix Spike	50/50	1		10/23/07 19:46
76	P2.102307.195257	WG253479-05	Matrix Spike Duplica	50/50	1		10/23/07 19:52
77	P2.102307.195922	L0710453-02	AV-OU10-PT-01-G-101607	50/50	1		10/23/07 19:59
78	P2.102307.200545	L0710453-01	AV-OU10-PT-01-C-101607	50/50	1		10/23/07 20:05
79	P2.102307.201210	WG253535-01	Post Digestion Spike		1	L0710453-01	10/23/07 20:12
80	P2.102307.201834	WG253535-02	Serial Dilution		5	L0710453-01	10/23/07 20:18
52	P2.102307.202455	WG253698-20	CCV		1		10/23/07 20:24
53	P2.102307.203118	WG253698-21	CCB		1		10/23/07 20:31
81	P2.102307.203734	L0710539-01	MIN-01	50/50	1		10/23/07 20:37
82	P2.102307.204257	L0710539-03	MIN-02	50/50	1		10/23/07 20:42
83	P2.102307.204923	L0710540-01	SWL-01	50/50	1		10/23/07 20:49
84	P2.102307.205443	L0710540-03	SWL-01D	50/50	1		10/23/07 20:54
85	P2.102307.210008	L0710541-01	MTE-01	50/50	1		10/23/07 21:00
86	P2.102307.210538	L0710542-01	STA-01	50/50	1		10/23/07 21:05
87	P2.102307.211102	L0710543-01	SUC-01	50/50	1		10/23/07 21:11
88	P2.102307.211727	L0710543-03	SUC-02	50/50	1		10/23/07 21:17
89	P2.102307.212351	L0710571-01	LCR-01	50/50	1		10/23/07 21:23
90	P2.102307.213007	L0710572-03	TWP-02	50/50	1		10/23/07 21:30
54	P2.102307.213533	WG253698-22	CCV		1		10/23/07 21:35

Approved: October 24, 2007

Maren Beery

KEMRON Environmental Services
Instrument Run Log

Instrument: PE-ICP2 Dataset: 102307H2.CSV
Analyst1: KRV Analyst2: N/A
Method: 6010B SOP: ME600E Rev: 6
Maintenance Log ID: 21420

Calibration Std: STD22439 ICV/CCV Std: STD22609 Post Spike: STD22493
ICSA: STD22610 ICSAB: STD22567

Workgroups: 252879,253535,253625

Comments:

Seq.	File ID	Sample	ID	Prep	Dil	Reference	Date/Time
55	P2.102307.214155	WG253698-23	CCB		1		10/23/07 21:41
56	P2.102307.214816	WG253556-02	Method/Prep Blank	50/50	1		10/23/07 21:48
57	P2.102307.215436	WG253556-03	Laboratory Control S	50/50	1		10/23/07 21:54
58	P2.102307.220101	WG253556-01	Reference Sample		1	L0710557-04	10/23/07 22:01
59	P2.102307.220727	WG253556-04	Matrix Spike	50/50	1		10/23/07 22:07
60	P2.102307.221351	WG253556-05	Matrix Spike Duplica	50/50	1		10/23/07 22:13
61	P2.102307.222018	L0710557-05	47WW13-101607	50/50	1		10/23/07 22:20
62	P2.102307.222639	L0710557-06	47WW19-101707	50/50	1		10/23/07 22:26
63	P2.102307.223258	L0710557-01	47WW08-101707	50/50	1		10/23/07 22:32
64	P2.102307.223921	WG253625-01	POST SPIKE DIGESTION		1	L0710557-01	10/23/07 22:39
65	P2.102307.224548	WG253625-02	Serial Dilution		5	L0710557-01	10/23/07 22:45
66	P2.102307.225213	WG253698-24	CCV		1		10/23/07 22:52
67	P2.102307.225842	WG253698-25	CCB		1		10/23/07 22:58
68	P2.102307.230458	L0710557-09	47WW09-101607-FD	50/50	1		10/23/07 23:04
69	P2.102307.231117	WG253698-26	CCV		1		10/23/07 23:11
70	P2.102307.231738	WG253698-27	CCB		1		10/23/07 23:17

Page: 3 Approved: October 24, 2007

Maren Beery

KEMRON Environmental Services

Instrument Run Log

Instrument: PE-ICP2 Dataset: 102407H.CSV
Analyst1: KRV Analyst2: N/A
Method: 6010B SOP: ME600E Rev: 6
Maintenance Log ID: 21437

Calibration Std: STD22439 ICV/CCV Std: STD22609 Post Spike: STD22493
ICSA: STD22610 ICSAB: STD22567

Workgroups: 253688, 253535, 252879, 253625, 253748, 253772

Comments:

Seq.	File ID	Sample	ID	Prep	Dil	Reference	Date/Time
1	P2.102407.074411	WG253767-01	Calibration Point		1		10/24/07 07:44
2	P2.102407.075025	WG253767-02	Calibration Point		1		10/24/07 07:50
3	P2.102407.075639	WG253767-03	Calibration Point		1		10/24/07 07:56
4	P2.102407.080253	WG253767-04	Calibration Point		1		10/24/07 08:02
5	P2.102407.080919	WG253767-05	Calibration Point		1		10/24/07 08:09
6	P2.102407.081539	WG253767-06	Initial Calibration Verification		1		10/24/07 08:15
7	P2.102407.082201	WG253767-07	Initial Calib Blank		1		10/24/07 08:22
8	P2.102407.082818	WG253767-08	Interference Check		1		10/24/07 08:28
9	P2.102407.083337	WG253767-09	Interference Check		1		10/24/07 08:33
10	P2.102407.083901	WG253767-10	CCV		1		10/24/07 08:39
11	P2.102407.084532	WG253767-11	CCB		1		10/24/07 08:45
12	P2.102407.091955	WG253599-02	Method/Prep Blank	50/50	1		10/24/07 09:19
13	P2.102407.092607	WG253599-03	Laboratory Control S	50/50	1		10/24/07 09:26
14	P2.102407.093249	WG253496-01	Fluid Blank		1		10/24/07 09:32
15	P2.102407.093919	WG253599-01	Reference Sample		1	L0710523-13	10/24/07 09:39
16	P2.102407.094541	WG253599-04	Matrix Spike	5/50	1		10/24/07 09:45
17	P2.102407.095204	WG253599-05	Matrix Spike Duplica	5/50	1		10/24/07 09:52
18	P2.102407.095836	L0710551-01	SO-B001-1-010	5/50	1		10/24/07 09:58
19	P2.102407.100512	L0710523-01	0236-001	5/50	1		10/24/07 10:05
20	P2.102407.101137	WG253688-01	Post Digestion Spike		1	L0710523-01	10/24/07 10:11
21	P2.102407.101800	WG253688-02	Serial Dilution		5	L0710523-01	10/24/07 10:18
22	P2.102407.102423	WG253767-12	CCV		1		10/24/07 10:24
23	P2.102407.103118	WG253767-13	CCB		1		10/24/07 10:31
24	P2.102407.103736	L0710523-02	0236-002	5/50	1		10/24/07 10:37
25	P2.102407.104424	L0710523-03	0236-003	5/50	1		10/24/07 10:44
26	P2.102407.105042	L0710523-04	0236-004	5/50	1		10/24/07 10:50
27	P2.102407.105705	L0710523-05	0236-005	5/50	1		10/24/07 10:57
28	P2.102407.110333	L0710523-06	0236-006	5/50	1		10/24/07 11:03
29	P2.102407.110957	L0710523-07	0236-007	5/50	1		10/24/07 11:09
30	P2.102407.111624	L0710523-08	0236-008	5/50	1		10/24/07 11:16
31	P2.102407.112250	L0710523-09	0236-009	5/50	1		10/24/07 11:22
32	P2.102407.112919	L0710523-10	0236-010	5/50	1		10/24/07 11:29
33	P2.102407.113534	L0710523-11	0236-011	5/50	1		10/24/07 11:35
34	P2.102407.114154	WG253767-14	CCV		1		10/24/07 11:41
35	P2.102407.114816	WG253767-15	CCB		1		10/24/07 11:48
36	P2.102407.115431	L0710523-12	0236-012	5/50	1		10/24/07 11:54
37	P2.102407.120053	L0710556-01	WASTE-EW-7A-101807	5/50	1		10/24/07 12:00

Page: 1 Approved: October 25, 2007

Maren Beery

Run Log ID:**18947**

00101270

KEMRON Environmental Services

Instrument Run Log

Instrument: PE-ICP2 Dataset: 102407H.CSV

Analyst1: KRV Analyst2: N/A

Method: 6010B SOP: ME600E Rev: 6

Maintenance Log ID: 21437

Calibration Std: STD22439 ICV/CCV Std: STD22609 Post Spike: STD22493

ICSA: STD22610 ICSAB: STD22567

Workgroups: 253688, 253535, 252879, 253625, 253748, 253772

Comments:

Seq.	File ID	Sample	ID	Prep	Dil	Reference	Date/Time
38	P2.102407.120716	L0710556-03	WASTE-EW-5-101807	5/50	1		10/24/07 12:07
39	P2.102407.121332	L0710556-05	WASTE-EW-6-101807	5/50	1		10/24/07 12:13
40	P2.102407.121955	L0710556-07	WASTE-EW-7-101807	5/50	1	WG253614-01	10/24/07 12:19
41	P2.102407.122616	WG253767-16	CCV		1		10/24/07 12:26
42	P2.102407.123237	WG253767-17	CCB		1		10/24/07 12:32
43	P2.102407.123852	WG253479-02	Method/Prep Blank	50/50	1		10/24/07 12:38
44	P2.102407.124504	WG253479-03	Laboratory Control S	50/50	1		10/24/07 12:45
45	P2.102407.125133	WG253479-01	Reference Sample		10	L0710572-01	10/24/07 12:51
46	P2.102407.125745	WG253479-04	Matrix Spike	50/50	10		10/24/07 12:57
47	P2.102407.130401	WG253479-05	Matrix Spike Duplica	50/50	10		10/24/07 13:04
48	P2.102407.131027	L0710453-01	AV-OU10-PT-01-C-101607	50/50	1		10/24/07 13:10
49	P2.102407.131643	WG253535-01	Post Digestion Spike		1	L0710453-01	10/24/07 13:16
50	P2.102407.132315	WG253535-02	Serial Dilution		5	L0710453-01	10/24/07 13:23
51	P2.102407.132729	WG253217-01	Fluid Blank		1		10/24/07 13:27
52	P2.102407.133344	WG253767-18	CCV		1		10/24/07 13:33
53	P2.102407.134004	WG253767-19	CCB		1		10/24/07 13:40
54	P2.102407.143844	L0710300-03	8004	50/50	1		10/24/07 14:38
55	P2.102407.144458	L0710300-05	8902L	50/50	1		10/24/07 14:44
56	P2.102407.145115	L0710300-12	RIVER \#4	50/50	1		10/24/07 14:51
57	P2.102407.145732	L0710298-05	8906L	50/50	1		10/24/07 14:57
58	P2.102407.150346	L0710298-06	8907U	50/50	1		10/24/07 15:03
59	P2.102407.151002	L0710299-02	8910 P-R	50/50	5		10/24/07 15:10
60	P2.102407.151618	L0710298-03	8714P	50/50	10		10/24/07 15:16
61	P2.102407.152238	L0710298-04	8716P	50/50	10		10/24/07 15:22
62	P2.102407.152854	L0710298-07	8908L	50/50	10		10/24/07 15:28
63	P2.102407.153513	WG253767-20	CCV		1		10/24/07 15:35
64	P2.102407.154129	WG253767-21	CCB		1		10/24/07 15:41
65	P2.102407.154740	L0710300-01	RIVER \#1	50/50	5		10/24/07 15:47
66	P2.102407.155355	WG252879-01	Post Digestion Spike		5	L0710300-01	10/24/07 15:53
67	P2.102407.160010	L0710300-02	LEACHATE	50/50	50		10/24/07 16:00
68	P2.102407.160632	L0710300-04	8902U	50/50	10		10/24/07 16:06
69	P2.102407.161340	L0710300-06	8905U	50/50	20		10/24/07 16:13
70	P2.102407.161956	L0710300-07	8905L	50/50	20		10/24/07 16:19
71	P2.102407.162611	L0710300-08	DUPLICATE 1	50/50	10		10/24/07 16:26
72	P2.102407.163226	L0710300-09	8912U	50/50	10		10/24/07 16:32
73	P2.102407.163841	L0710300-10	8912L	50/50	10		10/24/07 16:38
74	P2.102407.164456	L0710300-11	RIVER \#2	50/50	10		10/24/07 16:44

Approved: October 25, 2007

Maren Beery

KEMRON Environmental Services
Instrument Run Log

Instrument: PE-ICP2 Dataset: 102407H.CSV
Analyst1: KRV Analyst2: N/A
Method: 6010B SOP: ME600E Rev: 6
Maintenance Log ID: 21437

Calibration Std: STD22439 ICV/CCV Std: STD22609 Post Spike: STD22493
ICSA: STD22610 ICSAB: STD22567

Workgroups: 253688, 253535, 252879, 253625, 253748, 253772

Comments:

Seq.	File ID	Sample	ID	Prep	Dil	Reference	Date/Time
75	P2.102407.165111	WG253767-22	CCV		1		10/24/07 16:51
76	P2.102407.165727	WG253767-23	CCB		1		10/24/07 16:57
77	P2.102407.170338	WG253556-01	Reference Sample		10	L0710557-04	10/24/07 17:03
78	P2.102407.170957	WG253556-04	Matrix Spike	50/50	10		10/24/07 17:09
79	P2.102407.171616	WG253556-05	Matrix Spike Duplica	50/50	10		10/24/07 17:16
80	P2.102407.172235	L0710557-01	47WW08-101707	50/50	10		10/24/07 17:22
81	P2.102407.172854	WG253625-01	POST SPIKE DIGESTION		10	L0710557-01	10/24/07 17:28
82	P2.102407.173513	L0710557-06	47WW19-101707	50/50	10		10/24/07 17:35
83	P2.102407.174132	L0710557-09	47WW09-101607-FD	50/50	10		10/24/07 17:41
84	P2.102407.174751	WG253767-24	CCV		1		10/24/07 17:47
85	P2.102407.175407	WG253767-25	CCB		1		10/24/07 17:54
86	P2.102407.180018	WG253667-02	Method/Prep Blank	50/50	1		10/24/07 18:00
87	P2.102407.180633	WG253667-03	Laboratory Control S	50/50	1		10/24/07 18:06
88	P2.102407.181252	WG253667-01	Reference Sample		1	L0710552-02	10/24/07 18:12
89	P2.102407.181911	WG253667-04	Matrix Spike	50/50	1		10/24/07 18:19
90	P2.102407.182530	WG253667-05	Matrix Spike Duplica	50/50	1		10/24/07 18:25
91	P2.102407.183150	L0710552-01	001-SW	50/50	1		10/24/07 18:31
92	P2.102407.183805	L0710553-01	008	50/50	1		10/24/07 18:38
93	P2.102407.184420	L0710544-02	NSIU021001/COMP	50/50	1		10/24/07 18:44
94	P2.102407.185040	WG253748-01	Post Digestion Spike		1	L0710544-02	10/24/07 18:50
95	P2.102407.185700	WG253748-02	Serial Dilution		5	L0710544-02	10/24/07 18:57
96	P2.102407.190319	WG253767-26	CCV		1		10/24/07 19:03
97	P2.102407.190935	WG253767-27	CCB		1		10/24/07 19:09
98	P2.102407.191546	L0710591-01	PARSONS \#1 FRAC POND	50/50	1	WG253524-01	10/24/07 19:15
99	P2.102407.192202	L0710594-02	SPRING 1	50/50	1		10/24/07 19:22
100	P2.102407.192818	WG253767-28	CCV		1		10/24/07 19:28
101	P2.102407.193434	WG253767-29	CCB		1		10/24/07 19:34
102	P2.102407.194045	WG253714-02	Method/Prep Blank	50/50	1		10/24/07 19:40
103	P2.102407.194700	WG253714-03	Laboratory Control S	50/50	1		10/24/07 19:47
104	P2.102407.195319	WG253629-01	Fluid Blank		1		10/24/07 19:53
105	P2.102407.195938	WG253714-01	Reference Sample		1	L0710499-01	10/24/07 19:59
106	P2.102407.200602	WG253714-04	Matrix Spike	5/50	1		10/24/07 20:06
107	P2.102407.201222	WG253714-05	Matrix Spike Duplicate	5/50	1		10/24/07 20:12
108	P2.102407.201842	L0710499-03	LOWER LOT BURN PILE N	5/50	1		10/24/07 20:18
109	P2.102407.202502	L0710499-02	LOWER LOT BURN PILE S	5/50	1		10/24/07 20:25
110	P2.102407.203121	WG253772-01	Post Digestion Spike		1		10/24/07 20:31
111	P2.102407.203741	WG253772-02	Serial Dilution		5		10/24/07 20:37

Approved: October 25, 2007
Maren Beery

KEMRON Environmental Services

Instrument Run Log

Instrument:	PE-ICP2	Dataset:	102407H.CSV		
Analyst1:	KRV	Analyst2:	N/A		
Method:	6010B	SOP:	ME600E	Rev:	6
Maintenance Log ID:	21437				

Calibration Std:	STD22439	ICV/CCV Std:	STD22609	Post Spike:	STD22493
ICSA:	STD22610	ICSAB:	STD22567		

Workgroups: 253688, 253535, 252879, 253625, 253748, 253772

Comments:

Seq.	File ID	Sample	ID	Prep	Dil	Reference	Date/Time
112	P2.102407.204400	WG253767-30	CCV		1		10/24/07 20:44
113	P2.102407.205016	WG253767-31	CCB		1		10/24/07 20:50
114	P2.102407.205627	L0710520-01	ATHENS CO	5/50	1		10/24/07 20:56
115	P2.102407.210246	L0710522-01	WASHINGTON CO	5/50	1		10/24/07 21:02
116	P2.102407.210906	L0710532-01	#1 STRIPPING COLUMN	5/50	1		10/24/07 21:09
117	P2.102407.211526	WG253767-32	CCV		1		10/24/07 21:15
118	P2.102407.212142	WG253767-33	CCB		1		10/24/07 21:21

Comments

Seq.	Rerun	Dil.	Reason	Analytes
98				

Al TN; needs reanalyzed @ dil. for Al.

Page: 4

Approved: October 25, 2007

Maren Beery

Run Log ID:**18970**

00101273

KEMRON Environmental Services

Instrument Run Log

Instrument: PE-ICP2 Dataset: 102507H2.CSV

Analyst1: SLP Analyst2: N/A

Method: 6010B SOP: ME600E Rev: 6

Maintenance Log ID: 21452

Calibration Std: STD22439 ICV/CCV Std: STD22609 Post Spike: STD22493

ICSA: STD22610 ICSAB: STD22567

Workgroups: 253686, 253161, 253625, 253748, 253858, 253859

Comments:

Seq.	File ID	Sample	ID	Prep	Dil	Reference	Date/Time
1	P2.102507.102000	WG253888-01	Calibration Point		1		10/25/07 10:20
2	P2.102507.102612	WG253888-02	Calibration Point		1		10/25/07 10:26
3	P2.102507.103227	WG253888-03	Calibration Point		1		10/25/07 10:32
4	P2.102507.103845	WG253888-04	Calibration Point		1		10/25/07 10:38
5	P2.102507.104503	WG253888-05	Calibration Point		1		10/25/07 10:45
6	P2.102507.105133	WG253888-06	Initial Calibration Verification		1		10/25/07 10:51
7	P2.102507.105756	WG253888-07	Initial Calib Blank		1		10/25/07 10:57
8	P2.102507.110412	WG253888-08	Interference Check		1		10/25/07 11:04
9	P2.102507.110932	WG253888-09	Interference Check		1		10/25/07 11:09
10	P2.102507.111515	WG253888-10	Interference Check		1		10/25/07 11:15
11	P2.102507.112035	WG253888-11	Interference Check		1		10/25/07 11:20
12	P2.102507.112556	WG253888-12	CCV		1		10/25/07 11:25
13	P2.102507.113218	WG253888-13	CCB		1		10/25/07 11:32
14	P2.102507.113838	L0710345-01	IDL1-ICP-PE2	50/50	1		10/25/07 11:38
15	P2.102507.114457	L0710345-02	IDL2-ICP-PE2	50/50	1		10/25/07 11:44
16	P2.102507.115115	L0710345-03	IDL3-ICP-PE2	50/50	1		10/25/07 11:51
17	P2.102507.115736	L0710345-04	IDL4-ICP-PE2	50/50	1		10/25/07 11:57
18	P2.102507.120349	L0710345-05	IDL5-ICP-PE2	50/50	1		10/25/07 12:03
19	P2.102507.121008	L0710345-06	IDL6-ICP-PE2	50/50	1		10/25/07 12:10
20	P2.102507.121626	L0710345-07	IDL7-ICP-PE2	50/50	1		10/25/07 12:16
21	P2.102507.122239	WG253888-14	CCV		1		10/25/07 12:22
22	P2.102507.122903	WG253888-15	CCB		1		10/25/07 12:29
23	P2.102507.123524	WG252913-02	Method/Prep Blank	50/50	1		10/25/07 12:35
24	P2.102507.124144	WG252913-03	Laboratory Control S	50/50	1		10/25/07 12:41
25	P2.102507.124806	L0710229-02	C-004	50/50	1		10/25/07 12:48
26	P2.102507.125423	WG253161-01	Post Digestion Spike		1	L0710229-02	10/25/07 12:54
27	P2.102507.130048	L0710356-01	GP-OFFSITE-INF	50/50	1		10/25/07 13:00
28	P2.102507.130615	L0710356-02	GP-ONSITE-PRESW	50/50	1		10/25/07 13:06
29	P2.102507.131238	L0710356-03	GP-ONSITE-POSTSW	50/50	1		10/25/07 13:12
30	P2.102507.131856	L0710356-04	GP-ONSITE-INF	50/50	1		10/25/07 13:18
31	P2.102507.132517	L0710356-05	GP-OFFSITE-EFF	50/50	1		10/25/07 13:25
32	P2.102507.133144	WG252913-01	Reference Sample		1	L0710356-06	10/25/07 13:31
33	P2.102507.133752	WG253888-16	CCV		1		10/25/07 13:37
34	P2.102507.134413	WG253888-17	CCB		1		10/25/07 13:44
35	P2.102507.135035	WG252913-04	Matrix Spike	50/50	1		10/25/07 13:50
36	P2.102507.135600	WG252913-05	Matrix Spike Duplica	50/50	1		10/25/07 13:56
37	P2.102507.140152	L0710557-01	47WW08-101707	50/50	10		10/25/07 14:01

Page: 1

Approved: October 26, 2007

Maren Beery

KEMRON Environmental Services

Instrument Run Log

Instrument: PE-ICP2 Dataset: 102507H2.CSV
Analyst1: SLP Analyst2: N/A
Method: 6010B SOP: ME600E Rev: 6
Maintenance Log ID: 21452

Calibration Std: STD22439 ICV/CCV Std: STD22609 Post Spike: STD22493
ICSA: STD22610 ICSAB: STD22567

Workgroups: 253686, 253161, 253625, 253748, 253858, 253859

Comments:

Seq.	File ID	Sample	ID	Prep	Dil	Reference	Date/Time
38	P2.102507.140812	WG253625-02	Serial Dilution		50	L0710557-01	10/25/07 14:08
39	P2.102507.141433	WG253625-01	POST SPIKE DIGESTION		10	L0710557-01	10/25/07 14:14
40	P2.102507.142057	L0710591-01	PARSONS \#1 FRAC POND	50/50	2		10/25/07 14:20
41	P2.102507.142721	WG253888-18	CCV		1		10/25/07 14:27
42	P2.102507.143353	WG253888-19	CCB		1		10/25/07 14:33
43	P2.102507.144206	L0710356-02	GP-ONSITE-PRESW	50/50	5		10/25/07 14:42
44	P2.102507.144820	L0710356-03	GP-ONSITE-POSTSW	50/50	5		10/25/07 14:48
45	P2.102507.145446	L0710356-04	GP-ONSITE-INF	50/50	5		10/25/07 14:54
46	P2.102507.150114	L0710356-05	GP-OFFSITE-EFF	50/50	5		10/25/07 15:01
47	P2.102507.150736	WG252913-01	Reference Sample		2	L0710356-06	10/25/07 15:07
48	P2.102507.151357	WG252913-04	Matrix Spike	50/50	2		10/25/07 15:13
49	P2.102507.152016	WG252913-05	Matrix Spike Duplica	50/50	2		10/25/07 15:20
50	P2.102507.152631	WG253888-20	CCV		1		10/25/07 15:26
51	P2.102507.153301	WG253888-21	CCB		1		10/25/07 15:33
52	P2.102507.153718	WG253555-02	Method/Prep Blank	50/50	1		10/25/07 15:37
53	P2.102507.154332	WG253555-03	Laboratory Control S	50/50	1		10/25/07 15:43
54	P2.102507.154959	L0710441-02	C-004-LAB FILTER	50/50	1		10/25/07 15:49
55	P2.102507.155615	WG253858-02	Serial Dilution		5	L0710441-02	10/25/07 15:56
56	P2.102507.160233	WG253858-01	Post Digestion Spike		1	L0710441-02	10/25/07 16:02
57	P2.102507.160906	WG253555-01	Reference Sample		1	L0710572-02	10/25/07 16:09
58	P2.102507.161522	WG253555-04	Matrix Spike	50/50	1		10/25/07 16:15
59	P2.102507.162144	WG253555-05	Matrix Spike Duplica	50/50	1		10/25/07 16:21
60	P2.102507.162820	L0710572-04	TWP-02	50/50	1		10/25/07 16:28
61	P2.102507.163438	WG253888-22	CCV		1		10/25/07 16:34
62	P2.102507.164059	WG253888-23	CCB		1		10/25/07 16:40
63	P2.102507.164717	WG253666-02	Method/Prep Blank	50/50	1		10/25/07 16:47
64	P2.102507.165337	WG253666-03	Laboratory Control S	50/50	1		10/25/07 16:53
65	P2.102507.170002	L0710603-01	SE-3026P	50/50	1		10/25/07 17:00
66	P2.102507.170623	L0710610-01	GP-01	50/50	1		10/25/07 17:06
67	P2.102507.171153	L0710610-02	GP-02	50/50	1		10/25/07 17:11
68	P2.102507.171712	L0710610-03	GP-03	50/50	1		10/25/07 17:17
69	P2.102507.172234	L0710610-04	GP-04	50/50	1		10/25/07 17:22
70	P2.102507.172759	WG253666-01	Reference Sample		1	L0710524-04	10/25/07 17:27
71	P2.102507.173412	WG253666-04	Matrix Spike	50/50	1	L0710524-05	10/25/07 17:34
72	P2.102507.174036	WG253666-05	Matrix Spike Duplica	50/50	1	L0710524-06	10/25/07 17:40
73	P2.102507.174656	WG253888-24	CCV		1		10/25/07 17:46
74	P2.102507.175317	WG253888-25	CCB		1		10/25/07 17:53

Page: 2 Approved: October 26, 2007

Maren Beery

KEMRON Environmental Services
Instrument Run Log

Instrument: PE-ICP2 Dataset: 102507H2.CSV
Analyst1: SLP Analyst2: N/A
Method: 6010B SOP: ME600E Rev: 6
Maintenance Log ID: 21452

Calibration Std: STD22439 ICV/CCV Std: STD22609 Post Spike: STD22493
ICSA: STD22610 ICSAB: STD22567

Workgroups: 253686, 253161, 253625, 253748, 253858, 253859

Comments:

Seq.	File ID	Sample	ID	Prep	Dil	Reference	Date/Time
75	P2.102507.175934	L0710524-11	MW2D-218-14	50/50	1		10/25/07 17:59
76	P2.102507.180553	WG253859-02	Serial Dilution		5	L0710524-11	10/25/07 18:05
77	P2.102507.181213	WG253859-01	Post Digestion Spike		1	L0710524-11	10/25/07 18:12
78	P2.102507.181838	WG253888-26	CCV		1		10/25/07 18:18
79	P2.102507.182500	WG253888-27	CCB		1		10/25/07 18:25
80	P2.102507.183116	L0710404-01	POND 012		10		10/25/07 18:31
81	P2.102507.183736	L0710404-02	POND 012		10		10/25/07 18:37
82	P2.102507.184351	L0710404-03	POND 016		10		10/25/07 18:43
83	P2.102507.185016	L0710404-04	POND 016		10		10/25/07 18:50
84	P2.102507.185639	L0710404-05	POND 017		10		10/25/07 18:56
85	P2.102507.190258	L0710404-06	POND 017		10		10/25/07 19:02
86	P2.102507.190912	L0710404-07	POND 018		10		10/25/07 19:09
87	P2.102507.191535	L0710404-08	POND 018		10		10/25/07 19:15
88	P2.102507.192200	Blank	Blank		1		10/25/07 19:22
89	P2.102507.192813	Blank	Blank		1		10/25/07 19:28
90	P2.102507.193431	WG253888-28	CCV		1		10/25/07 19:34
91	P2.102507.194052	WG253888-29	CCB		1		10/25/07 19:40
92	P2.102507.195350	L0710524-14	MW4A-218-14	50/50	1		10/25/07 19:53
93	P2.102507.200003	L0710524-17	MW4C-218-14	50/50	1		10/25/07 20:00
94	P2.102507.200620	L0710524-20	MW4C2-218-14	50/50	1		10/25/07 20:06
95	P2.102507.201241	L0710524-23	MW5A-218-14	50/50	1		10/25/07 20:12
96	P2.102507.201856	L0710524-26	OW1A-218-14	50/50	1		10/25/07 20:18
97	P2.102507.202520	L0710524-29	OW2A-218-14	50/50	1		10/25/07 20:25
98	P2.102507.203140	L0710524-32	OW3A-218-14	50/50	1		10/25/07 20:31
99	P2.102507.203754	L0710573-01	ELK-01	50/50	1		10/25/07 20:37
100	P2.102507.204421	L0710574-01	LAS-01	50/50	1		10/25/07 20:44
101	P2.102507.205128	L0710574-03	LAS-02	50/50	1		10/25/07 20:51
102	P2.102507.205748	WG253888-30	CCV		1		10/25/07 20:57
103	P2.102507.210413	WG253888-31	CCB		1		10/25/07 21:04
104	P2.102507.211038	L0710576-01	ALS-01	50/50	1		10/25/07 21:10
105	P2.102507.211657	L0710539-02	MIN-01	50/50	1		10/25/07 21:16
106	P2.102507.212323	L0710539-04	MIN-02	50/50	1		10/25/07 21:23
107	P2.102507.212952	L0710540-02	SWL-01	50/50	1		10/25/07 21:29
108	P2.102507.213612	L0710540-04	SWL-01D	50/50	1		10/25/07 21:36
109	P2.102507.214239	L0710541-02	MTE-01	50/50	1		10/25/07 21:42
110	P2.102507.214907	L0710542-02	STA-01	50/50	1		10/25/07 21:49
111	P2.102507.215526	L0710543-02	SUC-01	50/50	1		10/25/07 21:55

Page: 3 Approved: October 26, 2007

Maren Beery

KEMRON Environmental Services
Instrument Run Log

Instrument: PE-ICP2 Dataset: 102507H2.CSV
Analyst1: SLP Analyst2: N/A
Method: 6010B SOP: ME600E Rev: 6
Maintenance Log ID: 21452

Calibration Std: STD22439 ICV/CCV Std: STD22609 Post Spike: STD22493
ICSA: STD22610 ICSAB: STD22567

Workgroups: 253686, 253161, 253625, 253748, 253858, 253859

Comments:

Seq.	File ID	Sample	ID	Prep	Dil	Reference	Date/Time
112	P2.102507.220214	L0710543-04	SUC-02	50/50	1		10/25/07 22:02
113	P2.102507.220841	L0710571-02	LCR-01	50/50	1		10/25/07 22:08
114	P2.102507.221500	WG253888-32	CCV		1		10/25/07 22:15
115	P2.102507.222126	WG253888-33	CCB		1		10/25/07 22:21
116	P2.102507.222751	L0710573-02	ELK-01	50/50	1		10/25/07 22:27
117	P2.102507.223410	L0710574-02	LAS-01	50/50	1		10/25/07 22:34
118	P2.102507.224036	L0710574-04	LAS-02	50/50	1		10/25/07 22:40
119	P2.102507.224702	L0710575-02	WAR 01	50/50	1		10/25/07 22:47
120	P2.102507.225321	L0710575-04	WAR 02	50/50	1		10/25/07 22:53
121	P2.102507.225946	L0710575-06	WAR 03	50/50	1		10/25/07 22:59
122	P2.102507.230613	L0710576-02	ALS-01	50/50	1		10/25/07 23:06
123	P2.102507.231233	L0710610-04	GP-04	50/50	5		10/25/07 23:12
124	P2.102507.231901	WG253888-34	CCV		1		10/25/07 23:19
125	P2.102507.232525	WG253888-35	CCB		1		10/25/07 23:25

Comments

Seq.	Rerun	Dil.	Reason	Analytes
8			Reanalyzed due to Ba failure.	
9			Reanalyzed due to K failure.	
55			Analyst failed to add sample to serial dilution; data not used.	

Approved: October 26, 2007
Maren Beery

KEMRON Environmental Services
Data Checklist

Date: 23-OCT-2007
Analyst: KRV
Analyst: NA
Method: 6010
Instrument: PE-ICP2
Curve Workgroup: WG253698
Runlog ID: 18927
Analytical Workgroups: 252879,253535,253625

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	539,540,541,542,543,571,572
Level 3	557
Level 4	453
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	KRV
Secondary Reviewer	MMB
Comments	

Primary Reviewer:
24-OCT-2007
Katie Vickers

Secondary Reviewer:
24-OCT-2007
Maren Beery

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KEMRON Environmental Services
Data Checklist

Date: 24-OCT-2007
Analyst: KRV
Analyst: NA
Method: 6010
Instrument: PE-ICP2
Curve Workgroup: 253767
Runlog ID: 18947
Analytical Workgroups: 253688, 253535, 252879, 253625, 253748, 253772

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	523, 551, 556, 572, 299, 557, 591, 520, 522
Client Forms	X
Level X	572, 520, 522
Level 3	557
Level 4	523, 551, 556
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	SLP
Secondary Reviewer	MMB
Comments	

Primary Reviewer:
25-OCT-2007
Sheri L. Pfalzgraf

Secondary Reviewer:
25-OCT-2007
Maren Beery

Generated: OCT-25-2007 14:50:30

KEMRON Environmental Services
Data Checklist

Date: 25-OCT-2007
Analyst: SLP
Analyst: NA
Method: 6010B
Instrument: PE-ICP2
Curve Workgroup: 253888
Runlog ID: 18970
Analytical Workgroups: 253161, 253625, 253748, 253858, 253859

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	356, 557, 591, 572, 539, 540, 541, 542, 543,
	571, 573, 574, 575, 576, 603, 610
Client Forms	X
Level X	572, 539, 540, 541, 542, 543, 571, 573, 574,
	575, 576
Level 3	557
Level 4	356
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	SLP
Secondary Reviewer	MMB
Comments	

Primary Reviewer:
26-OCT-2007
Sheri L. Pfalzgraf

Secondary Reviewer:
26-OCT-2007
Maren Beery

Generated: OCT-26-2007 14:51:46

KEMRON Environmental Services
HOLDING TIMES
EQUIVALENT TO AFCEE FORM 9

Analytical Method: 6010B	AAB#: WG253625

Login Number: L0710557

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
47WW09-101607	10/16/07	10/19/07	10/23/07	180	6.58	10/23/07	180	0.674	
47WW09-101607-FD	10/16/07	10/19/07	10/23/07	180	6.58	10/23/07	180	0.719	
47WW08-101707	10/17/07	10/19/07	10/23/07	180	5.90	10/24/07	180	1.48	
47WW09-101607	10/16/07	10/19/07	10/23/07	180	6.58	10/24/07	180	1.47	
47WW19-101707	10/17/07	10/19/07	10/23/07	180	5.82	10/24/07	180	1.49	
47WW19-101707	10/17/07	10/19/07	10/23/07	180	5.82	10/23/07	180	0.692	
47WW08-101707	10/17/07	10/19/07	10/23/07	180	5.90	10/25/07	180	2.34	
47WW09-101607-FD	10/16/07	10/19/07	10/23/07	180	6.58	10/24/07	180	1.49	
47WW08-101707	10/17/07	10/19/07	10/23/07	180	5.90	10/23/07	180	0.697	
47WW13-101607	10/16/07	10/19/07	10/23/07	180	6.56	10/23/07	180	0.688	

* EXT = SEE PROJECT QAPP REQUIREMENTS
*ANAL = SEE PROJECT QAPP REQUIREMENTS

KEMRON FORMS - Modified 11/20/2006
Version 1.5	PDF File ID: 914793
Report generated	10/26/2007 09:21

METHOD BLANK SUMMARY

Login Number: L0710557
Work Group: WG253625
Blank File ID: P2.102307.214816
Blank Sample ID: WG253556-02
Prep Date: 10/23/07 05:50
Instrument ID: PE-ICP2
Analyzed Date: 10/23/07 21:48
Method: 6010B
Analyst: KRV

This Method Blank Applies To The Following Samples:

Client ID	Lab Sample ID	Lab File ID	Time Analyzed	TAG
LCS	WG253556-03	P2.102307.215436	10/23/07 21:54	01
47WW09-101607	L0710557-04	P2.102307.220101	10/23/07 22:01	01
47WW13-101607	L0710557-05	P2.102307.222018	10/23/07 22:20	01
47WW19-101707	L0710557-06	P2.102307.222639	10/23/07 22:26	01
47WW08-101707	L0710557-01	P2.102307.223258	10/23/07 22:32	01
47WW09-101607-FD	L0710557-09	P2.102307.230458	10/23/07 23:04	01
47WW09-101607	L0710557-04	P2.102407.170338	10/24/07 17:03	DL01
47WW08-101707	L0710557-01	P2.102407.172235	10/24/07 17:22	DL01
47WW19-101707	L0710557-06	P2.102407.173513	10/24/07 17:35	DL01
47WW09-101607-FD	L0710557-09	P2.102407.174132	10/24/07 17:41	DL01
47WW08-101707	L0710557-01	P2.102507.140152	10/25/07 14:01	DL02

METHOD BLANK REPORT

Login Number: L0710557
Prep Date: 10/23/07 05:50
Sample ID: WG253556-02
Instrument ID: PE-ICP2
Run Date: 10/23/07 21:48
Prep Method: 3005A
File ID: P2.102307.214816
Analyst: KRV
Method: 6010B
Workgroup (AAB#): WG253625
Matrix: Water
Units: mg/L
Contract #: DACA56-94-D-0020
Cal ID: PE-ICP - 23-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: 914795
Report generated 10/24/2007 10:28

LABORATORY CONTROL SAMPLE (LCS)

00101283

Login Number: L0710557
Run Date: 10/23/2007
Sample ID: WG253556-03
Instrument ID: PE-ICP2
Run Time: 21:54
Prep Method: 3005A
File ID: P2.102307.215436
Analyst: KRV
Method: 6010B
Workgroup (AAB#): WG253625
Matrix: Water
Units: mg/L
QC Key: STD
Lot#: MI0058-81
Cal ID: PE-ICP - 23-OCT-07

Analytes	Expected	Found	% Rec	LCS Limits	Q
Aluminum, Dissolved	5.00	4.94	98.7	85 - 115	
Beryllium, Dissolved	0.0250	0.0245	97.9	85 - 115	
Calcium, Dissolved	5.00	4.90	98.1	85 - 115	
Cobalt, Dissolved	0.100	0.0998	99.8	85 - 115	
Iron, Dissolved	2.00	2.00	99.9	85 - 115	
Potassium, Dissolved	25.0	24.2	96.9	85 - 115	
Magnesium, Dissolved	5.00	5.02	100	85 - 115	
Sodium, Dissolved	25.0	25.9	104	85 - 115	
Vanadium, Dissolved	0.500	0.506	101	85 - 115	
Zinc, Dissolved	0.500	0.504	101	85 - 115	

KEMRON FORMS - Modified 09/06/2007
Version 1.5 PDF File ID: 914796
Report generated 10/24/2007 10:28

MATRIX SPIKE AND MATRIX SPIKE DUP (MS/MSD)

00101284

Loginnum: L0710557 Cal ID: PE-ICP2 - Worknum: WG253625
Instrument ID: PE-ICP2 Contract #: DACA56-94-D-0020 Method: 6010B
Parent ID: WG253556-01 File ID: P2.102307.220101 Dil: 1 Matrix: WATER
Sample ID: WG253556-04 MS File ID: P2.102307.220727 Dil: 1 Units: mg/L
Sample ID: WG253556-05 MSD File ID: P2.102307.221351 Dil: 1

Analyte	Parent	MS Spiked	MS Found	MS %Rec	MSD Spiked	MSD Found	MSD %Rec	%RPD	%Rec Limits	RPD Limit	Q
Aluminum, Dissolved	ND	5.00	4.80	95.9	5.00	4.73	94.7	1.31	80 - 120	20	
Beryllium, Dissolved	ND	0.0250	0.0238	95.4	0.0250	0.0240	95.9	0.513	80 - 120	20	
Calcium, Dissolved	176	5.00	180	80.4	5.00	180	73.5	0.193	80 - 120	20	*
Cobalt, Dissolved	ND	0.100	0.0961	96.1	0.100	0.0961	96.1	0.0731	80 - 120	20	
Iron, Dissolved	0.196	2.00	2.21	101	2.00	2.15	97.9	2.53	80 - 120	20	
Magnesium, Dissolved	124	5.00	127	73.0	5.00	125	32.8	1.59	80 - 120	20	*
Potassium, Dissolved	6.68	25.0	40.8	136	25.0	40.2	134	1.34	80 - 120	20	*
Zinc, Dissolved	ND	0.500	0.471	94.3	0.500	0.472	94.4	0.162	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: 914797
Report generated 10/25/2007 11:13

MATRIX SPIKE AND MATRIX SPIKE DUP (MS/MSD)

Loginnum:L0710557 Cal ID: PE-ICP2 - Worknum:WG253625

Instrument ID:PE-ICP2 Contract #:DACA56-94-D-0020 Method:6010B

Parent ID:WG253556-01 File ID:P2.102407.170338 Dil:10 Matrix:WATER

Sample ID:WG253556-04 MS File ID:P2.102407.170957 Dil:10 Units:mg/L

Sample ID:WG253556-05 MSD File ID:P2.102407.171616 Dil:10

Analyte	Parent	MS Spiked	MS Found	MS %Rec	MSD Spiked	MSD Found	MSD %Rec	%RPD	%Rec Limits	RPD Limit	Q
Sodium, Dissolved	633	25.0	666	132	25.0	711	313	6.57	80 - 120	20	*
Vanadium, Dissolved	ND	0.500	0.495	99.1	0.500	0.483	96.6	2.52	80 - 120	20	

* FAILS %REC LIMIT

FAILS RPD LIMIT

NOTE: This is an internal quality control sample.

KEMRON ENVIRONMENTAL SERVICES
SERIAL DILUTION REPORT

Sample Login ID: L0710557 Worknum: WG253625
Instrument ID: PE-ICP2 Method: 6010B
Sample ID: L0710557-01 File ID: P2.102307.223258 Dil: 1 Units: mg/L
Serial Dilution ID: WG253625-02 File ID: P2.102307.224548 Dil: 5

Analyte	Sample	C	Serial Dilution	C	% Difference	Q
Aluminum	0	U	ND	U		
Beryllium	ND	U	0	U		
Calcium	179		162		9.50	
Cobalt	0.0510	X	0.0525	X	2.94	
Iron	1.51		1.55	X	2.65	
Magnesium	91.9		93.0		1.20	
Potassium	7.13	X	6.43	X	9.82	
Sodium	645		972		50.7	E
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: 914791
Report generated 10/26/2007 09:21

KEMRON ENVIRONMENTAL SERVICES
SERIAL DILUTION REPORT

Sample Login ID: L0710557 Worknum: WG253625
Instrument ID: PE-ICP2 Method: 6010B
Sample ID: L0710557-01 File ID: P2.102507.140152 Dil: 10 Units: mg/L
Serial Dilution ID: WG253625-02 File ID: P2.102507.140812 Dil: 50

Analyte	Sample	C	Serial Dilution	C	% Difference	Q
Aluminum	0	U	0	U		
Beryllium	0	U	0	U		
Calcium	157		155	X	1.27	
Cobalt	0.0579	X	0	U	100	E
Iron	1.70	X	1.96	F	15.3	E
Magnesium	95.5	X	96.3	X	0.838	
Potassium	5.72	F	0	U	100	E
Sodium	1010		1000		0.990	
Vanadium	ND	U	0	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: 914791
Report generated 10/26/2007 09:21

KEMRON ENVIRONMENTAL SERVICES
POST SPIKE REPORT

Sample Login ID: L0710557 **Worknum:** WG253625
Instrument ID: PE-ICP2 **Method:** 6010B
Post Spike ID: WG253625-01 **File ID:** P2.102307.223921 **Dil:** 1 **Units:** mg/L
Sample ID: L0710557-01 **File ID:** P2.102307.223258 **Dil:** 1 **Matrix:** Water

Analyte	Post Spike Result	C	Sample Result	C	Spike Added(SA)	% R	Control Limit %R	Q
ALUMINUM	4.88		0	U	5	97.6	75 - 125	
BERYLLIUM	0.0245		0	U	.025	97.9	75 - 125	
CALCIUM	161		179		5	-05.9	75 - 125	N
COBALT	0.141		0.0510		.1	95.3	75 - 125	
IRON	3.37		1.51		2	100.9	75 - 125	
MAGNESIUM	86.9		91.9		5	83.0	75 - 125	
POTASSIUM	42.3		7.13		25	143.7	75 - 125	N
SODIUM	624		645		25	173.6	75 - 125	N
VANADIUM	0.498		0	U	.5	99.6	75 - 125	
ZINC	0.477		0	U	.5	95.3	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: 914792
Report generated 10/26/2007 09:21

KEMRON ENVIRONMENTAL SERVICES
POST SPIKE REPORT

Sample Login ID: L0710557 **Worknum:** WG253625
Instrument ID: PE-ICP2 **Method:** 6010B
Post Spike ID: WG253625-01 **File ID:** P2.102407.172854 **Dil:** 10 **Units:** mg/L
Sample ID: L0710557-01 **File ID:** P2.102407.172235 **Dil:** 10 **Matrix:** Water

Analyte	Post Spike Result	C	Sample Result	C	Spike Added(SA)	% R	Control Limit %R	Q
ALUMINUM	5.65		0	U	5	113.1	75 - 125	
BERYLLIUM	0.0259		0	U	.025	103.5	75 - 125	
CALCIUM	21.4		17.4		5	80.2	75 - 125	
COBALT	0.107		0.00632	F	.1	100.2	75 - 125	
IRON	2.39		0.175		2	111.0	75 - 125	
MAGNESIUM	14.5		10.5		5	80.3	75 - 125	
POTASSIUM	32.1		0.603	F	25	125.9	75 - 125	N
SODIUM	122		111		25	42.4	75 - 125	N
VANADIUM	0.515		0	U	.5	102.9	75 - 125	
ZINC	0.524		0	U	.5	104.9	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: 914792
Report generated 10/26/2007 09:21

KEMRON ENVIRONMENTAL SERVICES
POST SPIKE REPORT

Sample Login ID: L0710557 **Worknum:** WG253625
Instrument ID: PE-ICP2 **Method:** 6010B
Post Spike ID: WG253625-01 **File ID:** P2.102507.141433 **Dil:** 10 **Units:** mg/L
Sample ID: L0710557-01 **File ID:** P2.102507.140152 **Dil:** 10 **Matrix:** Water

Analyte	Post Spike Result	C	Sample Result	C	Spike Added(SA)	% R	Control Limit %R	Q
ALUMINUM	4.97		0	U	5	99.5	75 - 125	
BERYLLIUM	0.0254		0	U	.025	101.5	75 - 125	
CALCIUM	21.3		15.7		5	111.4	75 - 125	
COBALT	0.108		0.00579	F	.1	102.3	75 - 125	
IRON	2.25		0.170		2	103.9	75 - 125	
MAGNESIUM	14.5		9.55		5	99.5	75 - 125	
POTASSIUM	28.7		0.572	F	25	112.7	75 - 125	
SODIUM	122		101		25	85.6	75 - 125	
VANADIUM	0.512		0	U	.5	102.5	75 - 125	
ZINC	0.522		0	U	.5	104.5	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

INITIAL CALIBRATION SUMMARY

00101291

Login Number: L0710557
Workgroup (AAB#): WG253625
Analytical Method: 6010B
Instrument ID: PE-ICP2
ICAL Worknum: WG253698
Initial Calibration Date: 23-OCT-2007 14:23

Analyte	WG253698-01		WG253698-02		WG253698-03		WG253698-04		WG253698-05			
	STD	INT	STD	INT	STD	INT	STD	INT	STD	INT	R	Q
Aluminum	0	202.5440168	.1	386.8121548	.2	793.9468694	10	38855.46937	20	78058.94767	0.999998	
Beryllium	0	-1032.72104	.0005	245.5457162	.001	557.6694099	.05	27542.47352	.1	55373.89031	0.999997	
Calcium	0	-71.3462133	.1	22.05496642	.2	33.09975797	10	1455.733237	20	2994.983339	0.999897	
Cobalt	0	-68.8687380	.002	60.28939924	.004	126.5601654	.1	6756.798227	.4	13409.85951	0.999992	
Iron	0	1.036388351	.04	12.63366691	.08	28.98457965	4	1334.441237	8	2659.520091	0.999998	
Magnesium	0	20.26619535	.1	30.17397647	.2	72.19918054	10	3755.101924	20	7475.902198	0.999997	
Potassium	0	-593.691265	.5	1132.172168	1	2497.549436	50	146436.8984	100	312664.1914	1.00000	
Sodium	0	574.2637915	.5	2849.862584	1	5966.378379	50	328938.2959	100	685710.0318	1.00000	
Vanadium	0	5907.371173	.01	1102.561692	.02	2103.473579	1	106737.1133	2	212929.8874	0.999999	
Zinc	0	6.638753297	.01	210.5584816	.02	402.8573471	1	18812.56948	2	37200.66587	0.999986	

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: 914800
Report generated 10/26/2007 09:21

INITIAL CALIBRATION SUMMARY

Login Number: L0710557 Workgroup (AAB#): WG253625

Analytical Method: 6010B Instrument ID: PE-ICP2

ICAL Worknum: WG253767 Initial Calibration Date: 24-OCT-2007 08:09

Analyte	WG253767-01		WG253767-02		WG253767-03		WG253767-04		WG253767-05			
	STD	INT	STD	INT	STD	INT	STD	INT	STD	INT	R	Q
Aluminum	0	83.60915806	.1	313.8322017	.2	731.2114641	10	37722.19107	20	75809.46724	0.999997	
Beryllium	0	-1054.72739	.0005	248.9338847	.001	528.9949179	.05	25579.31807	.1	52486.81204	0.999924	
Calcium	0	-73.6703099	.1	5.597649776	.2	28.91058494	10	1363.240591	20	2873.998083	0.999692	
Cobalt	0	-70.0688806	.002	63.7669947	.004	131.8688958	.1	6389.650257	.4	12889.15303	0.999991	
Iron	0	-1.40086666	.04	14.77850787	.08	24.98730772	4	1235.32471	8	2437.639869	0.999979	
Magnesium	0	16.26595303	.1	29.51028359	.2	70.16251661	10	3484.357199	20	6920.75267	0.999994	
Potassium	0	-556.234534	.5	1106.043902	1	2405.244939	50	141967.1845	100	304341.2165	1.00000	
Sodium	0	1260.639372	.5	2868.59564	1	5861.35917	50	334529.0561	100	689994.2974	1.00000	
Vanadium	0	5744.28869	.01	1080.780907	.02	1976.297921	1	100853.7696	2	203239.7876	0.999993	
Zinc	0	61.8340795	.01	147.7524855	.02	309.394432	1	17414.0022	2	35030.58674	0.999996	

INT = Instrument intensity
R = Coefficient of correlation
Q = Data Qualifier
*** = Out of Compliance; R < 0.995**

INITIAL CALIBRATION SUMMARY

00101293

Login Number: L0710557 Workgroup (AAB#): WG253625
Analytical Method: 6010B Instrument ID: PE-ICP2
ICAL Worknum: WG253888 Initial Calibration Date: 25-OCT-2007 10:45

Analyte	WG253888-01		WG253888-02		WG253888-03		WG253888-04		WG253888-05			
	STD	INT	STD	INT	STD	INT	STD	INT	STD	INT	R	Q
Aluminum	0	70.41924717	.1	330.0416206	.2	664.6763943	10	35770.07448	20	73416.05282	0.999925	
Beryllium	0	-1038.41976	.0005	270.0210405	.001	532.6310389	.05	25778.12619	.1	52742.02974	0.999939	
Calcium	0	-92.9262304	.1	18.18929717	.2	32.40210137	10	1375.344957	20	2866.044174	0.999796	
Cobalt	0	-51.4643141	.002	61.97946674	.004	128.7773267	.1	6394.444347	.4	12978.11402	0.999975	
Iron	0	.9373450836	.04	9.944322486	.08	22.59092705	4	1184.457206	8	2388.672142	0.999993	
Magnesium	0	13.88743561	.1	30.05120806	.2	68.7200696	10	3402.639375	20	6866.447382	0.999991	
Potassium	0	-450.559698	.5	1069.465812	1	2272.673753	50	135236.2691	100	293550.1039	1.00000	
Sodium	0	878.2218508	.5	2880.174582	1	5691.580667	50	324166.8829	100	670176.1493	1.00000	
Vanadium	0	6048.915088	.01	937.6756949	.02	1950.321801	1	100467.0633	2	205498.5496	0.999943	
Zinc	0	14.38051257	.01	190.0208559	.02	387.8171019	1	17782.9781	2	35852.73454	0.999991	

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: 914800
Report generated 10/26/2007 09:21

KEMRON Environmental Services
INITIAL CALIBRATION BLANK (ICB)

Login Number: L0710557
Run Date: 10/23/2007
Sample ID: WG253698-07
Instrument ID: PE-ICP2
Run Time: 14:36
Method: 6010
File ID: P2.102307.143614
Analyst: KRV
Units: mg/L
Workgroup (AAB#): WG253625
Cal ID: PE-ICP2 - 23-OCT-07
Matrix: WATER

Analytes	MDL	RDL	Concentration	Dilution	Qualifier
ALUMINUM	.05	.1	-.014	1	U
BERYLLIUM	.0005	.002	.0000311	1	U
CALCIUM	.1	.2	-.00406	1	U
COBALT	.0025	.005	-.0000748	1	U
IRON	.025	.1	-.00423	1	U
MAGNESIUM	.25	.5	-.0166	1	U
POTASSIUM	.25	1	.116	1	U
SODIUM	.25	.5	.0608	1	U
VANADIUM	.005	.01	-.000403	1	U
ZINC	.005	.02	-.00232	1	U

KEMRON FORMS - Modified 10/02/2007
Version 2.0 PDF File ID: 914802
Report generated 10/26/2007 09:21

KEMRON Environmental Services

INITIAL CALIBRATION BLANK (ICB)

Login Number: L0710557
Run Date: 10/24/2007
Sample ID: WG253767-07
Instrument ID: PE-ICP2
Run Time: 08:22
Method: 6010
File ID: P2.102407.082201
Analvst: KRV
Units: mg/L
Workgroup (AAB#): WG253625
Cal ID: PE-ICP2 - 24-OCT-07
Matrix: WATER

Analytes	MDL	RDL	Concentration	Dilution	Qualifier
ALUMINUM	.05	.1	-.00885	1	U
BERYLLIUM	.0005	.002	.000196	1	U
CALCIUM	.1	.2	.0365	1	U
COBALT	.0025	.005	.000333	1	U
IRON	.025	.1	-.00163	1	U
MAGNESIUM	.25	.5	-.0135	1	U
POTASSIUM	.25	1	.0579	1	U
SODIUM	.25	.5	.0135	1	U
VANADIUM	.005	.01	.00162	1	U
ZINC	.005	.02	.00243	1	U

KEMRON FORMS - Modified 10/02/2007
Version 2.0 PDF File ID: 914802
Report generated 10/26/2007 09:21

KEMRON Environmental Services
INITIAL CALIBRATION BLANK (ICB)

Login Number: L0710557
Run Date: 10/25/2007
Sample ID: WG253888-07
Instrument ID: PE-ICP2
Run Time: 10:57
Method: 6010
File ID: P2.102507.105756
Analyst: SLP
Units: mg/L
Workgroup (AAB#): WG253625
Cal ID: PE-ICP2 - 25-OCT-07
Matrix: WATER

Analytes	MDL	RDL	Concentration	Dilution	Qualifier
ALUMINUM	.05	.1	.0228	1	U
BERYLLIUM	.0005	.002	.000165	1	U
CALCIUM	.1	.2	.0911	1	U
COBALT	.0025	.005	.000266	1	U
IRON	.025	.1	.000919	1	U
MAGNESIUM	.25	.5	.00841	1	U
POTASSIUM	.25	1	.0692	1	U
SODIUM	.25	.5	.044	1	U
VANADIUM	.005	.01	.00303	1	U
ZINC	.005	.02	.000233	1	U

KEMRON FORMS - Modified 10/02/2007
Version 2.0 PDF File ID: 914802
Report generated 10/26/2007 09:21

CONTINUING CALIBRATION BLANK (CCB)

00101297

Login Number: L0710557
Run Date: 10/23/2007
Sample ID: WG253698-11
Instrument ID: PE-ICP2
Run Time: 15:00
Method: 6010B
File ID: P2.102307.150000
Analyst: KRV
Units: mg/L
Workgroup (AAB#): WG253625
Cal ID: PE-ICP - 23-OCT-07
Matrix: WATER

Analytes	MDL	RDL	Concentration	Dilution	Qualifier
Aluminum	0.0500	0.100	-0.00225	1	U
Beryllium	0.000500	0.00200	0.0000543	1	U
Calcium	0.100	0.200	0.0488	1	U
Cobalt	0.00250	0.00500	-0.000270	1	U
Iron	0.0250	0.100	-0.00571	1	U
Potassium	0.250	1.00	0.0490	1	U
Magnesium	0.250	0.500	-0.0134	1	U
Sodium	0.250	0.500	0.0508	1	U
Vanadium	0.00500	0.0100	0.000438	1	U
Zinc	0.00500	0.0200	-0.00219	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: 914805
Report generated 10/26/2007 09:21

CONTINUING CALIBRATION BLANK (CCB)

00101298

Login Number: L0710557
Run Date: 10/23/2007
Sample ID: WG253698-23
Instrument ID: PE-ICP2
Run Time: 21:41
Method: 6010B
File ID: P2.102307.214155
Analyst: KRV
Units: mg/L
Workgroup (AAB#): WG253625
Cal ID: PE-ICP - 23-OCT-07
Matrix: WATER

Analytes	MDL	RDL	Concentration	Dilution	Qualifier
Aluminum	0.0500	0.100	0.0114	1	U
Beryllium	0.000500	0.00200	0.0000571	1	U
Calcium	0.100	0.200	0.0186	1	U
Cobalt	0.00250	0.00500	0.000170	1	U
Iron	0.0250	0.100	0.00299	1	U
Potassium	0.250	1.00	0.143	1	U
Magnesium	0.250	0.500	-0.0118	1	U
Sodium	0.250	0.500	0.125	1	U
Vanadium	0.00500	0.0100	0.000322	1	U
Zinc	0.00500	0.0200	-0.00241	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: 914805
Report generated 10/26/2007 09:21

CONTINUING CALIBRATION BLANK (CCB)

Login Number: L0710557
Run Date: 10/23/2007
Sample ID: WG253698-25
Instrument ID: PE-ICP2
Run Time: 22:58
Method: 6010B
File ID: P2.102307.225842
Analyst: KRV
Units: mg/L
Workgroup (AAB#): WG253625
Cal ID: PE-ICP - 23-OCT-07
Matrix: WATER

Analytes	MDL	RDL	Concentration	Dilution	Qualifier
Aluminum	0.0500	0.100	0.000978	1	U
Beryllium	0.000500	0.00200	-0.0000191	1	U
Calcium	0.100	0.200	-0.00749	1	U
Cobalt	0.00250	0.00500	0.0000479	1	U
Iron	0.0250	0.100	0.000356	1	U
Potassium	0.250	1.00	0.127	1	U
Magnesium	0.250	0.500	-0.00444	1	U
Sodium	0.250	0.500	0.319	1	F
Vanadium	0.00500	0.0100	0.00130	1	U
Zinc	0.00500	0.0200	-0.00243	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: 914805
Report generated 10/26/2007 09:21

CONTINUING CALIBRATION BLANK (CCB)

00101300

Login Number: L0710557
Run Date: 10/23/2007
Sample ID: WG253698-27
Instrument ID: PE-ICP2
Run Time: 23:17
Method: 6010B
File ID: P2.102307.231738
Analyst: KRV
Units: mg/L
Workgroup (AAB#): WG253625
Cal ID: PE-ICP - 23-OCT-07
Matrix: WATER

Analytes	MDL	RDL	Concentration	Dilution	Qualifier
Aluminum	0.0500	0.100	-0.00158	1	U
Beryllium	0.000500	0.00200	-0.00000547	1	U
Calcium	0.100	0.200	0.0257	1	U
Cobalt	0.00250	0.00500	0.0000954	1	U
Iron	0.0250	0.100	-0.00482	1	U
Potassium	0.250	1.00	0.112	1	U
Magnesium	0.250	0.500	-0.00779	1	U
Sodium	0.250	0.500	0.260	1	F
Vanadium	0.00500	0.0100	0.000467	1	U
Zinc	0.00500	0.0200	-0.00257	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: 914805
Report generated 10/26/2007 09:21

CONTINUING CALIBRATION BLANK (CCB)

00101301

Login Number: L0710557
Run Date: 10/24/2007
Sample ID: WG253767-11
Instrument ID: PE-ICP2
Run Time: 08:45
Method: 6010B
File ID: P2.102407.084532
Analyst: KRV
Units: mg/L
Workgroup (AAB#): WG253625
Cal ID: PE-ICP - 24-OCT-07
Matrix: WATER

Analytes	MDL	RDL	Concentration	Dilution	Qualifier
Aluminum	0.0500	0.100	-0.00728	1	U
Beryllium	0.000500	0.00200	0.000196	1	U
Calcium	0.100	0.200	0.0427	1	U
Cobalt	0.00250	0.00500	0.000330	1	U
Iron	0.0250	0.100	-0.00323	1	U
Potassium	0.250	1.00	0.0675	1	U
Magnesium	0.250	0.500	-0.0159	1	U
Sodium	0.250	0.500	-0.0115	1	U
Vanadium	0.00500	0.0100	0.00349	1	U
Zinc	0.00500	0.0200	0.00234	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: 914805
Report generated 10/26/2007 09:21

CONTINUING CALIBRATION BLANK (CCB)

00101302

Login Number: L0710557
Run Date: 10/24/2007
Sample ID: WG253767-23
Instrument ID: PE-ICP2
Run Time: 16:57
Method: 6010B
File ID: P2.102407.165727
Analyst: KRV
Units: mg/L
Workgroup (AAB#): WG253625
Cal ID: PE-ICP - 24-OCT-07
Matrix: WATER

Analytes	MDL	RDL	Concentration	Dilution	Qualifier
Aluminum	0.0500	0.100	-0.0186	1	U
Beryllium	0.000500	0.00200	0.000218	1	U
Calcium	0.100	0.200	0.000804	1	U
Cobalt	0.00250	0.00500	0.000467	1	U
Iron	0.0250	0.100	-0.00138	1	U
Potassium	0.250	1.00	0.0699	1	U
Magnesium	0.250	0.500	-0.0143	1	U
Sodium	0.250	0.500	-0.0284	1	U
Vanadium	0.00500	0.0100	0.00269	1	U
Zinc	0.00500	0.0200	-0.000592	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: 914805
Report generated 10/26/2007 09:21

CONTINUING CALIBRATION BLANK (CCB)

00101303

Login Number: L0710557 Run Date: 10/24/2007 Sample ID: WG253767-25
Instrument ID: PE-ICP2 Run Time: 17:54 Method: 6010B
File ID: P2.102407.175407 Analyst: KRV Units: mg/L
Workgroup (AAB#): WG253625 Cal ID: PE-ICP - 24-OCT-07
Matrix: WATER

Analytes	MDL	RDL	Concentration	Dilution	Qualifier
Aluminum	0.0500	0.100	0.000401	1	U
Beryllium	0.000500	0.00200	0.000191	1	U
Calcium	0.100	0.200	0.0137	1	U
Cobalt	0.00250	0.00500	0.000394	1	U
Iron	0.0250	0.100	0.00306	1	U
Potassium	0.250	1.00	0.0497	1	U
Magnesium	0.250	0.500	-0.0214	1	U
Sodium	0.250	0.500	-0.0228	1	U
Vanadium	0.00500	0.0100	0.00375	1	U
Zinc	0.00500	0.0200	-0.000410	1	U

U = Result is less than MDL
F = Result is between MDL and RL
* = Result is above RL

CONTINUING CALIBRATION BLANK (CCB)

Login Number: L0710557
Run Date: 10/25/2007
Sample ID: WG253888-13
Instrument ID: PE-ICP2
Run Time: 11:32
Method: 6010B
File ID: P2.102507.113218
Analyst: SLP
Units: mg/L
Workgroup (AAB#): WG253625
Cal ID: PE-ICP - 25-OCT-07
Matrix: WATER

Analytes	MDL	RDL	Concentration	Dilution	Qualifier
Aluminum	0.0500	0.100	0.0207	1	U
Beryllium	0.000500	0.00200	0.000166	1	U
Calcium	0.100	0.200	0.0752	1	U
Cobalt	0.00250	0.00500	0.000398	1	U
Iron	0.0250	0.100	0.0105	1	U
Potassium	0.250	1.00	0.0391	1	U
Magnesium	0.250	0.500	0.0166	1	U
Sodium	0.250	0.500	0.0228	1	U
Vanadium	0.00500	0.0100	0.00260	1	U
Zinc	0.00500	0.0200	0.000177	1	U

U = Result is less than MDL
F = Result is between MDL and RL
* = Result is above RL

CONTINUING CALIBRATION BLANK (CCB)

00101305

Login Number: L0710557
Run Date: 10/25/2007
Sample ID: WG253888-17
Instrument ID: PE-ICP2
Run Time: 13:44
Method: 6010B
File ID: P2.102507.134413
Analyst: SLP
Units: mg/L
Workgroup (AAB#): WG253625
Cal ID: PE-ICP - 25-OCT-07
Matrix: WATER

Analytes	MDL	RDL	Concentration	Dilution	Qualifier
Aluminum	0.0500	0.100	0.0356	1	U
Beryllium	0.000500	0.00200	0.000188	1	U
Calcium	0.100	0.200	0.0691	1	U
Cobalt	0.00250	0.00500	0.000173	1	U
Iron	0.0250	0.100	0.00250	1	U
Potassium	0.250	1.00	0.0670	1	U
Magnesium	0.250	0.500	0.00118	1	U
Sodium	0.250	0.500	0.0710	1	U
Vanadium	0.00500	0.0100	0.00318	1	U
Zinc	0.00500	0.0200	0.0000207	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: 914805
Report generated 10/26/2007 09:21

CONTINUING CALIBRATION BLANK (CCB)

Login Number: L0710557
Run Date: 10/25/2007
Sample ID: WG253888-19
Instrument ID: PE-ICP2
Run Time: 14:33
Method: 6010B
File ID: P2.102507.143353
Analyst: SLP
Units: mg/L
Workgroup (AAB#): WG253625
Cal ID: PE-ICP - 25-OCT-07
Matrix: WATER

Analytes	MDL	RDL	Concentration	Dilution	Qualifier
Aluminum	0.0500	0.100	0.0305	1	U
Beryllium	0.000500	0.00200	0.000211	1	U
Calcium	0.100	0.200	0.0648	1	U
Cobalt	0.00250	0.00500	0.000355	1	U
Iron	0.0250	0.100	0.00188	1	U
Potassium	0.250	1.00	0.0322	1	U
Magnesium	0.250	0.500	0.00848	1	U
Sodium	0.250	0.500	0.157	1	U
Vanadium	0.00500	0.0100	0.00237	1	U
Zinc	0.00500	0.0200	-0.000244	1	U

U = Result is less than MDL
F = Result is between MDL and RL
* = Result is above RL

INITIAL CALIBRATION VERIFICATION (ICV)

00101307

Login Number: L0710557
Run Date: 10/23/2007
Sample ID: WG253698-06
Instrument ID: PE-ICP2
Run Time: 14:29
Method: 6010B
File ID: P2.102307.142958
Analyst: KRV
Units: mg/L
Workgroup (AAB#): WG253625
Cal ID: PE-ICP - 23-OCT-07
QC Key: STD

Analyte		Expected	Found	%REC	LIMITS	Q
Aluminum		10	10.1	101	90 - 110	
Beryllium		.05	0.0498	99.5	90 - 110	
Calcium		10	10.3	103	90 - 110	
Cobalt		.2	0.201	101	90 - 110	
Iron		4	4.08	102	90 - 110	
Potassium		50	50.3	101	90 - 110	
Magnesium		10	10.0	100	90 - 110	
Sodium		50	50.7	101	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: 914801
Report generated 10/26/2007 09:21

INITIAL CALIBRATION VERIFICATION (ICV)

00101308

Login Number: L0710557
Run Date: 10/24/2007
Sample ID: WG253767-06
Instrument ID: PE-ICP2
Run Time: 08:15
Method: 6010B
File ID: P2.102407.081539
Analyst: KRV
Units: mg/L
Workgroup (AAB#): WG253625
Cal ID: PE-ICP - 24-OCT-07
QC Key: STD

Analyte		Expected	Found	%REC	LIMITS	Q
Aluminum		10	10.0	100	90 - 110	
Beryllium		.05	0.0502	100	90 - 110	
Calcium		10	10.3	103	90 - 110	
Cobalt		.2	0.201	100	90 - 110	
Iron		4	4.11	103	90 - 110	
Potassium		50	50.4	101	90 - 110	
Magnesium		10	10.1	101	90 - 110	
Sodium		50	49.6	99.3	90 - 110	
Vanadium		1	1.00	100	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: 914801
Report generated 10/26/2007 09:21

INITIAL CALIBRATION VERIFICATION (ICV)

00101309

Login Number: L0710557
Instrument ID: PE-ICP2
File ID: P2.102507.105133
Workgroup (AAB#): WG253625
QC Key: STD

Run Date: 10/25/2007
Run Time: 10:51
Analyst: SLP
Cal ID: PE-ICP - 25-OCT-07

Sample ID: WG253888-06
Method: 6010B
Units: mg/L

Analyte		Expected	Found	%REC	LIMITS	Q
Aluminum		10	10.1	101	90 - 110	
Beryllium		.05	0.0484	96.7	90 - 110	
Calcium		10	10.2	102	90 - 110	
Cobalt		.2	0.197	98.3	90 - 110	
Iron		4	4.13	103	90 - 110	
Potassium		50	51.3	103	90 - 110	
Magnesium		10	10.1	101	90 - 110	
Sodium		50	51.0	102	90 - 110	
Vanadium		1	0.964	96.4	90 - 110	
Zinc		1	1.00	100	90 - 110	

* Exceeds LIMITS Limit

KEMRON FORMS - Modified 09/06/2007 (ICV)
Version 1.5 PDF File ID: 914801
Report generated 10/26/2007 09:21

CONTINUING CALIBRATION VERIFICATION (CCV)

00101310

Login Number: L0710557
Run Date: 10/23/2007
Sample ID: WG253698-10
Instrument ID: PE-ICP2
Run Time: 14:53
Method: 6010B
File ID: P2.102307.145336
Analyst: KRV
QC Key: STD
Workgroup (AAB#): WG253625
Cal ID: PE-ICP - 23-OCT-07

Analyte		Expected	Found	UNITS	%REC	LIMITS		Q
Aluminum		10.0	10.2	mg/L	102	90 - 110		
Beryllium		0.0500	0.0497	mg/L	99.3	90 - 110		
Calcium		10.0	10.2	mg/L	102	90 - 110		
Cobalt		0.200	0.199	mg/L	99.3	90 - 110		
Iron		4.00	4.19	mg/L	105	90 - 110		
Potassium		50.0	50.4	mg/L	101	90 - 110		
Magnesium		10.0	10.3	mg/L	103	90 - 110		
Sodium		50.0	50.9	mg/L	102	90 - 110		
Vanadium		1.00	0.994	mg/L	99.4	90 - 110		
Zinc		1.00	1.03	mg/L	103	90 - 110		

* Exceeds LIMITS Criteria

KEMRON FORMS - Modified 09/06/2007 - (CCV)
Version 1.5 PDF File ID: 914804
Report generated 10/26/2007 09:21

CONTINUING CALIBRATION VERIFICATION (CCV)

00101311

Login Number: L0710557 Run Date: 10/23/2007 Sample ID: WG253698-22
Instrument ID: PE-ICP2 Run Time: 21:35 Method: 6010B
File ID: P2.102307.213533 Analyst: KRV QC Key: STD
Workgroup (AAB#): WG253625 Cal ID: PE-ICP - 23-OCT-07

Analyte		Expected	Found	UNITS	%REC	LIMITS		Q
Aluminum		10.0	10.1	mg/L	101	90 - 110		
Beryllium		0.0500	0.0488	mg/L	97.6	90 - 110		
Calcium		10.0	10.2	mg/L	102	90 - 110		
Cobalt		0.200	0.197	mg/L	98.7	90 - 110		
Iron		4.00	4.06	mg/L	101	90 - 110		
Potassium		50.0	50.5	mg/L	101	90 - 110		
Magnesium		10.0	10.0	mg/L	100	90 - 110		
Sodium		50.0	51.9	mg/L	104	90 - 110		
Vanadium		1.00	0.983	mg/L	98.3	90 - 110		
Zinc		1.00	1.01	mg/L	101	90 - 110		

* Exceeds LIMITS Criteria

KEMRON FORMS - Modified 09/06/2007 - (CCV)
Version 1.5 PDF File ID: 914804
Report generated 10/26/2007 09:21

CONTINUING CALIBRATION VERIFICATION (CCV)

00101312

Login Number: L0710557
Run Date: 10/23/2007
Sample ID: WG253698-24
Instrument ID: PE-ICP2
Run Time: 22:52
Method: 6010B
File ID: P2.102307.225213
Analvst: KRV
QC Key: STD
Workgroup (AAB#): WG253625
Cal ID: PE-ICP - 23-OCT-07

Analyte		Expected	Found	UNITS	%REC	LIMITS		Q
Aluminum		10.0	10.1	mg/L	101	90 - 110		
Beryllium		0.0500	0.0491	mg/L	98.1	90 - 110		
Calcium		10.0	10.2	mg/L	102	90 - 110		
Cobalt		0.200	0.199	mg/L	99.3	90 - 110		
Iron		4.00	4.07	mg/L	102	90 - 110		
Potassium		50.0	51.0	mg/L	102	90 - 110		
Magnesium		10.0	10.1	mg/L	101	90 - 110		
Sodium		50.0	53.1	mg/L	106	90 - 110		
Vanadium		1.00	0.989	mg/L	98.9	90 - 110		
Zinc		1.00	1.01	mg/L	101	90 - 110		

* Exceeds LIMITS Criteria

KEMRON FORMS - Modified 09/06/2007 - (CCV)
Version 1.5 PDF File ID: 914804
Report generated 10/26/2007 09:21

CONTINUING CALIBRATION VERIFICATION (CCV)

00101313

Login Number: L0710557 Run Date: 10/23/2007 Sample ID: WG253698-26
Instrument ID: PE-ICP2 Run Time: 23:11 Method: 6010B
File ID: P2.102307.231117 Analyst: KRV QC Key: STD
Workgroup (AAB#): WG253625 Cal ID: PE-ICP - 23-OCT-07

Analyte		Expected	Found	UNITS	%REC	LIMITS		Q
Aluminum		10.0	10.1	mg/L	101	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	0.196	mg/L	98.1	90 - 110		
Iron		4.00	4.13	mg/L	103	90 - 110		
Potassium		50.0	51.0	mg/L	102	90 - 110		
Magnesium		10.0	10.2	mg/L	102	90 - 110		
Sodium		50.0	53.6	mg/L	107	90 - 110		
Vanadium		1.00	0.971	mg/L	97.1	90 - 110		
Zinc		1.00	0.996	mg/L	99.6	90 - 110		

* Exceeds LIMITS Criteria

KEMRON FORMS - Modified 09/06/2007 - (CCV)
Version 1.5 PDF File ID: 914804
Report generated 10/26/2007 09:21

CONTINUING CALIBRATION VERIFICATION (CCV)

00101314

Login Number: L0710557 Run Date: 10/24/2007 Sample ID: WG253767-10
Instrument ID: PE-ICP2 Run Time: 08:39 Method: 6010B
File ID: P2.102407.083901 Analyst: KRV QC Key: STD
Workgroup (AAB#): WG253625 Cal ID: PE-ICP - 24-OCT-07

Analyte		Expected	Found	UNITS	%REC	LIMITS		Q
Aluminum		10.0	10.2	mg/L	102	90 - 110		
Beryllium		0.0500	0.0506	mg/L	101	90 - 110		
Calcium		10.0	10.4	mg/L	104	90 - 110		
Cobalt		0.200	0.202	mg/L	101	90 - 110		
Iron		4.00	4.11	mg/L	103	90 - 110		
Potassium		50.0	50.9	mg/L	102	90 - 110		
Magnesium		10.0	10.1	mg/L	101	90 - 110		
Sodium		50.0	50.0	mg/L	100	90 - 110		
Vanadium		1.00	1.01	mg/L	101	90 - 110		
Zinc		1.00	1.05	mg/L	105	90 - 110		

* Exceeds LIMITS Criteria

KEMRON FORMS - Modified 09/06/2007 - (CCV)
Version 1.5 PDF File ID: 914804
Report generated 10/26/2007 09:21

CONTINUING CALIBRATION VERIFICATION (CCV)

00101315

Login Number: L0710557
Run Date: 10/24/2007
Sample ID: WG253767-22
Instrument ID: PE-ICP2
Run Time: 16:51
Method: 6010B
File ID: P2.102407.165111
Analyst: KRV
QC Key: STD
Workgroup (AAB#): WG253625
Cal ID: PE-ICP - 24-OCT-07

Analyte		Expected	Found	UNITS	%REC	LIMITS		Q
Aluminum		10.0	10.1	mg/L	101	90 - 110		
Beryllium		0.0500	0.0510	mg/L	102	90 - 110		
Calcium		10.0	10.5	mg/L	105	90 - 110		
Cobalt		0.200	0.202	mg/L	101	90 - 110		
Iron		4.00	3.98	mg/L	99.4	90 - 110		
Potassium		50.0	50.5	mg/L	101	90 - 110		
Magnesium		10.0	9.75	mg/L	97.5	90 - 110		
Sodium		50.0	48.3	mg/L	96.5	90 - 110		
Vanadium		1.00	1.00	mg/L	100	90 - 110		
Zinc		1.00	1.05	mg/L	105	90 - 110		

* Exceeds LIMITS Criteria

KEMRON FORMS - Modified 09/06/2007 - (CCV)
Version 1.5 PDF File ID: 914804
Report generated 10/26/2007 09:21

CONTINUING CALIBRATION VERIFICATION (CCV)

00101316

Login Number: L0710557
Run Date: 10/24/2007
Sample ID: WG253767-24
Instrument ID: PE-ICP2
Run Time: 17:47
Method: 6010B
File ID: P2.102407.174751
Analyst: KRV
QC Key: STD
Workgroup (AAB#): WG253625
Cal ID: PE-ICP - 24-OCT-07

Analyte		Expected	Found	UNITS	%REC	LIMITS		Q
Aluminum		10.0	10.0	mg/L	100	90 - 110		
Beryllium		0.0500	0.0507	mg/L	101	90 - 110		
Calcium		10.0	10.2	mg/L	102	90 - 110		
Cobalt		0.200	0.200	mg/L	100	90 - 110		
Iron		4.00	4.05	mg/L	101	90 - 110		
Potassium		50.0	50.2	mg/L	100	90 - 110		
Magnesium		10.0	9.97	mg/L	99.7	90 - 110		
Sodium		50.0	49.6	mg/L	99.2	90 - 110		
Vanadium		1.00	0.993	mg/L	99.3	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: 914804
Report generated 10/26/2007 09:21

CONTINUING CALIBRATION VERIFICATION (CCV)

00101317

Login Number: L0710557 Run Date: 10/25/2007 Sample ID: WG253888-12
Instrument ID: PE-ICP2 Run Time: 11:25 Method: 6010B
File ID: P2.102507.112556 Analyst: SLP QC Key: STD
Workgroup (AAB#): WG253625 Cal ID: PE-ICP - 25-OCT-07

Analyte		Expected	Found	UNITS	%REC	LIMITS		Q
Aluminum		10.0	10.0	mg/L	100	90 - 110		
Beryllium		0.0500	0.0494	mg/L	98.9	90 - 110		
Calcium		10.0	10.3	mg/L	103	90 - 110		
Cobalt		0.200	0.200	mg/L	100	90 - 110		
Iron		4.00	4.13	mg/L	103	90 - 110		
Potassium		50.0	50.6	mg/L	101	90 - 110		
Magnesium		10.0	10.1	mg/L	101	90 - 110		
Sodium		50.0	50.0	mg/L	100	90 - 110		
Vanadium		1.00	0.988	mg/L	98.8	90 - 110		
Zinc		1.00	1.03	mg/L	103	90 - 110		

* Exceeds LIMITS Criteria

KEMRON FORMS - Modified 09/06/2007 - (CCV)
Version 1.5 PDF File ID: 914804
Report generated 10/26/2007 09:21

CONTINUING CALIBRATION VERIFICATION (CCV)

00101318

Login Number: L0710557
Run Date: 10/25/2007
Sample ID: WG253888-16
Instrument ID: PE-ICP2
Run Time: 13:37
Method: 6010B
File ID: P2.102507.133752
Analyst: SLP
QC Key: STD
Workgroup (AAB#): WG253625
Cal ID: PE-ICP - 25-OCT-07

Analyte		Expected	Found	UNITS	%REC	LIMITS		Q
Aluminum		10.0	10.1	mg/L	101	90 - 110		
Beryllium		0.0500	0.0496	mg/L	99.2	90 - 110		
Calcium		10.0	10.3	mg/L	103	90 - 110		
Cobalt		0.200	0.200	mg/L	99.8	90 - 110		
Iron		4.00	4.10	mg/L	103	90 - 110		
Potassium		50.0	51.2	mg/L	102	90 - 110		
Magnesium		10.0	10.1	mg/L	101	90 - 110		
Sodium		50.0	49.6	mg/L	99.3	90 - 110		
Vanadium		1.00	0.986	mg/L	98.6	90 - 110		
Zinc		1.00	1.03	mg/L	103	90 - 110		

* Exceeds LIMITS Criteria

KEMRON FORMS - Modified 09/06/2007 - (CCV)
Version 1.5 PDF File ID: 914804
Report generated 10/26/2007 09:21

CONTINUING CALIBRATION VERIFICATION (CCV)

00101319

Login Number: L0710557 Run Date: 10/25/2007 Sample ID: WG253888-18
Instrument ID: PE-ICP2 Run Time: 14:27 Method: 6010B
File ID: P2.102507.142721 Analvst: SLP QC Key: STD
Workgroup (AAB#): WG253625 Cal ID: PE-ICP - 25-OCT-07

Analyte		Expected	Found	UNITS	%REC	LIMITS		Q
Aluminum		10.0	10.1	mg/L	101	90 - 110		
Beryllium		0.0500	0.0505	mg/L	101	90 - 110		
Calcium		10.0	10.4	mg/L	104	90 - 110		
Cobalt		0.200	0.203	mg/L	101	90 - 110		
Iron		4.00	4.19	mg/L	105	90 - 110		
Potassium		50.0	51.4	mg/L	103	90 - 110		
Magnesium		10.0	10.2	mg/L	102	90 - 110		
Sodium		50.0	50.4	mg/L	101	90 - 110		
Vanadium		1.00	1.00	mg/L	100	90 - 110		
Zinc		1.00	1.05	mg/L	105	90 - 110		

* Exceeds LIMITS Criteria

KEMRON FORMS - Modified 09/06/2007 - (CCV)
Version 1.5 PDF File ID: 914804
Report generated 10/26/2007 09:21

Login number: L0710557
Instrument ID: PE-ICP2
Sol. A : WG253698-08 **File ID:** P2.102307.144249
Sol. AB : WG253698-09 **File ID:** P2.102307.144813
Workgroup (AAB#): WG253625
Method: 6010B
Units: mg/L

	Sol. A			Sol. AB			
ANALYTE	True	Found	%Recovery	True	Found	%Recovery	Q
Aluminum	250	252	101	250	255	102	
Beryllium	NS	-0.0000400	NS	0.250	0.250	100	
Calcium	250	268	107	250	266	106	
Cobalt	NS	0.000480	NS	0.250	0.228	91.2	
Iron	100	100	100	100	101	101	
Magnesium	250	252	101	250	254	102	
Potassium	NS	0.0172	NS	5.00	5.78	116	
Sodium	NS	0.0649	NS	5.00	5.70	114	
Vanadium	NS	0.00341	NS	0.250	0.252	101	
Zinc	NS	0.00550	NS	0.500	0.471	94.2	

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).

Login number: L0710557

Instrument ID: PE-ICP2

Sol. A : WG253767-08 **File ID:** P2.102407.082818

Sol. AB : WG253767-09 **File ID:** P2.102407.083337

Workgroup (AAB#): WG253625

Method: 6010B

Units: mg/L

	Sol. A			Sol. AB			
ANALYTE	True	Found	%Recovery	True	Found	%Recovery	Q
Aluminum	250	251	100	250	251	100	
Beryllium	NS	0.000390	NS	0.250	0.256	102	
Calcium	250	271	108	250	273	109	
Cobalt	NS	0.000910	NS	0.250	0.233	93.2	
Iron	100	99.0	99.0	100	100	100	
Magnesium	250	251	100	250	253	101	
Potassium	NS	-0.0112	NS	5.00	5.86	117	
Sodium	NS	0.0325	NS	5.00	5.55	111	
Vanadium	NS	0.00474	NS	0.250	0.259	104	
Zinc	NS	0.00587	NS	0.500	0.485	97.0	

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: 914803
Report generated 10/26/2007 09:21

Login number: L0710557 **Workgroup (AAB#):** WG253625
Instrument ID: PE-ICP2 **Method:** 6010B
Sol. A : WG253888-10 **File ID:** P2.102507.111515 **Units:** mg/L
Sol. AB : WG253888-11 **File ID:** P2.102507.112035

	Sol. A			Sol. AB			
ANALYTE	True	Found	%Recovery	True	Found	%Recovery	Q
Aluminum	250	255	102	250	250	100	
Beryllium	NS	-0.0000100	NS	0.250	0.247	98.8	
Calcium	250	275	110	250	273	109	
Cobalt	NS	0.000680	NS	0.250	0.230	92.0	
Iron	100	99.9	99.9	100	98.8	98.8	
Magnesium	250	251	100	250	249	99.6	
Potassium	NS	-0.0741	NS	5.00	5.90	118	
Sodium	NS	0.0335	NS	5.00	5.49	110	
Vanadium	NS	0.00535	NS	0.250	0.256	102	
Zinc	NS	0.00722	NS	0.500	0.473	94.6	

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).

INTERELEMENT CORRECTION FACTORS (ANNUALLY)

00101323

Login Number: L0710557 **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

KEMRON FORMS - Modified 02/14/2006
Version 1.5 PDF File ID: 914799
Report generated 10/26/2007 09:21

INTERELEMENT CORRECTION FACTORS (ANNUALLY)

Login Number: L0710557 **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

INTERELEMENT CORRECTION FACTORS (ANNUALLY)

00101325

Login Number: L0710557 **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

INTERELEMENT CORRECTION FACTORS (ANNUALLY)

00101326

Login Number: L0710557 **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

KEMRON FORMS - Modified 02/14/2006
Version 1.5 PDF File ID: 914799
Report generated 10/26/2007 09:21

INTERELEMENT CORRECTION FACTORS (ANNUALLY)

00101327

Login Number: L0710557 **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

KEMRON FORMS - Modified 02/14/2006
Version 1.5 PDF File ID: 914799
Report generated 10/26/2007 09:21

INTERELEMENT CORRECTION FACTORS (ANNUALLY)

00101328

Login Number: L0710557 **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

KEMRON FORMS - Modified 02/14/2006
Version 1.5 PDF File ID: 914799
Report generated 10/26/2007 09:21

LINEAR RANGE (QUARTERLY)

00101329

Login Number: L0710557 **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

00101332

L0710557

10/29/07 13:41

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: LHAAP

P.O. Number: 322255 OP

Sample Analysis Summary

Client ID	Lab ID	Method	Dilution	Date Received
47WW08-101707	L0710557-01	6020	10	19-OCT-07
47WW08-101707	L0710557-01	6020	100	19-OCT-07
47WW09-101607	L0710557-04	6020	10	19-OCT-07
47WW13-101607	L0710557-05	6020	10	19-OCT-07
47WW19-101707	L0710557-06	6020	10	19-OCT-07
47WW09-101607-FD	L0710557-09	6020	10	19-OCT-07

Sample Number:**L0710557-01**
Client ID:**47WW08-101707**
Matrix:**Water**
Workgroup Number:**WG253588**
Collect Date:**10/17/2007 08:10**
Sample Tag:**DL01**

PrePrep Method:**NONE**
Prep Method:**3015**
Analytical Method:**6020**
Analyst:**JYH**
Dilution:**10**
Units:**mg/L**

Instrument:**ELAN-ICP**
Prep Date:**10/22/2007 07:00**
Cal Date:**10/24/2007 14:40**
Run Date:**10/24/2007 15:40**
File ID:**EL.102407.154024**

Analyte	CAS. Number	Result	Qual	PQL	SDL
Silver, Dissolved	7440-22-4		U	0.0100	0.00250
Arsenic, Dissolved	7440-38-2	0.00532	J	0.0100	0.00250
Barium, Dissolved	7440-39-3	0.0433		0.0300	0.00500
Cadmium, Dissolved	7440-43-9		U	0.00500	0.00125
Chromium, Dissolved	7440-47-3	0.0725		0.0200	0.00500
Copper, Dissolved	7440-50-8		U	0.0200	0.00500
Lead, Dissolved	7439-92-1		U	0.00500	0.00250
Manganese, Dissolved	7439-96-5	2.06		0.0200	0.00500
Antimony, Dissolved	7440-36-0		U	0.0100	0.00250
Selenium, Dissolved	7782-49-2	0.0256		0.0100	0.00500
Thallium, Dissolved	7440-28-0	0.00410		0.00200	0.000500

J The analyte was positively identified, but the quantitation was below the RL
U Not detected at or above adjusted sample detection limit

Sample Number:L0710557-01
Client ID:47WW08-101707
Matrix:Water
Workgroup Number:WG253588
Collect Date:10/17/2007 08:10
Sample Tag:DL02

PrePrep Method:NONE
Prep Method:3015
Analytical Method:6020
Analyst:JYH
Dilution:100
Units:mg/L

Instrument:ELAN-ICP
Prep Date:10/22/2007 07:00
Cal Date:10/25/2007 09:37
Run Date:10/25/2007 15:07
File ID:EL.102507.150701

Analyte	CAS. Number	Result	Qual	PQL	SDL
Nickel, Dissolved	7440-02-0	7.41		0.400	0.100

Sample Number:L0710557-04
Client ID:47WW09-101607
Matrix:Water
Workgroup Number:WG253588
Collect Date:10/16/2007 15:50
Sample Tag:DL01

PrePrep Method:NONE
Prep Method:3015
Analytical Method:6020
Analyst:JYH
Dilution:10
Units:mg/L

Instrument:ELAN-ICP
Prep Date:10/22/2007 07:00
Cal Date:10/24/2007 14:40
Run Date:10/24/2007 15:48
File ID:EL.102407.154803

Analyte	CAS. Number	Result	Qual	PQL	SDL
Silver, Dissolved	7440-22-4		U	0.0100	0.00250
Arsenic, Dissolved	7440-38-2	0.00391	J	0.0100	0.00250
Barium, Dissolved	7440-39-3	0.0183	J	0.0300	0.00500
Cadmium, Dissolved	7440-43-9		U	0.00500	0.00125
Chromium, Dissolved	7440-47-3	0.00923	J	0.0200	0.00500
Copper, Dissolved	7440-50-8		U	0.0200	0.00500
Lead, Dissolved	7439-92-1		U	0.00500	0.00250
Manganese, Dissolved	7439-96-5	0.141		0.0200	0.00500
Nickel, Dissolved	7440-02-0	0.0107	J	0.0400	0.0100
Antimony, Dissolved	7440-36-0		U	0.0100	0.00250
Selenium, Dissolved	7782-49-2	0.0167		0.0100	0.00500
Thallium, Dissolved	7440-28-0	0.00244		0.00200	0.000500

J The analyte was positively identified, but the quantitation was below the RL
U Not detected at or above adjusted sample detection limit

Report Number: **L0710557**
Report Date : **October 29, 2007**

Sample Number:	L0710557-05	PrePrep Method:	NONE	Instrument:	ELAN-ICP
Client ID:	47WW13-101607	Prep Method:	3015	Prep Date:	10/22/2007 07:00
Matrix:	Water	Analytical Method:	6020	Cal Date:	10/24/2007 14:40
Workgroup Number:	WG253588	Analyst:	JYH	Run Date:	10/24/2007 15:54
Collect Date:	10/16/2007 16:20	Dilution:	10	File ID:	EL.102407.155444
Sample Tag:	DL01	Units:	mg/L		

Analyte	CAS. Number	Result	Qual	PQL	SDL
Silver, Dissolved	7440-22-4		U	0.0100	0.00250
Arsenic, Dissolved	7440-38-2	0.0359		0.0100	0.00250
Barium, Dissolved	7440-39-3	0.136		0.0300	0.00500
Cadmium, Dissolved	7440-43-9		U	0.00500	0.00125
Chromium, Dissolved	7440-47-3	0.0294		0.0200	0.00500
Copper, Dissolved	7440-50-8	0.0236		0.0200	0.00500
Lead, Dissolved	7439-92-1	0.0106		0.00500	0.00250
Manganese, Dissolved	7439-96-5	0.899		0.0200	0.00500
Nickel, Dissolved	7440-02-0	0.157		0.0400	0.0100
Antimony, Dissolved	7440-36-0		U	0.0100	0.00250
Selenium, Dissolved	7782-49-2	0.00652	J	0.0100	0.00500
Thallium, Dissolved	7440-28-0	0.000728	J	0.00200	0.000500

J The analyte was positively identified, but the quantitation was below the RL
U Not detected at or above adjusted sample detection limit

Sample Number:	L0710557-06	PrePrep Method:	NONE	Instrument:	ELAN-ICP
Client ID:	47WW19-101707	Prep Method:	3015	Prep Date:	10/22/2007 07:00
Matrix:	Water	Analytical Method:	6020	Cal Date:	10/24/2007 14:40
Workgroup Number:	WG253588	Analyst:	JYH	Run Date:	10/24/2007 16:01
Collect Date:	10/17/2007 10:08	Dilution:	10	File ID:	EL.102407.160118
Sample Tag:	DL01	Units:	mg/L		

Analyte	CAS. Number	Result	Qual	PQL	SDL
Silver, Dissolved	7440-22-4		U	0.0100	0.00250
Arsenic, Dissolved	7440-38-2		U	0.0100	0.00250
Barium, Dissolved	7440-39-3	0.0584		0.0300	0.00500
Cadmium, Dissolved	7440-43-9		U	0.00500	0.00125
Chromium, Dissolved	7440-47-3		U	0.0200	0.00500
Copper, Dissolved	7440-50-8		U	0.0200	0.00500
Lead, Dissolved	7439-92-1		U	0.00500	0.00250
Manganese, Dissolved	7439-96-5	1.10		0.0200	0.00500
Nickel, Dissolved	7440-02-0	0.0308	J	0.0400	0.0100
Antimony, Dissolved	7440-36-0		U	0.0100	0.00250
Selenium, Dissolved	7782-49-2	0.0107		0.0100	0.00500
Thallium, Dissolved	7440-28-0	0.00169	J	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

Sample Number: L0710557-09	PrePrep Method: NONE	Instrument: ELAN-ICP
Client ID: 47WW09-101607-FD	Prep Method: 3015	Prep Date: 10/22/2007 07:00
Matrix: Water	Analytical Method: 6020	Cal Date: 10/24/2007 14:40
Workgroup Number: WG253588	Analyst: JYH	Run Date: 10/24/2007 16:07
Collect Date: 10/16/2007 15:50	Dilution: 10	File ID: EL.102407.160755
Sample Tag: DL01	Units: mg/L	

Analyte	CAS. Number	Result	Qual	PQL	SDL
Silver, Dissolved	7440-22-4		U	0.0100	0.00250
Arsenic, Dissolved	7440-38-2	0.00461	J	0.0100	0.00250
Barium, Dissolved	7440-39-3	0.0206	J	0.0300	0.00500
Cadmium, Dissolved	7440-43-9		U	0.00500	0.00125
Chromium, Dissolved	7440-47-3	0.00514	J	0.0200	0.00500
Copper, Dissolved	7440-50-8		U	0.0200	0.00500
Lead, Dissolved	7439-92-1		U	0.00500	0.00250
Manganese, Dissolved	7439-96-5	0.151		0.0200	0.00500
Nickel, Dissolved	7440-02-0	0.0128	J	0.0400	0.0100
Antimony, Dissolved	7440-36-0		U	0.0100	0.00250
Selenium, Dissolved	7782-49-2	0.0167		0.0100	0.00500
Thallium, Dissolved	7440-28-0	0.00172	J	0.00200	0.000500

J The analyte was positively identified, but the quantitation was below the RL
U Not detected at or above adjusted sample detection limit

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

Microwave Digestion Log

Analyst(s): VC
Date: 10/22/07 07:00
LCS: .125 mL STD 21717
MS/MSD: .125 mL STD 21717
Witness: AM
HNO_3 Lot #: L0A12617
HCl Lot #: —
Digest Tube Lot #: ~~L0A 1252~~ 1254 VC 10/22/07
Earliest Sample Due Date: 10/25
Microwave #: MW2

Box: 83 129656
Digestion Work Group: WG 253512
ME407 Revision # 8 Method 3015-Water
ME406 Revision # ____ Method 3051-Soil-Oil

Relinquished By: VC
Digest Received By: [illegible] Date: 10-22-07

	KEMRON #	Initial Wt/Vol	Final Volume	Initial Weight	Final Weight	Comments	Due Date
1	PBW	40mL	100mL	206.79	206.79	02	
2	LCS			203.84	203.84	03	
3	10-416-11 Rg A			208.95	208.94	DOD 01	10/29
4	12MS			204.14	204.14	04	
5	13MSD			207.99	207.98	05	
6	14			205.74	205.73		
7	546.01			204.99	204.98		10/25
8	02			205.48	205.47		
9	03			208.63	208.62		
10	04			208.73	208.70		
11	05			208.31	208.30		
12	06			208.65	208.64		
13	444.01			204.46	204.44		10/31
14	02			207.39	207.38		
15	03			205.85	205.83		
16	04			209.50	209.48		
17	05			207.23	207.21		
18	06			205.48	205.47		
19	07			207.20	207.22		
20	557.01			206.13	206.13	Lab Filtered	10/26
21	04			208.55	208.54		
22	05			208.94	208.92		
23	06			207.86	207.85		
24	09			207.31	207.32		
25							
26							
27				VC 10/22/07			
28							
29							
30							

Comments:

Primary Review: [illegible] 10/22/07 Secondary Review: [illegible] 10/22/07

KEMRON Environmental Services
Instrument Run Log

Instrument: ELAN-ICP Dataset: 102407A.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: 253512

Comments:

Seq.	File ID	Sample	ID	Prep	Dil	Reference	Date/Time
1	EL.102407.095935	Blank	Blank		1		10/24/07 09:59
2	EL.102407.100605	WG253761-01	Calibration Point		1		10/24/07 10:06
3	EL.102407.101236	WG253761-02	Calibration Point		1		10/24/07 10:12
4	EL.102407.101907	WG253761-03	Calibration Point		1		10/24/07 10:19
5	EL.102407.102539	WG253761-04	Calibration Point		1		10/24/07 10:25
6	EL.102407.103212	WG253761-05	Initial Calibration Verification		1		10/24/07 10:32
7	EL.102407.103853	WG253761-06	Initial Calib Blank		1		10/24/07 10:38
8	EL.102407.104536	WG253761-07	CRQL Check Solid		1		10/24/07 10:45
9	EL.102407.105212	WG253761-08	CRQL Check Water		1		10/24/07 10:52
10	EL.102407.105847	WG253761-09	Interference Check		1		10/24/07 10:58
11	EL.102407.110521	WG253761-10	Interference Check		1		10/24/07 11:05
12	EL.102407.111155	WG253761-11	CCV		1		10/24/07 11:11
13	EL.102407.111836	WG253761-12	CCB		1		10/24/07 11:18
14	EL.102407.112518	WG253512-02	Method/Prep Blank	40/100	1		10/24/07 11:25
15	EL.102407.113152	WG253512-03	Laboratory Control S	40/100	1		10/24/07 11:31
16	EL.102407.113826	WG253512-01	Reference Sample		1	L0710416-11	10/24/07 11:38
17	EL.102407.114458	WG253512-04	Matrix Spike	40/100	1	L0710416-12	10/24/07 11:44
18	EL.102407.115129	WG253512-05	Matrix Spike Duplica	40/100	1	L0710416-13	10/24/07 11:51
19	EL.102407.115800	L0710416-14	101107RB	40/100	1		10/24/07 11:58
20	EL.102407.120432	WG253588-01	Post Digestion Spike		1	L0710416-14	10/24/07 12:04
21	EL.102407.121103	WG253588-02	Serial Dilution		5	L0710416-14	10/24/07 12:11
22	EL.102407.121736	WG253761-13	CCV		1		10/24/07 12:17
23	EL.102407.122417	WG253761-14	CCB		1		10/24/07 12:24
24	EL.102407.123058	L0710546-01	071000295-1	40/100	1		10/24/07 12:30
25	EL.102407.123731	L0710546-02	071000295-2	40/100	1		10/24/07 12:37
26	EL.102407.124404	L0710546-03	071000295-3	40/100	1		10/24/07 12:44
27	EL.102407.125037	L0710546-04	071000295-4	40/100	1		10/24/07 12:50
28	EL.102407.125711	L0710546-05	071000295-5	40/100	1		10/24/07 12:57
29	EL.102407.130345	L0710546-06	071000295-6	40/100	1		10/24/07 13:03
30	EL.102407.131019	L0710444-01	MW-2	40/100	1		10/24/07 13:10
31	EL.102407.131652	L0710444-02	MW-3	40/100	1		10/24/07 13:16
32	EL.102407.132323	L0710444-03	MW-7	40/100	1	WG253478-01	10/24/07 13:23
33	EL.102407.133301	WG253761-15	CCV		1		10/24/07 13:33
34	EL.102407.133943	WG253761-16	CCB		1		10/24/07 13:39

Page: 1 Approved: October 24, 2007

Maren Beery

KEMRON Environmental Services
Instrument Run Log

Instrument: ELAN-ICP Dataset: 102407B.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: 253588,253713

Comments:

Seq.	File ID	Sample	ID	Prep	Dil	Reference	Date/Time
1	EL.102407.141359	Blank	Blank		1		10/24/07 14:13
2	EL.102407.142029	WG253800-01	Calibration Point		1		10/24/07 14:20
3	EL.102407.142659	WG253800-02	Calibration Point		1		10/24/07 14:26
4	EL.102407.143331	WG253800-03	Calibration Point		1		10/24/07 14:33
5	EL.102407.144003	WG253800-04	Calibration Point		1		10/24/07 14:40
6	EL.102407.144635	WG253800-05	Initial Calibration Verification		1		10/24/07 14:46
7	EL.102407.145317	WG253800-06	Initial Calib Blank		1		10/24/07 14:53
8	EL.102407.150000	WG253800-07	CRQL Check Solid		1		10/24/07 15:00
9	EL.102407.150636	WG253800-08	CRQL Check Water		1		10/24/07 15:06
10	EL.102407.151311	WG253800-09	Interference Check		1		10/24/07 15:13
11	EL.102407.151945	WG253800-10	Interference Check		1		10/24/07 15:19
12	EL.102407.152618	WG253800-11	CCV		1		10/24/07 15:26
13	EL.102407.153300	WG253800-12	CCB		1		10/24/07 15:33
14	EL.102407.154024	L0710557-01	47WW08-101707	40/100	10		10/24/07 15:40
15	EL.102407.154803	L0710557-04	47WW09-101607	40/100	10		10/24/07 15:48
16	EL.102407.155444	L0710557-05	47WW13-101607	40/100	10		10/24/07 15:54
17	EL.102407.160118	L0710557-06	47WW19-101707	40/100	10		10/24/07 16:01
18	EL.102407.160755	L0710557-09	47WW09-101607-FD	40/100	10		10/24/07 16:07
19	EL.102407.161429	WG253512-01	Reference Sample		100	L0710416-11	10/24/07 16:14
20	EL.102407.162103	WG253512-04	Matrix Spike	40/100	100	L0710416-12	10/24/07 16:21
21	EL.102407.162734	WG253512-05	Matrix Spike Duplica	40/100	100	L0710416-13	10/24/07 16:27
22	EL.102407.163406	WG253800-13	CCV		1		10/24/07 16:34
23	EL.102407.164048	WG253800-14	CCB		1		10/24/07 16:40
24	EL.102407.164729	L0710444-04	MW-1S	40/100	1		10/24/07 16:47
25	EL.102407.165401	L0710444-05	MW-2S	40/100	1		10/24/07 16:54
26	EL.102407.170034	L0710444-06	MW-3S	40/100	1		10/24/07 17:00
27	EL.102407.170707	L0710444-07	MW-7S	40/100	1		10/24/07 17:07
28	EL.102407.171340	L0710444-03	MW-7	40/100	5		10/24/07 17:13
29	EL.102407.172013	WG253800-15	CCV		1		10/24/07 17:20
30	EL.102407.172655	WG253800-16	CCB		1		10/24/07 17:26
31	EL.102407.173336	WG253508-02	Method/Prep Blank	40/100	1		10/24/07 17:33
32	EL.102407.174010	WG253508-03	Laboratory Control S	40/100	1		10/24/07 17:40
33	EL.102407.174645	WG253508-01	Reference Sample		1	L0710413-04	10/24/07 17:46
34	EL.102407.175319	WG253508-04	Matrix Spike	40/100	1	L0710413-05	10/24/07 17:53
35	EL.102407.175954	WG253508-05	Matrix Spike Duplica	40/100	1	L0710413-06	10/24/07 17:59
36	EL.102407.180628	L0710413-07	10-170-07	40/100	1		10/24/07 18:06
37	EL.102407.181300	WG253713-01	Post Digestion Spike		1	L0710413-07	10/24/07 18:13

Page: 1

Approved: October 26, 2007
Maren Beery

KEMRON Environmental Services

Instrument Run Log

Instrument: ELAN-ICP Dataset: 102407B.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: 253588,253713

Comments:

Seq.	File ID	Sample	ID	Prep	Dil	Reference	Date/Time
38	EL.102407.181933	WG253713-02	Serial Dilution		5	L0710413-07	10/24/07 18:19
39	EL.102407.182605	WG253800-17	CCV		1		10/24/07 18:26
40	EL.102407.183247	WG253800-18	CCB		1		10/24/07 18:32
41	EL.102407.183929	L0710416-01	MW-05	40/100	1		10/24/07 18:39
42	EL.102407.184602	L0710416-02	MW-05D	40/100	1		10/24/07 18:46
43	EL.102407.185235	L0710416-03	MW-04	40/100	1		10/24/07 18:52
44	EL.102407.185909	L0710416-04	MW-03	40/100	1		10/24/07 18:59
45	EL.102407.190543	L0710416-05	MW-02	40/100	1		10/24/07 19:05
46	EL.102407.191218	L0710416-06	MW-01	40/100	1		10/24/07 19:12
47	EL.102407.191853	L0710416-07	MW-07	40/100	1		10/24/07 19:18
48	EL.102407.192528	L0710416-08	MW-08	40/100	1		10/24/07 19:25
49	EL.102407.193204	L0710416-09	MW-09	40/100	1		10/24/07 19:32
50	EL.102407.193838	L0710416-10	MW-10	40/100	1		10/24/07 19:38
51	EL.102407.194511	WG253800-19	CCV		1		10/24/07 19:45
52	EL.102407.195152	WG253800-20	CCB		1		10/24/07 19:51
53	EL.102407.195833	L0710413-01	10-166-07	40/100	1		10/24/07 19:58
54	EL.102407.200506	L0710413-02	10-167-07	40/100	1		10/24/07 20:05
55	EL.102407.201139	L0710413-03	10-168-07	40/100	1		10/24/07 20:11
56	EL.102407.201812	WG253800-21	CCV		1		10/24/07 20:18
57	EL.102407.202454	WG253800-22	CCB		1		10/24/07 20:24

Page: 2 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
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

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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

Page: 2　Approved: October 26, 2007

Maren Beery

KEMRON Environmental Services
Data Checklist

Date: 24-OCT-2007
Analyst: JYH
Analyst: NA
Method: 6020
Instrument: ELAN
Curve Workgroup: 253761
Runlog ID: 18946
Analytical Workgroups: 253588

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	416,546,444
Client Forms	X
Level X	444
Level 3	546
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: Ji-Yu Hu

Secondary Reviewer: 24-OCT-2007 Maren Beery

Generated: OCT-24-2007 18:54:27

Checklist ID: 22617

00101349

KEMRON Environmental Services
Data Checklist

Date: 24-OCT-2007

Analyst: JYH

Analyst: NA

Method: 6020

Instrument: ELAN

Curve Workgroup: 253800

Runlog ID: 18950

Analytical Workgroups: 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	444,557,413,416
Client Forms	X
Level X	444
Level 3	557
Level 4	413,416
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:

Jiyu Hu

Secondary Reviewer:
26-OCT-2007

Maren Beery

Generated: OCT-26-2007 10:27:57

Checklist ID: 22641

00101350

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#: WG253588

Login Number: L0710557

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
47WW09-101607	10/16/07	10/19/07	10/22/07	180	5.63	10/24/07	180	2.37	
47WW09-101607-FD	10/16/07	10/19/07	10/22/07	180	5.63	10/24/07	180	2.38	
47WW13-101607	10/16/07	10/19/07	10/22/07	180	5.61	10/24/07	180	2.37	
47WW08-101707	10/17/07	10/19/07	10/22/07	180	4.95	10/25/07	180	3.34	
47WW19-101707	10/17/07	10/19/07	10/22/07	180	4.87	10/24/07	180	2.38	
47WW08-101707	10/17/07	10/19/07	10/22/07	180	4.95	10/24/07	180	2.36	

* EXT = SEE PROJECT QAPP REQUIREMENTS

*ANAL = SEE PROJECT QAPP REQUIREMENTS

KEMRON FORMS - Modified 11/20/2006
Version 1.5 PDF File ID: 916192
Report generated 10/26/2007 08:07

METHOD BLANK SUMMARY

Login Number: L0710557
Blank File ID: EL.102407.112518
Prep Date: 10/22/07 07:00
Analyzed Date: 10/24/07 11:25
Analyst: JYH

Work Group: WG253588
Blank Sample ID: WG253512-02
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	WG253512-03	EL.102407.113152	10/24/07 11:31	01
47WW08-101707	L0710557-01	EL.102407.154024	10/24/07 15:40	DL01
47WW09-101607	L0710557-04	EL.102407.154803	10/24/07 15:48	DL01
47WW13-101607	L0710557-05	EL.102407.155444	10/24/07 15:54	DL01
47WW19-101707	L0710557-06	EL.102407.160118	10/24/07 16:01	DL01
47WW09-101607-FD	L0710557-09	EL.102407.160755	10/24/07 16:07	DL01
47WW08-101707	L0710557-01	EL.102507.150701	10/25/07 15:07	DL02

KEMRON FORMS - Modified 01/31/2007
Version 1.5 PDF File ID: 916193
Report generated 10/26/2007 08:07

METHOD BLANK REPORT

00101353

Login Number: L0710557 | Prep Date: 10/22/07 07:00 | Sample ID: WG253512-02
Instrument ID: ELAN-ICP | Run Date: 10/24/07 11:25 | Prep Method: 3015
File ID: EL.102407.112518 | Analyst: JYH | Method: 6020
Workgroup (AAB#): WG253588 | Matrix: Water | Units: mg/L
Contract #: DACA56-94-D-0020 | Cal ID: ELAN-I - 24-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: 916194
Report generated 10/26/2007 08:07

LABORATORY CONTROL SAMPLE (LCS)

00101354

Login Number: L0710557
Run Date: 10/24/2007
Sample ID: WG253512-03
Instrument ID: ELAN-ICP
Run Time: 11:31
Prep Method: 3015
File ID: EL.102407.113152
Analyst: JYH
Method: 6020
Workgroup (AAB#): WG253588
Matrix: Water
Units: mg/L
QC Key: STD
Lot#: STD21680
Cal ID: ELAN-I - 24-OCT-07

Analytes	Expected	Found	% Rec	LCS Limits	Q
Silver, Dissolved	0.0625	0.0625	100	80 - 120	
Arsenic, Dissolved	0.0625	0.0639	102	80 - 120	
Barium, Dissolved	0.0625	0.0633	101	80 - 120	
Cadmium, Dissolved	0.0625	0.0644	103	80 - 120	
Chromium, Dissolved	0.0625	0.0666	107	80 - 120	
Copper, Dissolved	0.0625	0.0667	107	80 - 120	
Lead, Dissolved	0.0625	0.0639	102	80 - 120	
Manganese, Dissolved	0.0625	0.0669	107	80 - 120	
Nickel, Dissolved	0.0625	0.0667	107	80 - 120	
Antimony, Dissolved	0.0625	0.0642	103	80 - 120	
Selenium, Dissolved	0.0625	0.0625	100	80 - 120	
Thallium, Dissolved	0.0625	0.0637	102	80 - 120	

MATRIX SPIKE AND MATRIX SPIKE DUP (MS/MSD)

00101355

Loginnum: L0710557 Cal ID: ELAN-ICP - Worknum: WG253588
Instrument ID: ELAN-ICP Contract #: DACA56-94-D-0020 Method: 6020
Parent ID: WG253512-01 File ID: EL.102407.113826 Dil: 1 Matrix: WATER
Sample ID: WG253512-04 MS File ID: EL.102407.114458 Dil: 1 Units: mg/L
Sample ID: WG253512-05 MSD File ID: EL.102407.115129 Dil: 1

Analyte	Parent	MS Spiked	MS Found	MS %Rec	MSD Spiked	MSD Found	MSD %Rec	%RPD	%Rec Limits	RPD Limit	Q
Antimony	0.000431	0.0625	0.0653	104	0.0625	0.0646	103	1.02	75 - 125	20	
Arsenic	0.0559	0.0625	0.110	86.0	0.0625	0.109	85.0	0.597	75 - 125	20	
Cadmium	ND	0.0625	0.0618	98.9	0.0625	0.0609	97.5	1.46	75 - 125	20	
Chromium	0.00914	0.0625	0.0741	104	0.0625	0.0726	102	1.96	75 - 125	20	
Copper	0.00166	0.0625	0.0654	102	0.0625	0.0642	100	1.87	75 - 125	20	
Lead	0.000596	0.0625	0.0695	110	0.0625	0.0693	110	0.378	75 - 125	20	
Nickel	0.00332	0.0625	0.0671	102	0.0625	0.0665	101	0.906	75 - 125	20	
Selenium	0.0108	0.0625	0.0620	81.8	0.0625	0.0635	84.2	2.41	75 - 125	20	
Silver	ND	0.0625	0.0603	96.5	0.0625	0.0597	95.5	1.00	75 - 125	20	
Thallium	0.000761	0.0625	0.0689	109	0.0625	0.0691	109	0.304	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: 916196
Report generated 10/26/2007 09:43

MATRIX SPIKE AND MATRIX SPIKE DUP (MS/MSD)

00101356

Loginnum:L0710557 Cal ID: ELAN-ICP - Worknum:WG253588
Instrument ID:ELAN-ICP Contract #:DACA56-94-D-0020 Method:6020
Parent ID:WG253512-01 File ID:EL.102407.161429 Dil:100 Matrix:WATER
Sample ID:WG253512-04 MS File ID:EL.102407.162103 Dil:100 Units:mg/L
Sample ID:WG253512-05 MSD File ID:EL.102407.162734 Dil:100

Analyte	Parent	MS Spiked	MS Found	MS %Rec	MSD Spiked	MSD Found	MSD %Rec	%RPD	%Rec Limits	RPD Limit	Q
Barium	0.423	0.0625	0.437	22.2	0.0625	0.454	50.0	3.91	75 - 125	20	*
Manganese	7.47	0.0625	6.81	-1060	0.0625	7.19	-454	5.44	75 - 125	20	*

* FAILS %REC LIMIT

FAILS RPD LIMIT

NOTE: This is an internal quality control sample.

SERIAL DILUTION REPORT

Sample Login ID: L0710557 | Worknum: WG253588
Instrument ID: ELAN-ICP | Method: 6020
Sample ID: L0710416-14 File ID: EL.102407.115800 Dil: 1 | Units: ug/L
Serial Dilution ID: WG253588-02 File ID: EL.102407.121103 Dil: 5

Analyte	Sample	C	Serial Dilution	C	% Difference	Q
Antimony	ND	U	ND	U		
Arsenic	ND	U	ND	U		
Barium	0	U	0	U		
Cadmium	ND	U	0	U		
Chromium	0.456	F	0	U	100	E
Copper	ND	U	0	U		
Lead	0	U	0	U		
Manganese	1.12	X	0	U	100	E
Nickel	0	U	0	U		
Selenium	ND	U	ND	U		
Silver	0	U	0	U		
Thallium	0.0629	F	0.194	F	208	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: 916190
Report generated 10/26/2007 08:07

KEMRON ENVIRONMENTAL SERVICES
POST SPIKE REPORT

Sample Login ID: L0710557 **Worknum:** WG253588
Instrument ID: ELAN-ICP **Method:** 6020
Post Spike ID: WG253588-01 **File ID:** EL.102407.120432 **Dil:** 1 **Units:** ug/L
Sample ID: L0710416-14 **File ID:** EL.102407.115800 **Dil:** 1 **Matrix:** Water

Analyte	Post Spike Result	C	Sample Result	C	Spike Added(SA)	% R	Control Limit %R	Q
ANTIMONY	52.6		0	U	50	105.2	75 - 125	
ARSENIC	49.9		0	U	50	99.8	75 - 125	
BARIUM	54.8		0	U	50	109.6	75 - 125	
CADMIUM	51.3		0	U	50	102.5	75 - 125	
CHROMIUM	56.4		0.456	F	50	111.9	75 - 125	
COPPER	56.6		0	U	50	113.2	75 - 125	
LEAD	55.2		0	U	50	110.3	75 - 125	
MANGANESE	57.0		1.12		50	111.7	75 - 125	
NICKEL	56.1		0	U	50	112.1	75 - 125	
SELENIUM	46.7		0	U	50	93.4	75 - 125	
SILVER	51.9		0	U	50	103.7	75 - 125	
THALLIUM	54.9		0.0629	F	50	109.7	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: 916191
Report generated 10/26/2007 08:07

KEMRON Environmental Services

INITIAL CALIBRATION SUMMARY

00101359

Login Number: L0710557 Workgroup (AAB#): WG253588

Analytical Method: 6020 Instrument ID: ELAN-ICP

ICAL Worknum: WG253761 Initial Calibration Date: 24-OCT-2007 10:25

Analyte	WG253761-01		WG253761-02		WG253761-03		WG253761-04			
	STD	INT	STD	INT	STD	INT	STD	INT	R	Q
Antimony	0	27.156	.4	1483.74	50	150285.936	100	282187.544	0.999997	
Arsenic	0	-323.075	.4	305.882	50	60351.572	100	113601.297	1.00000	
Barium	0	77.668	.4	721.71	50	74171.294	100	140470.204	0.999997	
Cadmium	0	8.458	.4	412.983	50	46364.826	100	87924.614	0.999974	
Chromium	0	13900.986	.4	17355.567	50	395329.052	100	734300.544	0.999992	
Copper	0	196.338	.4	1244.121	50	107836.888	100	200330.679	0.999992	
Lead	0	342.34	.4	8430.678	50	982617.745	100	1878315.533	0.999985	
Manganese	0	607.699	.4	5076.854	50	514741.413	100	951360.865	0.999976	
Nickel	0	41.667	.4	912.067	50	98499.115	100	182747.65	0.999987	
Selenium	0	.603	.4	60.317	50	4950.558	100	9022.885	0.999911	
Silver	0	26.667	.4	2361.414	50	270123.909	100	503674.43	0.999999	
Thallium	0	25.334	.4	2609.169	50	307637.143	100	588606.394	0.999987	

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: 916199
Report generated 10/26/2007 08:07

INITIAL CALIBRATION SUMMARY

Login Number: L0710557
Workgroup (AAB#): WG253588
Analytical Method: 6020
Instrument ID: ELAN-ICP
ICAL Worknum: WG253800
Initial Calibration Date: 24-OCT-2007 14:40

Analyte	WG253800-01		WG253800-02		WG253800-03		WG253800-04			
	STD	INT	STD	INT	STD	INT	STD	INT	R	Q
Antimony	0	60.658	.4	1628.358	50	161530.097	100	308303.875	0.999925	
Arsenic	0	-320.793	.4	245.472	50	66314.982	100	124176.518	1.00000	
Barium	0	87.335	.4	758.048	50	79411.865	100	151340.185	1.00000	
Cadmium	0	11.279	.4	425.174	50	51362.556	100	95783.433	1.00000	
Chromium	0	15500.291	.4	18398.185	50	430263.585	100	804687.967	0.999960	
Copper	0	191.671	.4	1383.148	50	116291.864	100	214560.828	0.999985	
Lead	0	382.341	.4	9107.71	50	1045213.494	100	2007955.748	0.999997	
Manganese	0	963.742	.4	5749.037	50	570713.286	100	1070047.54	0.999998	
Nickel	0	49.667	.4	972.076	50	106986.179	100	199354.413	0.999999	
Selenium	0	12.363	.4	44.981	50	5460.894	100	10029.285	0.999960	
Silver	0	37.667	.4	2535.809	50	295221.384	100	552253.856	0.999998	
Thallium	0	31.667	.4	2759.561	50	332008.776	100	634040.171	0.999985	

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: 916199
Report generated 10/26/2007 08:07

INITIAL CALIBRATION SUMMARY

Login Number: L0710557 Workgroup (AAB#): WG253588
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: 916199
Report generated 10/26/2007 08:07

KEMRON Environmental Services
INITIAL CALIBRATION BLANK (ICB)

Login Number: L0710557
Instrument ID: ELAN-ICP
File ID: EL.102407.103853
Workgroup (AAB#): WG253588
Matrix: WATER

Run Date: 10/24/2007
Run Time: 10:38
Analyst: JYH
Cal ID: ELAN-ICP - 24-OCT-07

Sample ID: WG253761-06
Method: 6020
Units: mg/L

Analytes	MDL	RDL	Concentration	Dilution	Qualifier
SILVER	.0001	.0004	-.0000062	1	U
ARSENIC	.0001	.0004	-.0000569	1	U
BARIUM	.0002	.0012	-.0000083	1	U
CADMIUM	.00005	.0002	-.0000052	1	U
CHROMIUM	.0002	.0008	-.0000332	1	U
COPPER	.0002	.0008	-.0000678	1	U
MANGANESE	.0002	.0008	-.0000158	1	U
NICKEL	.0004	.0016	-.0000252	1	U
LEAD	.0001	.0002	.0000048	1	U
ANTIMONY	.0001	.0004	.0000924	1	U
SELENIUM	.0002	.0004	-.0000193	1	U
THALLIUM	.00002	.00008	-.0000017	1	U

KEMRON FORMS - Modified 10/02/2007
Version 2.0 PDF File ID: 916201
Report generated 10/26/2007 08:07

KEMRON Environmental Services
INITIAL CALIBRATION BLANK (ICB)

Login Number: L0710557
Run Date: 10/24/2007
Sample ID: WG253800-06
Instrument ID: ELAN-ICP
Run Time: 14:53
Method: 6020
File ID: EL.102407.145317
Analyst: JYH
Units: mg/L
Workgroup (AAB#): WG253588
Cal ID: ELAN-ICP - 24-OCT-07
Matrix: WATER

Analytes	MDL	RDL	Concentration	Dilution	Qualifier
SILVER	.0001	.0004	.0000065	1	U
ARSENIC	.0001	.0004	.000028	1	U
BARIUM	.0002	.0012	-.0000006	1	U
CADMIUM	.00005	.0002	.0000244	1	U
CHROMIUM	.0002	.0008	.0000154	1	U
COPPER	.0002	.0008	-.000071	1	U
MANGANESE	.0002	.0008	-.0000015	1	U
NICKEL	.0004	.0016	-.0000066	1	U
LEAD	.0001	.0002	.0000079	1	U
ANTIMONY	.0001	.0004	.000128	1	F
SELENIUM	.0002	.0004	.000105	1	U
THALLIUM	.00002	.00008	.0000106	1	U

KEMRON FORMS - Modified 10/02/2007
Version 2.0 PDF File ID: 916201
Report generated 10/26/2007 08:07

KEMRON Environmental Services
INITIAL CALIBRATION BLANK (ICB)

Login Number: L0710557
Instrument ID: ELAN-ICP
File ID: EL.102507.095031
Workgroup (AAB#): WG253588
Matrix: WATER

Run Date: 10/25/2007
Run Time: 09:50
Analyst: JYH
Cal ID: ELAN-ICP - 25-OCT-07

Sample ID: WG253869-06
Method: 6020
Units: mg/L

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: 916201
Report generated 10/26/2007 08:07

CONTINUING CALIBRATION BLANK (CCB)

Login Number: L0710557
Run Date: 10/24/2007
Sample ID: WG253761-12
Instrument ID: ELAN-ICP
Run Time: 11:18
Method: 6020
File ID: EL.102407.111836
Analyst: JYH
Units: ug/L
Workgroup (AAB#): WG253588
Cal ID: ELAN-I - 24-OCT-07
Matrix: WATER

Analytes	MDL	RDL	Concentration	Dilution	Qualifier
Silver	0.100	0.400	-0.00280	1	U
Arsenic	0.100	0.400	-0.0625	1	U
Barium	0.200	1.20	-0.0110	1	U
Cadmium	0.0500	0.200	-0.00420	1	U
Chromium	0.200	0.800	0.0306	1	U
Copper	0.200	0.800	-0.0596	1	U
Lead	0.100	0.200	0.00690	1	U
Manganese	0.200	0.800	-0.0132	1	U
Nickel	0.400	1.60	-0.0207	1	U
Antimony	0.100	0.400	0.115	1	F
Selenium	0.200	0.400	-0.0907	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: 916204
Report generated 10/26/2007 08:07

CONTINUING CALIBRATION BLANK (CCB)

00101366

Login Number: L0710557
Run Date: 10/24/2007
Sample ID: WG253761-14
Instrument ID: ELAN-ICP
Run Time: 12:24
Method: 6020
File ID: EL.102407.122417
Analyst: JYH
Units: ug/L
Workgroup (AAB#): WG253588
Cal ID: ELAN-I - 24-OCT-07
Matrix: WATER

Analytes	MDL	RDL	Concentration	Dilution	Qualifier
Silver	0.100	0.400	-0.00830	1	U
Arsenic	0.100	0.400	-0.0608	1	U
Barium	0.200	1.20	-0.0123	1	U
Cadmium	0.0500	0.200	-0.00650	1	U
Chromium	0.200	0.800	0.0453	1	U
Copper	0.200	0.800	-0.0624	1	U
Lead	0.100	0.200	0.00490	1	U
Manganese	0.200	0.800	-0.0138	1	U
Nickel	0.400	1.60	-0.0226	1	U
Antimony	0.100	0.400	0.0663	1	U
Selenium	0.200	0.400	-0.142	1	U
Thallium	0.0200	0.0800	-0.00550	1	U

U = Result is less than MDL
F = Result is between MDL and RL
* = Result is above RL

CONTINUING CALIBRATION BLANK (CCB)

00101367

Login Number: L0710557
Run Date: 10/24/2007
Sample ID: WG253800-12
Instrument ID: ELAN-ICP
Run Time: 15:33
Method: 6020
File ID: EL.102407.153300
Analyst: JYH
Units: ug/L
Workgroup (AAB#): WG253588
Cal ID: ELAN-I - 24-OCT-07
Matrix: WATER

Analytes	MDL	RDL	Concentration	Dilution	Qualifier
Silver	0.100	0.400	0.00300	1	U
Arsenic	0.100	0.400	-0.00760	1	U
Barium	0.200	1.20	0.00670	1	U
Cadmium	0.0500	0.200	0.0224	1	U
Chromium	0.200	0.800	0.0563	1	U
Copper	0.200	0.800	-0.0718	1	U
Lead	0.100	0.200	0.00590	1	U
Manganese	0.200	0.800	-0.00150	1	U
Nickel	0.400	1.60	-0.00440	1	U
Antimony	0.100	0.400	0.128	1	F
Selenium	0.200	0.400	0.110	1	U
Thallium	0.0200	0.0800	0.0100	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: 916204
Report generated 10/26/2007 08:07

CONTINUING CALIBRATION BLANK (CCB)

Login Number: L0710557
Run Date: 10/24/2007
Sample ID: WG253800-14
Instrument ID: ELAN-ICP
Run Time: 16:40
Method: 6020
File ID: EL.102407.164048
Analyst: JYH
Units: ug/L
Workgroup (AAB#): WG253588
Cal ID: ELAN-I - 24-OCT-07
Matrix: WATER

Analytes	MDL	RDL	Concentration	Dilution	Qualifier
Silver	0.100	0.400	0.00680	1	U
Arsenic	0.100	0.400	0.0115	1	U
Barium	0.200	1.20	0.00350	1	U
Cadmium	0.0500	0.200	0.0275	1	U
Chromium	0.200	0.800	0.0389	1	U
Copper	0.200	0.800	-0.0723	1	U
Lead	0.100	0.200	0.00790	1	U
Manganese	0.200	0.800	-0.00480	1	U
Nickel	0.400	1.60	-0.00560	1	U
Antimony	0.100	0.400	0.0860	1	U
Selenium	0.200	0.400	0.108	1	U
Thallium	0.0200	0.0800	0.0118	1	U

U = Result is less than MDL
F = Result is between MDL and RL
* = Result is above RL

CONTINUING CALIBRATION BLANK (CCB)

00101369

Login Number: L0710557
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#): WG253588
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

CONTINUING CALIBRATION BLANK (CCB)

Login Number: L0710557
Run Date: 10/25/2007
Sample ID: WG253869-18
Instrument ID: ELAN-ICP
Run Time: 14:30
Method: 6020
File ID: EL.102507.143049
Analyst: JYH
Units: ug/L
Workgroup (AAB#): WG253588
Cal ID: ELAN-I - 25-OCT-07
Matrix: WATER

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: 916204
Report generated 10/26/2007 08:07

CONTINUING CALIBRATION BLANK (CCB)

00101371

Login Number: L0710557
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#): WG253588
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: 916204
Report generated 10/26/2007 08:07

INITIAL CALIBRATION VERIFICATION (ICV)

Login Number: L0710557
Run Date: 10/24/2007
Sample ID: WG253761-05
Instrument ID: ELAN-ICP
Run Time: 10:32
Method: 6020
File ID: EL.102407.103212
Analyst: JYH
Units: ug/L
Workgroup (AAB#): WG253588
Cal ID: ELAN-I - 24-OCT-07
QC Key: STD

Analyte		Expected	Found	%REC	LIMITS	Q
Silver		50	47.9	95.8	90 - 110	
Arsenic		50	49.0	97.9	90 - 110	
Barium		50	49.4	98.8	90 - 110	
Cadmium		50	49.1	98.2	90 - 110	
Chromium		50	49.4	98.9	90 - 110	
Copper		50	50.6	101	90 - 110	
Lead		50	51.3	103	90 - 110	
Manganese		50	49.3	98.6	90 - 110	
Nickel		50	49.5	99.1	90 - 110	
Antimony		50	49.4	98.9	90 - 110	
Selenium		50	50.7	101	90 - 110	
Thallium		50	50.7	101	90 - 110	

* Exceeds LIMITS Limit

KEMRON FORMS - Modified 09/06/2007 (ICV)
Version 1.5 PDF File ID: 916200
Report generated 10/26/2007 08:07

INITIAL CALIBRATION VERIFICATION (ICV)

Login Number: L0710557
Run Date: 10/24/2007
Sample ID: WG253800-05
Instrument ID: ELAN-ICP
Run Time: 14:46
Method: 6020
File ID: EL.102407.144635
Analyst: JYH
Units: ug/L
Workgroup (AAB#): WG253588
Cal ID: ELAN-I - 24-OCT-07
QC Key: STD

Analyte		Expected	Found	%REC	LIMITS	Q
Silver		50	49.4	98.7	90 - 110	
Arsenic		50	50.2	100	90 - 110	
Barium		50	50.6	101	90 - 110	
Cadmium		50	50.1	100	90 - 110	
Chromium		50	50.7	101	90 - 110	
Copper		50	51.7	103	90 - 110	
Lead		50	51.2	102	90 - 110	
Manganese		50	50.2	100	90 - 110	
Nickel		50	50.6	101	90 - 110	
Antimony		50	50.9	102	90 - 110	
Selenium		50	51.3	103	90 - 110	
Thallium		50	50.2	100	90 - 110	

* Exceeds LIMITS Limit

INITIAL CALIBRATION VERIFICATION (ICV)

00101374

Login Number:	L0710557	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#):	WG253588	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: 916200
Report generated 10/26/2007 08:07

CONTINUING CALIBRATION VERIFICATION (CCV)

00101375

Login Number: L0710557
Run Date: 10/24/2007
Sample ID: WG253761-11
Instrument ID: ELAN-ICP
Run Time: 11:11
Method: 6020
File ID: EL.102407.111155
Analyst: JYH
QC Key: STD
Workgroup (AAB#): WG253588
Cal ID: ELAN-I - 24-OCT-07

Analyte		Expected	Found	UNITS	%REC	LIMITS		Q
Silver		50.0	48.2	ug/L	96.3	90 - 110		
Arsenic		50.0	49.1	ug/L	98.1	90 - 110		
Barium		50.0	49.3	ug/L	98.6	90 - 110		
Cadmium		50.0	49.5	ug/L	99.1	90 - 110		
Chromium		50.0	50.1	ug/L	100	90 - 110		
Copper		50.0	50.8	ug/L	102	90 - 110		
Lead		50.0	51.3	ug/L	103	90 - 110		
Manganese		50.0	49.6	ug/L	99.3	90 - 110		
Nickel		50.0	50.3	ug/L	101	90 - 110		
Antimony		50.0	50.1	ug/L	100	90 - 110		
Selenium		50.0	50.0	ug/L	100	90 - 110		
Thallium		50.0	50.4	ug/L	101	90 - 110		

* Exceeds LIMITS Criteria

KEMRON FORMS - Modified 09/06/2007 - (CCV)
Version 1.5 PDF File ID: 916203
Report generated 10/26/2007 08:07

CONTINUING CALIBRATION VERIFICATION (CCV)

00101376

Login Number: L0710557
Run Date: 10/24/2007
Sample ID: WG253761-13
Instrument ID: ELAN-ICP
Run Time: 12:17
Method: 6020
File ID: EL.102407.121736
Analyst: JYH
QC Key: STD
Workgroup (AAB#): WG253588
Cal ID: ELAN-I - 24-OCT-07

Analyte		Expected	Found	UNITS	%REC	LIMITS		Q
Silver		50.0	48.4	ug/L	96.8	90 - 110		
Arsenic		50.0	48.7	ug/L	97.5	90 - 110		
Barium		50.0	49.8	ug/L	99.6	90 - 110		
Cadmium		50.0	49.0	ug/L	98.0	90 - 110		
Chromium		50.0	51.3	ug/L	103	90 - 110		
Copper		50.0	50.5	ug/L	101	90 - 110		
Lead		50.0	51.6	ug/L	103	90 - 110		
Manganese		50.0	51.6	ug/L	103	90 - 110		
Nickel		50.0	51.0	ug/L	102	90 - 110		
Antimony		50.0	49.3	ug/L	98.6	90 - 110		
Selenium		50.0	49.9	ug/L	99.8	90 - 110		
Thallium		50.0	50.9	ug/L	102	90 - 110		

* Exceeds LIMITS Criteria

KEMRON FORMS - Modified 09/06/2007 - (CCV)
Version 1.5 PDF File ID: 916203
Report generated 10/26/2007 08:07

CONTINUING CALIBRATION VERIFICATION (CCV)

00101377

Login Number: L0710557 Run Date: 10/24/2007 Sample ID: WG253800-11
Instrument ID: ELAN-ICP Run Time: 15:26 Method: 6020
File ID: EL.102407.152618 Analyst: JYH QC Key: STD
Workgroup (AAB#): WG253588 Cal ID: ELAN-I - 24-OCT-07

Analyte		Expected	Found	UNITS	%REC	LIMITS		Q
Silver		50.0	48.5	ug/L	97.0	90 - 110		
Arsenic		50.0	49.7	ug/L	99.4	90 - 110		
Barium		50.0	49.8	ug/L	99.6	90 - 110		
Cadmium		50.0	49.6	ug/L	99.2	90 - 110		
Chromium		50.0	50.8	ug/L	102	90 - 110		
Copper		50.0	51.0	ug/L	102	90 - 110		
Lead		50.0	50.0	ug/L	100	90 - 110		
Manganese		50.0	50.0	ug/L	100	90 - 110		
Nickel		50.0	49.9	ug/L	99.7	90 - 110		
Antimony		50.0	49.5	ug/L	99.1	90 - 110		
Selenium		50.0	50.3	ug/L	101	90 - 110		
Thallium		50.0	49.1	ug/L	98.2	90 - 110		

* Exceeds LIMITS Criteria

KEMRON FORMS - Modified 09/06/2007 - (CCV)
Version 1.5 PDF File ID: 916203
Report generated 10/26/2007 08:07

CONTINUING CALIBRATION VERIFICATION (CCV)

00101378

Login Number: L0710557
Run Date: 10/24/2007
Sample ID: WG253800-13
Instrument ID: ELAN-ICP
Run Time: 16:34
Method: 6020
File ID: EL.102407.163406
Analyst: JYH
QC Key: STD
Workgroup (AAB#): WG253588
Cal ID: ELAN-I - 24-OCT-07

Analyte		Expected	Found	UNITS	%REC	LIMITS		Q
Silver		50.0	48.3	ug/L	96.7	90 - 110		
Arsenic		50.0	49.2	ug/L	98.4	90 - 110		
Barium		50.0	48.9	ug/L	97.7	90 - 110		
Cadmium		50.0	48.9	ug/L	97.9	90 - 110		
Chromium		50.0	50.3	ug/L	101	90 - 110		
Copper		50.0	50.6	ug/L	101	90 - 110		
Lead		50.0	50.9	ug/L	102	90 - 110		
Manganese		50.0	50.3	ug/L	101	90 - 110		
Nickel		50.0	50.0	ug/L	100	90 - 110		
Antimony		50.0	49.4	ug/L	98.9	90 - 110		
Selenium		50.0	50.4	ug/L	101	90 - 110		
Thallium		50.0	49.8	ug/L	99.5	90 - 110		

* Exceeds LIMITS Criteria

KEMRON FORMS - Modified 09/06/2007 - (CCV)
Version 1.5 PDF File ID: 916203
Report generated 10/26/2007 08:07

CONTINUING CALIBRATION VERIFICATION (CCV)

00101379

Login Number: L0710557
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#): WG253588
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: 916203
Report generated 10/26/2007 08:07

CONTINUING CALIBRATION VERIFICATION (CCV)

Login Number: L0710557 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#): WG253588 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

CONTINUING CALIBRATION VERIFICATION (CCV)

00101381

Login Number: L0710557 | 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#): WG253588 | 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: 916203
Report generated 10/26/2007 08:07

Login number: L0710557 **Workgroup (AAB#):** WG253588
Instrument ID: ELAN-ICP **Method:** 6020
Sol. A : WG253761-09 **File ID:** EL.102407.105847 **Units:** ug/L
Sol. AB : WG253761-10 **File ID:** EL.102407.110521

	Sol. A			Sol. AB			
ANALYTE	True	Found	%Recovery	True	Found	%Recovery	Q
Antimony	NS	-0.00160	NS	100	101	101	
Arsenic	NS	-0.0679	NS	100	99.2	99.2	
Barium	NS	0.0109	NS	100	100	100	
Cadmium	NS	0.0244	NS	100	101	101	
Chromium	NS	0.138	NS	100	100	100	
Copper	NS	0.270	NS	100	98.4	98.4	
Lead	NS	0.0771	NS	100	98.9	98.9	
Manganese	NS	0.358	NS	100	98.6	98.6	
Nickel	NS	1.00	NS	100	99.2	99.2	
Selenium	NS	-0.255	NS	100	96.5	96.5	
Silver	NS	-0.00670	NS	100	96.1	96.1	
Thallium	NS	-0.00560	NS	100	98.8	98.8	

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).

Login number: L0710557 **Workgroup (AAB#):** WG253588
Instrument ID: ELAN-ICP **Method:** 6020
Sol. A : WG253800-09 **File ID:** EL.102407.151311 **Units:** ug/L
Sol. AB : WG253800-10 **File ID:** EL.102407.151945

	Sol. A			Sol. AB			
ANALYTE	True	Found	%Recovery	True	Found	%Recovery	Q
Antimony	NS	-0.00340	NS	100	101	101	
Arsenic	NS	-0.0421	NS	100	99.4	99.4	
Barium	NS	0.0184	NS	100	99.7	99.7	
Cadmium	NS	0.125	NS	100	98.8	98.8	
Chromium	NS	0.165	NS	100	100	100	
Copper	NS	0.265	NS	100	98.2	98.2	
Lead	NS	0.0747	NS	100	101	101	
Manganese	NS	0.364	NS	100	99.6	99.6	
Nickel	NS	1.04	NS	100	98.2	98.2	
Selenium	NS	-0.199	NS	100	97.3	97.3	
Silver	NS	0.00420	NS	100	96.1	96.1	
Thallium	NS	0.00780	NS	100	99.9	99.9	

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).

Login number: L0710557
Instrument ID: ELAN-ICP
Sol. A : WG253869-09 **File ID:** EL.102507.101025
Sol. AB : WG253869-10 **File ID:** EL.102507.101659

Workgroup (AAB#): WG253588
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: 916202
Report generated 10/26/2007 08:07

CRI SAMPLE

Login Number: L0710557
Run Date: 10/24/2007
Sample ID: WG253800-08
Instrument ID: ELAN-ICP
Run Time: 15:06
Prep Method: 3015
File ID: EL.102407.150636
Analyst: JYH
Method: 6020
Workgroup (AAB#): WG253800
Matrix: Water
Units: ug/L
Contract #: DACA56-94-D-0020
Cal ID: ELAN-ICP - 24-OCT-2007 14:40

Analytes	Expected	Found	% Rec	Limits	Q
Cadmium, Dissolved	0.200	0.195	97.5	50 - 150	
Thallium, Dissolved	0.0800	0.0909	114	50 - 150	

CRI SAMPLE

Login Number: L0710557
Run Date: 10/24/2007
Sample ID: WG253761-08
Instrument ID: ELAN-ICP
Run Time: 10:52
Prep Method: 3015
File ID: EL.102407.105212
Analyst: JYH
Method: 6020
Workgroup (AAB#): WG253761
Matrix: Water
Units: ug/L
Contract #: DACA56-94-D-0020
Cal ID: ELAN-ICP - 24-OCT-2007 10:25

Analytes	Expected	Found	% Rec	Limits	Q
Cadmium, Dissolved	0.200	0.221	111	50 - 150	
Thallium, Dissolved	0.0800	0.0808	101	50 - 150	

KEMRON FORMS - Modified 02/14/2006
Version 1.5 PDF File ID: 916198
Report generated 10/25/2007 09:29

LINEAR RANGE (QUARTERLY)

Login Number: L0710557 **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

00101390

L0710557

10/29/07 13:41

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: LHAAP

P.O. Number: 322255 OP

Sample Analysis Summary

Client ID	Lab ID	Method	Dilution	Date Received
47WW08-101707	L0710557-01	7470A	1	19-OCT-07
47WW09-101607	L0710557-04	7470A	1	19-OCT-07
47WW13-101607	L0710557-05	7470A	1	19-OCT-07
47WW19-101707	L0710557-06	7470A	1	19-OCT-07
47WW09-101607-FD	L0710557-09	7470A	1	19-OCT-07

Sample Number:	L0710557-01	PrePrep Method:	NONE	Instrument:	HYDRA
Client ID:	47WW08-101707	Prep Method:	METHOD	Prep Date:	10/22/2007 07:40
Matrix:	Water	Analytical Method:	7470A	Cal Date:	10/23/2007 10:41
Workgroup Number:	WG253567	Analyst:	ED	Run Date:	10/23/2007 11:32
Collect Date:	10/17/2007 08:10	Dilution:	1	File ID:	HY.102307.113209
Sample Tag:	01	Units:	mg/L		

Analyte	CAS. Number	Result	Qual	PQL	SDL
Mercury, Dissolved	7439-97-6	0.000137	J	0.000200	0.000100

J The analyte was positively identified, but the quantitation was below the RL

00101392

Sample Number:L0710557-04
Client ID:47WW09-101607
Matrix:Water
Workgroup Number:WG253567
Collect Date:10/16/2007 15:50
Sample Tag:01

PrePrep Method:NONE
Prep Method:METHOD
Analytical Method:7470A
Analyst:ED
Dilution:1
Units:mg/L

Instrument:HYDRA
Prep Date:10/22/2007 07:40
Cal Date:10/23/2007 10:41
Run Date:10/23/2007 11:33
File ID:HY.102307.113346

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: L0710557-05
Client ID: 47WW13-101607
Matrix: Water
Workgroup Number: WG253567
Collect Date: 10/16/2007 16:20
Sample Tag: 01

PrePrep Method: NONE
Prep Method: METHOD
Analytical Method: 7470A
Analyst: ED
Dilution: 1
Units: mg/L

Instrument: HYDRA
Prep Date: 10/22/2007 07:40
Cal Date: 10/23/2007 10:41
Run Date: 10/23/2007 11:38
File ID: HY.102307.113849

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:	L0710557-06	PrePrep Method:	NONE	Instrument:	HYDRA
Client ID:	47WW19-101707	Prep Method:	METHOD	Prep Date:	10/22/2007 07:40
Matrix:	Water	Analytical Method:	7470A	Cal Date:	10/23/2007 10:41
Workgroup Number:	WG253567	Analyst:	ED	Run Date:	10/23/2007 11:40
Collect Date:	10/17/2007 10:08	Dilution:	1	File ID:	HY.102307.114028
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:	L0710557-09	PrePrep Method:	NONE	Instrument:	HYDRA
Client ID:	47WW09-101607-FD	Prep Method:	METHOD	Prep Date:	10/22/2007 07:40
Matrix:	Water	Analytical Method:	7470A	Cal Date:	10/23/2007 10:41
Workgroup Number:	WG253567	Analyst:	ED	Run Date:	10/23/2007 11:43
Collect Date:	10/16/2007 15:50	Dilution:	1	File ID:	HY.102307.114306
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): RM
Date: 10/22/07
LCS: 4ml STD 22590
MS/MSD: 4ml STD 22590
Witness: VC
H_2SO_4 Lot #: Con 12284
$K2S_2O_8$ Lot #: PCT 12115
$KMNO_4$ Lot #: PCT 12157
HNO_3 Lot #: Con 12617
Digest Tube Lot #: Con 12400
Aqua Regia: NA
Earliest Sample Due Date: 10/26
ICV / CCV: STD 22592
Stds: 0, 0.2, 1, 2, 5, 10: STD 22593 - 22598

Box: C4

Digestion Work Group: WG253478

ME404 Revision # 10 - Method 7470A-Water
ME405 Revision # ____ - Method 7471A-Soil

Hot Block Temperature at start: 94.6°C 0740

Hot Block Temperature at end: 96.3°C 0940

Relinquished By: M
Digest Received By: NH Date: 10/22/07

	KEMRON #	Initial Wt/Vol	Final Volume	Comments	Due Date
1	MBW	40ml	40ml	-02	
2	LCW			-03	
3	10-444-01				10/31
4	-02				
5	-03			-01	
6	-03 MS	36ml		-04	
7	-03 MSD			-05	
8	-04	40ml			
9	-05				
10	-06				
11	-07				
12	10-513-01				11/1
13	-02				
14	-03				
15	-04				
16	-05				
17	10-544-02			NPDES	10/30
18	10-557-01			LAB FILT 10/22	10/26
19	-04				
20	-05				
21	-06				
22	-09				
23	RM 10/22/07				
24					
~~25~~					

Comments: ______________________

Primary Review: [signature] 10/22/07 Secondary Review: Vicki Collier 10/22/07

KEMRON Environmental Services
Instrument Run Log

Instrument: HYDRA   Dataset: 102307F.PRN
Analyst1: ED   Analyst2: NA
Method: 7470A   SOP: 404   Rev: 10
Maintenance Log ID: 21408

Calibration Std: STD22598   ICV/CCV Std: STD22592   Post Spike: STD22598
ICSA: N/A   ICSAB: N/A

Workgroups: WG253567

Comments:

Seq.	File ID	Sample	ID	Prep	Dil	Reference	Date/Time
1	HY.102307.103121	WG253874-01	Calibration Point		1		10/23/07 10:31
2	HY.102307.103259	WG253874-02	Calibration Point		1		10/23/07 10:32
3	HY.102307.103507	WG253874-03	Calibration Point		1		10/23/07 10:35
4	HY.102307.103723	WG253874-04	Calibration Point		1		10/23/07 10:37
5	HY.102307.103921	WG253874-05	Calibration Point		1		10/23/07 10:39
6	HY.102307.104111	WG253874-06	Calibration Point		1		10/23/07 10:41
7	HY.102307.104406	WG253874-07	Initial Calibration Verification		1		10/23/07 10:44
8	HY.102307.104607	WG253874-08	Initial Calib Blank		1		10/23/07 10:46
9	HY.102307.104757	WG253874-09	CCV		1		10/23/07 10:47
10	HY.102307.104959	WG253874-10	CCB		1		10/23/07 10:49
11	HY.102307.105421	WG253478-02	Method/Prep Blank	40/40	1		10/23/07 10:54
12	HY.102307.105613	WG253478-03	Laboratory Control S	40/40	1		10/23/07 10:56
13	HY.102307.105822	L0710544-02	NSIU021001/COMP	40/40	1		10/23/07 10:58
14	HY.102307.110034	L0710444-01	MW-2	40/40	1		10/23/07 11:00
15	HY.102307.110212	WG253567-01	Post Digestion Spike		1	L0710444-01	10/23/07 11:02
16	HY.102307.110348	L0710444-02	MW-3	40/40	1		10/23/07 11:03
17	HY.102307.110525	WG253478-01	Reference Sample		1	L0710444-03	10/23/07 11:05
18	HY.102307.110758	WG253478-04	Matrix Spike	36/40	1		10/23/07 11:07
19	HY.102307.110946	WG253478-05	Matrix Spike Duplica	36/40	1		10/23/07 11:09
20	HY.102307.111126	L0710444-04	MW-1S	40/40	1		10/23/07 11:11
21	HY.102307.111308	WG253874-11	CCV		1		10/23/07 11:13
22	HY.102307.111505	WG253874-12	CCB		1		10/23/07 11:15
23	HY.102307.111707	L0710444-05	MW-2S	40/40	1		10/23/07 11:17
24	HY.102307.111859	L0710444-06	MW-3S	40/40	1		10/23/07 11:18
25	HY.102307.112109	L0710444-07	MW-7S	40/40	1		10/23/07 11:21
26	HY.102307.112258	L0710513-01	MW-1	40/40	1		10/23/07 11:22
27	HY.102307.112449	L0710513-02	MW-4	40/40	1		10/23/07 11:24
28	HY.102307.112647	L0710513-03	MW-6	40/40	1		10/23/07 11:26
29	HY.102307.112823	L0710513-04	MW-4S	40/40	1		10/23/07 11:28
30	HY.102307.113030	L0710513-05	MW-6S	40/40	1	WG253273-04	10/23/07 11:30
31	HY.102307.113209	L0710557-01	47WW08-101707	40/40	1		10/23/07 11:32
32	HY.102307.113346	L0710557-04	47WW09-101607	40/40	1	WG253556-01	10/23/07 11:33
33	HY.102307.113528	WG253874-13	CCV		1		10/23/07 11:35
34	HY.102307.113710	WG253874-14	CCB		1		10/23/07 11:37
35	HY.102307.113849	L0710557-05	47WW13-101607	40/40	1		10/23/07 11:38
36	HY.102307.114028	L0710557-06	47WW19-101707	40/40	1		10/23/07 11:40
37	HY.102307.114306	L0710557-09	47WW09-101607-FD	40/40	1	WG253547-04	10/23/07 11:43

Page: 1   Approved: October 26, 2007

Maren Beery

KEMRON Environmental Services

Instrument Run Log

Instrument: HYDRA Dataset: 102307F.PRN
Analyst1: ED Analyst2: NA
Method: 7470A SOP: 404 Rev: 10
Maintenance Log ID: 21408

Calibration Std: STD22598 ICV/CCV Std: STD22592 Post Spike: STD22598
ICSA: N/A ICSAB: N/A

Workgroups: WG253567

Comments:

Seq.	File ID	Sample	ID	Prep	Dil	Reference	Date/Time
38	HY.102307.114444	WG253874-15	CCV		1		10/23/07 11:44
39	HY.102307.114735	WG253874-16	CCB		1		10/23/07 11:47

Page: 2 Approved: October 26, 2007

Maren Beery

Checklist ID: 22644

00101401

KEMRON Environmental Services

Data Checklist

Date: 25-OCT-2007

Analyst: ED

Analyst: NA

Method: 7470A

Instrument: HYDRA

Curve Workgroup: WG253874

Runlog ID: 18966

Analytical Workgroups: WG253567

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	444,513,557
Client Forms	
Level X	444,513
Level 3	557
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: 26-OCT-2007 Maren Beery

Generated: OCT-26-2007 09:01:46

Analytical Method: 7470A

AAB#: WG253567

Login Number: L0710557

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
47WW09-101607-FD	10/16/07	10/19/07	10/22/07	28	5.66	10/23/07	28	1.17	
47WW19-101707	10/17/07	10/19/07	10/22/07	28	4.90	10/23/07	28	1.17	
47WW09-101607	10/16/07	10/19/07	10/22/07	28	5.66	10/23/07	28	1.16	
47WW08-101707	10/17/07	10/19/07	10/22/07	28	4.98	10/23/07	28	1.16	
47WW13-101607	10/16/07	10/19/07	10/22/07	28	5.64	10/23/07	28	1.17	

* EXT = SEE PROJECT QAPP REQUIREMENTS
*ANAL = SEE PROJECT QAPP REQUIREMENTS

METHOD BLANK SUMMARY

Login Number: L0710557
Blank File ID: HY.102307.105421
Prep Date: 10/22/07 07:40
Analyzed Date: 10/23/07 10:54
Analyst: ED

Work Group: WG253567
Blank Sample ID: WG253478-02
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	WG253478-03	HY.102307.105613	10/23/07 10:56	01
47WW08-101707	L0710557-01	HY.102307.113209	10/23/07 11:32	01
47WW09-101607	L0710557-04	HY.102307.113346	10/23/07 11:33	01
47WW13-101607	L0710557-05	HY.102307.113849	10/23/07 11:38	01
47WW19-101707	L0710557-06	HY.102307.114028	10/23/07 11:40	01
47WW09-101607-FD	L0710557-09	HY.102307.114306	10/23/07 11:43	01

METHOD BLANK REPORT

Login Number: L0710557
Prep Date: 10/22/07 07:40
Sample ID: WG253478-02
Instrument ID: HYDRA
Run Date: 10/23/07 10:54
Prep Method: METHOD
File ID: HY.102307.105421
Analyst: ED
Method: 7470A
Workgroup (AAB#): WG253567
Matrix: Water
Units: mg/L
Contract #: DACA56-94-D-0020
Cal ID: HYDRA-23-OCT-07

Analytes	SDL	PQL	Concentration	Dilution	Qualifier
Mercury, Dissolved	0.000100	0.000200	0.000164	1	J

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: 917171
Report generated 10/25/2007 15:50

LABORATORY CONTROL SAMPLE (LCS)

Login Number: L0710557
Run Date: 10/23/2007
Sample ID: WG253478-03
Instrument ID: HYDRA
Run Time: 10:56
Prep Method: METHOD
File ID: HY.102307.105613
Analyst: ED
Method: 7470A
Workgroup (AAB#): WG253567
Matrix: Water
Units: mg/L
QC Key: STD
Lot#: MI-7470-01
Cal ID: HYDRA - 23-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: 917172
Report generated 10/25/2007 15:50

MATRIX SPIKE AND MATRIX SPIKE DUP (MS/MSD)

00101406

Loginnum:L0710557 Cal ID: HYDRA - Worknum:WG253567
Instrument ID:HYDRA Contract #:DACA56-94-D-0020 Method:7470A
Parent ID:WG253478-01 File ID:HY.102307.110525 Dil:1 Matrix:WATER
Sample ID:WG253478-04 MS File ID:HY.102307.110758 Dil:1 Units:mg/L
Sample ID:WG253478-05 MSD File ID:HY.102307.110946 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	0.00507	114	0.00444	0.00488	110	3.80	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: 917173
Report generated 10/25/2007 15:50

KEMRON ENVIRONMENTAL SERVICES
POST SPIKE REPORT

Sample Login ID: L0710557 **Worknum:** WG253567
Instrument ID: HYDRA **Method:** 7470A
Post Spike ID: WG253567-01 **File ID:** HY.102307.110212 **Dil:** 1 **Units:** ug/L
Sample ID: L0710444-01 **File ID:** HY.102307.110034 **Dil:** 1 **Matrix:** Water

Analyte	Post Spike Result	C	Sample Result	C	Spike Added(SA)	% R	Control Limit %R	Q
MERCURY	1.03		0	U	1	103.0	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

INITIAL CALIBRATION SUMMARY

00101408

Login Number:L0710557
Analytical Method:7470A
ICAL Worknum:WG253874

Workgroup (AAB#):WG253567
Instrument ID:HYDRA
Initial Calibration Date:10/23/2007 10:41

Analyte	WG253874-01		WG253874-02		WG253874-03		WG253874-04		WG253874-05		WG253874-06	
	STD	INT	STD	INT	STD	INT	STD	INT	STD	INT	STD	INT
Mercury	0	1633	0.200	6194	1.00	45032	2.00	105198	5.00	260622	10.0	515345

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: 917174
Report generated 10/25/2007 15:50

INITIAL CALIBRATION SUMMARY

Login Number: L0710557
Analytical Method: 7470A
ICAL Worknum: WG253874

Workgroup (AAB#): WG253567
Instrument ID: HYDRA
Initial Calibration Date: 10/23/2007 10:41

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: 917174
Report generated 10/25/2007 15:50

KEMRON Environmental Services
INITIAL CALIBRATION BLANK (ICB)

Login Number: L0710557
Run Date: 10/23/2007
Sample ID: WG253874-08
Instrument ID: HYDRA
Run Time: 10:46
Method: 7471
File ID: HY.102307.104607
Analvst: ED
Units: mg/L
Workgroup (AAB#): WG253567
Cal ID: HYDRA - 23-OCT-07
Matrix: WATER

Analytes	MDL	RDL	Concentration	Dilution	Qualifier
MERCURY	.0001	.0002	.000023	1	U

KEMRON FORMS - Modified 10/02/2007
Version 2.0 PDF File ID: 917176
Report generated 10/25/2007 15:50

CONTINUING CALIBRATION BLANK (CCB)

00101411

Login Number: L0710557
Run Date: 10/23/2007
Sample ID: WG253874-10
Instrument ID: HYDRA
Run Time: 10:49
Method: 7470A
File ID: HY.102307.104959
Analyst: ED
Units: ug/L
Workgroup (AAB#): WG253567
Cal ID: HYDRA - 23-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

CONTINUING CALIBRATION BLANK (CCB)

00101412

Login Number: L0710557
Run Date: 10/23/2007
Sample ID: WG253874-12
Instrument ID: HYDRA
Run Time: 11:15
Method: 7470A
File ID: HY.102307.111505
Analyst: ED
Units: ug/L
Workgroup (AAB#): WG253567
Cal ID: HYDRA - 23-OCT-07
Matrix: WATER

Analytes	MDL	RDL	Concentration	Dilution	Qualifier
Mercury	0.100	0.200	0.0670	1	U

U = Result is less than MDL
F = Result is between MDL and RL
* = Result is above RL

CONTINUING CALIBRATION BLANK (CCB)

Login Number: L0710557
Run Date: 10/23/2007
Sample ID: WG253874-14
Instrument ID: HYDRA
Run Time: 11:37
Method: 7470A
File ID: HY.102307.113710
Analyst: ED
Units: ug/L
Workgroup (AAB#): WG253567
Cal ID: HYDRA - 23-OCT-07
Matrix: WATER

Analytes	MDL	RDL	Concentration	Dilution	Qualifier
Mercury	0.100	0.200	0	1	U

U = Result is less than MDL
F = Result is between MDL and RL
* = Result is above RL

CONTINUING CALIBRATION BLANK (CCB)

00101414

Login Number: L0710557
Run Date: 10/23/2007
Sample ID: WG253874-16
Instrument ID: HYDRA
Run Time: 11:47
Method: 7470A
File ID: HY.102307.114735
Analyst: ED
Units: ug/L
Workgroup (AAB#): WG253567
Cal ID: HYDRA - 23-OCT-07
Matrix: WATER

Analytes	MDL	RDL	Concentration	Dilution	Qualifier
Mercury	0.100	0.200	0.0450	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: 917178
Report generated 10/25/2007 15:50

INITIAL CALIBRATION VERIFICATION (ICV)

00101415

Login Number: L0710557
Run Date: 10/23/2007
Sample ID: WG253874-07
Instrument ID: HYDRA
Run Time: 10:44
Method: 7470A
File ID: HY.102307.104406
Analyst: ED
Units: ug/L
Workgroup (AAB#): WG253567
Cal ID: HYDRA - 23-OCT-07
QC Key: STD

Analyte		Expected	Found	%REC	LIMITS	Q
Mercury		2	2.06	103	90 - 110	

* Exceeds LIMITS Limit

KEMRON FORMS - Modified 09/06/2007 (ICV)
Version 1.5 PDF File ID: 917175
Report generated 10/25/2007 15:50

CONTINUING CALIBRATION VERIFICATION (CCV)

00101416

Login Number: L0710557
Instrument ID: HYDRA
File ID: HY.102307.104757
Workgroup (AAB#): WG253567

Run Date: 10/23/2007
Run Time: 10:47
Analyst: ED
Cal ID: HYDRA - 23-OCT-07

Sample ID: WG253874-09
Method: 7470A
QC Key: STD

Analyte		Expected	Found	UNITS	%REC	LIMITS		Q
Mercury, Total		0.00200	0.00211	mg/L	106	80 - 120		

* Exceeds LIMITS Criteria

KEMRON FORMS - Modified 09/06/2007 - (CCV)
Version 1.5 PDF File ID: 917177
Report generated 10/25/2007 15:50

CONTINUING CALIBRATION VERIFICATION (CCV)

00101417

Login Number: L0710557
Run Date: 10/23/2007
Sample ID: WG253874-11
Instrument ID: HYDRA
Run Time: 11:13
Method: 7470A
File ID: HY.102307.111308
Analyst: ED
QC Key: STD
Workgroup (AAB#): WG253567
Cal ID: HYDRA - 23-OCT-07

Analyte		Expected	Found	UNITS	%REC	LIMITS		Q
Mercury, Total		0.00200	0.00210	mg/L	105	80 - 120		

* Exceeds LIMITS Criteria

KEMRON FORMS - Modified 09/06/2007 - (CCV)
Version 1.5 PDF File ID: 917177
Report generated 10/25/2007 15:50

CONTINUING CALIBRATION VERIFICATION (CCV)

Login Number: L0710557
Run Date: 10/23/2007
Sample ID: WG253874-13
Instrument ID: HYDRA
Run Time: 11:35
Method: 7470A
File ID: HY.102307.113528
Analyst: ED
QC Key: STD
Workgroup (AAB#): WG253567
Cal ID: HYDRA - 23-OCT-07

Analyte		Expected	Found	UNITS	%REC	LIMITS		Q
Mercury, Total		0.00200	0.00219	mg/L	110	80 - 120		

* Exceeds LIMITS Criteria

KEMRON FORMS - Modified 09/06/2007 - (CCV)
Version 1.5 PDF File ID: 917177
Report generated 10/25/2007 15:50

CONTINUING CALIBRATION VERIFICATION (CCV)

00101419

Login Number: L0710557
Run Date: 10/23/2007
Sample ID: WG253874-15
Instrument ID: HYDRA
Run Time: 11:44
Method: 7470A
File ID: HY.102307.114444
Analyst: ED
QC Key: STD
Workgroup (AAB#): WG253567
Cal ID: HYDRA - 23-OCT-07

Analyte		Expected	Found	UNITS	%REC	LIMITS		Q
Mercury, Total		0.00200	0.00216	mg/L	108	80 - 120		

* Exceeds LIMITS Criteria

KEMRON FORMS - Modified 09/06/2007 - (CCV)
Version 1.5 PDF File ID: 917177
Report generated 10/25/2007 15:50

2.3 General Chemistry Data

KEMRON ENVIRONMENTAL SERVICES
GENERAL CHEMISTRY

KEMRON Login No.: L0710557

METHOD

Analysis: See report for method reference.

HOLDING TIMES

Sample Preparation: All holding times were met.

Sample Analysis: All holding times were met.

PREPARATION

Sample preparation proceeded normally.

BATCH QA/QC

Method Blank: All acceptance criteria were met.

Laboratory Control Sample: All acceptance criteria were met.

Duplicates: All acceptance criteria were met.

Matrix Spikes: All acceptance criteria were met.

SAMPLES

There were no technical difficulties with the sample group.

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.

Analyst: DIH

Approved: 26-OCT-07
Donna Hesson

2.3.1 Perchlorate Data

2.3.1.1 Summary Data

LABORATORY REPORT

L0710557

00101424

10/29/07 13:41

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: LHAAP

P.O. Number: 322255 OP

Sample Analysis Summary

Client ID	Lab ID	Method	Dilution	Date Received
LHSMW54-101707	L0710557-02	314.0	1	19-OCT-07
47WW28-101707	L0710557-07	314.0	1	19-OCT-07
47WW29-101707	L0710557-08	314.0	1	19-OCT-07

Sample Number:L0710557-02
Client ID:LHSMW54-101707
Matrix:Water
Workgroup Number:WG253613
Collect Date:10/17/2007 12:40
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:10/22/2007 14:47
Cal Date:10/22/2007 10:42
Run Date:10/22/2007 14:47
File ID:I11022071447.18

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

Sample Number:	L0710557-07	PrePrep Method:	NONE	Instrument:	IC1
Client ID:	47WW28-101707	Prep Method:	314.0	Prep Date:	10/22/2007 15:07
Matrix:	Water	Analytical Method:	314.0	Cal Date:	10/22/2007 10:42
Workgroup Number:	WG253613	Analyst:	DSF	Run Date:	10/22/2007 15:07
Collect Date:	10/17/2007 13:55	Dilution:	1	File ID:	I11022071507.19
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:	L0710557-08	PrePrep Method:	NONE	Instrument:	IC1
Client ID:	47WW29-101707	Prep Method:	314.0	Prep Date:	10/22/2007 15:28
Matrix:	Water	Analytical Method:	314.0	Cal Date:	10/22/2007 10:42
Workgroup Number:	WG253613	Analyst:	DSF	Run Date:	10/22/2007 15:28
Collect Date:	10/17/2007 13:30	Dilution:	1	File ID:	I11022071528.20
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

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: 102207 CLO4 IC1.SEQ
Analyst1: DSF Analyst2: NA
Method: CLO4 SOP: IC2 Rev: 4

Maintenance Log ID: 21406

Column 1 ID: AS16-4MM Column 2 ID: NA
Workgroups: WG253613
Internal STD: NA Surrogate STD: NA Calibration STD STD20008

Comments: L0710509, 510 and 557 samples were analyzed for perchlorate.

Seq.	File ID	Sample Information	Mat	Dil	Reference	Date/Time
1	I11022070900.01	CLO4 @ 100 ppb	1	1		10/22/07 09:00
2	I11022070920.02	CLO4 @ 50 ppb	1	1		10/22/07 09:20
3	I11022070941.03	CLO4 @ 25 ppb	1	1		10/22/07 09:41
4	I11022071001.04	CLO4 @ 10 ppb	1	1		10/22/07 10:01
5	I11022071021.05	CLO4 @ 4 ppb	1	1		10/22/07 10:21
6	I11022071042.06	CLO4 @ 1 ppb	1	1		10/22/07 10:42
7	I11022071102.07	CLO4 ALT @ 25 ppb	1	1		10/22/07 11:02
8	I11022071123.08	ELUENT	1	1		10/22/07 11:23
9	I11022071143.09	MCT \#4 (@25 ppb)	1	1		10/22/07 11:43
10	I11022071203.10	MCT \#5 (@25 ppb)	1	1		10/22/07 12:03
11	I11022071224.11	CCV (1 ppb) CLO4	1	1		10/22/07 12:24
12	I11022071244.12	WG253613-01 BLANK	1	1		10/22/07 12:44
13	I11022071305.13	WG253613-02 LCS (25 ppb)	1	1		10/22/07 13:05
14	I11022071325.14	L0710509-02 1/3	1	3		10/22/07 13:25
15	I11022071345.15	L0710509-02 1/3	1	3		10/22/07 13:45
16	I11022071406.16	L0710510-01 1/3	1	3		10/22/07 14:06
17	I11022071426.17	L0710510-02 1/3	1	3		10/22/07 14:26
18	I11022071447.18	L0710557-02 1/2	1	2		10/22/07 14:47
19	I11022071507.19	L0710557-07 1/3	1	3		10/22/07 15:07
20	I11022071528.20	L0710557-08 1/2 REF	1	2		10/22/07 15:28
21	I11022071548.21	WG253613-04 DUP 557-08 1/2	1	2		10/22/07 15:48
22	I11022071608.22	CCV (25 ppb) CLO4	1	1		10/22/07 16:08
23	I11022071629.23	WG253613-05 MS 557-08 1/2	1	2		10/22/07 16:29
24	I11022071649.24	WG253613-06 MSD 557-08 1/2	1	2		10/22/07 16:49
25	I11022071710.25	CCV (50 ppb) CLO4	1	1		10/22/07 17:10

Comments

Seq.	Rerun	Dil.	Reason	Analytes
14		3		
	Sample analyzed at a dilution due to high conductivity reading.			
15		3		
	Sample analyzed at a dilution due to high conductivity reading.			
16		3		
	Sample analyzed at a dilution due to high conductivity reading.			
17		3		

Page: 1 Approved: 23-OCT-07

KEMRON Environmental Services
Instrument Run Log

Instrument:	IC1	Dataset:	102207 CLO4 IC1.SEQ		
Analyst1:	DSF	Analyst2:	NA		
Method:	CLO4	SOP:	IC2	Rev:	4

Maintenance Log ID: 21406

Column 1 ID: AS16-4MM   Column 2 ID: NA

Workgroups: WG253613

Internal STD: NA   Surrogate STD: NA   STD20008

Comments

Seq.	Rerun	Dil.	Reason	Analytes
	Sample analyzed at a dilution due to high conductivity reading.			
18		2		
	Sample analyzed at a dilution due to high conductivity reading.			
19		3		
	Sample analyzed at a dilution due to high conductivity reading.			
20		2		
	Sample analyzed at a dilution due to high conductivity reading.			

Page: 2   Approved: 23-OCT-07

Checklist ID: 22527

00101432

KEMRON Environmental Services
Data Checklist

Date: 22-OCT-2007
Analyst: DSF
Analyst: NA
Method: CLO4
Instrument: IC1
Curve Workgroup: NA
Runlog ID: 18911
Analytical Workgroups: L0710509, L0710510, L0710557

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	NA
Reruns	NA
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:
23-OCT-2007
Debra S. Frederick

Secondary Reviewer:
23-OCT-2007
Michael Cordova

Generated: OCT-23-2007 11:35:18

Analytical Method: 314.0

AAB#: WG253613

Login Number: L0710557

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
47WW28-101707	10/17/07	10/19/07	10/22/07	28	5.05	10/22/07	28	5.05	
47WW29-101707	10/17/07	10/19/07	10/22/07	28	5.08	10/22/07	28	5.08	
LHSMW54-101707	10/17/07	10/19/07	10/22/07	28	5.09	10/22/07	28	5.09	

* EXT = SEE PROJECT QAPP REQUIREMENTS
*ANAL = SEE PROJECT QAPP REQUIREMENTS

KEMRON FORMS - Modified 11/20/2006
Version 1.5 PDF File ID: 913728
Report generated 10/23/2007 14:41

00101434

METHOD BLANK SUMMARY

Login Number: L0710557
Work Group: WG253613
Blank File ID: I11022071244.12
Blank Sample ID: WG253613-01
Prep Date: 10/22/07 12:44
Instrument ID: IC1
Analyzed Date: 10/22/07 12:44
Method: 314.0
Analyst: DSF

This Method Blank Applies To The Following Samples:

Client ID	Lab Sample ID	Lab File ID	Time Analyzed	TAG
LCS	WG253613-02	I11022071305.13	10/22/07 13:05	01
LHSMW54-101707	L0710557-02	I11022071447.18	10/22/07 14:47	DL01
47WW28-101707	L0710557-07	I11022071507.19	10/22/07 15:07	DL01
47WW29-101707	L0710557-08	I11022071528.20	10/22/07 15:28	DL01
DUP	WG253613-04	I11022071548.21	10/22/07 15:48	DL01

KEMRON FORMS - Modified 01/31/2007
Version 1.5 PDF File ID: 913729
Report generated 10/23/2007 14:41

METHOD BLANK REPORT

00101435

Login Number: L0710557
Prep Date: 10/22/07 12:44
Sample ID: WG253613-01
Instrument ID: IC1
Run Date: 10/22/07 12:44
Prep Method: 314.0
File ID: I11022071244.12
Analyst: DSF
Method: 314.0
Workgroup (AAB#): WG253613
Matrix: Water
Units: ug/L
Contract #: DACA56-94-D-0020
Cal ID: IC1 - 22-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: 913730
Report generated 10/23/2007 14:41

LABORATORY CONTROL SAMPLE (LCS)

Login Number: L0710557
Run Date: 10/22/2007
Sample ID: WG253613-02
Instrument ID: IC1
Run Time: 13:05
Prep Method: 314.0
File ID: I11022071305.13
Analyst: DSF
Method: 314.0
Workgroup (AAB#): WG253613
Matrix: Water
Units: ug/L
QC Key: STD
Lot#: STD20008
Cal ID: IC1-22-OCT-07

Analytes	Expected	Found	% Rec	LCS Limits	Q
Perchlorate	25.0	25.0	99.9	85 - 115	

KEMRON FORMS - Modified 09/06/2007
Version 1.5 PDF File ID: 913731
Report generated 10/23/2007 14:41

DUPLICATE (DUP)

00101437

Sample Ref: L0710557-08 Cal ID: IC1-22-OCT-2007 Worknum: WG253613
Instrument ID: IC1 Method: 314
Sample ID: WG253613-03 File ID: I11022071528.20 Dil: 1 Matrix: WATER
Duplicate ID: WG253613-04 File ID: I11022071548.21 Dil: 1 Units: ug/L

Analyte	Sample	Duplicate	RPD	RPD Limit	Q
Perchlorate	ND	ND	0	25	

FAILS RPD LIMIT

NOTE: This is an internal quality control sample.

KEMRON FORMS - Modified 03/06/2006
Version 1.5 PDF File ID: 913733
Report generated 10/23/2007 14:41

KEMRON
ENVIRONMENTAL SERVICES

Conductivity Probe
Calibration Check:
1413/1410 µs/cm

Perchlorate Conductivity Check

Working MCT Level:
967 µs/cm

Sample	Conductivity (µs/cm)	Pretreatment or Dilution Needed
L0710509-01	2330, 816	1/3 Diluted for Conductivity
-02	2330, 817	1/3
L0710510-01	2350, 827	1/3
-02	2380, 834	1/3
L0710557-02	1510, 791	1/2
-07	2270, 821	1/3
-08	1298, 674	1/2

AST
Analyst

10/22/07 09:00
Date/Time

DCN#71512

MATRIX SPIKE AND MATRIX SPIKE DUP (MS/MSD)

00101439

Loginnum:L0710557 Cal ID: IC1-22-OCT-2007 Worknum:WG253613
Instrument ID:IC1 Contract #:DACA56-94-D-0020 Method:314.0
Parent ID:WG253613-03 File ID:I11022071528.20 Dil:1 Matrix:WATER
Sample ID:WG253613-05 MS File ID:I11022071629.23 Dil:2 Units:ug/L
Sample ID:WG253613-06 MSD File ID:I11022071649.24 Dil:2

Analyte	Parent	MS Spiked	MS Found	MS %Rec	MSD Spiked	MSD Found	MSD %Rec	%RPD	%Rec Limits	RPD Limit	Q
Perchlorate	ND	25.0	25.9	104	25.0	25.7	103	1.05	80 - 120	25	

* 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: 913732
Report generated 10/23/2007 14:41

2.3.2 Total Dissolved Solids Data

2.3.2.1 Summary Data

LABORATORY REPORT

L0710557

00101442

10/29/07 13:41

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: LHAAP

P.O. Number: 322255 OP

Sample Analysis Summary

Client ID	Lab ID	Method	Dilution	Date Received
47WW08-101707	L0710557-01	160.1	1	19-OCT-07
47WW09-101607	L0710557-04	160.1	1	19-OCT-07
47WW13-101607	L0710557-05	160.1	1	19-OCT-07
47WW19-101707	L0710557-06	160.1	1	19-OCT-07
47WW09-101607-FD	L0710557-09	160.1	1	19-OCT-07

Sample Number: L0710557-01
Client ID: 47WW08-101707
Matrix: Water
Workgroup Number: WG253611
Collect Date: 10/17/2007 08:10

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 14:00
Cal Date:
Run Date: 10/23/2007 14:00
File ID: EN.0710231400-04

Analyte	CAS. Number	Result	Qual	PQL	SDL
Total Dissolved Solids		1350		20.0	10.0

Sample Number: **L0710557-04**
Client ID: **47WW09-101607**
Matrix: **Water**
Workgroup Number: **WG253547**
Collect Date: **10/16/2007 15:50**

PrePrep Method: **NONE**
Prep Method: **160.1**
Analytical Method: **160.1**
Analyst: **TMM**
Dilution: **1**
Units: **mg/L**

Instrument: **OVEN**
Prep Date: **10/22/2007 15:25**
Cal Date:
Run Date: **10/22/2007 15:25**
File ID: **EN.0710221525-08**

Analyte	CAS. Number	Result	Qual	PQL	SDL
Total Dissolved Solids		**2750**		**20.0**	**10.0**

00101445

Sample Number: L0710557-05
Client ID: 47WW13-101607
Matrix: Water
Workgroup Number: WG253547
Collect Date: 10/16/2007 16:20

PrePrep Method: NONE
Prep Method: 160.1
Analytical Method: 160.1
Analyst: TMM
Dilution: 1
Units: mg/L

Instrument: OVEN
Prep Date: 10/22/2007 15:25
Cal Date:
Run Date: 10/22/2007 15:25
File ID: EN.0710221525-10

Analyte	CAS. Number	Result	Qual	PQL	SDL
Total Dissolved Solids		674		20.0	10.0

00101446

Sample Number: L0710557-06	PrePrep Method: NONE	Instrument: OVEN
Client ID: 47WW19-101707	Prep Method: 160.1	Prep Date: 10/23/2007 14:00
Matrix: Water	Analytical Method: 160.1	Cal Date:
Workgroup Number: WG253611	Analyst: TMM	Run Date: 10/23/2007 14:00
Collect Date: 10/17/2007 10:08	Dilution: 1	File ID: EN.0710231400-05
	Units: mg/L	

Analyte	CAS. Number	Result	Qual	PQL	SDL
Total Dissolved Solids		1760		20.0	10.0

Sample Number:	L0710557-09	PrePrep Method:	NONE	Instrument:	OVEN
Client ID:	47WW09-101607-FD	Prep Method:	160.1	Prep Date:	10/22/2007 15:25
Matrix:	Water	Analytical Method:	160.1	Cal Date:	
Workgroup Number:	WG253547	Analyst:	TMM	Run Date:	10/22/2007 15:25
Collect Date:	10/16/2007 15:50	Dilution:	1	File ID:	EN.0710221525-09
		Units:	mg/L		

Analyte	CAS. Number	Result	Qual	PQL	SDL
Total Dissolved Solids		2840		20.0	10.0

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: 22-OCT-2007
Analyst: TMM
Analyst: HJR
Method: TDS
Instrument: OVEN
Curve Workgroup: NA
Runlog ID:
Analytical Workgroups: WG253547

Calibration/Linearity	10/22/07
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: 25-OCT-2007 H J Reed

Secondary Reviewer: 26-OCT-2007 Donna Hesson

Generated: OCT-26-2007 13:01:38

KEMRON Environmental Services
Data Checklist

Date: 23-OCT-2007
Analyst: TMM
Analyst: HJR
Method: TDS
Instrument: OVEN
Curve Workgroup: NA
Runlog ID:
Analytical Workgroups: WG253611

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:
25-OCT-2007
H J Reed

Secondary Reviewer:
26-OCT-2007
Donna Hesson

Generated: OCT-26-2007 13:03:09

Analytical Method: 160.1 AAB#: WG253611

Login Number: L0710557

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
47WW08-101707	10/17/07	10/19/07	10/23/07	7	6.24	10/23/07	7	6.24	
47WW19-101707	10/17/07	10/19/07	10/23/07	7	6.16	10/23/07	7	6.16	

* EXT = SEE PROJECT QAPP REQUIREMENTS
*ANAL = SEE PROJECT QAPP REQUIREMENTS

KEMRON FORMS - Modified 11/20/2006
Version 1.5 PDF File ID: 918022
Report generated 10/26/2007 12:57

KEMRON Environmental Services
HOLDING TIMES
EQUIVALENT TO AFCEE FORM 9

Analytical Method: 160.1

Login Number: L0710557

AAB#: WG253547

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
47WW13-101607	10/16/07	10/19/07	10/22/07	7	5.96	10/22/07	7	5.96	
47WW09-101607	10/16/07	10/19/07	10/22/07	7	5.98	10/22/07	7	5.98	
47WW09-101607-FD	10/16/07	10/19/07	10/22/07	7	5.98	10/22/07	7	5.98	

* EXT = SEE PROJECT QAPP REQUIREMENTS
*ANAL = SEE PROJECT QAPP REQUIREMENTS

KEMRON FORMS - Modified 11/20/2006
Version 1.5 PDF File ID: 918022
Report generated 10/26/2007 12:57

METHOD BLANK SUMMARY

Login Number: L0710557
Work Group: WG253547
Blank File ID: EN.0710221525-01
Blank Sample ID: WG253547-01
Prep Date: 10/22/07 15:25
Instrument ID: OVEN
Analyzed Date: 10/22/07 15:25
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	WG253547-02	EN.0710221525-02	10/22/07 15:25	
LCS2	WG253547-03	EN.0710221525-03	10/22/07 15:25	
47WW09-101607	L0710557-04	EN.0710221525-08	10/22/07 15:25	
47WW09-101607-FD	L0710557-09	EN.0710221525-09	10/22/07 15:25	
47WW13-101607	L0710557-05	EN.0710221525-10	10/22/07 15:25	
DUP	WG253547-05	EN.0710221525-13	10/22/07 15:25	

METHOD BLANK SUMMARY

Login Number: L0710557
Blank File ID: EN.0710231400-01
Prep Date: 10/23/07 14:00
Analyzed Date: 10/23/07 14:00
Analyst: TMM

Work Group: WG253611
Blank Sample ID: WG253611-01
Instrument ID: OVEN
Method: 160.1

This Method Blank Applies To The Following Samples:

Client ID	Lab Sample ID	Lab File ID	Time Analyzed	TAG
LCS	WG253611-02	EN.0710231400-02	10/23/07 14:00	
LCS2	WG253611-03	EN.0710231400-03	10/23/07 14:00	
47WW08-101707	L0710557-01	EN.0710231400-04	10/23/07 14:00	
47WW19-101707	L0710557-06	EN.0710231400-05	10/23/07 14:00	
DUP	WG253611-05	EN.0710231400-24	10/23/07 14:00	

KEMRON FORMS - Modified 01/31/2007
Version 1.5 PDF File ID: 918023
Report generated 10/26/2007 12:57

METHOD BLANK REPORT

Login Number: L0710557
Prep Date: 10/22/07 15:25
Sample ID: WG253547-01
Instrument ID: OVEN
Run Date: 10/22/07 15:25
Prep Method: 160.1
File ID: EN.0710221525-01
Analyst: TMM
Method: 160.1
Workgroup (AAB#): WG253547
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

METHOD BLANK REPORT

Login Number: L0710557 Prep Date: 10/23/07 14:00 Sample ID: WG253611-01
Instrument ID: OVEN Run Date: 10/23/07 14:00 Prep Method: 160.1
File ID: EN.0710231400-01 Analyst: TMM Method: 160.1
Workgroup (AAB#): WG253611 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

LABORATORY CONTROL SAMPLE (LCS)

00101458

Login Number: L0710557 Analyst: TMM Prep Method: 160.1
Instrument ID: OVEN Matrix: Water Method: 160.1
Workgroup (AAB#): WG253611 Units: mg/L
QC Key: STD Lot #: STD19758

Sample ID: WG253611-02 LCS File ID: EN.0710231400-02 Run Date: 10/23/2007 14:00
Sample ID: WG253611-03 LCS2 File ID: EN.0710231400-03 Run Date: 10/23/2007 14:00

Analytes	LCS			LCS2			%RPD	%Rec Limits	RPD Lmt	Q
	Known	Found	% REC	Known	Found	% REC				
Total Dissolved Solids	500	506	101	500	506	101	0.00	80 - 120	25	

LABORATORY CONTROL SAMPLE (LCS)

00101459

Login Number: L0710557 Analyst: TMM Prep Method: 160.1
Instrument ID: OVEN Matrix: Water Method: 160.1
Workgroup (AAB#): WG253547 Units: mg/L
QC Key: STD Lot #: STD19758

Sample ID: WG253547-02 LCS File ID: EN.0710221525-02 Run Date: 10/22/2007 15:25
Sample ID: WG253547-03 LCS2 File ID: EN.0710221525-03 Run Date: 10/22/2007 15:25

Analytes	LCS			LCS2			%RPD	%Rec Limits	RPD Lmt	Q
	Known	Found	% REC	Known	Found	% REC				
Total Dissolved Solids	500	506	101	500	504	101	0.396	80 - 120	25	

2.3.2.3 Raw Data

WORKGROUP: WG253547

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	K2	100	73.0534	73.0535	73.0535	
LCS: 500 mg/L	W6	50	75.1620	75.6874	75.6873	
LCSDUP: 500 mg/L	W2		77.9133	77.9387	77.9385	
10-540-01	W7		82.6946	82.2380	82.2380	
-03	K3		79.6860	79.8306	79.8304	
10-541-01	W3		75.2048	75.3560	75.3559	
10-539-01	W1		76.4246	76.46208	76.6205	
10-557-04	P4		74.5150	74.6526	74.6524	
-09	L17		77.9362	78.0782	78.0780	
-05	K1		73.9916	74.0255	74.0253	
10-539-03	A7		66.0433	66.1590	66.1589	
10-542-01	P5		75.5290	75.6704	75.6702	
~~10-557-01~~	ASK 10-22-07					
DUP: 10-557-09	L68	50	73.4228	73.5650	73.5648	

ANALYST: ~~[signature]~~ Tammy Morris

DATE/TIME: (on) 10-22-07 1525
DATE/TIME: (off) 10-23-07 1145
DATE/TIME: (off) 10-23-07 1415
DATE/TIME: (off)

DCN#71529

Donna Jesson
Approved: October 26, 2007

KEMRON ENVIRONMENTAL SERVICES
GRAVIMETRIC REPORT

Workgroup (AAB#): WG253547 Analyst: TMM
Product: 160.1 Run Date: 10/22/2007 15:25
Analyte: TOTAL DISSOLVED SOLIDS

SAMPLE NUMBER	INITIAL VOL	INITIAL WT	FINAL WT	Anal. Conc	Rep. Conc.	Units
WG253547-01	100	73.0534	73.0535	1.000	1.000	mg/L
WG253547-02	50	75.662	75.6873	506.0	506.0	mg/L
WG253547-03	50	77.9133	77.9385	504.0	504.0	mg/L
L0710540-01	50	82.0946	82.238	2868	2868	mg/L
L0710540-03	50	79.686	79.8304	2888	2888	mg/L
L0710541-01	50	75.2048	75.3559	3022	3022	mg/L
L0710539-01	50	76.4246	76.6205	3918	3918	mg/L
L0710557-04	50	74.515	74.6524	2748	2748	mg/L
L0710557-09	50	77.9362	78.078	2836	2836	mg/L
WG253547-04	50	77.9362	78.078	2836	2836	mg/L
L0710557-05	50	73.9916	74.0253	674.0	674.0	mg/L
L0710539-03	50	66.0433	66.1589	2312	2312	mg/L
L0710542-01	50	75.529	75.6702	2824	2824	mg/L
WG253547-05	50	73.4228	73.5648	2840	2840	mg/L

KEMRON FORMS - Modified 02/26/2007
Version 1.3
Report generated 10/25/2007 07:55

Donna Eisson

Approved: October 26, 2007

WORKGROUP: WG253611

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	P3	100	75.2607	75.2608	75.2608	
LCS: 500 mg/L	J6	50	57.3095	57.3345	57.3348	
LCSDUP: 500 mg/L	12	↓	52.0627	52.0877	52.0880	
10-557-01	7h		56.8867	56.9541	56.9540	
-06	10		54.0032	54.0909	54.0910	
10-543-01	7	↓	51.2942	51.3257	51.3259	
10-571-01	13	25	56.5408	56.6010	56.6011	
10-543-03	22		53.1870	53.2363	53.2365	
10-575-01	20		53.9396	53.9674	53.9678	
-03	A		51.3436	51.4037	51.4039	
-05	B	↓	47.~~8279~~26	47.9047	47.9048	
10-554-09	B11	50	51.6548	51.6586	51.6590	
-10	17		54.1971	54.1999	54.1999	
-11	F5	↓	58.0817	58.0930	58.0932	
10-574-01	F8	25	62.2255	62.2915	62.2919	
10-554-07	14	50	55.4258	55.4315	55.4317	HW 10-23-07
-08	5	↓	51.5373	51.5428	51.5430	
10-574-03	F9	25	58.8644	~~58.5~~ 59.0406	59.0403	
10-554-01	23	50	49.9276	49.9382	49.9383	
-02	24		54.4705	54.4819	54.4820	
-03	J1		56.9200	56.9326	56.9328	
-05	F6		56.2355	56.2489	56.2490	
10-545-02	2		48.5610	48.6456	48.6456	
DUP: 10-545-02	J7	↓	54.8088	54.8996	54.8996	

ANALYST: D. J. Reed
Tammy Morris

DATE/TIME: (on) 10-23-07 1400
DATE/TIME: (off) 10-24-07 1230
DATE/TIME: (off) 10-24-07 1405
DATE/TIME: (off)

DCN#71541

Donna Besson
Approved: October 26, 2007

KEMRON ENVIRONMENTAL SERVICES
GRAVIMETRIC REPORT

Workgroup (AAB#): WG253611 Analyst: TMM
Product: 160.1 Run Date: 10/23/2007 14:00
Analyte: TOTAL DISSOLVED SOLIDS

SAMPLE NUMBER	INITIAL VOL	INITIAL WT	FINAL WT	Anal. Conc	Rep. Conc.	Units
WG253611-01	100	75.2607	75.2608	1.000	1.000	mg/L
WG253611-02	50	57.3095	57.3348	506.0	506.0	mg/L
WG253611-03	50	52.0627	52.088	506.0	506.0	mg/L
L0710557-01	50	56.8867	56.954	1346	1346	mg/L
L0710557-06	50	54.0032	54.091	1756	1756	mg/L
L0710543-01	50	51.2942	51.3259	634.0	634.0	mg/L
L0710571-01	25	56.5408	56.6011	2412	2412	mg/L
L0710543-03	25	53.187	53.2365	1980	1980	mg/L
L0710575-01	25	53.9396	53.9678	1128	1128	mg/L
L0710575-03	25	51.3436	51.4039	2412	2412	mg/L
L0710575-05	25	47.7926	47.9048	4488	4488	mg/L
L0710554-09	50	51.6548	51.659	84.00	84.00	mg/L
L0710554-10	50	54.1971	54.1999	56.00	56.00	mg/L
L0710554-11	50	58.0817	58.0932	230.0	230.0	mg/L
L0710574-01	25	62.2255	62.2919	2656	2656	mg/L
L0710554-07	50	55.4258	55.4317	118.0	118.0	mg/L
L0710554-08	50	51.5373	51.543	114.0	114.0	mg/L
L0710574-03	25	58.8644	59.0403	7036	7036	mg/L
L0710554-01	50	49.9276	49.9383	214.0	214.0	mg/L
L0710554-02	50	54.4705	54.482	230.0	230.0	mg/L
L0710554-03	50	56.92	56.9328	256.0	256.0	mg/L
L0710554-05	50	56.2355	56.249	270.0	270.0	mg/L
L0710545-02	50	48.561	48.6456	1692	1692	mg/L
WG253611-04	50	48.561	48.6456	1692	1692	mg/L
WG253611-05	50	54.8088	54.8996	1816	1816	mg/L

KEMRON FORMS - Modified 02/26/2007
Version 1.3
Report generated 10/26/2007 11:09

Donna Eisson

Approved: October 26, 2007

2.3.3 Total Suspended Solids Data

2.3.3.1 Summary Data

LABORATORY REPORT

L0710557

00101467

10/29/07 13:41

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: LHAAP

P.O. Number: 322255 OP

Sample Analysis Summary

Client ID	Lab ID	Method	Dilution	Date Received
47WW08-101707	L0710557-01	160.2	1	19-OCT-07
47WW09-101607	L0710557-04	160.2	1	19-OCT-07
47WW13-101607	L0710557-05	160.2	1	19-OCT-07
47WW19-101707	L0710557-06	160.2	1	19-OCT-07
47WW09-101607-FD	L0710557-09	160.2	1	19-OCT-07

Sample Number:	L0710557-01	PrePrep Method:	NONE	Instrument:	OVEN
Client ID:	47WW08-101707	Prep Method:	160.2	Prep Date:	10/22/2007 14:25
Matrix:	Water	Analytical Method:	160.2	Cal Date:	
Workgroup Number:	WG253298	Analyst:	TMM	Run Date:	10/22/2007 14:25
Collect Date:	10/17/2007 08:10	Dilution:	1	File ID:	EN.0710221425-18
		Units:	mg/L		

Analyte	CAS. Number	Result	Qual	PQL	SDL
Total Suspended Solids		5190		100	50.0

Sample Number:	L0710557-04	PrePrep Method:	NONE	Instrument:	OVEN
Client ID:	47WW09-101607	Prep Method:	160.2	Prep Date:	10/22/2007 14:25
Matrix:	Water	Analytical Method:	160.2	Cal Date:	
Workgroup Number:	WG253298	Analyst:	TMM	Run Date:	10/22/2007 14:25
Collect Date:	10/16/2007 15:50	Dilution:	1	File ID:	EN.0710221425-12
		Units:	mg/L		

Analyte	CAS. Number	Result	Qual	PQL	SDL
Total Suspended Solids		7.50		5.00	2.50

Sample Number: L0710557-05
Client ID: 47WW13-101607
Matrix: Water
Workgroup Number: WG253298
Collect Date: 10/16/2007 16:20

PrePrep Method: NONE
Prep Method: 160.2
Analytical Method: 160.2
Analyst: TMM
Dilution: 1
Units: mg/L

Instrument: OVEN
Prep Date: 10/22/2007 14:25
Cal Date:
Run Date: 10/22/2007 14:25
File ID: EN.0710221425-14

Analyte	CAS. Number	Result	Qual	PQL	SDL
Total Suspended Solids		18.0		5.00	2.50

Report Number: **L0710557**
Report Date : **October 29, 2007**

00101471

Sample Number: **L0710557-06**
Client ID: **47WW19-101707**
Matrix: **Water**
Workgroup Number: **WG253298**
Collect Date: **10/17/2007 10:08**

PrePrep Method: **NONE**
Prep Method: **160.2**
Analytical Method: **160.2**
Analyst: **TMM**
Dilution: **1**
Units: **mg/L**

Instrument: **OVEN**
Prep Date: **10/22/2007 14:25**
Cal Date:
Run Date: **10/22/2007 14:25**
File ID: **EN.0710221425-16**

Analyte	CAS. Number	Result	Qual	PQL	SDL
Total Suspended Solids		17.5		5.00	2.50

Sample Number:	L0710557-09	PrePrep Method:	NONE	Instrument:	OVEN
Client ID:	47WW09-101607-FD	Prep Method:	160.2	Prep Date:	10/22/2007 14:25
Matrix:	Water	Analytical Method:	160.2	Cal Date:	
Workgroup Number:	WG253298	Analyst:	TMM	Run Date:	10/22/2007 14:25
Collect Date:	10/16/2007 15:50	Dilution:	1	File ID:	EN.0710221425-13
		Units:	mg/L		

Analyte	CAS. Number	Result	Qual	PQL	SDL
Total Suspended Solids		13.5		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: 22-OCT-2007
Analyst: TMM
Analyst: HJR
Method: TSS
Instrument: OVEN
Curve Workgroup: NA
Runlog ID:
Analytical Workgroups: WG253298

Calibration/Linearity	10/22/07
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: 25-OCT-2007

Secondary Reviewer: 26-OCT-2007

Generated: OCT-26-2007 13:02:31

KEMRON Environmental Services
HOLDING TIMES
EQUIVALENT TO AFCEE FORM 9

00101476

Analytical Method: 160.2

AAB#: WG253298

Login Number: L0710557

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
47WW19-101707	10/17/07	10/19/07	10/22/07	7	5.18	10/22/07	7	5.18	
47WW08-101707	10/17/07	10/19/07	10/22/07	7	5.26	10/22/07	7	5.26	
47WW09-101607	10/16/07	10/19/07	10/22/07	7	5.94	10/22/07	7	5.94	
47WW09-101607-FD	10/16/07	10/19/07	10/22/07	7	5.94	10/22/07	7	5.94	
47WW13-101607	10/16/07	10/19/07	10/22/07	7	5.92	10/22/07	7	5.92	

* EXT = SEE PROJECT QAPP REQUIREMENTS

*ANAL = SEE PROJECT QAPP REQUIREMENTS

KEMRON FORMS - Modified 11/20/2006
Version 1.5 PDF File ID: 918127
Report generated 10/26/2007 11:28

METHOD BLANK SUMMARY

Login Number: L0710557
Work Group: WG253298
Blank File ID: EN.0710221425-01
Blank Sample ID: WG253298-01
Prep Date: 10/22/07 14:25
Instrument ID: OVEN
Analyzed Date: 10/22/07 14:25
Method: 160.2
Analyst: TMM

This Method Blank Applies To The Following Samples:

Client ID	Lab Sample ID	Lab File ID	Time Analyzed	TAG
LCS	WG253298-02	EN.0710221425-02	10/22/07 14:25	
LCS2	WG253298-03	EN.0710221425-03	10/22/07 14:25	
47WW09-101607	L0710557-04	EN.0710221425-12	10/22/07 14:25	
47WW09-101607-FD	L0710557-09	EN.0710221425-13	10/22/07 14:25	
47WW13-101607	L0710557-05	EN.0710221425-14	10/22/07 14:25	
47WW19-101707	L0710557-06	EN.0710221425-16	10/22/07 14:25	
47WW08-101707	L0710557-01	EN.0710221425-18	10/22/07 14:25	
DUP	WG253298-05	EN.0710221425-24	10/22/07 14:25	

METHOD BLANK REPORT

Login Number: L0710557 Prep Date: 10/22/07 14:25 Sample ID: WG253298-01
Instrument ID: OVEN Run Date: 10/22/07 14:25 Prep Method: 160.2
File ID: EN.0710221425-01 Analyst: TMM Method: 160.2
Workgroup (AAB#): WG253298 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

LABORATORY CONTROL SAMPLE (LCS)

00101479

Login Number: L0710557 Analyst: TMM Prep Method: 160.2
Instrument ID: OVEN Matrix: Water Method: 160.2
Workgroup (AAB#): WG253298 Units: mg/L
QC Key: STD Lot #: STD22620

Sample ID: WG253298-02 LCS File ID: EN.0710221425-02 Run Date: 10/22/2007 14:25
Sample ID: WG253298-03 LCS2 File ID: EN.0710221425-03 Run Date: 10/22/2007 14:25

Analytes	LCS			LCS2			%RPD	%Rec Limits	RPD Lmt	Q
	Known	Found	% REC	Known	Found	% REC				
Total Suspended Solids	50.0	52.0	104	50.0	51.0	102	1.94	75 - 125	25	

KEMRON FORMS - Modified 02/08/2007
Version 1.5 PDF File ID: 918130
Report generated 10/26/2007 11:28

2.3.3.3 Raw Data

00101481

WORKGROUP: WG253298

Kemron
ENVIRONMENTAL SERVICES

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	0.0919	0.0921	0.0920	
LCS: 50 mg/L	LCS	100	0.0910	0.0963	0.0962	
LCSDUP: 50 mg/L	LCS2	↓	0.0909	0.0961	0.0960	
10-498-02	1	200	0.0920	~~0.0229~~ 0.0923	0.0922	
-04	2		0.0921	~~0.0239~~ 0.0925	0.0925	
10-507-01	3		0.0918	0.0926	0.0926	
-03	4		0.0917	0.0929	0.0930	
-05	5		0.0925	0.0931	0.0930	
10-505-01	6		0.0926	0.0937	0.0936	
10-531-01	7		0.0918	0.1000	~~0.0998~~ 0.0998	
10-533-01	8		0.0919	0.0945	0.0944	
10-557-04	9		0.0922	0.0938	0.0937	
-09	10		0.0908	0.0936	0.0935	
-05	11	↓	0.0912	0.0949	0.0948	
10-570-01	12	50	0.0917	0.1242	0.1239	
10-557-06	13	200	0.0915	0.0953	0.0950	
10-570-02	14	100	0.0920	0.1036	0.1034	
10-557-01	15	10	0.0919	0.1441	0.1438	
10-524-24	16	150	0.0922	0.0939	0.0938	
-27	17	200	0.0907	0.1049	0.1045	
10-491-11	18	30	0.0915	0.1520	0.1517	
-13	19	30	0.0922	0.1050	0.1048	
-15	20	200	0.0919	0.0926	0.0925	
DUP 10-570-01	Dup	50	0.0920	0.1240	0.1238	

ANALYST: [signature] DATE/TIME: (on) 10-22-07 1425

Tommy Morris DATE/TIME: (off) 10-23-07 0940

DATE/TIME: (off) 10-23-07 1630

DATE/TIME: (off) ____

DCN#71481

Donna Jesson
Approved: October 26, 2007

KEMRON ENVIRONMENTAL SERVICES
GRAVIMETRIC REPORT

Workgroup (AAB#): WG253298
Analyst: TMM
Product: 160.2
Run Date: 10/22/2007 14:25
Analyte: TOTAL SUSPENDED SOLIDS

SAMPLE NUMBER	INITIAL VOL	INITIAL WT	FINAL WT	Anal. Conc	Rep. Conc.	Units
WG253298-01	200	0.0919	0.092	0.5000	0.5000	mg/L
WG253298-02	100	0.091	0.0962	52.00	52.00	mg/L
WG253298-03	100	0.0909	0.096	51.00	51.00	mg/L
L0710498-02	200	0.092	0.0922	1.000	ND	mg/L
L0710498-04	200	0.0921	0.0925	2.000	ND	mg/L
L0710507-01	200	0.0918	0.0926	4.000	ND	mg/L
L0710507-03	200	0.0917	0.093	6.500	6.500	mg/L
L0710507-05	200	0.0925	0.093	2.500	ND	mg/L
L0710505-01	200	0.0926	0.0936	5.000	5.000	mg/L
L0710531-01	200	0.0918	0.0998	40.00	40.00	mg/L
L0710533-01	200	0.0919	0.0944	12.50	12.50	mg/L
L0710557-04	200	0.0922	0.0937	7.500	7.500	mg/L
L0710557-09	200	0.0908	0.0935	13.50	13.50	mg/L
L0710557-05	200	0.0912	0.0948	18.00	18.00	mg/L
L0710570-01	50	0.0917	0.1239	644.0	644.0	mg/L
WG253298-04	50	0.0917	0.1239	644.0	644.0	mg/L
L0710557-06	200	0.0915	0.095	17.50	17.50	mg/L
L0710570-02	100	0.092	0.1034	114.0	114.0	mg/L
L0710557-01	10	0.0919	0.1438	5190	5190	mg/L
L0710524-24	150	0.0922	0.0938	10.67	10.67	mg/L
L0710524-27	200	0.0907	0.1045	69.00	69.00	mg/L
L0710491-11	30	0.0915	0.1517	2007	2007	mg/L
L0710491-13	30	0.0922	0.1048	420.0	420.0	mg/L
L0710491-15	200	0.0919	0.0925	3.000	ND	mg/L
WG253298-05	50	0.092	0.1238	636.0	636.0	mg/L

KEMRON FORMS - Modified 02/26/2007
Version 1.3
Report generated 10/25/2007 07:47

Donna Hesson

Approved: October 26, 2007

3.0 Attachments

Kemron Environmental Services
Analyst Listing
October 29, 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

October 29, 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.

00101486

Shaw® Shaw Environmental, Inc.

3010 Briarpark Drive, Suite 4N
Houston, TX 77042 (713) 996-4400

CHAIN-OF-CUSTODY

No. 10345

Laboratory Name: Kemron — Address: 156 Starlite Drive, Marietta, Ohio 45750 — 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 Doty — Telephone No.: (713) 996-4547

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	TAL Metals (Filter @ lab)	TSS/TDS	Perchlorate 314.1	VOCs 8260				Remarks
																Please filter metals TRIP BLANK INCL.
1	47WW08-101707	10/17/07	0810		✓	W	47WW08, LHAAP-47	2	X	X						
2	LHSMW54-101707	10/17/07	12:40		✓	W	LHSMW54, LHAAP-47	4			X	X				
3	47WW03-101707	10/17/07	16:30		✓	W	47WW03, LHAAP-47	3			X					
4	47WW09-101607	10/16/07	15:50		✓	W	47WW09, LHAAP-47	2	X	X						
5	47WW13-101607	10/16/07	16:20		✓	W	47WW13, LHAAP-47	2	X	X						
6	47WW19-101707	10/17/07	10:08		✓	W	47WW19, LHAAP-47	2	X	X						
7	47WW28-101707	10/17/07	1355		✓	W	47WW28, LHAAP-47	4			X	X				
8	47WW29-101707	10/17/07	1330		✓	W	47WW29, LHAAP-47	3				X				
9	47WW09-101607-FD	10/16/07	15:50		✓	W	47WW09, LHAAP-47	2	X	X						Field Duplicate
10																

Transfers Relinquished By (Signature)	Date/Time	Transfers Accepted By (Signature)	Date/Time
[signature]	10/17/07 17:00		
		Laboratory [signature]	10-19-07 1025

Special Instructions: Please filter metals
7-day TAT

FedEx Airbill No.:

Sampler's Signature: [signature]

TAT: _____ Standard _____ Rush Due: ___ Seals Intact? _____ Y _____ N Received Good Condition _____ Y _____ N _____ Cold

White - Lab Copy Canary - Field Copy Pink - File Copy

Client: SHAW Houston					
Workorder Number: B —					
Date Received: 10-18-07					
Delivered by:	( ) Fedx	(✓) UPS	( ) Client	( ) Courier	Time: 1025
Opened by: EE					
IR Temp Gun:	( ) D	(✓) G			
Logged by:	BJ			L 10-557	

Cooler Information

Cooler ID	Temp C	Airbill#	COC#	Other
939	1	1Z66U7250195360123		

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/dated?		✓		1
Were sample containers and labels intact?	✓			
Were correct containers used?	✓			
Were correct preservatives used (water only)?			✓	
Were pH ranges acceptable?			✓	
Were VOA samples free of headspace?		✓		2
Were samples received within EPA hold times?	✓			

Discrepancy/Comments/Other Problems

1 Trip Blanks not on COC (2 Bottles), also chain reads 3 bottle Cl04 - MW03 Rec'd 3 vials VOAS EKT 10/19/07
2 Bubbles in Trips Pea size
3 Rec'd Cl04 for sample ID 47WW29-101707 not marked on c/c

Distribution

Name of KEMRON representative
Client/Company:
Person Contacted:
Date contacted:

Resolution/other comments:

KEMRON Environmental Services
Internal Chain of Custody Report

00101488

Login: L0710557
Account: 2773
Project: 2773.025
Samples: 10
Due Date: 26-OCT-2007

Samplenum	Container ID	Products
L0710557-07	387085	CLO4

Bottle: 1

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish
1	LOGIN	COOLER	W1	19-OCT-2007 12:58	BRG	
2	ANALYZ	W1	SEM	22-OCT-2007 08:20	DSF	JKT
3	STORE	SEM	A1	23-OCT-2007 11:36	ERE	DSF

Samplenum	Container ID	Products
L0710557-01	387074	AG-MSD AL-D AS-MS-D BA-MS-D BE-AX-D CA-D CD-MS

Bottle: 1

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish
1	LOGIN	COOLER	W1	19-OCT-2007 12:58	BRG	
2	PREP	W1	DIG	22-OCT-2007 06:20	REK	JKT
3	STORE	DIG	A1	23-OCT-2007 13:45	RLK	REK

Samplenum	Container ID	Products
L0710557-01	387073	TSS

Bottle: 1

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish
1	LOGIN	COOLER	W1	19-OCT-2007 12:58	BRG	
2	ANALYZ	W1	WET	22-OCT-2007 14:11	HJR	ERE
3	STORE	WET	A1	25-OCT-2007 08:49	ERE	HJR

Samplenum	Container ID	Products
L0710557-02	387075	826-SPE

Bottle: 1

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish
1	LOGIN	COOLER	V1	19-OCT-2007 12:58	BRG	
2	ANALYZ	V1	ORG4	22-OCT-2007 10:04	KJW	ERE

Bottle: 2

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish
1	LOGIN	COOLER	V1	19-OCT-2007 12:58	BRG	
2	ANALYZ	V1	ORG4	22-OCT-2007 10:04	KJW	ERE

Bottle: 3

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish
1	LOGIN	COOLER	V1	19-OCT-2007 12:58	BRG	
2	ANALYZ	V1	ORG4	22-OCT-2007 10:04	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 00101489

Internal Chain of Custody Report

Login: L0710557
Account: 2773
Project: 2773.025
Samples: 10
Due Date: 26-OCT-2007

Samplenum	**Container ID**	**Products**
L0710557-03	387077	826-SPE

Bottle: 1

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish
1	LOGIN	COOLER	V1	19-OCT-2007 12:58	BRG	
2	ANALYZ	V1	ORG4	22-OCT-2007 10:05	KJW	ERE

Bottle: 2

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish
1	LOGIN	COOLER	V1	19-OCT-2007 12:58	BRG	
2	ANALYZ	V1	ORG4	22-OCT-2007 10:05	KJW	ERE

Bottle: 3

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish
1	LOGIN	COOLER	V1	19-OCT-2007 12:58	BRG	
2	ANALYZ	V1	ORG4	22-OCT-2007 10:05	KJW	ERE

Samplenum	**Container ID**	**Products**
L0710557-06	387082	TSS

Bottle: 1

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish
1	LOGIN	COOLER	W1	19-OCT-2007 12:58	BRG	
2	ANALYZ	W1	WET	22-OCT-2007 14:11	HJR	ERE
3	STORE	WET	A1	25-OCT-2007 08:49	ERE	HJR

Samplenum	**Container ID**	**Products**
L0710557-02	387076	CLO4

Bottle: 1

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish
1	LOGIN	COOLER	W1	19-OCT-2007 12:58	BRG	
2	ANALYZ	W1	SEM	22-OCT-2007 08:20	DSF	JKT
3	STORE	SEM	A1	23-OCT-2007 11:36	ERE	DSF

Samplenum	**Container ID**	**Products**
L0710557-04	387078	TSS

Bottle: 1

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish
1	LOGIN	COOLER	W1	19-OCT-2007 12:58	BRG	
2	ANALYZ	W1	WET	22-OCT-2007 14:11	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

00101490

Internal Chain of Custody Report

Login: L0710557
Account: 2773
Project: 2773.025
Samples: 10
Due Date: 26-OCT-2007

Samplenum	Container ID	Products
L0710557-09	387087	TSS

Bottle: 1

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish
1	LOGIN	COOLER	W1	19-OCT-2007 12:59	BRG	
2	ANALYZ	W1	WET	22-OCT-2007 14:11	HJR	ERE
3	STORE	WET	A1	25-OCT-2007 08:49	ERE	HJR

Samplenum	Container ID	Products
L0710557-10	387089	826-SPE

Bottle: 1

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish
1	LOGIN	COOLER	V1	19-OCT-2007 12:59	BRG	
2	ANALYZ	V1	ORG4	22-OCT-2007 10:05	KJW	ERE

Bottle: 2

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish
1	LOGIN	COOLER	V1	19-OCT-2007 12:59	BRG	
2	ANALYZ	V1	ORG4	22-OCT-2007 10:05	KJW	ERE

Samplenum	Container ID	Products
L0710557-08	387086	826-SPE

Bottle: 1

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish
1	LOGIN	COOLER	V1	19-OCT-2007 12:59	BRG	
2	ANALYZ	V1	ORG4	22-OCT-2007 10:05	KJW	ERE

Bottle: 2

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish
1	LOGIN	COOLER	V1	19-OCT-2007 12:59	BRG	
2	ANALYZ	V1	ORG4	22-OCT-2007 10:05	KJW	ERE

Bottle: 3

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish
1	LOGIN	COOLER	V1	19-OCT-2007 12:59	BRG	
2	ANALYZ	V1	ORG4	22-OCT-2007 10:05	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

KEMRON Environmental Services

00101491

Internal Chain of Custody Report

Login: L0710557
Account: 2773
Project: 2773.025
Samples: 10
Due Date: 26-OCT-2007

Samplenum	**Container ID**	**Products**
L0710557-09	387088	AG-MSD AL-D AS-MS-D BA-MS-D BE-AX-D CA-D CD-MS

Bottle: 1

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish
1	LOGIN	COOLER	W1	19-OCT-2007 12:59	BRG	
2	PREP	W1	DIG	22-OCT-2007 06:20	REK	JKT
3	STORE	DIG	A1	23-OCT-2007 13:45	RLK	REK

Samplenum	**Container ID**	**Products**
L0710557-05	387080	TSS

Bottle: 1

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish
1	LOGIN	COOLER	W1	19-OCT-2007 12:58	BRG	
2	ANALYZ	W1	WET	22-OCT-2007 14:11	HJR	ERE
3	STORE	WET	A1	25-OCT-2007 08:49	ERE	HJR

Samplenum	**Container ID**	**Products**
L0710557-06	387083	AG-MSD AL-D AS-MS-D BA-MS-D BE-AX-D CA-D CD-MS

Bottle: 1

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish
1	LOGIN	COOLER	W1	19-OCT-2007 12:58	BRG	
2	PREP	W1	DIG	22-OCT-2007 06:20	REK	JKT
3	STORE	DIG	A1	23-OCT-2007 13:45	RLK	REK

Samplenum	**Container ID**	**Products**
L0710557-05	387081	AG-MSD AL-D AS-MS-D BA-MS-D BE-AX-D CA-D CD-MS

Bottle: 1

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish
1	LOGIN	COOLER	W1	19-OCT-2007 12:58	BRG	
2	PREP	W1	DIG	22-OCT-2007 06:20	REK	JKT
3	STORE	DIG	A1	23-OCT-2007 13:46	RLK	REK

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

00101492

Login: L0710557
Account: 2773
Project: 2773.025
Samples: 10
Due Date: 26-OCT-2007

Samplenum	Container ID	Products
L0710557-08	387093	CLO4

Bottle: 1

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish
1	LOGIN	COOLER	W1	19-OCT-2007 13:23	BRG	
2	ANALYZ	W1	SEM	22-OCT-2007 08:20	DSF	JKT
3	STORE	SEM	A1	23-OCT-2007 11:36	ERE	DSF

Samplenum	Container ID	Products
L0710557-04	387079	AG-MSD AL-D AS-MS-D BA-MS-D BE-AX-D CA-D CD-MS

Bottle: 1

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish
1	LOGIN	COOLER	W1	19-OCT-2007 12:58	BRG	
2	PREP	W1	DIG	22-OCT-2007 06:20	REK	JKT
3	STORE	DIG	A1	23-OCT-2007 13:46	RLK	REK

Samplenum	Container ID	Products
L0710557-07	387084	826-SPE

Bottle: 1

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish
1	LOGIN	COOLER	V1	19-OCT-2007 12:58	BRG	
2	ANALYZ	V1	ORG4	22-OCT-2007 10:05	KJW	ERE

Bottle: 2

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish
1	LOGIN	COOLER	V1	19-OCT-2007 12:58	BRG	
2	ANALYZ	V1	ORG4	22-OCT-2007 10:05	KJW	ERE

Bottle: 3

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish
1	LOGIN	COOLER	V1	19-OCT-2007 12:58	BRG	
2	ANALYZ	V1	ORG4	22-OCT-2007 10:05	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