APPENDIX A
PHOTOGRAPHIC LOG

Site: Lower Rouge River
Photograph No.: 001
Direction: Northwest

Subject: Hot Spot 1
Date: 5/30/2008
Photographer: Michael Browning

Site: Lower Rouge River
Photograph No.: 002
Direction: Northwest

Subject: Hot Spot 1
Date: 5/30/2008
Photographer: Michael Browning

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Site: Lower Rouge River
Photograph No.: 003
Direction: Southwest

Subject: Hot Spot 3
Date: 5/30/2008
Photographer: Dan Capone

Site: Lower Rouge River
Photograph No.: 004
Direction: Southwest

Subject: Hot Spot 4
Date: 5/30/2008
Photographer: Dan Capone

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Site: Lower Rouge River
Photograph No.: 005
Direction: Northwest
Subject: Hot Spot 4
Date: 5/30/2008
Photographer: Michael Browning

Site: Lower Rouge River
Photograph No.: 006
Direction: North
Subject: Hot Spot 5
Date: 5/30/2008
Photographer: Michael Browning

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Site: Lower Rouge River
Photograph No.: 007
Direction: Northeast
Subject: Hot Spot 5
Date: 5/30/2008
Photographer: Michael Browning

Site: Lower Rouge River
Photograph No.: 008
Direction: West
Subject: Hot Spot 5
Date: 5/30/2008
Photographer: Michael Browning

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Site: Lower Rouge River
Photograph No.: 009
Direction: Southeast
Subject: Hot Spot 6
Date: 5/30/2008
Photographer: Dan Capone

Site: Lower Rouge River
Photograph No.: 010
Direction: Northeast
Subject: Hot Spot 6
Date: 5/30/2008
Photographer: Dan Capone

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Site: Lower Rouge River
Photograph No.: 011
Direction: West
Subject: O'Brien Creek
Date: 5/30/2008
Photographer: Dan Capone

Site: Lower Rouge River
Photograph No.: 012
Direction: Northwest
Subject: Outfall 2
Date: 5/30/2008
Photographer: Dan Capone

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Site: Lower Rouge River **Subject:** Outfall 17
Photograph No.: 013 **Date:** 5/30/2008
Direction: Northwest **Photographer:** Dan Capone

Site: Lower Rouge River **Subject:** Visible oil sheen on Rouge River water surface.
Photo Number: 014 **Date:** 05/12/09
Direction: Down **Photographer:** Alex Clark

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Site: Lower Rouge River **Subject:** Resident home along Rouge River.
Photo Number: 015 **Date:** 5/12/09
Direction: Southeast **Photographer:** Alex Clark

Site: Lower Rouge River **Subject:** Debris trapped in a fallen tree.
Photo Number: 016 **Date:** 5/13/09
Direction: Down **Photographer:** Alex Clark

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Site: Lower Rouge River **Subject:** Stained concrete ramp leading into the Rouge River.
Photo Number: 017 **Date:** 5/13/09
Direction: West **Photographer:** Alex Clark

Site: Lower Rouge River **Subject:** Ponar sample taken at Outfall 2.
Photo Number: 018 **Date:** 10/22/08
Direction: West **Photographer:** Matthew Beer

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Site: Lower Rouge River **Subject:** Preparation of core for sampling at Outfall No 2.
Photo Number: 019 **Date:** 10/22/08
Direction: Down **Photographer:** Matthew Beer

Site: Lower Rouge River **Subject:** Homogenized sample from Outfall 2.
Photo Number: 020 **Date:** 10/22/08
Direction: Down **Photographer:** Matthew Beer

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Site: Lower Rouge River **Subject:** Location HS4, Interval 1to 3 ft in mixing pans.
Photo Number: 021 **Date:** 10/23/08
Direction: Down **Photographer:** Matthew Beer

Site: Lower Rouge River **Subject:** Decontamination activities after sampling event
Photo Number: 022 **Date:** 10/23/08
Direction: Down **Photographer:** Matthew Beer

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Site: Lower Rouge River **Subject:** Light brown clay layer at ~4ft, location HS4.
Photo Number: 023 **Date:** 10/23/08
Direction: Down **Photographer:** Matthew Beer

Site: Lower Rouge River **Subject:** USEPA filling sample jars.
Photo Number: 024 **Date:** 10/23/08
Direction: Down **Photographer:** Matthew Beer

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Site: Lower Rouge River **Subject:** Location OBC, clay layer at ~3ft.
Photo Number: 025 **Date:** 10/23/08
Direction: Down **Photographer:** Matthew Beer

Site: Lower Rouge River **Subject:** Ponar sample at Location OBC-B, small oil droplets.
Photo Number: 026 **Date:** 10/23/08
Direction: Down **Photographer:** Matthew Beer

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APPENDIX B
ANALYTICAL DATA

APPENDIX C
SEDIMENT TOXICITY TEST RESULTS

Results of 28-Day *Hyalella azteca* and 20-day *Chironomus tentans* Toxicity Tests with Whole Sediment Samples from the Lower Rouge River, Wayne County, MI Samples Collected October 21, 22, 23, 2008

Prepared by

ASci Corporation
Environmental Testing Laboratory
4444 Airpark Boulevard
Duluth, Minnesota 55811-5712
(218) 722-4040

Submitted to

Weston Solutions, Inc.
750 East Bunker Court Suite 500
Vernon Hills, IL 60061-1450

Submitted December 2008

REPORT APPROVAL

Name (signed): _____

Name (typed): Dennis L. Hansen

Title: Operations Manager

* * * * *

Name (signed): _____

Name (typed): Katherine A. Wormer

Title: Senior Biologist

* * * * *

Name (signed): _____

Name (typed): Kate M. Anderson

Title: Data Reviewer

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APPENDIX C -- Statistical Analyses

APPENDIX D -- Precision of ASci's NaCl Reference Toxicant Testing

TABLE 1. *Chironomus tentans* and *Hyalella azteca* Survival and Growth Results Following Exposure to the Lower Rouge River Sediment.

Summary of Survival and Growth Data

Endpoint Averages per Site	EPA 2000 minimum criteria	WBS	LRR-WJB-A-01	LRR-HS4-B-01	LRR-O17-A-01	LRR-HS5-A-01	LRR-OF2-B-01	LRR-HS1-A-01	LRR-OBC-B-01
C. tentans Survival (%)	≥70%	76.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
C. tentans AFDW[a] (mg/org)	≥0.48	0.59	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Endpoint Averages per Site	EPA 2000 minimum criteria	WBS	LRR-WJB-A-01	LRR-HS4-B-01	LRR-O17-A-01	LRR-HS5-A-01	LRR-OF2-B-01	LRR-HS1-A-01	LRR-OBC-B-01
H.azteca Survival (%)	≥80%	90.0%	0.0%	6.3%	0.0%	8.8%	80.0%	35.0%	0.0%
H.azteca DW[b] (mg/org)	≥0.15	0.16	0.00	0.04	0.00	0.02	0.11	0.05	0.00
H.azteca Length (mm/org)	≥3.2	3.34	0.00	1.71	0.00	1.51	3.40	2.26	0.00

Significance was determined by utilizing Wilcoxon Rank Sum Test with Bonferroni Adjustment T-test (P=0.05)

[a] Ash-Free Dry Weight

[b] Dry Weight

Significantly Lower than West Bearskin control results

INTRODUCTION

At the request of Weston Solutions Inc., ASci-Environmental Testing Laboratory (ASci-ETL) performed toxicity tests with bulk sediment samples collected from the Lower Rouge River, Wayne County, MI. The tests were performed to measure the toxicity of selected sediment samples to *Hyalella azteca* (amphipod) and larval *Chironomus tentans* (midge also known as *Chironomus dilutus).* The *H. azteca* test endpoints were survival and growth (weight and length), and the *C. tentans* endpoints were survival and growth (dry weight and ash-free dry weight, AFDW).

METHODS AND MATERIALS

General Test Methods

Exposures to determine the toxicity of whole sediment samples from the Lower Rouge River were performed following the suggested United States Environmental Protection Agency methods (USEPA 2000). A 20-day test exposing *C. tentans* and 28-day test exposing *H. azteca* were conducted to determine if each test sediment affected organism survival and growth. Effect was determined by comparing the test organism's performance to organisms exposed to a reference site's sediment, West Bearskin Lake (Cook County, MN; USEPA 2000). Exposure conditions were maintained using an intermittent flow system for renewal of overlying water. Following are detailed descriptions of test performance, test results, data reduction, and results interpretation.

Test Organism Culturing, Holding, and Acclimation

Hyalella azteca and *Chironomus tentans* were obtained from Environmental Consulting and Testing (Superior, WI). Culture conditions were maintained according to suggested EPA methods (EPA 2000). The *H. azteca* were cultured in a static-renewal system with overlying water renewed twice per week, and the *C. tentans* were cultured in a re-circulating system. Culture temperature is maintained near the test temperature of 23ºC.

The batches of test organisms were hand delivered to ASci-ETL. Upon arrival at ASci-ETL, the batches of organisms were logged in and quarantined in plastic containers. The organisms were not crowded or subjected to daily temperature changes greater than 3ºC per day during holding. The holding tanks were

lightly aerated during the pre-test period. At test initiation the *H. azteca* were 7-8 days old. The *C. tentans* were <24 hours old.

Overlying Water Characteristics

Overlying water supplied to the test chambers was dechlorinated City of Duluth tap water. The City draws its water from Lake Superior. The tap water was dechlorinated and metals were removed with treatment through two, 1.5 cubic-foot activated carbon beds (Culligan Co., Minnetonka, MN).

Exposure System

Sediment from each site tested included 8 replicates for each species. Exposure chambers were 300-ml Berzilius® glass beakers with 1.5 cm diameter sidewall ports screened with a stainless steel mesh. The ports were located approximately 8 cm above the base of the beaker. The screens were fixed to the beakers using aquarium-grade silicone adhesive. Sixteen replicate test chambers (eight for each species) of each sediment exposure were held in a single all glass 12-L aquarium constructed with silicone adhesive and held a water volume of 8 L (6.8 L when sediment displacement is accounted for). The 12-L aquaria were fitted with a self-starting siphon drain positioned 10 cm above the base of the tank.

The renewal water was dechlorinated tap water, fed to a 5-gallon stainless steel headbox where the water was heated and aerated to reduce supersaturated levels of dissolved gasses. The water was gravity fed in a regulated manner to an intermediate polyethylene delivery tank. The intermediate tank contained a submersible pump controlled by a timer. The timer was set to activate the pump at 4-hour intervals (6 times per day). The pump was activated for 1 minute to start the siphon and deliver an appropriate volume of overlying water to the test system. This volume was rapidly pumped to splitter tubes that delivered fresh overlying water to each test's holding aquarium. The configuration resulted in two turnovers of overlying water per day. Test temperatures (23 ± 1ºC) were maintained using a constant temperature water bath. Test photoperiod was maintained at 16 hours light and 8 hours darkness per day. Light was supplied by cool-white fluorescent bulbs at an intensity of 50 to 100 ft-candles.

Test Performance

Seven sediment samples were collected by Weston Solutions personnel and were delivered to ASci-ETL via express courier on October 25, 2008. The Chain of Custody Form was completed upon the samples' arrival. Sample log-in included visual inspection of the shipping coolers, sample container integrity, and

sediment temperature and appearance. There were no sample abnormalities noted during the sample log in. Following log-in procedures, the samples were stored in darkness at 1-4ºC until use. Appendix A contains a copy of the Chain of Custody Form.

Laboratory control sediment was collected on September 29th, 2008, from West Bearskin Lake (Cook County, MN: USEPA 2000). The West Bearskin sediment sample (5-gallons) was logged-in upon arrival at the laboratory and stored under refrigeration (1-4^{o}C) until use. Before use in the tests, the laboratory control sediment was thoroughly homogenized, then sieved through a 2-mm screen to remove indigenous organisms.

The toxicity exposures with both test species were performed simultaneously. Twenty-four hours before toxicity test initiation, each sample was thoroughly homogenized with a stainless steel auger, and 100-ml portions were transferred to each of the designated replicate exposure chambers. Each set of replicate test chambers were then placed into an assigned 12-L holding chamber containing 8 L of overlying water. The toxicity tests were initiated approximately 24 hours later. The *H. azteca* and *C. tentans* were introduced on November 4th and 5th, 2008, respectively.

To start the tests, ten *H. azteca* (7-8 days old), and twelve *C. tentans* (<24 hours old) were impartially distributed to designated intermediate holding cups. The organisms were handled with a wide-bore glass pipette. The organisms were then transferred from the intermediate vessels to an assigned test replicate.

At test initiation and each daily observation, head flow rate was measured, and any flows found to be outside the range of ± 10% from target flow were adjusted. Measurements of overlying water pH, conductivity, and dissolved oxygen were measured three times per week. Temperature was measured daily. The total residual chlorine concentration of the post-carbon water was measured periodically during the test to check for breakthrough. Hardness and alkalinity were measured at test initiation and termination.

The test organisms were fed a diet based on EPA methods. The *H. azteca* were fed a mixture of yeast, Cerophyl®, and fermented trout chow (YCT) prepared to contain 1.8 g/L total solids. *Chironomus azteca* test chambers received a Tetrafin® slurry. The slurry was prepared to contain 4 g/L total solids. Each test replicate received 1.5 ml of the respective dietary component daily.

The tests were terminated following 20 days of exposure (*C. tentans*) and 28-days (*H. azteca*). Any organisms in the overlying water were removed first. The sediments were then removed from the test chambers in a layered fashion using a gentle stream of post-carbon treated water. The sediments were collected in a U.S. Standard #40 sieve. The contents retained on the sieve were rinsed into a white polyethylene pan, placed on a light source, and the sieved contents were searched for test organisms. Numbers of live organisms and dead organisms found were counted and recorded. Organisms not found were recorded as dead. These organisms were assumed to have died early in the exposures and the remains had decayed.

The live *C. tentans* from each replicate were pooled, rinsed, and placed in pre-ashed, pre-weighed aluminum massing pans. The organisms pooled from each test replicate were then dried at 60°C for 24 hours. The dried, pooled organisms were then massed to the nearest 0.01 mg to determine mean dried weights. The dried *C. tentans* were then ashed at 550°C for two hours, and then massed to determine ash-free dry weight (AFDW). AFDW equals the weight of dried larvae minus weight of ashed larvae.

Any pupae that were recovered were included in survival measurements but not growth measurements. If replicates were found to contain pupae, the mean weight was calculated by dividing the pooled dry weight of the replicate by the number of organisms exposed less the number of pupae recovered. In these tests, no pupae were recovered.

At test termination the *H. azteca* were pooled, rinsed, and preserved in 10% formalin. Length was determined under a dissecting microscope via a calibrated eyepiece micrometer. *Hyalella azteca* were then placed in pre-weighed aluminum pans and dried at 60^{o}C for 24 hours to determine mean dried weight.

Treatment of Results

The cumulative number of surviving organisms for each test sediment exposure was compared to cumulative survival of organisms exposed to the selected reference site sediment exposure to measure effect. The survival data were analyzed using Toxcalc Version 5.0.23, (Tidepool Scientific Software). The survival data was first checked for normality of distribution and then checked for equality of variance. Depending on the normality of and homoscedasticity of the results, the Bonferroni T-test, Wilcoxon Rank Sum test or Steel's Many-One Rank test was then performed to determine significant effect (p=0.05) as compared to the reference site results.

Depending on the normality of and homoscedasticity of the results, the growth data sets (of surviving organisms) were then analyzed for significant effect (p=0.05) using the Bonferroni T-test, Wilcoxon Rank Sum test or Steel's Many-One Rank test. Mean growth at each test site was compared to the reference site result to determine effect.

Two *H. azteca* sediment test chambers, replicates D and H, from site LRR- OF2-B-01 were omitted from all statistical analyses due to a mechanical error during the test where these to chambers were observed to overflow due to the beakers' ports blocked by suspended sediment depositions on the screen.

RESULTS

Overlying Water Characteristics

Headbox flow rates were measured daily. The daily values, calculated test chamber flow rates, and volume exchanges are in Table 2. The overall mean flow rate for each of the test chamber holding tanks during the test period was 16.0 ml/minute. The mean flow rate shows overlying water was renewed at a rate that averaged 1.9 tank volumes per day.

Tables 3 and 4 summarize the overlying water temperature values measured daily from the *Hyalella azteca* and *Chironomus tentans* exposure chambers. The individual temperature values ranged from 22.0ºC to 23.7ºC. All the individual values were within the proposed range of 23º C ± 1ºC. The mean test temperature was 22.5ºC.

Overlying water dissolved oxygen (DO) concentrations in the *Hyalella azteca* and *Chironomus tentans* test chambers are in Tables 5 and 6. DO values ranged from 3.4 to 6.7 mg/L during the *Hyalella azteca* exposures. DO values ranged from 2.4 to 7.5 mg/L during the *Chironomus tentans* exposures. Two sites did however fall below the required dissolved oxygen levels. They were LRR-017-A-01(on Day 14) and LRR-HS5A-01 (on Day 7) in the *C. tentans* tests. These sites also appeared to have a fungus growing on top of the sediment, which may have decreased the D.O. values. Feeding was with-held for the entire *C. tentans* test for one day, until the D.O. values increased. Their endpoint survivals were 0% however,

"periodic depressions of DO below 2.5mg/L (but not below 1.5mg/L) are not likely to adversely affect test results and thus should not be a reason to discard test data." (EPA 2000)

Overlying water pH's for the *H. azteca* and *C. tentans* test chambers are in Tables 7 and 8. The pH of overlying water in the *H. azteca* and *C. tentans* exposures ranged from 7.03 to 8.46. None of the pH values were outside of the organisms' physiological tolerance range.

Tables 9 and 10 contain the overlying water conductivity values for the *H. azteca* and *C. tentans* exposures. The conductivity values for both exposures ranged from 138 to 1029 µmhos/cm. None of the values indicated that a biologically significant amount of ionized material was released from the test sediments.

Tables 11 and 12 contain overlying water alkalinity values for the *H. azteca* and *C. tentans* exposures, respectively. Alkalinity values ranged from 44-132 mg/L as $CaCO_3$.

Tables 13 and 14 contain the overlying total hardness values for the exposures. Concentrations ranged from 42-152 mg/L as $CaCO_3$.

Tables 15 and 16 contain the results of total ammonia measurements for the exposures. Concentrations ranged from <1.00 to 12.2 mg/L. High ammonia values were not a factor in survival rates of the *C. tentans.* The EPA 2000 sediment methods state that ammonia toxicity to *C. tentans* is dependent on a solution's pH (EPA 2000). When the ammonia levels were compared to the respective pH values, there appeared to be no values that indicated that the low survival was attributed to ammonia toxicity.

The routine chemistry values indicated the test system maintained suitable water quality to allow assessment of sediment toxicity for both species.

Biological Exposure Results

Hyalella azteca Survival -

Table 1 summarizes the *H. azteca* survival results for the 28-day exposures. The laboratory control sediment (West Bearskin) supported acceptable 28-day mean *H. azteca* survival of 90%. The test sediments had mean survival rates from 0 to 80%. Kolmogorov D's statistical analysis showed the data exhibited a non-normal distribution ($P<0.01$). For the survival test's results, equality of variances could not be confirmed, so the Wilcoxon Rank Sum with Bonferroni Adjustment t-Test was utilized to compare the results. The analyses indicated that only one site's sediment (LRR-OF2-B-01) supported survival that was not significantly lower than West Bearskin Lake sediments. All other sites' sediments supported a significantly lower survival than West Bearskin control sediment's results.

Hyalella azteca Mean Dried Weight -

Table 1 also summarizes the *H. azteca* mean dried weight results for the 28-day exposures. Statistical analyses for dry weight were only performed on the sites that supported any amount of organism survival. The laboratory control sediment (West Bearskin Lake) supported a 28-day mean organism weight of 0.16 mg/organism. The test sediments supported mean dry weights from 0.04-0.11 mg/organism. Statistical analysis showed the data had a normal distribution ($P>0.01$) with unequal variances. Wilcoxon Rank Sum with Bonferroni T-tests indicated that the *H. azteca* dry weights for site LRR-OF2-B-01 was not different than the dry weights measured in the control values ($P>0.05$). All other sites were significantly lower than the control.

Hyalella azteca Length -

Table 1 also summarizes the *H. azteca* length results for the 28-day exposures. Statistical analysis for length was performed on the sites that had survival. The laboratory control sediment (West Bearskin Lake) supported an acceptable 28-day mean length of 3.34 millimeter per organism. The test sediments support mean lengths of 2.42 to 3.43 millimeters per organism. Statistical analyses showed the data showed a normal distribution ($P>0.01$), with equal variances. Results from the Bonferroni T-tests showed that sites LRR-OF2-B-01and LRR-HS4-B-01 were the only two sites that did not support significantly lower body lengths than the *H. azteca* exposed to West Bearskin control results ($P>0.05$).

Chironomus tentans Survival and Growth Results -

Table 1 summarizes the *C. tentans* survival, and growth results for the 20-day exposures. All sites were found to have no survival after the 20-day exposures. Therefore, statistical analysis was unable to be calculated on ToxCalc to compare the control site to the sediment sites. Analyses of endpoint data for the control site, West Bearskin Lake was conducted using Excel (Microsoft Office, 2000).

The laboratory's control sediment (West Bearskin Lake) supported the USEPA's required growth and survival performances for test acceptability. The control sediment was found to have supported an acceptable 20-day mean survival of 76.0%, an acceptable average mean dry weight of 0.77 mg/organism, and an acceptable ash-free dry weight of 0.59 mg/organism.

CONCLUSIONS

Utilizing Bonferroni T-tests, at the 95% Confidence level, the following conclusions can be drawn from the study results.

- The primary laboratory control sediment used for this study, West Bearskin Lake sediment, supported acceptable organism survival and growth for both test species.

- Sediment from sites LRR-WJB-A-01, LRR-O17-A-01, LRR-HS1-A-01, LRR-HS5-A-01, and LRR-OBC-B-01 supported significantly lower *Chironomus tentans* and *Hyalella azteca* survival and growth than the primary laboratory control, West Bearskin Lake sediment ($P<0.05$).

- Sediment from site LRR-HS4-B-01 was found to support significantly lower *Chironomus tentans* and *Hyalella azteca* survival, dry weight (*H. azteca*) and AFDW (*C. tentans*) than the control ($P<0.05$).
- Sediment LRR-HS4-B-01 did support an acceptable *Hyalella azteca* growth when compared to the body lengths of the control organisms ($P>0.05$).

- Sediment from site LRR-OF2-B-01 was found to support significantly lower *Chironomus tentans* survival and growth than that of the control site ($P<0.05$).

- Sediment from site LRR-OF2-B-01 supported acceptable *Hyalella azteca* survival, length, and dry weight ($P>0.05$) when compared to that of the control site.

REFERENCES

USEPA.2000. Methods for Measuring the Toxicity and Bioaccumulation of Sediment- Associated Contaminants With Freshwater Invertebrates. Second Edition. EPA 600/R-99/064.

Benoit, D.A., G. Phipps, and G.T. Ankley. 1993. A Sediment Testing Intermittent Renewal System for the Automated Renewal of Overlying Water in Toxicity Tests with Contaminated Sediments. Water Research 27:1403-1412.

TOXCALC. 2006. Toxicity Data Analysis Software. Version 5.0.23. Tidepool Scientific Software.

TABLE 2. Flow Rates (ml/min) of Overlying Water and Daily Turnover Rates to the Lower Rouge River Sediments *Hyalella* and *Chironomus* Exposure Test Chambers

	Test Day																		
Test Day	0/-1	1/0	2/1	3/2	4/3	5/4	6/5	7/6	8/7	9/8	10/9	11/10	12/11	13/12	14/13	15/14	16/15	17/16	18/17
Date (2008)	11/4	11/5	11/6	11/7	11/8	11/9	11/10	11/11	11/12	11/13	11/14	11/15	11/16	11/17	11/18	11/19	11/20	11/21	11/22
Head Flow Rate (ml/min)	106	107	108	105	100	100	102	106	120	102	102	104	100	102	102	112	110	102	100
Test Chamber Flow Rate (L/Day)	16.1	16.2	16.4	15.9	15.2	15.2	15.5	16.1	18.2	15.5	15.5	15.8	15.2	15.5	15.5	17.0	16.7	15.5	15.2
Daily Volume Exchanges	1.9	1.9	1.9	1.9	1.8	1.8	1.8	1.9	2.1	1.8	1.8	1.8	1.8	1.8	1.8	2.0	1.9	1.8	1.8

	Test Day												
Test Day	19/18	20/19	21/20	22	23	24	25	26	27	28	Mean	Low	High
Date (2008)	11/23	11/24	11/25	11/26	11/27	11/28	11/29	11/30	12/1	12/2			
Head Flow Rate (ml/min)	108	100	102	108	104	102	118	106	106	122	105.7	100.0	122.0
Test Chamber Flow Rate (L/Day)	16.4	15.2	15.5	16.4	15.8	15.5	17.9	16.1	16.1	18.5	16.0	15.2	18.5
Daily Volume Exchanges	1.9	1.8	1.8	1.9	1.8	1.8	2.1	1.9	1.9	2.2	1.9	1.8	2.2

TABLE 3. Overlying Water Temperature Values (°C) for the Lower Rouge River Sediments Hyalella Exposures

Day	WBS	LLR-WJB-A-01	LLR-HS4-B-01	LLR-O17-A-01	LLR-HS5-A-01	LLR-OF2-B-01	LLR-HS1-A-01	LLR-OBC-B-01
0	23.0	23.0	22.9	22.8	22.8	22.9	22.9	23.0
1	23.1	23.0	23.0	23.0	22.9	23.0	23.0	23.0
2	22.4	22.6	22.6	22.2	22.3	22.4	22.6	22.4
3	22.2	22.1	22.2	22.2	22.3	22.2	22.4	22.4
4	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0
5	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0
6	22.1	22.1	22.2	22.1	22.2	22.2	22.2	22.1
7	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0
8	22.4	22.7	22.6	22.4	22.4	22.4	22.5	22.5
9	22.6	22.9	22.8	22.9	22.9	22.8	23.0	22.9
10	22.9	23.0	23.0	23.0	23.0	22.9	23.0	22.9
11	22.6	22.9	22.8	22.9	22.6	22.8	22.9	22.7
12	22.5	22.7	22.5	22.5	22.5	22.5	22.7	22.6
13	22.2	22.4	22.2	22.2	22.2	22.4	22.4	22.2
14	22.1	22.2	22.2	22.1	22.2	22.2	22.3	22.2
15	22.2	22.2	22.2	22.1	22.2	22.1	22.2	22.1
16	22.4	22.3	22.1	22.2	22.1	22.2	22.2	22.3
17	22.1	22.4	22.4	22.2	22.2	22.0	22.2	22.0
18	23.1	23.1	23.1	23.1	23.1	23.1	23.1	23.1
19	22.0	22.4	22.3	22.3	22.2	22.0	22.3	22.0
20	22.1	22.7	22.6	22.4	22.6	22.3	22.6	22.5
21	22.2	23.0	23.7	22.6	22.4	22.3	23.2	23.1
22	23.5	23.3	23.2	23.0	22.8	22.8	23.0	23.0
23	22.5	22.6	22.8	22.6	22.6	22.8	22.5	22.9
24	22.4	22.8	22.6	22.8	22.8	22.2	22.4	22.3
25	22.4	22.6	22.5	22.5	22.4	22.4	22.5	22.5
26	22.0	22.0	22.0	22.0	22.0	22.0	22.1	22.0
27	22.1	22.5	22.6	22.5	22.5	22.3	22.4	22.5
28	22.2	22.4	22.2	22.6	22.4	22.5	22.2	22.5
Low	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0
High	23.5	23.3	23.7	23.1	23.1	23.1	23.2	23.1
Mean	22.4	22.5	22.5	22.4	22.4	22.4	22.5	22.5

TABLE 4. Overlying Water Temperature Values (°C) for the Lower Rouge River Sediments Chironomus Exposures

Day	WBS	LRR-WJB-A-01	LRR-HS4-B-01	LRR-O17-A-01	LRR-HS5-A-01	LRR-OF2-B-01	LRR-HS1-A-01	LRR-OBC-B-01
0	23.0	23.0	23.0	23.0	23.0	22.9	23.0	22.9
1	22.4	22.6	22.6	22.2	22.3	22.4	22.6	22.4
2	22.2	22.3	22.3	22.4	22.3	22.3	22.3	22.4
3	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0
4	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0
5	22.2	22.1	22.1	22.1	22.2	22.1	22.1	22.1
6	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0
7	22.3	22.3	22.2	22.2	22.2	22.2	22.2	22.3
8	22.9	22.8	22.9	22.8	22.7	22.7	23.0	22.8
9	22.8	22.9	22.7	22.7	22.8	22.8	22.9	22.8
10	22.6	22.8	22.5	22.6	22.6	22.7	22.7	22.8
11	22.5	22.7	22.5	22.7	22.5	22.5	22.4	22.6
12	22.9	22.7	22.5	22.6	22.5	22.6	22.6	22.6
13	22.0	22.0	22.1	22.0	22.1	22.1	22.2	22.1
14	22.2	22.1	22.1	22.1	22.2	22.1	22.2	22.1
15	22.4	22.3	22.1	22.2	22.1	22.2	22.2	22.3
16	22.0	22.0	22.0	22.1	22.1	22.0	22.2	22.2
17	23.1	23.1	23.1	23.1	23.1	23.1	23.1	23.1
18	22.3	22.4	22.3	22.3	22.3	22.2	22.2	22.3
19	22.1	22.4	22.5	22.4	22.5	22.3	22.4	22.5
20	22.6	22.9	23.0	22.3	22.1	22.2	22.9	22.9
Low	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0
High	23.1	23.1	23.1	23.1	23.1	23.1	23.1	23.1
Mean	22.4	22.4	22.4	22.4	22.4	22.4	22.4	22.4

TABLE 5. Overlying Water Dissolved Oxygen Values (mg/L) for the Lower Rouge River Sediments Hyalella Exposures

Day	WBS	LRR-WJB-A-01	LRR-HS4-B-01	LRR-O17-A-01	LRR-HS5-A-01	LRR-OF2-B-01	LRR-HS1-A-01	LRR-OBC-B-01
0	6.7	5.6	6.5	5.0	4.2	5.3	5.3	5.6
3	7.2	3.9	4.8	4.9	5.6	6.8	6.4	6.2
6	7.8	6.3	5.8	6.0	6.5	7.2	6.4	6.4
8	7.4	5.0	4.4	4.3	3.5	5.5	5.3	4.6
10	7.2	5.4	6.6	5.0	5.3	6.4	5.6	4.9
13	7.2	5.4	6.3	4.6	5.0	5.4	5.7	5.5
15	8.2	4.6	6.5	4.3	4.2	6.2	4.4	4.9
17	7.1	4.4	5.8	4.1	4.5	5.5	5.4	4.7
20	7.2	5.2	5.8	4.3	4.2	4.9	5.4	4.8
22	7.2	5.4	5.9	4.0	4.3	5.2	5.0	4.7
24	7.0	4.5	5.2	3.5	3.5	5.4	4.7	4.8
28	7.4	5.1	6.0	3.4	4.2	5.7	5.2	5.0
Low	6.7	3.9	4.4	3.4	3.5	4.9	4.4	4.6
High	8.2	6.3	6.6	6.0	6.5	7.2	6.4	6.4
Mean	7.3	5.1	5.8	4.5	4.6	5.8	5.4	5.2

TABLE 6. Overlying Water Dissolved Oxygen Values (mg/L) for the Lower Rouge River Sediments Chironomus Exposures

Day	WBS	LRR-WJB-A-01	LRR-HS4-B-01	LRR-O17-A-01	LRR-HS5-A-01	LRR-OF2-B-01	LRR-HS1-A-01	LRR-OBC-B-01
0	6.7	5.6	6.5	5.0	4.2	5.3	5.3	5.6
2	6.5	5.5	6.2	3.8	3.3	6.5	5.6	5.1
5	6.0	5.4	4.4	3.9	3.3	5.3	4.1	5.3
7	6.6	4.8	5.1	4.7	2.4	4.2	3.5	3.5
9	6.4	5.7	4.5	4.6	5.3	6.1	5.3	4.9
12	6.8	4.6	4.2	3.4	4.4	4.6	4.1	4.2
14	7.2	7.5	4.1	2.4	2.8	3.6	3.9	4.7
17	5.5	3.9	5.3	4.0	3.9	4.5	5.9	5.6
20	3.3	3.2	3.2	3.2	3.4	4.2	3.4	3.4
Low	3.3	3.2	3.2	2.4	2.4	3.6	3.4	3.4
High	7.2	7.5	6.5	5.0	5.3	6.5	5.9	5.6
Mean	6.1	5.1	4.8	3.9	3.7	4.9	4.6	4.7

TABLE 7. Overlying Water pH Values for the Lower Rouge River Sediments *Hyalella* Exposures

Test Days	WBS	LRR-WJB-A-01	LRR-HS4-B-01	LRR-O17-A-01	LRR-HS5-A-01	LRR-OF2-B-01	LRR-HS1-A-01	LRR-OBC-B-01
0	7.58	7.82	7.80	7.91	7.72	7.91	7.82	7.70
3	7.21	7.50	7.33	7.64	7.53	7.79	7.62	7.70
6	7.54	7.70	7.37	7.69	7.65	7.77	7.71	7.89
8	7.48	7.50	7.22	7.56	7.46	7.61	7.58	7.57
10	7.60	7.67	7.77	7.61	7.72	7.90	7.94	7.91
13	7.43	7.98	7.75	7.67	7.74	7.92	8.22	8.17
15	7.61	7.84	7.76	7.68	7.84	8.03	7.99	8.11
17	7.35	7.86	7.65	7.59	7.95	8.05	8.02	7.87
20	7.46	8.44	7.85	7.67	8.17	8.46	8.13	8.10
22	7.38	8.21	7.81	7.53	7.97	8.23	7.83	7.88
24	7.46	8.05	7.74	7.60	7.90	8.14	8.01	7.87
28	7.54	8.12	7.80	7.68	8.22	8.08	7.90	7.84

TABLE 8. Overlying Water pH Values for the Lower Rouge River Sediments *Chironomus* Exposures

Test Days	WBS	LRR-WJB-A-01	LRR-HS4-B-01	LRR-O17-A-01	LRR-HS5-A-01	LRR-OF2-B-01	LRR-HS1-A-01	LRR-OBC-B-01
0	7.58	7.82	7.80	7.91	7.72	7.91	7.82	7.70
2	7.25	7.57	7.50	7.66	7.38	7.76	7.56	7.53
5	7.33	7.52	7.19	7.49	7.37	7.52	7.41	7.47
7	7.31	7.48	7.17	7.47	7.31	7.51	7.36	7.40
9	7.62	7.74	7.30	7.62	7.81	7.83	7.66	7.67
12	7.49	7.46	7.18	7.44	7.65	7.52	7.42	7.49
14	7.65	7.93	7.36	7.62	7.59	7.53	7.70	7.86
17	7.06	7.63	7.33	7.45	7.49	7.60	7.35	7.42
20	7.03	7.53	7.48	7.42	7.44	7.51	7.35	7.42

TABLE 9. Overlying Water Conductivity Values (µmhos/cm) for the Lower Rouge River Sediments *Hyalella* Exposures

Test Days	WBS	LRR-WJB-A-01	LRR-HS4-B-01	LRR-O17-A-01	LRR-HS5-A-01	LRR-OF2-B-01	LRR-HS1-A-01	LRR-OBC-B-01
0	138	239	378	282	294	180	252	245
28	139	240	212	309	352	239	181	226

TABLE 10. Overlying Water Conductivity Values (µmhos/cm) for the Lower Rouge River Sediments *Chironomus* Exposures

Test Days	WBS	LRR-WJB-A-01	LRR-HS4-B-01	LRR-O17-A-01	LRR-HS5-A-01	LRR-OF2-B-01	LRR-HS1-A-01	LRR-OBC-B-01
0	138	239	378	282	294	180	252	245
20	141	277	1029	251	245	163	186	217

TABLE 11. Overlying Water Alkalinity Values (mg/L) for the Lower Rouge River Sediments *Hyalella* Exposures

Test Days	WBS	LRR-WJB-A-01	LRR-HS4-B-01	LRR-O17-A-01	LRR-HS5-A-01	LRR-OF2-B-01	LRR-HS1-A-01	LRR-OBC-B-01
0	44	76	80	112	104	70	96	50
28	46	92	62	130	144	94	68	82

TABLE 12. Overlying Water Alkalinity Values (mg/L) for the Lower Rouge River Sediments *Chironomus* Exposures

Test Days	WBS	LRR-WJB-A-01	LRR-HS4-B-01	LRR-O17-A-01	LRR-HS5-A-01	LRR-OF2-B-01	LRR-HS1-A-01	LRR-OBC-B-01
0	44	76	80	112	104	70	96	50
20	48	124	96	132	108	90	96	98

TABLE 13. Overlying Water Hardness Values (mg/L) for the Lower Rouge River Sediments *Hyalella* Exposures

Test Days	WBS	LRR-WJB-A-01	LRR-HS4-B-01	LRR-O17-A-01	LRR-HS5-A-01	LRR-OF2-B-01	LRR-HS1-A-01	LRR-OBC-B-01
0	60	74	104	98	100	68	70	70
28	48	96	42	128	152	96	72	86

TABLE 14. Overlying Water Hardness Values (mg/L) for the Lower Rouge River Sediments *Chironomus* Exposures

Test Days	WBS	LRR-WJB-A-01	LRR-HS4-B-01	LRR-O17-A-01	LRR-HS5-A-01	LRR-OF2-B-01	LRR-HS1-A-01	LRR-OBC-B-01
0	60	74	104	98	100	68	70	70
20	44	106	66	102	86	80	86	86

TABLE 15. Overlying Water Ammonia Values (mg/L) for the Lower Rouge River Sediments *Hyalella* Exposures

Test Days	WBS	LRR-WJB-A-01	LRR-HS4-B-01	LRR-O17-A-01	LRR-HS5-A-01	LRR-OF2-B-01	LRR-HS1-A-01	LRR-OBC-B-01
0	<1.00	1.25	1.86	5.28	5.77	1.39	6.52	1.84
28	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00

TABLE 16. Overlying Water Ammonia Values (mg/L) for the Lower Rouge River Sediments *Chironomus* Exposures

Test Days	WBS	LRR-WJB-A-01	LRR-HS4-B-01	LRR-O17-A-01	LRR-HS5-A-01	LRR-OF2-B-01	LRR-HS1-A-01	LRR-OBC-B-01
0	<1.00	1.25	1.86	5.28	5.77	1.39	6.52	1.84
20	3.41	2.88	5.91	4.25	12.20	4.32	8.76	10.50

APPENDIX A

Chain of Custody Forms

USEPA Contract Laboratory Program
Generic Chain of Custody

Reference Case 37965
Client No:
SDG No: L

Date Shipped:	10/24/2008
Carrier Name:	FedEx
Airbill:	821283827033
Shipped to:	ASci Environmental Testting Laboratory 4444 Airpark Blvd Duluth MN 55811 (218) 722-6843

Chain of Custody Record

Relinquished By	(Date / Time)	Received By	(Date / Time)
1	10/23/8 1600		10/25/08 0850
2			
3			
4			

Sampler Signature:

For Lab Use Only

Lab Contract No:
Unit Price:
Transfer To:
Lab Contract No:
Unit Price:

SAMPLE No.	MATRIX/ SAMPLER	CONC/ TYPE	ANALYSIS/ TURNAROUND	TAG No./ PRESERVATIVE/ Bottles	STATION LOCATION	SAMPLE COLLECT DATE/TIME		FOR LAB USE ONLY Sample Condition On Receipt
LRR-HS1-A-01	Sediment/ Alex Clark	L/G	TOX (21)	(Ice Only) (1)	LRR-HS1-A-01	S: 10/21/2008	15:15	Acceptable
LRR-HS4-B-01	Sediment/ Alex Clark	L/G	TOX (21)	(Ice Only) (1)	LRR-HS4-B-01	S: 10/23/2008	10:37	Acceptable
LRR-HS5-A-01	Sediment/ Alex Clark	L/G	TOX (21)	(Ice Only) (1)	LRR-HS5-A-01	S: 10/22/2008	15:52	Acceptable
LRR-O17-A-01	Sediment/ Alex Clark	L/G	TOX (21)	(Ice Only) (1)	LRR-O17-A-01	S: 10/21/2008	12:05	Acceptable
LRR-OBC-B-01	Sediment/ Alex Clark	L/G	TOX (21)	(Ice Only) (1)	LRR-OBC-B-01	S: 10/23/2008	15:25	Acceptable
LRR-OF2-B-01	Sediment/ Alex Clark	L/G	TOX (21)	(Ice Only) (1)	LRR-OF2-B-01	S: 10/22/2008	12:34	Acceptable
LRR-WJB-A-01	Sediment/ Alex Clark	L/G	TOX (21)	(Ice Only) (1)	LRR-WJB-A-01	S: 10/21/2008	16:35	Acceptable

Shipment for Case Complete? N	Sample(s) to be used for laboratory QC:	Additional Sampler Signature(s):	Cooler Temperature Upon Receipt: 6.2°	Chain of Custody Seal Number: Z
Analysis Key: TOX = Toxicity	Concentration: L = Low, M = Low/Medium, H = High	Type/Designate: Composite = C, Grab = G		Custody Seal Intact? Y / Shipment Iced? Y

TR Number: 5-043013577-102408-0003

PR provides preliminary results. Requests for preliminary results will increase analytical costs.
Send Copy to: Sample Management Office, Attn: Heather Bauer, CSC, 15000 Conference Center Dr., Chantilly, VA 20151-3819; Phone 703/818-4200; Fax 703/818-4602

LABORATORY COPY

Submitted to Weston Solutions
ASci-ETL ID# 1050-253
Testing of Sediment from the Rouge River
Sampled October 21, 22, 23, 2008

APPENDIX B

Raw Data Sheets

ASci Corporation

SEDIMENT TOXICITY TEST

TEST SPONSOR Weston Solutions, Inc.

ASci ID# 5010-253

PROJECT NAME Lower Rouge River

TEST DATES 11/4/08- 12/2/08

ASci STUDY DIRECTOR Dennis Hansen

ASci TECHNICIANS KW, JB, AP, KA

WHOLE-SEDIMENT TOXICITY TESTING INFORMATION

TEST INFORMATION

Project: Sediment Bioassay Toxicity Testing – Lower Rouge River
Client: Weston Solutions, Inc.
Test Dates: November 4 to December 2, 2008
Sample No.: West Bearskin (WBS), LRR-WJB-A-01, LRR-HS4-B-01, LRR-O17-A-01, LRR-HS5-A-01, LRR-OF2-B-01, LRR-HS1-A-01, and LRROBC-B-01
Test Type: 28-day *Hyalella azteca* (Survival and Growth) and 20-day Chironomus dilutes (Survival and Growth)
Renewal Frequency: Two renewals of overlaying water daily
Overlaying Water: PC
Template #: Standard Randomization
Test Site: Bio VII
Light Intensity: 50-100 Foot Candles Photo Period: 16 Hour Light/8 Hour Dark
Temperature: 23ºC ± 1ºC

TEST ORGANISM INFORMATION

Organism	*Hyalella azteca*	*Chironomus tentans*
Source	ECT (Superior, WI)	ECT (Superior, WI)
Age	7 to 8 days	<24 hours
ASci Log No.	110408-III	110508-II
Food	1.0 mL YCT/Algae Daily	1.5 mL Tetrafin Slurry daily
Test Chamber	300 mL glass Berzelius Beakers	300 mL glass Berzelius Beakers
Sediment Volume	100 mL	100 mL
Number of Replicates	8	8
Organisms Per Chamber	10	12

PC = Post-Carbon (City of Duluth Carbon Treated Tap water)

Exposure System Observations/Activities Sheet for Sediments (Weston Solutions 5010-253)

Date	Day of Test (HA/CT)	HA Fed 1.0 mL YCT?	CT Fed 1.5 mL Slurry?	Head Flow (ml/min):	Observations
11/4/2008	0/-1	Yes ~~NA~~ KW 12/9	NA	106	11/3/08 - Sediments loaded 11/4/08 - Chemistries took HA loaded into test chambers
11/5/2008	1/0	Yes	Yes	107	CT loaded into test chambers
11/6/2008	2/1	Yes	Yes	108	Test conditions normal
11/7/2008	3/2	Yes	Yes	105	Test conditions normal
11/8/2008	4/3	Yes	Yes	100	Test conditions normal
11/9/2008	5/4	Yes	Yes	100	Test conditions normal
11/10/2008	6/5	Yes	Yes	102	Test conditions normal
11/11/2008	7/6	Yes	Yes	106	Test conditions normal
11/12/2008	8/7	Yes	No	120	-CT D.O.'s low test not fed -screens cleaned
11/13/2008	9/8	Yes	Yes	102	Test conditions normal
11/14/2008	10/9	Yes	Yes	102	Test conditions normal
11/15/2008	11/10	Yes	Yes	104	Test conditions normal
11/16/2008	12/11	Yes	Yes	100	Test conditions normal
11/17/2008	13/12	Yes	Yes	102	OF2 reps D+H observed overflowing - omit from testing. Screens were cleaned for all chambers
11/18/2008	14/13	Yes	Yes	102	Test conditions normal

Exposure System Observations/Activities Sheet for Sediments (Weston Solutions 5010-253)

Date	Day of Test (HA/CT)	HA Fed 1.0 mL YCT?	CT Fed 1.5 mL Slurry?	Head Flow (ml/min):	Observations
11/19/2008	15/14	Yes ~~NA~~ KJD 12/1/9	NO ~~NA~~ KJD 12/1/9	112	-CT not fed due to low D.O.'s fungus/bacteria on sediment surface
11/20/2008	16/15	Yes	Yes	110	Test Conditions normal
11/21/2008	17/16	Yes	Yes	102	Test conditions normal
11/22/2008	18/17	Yes	Yes	100	Screens Cleaned
11/23/2008	19/18	Yes	Yes	108	Test conditions normal
11/24/2008	20/19	Yes	Yes	100	Test conditions normal
11/25/2008	21/20	Yes	yes	102	CT removed from sediment CT test terminated & chems took
11/26/2008	22	Yes	—	108	Test conditions normal
11/27/2008	23	Yes	—	104	Test conditions normal
11/28/2008	24	Yes	—	102	Test conditions normal
11/29/2008	25	Yes	—	118	Test conditions normal
11/30/2008	26	Yes	—	106	Test conditions normal
12/1/2008	27	Yes	—	106	Test conditions normal
12/2/2008	28	yes	—	122	HA removed from Sediment HA test terminated & chems took

Overlaying Water Temperature Values for *C. tentans* Sediment Test (Page 1)										
Date	Test Day	WBS	WJB	HS4	O17	HS5	OF2	OBC	HS1	
11/5/2008	0	23.0	23.0	23.0	23.0	23.0	22.9	22.9	23.0	
11/6/2008	1	22.4	22.6	22.6	22.2	22.3	22.4	22.4	22.6	
11/7/2008	2	22.2	22.3	22.3	22.4	22.3	22.3	22.4	22.3	
11/8/2008	3	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0	11/8/08 KA
11/9/2008	4	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0	11/9/08 KA
11/10/2008	5	22.2	22.1	22.1	22.1	22.2	22.1	22.1	22.1	
11/11/2008	6	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0	11/11/08 KA
11/12/2008	7	22.3	22.3	22.2	22.2	22.2	22.2	22.3	22.2	
11/13/2008	8	22.9	22.8	22.9	22.8	22.7	22.7	22.8	23.0	
11/14/2008	9	22.8	22.9	22.7	22.7	22.8	22.8	22.8	22.9	
11/15/2008	10	22.6	22.8	22.5	22.6	22.6	22.7	22.8	22.7	11/15/08 KA
11/16/2008	11	22.5	22.7	22.5	22.7	22.5	22.5	22.6	22.4	11/16/08 KA
11/17/2008	12	22.9	22.7	22.5	22.6	22.5	22.6	22.6	22.6	
11/18/2008	13	22.0	22.0	22.1	22.0	22.1	22.1	22.1	22.2	
11/19/2008	14	22.2	22.1	22.1	22.1	22.2	22.1	22.1	22.2	
11/20/2008	15	22.4	22.3	22.1	22.2	22.1	22.2	22.3	22.2	
11/21/2008	16	22.0	22.0	22.0	22.1	22.1	22.0	22.2	22.2	
11/22/2008	17	23.1	23.1	23.1	23.1	23.1	23.1	23.1	23.1	11/22/08 KA
11/23/2008	18	22.3	22.4	22.3	22.3	22.3	22.2	22.3	22.2	11/23/08 KA
11/24/2008	19	22.1	22.4	22.5	22.4	22.5	22.3	22.5	22.4	
11/25/2008	20	22.6	22.9	23.0	22.3	22.1	22.2	22.9	22.9	11/25/08 KA

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Overlaying Water DO Values for *C. tentans* Sediment Test (Page 1)									
Date	Test Day	WBS	WJB	HS4	O17	HS5	OF2	OBC	HS1
11/5/2008	0	6.7	5.6	6.5	5.0	4.2	5.3	5.6	5.3
11/7/2008	2	6.5	5.5	6.2	3.8	3.3	6.5	5.1	5.6
11/10/2008	5	6.0	5.4	4.4	3.9	3.3	5.3	5.3	4.1
11/12/2008	7	6.6	4.8	5.1	4.7	2.4	4.2	3.5	3.5
11/14/2008	9	6.4	5.7	4.5	4.4	5.3	6.1	4.9	5.3
11/17/2008	12	6.8	4.6	4.2	3.4	4.4	4.6	4.2	4.1
11/19/2008	14	7.2	7.5	4.1	2.4	2.8	3.6	4.7	3.9
11/22/2008	17	5.5	3.9	5.3	4.0	3.9	4.5	5.6	5.9
11/25/2008	20	3.3	3.2	3.2	3.2	3.4	4.2	3.4	3.4

KA 11/7/08

KA 11/10/08

Overlaying Water pH Values for *C. tentans* Sediment Test (Page 1)										
Date	Test Day	WBS	WJB	HS4	O17	HS5	OF2	OBC	HS1	
11/5/2008	0	7.58	7.82	7.80	7.91	7.72	7.91	7.70	7.82	
11/7/2008	2	7.25	7.57	7.50	7.66	7.38	7.76	7.53	7.56	KA 11/7/08
11/10/2008	5	7.33	7.52	7.19	7.49	7.37	7.52	7.47	7.41	KA 11/10/08
11/12/2008	7	7.31	7.48	7.17	7.47	7.31	7.51	7.40	7.36	
11/14/2008	9	7.62	7.74	7.30	7.62	7.81	7.83	7.67	7.66	
11/17/2008	12	7.49	7.46	7.18	7.44	7.65	7.52	7.49	7.42	
11/19/2008	14	7.65	7.93	7.36	7.62	7.59	7.53	7.86	7.70	
11/22/2008	17	7.06	7.63	7.33	7.45	7.49	7.60	7.42	7.35	KA 11/22/08
11/25/2008	20	7.03	7.53	7.48	7.42	7.44	7.51	7.42	7.35	

Overlaying Water Conductivity Values for *C. tentans* Sediment Test (Page 1)									
Date	Test Day	WBS	WJB	HS4	O17	HS5	OF2	OBC	HS1
11/5/2008	0	138	239	3780 (EE 12/9/08)	282	294	180	245	252
11/25/2008	20	141	277	1029	251	245	163	217	186

Overlaying Water Alkalinity Values for *C. tentans* Sediment Test (Page 1)									
Date	Test Day	WBS	WJB	HS4	O17	HS5	OF2	OBC	HS1
11/5/2008	0	44	76	80	112	104	70	50	96
11/25/2008	20	48	124	96	132	108	90	98	96

Overlaying Water Hardness Values for *C. tentans* Sediment Test (Page 1)									
Date	Test Day	WBS	WJB	HS4	O17	HS5	OF2	OBC	HS1
11/5/2008	0	60	74	104	98	100	68	70	70
11/25/2008	20	44	106	66	102	86	80	86	86

Overlaying Water Ammonia Values for *C. tentans* Sediment Test (Page 1)									
Date	Test Day	WBS	WJB	HS4	O17	HS5	OF2	OBC	HS1
11/5/2008	0	41.00	1.25	1.86	5.28	5.77	1.39	1.84	6.52
11/25/2008	20	3.41	2.88	5.91	~~4.5~~ 4.25 (EE KA)	12.20	4.32	10.50	8.76

TEMPERATURE FOR OVERLYING SURFACE WATER OF 28 DAY HAYALLELA SEDIMENT TESTS (WESTON 1050-253) Page 1										
Date	Test Day	WBS	WJB	HS4	O17	HS5	OF2	OBC	HS1	
11/4/2008	0	23.0	23.0	22.9	22.8	22.8	22.9	23.0	22.9	
11/5/2008	1	23.1	23.0	23.0	23.0	22.9	23.0	23.0	23.0	
11/6/2008	2	22.4	22.6	22.6	22.2	22.3	22.4	22.4	22.6	
11/7/2008	3	22.2	22.1	22.2	22.2	22.3	22.2	22.4	22.4	
11/8/2008	4	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0	11/8/08 KA
11/9/2008	5	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0	11/9/08 KA
11/10/2008	6	22.1	22.1	22.2	22.1	22.2	22.2	22.1	22.2	
11/11/2008	7	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0	11/11/08 KA
11/12/2008	8	22.4	22.7	22.6	22.4	22.4	22.4	22.5	22.5	
11/13/2008	9	22.4	22.9	22.8	22.9	22.9	22.8	22.9	23.0	
11/14/2008	10	22.9	23.0	23.0	23.0	23.0	22.9	22.9	23.0	
11/15/2008	11	22.6	22.9	22.8	22.9	22.6	22.8	22.7	22.9	11/15/08 KA
11/16/2008	12	22.5	22.7	22.5	22.5	22.5	22.5	22.6	22.7	11/16/08 KA
11/17/2008	13	22.2	22.4	22.2	22.2	22.2	22.4	22.2	22.4	
11/18/2008	14	22.1	22.2	22.2	22.1	22.2	22.2	22.2	22.3	

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TEMPERATURE FOR OVERLYING SURFACE WATER OF 28 DAY HAYALLELA SEDIMENT TESTS (WESTON 1050-253) Page 2

Date	Test Day	WBS	WJB	HS4	O17	HS5	OF2	OBC	HS1	
11/19/2008	15	22.2	22.2	22.2	22.1	22.2	22.1	22.1	22.2	
11/20/2008	16	22.4	22.3	22.1	22.2	22.1	22.2	22.3	22.2	
11/21/2008	17	22.1	22.4	22.4	22.2	22.2	22.0	22.0	22.2	
11/22/2008	18	23.1	23.1	23.1	23.1	23.1	23.1	23.1	23.1	KA 11/22/08
11/23/2008	19	22.0	22.4	22.3	22.3	22.3	22.0	22.0	22.3	KA 11/23/08
11/24/2008	20	22.1	22.7	22.6	22.4	22.6	22.3	22.5	22.6	
11/25/2008	21	22.2	23.0	23.7	22.6	22.4	22.3	23.1	23.2	KA 11/25/08
11/26/2008	22	23.5	23.3	23.2	23.0	22.8	22.8	23.0	23.0	JS 11/26/08
11/27/2008	23	22.5	22.6	22.8	22.6	22.6	22.8	22.9	22.5	
11/28/2008	24	22.4	22.8	22.6	22.8	22.8	22.2	22.3	22.4	
11/29/2008	25	22.4	22.6	22.5	22.5	22.4	22.4	22.5	22.5	KA 11/29/08
11/30/2008	26	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.1	KA 11/30/08
12/1/2008	27	22.1	22.5	22.6	22.5	22.5	22.3	22.5	22.4	
12/2/2008	28	22.2	22.4	22.2	22.6	22.4	22.5	22.5	22.2	

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Overlaying Water DO Values for *H. azteca* Sediment Test Weston (Page 1)

Date	Test Day	WBS	WJB	HS4	O17	HS5	OF2	OBC	HS1	
11/4/2008	0	6.7	5.6	6.5	5.0	4.2	5.3	5.6	5.3	
11/7/2008	3	7.2	3.9	4.8	4.9	5.6	6.8	6.2	6.4	KA 11/7/08
11/10/2008	6	7.8	6.3	5.8	6.0	6.5	7.2	6.4	6.4	KA 11/10/08
11/12/2008	8	7.4	5.0 ~~7~~ AS SB 11/12/08	4.4	4.3	3.5	5.5	4.6	5.3	
11/14/2008	10	7.2	5.4	6.6	5.0	5.3	6.4	4.9	5.6	
11/17/2008	13	7.2	5.4	6.3	4.6	5.0	5.4	5.5	5.7	
11/19/2008	15	8.2	4.6	6.5	4.3	4.2	6.2	4.9	4.4	
11/21/2008	17	7.1	4.4	5.8	4.1	4.5	5.5	4.7	5.4	
11/24/2008	20	7.2	5.2	5.8	4.3	4.2	4.9	4.8	5.4	
11/26/2008	22	7.2	5.4	5.9	4.0	4.3	5.2	4.7	5.0	
11/28/2008	24	7.0	4.5	5.2	3.5	3.5	5.4	4.8	4.7	
12/2/2008	28	7.4	5.1	6.0	3.4	4.2	5.7	5.0	5.2	

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Overlaying Water pH Values for *H. azteca* Sediment Test (Page 1)									
Date	Test Day	WBS	WJB	HS4	O17	HS5	OF2	OBC	HS1
11/4/2008	0	7.58	7.82	7.80	7.91	7.72	7.91	7.70	7.82
11/7/2008	3	7.21	7.50	7.33	7.64	7.53	7.79	7.70	7.62
11/10/2008	6	7.54	7.70	7.37	7.69	7.65	7.77	7.89	7.71
11/12/2008	8	7.48	7.50	7.22	7.56	7.46	7.61	7.57	7.58
11/14/2008	10	7.60	7.67	7.77	7.61	7.72	7.90	7.91	7.94
11/17/2008	13	7.43	7.98	7.75	7.67	7.74	7.92	8.17	8.22
11/19/2008	15	7.61	7.84	7.76	7.68	7.84	8.03	8.11	7.99
11/21/2008	17	7.35	7.86	7.65	7.59	7.95	8.05	7.87	8.02
11/24/2008	20	7.46	8.44	7.85	7.67	8.17	8.46	8.10	8.13
11/26/2008	22	7.58	8.21	7.81	7.53	7.97	8.23	7.88	7.83
11/28/2008	24	7.46	8.05	7.74	7.60	7.90	8.14	7.87	8.01
12/2/2008	28	7.54	8.12	7.80	7.68	8.22	8.28	7.84	7.90

KA 11/7/08

KA 11/10/08

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Overlaying Water Conductivity Values for *H. azteca* Sediment Test (Page 1)									
Date	Test Day	WBS	WJB	HS4	O17	HS5	OF2	OBC	HS1
11/4/2008	0	138	239	3730 SK RG 11/4/08	282	294	180	245	252
12/2/2008	28	139	240	212	309	352	239	226	181

Overlaying Water Alkalinity Values for *H. azteca* Sediment Test (Page 1)									
Date	Test Day	WBS	WJB	HS4	O17	HS5	OF2	OBC	HS1
11/4/2008	0	44	76	80	112	104	70	50	96
12/2/2008	28	46	92	62	130	144	94	82	68

Overlaying Water Hardness Values for *H. azteca* Sediment Test									
Date	Test Day	WBS	WJB	HS4	O17	HS5	OF2	OBC	HS1
11/4/2008	0	60	74	104	98	100	68	70	70
12/2/2008	28	48	96	42	128	152	96	86	72

Overlaying Water Ammonia Values for *H. azteca* Sediment Test (Page 1)									
Date	Test Day	WBS	WJB	HS4	O17	HS5	OF2	OBC	HS1
11/4/2008	0	<1.00	1.25	1.86	5.28	5.77	1.39	1.84	6.52
12/2/2008	28	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00

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C. tentans Survival and Growth						
Site ID # WBS						
Rep	# Organisms			Ashed Pan Wt. (mg)	Pan + Dried Org. Wt. (mg)	Pan + Ashed Org. Wt. (mg)
	Alive	Dead	Weighed			
A	6	4	6	1310.36	1315.88	1311.71
B	10	0	10	1316.22	1324.27	1317.83
C	10	0	10	1296.47	1303.22	1297.94
D	10	0	10	1310.34	1318.50	1312.07
E	10	0	10	1312.02	1318.97	1313.83
F	7	3	7	1313.05	1317.90	1314.29
G	10	0	10	1319.79	1328.04	1321.91
H	10	0	10	1318.19	1325.16	1319.84

C. tentans Survival and Growth						
Site ID # WJB						
Rep	# Organisms			Ashed Pan Wt. (mg)	Pan + Dried Org. Wt. (mg)	Pan + Ashed Org. Wt. (mg)
	Alive	Dead	Weighed			
A	0	10	0	1316.96	—	—
B	0	10	0	1320.40	—	—
C	0	10	0	1299.32	—	—
D	0	10	0	1300.11	—	—
E	0	10	0	1314.86	—	—
F	0	10	0	1302.41	—	—
G	0	10	0	1297.25	—	—
H	0	10	0	1330.34	—	—

C. *tentans* Survival and Growth

Site ID # HS4

Rep	# Organisms			Ashed Pan Wt. (mg)	Pan + Dried Org. Wt. (mg)	Pan + Ashed Org. Wt. (mg)
	Alive	Dead	Weighed			
A	0	10	0	1296.13	—	—
B	0	10	0	1293.31	—	—
C	0	10	0	1327.30	—	—
D	0	10	0	1302.90	—	—
E	0	10	0	1312.50	—	—
F	0	10	0	1316.89	—	—
G	0	10	0	1324.73	—	—
H	0	10	0	1305.62	—	—

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C. tentans Survival and Growth

Site ID # O17

Rep	# Organisms			Ashed Pan Wt. (mg)	Pan + Dried Org. Wt. (mg)	Pan + Ashed Org. Wt. (mg)
	Alive	Dead	Weighed			
A	0	10	0	1292.95	—	—
B	0	10	0	1305.31	—	—
C	0	10	0	1304.93	—	—
D	0	10	0	1335.53	—	—
E	0	10	0	1321.24	—	—
F	0	10	0	1324.02	—	—
G	0	10	0	1303.64	—	—
H	0	10	0	1311.71	—	—

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C. tentans Survival and Growth						
Site ID # HS5						
Rep	# Organisms			Ashed Pan Wt. (mg)	Pan + Dried Org. Wt. (mg)	Pan + Ashed Org. Wt. (mg)
	Alive	Dead	Weighed			
A	0	10	0	1310.31	—	—
B	0	10	0	1301.52	—	—
C	0	10	0	1324.65	—	—
D	0	10	0	1330.24	—	—
E	0	10	0	1314.26	—	—
F	0	10	0	1314.75	—	—
G	0	10	0	1314.35	—	—
H	0	10	0	1308,98	—	—

C. *tentans* Survival and Growth

Site ID # OF2

Rep	# Organisms			Ashed Pan Wt. (mg)	Pan + Dried Org. Wt. (mg)	Pan + Ashed Org. Wt. (mg)
	Alive	Dead	Weighed			
A	0	10	0	1322.96	—	—
B	0	10	0	1318.62	—	—
C	0	10	0	1314.32	—	—
D	0	10	0	1307.32	—	—
E	0	10	0	1315.05	—	—
F	0	10	0	1312.35	—	—
G	0	10	0	1328.44	—	—
H	0	10	0	1324.19	—	—

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C. tentans Survival and Growth						
Site ID # HS1						
Rep	# Organisms			Ashed Pan Wt. (mg)	Pan + Dried Org. Wt. (mg)	Pan + Ashed Org. Wt. (mg)
	Alive	Dead	Weighed			
A	0	10	0	1304.72	—	—
B	0	10	0	1313.79	—	—
C	0	10	0	1323.14	—	—
D	0	10	0	1319.15	—	—
E	0	10	0	1338.60	—	—
F	0	10	0	1314.61	—	—
G	0	10	0	1329.80	—	—
H	0	10	0	1326.14	—	—

***C. tentans* Survival and Growth**

Site ID # OBC

Rep	# Organisms			Ashed Pan Wt. (mg)	Pan + Dried Org. Wt. (mg)	Pan + Ashed Org. Wt. (mg)
	Alive	Dead	Weighed			
A	0	10	0	1317.24	—	—
B	0	10	0	1313.58	—	—
C	0	10	0	1309.84	—	—
D	0	10	0	1336.37	—	—
E	0	10	0	1316.11	—	—
F	0	10	0	1330.12	—	—
G	0	10	0	1322.80	—	—
H	0	10	0	1324.67	—	—

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H. azteca 28-day Survival and Growth					
Site I.D.: WBS Weight					
Rep	Number of Organisms Alive	Dead	Weighed	Dried Pan Weight (mg)	Dried Pan + Dried *H. azteca* (mg)
1	10	0	10	1322.74	1324.62
2	9	1	9	1318.79	1320.54
3	10	0	10	1326.80	1327.77
4	6	4	6	1318.52	1319.76
5	8	2	8	1311.37	1312.14
6	9	1	9	1313.88	1315.88
7	10	0	10	1324.98	1325.86
8	10	0	10	1332.33	1333.99

Length (mm)

REPLICATE	ORG 1	ORG 2	ORG 3	ORG 4	ORG 5	ORG 6	ORG 7	ORG 8	ORG 9	ORG 10
A	2.9	2.9	3.3	3.2	3.3	2.8	3.1	3.4	3.7	3.1
B	3.7	3.4	3.8	3.6	3.1	3.0	2.7	2.9	2.8	—
C	3.2	3.2	3.2	3.0	3.6	3.5	3.0	2.9	3.0	2.8
D	3.9	3.7	3.8	3.7	3.7	3.5	—	—	—	—
E	3.2	4.0	3.5	3.3	3.6	3.6	3.0	3.3	—	—
F	3.6	3.4	3.3	3.7	3.8	3.1	3.5	3.4	3.1	—
G	3.0	3.3	3.3	3.6	4.1	3.4	3.0	3.3	3.1	3.2
H	3.5	3.5	3.7	3.4	3.0	2.6	3.5	2.9	4.2	3.5

H. azteca 28-day Survival and Growth					
Site I.D.: WJB Weight					
Rep	Number of Organisms Alive	Dead	Weighed	Dried Pan Weight (mg)	Dried Pan + Dried *H. azteca* (mg)
1	0	10	0	—	—
2	0	10	0	—	—
3	0	10	0	—	—
4	0	10	0	—	—
5	0	10	0	—	—
6	0	10	0	—	—
7	0	10	0	—	—
8	0	10	0	—	—

Length (mm)

REPLICATE	ORG 1	ORG 2	ORG 3	ORG 4	ORG 5	ORG 6	ORG 7	ORG 8	ORG 9	ORG 10
A	—	—	—	—	—	—	—	—	—	—
B	—	—	—	—	—	—	—	—	—	—
C	—	—	—	—	—	—	—	—	—	—
D	—	—	—	—	—	—	—	—	—	—
E	—	—	—	—	—	—	—	—	—	—
F	—	—	—	—	—	—	—	—	—	—
G	—	—	—	—	—	—	—	—	—	—
H	—	—	—	—	—	—	—	—	—	—

Submitted to Weston Solutions
ASci-ETL ID# 1050-253
Testing of Sediment from the Rouge River
Sampled October 21, 22, 23, 2008

H. azteca 28-day Survival and Growth					
Site I.D.: HS4					
Weight					
Rep	Number of Organisms Alive	Dead	Weighed	Dried Pan Weight (mg)	Dried Pan + Dried *H. azteca* (mg)
1	1	9	1	1334.97	1335.01
2	0	10	0	—	—
3	1	9	1	1306.73	1306.77
4	0	10	0	—	—
5	0	10	0	—	—
6	2	8	2	1319.67	1319.74
7	1	9	1	1314.18	1314.21
8	0	10	0	—	—

Length (mm)

REPLICATE	ORG 1	ORG 2	ORG 3	ORG 4	ORG 5	ORG 6	ORG 7	ORG 8	ORG 9	ORG 10
A	4.0	—	—	—	—	—	—	—	—	—
B	—	—	—	—	—	—	—	—	—	—
C	3.5	—	—	—	—	—	—	—	—	—
D	—	—	—	—	—	—	—	—	—	—
E	—	—	—	—	—	—	—	—	—	—
F	3.0	3.9	—	—	—	—	—	—	—	—
G	2.7	—	—	—	—	—	—	—	—	—
H	—	—	—	—	—	—	—	—	—	—

H. azteca 28-day Survival and Growth					
Site I.D.: O17					
Weight					
Rep	Number of Organisms Alive	Dead	Weighed	Dried Pan Weight (mg)	Dried Pan + Dried *H. azteca* (mg)
1	0	10	0	—	—
2	0	10	0	—	—
3	0	10	0	—	—
4	0	10	0	—	—
5	0	10	0	—	—
6	0	10	0	—	—
7	0	10	0	—	—
8	0	10	0	—	—

Length (mm)

REPLICATE	ORG 1	ORG 2	ORG 3	ORG 4	ORG 5	ORG 6	ORG 7	ORG 8	ORG 9	ORG 10
A	—	—	—	—	—	—	—	—	—	—
B	—	—	—	—	—	—	—	—	—	—
C	—	—	—	—	—	—	—	—	—	—
D	—	—	—	—	—	—	—	—	—	—
E	—	—	—	—	—	—	—	—	—	—
F	—	—	—	—	—	—	—	—	—	—
G	—	—	—	—	—	—	—	—	—	—
H	—	—	—	—	—	—	—	—	—	—

Submitted to Weston Solutions
ASci-ETL ID# 1050-253
Testing of Sediment from the Rouge River
Sampled October 21, 22, 23, 2008

H. azteca 28-day Survival and Growth					
Site I.D.: HS5					
Weight					
Rep	Number of Organisms Alive	Dead	Weighed	Dried Pan Weight (mg)	Dried Pan + Dried *H. azteca* (mg)
1	1	9	1	1322.81	1322.83
2	0	10	0	—	—
3	2	8	2	1326.68	1326.72
4	1	9	1	1322.47	1322.48
5	0	10	0	—	—
6	1	9	1	1328.41	1328.43
7	2	8	2	1287.93	1287.97
8	0	10	0	—	—

Length (mm)

REPLICATE	ORG 1	ORG 2	ORG 3	ORG 4	ORG 5	ORG 6	ORG 7	ORG 8	ORG 9	ORG 10
A	2.8	—	—	—	—	—	—	—	—	—
B	—	—	—	—	—	—	—	—	—	—
C	3.1	2.0	—	—	—	—	—	—	—	—
D	2.0	—	—	—	—	—	—	—	—	—
E	—	—	—	—	—	—	—	—	—	—
F	2.1	—	—	—	—	—	—	—	—	—
G	2.4	2.7	—	—	—	—	—	—	—	—
H	—	—	—	—	—	—	—	—	—	—

Submitted to Weston Solutions
ASci-ETL ID# 1050-253
Testing of Sediment from the Rouge River
Sampled October 21, 22, 23, 2008

H. azteca 28-day Survival and Growth					
Site I.D.: OF2					
Weight					
Rep	Number of Organisms Alive	Dead	Weighed	Dried Pan Weight (mg)	Dried Pan + Dried *H. azteca* (mg)
1	7	3	7	1311.56	1312.43
2	6	4	6	1338.40	1338.99
3	8	2	8	1315.37	1316.25
4	0	0	0	1321.80	—
5	9	1	9	1326.32	1327.00
6	8	2	8	1309.88	1310.91
7	10	0	10	1332.10	1333.49
8	0	0	0	—	—

omit

omit

Length (mm)

REPLICATE	ORG 1	ORG 2	ORG 3	ORG 4	ORG 5	ORG 6	ORG 7	ORG 8	ORG 9	ORG 10
A	4.6	3.7	3.4	3.5	4.0	3.2	3.3	—	—	—
B	3.7	4.0	3.2	3.5	3.4	3.0	—	—	—	—
C	3.9	3.3	3.1	3.0	3.1	2.9	2.6	4.2	—	—
D	omit									
E	3.2	2.8	2.4	3.0	2.7	3.0	3.3	3.8	3.0	—
F	4.0	2.9	3.9	3.9	3.0	2.3	3.7	3.9	—	—
G	4.0	3.9	3.2	4.0	4.3	2.9	3.6	2.8	3.2	2.3
H	omit									

D+H omitted due to mechanic error - KW on 11/17/08

Submitted to Weston Solutions
ASci-ETL ID# 1050-253
Testing of Sediment from the Rouge River
Sampled October 21, 22, 23, 2008

H. azteca 28-day Survival and Growth					
Site I.D.: HS1					
Weight					
Rep	Number of Organisms Alive	Dead	Weighed	Dried Pan Weight (mg)	Dried Pan + Dried *H. azteca* (mg)
1	3	7	3	1313.24	1313.31
2	0	10	0	—	—
3	5	5	5	1327.47	1327.70
4	5	5	5	1311.75	1312.08
5	4	6	4	1313.94	1314.15
6	2	8	2	1326.81	1326.84
7	4	6	4	1320.15	1320.61
8	5	5	5	1336.40	1336.66

Length (mm)

REPLICATE	ORG 1	ORG 2	ORG 3	ORG 4	ORG 5	ORG 6	ORG 7	ORG 8	ORG 9	ORG 10
A	1.8	2.5	3.6	—	—	—	—	—	—	—
B	—	—	—	—	—	—	—	—	—	—
C	2.1	3.1	3.0	2.1	2.0	—	—	—	—	—
D	2.8	3.0	3.0	2.5	1.8	—	—	—	—	—
E	2.6	2.7	2.5	2.1	—	—	—	—	—	—
F	2.0	2.0	—	—	—	—	—	—	—	—
G	3.7	3.0	4.0	2.9	—	—	—	—	—	—
H	2.4	2.3	3.0	1.9	3.1	—	—	—	—	—

H. azteca 28-day Survival and Growth

Site I.D.: ~~H81~~ KID OBC-B-01

Weight

Rep	Number of Organisms Alive	Dead	Weighed	Dried Pan Weight (mg)	Dried Pan + Dried *H. azteca* (mg)
1	0	10	0	—	—
2	0	10	0	—	—
3	0	10	0	—	—
4	0	10	0	—	—
5	0	10	0	—	—
6	0	10	0	—	—
7	0	10	0	—	—
8	0	10	0	—	—

Length (mm)

REPLICATE	ORG 1	ORG 2	ORG 3	ORG 4	ORG 5	ORG 6	ORG 7	ORG 8	ORG 9	ORG 10
A	—	—	—	—	—	—	—	—	—	—
B	—	—	—	—	—	—	—	—	—	—
C	—	—	—	—	—	—	—	—	—	—
D	—	—	—	—	—	—	—	—	—	—
E	—	—	—	—	—	—	—	—	—	—
F	—	—	—	—	—	—	—	—	—	—
G	—	—	—	—	—	—	—	—	—	—
H	—	—	—	—	—	—	—	—	—	—
G	—	—	—	—	—	—	—	—	—	—
H	—	—	—	—	—	—	—	—	—	—

Submitted to Weston Solutions
ASci-ETL ID# 1050-253
Testing of Sediment from the Rouge River
Sampled October 21, 22, 23, 2008

APPENDIX C

Statistical Analysis

Chironomus

Evaluation of Dredge Materials for ~~Chironomidae~~ tentus- Survival

Start Date:	11/5/2008	Test ID:	Weston	Sample ID:	LRR
End Date:	11/20/2008	Lab ID:	5010	Sample Type:	SEDIMENT
Sample Date:		Protocol:	EPA 600/R-99/064	Test Species:	CT
Comments:					

Conc-%	1	2	3	4	5	6	7	8
WBS	0.5000	0.8333	0.8333	0.8333	0.8333	0.5833	0.8333	0.8333
LRR-WJB-A-01	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
LRR-HS4-B-01	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
LRR-O17-A-01	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
LRR-HS5-A-01	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
LRR-OF2-B-01	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
LRR-HS1-A-01	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
LRR-OBC-B-01	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

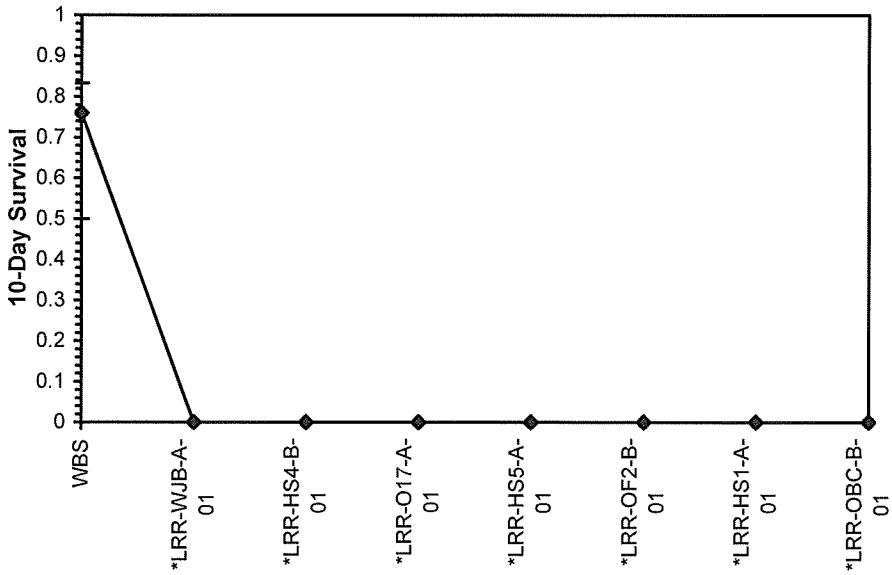
			Transform: Arcsin Square Root					Rank	1-Tailed
Conc-%	Mean	N-Mean	Mean	Min	Max	CV%	N	Sum	Critical
WBS	0.7604	1.0000	1.0695	0.7854	1.1503	14.136	8		
*LRR-WJB-A-01	0.0000	0.0000	0.0000	0.0000	0.0000	0.000	8	36.00	45.00
*LRR-HS4-B-01	0.0000	0.0000	0.0000	0.0000	0.0000	0.000	8	36.00	45.00
*LRR-O17-A-01	0.0000	0.0000	0.0000	0.0000	0.0000	0.000	8	36.00	45.00
*LRR-HS5-A-01	0.0000	0.0000	0.0000	0.0000	0.0000	0.000	8	36.00	45.00
*LRR-OF2-B-01	0.0000	0.0000	0.0000	0.0000	0.0000	0.000	8	36.00	45.00
*LRR-HS1-A-01	0.0000	0.0000	0.0000	0.0000	0.0000	0.000	8	36.00	45.00
*LRR-OBC-B-01	0.0000	0.0000	0.0000	0.0000	0.0000	0.000	8	36.00	45.00

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Kolmogorov D Test indicates non-normal distribution (p <= 0.01)	3.79512	1.035	-3.5617	19.5446
Equality of variance cannot be confirmed				

Hypothesis Test (1-tail, 0.05)

Steel's Many-One Rank Test indicates significant differences
Treatments vs WBS

Dose-Response Plot



Evaluation of Dredge Materials for Hyalella ~~azyrca~~ 28 Day Survival

Start Date:	11/4/2008	Test ID:	Weston	Sample ID:	LRR
End Date:	12/2/2008	Lab ID:	5010	Sample Type:	SEDIMENT
Sample Date:		Protocol:	EPA 600/R-99/064	Test Species:	HA
Comments:					

Conc-%	1	2	3	4	5	6	7	8
WBS	1.0000	0.9000	1.0000	0.6000	0.8000	0.9000	1.0000	1.0000
LRR-WJB-A-01	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
LRR-HS4-B-01	0.1000	0.0000	0.1000	0.0000	0.0000	0.2000	0.1000	0.0000
LRR-O17-A-01	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
LRR-HS5-A-01	0.1000	0.0000	0.2000	0.1000	0.0000	0.1000	0.2000	0.0000
LRR-OF2-B-01	0.7000	0.6000	0.8000	0.9000	0.8000	1.0000		
LRR-HS1-A-01	0.3000	0.0000	0.5000	0.5000	0.4000	0.2000	0.4000	0.5000
LRR-OBC-B-01	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

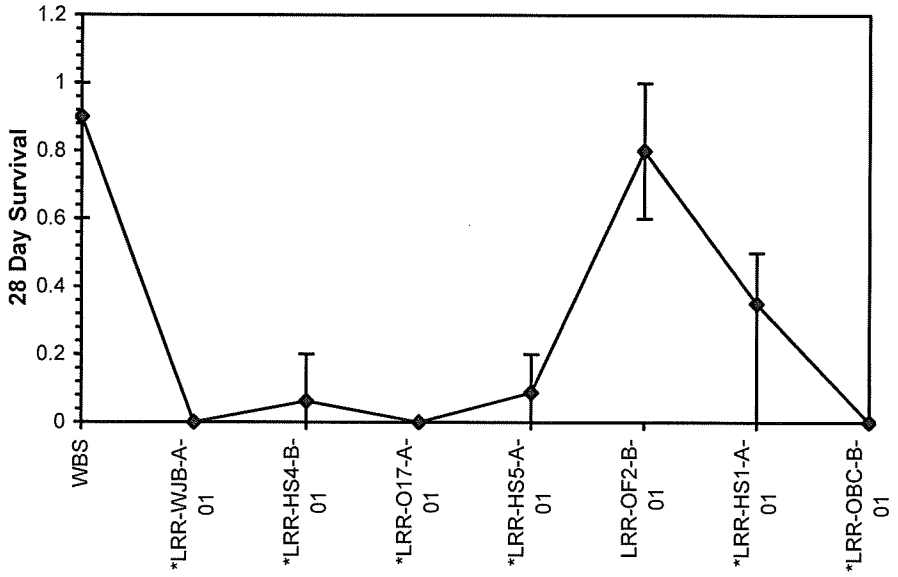
			Transform: Untransformed					Rank	1-Tailed
Conc-%	Mean	N-Mean	Mean	Min	Max	CV%	N	Sum	Critical
WBS	0.9000	1.0000	0.9000	0.6000	1.0000	15.713	8		
*LRR-WJB-A-01	0.0000	0.0000	0.0000	0.0000	0.0000	0.000	8	36.00	44.00
*LRR-HS4-B-01	0.0625	0.0694	0.0625	0.0000	0.2000	119.044	8	36.00	44.00
*LRR-O17-A-01	0.0000	0.0000	0.0000	0.0000	0.0000	0.000	8	36.00	44.00
*LRR-HS5-A-01	0.0875	0.0972	0.0875	0.0000	0.2000	95.374	8	36.00	44.00
LRR-OF2-B-01	0.8000	0.8889	0.8000	0.6000	1.0000	17.678	6	34.50	26.00
*LRR-HS1-A-01	0.3500	0.3889	0.3500	0.0000	0.5000	50.652	8	36.00	44.00
*LRR-OBC-B-01	0.0000	0.0000	0.0000	0.0000	0.0000	0.000	8	36.00	44.00

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Kolmogorov D Test indicates non-normal distribution (p <= 0.01)	2.18586	1.035	-1.143	3.57618
Equality of variance cannot be confirmed				

Hypothesis Test (1-tail, 0.05)

Wilcoxon Rank Sum Test indicates significant differences
Treatments vs WBS

Dose-Response Plot



Evaluation of Dredge Materials for Hyalella azteca-Dry weight

Start Date:	11/4/2008	Test ID:	Weston	Sample ID:	LRR
End Date:	12/2/2008	Lab ID:	5010	Sample Type:	SEDIMENT
Sample Date:		Protocol:	EPA/600/R-99/064	Test Species:	HA
Comments:					

Conc-%	1	2	3	4	5	6	7	8
WBS	0.1880	0.1944	0.0970	0.2067	0.0963	0.2222	0.0880	0.1660
LRR-HS4-B-01	0.0400	0.0400	0.0350	0.0300				
LRR-HS5-A-01	0.0200	0.0200	0.0100	0.0200	0.0200			
LRR-OF2-B-01	0.1243	0.0983	0.1100	0.0756	0.1287	0.1390		
LRR-HS1-A-01	0.0233	0.0460	0.0660	0.0525	0.0150	0.1150	0.0520	

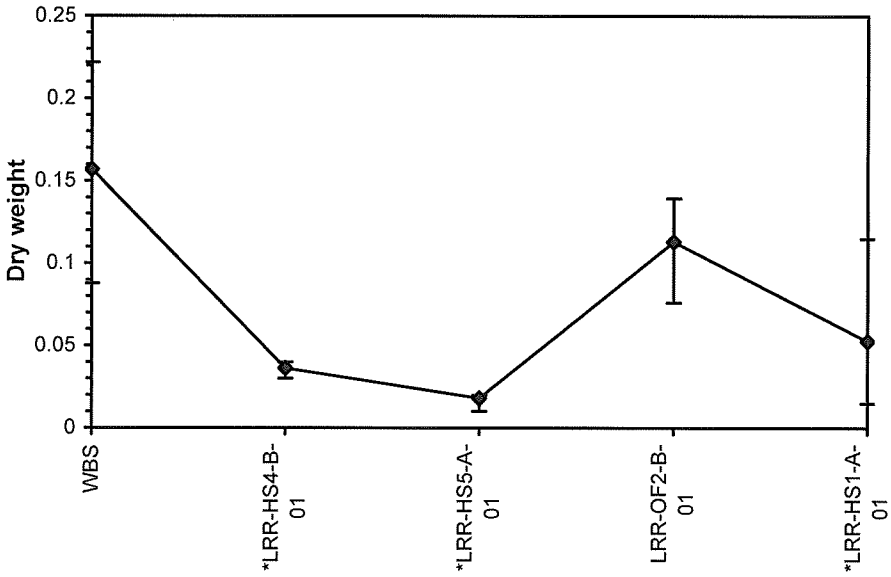
			Transform: Untransformed					Rank	1-Tailed
Conc-%	Mean	N-Mean	Mean	Min	Max	CV%	N	Sum	Critical
WBS	0.1573	1.0000	0.1573	0.0880	0.2222	34.993	8		
*LRR-HS4-B-01	0.0362	0.2304	0.0362	0.0300	0.0400	13.206	4	10.00	12.00
*LRR-HS5-A-01	0.0180	0.1144	0.0180	0.0100	0.0200	24.845	5	15.00	19.00
LRR-OF2-B-01	0.1127	0.7161	0.1127	0.0756	0.1390	20.539	6	36.00	27.00
*LRR-HS1-A-01	0.0528	0.3358	0.0528	0.0150	0.1150	61.755	7	31.00	36.00

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates normal distribution (p > 0.01)	0.94409	0.9	-0.1897	0.39977
Bartlett's Test indicates unequal variances (p = 5.76E-05)	24.7074	13.2767		

Hypothesis Test (1-tail, 0.05)

Wilcoxon Rank Sum Test indicates significant differences
Treatments vs WBS

Dose-Response Plot



Evaluation of Dredge Materials for Hyalella azteca-Length

Start Date:	11/4/2008	Test ID:	Weston	Sample ID:	LRR
End Date:	12/2/2008	Lab ID:	5010	Sample Type:	SEDIMENT
Sample Date:		Protocol:	~~EPAM 94-EPA/600/4-91/003~~ EPA-600/R-99/064	Test Species:	HA
Comments:					

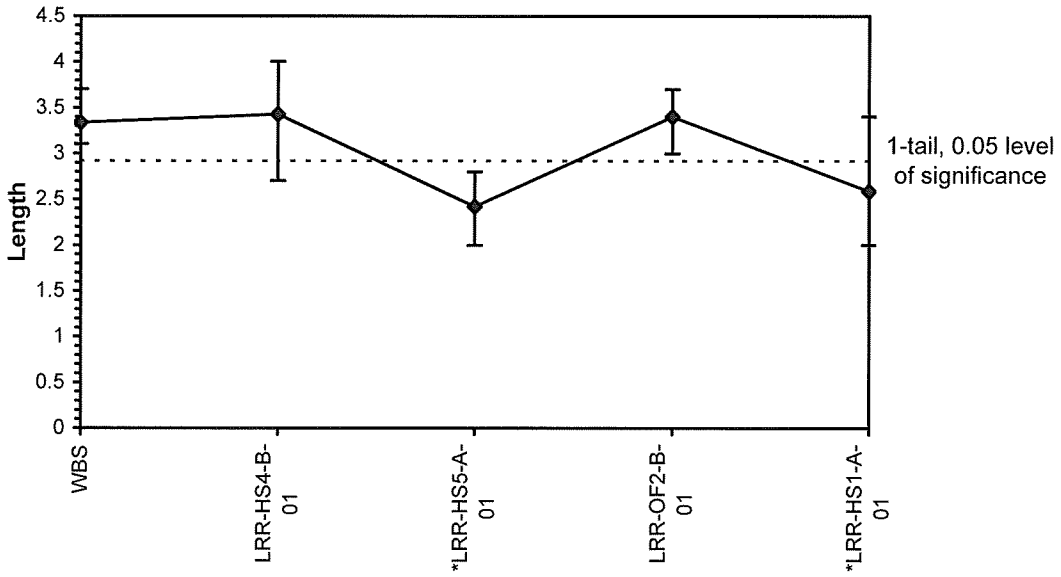
Conc-%	1	2	3	4	5	6	7	8
WBS	3.2000	3.2000	3.1000	3.7000	3.4000	3.4000	3.3000	3.4000
LRR-HS4-B-01	4.0000	3.5000	3.5000	2.7000				
LRR-HS5-A-01	2.8000	2.6000	2.0000	2.1000	2.6000			
LRR-OF2-B-01	3.7000	3.5000	3.3000	3.0000	3.5000	3.4000		
LRR-HS1-A-01	2.6000	2.5000	2.6000	2.5000	2.0000	3.4000	2.5000	

			Transform: Untransformed					1-Tailed		
Conc-%	Mean	N-Mean	Mean	Min	Max	CV%	N	t-Stat	Critical	MSD
WBS	3.3375	1.0000	3.3375	3.1000	3.7000	5.534	8			
LRR-HS4-B-01	3.4250	1.0262	3.4250	2.7000	4.0000	15.701	4	-0.419	2.385	0.4976
*LRR-HS5-A-01	2.4200	0.7251	2.4200	2.0000	2.8000	14.433	5	4.723	2.385	0.4632
LRR-OF2-B-01	3.4000	1.0187	3.4000	3.0000	3.7000	6.960	6	-0.340	2.385	0.4388
*LRR-HS1-A-01	2.5857	0.7747	2.5857	2.0000	3.4000	16.013	7	4.263	2.385	0.4205

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates normal distribution (p > 0.01)	0.96779	0.9	0.1171	1.16279
Bartlett's Test indicates equal variances (p = 0.17)	6.38818	13.2767		

Hypothesis Test (1-tail, 0.05)	MSDu	MSDp	MSB	MSE	F-Prob	df
Bonferroni t Test indicates significant differences Treatments vs WBS	0.42054	0.12601	1.36096	0.11611	1.7E-05	4, 25

Dose-Response Plot



WESTON SOLUTIONS, INC.
20 DAY CHIRONOMUS TENTANS SEDIMENT TEST
TEST DATES 11/5/08-11/25/08

Site #	WBS									
	# Organisms			Ashed Pan	Pan +	Pan +	Ash Free			
Rep	Alive	Dead	Weighed	Weight	Dried Org.	Ashed.	Dry Weight	Survival %	Dry Weight/ Org. (mg)	AFDW/ Org. (mg)
A	6	6	6	1310.36	1315.88	1311.71	4.17	50.0%	0.92	0.70
B	10	2	10	1316.22	1324.27	1317.83	6.44	83.3%	0.80	0.64
C	10	2	10	1296.47	1303.22	1297.94	5.28	83.3%	0.68	0.53
D	10	2	10	1310.34	1318.50	1312.07	6.43	83.3%	0.82	0.64
E	10	2	10	1312.02	1318.97	1313.83	5.14	83.3%	0.70	0.51
F	7	5	7	1313.05	1317.90	1314.29	3.61	58.3%	0.69	0.52
G	10	2	10	1319.79	1328.04	1321.91	6.13	83.3%	0.83	0.61
H	10	2	10	1318.19	1325.16	1319.84	5.32	83.3%	0.70	0.53
Average	9.13	2.88	9.13	1312.06	1318.99	1313.68	5.32	76.0%	0.77	0.59
Std Dev.	1.64	1.64	1.64	7.22	7.63	7.34	1.03	13.7%	0.09	0.07
Upper 95% CI	10.26	4.01	10.26	1317.06	1324.28	1318.77	6.03	85.5%	0.83	0.64
Lower 95% CI	7.99	1.74	7.99	1307.05	1313.70	1308.59	4.60	66.5%	0.70	0.54

WESTON SOLUTIONS, INC.
28 DAY HYALELLA AZTECA SEDIMENT TEST
TEST DATES 11/4/08-12/2/08

Site #	**WBS**							
	# Organisms			Dried Pan	Pan +			
Rep	Alive	Dead	Weighed	Weight	Dried Org.	Survival %	Dry Weight/ Org. (mg)	Length (mm)
A	10	0	10	1322.74	1324.62	100.0%	0.19	3.2
B	9	1	9	1318.79	1320.54	90.0%	0.19	3.2
C	10	0	10	1326.80	1327.77	100.0%	0.10	3.1
D	6	4	6	1318.52	1319.76	60.0%	0.21	3.7
E	8	2	8	1311.37	1312.14	80.0%	0.10	3.4
F	9	1	9	1313.88	1315.88	90.0%	0.22	3.4
G	10	0	10	1324.98	1325.86	100.0%	0.09	3.3
H	10	0	10	1332.33	1333.99	100.0%	0.17	3.4
Average	9.00	1.00	9.00	1321.18	1322.57	90.0%	0.16	3.4
Std Dev.	1.41	1.41	1.41	6.92	6.95	14.1%	0.06	0.19
Upper 95% CI	9.98	1.98	9.98	1325.97	1327.39	99.8%	0.20	3.48
Lower 95% CI	8.02	0.02	8.02	1316.38	1317.75	80.2%	0.12	3.22

WESTON SOLUTIONS, INC.
28 DAY HYALELLA AZTECA SEDIMENT TEST
TEST DATES 11/4/08-12/2/08

Site #	LRR-HS4-B-01							
	# Organisms			Dried Pan	Pan +			
Rep	Alive	Dead	Weighed	Weight	Dried Org.	Survival %	Dry Weight/ Org. (mg)	Length (mm)
A	1	9	1	1334.97	1335.01	10.0%	0.04	4.0
B	0	10	0			0.0%		
C	1	9	1	1306.73	1306.77	10.0%	0.04	3.5
D	0	10	0			0.0%		
E	0	10	0			0.0%		
F	2	8	2	1319.67	1319.74	20.0%	0.03	3.5
G	1	9	1	1314.18	1314.21	10.0%	0.03	2.7
H	0	10	0			0.0%		
Average	0.63	9.38	0.63	1318.89	1318.93	6.3%	0.04	3.4
Std Dev.	0.74	0.74	0.74	11.96	11.96	7.4%	0.00	0.54
Upper 95% CI	1.14	9.89	1.14	1327.18	1327.22	11.4%	0.04	3.78
Lower 95% CI	0.11	8.86	0.11	1310.60	1310.64	1.1%	0.03	3.04

WESTON SOLUTIONS, INC.
28 DAY HYALELLA AZTECA SEDIMENT TEST
TEST DATES 11/4/08-12/2/08

Site #	LRR-HS5-A-01							
	# Organisms			Dried Pan	Pan +			
Rep	Alive	Dead	Weighed	Weight	Dried Org.	Survival %	Dry Weight/ Org. (mg)	Length (mm)
A	1	9	1	1322.81	1322.83	10.0%	0.02	2.8
B	0	10	0			0.0%		
C	2	8	2	1326.68	1326.72	20.0%	0.02	2.6
D	1	9	1	1322.47	1322.48	10.0%	0.01	2.0
E	0	10	0			0.0%		
F	1	9	1	1328.41	1328.43	10.0%	0.02	2.1
G	2	8	2	1287.93	1287.97	20.0%	0.02	2.6
H	0	10	0			0.0%		
Average	0.88	9.13	0.88	1317.66	1317.69	8.8%	0.02	2.4
Std Dev.	0.83	0.83	0.83	16.81	16.80	8.3%	0.00	0.34
Upper 95% CI	1.45	9.70	1.45	1329.31	1329.33	14.5%	0.02	2.63
Lower 95% CI	0.30	8.55	0.30	1306.01	1306.04	3.0%	0.01	2.17

WESTON SOLUTIONS, INC.
28 DAY HYALELLA AZTECA SEDIMENT TEST
TEST DATES 11/4/08-12/2/08

Site #	LRR-OF2-B-01							
	# Organisms			Dried Pan	Pan +			
Rep	Alive	Dead	Weighed	Weight	Dried Org.	Survival %	Dry Weight/ Org. (mg)	Length (mm)
A	7	3	7	1311.56	1312.43	70.0%	0.12	3.7
B	6	4	6	1338.40	1338.99	60.0%	0.10	3.5
C	8	2	8	1315.37	1316.25	80.0%	0.11	3.3
E	9	1	9	1326.32	1327.00	90.0%	0.08	3.0
F	8	2	8	1309.88	1310.91	80.0%	0.13	3.5
G	10	0	10	1332.10	1333.49	100.0%	0.14	3.4
Average	8.00	2.00	8.00	1322.27	1323.18	80.0%	0.11	3.4
Std Dev.	1.41	1.41	1.41	11.74	11.70	14.1%	0.02	0.23
Upper 95% CI	8.98	2.98	8.98	1330.41	1331.29	89.8%	0.13	3.54
Lower 95% CI	7.02	1.02	7.02	1314.14	1315.07	70.2%	0.10	3.23

*REPS D AND H OMITTED DUE TO MECHANICAL ERROR.

WESTON SOLUTIONS, INC.
28 DAY HYALELLA AZTECA SEDIMENT TEST
TEST DATES 11/4/08-12/2/08

Site #	LRR-HS1-A-01							
	# Organisms			Dried Pan	Pan +			
Rep	Alive	Dead	Weighed	Weight	Dried Org.	Survival %	Dry Weight/ Org. (mg)	Length (mm)
A	3	7	3	1313.24	1313.31	30.0%	0.02	2.6
B	0	10	0			0.0%		
C	5	5	5	1327.47	1327.70	50.0%	0.05	2.5
D	5	5	5	1311.75	1312.08	50.0%	0.07	2.6
E	4	6	4	1313.94	1314.15	40.0%	0.05	2.5
F	2	8	2	1326.81	1326.84	20.0%	0.01	2.0
G	4	6	4	1320.15	1320.61	40.0%	0.11	3.4
H	5	5	5	1336.40	1336.66	50.0%	0.05	2.5
Average	3.50	6.50	3.50	1321.39	1321.62	35.0%	0.05	2.6
Std Dev.	1.77	1.77	1.77	9.20	9.20	17.7%	0.03	0.42
Upper 95% CI	4.73	7.73	4.73	1327.77	1327.99	47.3%	0.08	2.88
Lower 95% CI	2.27	5.27	2.27	1315.02	1315.25	22.7%	0.03	2.30

Weston 5010-253
Hyalella azteca Legths (mm)

Site WBS

Replicate	1	2	3	4	5	6	7	8	9	10	Average
A	2.9	2.9	3.3	3.2	3.3	2.8	3.1	3.4	3.7	3.1	3.2
B	3.7	3.4	3.8	3.6	3.1	3.0	2.7	2.9	2.8		3.2
C	3.2	3.2	3.2	3.0	3.6	3.5	3.0	2.9	3.0	2.8	3.1
D	3.9	3.7	3.8	3.7	3.7	3.5					3.7
E	3.2	4.0	3.5	3.3	3.6	3.6	3.0	3.3			3.4
F	3.6	3.4	3.3	3.7	3.8	3.1	3.5	3.4	3.1		3.4
G	3.0	3.3	3.3	3.6	4.1	3.4	3.0	3.3	3.1	3.2	3.3
H	3.5	3.5	3.7	3.4	3.0	2.6	3.5	2.9	4.2	3.5	3.4

Site HS4

Replicate	1	2	3	4	5	6	7	8	9	10	Average
A	4.0										4.0
B											
C	3.5										3.5
D											
E											
F	3.0	3.9									3.5
G	2.7										2.7
H											

Site HS5

Replicate	1	2	3	4	5	6	7	8	9	10	Average
A	2.8										2.8
B											
C	3.1	2.0									2.6
D	2.0										2.0
E											
F	2.1										2.1
G	2.4	2.7									2.6
H											

Site OF2

Replicate	1	2	3	4	5	6	7	8	9	10	Average
A	4.6	3.7	3.6	3.5	4.0	3.2	3.3				3.7
B	3.7	4.0	3.2	3.5	3.4	3.0					3.5
C	3.9	3.3	3.1	3.0	3.1	2.9	2.6	4.2			3.3
E	3.2	2.8	2.4	3.0	2.7	3.0	3.3	3.8	3.0		3.0
F	4.0	2.9	3.9	3.9	3.0	2.3	3.7	3.9			3.5
G	4.0	3.9	3.2	4.0	4.3	2.9	3.6	2.8	3.2	2.3	3.4

Site HS1

Replicate	1	2	3	4	5	6	7	8	9	10	Average
A	1.8	2.5	3.6								2.6
B											
C	2.1	3.1	3.0	2.1	2.0						2.5
D	2.8	3.0	3.0	2.5	1.8						2.6
E	2.6	2.7	2.5	2.1							2.5
F	2.0	2.0									2.0
G	3.7	3.0	4.0	2.9							3.4
H	2.4	2.3	3.0	1.9	3.1						2.5

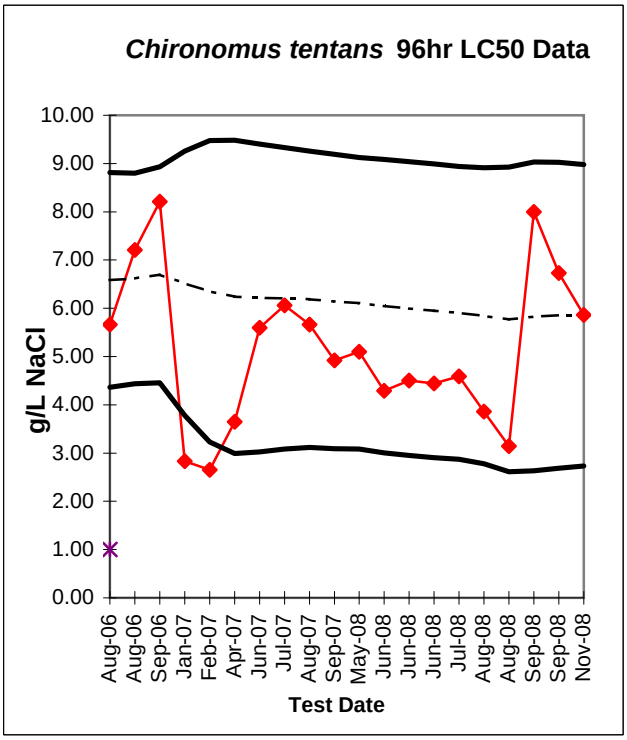
APPENDIX D

Precision of ASci's NaCl Reference Toxicant Testing

ASci Corporation Environmental Testing Laboratory
Precision of *Chironomus tentans* NaCl Reference Toxicant Testing

Date	LC50	+2SD	-2SD	MEAN
Aug-06	5.66	8.81	4.36	6.59
Aug-06	7.21	8.80	4.44	6.62
Sep-06	8.21	8.93	4.46	6.69
Jan-07	2.83	9.26	3.78	6.52
Feb-07	2.65	9.47	3.23	6.35
Apr-07	3.65	9.49	2.99	6.24
Jun-07	5.60	9.40	3.02	6.21
Jul-07	6.06	9.33	3.08	6.21
Aug-07	5.66	9.26	3.11	6.19
Sep-07	4.92	9.19	3.09	6.14
May-08	5.10	9.13	3.08	6.11
Jun-08	4.29	9.09	3.00	6.05
Jun-08	4.50	9.04	2.95	6.00
Jun-08	4.44	8.99	2.90	5.95
Jul-08	4.59	8.94	2.87	5.91
Aug-08	3.86	8.91	2.78	5.85
Aug-08	3.14	8.93	2.61	5.77
Sep-08	8.00	9.03	2.63	5.83
Sep-08	6.73	9.02	2.69	5.85
Nov-08	5.86	8.98	2.73	5.85

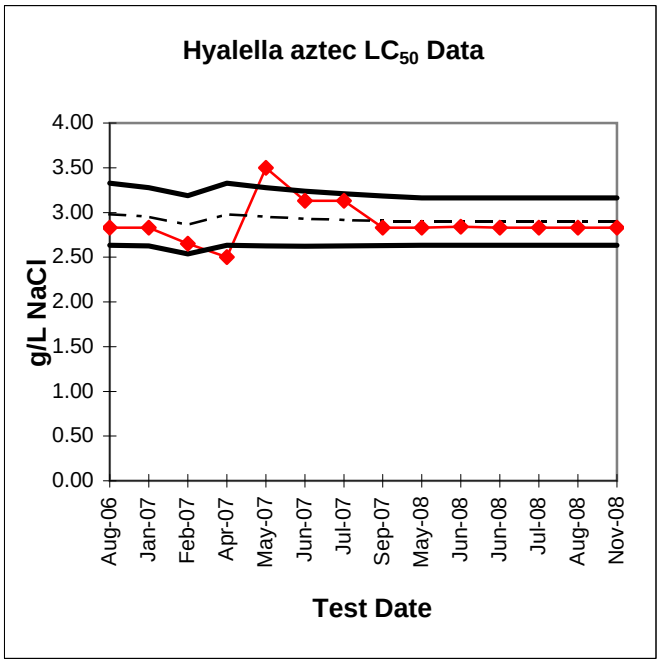
STD DEV	1.56
CV	27%



ASci Corporation Environmental Testing Laboratory
Precision of Hyalella aztec NaCl Reference Toxicant Testing

Date	LC50	+2SD	-2SD	MEAN
Aug-06	2.83	3.33	2.63	2.98
Jan-07	2.83	3.28	2.63	2.95
Feb-07	2.65	3.19	2.54	2.86
Apr-07	2.50	3.33	2.63	2.98
May-07	3.50	3.28	2.63	2.95
Jun-07	3.13	3.24	2.62	2.93
Jul-07	3.13	3.21	2.63	2.92
Sep-07	2.83	3.18	2.63	2.91
May-08	2.83	3.16	2.63	2.90
Jun-08	2.84	3.16	2.63	2.90
Jun-08	2.83	3.16	2.63	2.90
Jul-08	2.83	3.16	2.63	2.90
Aug-08	2.83	3.16	2.63	2.90
Nov-08	2.83	3.16	2.63	2.90

STDDEV	0.24
CV	8.2%



Results of 28-Day *Hyalella azteca* and 20-day *Chironomus tentans* Ammonia Treated Toxicity Tests with Whole Sediment Samples From the Lower Rouge River, Wayne County, MI Samples Collected May 12th, 13th and 15th, 2009

Prepared by

ASci Corporation
Environmental Testing Laboratory
4444 Airpark Boulevard
Duluth, Minnesota 55811-5712
(218) 722-4040

Submitted to

Weston Solutions, Inc.
750 East Bunker Court Suite 500
Vernon Hills, IL 60061-1450

Submitted October 2009

REPORT APPROVAL

Name (signed): _____

Name (typed): Dennis L. Hansen

Title: Operations Manager

* * * * *

Name (signed): _____

Name (typed): Katherine A. Wormer

Title: Senior Biologist

* * * * *

Name (signed): _____

Name (typed): Jennifer J. Berglund

Title: Data Reviewer

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TABLE 1. *Chironomus* and *Hyalella* Survival and Growth Results Following Exposure to the Lower Rouge River Sediment.

Summary of Survival and Growth Data

Endpoint Averages per Site	**EPA 2000 minimum criteria**	WBS Without Zeolites	WBS With Zeolites	LRR-HS1-A-01-R With Zeolites	LRR-HS3-A-01 With Zeolites	LRR-HS5-A- 01-R With Zeolites	LRR-HS6-DOWN2-01 With Zeolites	LRR-HS6-F-01 With Zeolites
C. tentans Survival (%)	≥70%	97.2%	71.9%	0.0%	0.0%	0.0%	14.6%	42.7%
C. tentans AFDW[a] (mg/org)	≥0.48	0.50	0.55	0.00	0.00	0.00	0.04	0.10

Endpoint Averages per Site	**EPA 2000 minimum criteria**	WBS without Zeolites	WBS With Zeolites	LRR-HS1-A-01-R	LRR-HS3-A-01	LRR-HS5-A- 01-R
H.azteca Survival (%)	≥80%	95.0%	96.7%	73.8%	58.8%	32.5%
H.azteca DW[b] (mg/org)	≥0.15	0.05	0.05	0.08	0.09	0.09
H.azteca Length (mm/org)	≥3.2	2.78	2.84	3.00	3.28	2.79

[a] Ash-Free Dry Weight
[b] Dry Weight
Significantly Lower than Zeolite Treated West Bearskin control results

INTRODUCTION

At the request of Weston Solutions Inc., ASci-Environmental Testing Laboratory (ASci-ETL) performed ammonia attenuated toxicity tests with bulk sediment samples collected from the Lower Rouge River, Wayne County, MI. The tests were performed to identify potential toxicity of selected sediment samples to *Hyalella azteca* (amphipod) and larval *Chironomus tentans* (midge; also known as *Chironomus dilutus)*. The *H. azteca* test endpoints were survival and growth (dry-weight and length), and the *C. tentans* endpoints were survival and growth (ash-free dry weight, AFDW).

METHODS AND MATERIALS

General Test Methods

Exposures to determine the toxicity of whole sediment samples from the Lower Rouge River were performed following the suggested United States Environmental Protection Agency methods (USEPA 2000). To reduce ammonia levels in the sediment, all samples were treated by adding Zeolite directly to the sediment (20% v/v; USEPA 2007). A 20-day test exposing *Chironomus tentans* and 28-day test exposing *Hyallela azteca* were conducted to determine if each test sediment affected organism survival and growth. Effect was determined by comparing the test organisms' performance to those exposed to a reference site's sediment, West Bearskin Lake (Cook County, MN; USEPA 2000). Exposure conditions were maintained using an intermittent flow system for renewal of overlying water. The following are detailed descriptions of test performance, test results, data reduction, and results interpretation.

Test Organism Culturing, Holding, and Acclimation

Hyalella azteca and *Chironomus tentans* were obtained from Environmental Consulting and Testing (Superior, WI). Culture conditions were maintained according to suggested EPA methods (EPA 2000). The *H. azteca* were cultured in a static-renewal system with overlying water renewed twice per week, and the *C. tentans* were cultured in a re-circulating system. Culture temperature was maintained near the test temperature of 23ºC.

The batches of test organisms were hand delivered to ASci-ETL. Upon arrival at ASci-ETL, the batches of organisms were logged in and quarantined in glass containers. The organisms were not crowded or

subjected to daily temperature changes greater than 3ºC per day during holding. The holding tanks were lightly aerated during the pre-test period. At test initiation the *H. azteca* were 7-8 days old. The *C. tentans* were <24 hours old.

Overlying Water Characteristics

Overlying water supplied to the test chambers was dechlorinated Duluth, MN municipal tap water, drawn from Lake Superior. The tap water was dechlorinated and metals were removed with treatment through two, 1.5 cubic-foot activated carbon beds (Culligan Co., Minnetonka, MN).

Exposure System

Sediment from each site tested included 8 replicates for each species. Exposure chambers were 300-ml Berzilius® glass beakers with 1.5 cm diameter sidewall ports, screened with a stainless steel mesh. The screens were fixed to the beakers using aquarium-grade silicone adhesive. Sixteen replicate test chambers (eight for each species) of each sediment exposure were held in a single all glass 14-L aquarium constructed with silicone adhesive and held a water volume of 11 L (7.5 L when sediment displacement was accounted for). The 12-L aquaria were fitted with a self-starting siphon drain positioned 10 cm above the base of the tank.

The renewal water was dechlorinated tap water, fed to a 5-gallon stainless steel headbox where the water was heated and aerated to reduce supersaturated levels of dissolved gasses. The water was gravity fed in a regulated manner to an intermediate polyethylene delivery tank. The intermediate tank contained a submersible pump controlled by a timer. The timer was set to activate the pump at 4-hour intervals (6 times per day). The pump was activated for 1 minute to start the siphon and deliver an appropriate volume of overlying water to the test system. This volume was rapidly pumped to splitter tubes that delivered fresh overlying water to each test's holding aquarium. The configuration resulted in two turnovers of overlying water per day. Test temperatures (23 ± 1ºC) were maintained using a constant temperature water bath. Test photoperiod was maintained at 16 hours light and 8 hours darkness per day. Light was supplied by cool-white fluorescent bulbs at an intensity of 50 to 100 ft-candles.

Test Performance

Five sediment samples were collected by Weston Solutions personnel from May 12-15, 2009 and were delivered to ASci-ETL via overnight courier. The Chain of Custody form was completed upon the samples' arrival. Sample log-in included visual inspection of the shipping coolers, sample container integrity, and sediment temperature and appearance. There were no sample abnormalities noted during the sample log in. Following log-in procedures, the samples were stored in darkness at 1-4ºC until use. Appendix A contains a copy of the Chain of Custody Form.

Laboratory control sediment was collected on September 29th, 2008, from West Bearskin Lake (Cook County, MN: USEPA 2000). The West Bearskin sediment sample (5-gallons) was logged-in upon arrival at the laboratory and stored under refrigeration (1-4^{o}C) until use. Before use in the tests, the laboratory control sediment was thoroughly homogenized.

The toxicity exposures with both test species were performed simultaneously. Seven days before toxicity test initiation, each sample was thoroughly homogenized with a stainless steel auger. An aliquot of each homogenized sample was set aside for ammonia testing. Each homogenized whole sediment sample was treated by the direct addition of Zeolite (20% v/v, Ginger Carbon Company, Toledo OH), to reduce ammonia concentrations. Prior to addition, the Zeolite was rinsed with deionized water until the rinsate was clear. 100-ml portions of the Zeolite treated sediments were transferred to each of the designated replicate exposure chambers. Each set of replicate test chambers were then placed into an assigned 12-L holding chamber containing 7.5 L of overlying water. Ammonia concentrations in the interstitial water and overlying water were monitored daily before the exposure test began. Interstitial ammonia was calculated by diluting 5.0 grams of the surface 2 cm of sediment from designated surrogate untreated and treated sediment replicates with 20mL of deionized water. The toxicity tests were initiated after interstitial ammonia concentrations were persistently below 20 mg/L. To start the tests, ten *H. azteca* (7-8 days old), and twelve *C. tentans* (<24 hours old) were impartially distributed to an assigned test replicate chamber with a wide-bore glass pipette. The *C. tentans* were loaded into the sediment on August 25th, 2009 and the *H. azteca* were loaded on August 26, 2009.

At test initiation and each daily observation, head flow rate was measured, and any flows found to be outside the range of ± 10% from target flow were adjusted. Measurements of overlying water pH, conductivity, and dissolved oxygen were measured three times per week. Temperature was measured daily. The total residual chlorine concentration of the post-carbon water was measured periodically

during the test to check for breakthrough. Hardness and alkalinity were measured at test initiation and termination.

The test organisms were fed a diet based on EPA methods. The *H. azteca* were fed a mixture of yeast, Cerophyl®, and fermented trout chow (YCT) prepared to contain 1.8 g/L total solids. *Chironomus tentans'* test chambers received Tetrafin® slurry. The slurry was prepared to contain 4 g/L total solids. Each test replicate received 1.5 ml of the respective dietary component daily.

The tests were terminated following 20 days of exposure (*C. tentans*) and 28-days (*H. azteca*). Any organisms in the overlying water were removed first. The sediments were then removed from the test chambers in a layered fashion using a gentle stream of post-carbon treated water. The sediments were collected in a U.S. Standard #40 sieve. The contents retained on the sieve were rinsed into a white, translucent polyethylene pan, placed on a light source, and the sieved contents were searched for test organisms. Numbers of live organisms and dead organisms found were counted and recorded. Organisms not found were recorded as dead. These organisms were assumed to have died during the exposures and the remains had decayed.

The live *C. tentans* from each replicate were pooled, rinsed, and placed in pre-ashed, pre-weighed aluminum massing pans. The organisms pooled from each test replicate were then dried at 60°C for 24 hours. The dried, pooled organisms were then massed to the nearest 0.01 mg to determine mean dried weights. The dried *C. tentans* were then ashed at 550°C for two hours, and then massed to determine ash-free dry weight (AFDW). AFDW equals the weight of dried larvae minus weight of ashed larvae.

Any pupae that were recovered were included in survival measurements but not growth measurements. If replicates were found to contain pupae, the mean weight was calculated by dividing the pooled dry weight of the replicate by the number of organisms exposed less the number of pupae recovered. In these tests, no pupae were recovered.

At test termination the *H. azteca* were pooled, rinsed, and preserved in 70% ethanol. The length of each *H. azteca* was measured microscopically utilizing a calibrated eyepiece micrometer. The *Hyalella azteca* were then placed in pre-weighed aluminum pans and dried at 60^{o}C for 24 hours to determine the mean dry weight per organism for each replicate.

Treatment of Results

To determine effect, the number of surviving organisms for each test sediment exposure was compared to the survival of organisms exposed to the West Bearskin Lake reference sediment exposure. The survival data was analyzed using Toxcalc Version 5.0.23, (Tidepool Scientific Software). The survival data was first checked for normality of distribution and then checked for equality of variance. Depending on the normality of and homoscedasticity of the results, the Bonferroni T-test, Wilcoxon Rank Sum test or Steel's Many-One Rank test was then performed to determine significant effect (P=0.05) as compared to the reference site results.

RESULTS

Overlying Water Characteristics

Headbox flow rates were measured daily. The daily values, calculated test chamber flow rates, and volume exchanges are in Table 2. The mean flow rate shows overlying water was renewed at a rate that averaged 2.06 tank volumes per day.

Tables 25 & 27 and 41 & 434 summarize the overlying water temperature values measured daily from the *Chironomus tentans* and *Hyalella azteca* exposure chambers, respectively. The individual temperature values ranged from 22.0ºC to 23.5ºC. All the individual values were within the proposed range of 23º C ± 1ºC.

Overlying water dissolved oxygen (DO) concentrations in the *Chironomus tentans* and *Hyalella azteca* test chambers are in Tables 3 and 4, respectively. DO values ranged from 3.0-8.7 mg/L during the *H. azteca* and *C. tentans* exposures. When DO concentrations began to attenuate, all exposures were gently aerated.

Overlying water pH's for the *H. azteca* and *C. tentans* test chambers are in Tables 21 and 23. The pH of overlying water in the *H. azteca* and *C. tentans* exposures ranged from 7.23 to 8.18. None of the pH values were outside of the organisms' physiological tolerance range.

Interstitial water pH's for the zeolite treated and non-zeolite treated *H. azteca* and *C. tentans* test chambers are in Tables 22, 24, 38 and 40.

Tables 5, 8, 11 and 14 contain the overlying water conductivity values for the *H. azteca* and *C. tentans* exposures. The conductivity values for the untreated and Zeolite treated sediments ranged from 129 to 224 µmhos/cm for both species. None of the values indicate that a biologically unfavorable amount of ionized material was released from the test sediments.

Tables 6, 9, 12 and 15 contain overlying water alkalinity values for the *H. azteca* and *C. tentans* exposures, respectively. The alkalinity values in the untreated and Zeolite treated sediments ranged from 30 to 164 mg/L as $CaCO_3$ for both species.

Tables 7, 10, 13 and 16 contain the overlying total hardness values for the exposures. Concentrations in the untreated and Zeolite treated sediments ranged from 44 to 90 mg/L as $CaCO_3$ for both species.

Tables 17-20 and 33-36 contain the results of overlying water and interstitial water ammonia measurements for the *C. tentans* and *H. azteca* exposures, respectively. To assure ammonia toxicity was not causing mortality in the sediment samples, sediments were treated with 20% v/v Zeolite and allowed to incubate in the water bath until interstitial water ammonia concentrations fell below 20 mg/L. While the ammonia concentrations were decreasing, overlying water was renewed twice daily as recommended by the US EPA (2000). The ammonia concentrations in the sediments' interstitial water were monitored daily. The organism exposures were started once the interstitial ammonia concentrations fell below 20 mg/L in all samples.

Tables 29-32 and 45-48 show the estimated NH_3 levels in overlying and interstitial waters for the *C. tentans* and *H. azteca* exposures, respectively. A conservative pKA value of 9.4 was used for the ammonia estimations. NH_3 was estimated using the following equation.

$$NH_3 = \frac{Total\ NH_3 / NH_4^+}{10\text{^}(9.4 - pH\ of\ Solution)}$$

The routine chemistry values indicated the test system maintained suitable water quality to allow assessment of sediment toxicity for both species.

Biological Exposure Results

Hyalella azteca Survival -

Table 1 summarizes the *H. azteca* survival results for the 28-day exposures. The laboratory control sediments, West Bearskin Lake and Zeolite treated West Bearskin Lake sediments, supported acceptable 28-day mean *H. azteca* survivals of 95%, and 96.7%, respectively. The Zeolite treated test sediments supported mean survival rates from 32.5-73.8%. Statistical analysis showed that sites LRR-HS1-A-01-R, LRR-HS3-A-01 and LRR-HS5-A-01-R supported significantly lower survival than both WBS controls ($P<0.05$).

Hyalella azteca Mean Dried Weight -

Table 1 summarizes the *H. azteca* mean dried weight results for the 28-day exposures. Statistical analyses for dry weights were performed on the sites that supported organism survival. The laboratory control sediments, West Bearskin Lake and Zeolite treated West Bearskin Lake sediments, supported 28-day mean organism dry weights of 0.05 mg/organism. The mean dry weights supported by the test sediments were not significantly lower than that supported by the test sediment ($P>0.05$).

Hyalella azteca Length -

Table 1 also summarizes the *H. azteca* length results for the 28-day exposures. Statistical analyses for length were performed on the sites that supported survival. The laboratory control sediments, West Bearskin Lake and Zeolite treated West Bearskin Lake sediments, supported 28-day mean lengths of 2.78 and 2.84 mm per organism, respectively. The test sediments supported mean lengths of 2.79 to 3.28 mm per organism. Statistical analysis showed that sites LRR-HS1-A-01-R, LRR-HS3-A-01 and LRR-HS5-A-01-R supported significantly similar body length than both WBS controls ($P<0.05$).

Chironomus tentans Survival and Growth Results -

Table 1 summarizes the *C. tentans* survival, and growth results for the 20-day exposures. Statistical analysis showed that all Zeolite treated samples, LRR-HS1-A-01-R, LRR-HS3-A-01, LRR-HS5-A-01-R, LRR-HS6-Down-2-01 and LRR-HS6-F-01 supported significantly lower survival than both WBS controls ($P<0.05$). Mean survival in test sediments ranged from 0% to 42.7 %.

The laboratory's control sediments, West Bearskin Lake and Zeolite treated West Bearskin Lake sediments, supported acceptable 20-day mean survivals of 97.2%, and 71.9%, respectively. The control sediment also supported acceptable ash-free dry weights of 0.50 and 0.55 mg/organism, respectively. These results met the USEPA's required growth and survival performances for test acceptability. Statistical analyses showed that LRR-HS1-A-01-R, LRR-HS3-A-01, LRR-HS5-A-01-R, LRR-HS6-Down-2-01 and LRR-HS6-F-01 supported significantly lower Ash-Free Dry Weights than the West Bearskin Lake control sediments.

CONCLUSIONS

At the 95% Confidence level, the following conclusions were drawn from the study results:

- The primary laboratory control sediment exposures used for this study, West Bearskin Lake and Zeolite treated West Bearskin Lake sediments supported acceptable organism survival for both test species, indicating the toxicity test produced valid results.

- All Zeolite treated test site sediments supported significantly lower survival for both test organisms, *Chironomus tentans* and *Hyalella azteca*, relative to the Zeolite treated WBS controls ($P<0.05$).

- All Zeolite treated test sites, , LRR-HS1-A-01-R, LRR-HS3-A-01, LRR-HS5-A-01-R, LRR-HS6-Down-2-01 and LRR-HS6-F-01, supported lower *C. tentans* AFDW, relative to the Zeolite treated WBS control ($P<0.05$).

- All Zeolite treated test sediments, LRR-HS1-A-01-R, LRR-HS3-A-01 and LRR-HS5-A-0 supported similar *Hyallela azteca* dry weights and body lengths when compared to the Zeolite treated WBS control sediments results ($P>0.05$).

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TABLE 2. Flow Rates (ml/min) of Overlying Water and Daily Turnover Rates to the Lower Rouge River Sediments Hyalella and Chironomus Exposure Test Chambers

Test Day (H.a./C.t.)	-1/0	0/1	1/2	2/3	3/4	4/5	5/6	6/7	7/8	8/9	9/10	10/11	11/12	12/13	13/14
Date (2009)	25-Aug	26-Aug	27-Aug	28-Aug	29-Aug	30-Aug	31-Aug	1-Sep	2-Sep	3-Sep	4-Sep	5-Sep	6-Sep	7-Sep	8-Sep
Head Flow Rate (ml/min)	220	218	218	216	240	236	232	226	228	220	232	236	233	232	232
Test Chamber Flow Rate (L/Day)	15.1	14.9	14.9	14.8	16.5	16.2	15.9	15.5	15.6	15.1	15.9	16.2	16.0	15.9	15.9
Daily Volume Exchanges	2.01	1.99	1.99	1.97	2.19	2.16	2.12	2.07	2.08	2.01	2.12	2.16	2.13	2.12	2.12

Test Day (H.a./C.t.)	14/15	15/16	16/17	17/18	18/19	19/20	20/21	21	22	23	24	25	26	27	28			
Date (2009)	9-Sep	10-Sep	11-Sep	12-Sep	13-Sep	14-Sep	15-Sep	16-Sep	17-Sep	18-Sep	19-Sep	20-Sep	21-Sep	22-Sep	23-Sep	Mean	Low	High
Head Flow Rate (ml/min)	230	228	230	228	230	232	230	230	228	226	230	228	230	230	232	228.7	216	240
Test Chamber Flow Rate (L/Day)	15.8	15.6	15.8	15.6	15.8	15.9	15.8	15.8	15.6	15.5	15.8	15.6	15.8	15.8	15.9	16.4664	15.552	17.28
Daily Volume Exchanges	2.10	2.08	2.10	2.08	2.10	2.12	2.10	2.10	2.08	2.07	2.10	2.08	2.10	2.10	2.12	2.0583	1.94	2.16

TABLE 3. Overlying Water Dissolved Oxygen Values (mg/L) for the Lower Rouge River Sediments *C. tentans* Exposures

Date	Day of Testing	WBS With Zeolites	LRR-HS1-A-01-R With Zeolites	LRR-HS3- A-01 With Zeolites	LRR-HS5-A- 01-R With Zeolites	LRR-HS6-DOWN2-01 With Zeolites	LRR-HS6-F-01 With Zeolites
8/25/2009	0	8.1	7.4	7.0	4.9	6.9	7.3
8/28/2009	3	8.5	7.6	7.2	5.0	7.8	7.9
8/31/2009	6	8.7	8.6	3.0	6.0	7.8	7.4
9/2/2009	8	8.4	8.4	8.2	8.2	8.4	8.4
9/4/2009	10	8.7	8.6	8.5	8.3	8.3	8.3
9/7/2009	13	8.0	7.9	7.9	6.4	7.8	7.9
9/9/2009	15	5.0	6.6	3.8	3.3	7.3	6.3
9/11/2009	17	8.2	8.3	7.1	6.5	7.6	7.9
9/14/2009	20	4.1	3.1	3.2	3.7	5.9	4.8
	Low	4.1	3.1	3.0	3.3	5.9	4.8
	High	8.7	8.6	8.5	8.3	8.4	8.4
	Mean	7.5	7.4	6.2	5.8	7.5	7.4

TABLE 4. Overlying Water Dissolved Oxygen Values (mg/L) for the Lower Rouge River Sediments *H azteca* Exposures

Date	Day of Testing	WBS With Zeolites	LRR-HS1-A-01-R With Zeolites	LRR-HS3- A-01 With Zeolites	LRR-HS5-A- 01-R With Zeolites
8/26/2009	0	7.5	5.5	5.1	5.1
8/28/2009	2	5.8	5.0	5.2	4.9
8/31/2009	5	7.0	4.7	3.5	3.5
9/2/2009	7	7.6	5.4	6.0	3.1
9/4/2009	9	7.3	5.5	5.9	3.5
9/7/2009	12	6.8	4.5	5.5	3.1
9/9/2009	14	5.7	3.3	4.8	3.8
9/11/2009	16	7.1	4.7	6.0	4.2
9/14/2009	19	6.8	4.8	5.4	4.5
9/16/2009	21	7.5	6.0	6.8	5.4
9/18/2009	23	7.0	5.6	5.8	5.6
9/21/2009	26	7.3	4.9	4.9	5.1
9/23/2009	28	7.2	4.8	4.8	5.1
	Low	5.7	3.3	3.5	3.1
	High	7.6	6.0	6.8	5.6
	Mean	6.8	4.8	5.3	4.0

Chemistries of Zeolite Treated Sediments

Table 5: Overlaying Water Conductivity Values for *H. azteca* Sediment Test With Zeolites

Date	Test Day	WBS	LRR-HS1-A-01-R With Zeolites	LRR-HS3- A-01 With Zeolites	LRR-HS5-A- 01-R With Zeolites
8/26/2009	0	140	180	209	210
8/28/2009	2	152	156	149	195
9/4/2009	9	143	185	167	224
9/11/2009	16	132	168	154	155
9/18/2009	23	138	152	150	161
9/23/2009	28	129	169	178	164

Table 6: Overlaying Water Alkalinity Values for *H. azteca* Sediment Test With Zeolites

Date	Test Day	WBS	LRR-HS1-A-01-R With Zeolites	LRR-HS3- A-01 With Zeolites	LRR-HS5-A- 01-R With Zeolites
8/26/2009	0	50	80	80	90
9/23/2009	28	50	62	64	60

Table 7: Overlaying Water Hardness Values for *H. azteca* Sediment Test With Zeolites

Date	Test Day	WBS	LRR-HS1-A-01-R With Zeolites	LRR-HS3- A-01 With Zeolites	LRR-HS5-A- 01-R With Zeolites
8/26/2009	0	50	70	82	82
9/23/2009	28	50	66	64	60

Table 8: Overlaying Water Conductivity Values for *C. tentans* Sediment Test With Zeolites

Date	Test Day	WBS	LRR-HS1-A-01-R With Zeolites	LRR-HS3- A-01 With Zeolites	LRR-HS5-A- 01-R With Zeolites	LRR-HS6-DOWN2-01 Without Zeolites	LRR-HS6-F-01 Without Zeolites
8/25/2009	0	140	181	209	210	212	178
8/28/2009	3	164	139	156	144	139	139
9/4/2009	10	141	142	142	140	140	135
9/11/2009	17	135	136	144	143	136	135
9/14/2009	20	146	185	175	172	144	159

Table 9: Overlaying Water Alkalinity Values for *C. tentans* Sediment Test With Zeolites

Date	Test Day	WBS	LRR-HS1-A-01-R With Zeolites	LRR-HS3- A-01 With Zeolites	LRR-HS5-A- 01-R With Zeolites	LRR-HS6-DOWN2-01 Without Zeolites	LRR-HS6-F-01 Without Zeolites
8/25/2009	0	50	80	80	90	80	70
9/14/2009	28	44	56	52	50	60	62

Table 10: Overlaying Water Hardness Values for *C. tentans* Sediment Test With Zeolites

Date	Test Day	WBS	LRR-HS1-A-01-R With Zeolites	LRR-HS3- A-01 With Zeolites	LRR-HS5-A- 01-R With Zeolites	LRR-HS6-DOWN2-01 Without Zeolites	LRR-HS6-F-01 Without Zeolites
8/25/2009	0	50	70	82	82	74	76
9/14/2009	28	50	64	58	64	54	56

Chemistries of Untreated Sediments

Table 11: Overlaying Water Conductivity Values for *H. azteca* Sediment Test Without Zeolites

Date	Test Day	WBS	LRR-HS1-A-01-R With Zeolites	LRR-HS3- A-01 With Zeolites	LRR-HS5-A- 01-R With Zeolites
8/26/2009	0	137	182	164	210
9/23/2009	28	129	168	175	160

Table 12: Overlaying Water Alkalinity Values for *H. azteca* Sediment Test Without Zeolites

Date	Test Day	WBS	LRR-HS1-A-01-R With Zeolites	LRR-HS3- A-01 With Zeolites	LRR-HS5-A- 01-R With Zeolites
8/26/2009	0	40	80	60	85
9/23/2009	28	40	60	64	58

Table 13: Overlaying Water Hardness Values for *H. azteca* Sediment Test Without Zeolites

Date	Test Day	WBS	LRR-HS1-A-01-R With Zeolites	LRR-HS3- A-01 With Zeolites	LRR-HS5-A- 01-R With Zeolites
8/26/2009	0	48	70	64	76
9/23/2009	28	40	64	66	58

Table 14: Overlaying Water Conductivity Values for *C. tentans* Sediment Test Without Zeolites

Date	Test Day	WBS	LRR-HS1-A-01-R With Zeolites	LRR-HS3- A-01 With Zeolites	LRR-HS5-A- 01-R With Zeolites	LRR-HS6-DOWN2-01 Without Zeolites	LRR-HS6-F-01 Without Zeolites
8/25/2009	0	137	182	164	210	216	166
9/14/2009	20	142	157	147	147	146	146

Table 15: Overlaying Water Alkalinity Values for *C. tentans* Sediment Test Without Zeolites

Date	Test Day	WBS	LRR-HS1-A-01-R With Zeolites	LRR-HS3- A-01 With Zeolites	LRR-HS5-A- 01-R With Zeolites	LRR-HS6-DOWN2-01 Without Zeolites	LRR-HS6-F-01 Without Zeolites
8/25/2009	0	40	80	60	85	75	70
9/14/2009	28	45	50	48	47	48	51

Table 16: Overlaying Water Hardness Values for *C. tentans* Sediment Test Without Zeolites

Date	Test Day	WBS	LRR-HS1-A-01-R With Zeolites	LRR-HS3- A-01 With Zeolites	LRR-HS5-A- 01-R With Zeolites	LRR-HS6-DOWN2-01 Without Zeolites	LRR-HS6-F-01 Without Zeolites
8/25/2009	0	48	70	64	76	73	62
9/14/2009	28	44	56	44	50	52	52

Ammonia Tracking :

Table 17: Overlying water Ammonia values for *C. tentans* Sediment Test with Zeolites (mg/L)

Date	Day of Testing	WBS With Zeolites	LRR-HS1-A-01-R With Zeolites	LRR-HS3- A-01 With Zeolites	LRR-HS5-A- 01-R With Zeolites	LRR-HS6-DOWN2-01 With Zeolites	LRR-HS6-F-01 With Zeolites
8/20/2009	-5	0.13	0.71	0.86	1.00	0.31	0.15
8/21/2009	-4	0.08	0.19	0.79	0.31	0.19	0.14
8/22/2009	-3	0.04	0.17	0.24	0.75	0.05	0.03
8/23/2009	-2	0.01	0.03	0.07	0.23	0.02	0.01
8/24/2009	-1	0.10	0.14	0.28	0.86	0.09	0.06
8/25/2009	0	0.03	0.07	0.22	0.69	0.06	0.04
8/26/2009	1	0.04	0.05	0.10	0.04	0.04	0.04
8/30/2009	5	0.04	0.03	0.05	0.03	0.03	0.03
9/4/2009	10	0.13	0.10	0.10	0.10	0.10	0.11
9/14/2009	20	0.70	0.98	1.04	0.95	0.77	0.18

Ammonia Tracking :

Table 18: Interstitial Ammonia values for *C. tentans* Sediment Test with Zeolites (mg/L)

Date	Day of Testing	WBSWith Zeolites	LRR-HS1-A-01-R With Zeolites	LRR-HS3- A-01 With Zeolites	LRR-HS5-A- 01-R With Zeolites	LRR-HS6-DOWN2-01 With Zeolites	LRR-HS6-F-01 With Zeolites
8/19/2009	-6	0.22	85.30	10.70	148.00	30.20	41.70
8/20/2009	-5	0.97	83.00	15.40	284.50	13.10	10.65
8/21/2009	-4	1.20	11.00	15.15	162.50	6.55	2.40
8/22/2009	-3	1.08	8.47	6.50	52.00	6.35	2.15
8/23/2009	-2	1.25	6.61	2.53	24.00	2.60	1.09
8/24/2009	-1	1.34	5.70	4.49	9.25	2.40	1.13
8/25/2009	0	0.98	1.57	6.20	5.75	1.60	1.02
8/26/2009	1	0.54	1.80	4.50	5.00	1.64	0.21
8/30/2009	5	0.38	3.41	2.57	3.56	1.45	1.20
9/4/2009	10	0.24	2.71	2.49	4.12	1.64	1.03
9/14/2009	20	0.27	0.64	1.00	1.40	0.42	0.33

Ammonia Tracking :

Table 19: Overlying water Ammonia values for *C. tentans* Sediment Test without Zeolites (mg/L)

Date	Day of Testing	WBS Without Zeolites	LRR-HS1-A-01-R Without Zeolites	LRR-HS3- A-01 Without Zeolites	LRR-HS5-A- 01-R Without Zeolites	LRR-HS6-DOWN2-01 Without Zeolites	LRR-HS6-F-01 Without Zeolites
8/20/2009	-5	0.24	0.53	1.94	1.98	0.74	0.29
8/21/2009	-4	0.13	0.19	1.42	1.15	0.21	0.21
8/22/2009	-3	0.08	0.47	1.33	5.92	0.20	0.04
8/23/2009	-2	0.02	0.13	0.29	2.01	0.06	0.02
8/24/2009	-1	0.03	0.71	0.91	5.69	0.28	0.11
8/25/2009	0	0.04	0.05	0.39	3.29	0.14	0.05
8/26/2009	1	0.02	0.34	0.85	0.06	0.08	0.08
8/30/2009	5	0.02	0.03	0.09	0.02	0.02	0.02
9/4/2009	10	0.06	0.05	0.04	0.04	0.05	0.04
9/14/2009	20	0.73	0.37	0.14	0.25	0.16	0.13

Ammonia Tracking :

Table 20: Interstitial Ammonia values for *C. tentans* Sediment Test without Zeolites (mg/L)

Date	Day of Testing	WBS Without Zeolites	LRR-HS1-A-01-R Without Zeolites	LRR-HS3- A-01 Without Zeolites	LRR-HS5-A- 01-R Without Zeolites	LRR-HS6-DOWN2-01 Without Zeolites	LRR-HS6-F-01 Without Zeolites
8/19/2009	-6	0.22	85.30	10.70	148.00	30.20	41.70
8/20/2009	-5	5.30	92.50	47.60	312.00	14.75	10.30
8/21/2009	-4	2.80	47.45	52.50	109.50	14.00	6.20
8/22/2009	-3	1.32	25.20	36.25	62.00	8.70	7.00
8/23/2009	-2	0.54	13.45	21.55	42.25	9.15	7.50
8/24/2009	-1	1.07	17.55	31.80	39.70	10.55	4.63
8/25/2009	0	1.02	13.20	17.70	16.30	5.40	2.09
8/26/2009	1	0.88	14.25	16.00	15.60	10.85	4.78
8/30/2009	5	0.64	11.15	14.05	7.85	4.52	3.66
9/4/2009	10	0.41	13.20	13.35	10.50	4.21	4.29
9/14/2009	20	0.23	3.03	3.99	1.30	2.08	1.31

pH Tracking :

Table 21: Overlying water pH values for *C. tentans* Sediment Test with Zeolites

Date	Day of Testing	WBS With Zeolites	LRR-HS1-A-01-R With Zeolites	LRR-HS3- A-01 With Zeolites	LRR-HS5-A-01-R With Zeolites	LRR-HS6-DOWN2-01 With Zeolites	LRR-HS6-F-01 With Zeolites
8/20/2009	-5	7.73	7.65	7.66	7.66	7.67	7.69
8/21/2009	-4	7.01	7.10	7.09	7.16	7.21	7.23
8/22/2009	-3	7.63	7.63	7.63	7.28	7.72	7.80
8/23/2009	-2	8.19	7.79	7.75	7.63	7.71	7.74
8/24/2009	-1	7.68	7.60	7.54	7.31	7.50	7.62
8/25/2009	0	7.90	7.78	7.64	7.48	7.80	7.79
8/26/2009	1	8.19	7.92	7.84	7.94	7.86	7.91
8/30/2009	5	7.83	7.89	7.84	7.92	7.94	7.95
9/4/2009	10	7.77	7.75	7.78	7.80	7.83	7.84
9/14/2009	20	7.93	7.78	7.78	7.75	7.80	7.75

pH Tracking :

Table 22 :Interstitial pH values for *C. tentans* Sediment Test with Zeolites

Date	Day of Testing	WBS With Zeolites	LRR-HS1-A-01-R With Zeolites	LRR-HS3- A-01 With Zeolites	LRR-HS5-A-01-R With Zeolites	LRR-HS6-DOWN2-01 With Zeolites	LRR-HS6-F-01 With Zeolites
8/19/2009	-6	8.13	8.11	8.07	7.92	7.98	7.96
8/20/2009	-5	8.20	8.06	8.00	7.84	7.85	7.93
8/21/2009	-4	8.17	7.98	7.86	7.77	7.74	7.84
8/22/2009	-3	7.55	7.66	7.63	7.58	7.66	7.65
8/23/2009	-2	7.64	7.69	7.64	7.59	7.69	7.69
8/24/2009	-1	7.76	7.75	7.69	7.68	7.72	7.79
8/25/2009	0	7.75	7.78	7.73	7.64	7.68	7.80
8/26/2009	1	7.65	7.61	7.74	7.72	7.71	7.76
8/30/2009	5	8.10	7.86	7.87	7.90	7.89	7.86
9/4/2009	10	7.84	7.82	7.78	7.69	7.70	7.84
9/14/2009	20	7.56	7.34	7.31	7.37	7.25	7.22

pH Tracking :

Table 23: Overlying water pH values for *C. tentans* Sediment Test without Zeolites

Date	Day of Testing	WBS Without Zeolites	LRR-HS1-A-01-R Without Zeolites	LRR-HS3- A-01 Without Zeolites	LRR-HS5-A-01-R Without Zeolites	LRR-HS6-DOWN2-01 Without Zeolites	LRR-HS6-F-01 Without Zeolites
8/20/2009	-5	7.73	7.65	7.66	7.66	7.67	7.69
8/21/2009	-4	7.01	7.10	7.09	7.16	7.21	7.23
8/22/2009	-3	7.63	7.63	7.63	7.28	7.72	7.80
8/23/2009	-2	8.19	7.79	7.75	7.63	7.71	7.74
8/24/2009	-1	7.68	7.60	7.54	7.31	7.50	7.62
8/25/2009	0	8.00	7.76	7.81	7.55	7.76	7.83
8/26/2009	1	7.93	7.76	7.71	7.94	7.91	7.91
8/30/2009	5	7.97	7.95	7.93	7.99	7.99	8.01
9/4/2009	10	7.96	7.94	7.95	7.95	7.98	7.98
9/14/2009	20	7.93	7.85	7.92	7.93	7.95	7.99

pH Tracking :

Table24: Interstitial pH values for *C. tentans* Sediment Test without Zeolites

Date	Day of Testing	WBS Without Zeolites	LRR-HS1-A-01-R Without Zeolites	LRR-HS3- A-01 Without Zeolites	LRR-HS5-A-01-R Without Zeolites	LRR-HS6-DOWN2-01 Without Zeolites	LRR-HS6-F-01 Without Zeolites
8/19/2009	-6	8.13	8.11	8.07	7.92	7.98	7.96
8/20/2009	-5	8.20	8.06	8.00	7.84	7.85	7.93
8/21/2009	-4	8.17	7.98	7.86	7.77	7.74	7.84
8/22/2009	-3	7.55	7.66	7.63	7.58	7.66	7.65
8/23/2009	-2	7.64	7.69	7.64	7.59	7.69	7.69
8/24/2009	-1	7.76	7.75	7.69	7.68	7.72	7.79
8/25/2009	0	7.76	7.79	7.75	7.62	7.65	7.82
8/26/2009	1	7.68	7.60	7.73	7.75	7.76	7.76
8/30/2009	5	8.05	7.79	7.78	7.81	7.79	7.74
9/4/2009	10	7.71	7.68	7.72	7.68	7.74	7.80
9/14/2009	20	7.61	7.40	7.34	7.42	7.29	7.23

Temperature Tracking :

Table 25: Overlying water Temperature values for *C. tentans* Sediment Test with Zeolites (°C)

Date	Day of Testing	WBS With Zeolites	LRR-HS1-A-01-R With Zeolites	LRR-HS3- A-01 With Zeolites	LRR-HS5-A- 01-R With Zeolites	LRR-HS6-DOWN2-01 With Zeolites	LRR-HS6-F-01 With Zeolites
8/20/2009	-5	22.1	22.3	22.5	22.2	22.5	22.3
8/21/2009	-4	22.4	22.4	22.3	22.1	22.1	22.1
8/22/2009	-3	22.1	22.1	22.1	22.0	22.0	22.0
8/23/2009	-2	22	22.0	22.1	22.1	22.1	22.1
8/24/2009	-1	22	22.1	22.1	22.0	22.1	22.1
8/25/2009	0	23	22.7	22.6	22.6	22.6	22.6
8/26/2009	1	22.8	22.4	22.4	22.3	22.3	22.3
8/30/2009	5	22.4	22.3	22.2	22.2	22.1	22.1
9/4/2009	10	22.4	22.5	22.4	22.3	22.1	22.1
9/14/2009	20	23.2	23.0	23.0	23.2	23.1	23.0

Temperature Tracking :

Table 26: Interstitial Temperature values for *C. tentans* Sediment Test with Zeolites (°C)

Date	Day of Testing	WBS With Zeolites	LRR-HS1-A-01-R With Zeolites	LRR-HS3- A-01 With Zeolites	LRR-HS5-A- 01-R With Zeolites	LRR-HS6-DOWN2-01 With Zeolites	LRR-HS6-F-01 With Zeolites
8/19/2009	-6	22.3	22.5	22.6	22.4	22.6	22.4
8/20/2009	-5	22.1	22.3	22.5	22.2	22.5	22.3
8/21/2009	-4	22.4	22.4	22.3	22.1	22.1	22.1
8/22/2009	-3	22.1	22.1	22.1	22	22	22
8/23/2009	-2	22	22	22.1	22.1	22.1	22.1
8/24/2009	-1	22	22.1	22.1	22	22.1	22.1
8/25/2009	0	23	22.7	22.6	22.6	22.6	22.6
8/26/2009	1	22.8	22.4	22.4	22.3	22.3	22.3
8/30/2009	5	22.4	22.3	22.2	22.2	22.1	22.1
9/4/2009	10	22.4	22.5	22.4	22.3	22.1	22.1
9/14/2009	20	23.2	23	23	23.2	23.1	23

Temperature Tracking :

Table 27: Overlying water Temperature values for *C. tentans* Sediment Test without Zeolites (°C)

Date	Day of Testing	WBS Without Zeolites	LRR-HS1-A-01-R Without Zeolites	LRR-HS3- A-01 Without Zeolites	LRR-HS5-A- 01-R Without Zeolites	LRR-HS6-DOWN2-01 Without Zeolites	LRR-HS6-F-01 Without Zeolites
8/20/2009	-5	22.1	22.3	22.5	22.2	22.5	22.3
8/21/2009	-4	22.4	22.4	22.3	22.1	22.1	22.1
8/22/2009	-3	22.1	22.1	22.1	22.0	22.0	22.0
8/23/2009	-2	22.0	22.0	22.1	22.1	22.1	22.1
8/24/2009	-1	22.0	22.1	22.1	22.0	22.1	22.1
8/25/2009	0	23.0	22.7	22.6	22.6	22.6	22.6
8/26/2009	1	22.8	22.4	22.4	22.3	22.3	22.3
8/30/2009	5	22.4	22.3	22.2	22.2	22.1	22.1
9/4/2009	10	22.4	22.5	22.4	22.3	22.1	22.1
9/14/2009	20	23.2	23.0	23.0	23.2	23.1	23.0

Temperature Tracking :

Table 28: Interstitial Temperature values for *C. tentans* Sediment Test without Zeolites (°C)

Date	Day of Testing	WBS Without Zeolites	LRR-HS1-A-01-R Without Zeolites	LRR-HS3- A-01 Without Zeolites	LRR-HS5-A- 01-R Without Zeolites	LRR-HS6-DOWN2-01 Without Zeolites	LRR-HS6-F-01 Without Zeolites
8/19/2009	-6	22.3	22.5	22.6	22.4	22.6	22.4
8/20/2009	-5	22.1	22.3	22.5	22.2	22.5	22.3
8/21/2009	-4	22.4	22.4	22.3	22.1	22.1	22.1
8/22/2009	-3	22.1	22.1	22.1	22.0	22.0	22.0
8/23/2009	-2	22.0	22.0	22.1	22.1	22.1	22.1
8/24/2009	-1	22.0	22.1	22.1	22.0	22.1	22.1
8/25/2009	0	23.0	22.7	22.6	22.6	22.6	22.6
8/26/2009	1	22.8	22.4	22.4	22.3	22.3	22.3
8/30/2009	5	22.4	22.3	22.2	22.2	22.1	22.1
9/4/2009	10	22.4	22.5	22.4	22.3	22.1	22.1
9/14/2009	20	23.2	23.0	23.0	23.2	23.1	23.0

NH_3 Tracking :

Table 29: Overlying water NH_3 values for *C. tentans* Sediment Test with Zeolites (mg/L; pKa=9.4)

Date	Day of Testing	WBS With Zeolites	LRR-HS1-A-01-R With Zeolites	LRR-HS3- A-01 With Zeolites	LRR-HS5-A- 01-R With Zeolites	LRR-HS6-DOWN2-01 With Zeolites	LRR-HS6-F-01 With Zeolites
8/20/2009	-5	0.003	0.013	0.016	0.018	0.006	0.003
8/21/2009	-4	0.000	0.001	0.004	0.002	0.001	0.001
8/22/2009	-3	0.001	0.003	0.004	0.006	0.001	0.001
8/23/2009	-2	0.000	0.001	0.001	0.004	0.000	0.000
8/24/2009	-1	0.002	0.002	0.004	0.007	0.001	0.001
8/25/2009	0	0.001	0.002	0.004	0.008	0.001	0.001
8/26/2009	1	0.003	0.002	0.003	0.001	0.001	0.001
8/30/2009	5	0.001	0.001	0.001	0.001	0.001	0.001
9/4/2009	10	0.003	0.002	0.002	0.002	0.003	0.003
9/14/2009	20	0.024	0.023	0.025	0.021	0.019	0.004

NH_3 Tracking :

Table 30: Interstitial NH_3 values for *C. tentans* Sediment Test with Zeolites (mg/L; pKa=9.4)

Date	Day of Testing	WBS With Zeolites	LRR-HS1-A-01-R With Zeolites	LRR-HS3- A-01 With Zeolites	LRR-HS5-A- 01-R With Zeolites	LRR-HS6-DOWN2-01 With Zeolites	LRR-HS6-F-01 With Zeolites
8/19/2009	-6	0.012	4.375	0.500	4.901	1.148	1.514
8/20/2009	-5	0.061	3.794	0.613	7.836	0.369	0.361
8/21/2009	-4	0.070	0.418	0.437	3.809	0.143	0.066
8/22/2009	-3	0.015	0.154	0.110	0.787	0.116	0.038
8/23/2009	-2	0.022	0.129	0.044	0.372	0.051	0.021
8/24/2009	-1	0.031	0.128	0.088	0.176	0.050	0.028
8/25/2009	0	0.022	0.038	0.133	0.100	0.030	0.026
8/26/2009	1	0.010	0.029	0.098	0.104	0.033	0.005
8/30/2009	5	0.019	0.098	0.076	0.112	0.045	0.034
9/4/2009	10	0.007	0.071	0.060	0.080	0.033	0.028
9/14/2009	20	0.004	0.006	0.008	0.013	0.003	0.002

NH_3 Tracking :

Table 31: Overlying water NH_3 values for *C. tentans* Sediment Test without Zeolites (mg/L; pKa=9.4)

Date	Day of Testing	WBS Without Zeolites	LRR-HS1-A-01-R Without Zeolites	LRR-HS3- A-01 Without Zeolites	LRR-HS5-A- 01-R Without Zeolites	LRR-HS6-DOWN2-01 Without Zeolites	LRR-HS6-F-01 Without Zeolites
8/20/2009	-5	0.005	0.009	0.035	0.036	0.014	0.006
8/21/2009	-4	0.001	0.001	0.007	0.007	0.001	0.001
8/22/2009	-3	0.001	0.008	0.023	0.045	0.004	0.001
8/23/2009	-2	0.001	0.003	0.007	0.034	0.001	0.000
8/24/2009	-1	0.001	0.011	0.012	0.046	0.004	0.002
8/25/2009	0	0.001	0.001	0.010	0.046	0.003	0.001
8/26/2009	1	0.001	0.008	0.017	0.002	0.003	0.003
8/30/2009	5	0.001	0.001	0.003	0.001	0.001	0.001
9/4/2009	10	0.002	0.002	0.001	0.002	0.002	0.002
9/14/2009	20	0.025	0.010	0.005	0.008	0.006	0.005

NH_3 Tracking :

Table 32: Interstitial NH_3 values for *C. tentans* Sediment Test without Zeolites (mg/L; pKa=9.4)

Date	Day of Testing	WBS Without Zeolites	LRR-HS1-A-01-R Without Zeolites	LRR-HS3- A-01 Without Zeolites	LRR-HS5-A- 01-R Without Zeolites	LRR-HS6-DOWN2-01 Without Zeolites	LRR-HS6-F-01 Without Zeolites
8/19/2009	-6	0.012	4.375	0.500	4.901	1.148	1.514
8/20/2009	-5	0.334	4.228	1.895	8.593	0.416	0.349
8/21/2009	-4	0.165	1.804	1.514	2.567	0.306	0.171
8/22/2009	-3	0.019	0.459	0.616	0.938	0.158	0.124
8/23/2009	-2	0.009	0.262	0.374	0.654	0.178	0.146
8/24/2009	-1	0.024	0.393	0.620	0.756	0.220	0.114
8/25/2009	0	0.023	0.324	0.396	0.271	0.096	0.055
8/26/2009	1	0.017	0.226	0.342	0.349	0.249	0.110
8/30/2009	5	0.028	0.274	0.337	0.202	0.111	0.080
9/4/2009	10	0.008	0.252	0.279	0.200	0.092	0.108
9/14/2009	20	0.004	0.030	0.035	0.014	0.016	0.009

Ammonia Tracking :

Table 33: Overlying water Ammonia values for *H. azteca* Sediment Test with Zeolites (mg/L)

Date	Day of Testing	WBS With Zeolites	LRR-HS1-A-01-R With Zeolites	LRR-HS3- A-01 With Zeolites	LRR-HS5-A- 01-R With Zeolites
8/20/2009	-6	0.24	0.37	1.19	1.58
8/21/2009	-5	0.13	0.38	0.38	0.93
8/22/2009	-4	0.09	0.34	0.31	1.89
8/23/2009	-3	0.02	0.53	0.16	0.68
8/24/2009	-2	0.08	0.22	0.69	1.85
8/25/2009	-1	0.05	0.22	0.20	0.03
8/26/2009	0	0.03	0.19	0.22	1.32
8/27/2009	1	0.06	0.11	0.04	0.66
8/31/2009	5	0.01	0.02	0.02	0.42
9/5/2009	10	0.31	0.23	0.11	1.02
9/15/2009	20	0.22	0.21	0.13	0.88
9/23/2009	28	0.08	0.11	0.06	0.16

Ammonia Tracking :

Table 34: Interstitial Ammonia values for *H. azteca* Sediment Test with Zeolites (mg/L)

Date	Day of Testing	WBSWith Zeolites	LRR-HS1-A-01-R With Zeolites	LRR-HS3- A-01 With Zeolites	LRR-HS5-A- 01-R With Zeolites
8/19/2009	-7	0.22	85.30	10.70	148.00
8/20/2009	-6	0.91	90.00	18.25	228.00
8/21/2009	-5	1.04	35.10	10.60	139.50
8/22/2009	-4	1.06	4.32	6.25	82.50
8/23/2009	-3	0.19	3.13	2.87	26.80
8/24/2009	-2	0.72	4.23	5.20	8.30
8/25/2009	-1	0.69	2.16	4.84	10.15
8/26/2009	0	0.55	2.41	4.05	16.05
8/27/2009	1	0.54	2.81	2.75	11.85
8/31/2009	5	0.26	5.40	11.65	5.95
9/5/2009	10	0.20	6.30	7.20	10.35
9/15/2009	20	0.48	5.90	7.95	9.20
9/23/2009	28	0.11	0.74	0.81	2.18

Ammonia Tracking :

Table 35: Overlying water Ammonia values for *H. azteca* Sediment Test without Zeolites (mg/L)

Date	Day of Testing	WBS Without Zeolites	LRR-HS1-A-01-R Without Zeolites	LRR-HS3- A-01 Without Zeolites	LRR-HS5-A- 01-R Without Zeolites
8/19/2009	-6	0.46	0.53	2.70	5.68
8/20/2009	-5	0.25	0.28	1.91	1.61
8/21/2009	-4	0.15	0.57	2.49	2.56
8/22/2009	-3	0.08	0.26	3.91	1.81
8/23/2009	-2	0.09	0.90	2.05	3.48
8/24/2009	-1	0.17	1.29	0.83	0.36
8/25/2009	0	0.07	0.56	2.27	2.53
8/26/2009	1	0.08	0.71	2.85	1.28
8/30/2009	5	0.05	0.18	0.25	0.35
9/4/2009	10	0.04	0.16	0.46	0.92
9/14/2009	20	0.07	0.24	0.40	0.41
9/23/2009	28	0.03	0.19	0.73	1.01

Ammonia Tracking :

Table 36: Interstial Ammonia values for *H. azteca* Sediment Test without Zeolites (mg/L)

Date	Day of Testing	WBS Without Zeolites	LRR-HS1-A-01-R Without Zeolites	LRR-HS3- A-01 Without Zeolites	LRR-HS5-A- 01-R Without Zeolites
8/19/2009	-7	0.22	85.30	10.70	148.00
8/20/2009	-6	5.46	168.50	59.50	357.00
8/21/2009	-5	5.30	92.50	55.50	198.00
8/22/2009	-4	4.61	24.30	29.00	71.00
8/23/2009	-3	3.63	24.35	28.00	23.90
8/24/2009	-2	1.04	15.25	26.45	19.13
8/25/2009	-1	2.70	8.30	17.31	19.75
8/26/2009	0	1.62	11.45	14.45	14.12
8/27/2009	1	1.19	4.85	17.30	16.45
8/31/2009	5	0.70	1.41	1.25	11.60
9/5/2009	10	0.41	1.13	1.21	12.25
9/15/2009	20	0.32	1.22	1.28	10.70
9/23/2009	28	0.13	1.78	3.01	4.39

pH Tracking :

Table 37: Overlying water pH values for *H. azteca* Sediment Test with Zeolites

Date	Day of Testing	WBS With Zeolites	LRR-HS1-A-01-R With Zeolites	LRR-HS3- A-01 With Zeolites	LRR-HS5-A- 01-R With Zeolites
8/20/2009	-6	8.06	8.00	7.86	7.91
8/21/2009	-5	7.35	7.33	7.46	7.40
8/22/2009	-4	7.58	7.56	7.59	7.31
8/23/2009	-3	7.70	7.54	7.54	7.28
8/24/2009	-2	7.64	7.49	7.42	7.35
8/25/2009	-1	7.76	7.44	7.50	7.55
8/26/2009	0	7.63	7.34	7.36	7.27
8/27/2009	1	8.09	7.88	7.80	7.81
8/31/2009	5	7.63	7.55	7.73	7.74
9/5/2009	10	7.84	7.70	7.71	7.64
9/15/2009	20	8.03	7.76	7.83	7.89
9/23/2009	28	7.70	7.57	7.52	7.59
	Low	7.35	7.33	7.36	7.27
	High	8.09	8.00	7.86	7.91

pH Tracking :

Table 38: Interstitial pH values for *H. azteca* Sediment Test with Zeolites

Date	Day of Testing	WBSWith Zeolites	LRR-HS1-A-01-R With Zeolites	LRR-HS3- A-01 With Zeolites	LRR-HS5-A- 01-R With Zeolites
8/19/2009	-7	8.12	8.10	8.08	7.93
8/20/2009	-6	8.03	7.81	7.74	7.72
8/21/2009	-5	7.94	7.77	7.70	7.64
8/22/2009	-4	7.34	7.57	7.58	7.42
8/23/2009	-3	7.52	7.59	7.60	7.46
8/24/2009	-2	7.61	7.63	7.63	7.54
8/25/2009	-1	7.64	7.68	7.72	7.61
8/26/2009	0	7.54	7.62	7.66	7.60
8/27/2009	1	7.48	7.51	7.61	7.57
8/31/2009	5	8.18	7.76	7.71	7.66
9/5/2009	10	7.52	7.68	7.63	7.60
9/15/2009	20	7.89	7.79	7.71	7.62
9/23/2009	28	7.92	7.94	7.83	7.74
	Low	7.34	7.51	7.58	7.42
	High	8.18	7.94	7.83	7.74

pH Tracking:

Table 39: Overlying water pH values for *H. azteca* Sediment Test without Zeolites

Date	Day of Testing	WBS Without Zeolites	LRR-HS1-A-01-R Without Zeolites	LRR-HS3- A-01 Without Zeolites	LRR-HS5-A- 01-R Without Zeolites
8/19/2009	-6	8.06	8.00	7.86	7.91
8/20/2009	-5	7.35	7.33	7.46	7.40
8/21/2009	-4	7.58	7.56	7.59	7.31
8/22/2009	-3	7.70	7.54	7.54	7.28
8/23/2009	-2	7.64	7.49	7.42	7.35
8/24/2009	-1	7.76	7.44	7.50	7.55
8/25/2009	0	7.39	7.44	7.42	7.36
8/26/2009	1	7.39	7.27	7.23	7.28
8/30/2009	5	7.55	7.46	7.45	7.46
9/4/2009	10	7.92	7.73	7.71	7.70
9/14/2009	20	7.90	7.76	7.72	7.72
9/23/2009	28	7.65	7.68	7.64	7.64
	Low	7.35	7.27	7.23	7.28
	High	8.06	8.00	7.86	7.91

pH Tracking :

Table 40: Interstial pH values for *H. azteca* Sediment Test without Zeolites

Date	Day of Testing	WBS Without Zeolites	LRR-HS1-A-01-R Without Zeolites	LRR-HS3- A-01 Without Zeolites	LRR-HS5-A- 01-R Without Zeolites
8/19/2009	-7	8.12	8.10	8.08	7.93
8/20/2009	-6	8.03	7.81	7.74	7.72
8/21/2009	-5	7.94	7.77	7.70	7.64
8/22/2009	-4	7.34	7.57	7.58	7.42
8/23/2009	-3	7.52	7.59	7.60	7.46
8/24/2009	-2	7.61	7.63	7.63	7.54
8/25/2009	-1	7.64	7.68	7.72	7.61
8/26/2009	0	7.50	7.61	7.63	7.58
8/27/2009	1	7.45	7.49	7.58	7.57
8/31/2009	5	7.77	7.69	7.73	7.66
9/5/2009	10	7.53	7.47	7.56	7.61
9/15/2009	20	7.79	7.51	7.75	7.71
9/23/2009	28	7.73	7.53	7.47	7.42
	Low	7.34	7.47	7.47	7.42
	High	8.03	7.81	7.75	7.72

Temperature Tracking :

Table 41: Overlying water Temperature values for *H. azteca* Sediment Test with Zeolites (°C)

Date	Day of Testing	WBS With Zeolites	LRR-HS1-A-01-R With Zeolites	LRR-HS3- A-01 With Zeolites	LRR-HS5-A- 01-R With Zeolites
8/20/2009	-6	22.4	22.5	22.3	22.3
8/21/2009	-5	22.1	22.3	22.4	22.3
8/22/2009	-4	22.0	22.0	22.0	22.1
8/23/2009	-3	22.0	22.0	22.1	22.1
8/24/2009	-2	22.1	22.1	22.1	22.1
8/25/2009	-1	22.5	22.1	22.2	22.3
8/26/2009	0	22.2	22.2	22.2	22.3
8/27/2009	1	22.2	22.2	22.3	22.2
8/31/2009	5	22.5	22.4	22.3	22.2
9/5/2009	10	22.4	22.4	22.5	22.5
9/15/2009	20	23.1	23.1	23.1	23.1
9/23/2009	28	22.5	22.5	22.5	22.6

Temperature Tracking :

Table 42: Interstitial Temperature values for *H. azteca* Sediment Test with Zeolites (°C)

Date	Day of Testing	WBSWith Zeolites	LRR-HS1-A-01-R With Zeolites	LRR-HS3- A-01 With Zeolites	LRR-HS5-A- 01-R With Zeolites
8/19/2009	-7	22.3	22.3	22.2	22.1
8/20/2009	-6	22.4	22.5	22.3	22.3
8/21/2009	-5	22.1	22.3	22.4	22.3
8/22/2009	-4	22.0	22.0	22.0	22.1
8/23/2009	-3	22.0	22.0	22.1	22.1
8/24/2009	-2	22.1	22.1	22.1	22.1
8/25/2009	-1	22.5	22.1	22.2	22.3
8/26/2009	0	22.2	22.2	22.2	22.3
8/27/2009	1	22.2	22.2	22.3	22.2
8/31/2009	5	22.5	22.4	22.3	22.2
9/5/2009	10	22.4	22.4	22.5	22.5
9/15/2009	20	23.1	23.1	23.1	23.1
9/23/2009	28	22.5	22.5	22.5	22.6

Temperature Tracking:

Table 43: Overlying water Temperature values for *H. azteca* Sediment Test without Zeolites (°C)

Date	Day of Testing	WBS Without Zeolites	LRR-HS1-A-01-R Without Zeolites	LRR-HS3- A-01 Without Zeolites	LRR-HS5-A- 01-R Without Zeolites
8/19/2009	-6	22.4	22.5	22.3	22.3
8/20/2009	-5	22.1	22.3	22.4	22.3
8/21/2009	-4	22.0	22.0	22.0	22.1
8/22/2009	-3	22.0	22.0	22.1	22.1
8/23/2009	-2	22.1	22.1	22.1	22.1
8/24/2009	-1	22.5	22.1	22.2	22.3
8/25/2009	0	22.2	22.2	22.2	22.3
8/26/2009	1	22.2	22.2	22.3	22.2
8/30/2009	5	22.5	22.4	22.3	22.2
9/4/2009	10	22.4	22.4	22.5	22.5
9/14/2009	20	23.1	23.1	23.1	23.1
9/23/2009	28	22.5	22.5	22.5	22.6

Temperature Tracking :

Table 44: Interstial Temperature values for *H. azteca* Sediment Test without Zeolites (°C)

Date	Day of Testing	WBS Without Zeolites	LRR-HS1-A-01-R Without Zeolites	LRR-HS3- A-01 Without Zeolites	LRR-HS5-A- 01-R Without Zeolites
8/19/2009	-7	22.3	22.3	22.2	22.1
8/20/2009	-6	22.4	22.5	22.3	22.3
8/21/2009	-5	22.1	22.3	22.4	22.3
8/22/2009	-4	22.0	22.0	22.0	22.1
8/23/2009	-3	22.0	22.0	22.1	22.1
8/24/2009	-2	22.1	22.1	22.1	22.1
8/25/2009	-1	22.5	22.1	22.2	22.3
8/26/2009	0	22.2	22.2	22.2	22.3
8/27/2009	1	22.2	22.2	22.3	22.2
8/31/2009	5	22.5	22.4	22.3	22.2
9/5/2009	10	22.4	22.4	22.5	22.5
9/15/2009	20	23.1	23.1	23.1	23.1
9/23/2009	28	22.5	22.5	22.5	22.6

NH_3 Tracking :

Table 45: Overlying water NH_3 values for *H. azteca* Sediment Test with Zeolites (mg/L; pKa=9.4)

Date	Day of Testing	WBS With Zeolites	LRR-HS1-A-01-R With Zeolites	LRR-HS3- A-01 With Zeolites	LRR-HS5-A- 01-R With Zeolites
8/20/2009	-6	0.011	0.015	0.034	0.051
8/21/2009	-5	0.001	0.003	0.004	0.009
8/22/2009	-4	0.001	0.005	0.005	0.015
8/23/2009	-3	0.000	0.007	0.002	0.005
8/24/2009	-2	0.001	0.003	0.007	0.016
8/25/2009	-1	0.001	0.002	0.002	0.000
8/26/2009	0	0.000	0.002	0.002	0.010
8/27/2009	1	0.003	0.003	0.001	0.017
8/31/2009	5	0.000	0.000	0.000	0.009
9/5/2009	10	0.009	0.005	0.002	0.018
9/15/2009	20	0.009	0.005	0.003	0.027
9/23/2009	28	0.002	0.002	0.001	0.002

NH_3 Tracking :

Table 46: Interstitial NH_3 values for *H. azteca* Sediment Test with Zeolites (mg/L; pKa=9.4)

Date	Day of Testing	WBSWith Zeolites	LRR-HS1-A-01-R With Zeolites	LRR-HS3- A-01 With Zeolites	LRR-HS5-A- 01-R With Zeolites
8/19/2009	-7	0.012	4.275	0.512	5.015
8/20/2009	-6	0.039	2.313	0.399	4.764
8/21/2009	-5	0.036	0.823	0.211	2.424
8/22/2009	-4	0.009	0.064	0.095	0.864
8/23/2009	-3	0.003	0.048	0.045	0.308
8/24/2009	-2	0.012	0.072	0.088	0.115
8/25/2009	-1	0.012	0.041	0.101	0.165
8/26/2009	0	0.008	0.040	0.074	0.254
8/27/2009	1	0.006	0.036	0.045	0.175
8/31/2009	5	0.016	0.124	0.238	0.108
9/5/2009	10	0.003	0.120	0.122	0.164
9/15/2009	20	0.015	0.145	0.162	0.153
9/23/2009	28	0.004	0.026	0.022	0.048

NH_3 Tracking:

Table 47: Overlying water NH_3 values for *H. azteca* Sediment Test without Zeolites (mg/L; pKa=9.4)

Date	Day of Testing	WBS Without Zeolites	LRR-HS1-A-01-R Without Zeolites	LRR-HS3- A-01 Without Zeolites	LRR-HS5-A- 01-R Without Zeolites
8/19/2009	-6	0.021	0.021	0.078	0.184
8/20/2009	-5	0.002	0.002	0.022	0.016
8/21/2009	-4	0.002	0.008	0.039	0.021
8/22/2009	-3	0.002	0.004	0.054	0.014
8/23/2009	-2	0.002	0.011	0.021	0.031
8/24/2009	-1	0.004	0.014	0.010	0.005
8/25/2009	0	0.001	0.006	0.024	0.023
8/26/2009	1	0.001	0.005	0.019	0.010
8/30/2009	5	0.001	0.002	0.003	0.004
9/4/2009	10	0.001	0.003	0.009	0.018
9/14/2009	20	0.002	0.006	0.008	0.009
9/23/2009	28	0.000	0.004	0.013	0.018

NH_3 Tracking :

Table 48: Interstial NH_3 values for *H. azteca* Sediment Test without Zeolites (mg/L; pKa=9.4)

Date	Day of Testing	WBS Without Zeolites	LRR-HS1-A-01-R Without Zeolites	LRR-HS3- A-01 Without Zeolites	LRR-HS5-A- 01-R Without Zeolites
8/19/2009	-7	0.012	4.275	0.512	5.015
8/20/2009	-6	0.233	4.331	1.302	7.459
8/21/2009	-5	0.184	2.168	1.107	3.441
8/22/2009	-4	0.040	0.359	0.439	0.743
8/23/2009	-3	0.048	0.377	0.444	0.274
8/24/2009	-2	0.017	0.259	0.449	0.264
8/25/2009	-1	0.047	0.158	0.362	0.320
8/26/2009	0	0.020	0.186	0.245	0.214
8/27/2009	1	0.013	0.060	0.262	0.243
8/31/2009	5	0.016	0.027	0.027	0.211
9/5/2009	10	0.006	0.013	0.017	0.199
9/15/2009	20	0.008	0.016	0.029	0.218
9/23/2009	28	0.003	0.024	0.035	0.046

TABLE 49: Overlying Water Temperature Values (°C) for the Lower Rouge River Sediments *Hyalella azteca* Exposures

Date	Day	WBS	LRR-HS1-A-01-R With Zeolites	LRR-HS3- A-01 With Zeolites	LRR-HS5-A- 01-R With Zeolites
8/26/2009	0	22.2	22.2	22.2	22.3
8/27/2009	1	22.2	22.2	22.3	22.2
8/28/2009	2	22.3	22.3	22.2	22.2
8/29/2009	3	22.4	22.1	22.0	22.3
8/30/2009	4	22.4	22.1	22.1	22.2
8/31/2009	5	22.5	22.4	22.3	22.2
9/1/2009	6	22.0	22.0	22.0	22.1
9/2/2009	7	22.3	22.3	22.3	22.4
9/3/2009	8	22.4	22.4	22.3	22.3
9/4/2009	9	22.3	22.4	22.1	22.2
9/5/2009	10	22.4	22.4	22.5	22.5
9/6/2009	11	22.3	22.2	22.0	22.2
9/7/2009	12	22.5	22.3	22.1	22.0
9/8/2009	13	22.4	22.4	22.3	22.3
9/9/2009	14	22.5	22.5	22.6	22.6
9/10/2009	15	22.8	23.0	23.0	23.1
9/11/2009	16	22.7	22.7	22.7	22.6
9/12/2009	17	23.5	23.6	23.5	23.5
9/13/2009	18	23.4	23.4	23.3	23.4
9/14/2009	19	23.0	23.1	22.9	23.0
9/15/2009	20	23.1	23.1	23.1	23.1
9/16/2009	21	23.0	23.0	23.1	23.0
9/17/2009	22	23.1	23.2	23.2	23.2
9/18/2009	23	23.2	23.0	23.2	23.2
9/19/2009	24	23.1	23.1	23.0	23.0
9/20/2009	25	22.8	22.8	22.8	22.8
9/21/2009	26	22.6	22.6	22.6	22.7
9/22/2009	27	22.6	22.6	22.7	22.7
9/23/2009	28	22.5	22.5	22.5	22.6
	Low	22.0	22.0	22.0	22.0
	High	23.5	23.6	23.5	23.5
	Mean	22.3	22.3	22.2	22.3

TABLE 50: Overlying Water Temperature Values (°C) for the Lower Rouge River Sediments *Chironomus tentans* Exposures

	Day	WBS	LRR-HS1-A-01-R With Zeolites	LRR-HS3- A-01 With Zeolites	LRR-HS5-A- 01-R With Zeolites	LRR-HS6-DOWN2-01 With Zeolites	LRR-HS6-F-01 With Zeolites
8/25/2009	0	23.0	22.7	22.6	22.6	22.6	22.6
8/26/2009	1	22.8	22.4	22.4	22.3	22.3	22.3
8/27/2009	2	22.6	22.5	22.3	22.3	22.3	22.2
8/28/2009	3	22.4	22.4	22.3	22.3	22.4	22.3
8/29/2009	4	22.8	22.6	22.6	22.6	22.5	22.4
8/30/2009	5	22.4	22.3	22.2	22.2	22.1	22.1
8/31/2009	6	22.8	22.6	22.5	22.5	22.4	22.3
9/1/2009	7	22.2	22.1	22.0	22.0	22.0	22.0
9/2/2009	8	22.7	22.6	22.5	22.4	22.3	22.3
9/3/2009	9	22.5	22.5	22.6	22.4	22.4	22.4
9/4/2009	10	22.4	22.5	22.4	22.3	22.1	22.1
9/5/2009	11	23.2	22.8	22.6	22.6	22.5	22.4
9/6/2009	12	22.3	22.1	22.1	22.0	22.0	22.0
9/7/2009	13	22.4	22.4	22.4	22.3	22.3	22.4
9/8/2009	14	22.5	22.5	22.5	22.5	22.5	22.5
9/9/2009	15	22.6	22.6	22.6	22.6	22.5	22.5
9/10/2009	16	22.8	23.0	23.0	23.0	22.9	22.9
9/11/2009	17	22.6	22.6	22.6	22.7	22.7	22.7
9/12/2009	18	23.5	23.3	23.5	23.6	23.7	23.4
9/13/2009	19	23.4	23.4	23.3	23.4	23.5	23.4
9/14/2009	20	23.2	23.0	23.0	23.2	23.1	23.0
	Low	22.2	22.1	22.0	22.0	22.0	22.0
	High	23.5	23.4	23.5	23.6	23.7	23.4
	Mean	22.7	22.6	22.6	22.6	22.5	22.5

APPENDIX A

Chain of Custody Forms

Submitted to Weston Solutions
ASci-ETL ID# 5010-253-002-09
Lower Rouge River

USEPA Contract Laboratory Program
Generic Chain of Custody

Reference Case 38564
Client No:
SDG No:
L

Date Shipped:	5/18/2009
Carrier Name:	FedEx
Airbill:	8647-1812-2490
Shipped to:	ASci Environmental Testting Laboratory 4444 Airpark Blvd Duluth MN 55811 (218) 722-6843

Chain of Custody Record

	Relinquished By	(Date / Time)	Sampler Signature: Received By	(Date / Time)
1	Alex Clark	5/18/09		5/19/09 0915
2				
3				
4				

For Lab Use Only
Lab Contract No:
Unit Price:
Transfer To:
Lab Contract No:
Unit Price:

SAMPLE No.	MATRIX/ SAMPLER	CONC/ TYPE	ANALYSIS/ TURNAROUND	TAG No./ PRESERVATIVE/ Bottles	STATION LOCATION	SAMPLE COLLECT DATE/TIME		FOR LAB USE ONLY Sample Condition On Receipt
LRR-HS1-A-01-R	Sediment/ Alex Clark	L/G	TOX (21)	(Ice Only) (1)	LRR-HS1-A-01-R	S: 5/15/2009	13:15	Acceptable
LRR-HS6-DOWN2-01	Sediment/ Alex Clark	L/G	TOX (21)	(Ice Only) (1)	LRR-HS6-DOWN2-01	S: 5/13/2009	10:00	Acceptable
LRR-HS6-F-01	Sediment/ Alex Clark	L/G	TOX (21)	(Ice Only) (1)	LRR-HS6-F-01	S: 5/12/2009	9:40	Acceptable

10/06/2009
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ASci Corporation Laboratory Testing & Environmental Services
4444 Airpark Blvd • Duluth, Minnesota 55811 • Phone (218) 722-4040 • Fax (218) 722-2592
• EMAIL: callen@ascicorp.com • WEBSITE: www.ascicorp.com

Shipment for Case Complete? N	Sample(s) to be used for laboratory QC:	Additional Sampler Signature(s):	Cooler Temperature Upon Receipt: 3.4 C	Chain of Custody Seal Number: Generic
Analysis Key: TOX = Toxicity	Concentration: L = Low, M = Low/Medium, H = High	Type/Designate: Composite = C, Grab = G		Custody Seal Intact? Y / Shipment Iced? Y

TR Number: 5-043013577-051809-0009

PR provides preliminary results. Requests for preliminary results will increase analytical costs.
Send Copy to: Sample Management Office, Attn: Heather Bauer, CSC, 15000 Conference Center Dr., Chantilly, VA 20151-3819; Phone 703/818-4200; Fax 703/818-4602

LABORATORY COPY

Submitted to Weston Solutions
ASci-ETL ID# 5010-253-002-09
Lower Rouge River

USEPA Contract Laboratory Program
Generic Chain of Custody

Reference Case 38564
Client No:
SDG No:
L

Date Shipped:	5/18/2009
Carrier Name:	FedEx
Airbill:	8645-7462-0588
Shipped to:	ASci Environmental Testting Laboratory 4444 Airpark Blvd Duluth MN 55811 (218) 722-6843

Chain of Custody Record

Relinquished By	(Date / Time)	Sampler Signature: Received By	(Date / Time)
1 Alex Clark	5/18/09		5/19/09 0915
2			
3			
4			

For Lab Use Only

Lab Contract No:
Unit Price:
Transfer To:
Lab Contract No:
Unit Price:

SAMPLE No.	MATRIX/ SAMPLER	CONC/ TYPE	ANALYSIS/ TURNAROUND	TAG No./ PRESERVATIVE/ Bottles	STATION LOCATION	SAMPLE COLLECT DATE/TIME		FOR LAB USE ONLY Sample Condition On Receipt
LRR-HS3-A-01	Sediment/ Alex Clark	L/G	TOX (21)	(Ice Only) (1)	LRR-HS3-A-01	S: 5/16/2009	9:20	Acceptable
LRR-HS5-A-01-R	Sediment/ Alex Clark	L/G	TOX (21)	(Ice Only) (1)	LRR-HS5-A-01-R	S: 5/15/2009	17:05	Acceptable
LRR-ZIC-C-01-TOX	Sediment/ Alex Clark	L/G	TOX (21)	(Ice Only) (1)	LRR-ZIC-C-01-TOX	S: 5/16/2009	13:20	Acceptable

Shipment for Case Complete? N	Sample(s) to be used for laboratory QC:	Additional Sampler Signature(s):	Cooler Temperature Upon Receipt: 3.9°C	Chain of Custody Seal Number: Generic
Analysis Key: TOX = Toxicity	**Concentration:** L = Low, M = Low/Medium, H = High	**Type/Designate:** Composite = C, Grab = G		**Custody Seal Intact?** Yes X **Shipment Iced?** Y

TR Number: 5-043013577-051809-0008

PR provides preliminary results. Requests for preliminary results will increase analytical costs.
Send Copy to: Sample Management Office, Attn: Heather Bauer, CSC, 15000 Conference Center Dr., Chantilly, VA 20151-3819; Phone 703/818-4200; Fax 703/818-4602

LABORATORY COPY

Submitted to Weston Solutions
ASci-ETL ID# 5010-253-002-09
Lower Rouge River
10/06/2009
Page 41 of 108

CHAIN OF CUSTODY RECORD

PAGE: 1 OF: 1

RTI LABORATORIES, INC.

MAIN LAB & HEADQUARTERS
RTI LABORATORIES, INC.
31628 Glendale Street
Livonia, MI 48150-1827
Phone (734) 422-8000
Fax (734) 422-5342
www.rtilab.com

A2LA Cert #570.01/02 | NELAC Cert #000973 | MBE Cert #R-8150-2-424 | 8(a) / SDB

Please Include Email Address of Report Recipient !!!

SUBMITTING COMPANY: Weston Solutions	REPORT TO: Tonya Balla	BILL TO: P.O. #
PROJECT NAME: LRR / PROJECT #: — / QUOTE #: —	COMPANY: Weston Solutions	COMPANY: Weston Solutions
SAMPLING LOCATION (STATE or COUNTRY): Detroit, MI	ADDRESS: 750 East Bunker Ct Suite 500	ADDRESS: same
SPECIAL INSTRUCTIONS / COMMENTS: ?'s call Lori Kozel 586-524-0613	CITY, STATE, ZIP: Vernon Hills, IL 60061	CITY, STATE, ZIP
	PHONE: 847-918-4094	EMAIL (OR FAX IF NO EMAIL AVAILABLE): t.balla@westonsolutions.com
SAMPLER'S PRINTED NAME:	SAMPLER'S SIGNATURE:	

ITEM NUMBER	SAMPLE I.D.	DATE SAMPLED	TIME SAMPLED (24-hour format)	MATRIX CODE (see codes below)	NBR OF BOTTLES	NBR OF CONTAINERS AND PRESERVATIVES: NONE	HCL	HNO_3	H_2SO_4	NaOH	Methanol	OTHER	ANALYTICAL PARAMETERS	COMMENTS (Methanol Preserved Weights, HOT Sample Notation, Additional Sample Description, Air Volume, etc.)
1	LRR-HS5-A-01-R	5/15/9	1700	SD	2	x								
2														
3														
4														
5														
6														
7														
8														
9														
10														

Relinquished By:	Date	Time	Received By:	Date	Time
Lori A. Kozel	8/17/09	1530		8/18/09	0930

REPORT TRANSMITTAL DESIRED:
☐ HARDCOPY (extra cost) ☐ FAX ☐ EMAIL ☐ ONLINE
ALL REPORTING IS VIA THE RTI "FLASHPOINT" ONLINE SYSTEM UNLESS OTHERWISE SPECIFIED

TURNAROUND DESIRED: Standard ☐ RUSH: Next BD ☐ 2nd BD ☐ 3rd BD ☐
Note: RUSH requests will incur surcharges!

FOR LAB USE ONLY
Temp of samples _____ °C On Wet Ice ? _____
Comments: _____

Distribution: White and Yellow - Lab; Pink - Field

See reverse side for Laboratory Terms and Conditions of Service

MATRIX CODES: A = AIR; SD = SOLID; DW = DRINKING WATER; SL = SLUDGE; GW = GROUNDWATER; SV = SOLVENT WASTE; L = LIQUID; W = WASTE; M = MISCELLANEOUS; WP = WIPE; O = OIL; WW = WASTE WATER; S = SOIL

APPENDIX B

Raw Data Sheets

ASci Corporation

SEDIMENT TOXICITY TEST

TEST SPONSOR WESTON SOLUTIONS

ASci STUDY ID 5010-253-005

TEST SPECIES *Hyalella azteca and Chironomus tentans*

PROJECT NAME Lower Rouge River (Re-Test)

TEST DATES 8/25/09 – 9/23/09

ASci STUDY DIRECTOR Dennis Hansen

ASci Biologists K. Wormer and J. Berglund

WHOLE-SEDIMENT TOXICITY TESTING INFORMATION

TEST INFORMATION

Project: Sediment Toxicity Assessments for the Lower Rouge River Project (Re-test)
Client: Weston Solutions, Inc.
Test Dates: 8/25/09 – 9/23/09
Samples.: West Bearskin (WBS), LRR-HS3-A-01(HA/CT), LRR-HS5-A-01-R(HA/CT), LRR-HS1-A-01-R(HA/CT), LRR-HS6-DOWN2-01 (CT) , LRR-HS6-F-01 (CT)
Test Type: 28-day *Hyalella azteca* (Survival and Growth) and 20-day *Chironomus tentans* (Survival and Growth)
Renewal Frequency: 2 renewals of the overlying water per day
Overlaying Water: PC
Template #: Standard Randomization
Test Site: Bio II
Light Intensity: 50-100 Foot Candles Photo Period: 16 Hour Light/8 Hour Dark
Temperature: 23ºC ± 1ºC (daily mean) ,instantaneous temperature always within ± 3ºC of 23ºC

BIOLOGICAL INFORMATION

Organism	*Hyalella azteca*	*Chironomus tentans*
Source	ECT (Superior, WI)	ECT (Superior, WI)
Age	7-8 day	<24 hours
ASci Log No.	OR-082609-I	OR-082509-I
Food	1.0 mL YCT/Day	1.5 mL Tetrafin Slurry (6mg dry solid) /day
Test Chamber	300 mL glass Berzelius Beakers	300 mL glass Berzelius Beakers
Sediment Volume	100 mL	100 mL
Number of Replicates	10*	10*
Organisms Per Chamber	10	12
Test Endpoints	Survival and Growth (length and weight)	Survival and Growth (dry weight and ash free dry weight)
Test Acceptability for **Controls**	Survival= 80%	Survival= 70% Growth= ave of 0.48 AFDW

PC = Post-Carbon (City of Duluth Carbon Treated Tap water)

*** 8 replicates with Zeolites, 1 replicate without Zeolites and 1 replicate without organisms with Zeolites for chemistries.**

Exposure System Observations/Activities Sheet for Sediment project (Weston Solutions 1050-253)

Date	Day of Test HA/CT	HA Fed YCT?	CT Fed Slurry?	Head Flow (ml/min)	Observations
08/24/09	-2/-1			~~220~~ ~~440~~ 0 CEFW 8/25	Sediment Loaded 8/19/09-KW
08/25/09	-1/0		yes	~~220~~ ~~450~~ KE KW 8/25	CT loaded + Total Chems took -KW (1) HS1 = Oligochaetes present HS5 = sediment expanded by 100% +HS3 & HS5 HS6 = mold spots & oxidation present
08/26/09	0/1	Yes	Yes	218	HA loaded + Total Chems took - KW HS6 = Mold Spots decreased
08/27/09	1/2	Yes	Yes	218	-Normal
08/28/09	2/3	Yes	Yes	216	-Normal
08/29/09	3/4	Yes	Yes	240	-Normal
08/30/09	4/5	Yes	Yes	236	-Normal
08/31/09	5/6	Yes	Yes	232	-Normal
09/01/09	6/7	Yes	Yes	226	-Normal
09/02/09	7/8	Yes	Yes	228	-Normal
09/03/09	8/9	Yes	Yes	~~220~~ ~~55~~ CEFW 9/3	-Normal
09/04/09	9/10	Yes	Yes	232	-Normal
09/05/09	10/11	Yes	Yes	236	-observations Normal -JS
09/06/09	11/12	Yes	Yes	233	-observations normal -JS
09/07/09	12/13	~~Yes~~ No JS 9/7	Yes	232	-observations Normal -JS -DO's low in HA HS5

(1) 8/25/09 D.O. of HS5 was 1.2 mg/L ~~aeration~~ aeration was started in all samples and HS5 was 4.9 mg/L before CT were loaded -KW

Exposure System Observations/Activities Sheet for Sediments (PAGE 2 of 2)

Date	Day of Test HA/CT	HA Fed YCT?	CT Fed Slurry?	Head Flow (ml/min)	Observations
09/08/09	13/14	Yes	Yes	232	-observations Normal
09/09/09	14/15	No	No	230	- DO's low in CT-HS5 & HA-HS1 Not fed
09/10/09	15/16	Yes	Yes	228	- observations Normal
09/11/09	16/17	Yes	Yes	230	-observations Normal
09/12/09	17/18	YES	YES	228	- ~~Normal~~ RECD 9/12 Normal
09/13/09	18/19	YES	YES	230	-Normal
09/14/09	19/20	YES		232	Total Chems completed for CT. CT removed
09/15/09	20	Yes		230	- Normal
09/16/09	21	Yes		230	-Normal
09/17/09	22	YES		228	-Normal -KW
09/18/09	23	YES		226	- Normal -KW
09/19/09	24	Yes		230	-observations Normal
09/20/09	25	Yes		228	-observations Normal
09/21/09	26	YES		230	Normal
09/22/09	27	YES		230	Normal
09/23/09	28			232	Total Chems took, HA removed & Test completed

ASci-Environmental Testing Laboratory
Weston Solutions Sediment Toxicity Test
ASci-ETL ID# 5010-253

Overlaying Water Temperature Values for *C. tentans* Sediment Test								
Date	Test Day	WBS	LRR-HS1-A01-R	LRR-HS3- A-01	LRR-HS5 -A-01-R	LRR-HS6-DOWN2-01	LRR-HS6- F-01	Initials
8/19/09	-6	22.3	22.5	22.6	22.4	22.6	22.4	KW
8/20/09	-5	22.1	22.3	22.5	22.2	22.5	22.3	KW
8/21/09	-4	22.4	22.4	22.3	22.1	22.1	22.1	KW
8/22/09	-3	22.1	22.1	22.1	22.0	22.0	22.0	JS
8/23/09	-2	22.0	22.0	22.1	22.1	22.1	22.1	JS
8/24/09	-1	22.0	22.1	22.1	22.0	22.1	22.1	JS

Overlaying Water Temperature Values for *H. azteca* Sediment Test						
Date	Test Day	WBS	LRR-HS1-A01-R	LRR-HS3- A-01	LRR-HS5 -A-01-R	Initials
8/19/09	-7	22.3	22.3	22.2	22.1	KW
8/20/09	-6	22.4	22.5	22.3	22.3	KW
8/21/09	-5	22.1	22.3	22.4	22.3	KW
8/22/09	-4	22.0	22.0	22.0	22.1	JS
8/23/09	-3	22.0	22.0	22.1	22.1	JS
8/24/09	-2	22.1	22.1	22.1	22.1	JS
8/25/09	-1	22.5	22.1	22.2	22.3	JS

Overlaying Water pH Values for *C. tentans* Sediment Test

Date	Test Day	WBS	LRR-HS1-A01-R	LRR-HS3- A-01	LRR-HS5 -A-01-R	LRR-HS6-DOWN2-01	LRR-HS6- F-01	Initials
8/19/09	-6	7.81	7.94	7.98	8.02	8.00	8.01	KW
8/20/09	-5	7.73	7.65	7.66	7.66	7.67	7.69	KW
8/21/09	-4	7.01	7.10	7.09	7.16	7.21	7.23	KW
8/22/09	-3	7.63	7.63	7.63	7.28	7.72	7.80	JB
8/23/09	-2	8.19	7.79	7.75	7.63	7.71	7.74	JB
8/24/09	-1	7.68	7.60	7.54	7.31	7.50	7.62	JB

Interstitial Water pH Values for *C. tentans* Sediment Test

Date	Test Day	WBS	LRR-HS1-A01-R	LRR-HS3- A-01	LRR-HS5 -A-01-R	LRR-HS6-DOWN2-01	LRR-HS6- F-01	Initials
8/19/09	-6	~~7.86~~ 8.13	8.11	8.07	7.92	7.98	7.96	KW
8/20/09	-5	8.20	8.06	8.00	7.84	7.85	7.93	KW
8/21/09	-4	8.17	7.98	7.86	7.77	7.74	7.84	KW
8/22/09	-3	7.55	7.66	7.63	7.58	7.66	7.65	JB
8/23/09	-2	7.64	7.69	7.64	7.59	7.69	7.69	JB
8/24/09	-1	7.76	7.75	7.69	7.68	7.72	7.79	JB

pH's are similar with or without Zeolites.

Overlaying Water pH Values for *H. azteca* Sediment Test [redacted]

Date	Test Day	WBS	LRR-HS1- A01 R	LRR-HS3- A-01	LRR-HS5 -A-01-R	Initials
8/19/09	-7	7.83	7.92	7.97	8.02	KW
8/20/09	-6	8.06	8.00	7.86	7.91	KW
8/21/09	-5	7.35	7.33	7.46	7.40	KW
8/22/09	-4	7.58	7.56	7.59	7.31	JB
8/23/09	-3	7.70	7.54	7.54	7.28	JB
8/24/09	-2	7.64	7.49	7.42	7.35	JB
8/25/09	-1	7.76	7.44	7.50	7.55	JB

Interstitial Water pH Values for *H. azteca* Sediment Test [redacted]

Date	Test Day	WBS	LRR-HS1- A01 R	LRR-HS3- A-01	LRR-HS5 -A-01-R	Initials
8/19/09	-7	8.12	8.10	8.08	7.93	KW
8/20/09	-6	8.03	7.81	7.74	7.72	KW
8/21/09	-5	7.94	7.77	7.70	7.64	KW
8/22/09	-4	7.34	7.57	7.58	7.42	JB
8/23/09	-3	7.52	7.59	7.60	7.46	JB
8/24/09	-2	7.61	7.63	7.63	7.54	JB
8/25/09	-1	7.64	7.68	7.72	7.61	KW

pH's are similar with or without Zeolites.

ASci-Environmental Testing Laboratory
Weston Solutions Sediment Toxicity Test
ASci-ETL ID# 5010-253

Overlaying Water Ammonia Values for *C. tentans* Sediment Test without Zeolites

Date	Test Day	WBS	LRR-HS1-A01-R	LRR-HS3- A-01	LRR-HS5 -A-01-R	LRR-HS6-DOWN2-01	LRR-HS6- F-01	Initials
8/19/09	-6							KW
8/20/09	-5	0.242	0.532	1.94	1.98	0.743	0.291	KW
8/21/09	-4	0.125	0.194	1.42	1.15	0.212	0.208	KW
8/22/09	-3	0.076	0.474	1.33	5.92	0.204	0.039	JS
8/23/09	-2	0.020	0.127	0.291	2.01	0.060	0.015	JS
8/24/09	-1	0.031	0.708	0.905	5.69	0.279	0.113	JS

Interstitial Ammonia Values for *C. tentans* Sediment Test without Zeolites

Date	Test Day	WBS	LRR-HS1-A01-R	LRR-HS3- A-01	LRR-HS5 -A-01-R	LRR-HS6-DOWN2-01	LRR-HS6- F-01	Initials
8/19/09	-6	0.220	85.3	10.7	148.0	30.2	41.7	KW
8/20/09	-5	5.30	92.5	47.6	312.0	14.75	10.3	KW
8/21/09	-4	2.80	47.45	52.50	109.5	14.0	6.20	KW
8/22/09	-3	1.32	25.20	36.25	62.0	8.70	7.00	JS
8/23/09	-2	0.540	13.45	21.55	42.25	9.15	7.50	JS
8/24/09	-1	1.065	17.55	31.80	39.70	10.55	4.63	JS

ASci-Environmental Testing Laboratory
Weston Solutions Sediment Toxicity Test

ASci-ETL ID# 5010-253

Overlaying Water Ammonia Values for *H. azteca* Sediment Test without Zeolites

Date	Test Day	WBS	LRR-HS1- A01 R	LRR-HS3- A-01	LRR-HS5 -A-01-R	Initials
8/19/09	-7					KW
8/20/09	-6	0.459	0.532	2.70	5.68	KW
8/21/09	-5	0.250	0.284	1.91	1.61	KW
8/22/09	-4	0.146	0.567	2.49	2.56	JB
8/23/09	-3	0.077	0.260	3.91	1.81	JB
8/24/09	-2	0.088	0.902	2.05	3.48	JB
8/25/09	-1	0.168	1.29	0.827	0.361	JB

Interstitial Ammonia Values for *H. azteca* Sediment Test without Zeolites

Date	Test Day	WBS	LRR-HS1- A01 R	LRR-HS3- A-01	LRR-HS5 -A-01-R	Initials
8/19/09	-7	0.220	85.3	10.7	148.0	KW
8/20/09	-6	1.92	33.7	11.9	71.4	KW
8/21/09	-5	1.06	18.5	11.1	39.6	KW
8/22/09	-4	0.921	4.86	5.80	14.2	JB
8/23/09	-3	0.725	4.87	4.65	4.78	JB
8/24/09	-2	0.207	3.05	9.23	3.82	JB
8/25/09	-1	0.539	1.66	5.64	6.68	JB

ASci-Environmental Testing Laboratory
Weston Solutions Sediment Toxicity Test
ASci-ETL ID# 5010-253

Overlaying Water Ammonia Values for *C. tentans* Sediment Test with Zeolites

Date	Test Day	WBS	LRR-HS1-A01-R	LRR-HS3- A-01	LRR-HS5 -A-01-R	LRR-HS6-DOWN2-01	LRR-HS6- F-01	Initials
8/19/09	-6							KW
8/20/09	-5	0.125	0.713	0.860	0.996	0.314	0.146	KW
8/21/09	-4	0.076	0.192	0.490	0.306	0.186	0.138	KW
8/22/09	-3	0.043	0.165	0.240	0.747	0.053	0.050	JK
8/23/09	-2	0.006	0.032	0.066	0.233	0.016	0.008	JK
8/24/09	-1	0.102	0.141	0.276	0.864	0.093	0.060	JK

Interstitial Ammonia Values for *C. tentans* Sediment Test with Zeolites

Date	Test Day	WBS	LRR-HS1-A01-R	LRR-HS3- A-01	LRR-HS5 -A-01-R	LRR-HS6-DOWN2-01	LRR-HS6- F-01	Initials
8/19/09	-6	0.220	85.3	10.7	148.0	30.2	41.7	KW
8/20/09	-5	0.970	83.0	15.4	284.5	13.1	10.65	KW
8/21/09	-4	1.195	11.00	15.15	162.50	6.55	24.0	KW
8/22/09	-3	1.080	8.47	6.50	52.0	6.35	2.15	JK
8/23/09	-2	1.25	6.61	2.53	24.0	2.60	1.09	JK
8/24/09	-1	1.34	5.70	4.49	9.25	2.40	1.13	JK

ASci-Environmental Testing Laboratory
Weston Solutions Sediment Toxicity Test

ASci-ETL ID# 5010-253

Overlaying Water Ammonia Values for *H. azteca* Sediment Test with Zeolites

Date	Test Day	WBS	LRR-HS1- A01 R	LRR-HS3- A-01	LRR-HS5 -A-01-R	Initials
8/19/09	-7					KW
8/20/09	-6	0.242	0.374	1.190	1.580	KW
8/21/09	-5	0.125	0.378	0.381	0.928	KW
8/22/09	-4	0.088	0.341	0.312	1.89	JB
8/23/09	-3	0.018	0.525	0.164	0.675	JB
8/24/09	-2	0.077	0.217	0.687	1.85	JB
8/25/09	-1	0.054	0.220	0.198	0.030	JB

Interstitial Ammonia Values for *H. azteca* Sediment Test with Zeolites

Date	Test Day	WBS	LRR-HS1- A01 R	LRR-HS3- A-01	LRR-HS5 -A-01-R	Initials
8/19/09	-7	0.220	85.30	10.70	148.0	KW
8/20/09	-6	0.910	90.0	RE 18.350 ~~18.65~~	228.0	KW
8/21/09	-5	1.035	35.10	10.60	139.5	KW
8/22/09	-4	1.060	4.32	6.25	82.5	JB
8/23/09	-3	0.190	3.13	2.87	26.8	JB
8/24/09	-2	0.715	4.23	5.20	8.30	JB
8/25/09	-1	0.685	2.16	4.84	10.15	JB

ASci-Environmental Testing Laboratory
Weston Solutions Sediment Toxicity Test
ASci-ETL ID# 5010-253

Interstitial Ammonia Values for *C. tentans* Sediment Test with Zeolites

Date	Test Day	WBS	LRR-HS1-A01-R	LRR-HS3- A-01	LRR-HS5 -A-01-R	LRR-HS6-DOWN2-01	LRR-HS6- F-01	Initials
8/25/09	0	0.975	1.565	6.20	5.75	1.595	1.02	KW
8/26/09	1	0.535	1.80	4.50	5.00	1.635	0.210	KW
8/30/09	5	0.375	3.405	2.570	3.555	1.450	1.195	JB
9/4/09	10	0.240	2.710	2.490	4.115	1.640	1.030	KW
9/14/09	20	0.269	0.638	1.00	1.40	0.415	0.329	KW

Interstitial Water pH Values for *C. tentans* Sediment Test with Zeolites

Date	Test Day	WBS	LRR-HS1-A01-R	LRR-HS3- A-01	LRR-HS5 -A-01-R	LRR-HS6-DOWN2-01	LRR-HS6- F-01	Initials
8/25/09	0	7.75	7.78	7.73	7.64	7.68	7.80	KW
8/26/09	1	7.65	7.61	7.74	7.72	7.71	7.76	KW
8/28/09	3	7.82	7.79	7.83	7.83	7.72	7.84	KW
8/30/09	5	8.10	7.86	7.87	7.90	7.89	7.86	JB
9/2/09	8	7.58	7.61	7.55	7.57	7.66	7.79	JB
9/4/09	10	7.84	7.82	7.78	7.69	7.70	7.84	KW
9/7/09	13	7.63	7.51	7.44	7.47	7.38	7.47	JB
9/9/09	15	7.65	7.73	7.49	7.52	7.61	7.62	JB
9/11/09	17	7.58	7.44	7.47	7.58	7.46	7.40	JB
~~9/17/09~~ 9/18/09	20	7.56	7.34	7.31	7.37	7.25	7.22	KW

ASci-Environmental Testing Laboratory
Weston Solutions Sediment Toxicity Test

ASci-ETL ID# 5010-253

Interstitial Ammonia Values for *H. azteca* Sediment Test with Zeolites

Date	Test Day	WBS	LRR-HS1- A01 R	LRR-HS3- A-01	LRR-HS5 -A-01-R	Initials
8/26/09	0	0.550	2.41	4.05	16.05	KW
8/27/09	1	0.540	2.81	2.745	11.85	KW
8/31/09	5	0.260	5.40	11.65	5.95	JS
9/5/09	10	0.195	6.30	7.20	10.35	KW
9/15/09	20	0.480	5.90	7.95	9.20	KW
9/23/09	28	0.107	0.740	0.811	2.180	KW

Interstitial Water pH Values for *H. azteca* Sediment Test with Zeolites

Date	Test Day	WBS	LRR-HS1- A01 R	LRR-HS3- A-01	LRR-HS5 -A-01-R	Initials
8/26/09	0	7.54	7.62	7.66	7.60	KW
8/27/09	1	7.48	7.51	7.61	7.57	KW
8/28/09	2	7.62	7.64	7.62	7.58	KW
8/31/09	5	8.18	7.76	7.71	7.66	JS
9/2/09	7	7.68	7.60	7.70	7.76	JS
9/5/09	10	7.52	7.68	7.63	7.60	KW
9/7/09	12	7.59	7.63	7.62	7.57	JS
9/9/09	14	7.61	7.63	7.68	7.54	JS
9/11/09	16	7.66	7.28	7.46	7.49	JS
9/15/09	20	7.89	7.79	7.71	7.62	KW
9/16/09	21	7.74	7.46	7.58	7.61	JS
9/18/09	23	7.86	7.62	7.67	7.50	JS
9/21/09	26	7.94	7.63	7.67	7.63	JS
9/23/09	28	7.92	7.94	7.83	7.74	KW

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Interstitial Ammonia Values for *C. tentans* Sediment Test without Zeolites

Date	Test Day	WBS	LRR-HS1-A01-R	LRR-HS3- A-01	LRR-HS5 -A-01-R	LRR-HS6-DOWN2-01	LRR-HS6- F-01	Initials
8/25/09	0	1.015	13.20	17.70	16.30	5.40	2.085	KW
8/26/09	1	0.880	14.250	16.0	15.6	10.85	4.78	KW
8/30/09	5	0.635	11.15	14.05	7.85	4.52	3.66	JTS
9/4/09	10	0.405	13.20	13.35	10.50	4.205	4.29	KW
9/14/09	20	0.225	3.03	3.99	1.30	2.08	1.31	KW

Interstitial Water pH Values for *C. tentans* Sediment Test without Zeolites

Date	Test Day	WBS	LRR-HS1-A01-R	LRR-HS3- A-01	LRR-HS5 -A-01-R	LRR-HS6-DOWN2-01	LRR-HS6- F-01	Initials
8/25/09	0	7.76	7.79	7.75	7.62	7.65	7.82	KW
8/26/09	1	7.68	7.60	7.73	7.75	7.76	7.76	KW
8/28/09	3	7.78	7.61	7.80	7.85	7.68	7.80	KW
8/30/09	5	8.05	7.79	7.78	7.81	7.79	7.74	JTS
9/2/09	8	7.77	7.60	7.55	7.60	7.59	7.76	JTS
9/4/09	10	7.71	7.68	7.72	7.68	7.74	7.80	KW
9/7/09	13	7.86	7.416	7.54	7.51	7.39	7.39	JTS
9/9/09	15	7.77	7.52	7.64	7.53	7.58	7.36	JTS
9/11/09	17	7.39	7.44	7.48	7.58	7.55	7.45	JTS
9/17/09	20	7.61	7.40	7.42	7.29	7.28	7.23	KW

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Interstitial Ammonia Values for *H. azteca* Sediment Test without Zeolites

Date	Test Day	WBS	LRR-HS1- A01 R	LRR-HS3- A-01	LRR-HS5 -A-01-R	Initials
8/26/09	0	1.615	11.45	14.45	14.12	KW
8/27/09	1	1.19	4.85	17.3	16.445	KW
8/31/09	5	0.695	1.405	1.245	11.60	JB
9/5/09	10	0.410	1.13	1.205	12.25	KW
9/15/09	20	0.320	1.215	1.280	10.70	KW
9/23/09	28	0.130	1.780	3.010	4.390	KW

Interstitial Water pH Values for *H. azteca* Sediment Test without Zeolites

Date	Test Day	WBS	LRR-HS1- A01 R	LRR-HS3- A-01	LRR-HS5 -A-01-R	Initials
8/26/09	0	7.50	7.61	7.63	7.58	KW
8/27/09	1	7.45	7.49	7.58	7.57	KW
8/28/09	2	7.63	7.67	7.65	7.62	KW
8/31/09	5	7.77	7.69	7.73	7.66	JB
9/2/09	7	7.80	7.54	7.64	7.65	JB
9/5/09	10	7.53	7.47	7.56	7.61	KW
9/7/09	12	7.84	7.52	7.52	7.48	JB
9/9/09	14	7.71	7.48	7.55	7.51	JB
9/11/09	16	7.63	7.36	7.44	7.46	JB
9/15/09	20	7.79	7.51	7.75	7.71	KW
9/16/09	21	7.76	7.48	7.62	7.60	JB
9/18/09	23	7.64	7.54	7.52	7.50	JB
9/21/09	26	7.69	7.53	7.50	7.49	JB
9/23/09	28	7.73	7.53	7.47	7.42	KW

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Overlying Water Temperature Values for *C. tentans* Sediment Test								
Date	Test Day	WBS	LRR-HS1-A01-R	LRR-HS3- A-01	LRR-HS5 -A-01-R	LRR-HS6-DOWN2-01	LRR-HS6- F-01	Initials
8/25/09	0	23.0	22.7	22.6	22.6	22.6	22.6	KW
8/26/09	1	22.8	22.4	22.4	22.3	22.3	22.3	KW
8/27/09	2	22.6	22.5	22.3	22.3	22.3	22.2	KW
8/28/09	3	22.4	22.4	22.3	22.3	22.4	22.3	KW
8/29/09	4	22.8	22.6	22.6	22.6	22.5	22.4	KW
8/30/09	5	22.4	22.3	22.2	22.2	22.1	22.1	JS
8/31/09	6	22.8	22.6	22.5	22.5	22.4	22.3	JS
9/1/09	7	22.2	22.1	22.0	22.0	22.0	22.0	JS
9/2/09	8	22.7	22.6	22.5	22.4	22.3	22.3	JS
9/3/09	9	22.5	22.5	22.6	22.4	22.4	22.4	KW
9/4/09	10	22.4	22.5	22.4	22.3	22.1	22.1	KW
9/5/09	11	23.2	22.8	22.6	22.6	22.5	22.4	JS
9/6/09	12	22.3	22.1	22.1	22.0	22.0	22.0	JS
9/7/09	13	22.4	22.4	22.4	22.3	22.3	22.4	JS
9/8/09	14	22.5	22.5	22.5	22.5	22.5	22.5	JS
9/9/09	15	22.6	22.6	22.6	22.6	22.5	22.5	JS
9/10/09	16	22.8	23.0	23.0	23.0	22.4	22.4	JS
9/11/09	17	22.6	22.6	22.6	22.7	22.7	22.7	JS
9/12/09	18	23.5	23.3	23.5	23.6	23.7	23.4	KW
9/13/09	19	23.4	23.4	23.3	23.4	23.5	23.4	KW
9/14/09	20	23.2	23.0	23.0	23.2	23.1	23.0	KW

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Overlying Water Temperature Values for *H. azteca* Sediment Test						
Date	Test Day	WBS	LRR-HS1- A01 R	LRR-HS3- A-01	LRR-HS5 -A-01-R	Initials
8/26/09	0	22.2	22.2	22.2	22.3	KW
8/27/09	1	22.2	22.2	22.3	22.2	KW
8/28/09	2	22.3	22.3	22.2	22.2	KW
8/29/09	3	22.4	22.1	22.0	22.3	KW
8/30/09	4	22.4	22.1	22.1	22.2	JB
8/31/09	5	22.5	22.4	22.3	22.2	JB
9/1/09	6	22.0	22.0	22.0	22.1	JB
9/2/09	7	22.3	22.3	22.3	22.4	JB
9/3/09	8	22.4	22.4	22.3	22.3	KW
9/4/09	9	22.3	22.4	22.1	22.2	KW
9/5/09	10	22.4	22.4	22.5	22.5	JB
9/6/09	11	22.3	22.2	22.0	22.2	JB
9/7/09	12	22.5	22.3	22.1	22.0	JB
9/8/09	13	22.4	22.4	22.3	22.3	JB
9/9/09	14	22.5	22.5	22.6	22.6	JB
9/10/09	15	22.8	23.0	23.0	23.1	JB
9/11/09	16	22.7	22.7	22.7	22.6	JB
9/12/09	17	23.5	23.6	23.5	23.5	KW
9/13/09	18	23.4	23.4	23.3	23.4	KW
9/14/09	19	23.0	23.1	22.9	23.0	KW
9/15/09	20	23.1	23.1	23.1	23.1	JB
9/16/09	21	23.0	23.0	23.1	23.0	JB
9/17/09	22	23.1	23.2	23.2	23.2	KW
9/18/09	23	23.2	23.0	23.2	23.2	KW
9/19/09	24	23.1	23.1	23.0	23.0	JB
9/20/09	25	22.8	22.8	22.8	22.8	JB
9/21/09	26	22.6	22.6	22.6	22.7	JB
9/22/09	27	22.6	22.6	22.7	22.7	KW
9/23/09	28	22.5	22.5	22.5	22.6	KW

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Overlying Water DO Values for *C. tentans* Sediment Test with zeolites

Date	Test Day	WBS	LRR-HS1-A01-R	LRR-HS3- A-01	LRR-HS5 -A-01-R	LRR-HS6-DOWN2-01	LRR-HS6- F-01	Initials
8/25/09	0	8.1	7.4	7.0	1.2/4.9	6.9	7.3	KW
8/28/09	3	8.5	7.6	7.2	5.0	7.8	7.9	KW
8/31/09	6	8.7	8.6	3.0	6.0	7.8	7.4	JB
9/2/09	8	8.4	8.4	8.2	8.2	8.4	8.4	JB
9/4/09	10	8.7	8.6	8.5	8.3	8.3	8.3	KW
9/7/09	13	8.0	7.9	7.9	6.4	7.8	7.9	JB
9/9/09	15	5.0	6.6	3.8	3.3	7.3	6.3	JB
9/11/09	17	8.2	8.3	7.1	6.5	7.6	7.9	JB
9/14/09	20	4.1	3.1	3.2	3.7	~~4.~~ 5.9	4.8	KW

Overlying Water DO Values for *H. azteca* Sediment Test with zeolites

Date	Test Day	WBS	LRR-HS1-A01-R	LRR-HS3- A-01	LRR-HS5 -A-01-R	Initials
8/26/09	0	7.5	5.5	5.1	5.1	KW
8/28/09	2	5.8	5.0	5.2	4.9	KW
8/31/09	5	7.0	4.7	3.5	3.5	JB
9/2/09	7	7.6	5.4	6.0	3.1	JB
9/4/09	9	7.3	5.5	5.9	3.5	KW
9/7/09	12	6.8	4.5	5.5	3.1	JB
9/9/09	14	5.7	3.3	4.8	3.8	JB
9/11/09	16	7.1	4.7	6.0	4.2	JB
9/14/09	19	6.8	4.8	5.4	4.5	KW
9/16/09	21	7.5	6.0	6.8	5.4	JB
9/18/09	23	7.0	5.6	5.8	5.6	KW
9/21/09	26	7.3	4.9	4.9	5.1	JB
9/23/09	28	7.2	4.8	4.8	5.1	KW

CT/8/25/09 - D.O. low aeration started after 8hrs D.O. was 4.9mg/L and CT was loaded into HS5. -KW

CT/8/28/09 - HS5 D.O. = 7.4mg/L - KW

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Overlying Water Conductivity Values for *C. tentans* Sediment Test with Zeolites

Date	Test Day	WBS	LRR-HS1-A01-R	LRR-HS3- A-01	LRR-HS5 -A-01-R	LRR-HS6-DOWN2-01	LRR-HS6- F-01	Initials
8/25/09	0	140	181	209	210	212	178	KW
8/28/09	3	164	139	156	144	139	139	KW
9/4/09	10	141	142	142	140	140	135	KW
9/11/09	17	155	136	144	143	136	135	JAS
9/14/09	20	146	185	175	172	144	~~140~~ 159	~~KW~~ KW

Overlying Water Alkalinity Values for *C. tentans* Sediment Test with Zeolites

Date	Test Day	WBS	LRR-HS1-A01-R	LRR-HS3- A-01	LRR-HS5 -A-01-R	LRR-HS6-DOWN2-01	LRR-HS6- F-01	Initials
8/25/09	0	50	80	80	90	80	70	KW
9/14/09	20	44	56	52	50	60	62	KW

Overlying Water Hardness Values for *C. tentans* Sediment Test with Zeolites

Date	Test Day	WBS	LRR-HS1-A01-R	LRR-HS3- A-01	LRR-HS5 -A-01-R	LRR-HS6-DOWN2-01	LRR-HS6- F-01	Initials
8/25/09	0	50	70	82	82	74	76	KW
9/14/09	20	50	64	58	64	54	56	KW

Overlying Water Conductivity Values for *H. azteca* Sediment Test with Zeolites

Date	Test Day	WBS	LRR-HS1-A01-R	LRR-HS3- A-01	LRR-HS5 -A-01-R	Initials
8/26/09	0	140	180	209	210	KW
8/28/09	2	152	156	149	195	KW
9/4/09	9	143	185	167	224	KW
9/11/09	16	132	168	154	155	JAS
9/18/09	23	138	152	150	161	KW
9/23/09	28	129	169	178	164	KW

Overlying Water Alkalinity Values for *H. azteca* Sediment Test with Zeolites

Date	Test Day	WBS	LRR-HS1-A01-R	LRR-HS3- A-01	LRR-HS5 -A-01-R	Initials
8/26/09	0	50	80	80	90	KW
9/23/09	28	50	62	64	60	KW

Overlying Water Hardness Values for *H. azteca* Sediment Test with Zeolites

Date	Test Day	WBS	LRR-HS1-A01-R	LRR-HS3- A-01	LRR-HS5 -A-01-R	Initials
8/26/09	0	50	70	82	82	KW
9/23/09	28	50	66	64	60	KW

Overlying Water Conductivity Values for *C. tentans* Sediment Test without Zeolites

Date	Test Day	WBS	LRR-HS1-A01-R	LRR-HS3- A-01	LRR-HS5 -A-01-R	LRR-HS6-DOWN2-01	LRR-HS6- F-01	Initials
8/25/09	0	137	182	164	210	216	166	KW
9/14/09	20	142	157	147	147	146	146	KW

Overlying Water Alkalinity Values for *C. tentans* Sediment Test without Zeolites

Date	Test Day	WBS	LRR-HS1-A01-R	LRR-HS3- A-01	LRR-HS5 -A-01-R	LRR-HS6-DOWN2-01	LRR-HS6- F-01	Initials
8/25/09	0	40	80	60	85	75	70	KW
9/14/09	20	45	50	48	47	48	51	KW

Overlying Water Hardness Values for *C. tentans* Sediment Test without Zeolites

Date	Test Day	WBS	LRR-HS1-A01-R	LRR-HS3- A-01	LRR-HS5 -A-01-R	LRR-HS6-DOWN2-01	LRR-HS6- F-01	Initials
8/25/09	0	48	70	64	76	73	62	KW
9/14/09	20	44	56	44	50	52	52	KW

Overlying Water Conductivity Values for *H. azteca* Sediment Test without Zeolites

Date	Test Day	WBS	LRR-HS1-A01-R	LRR-HS3- A-01	LRR-HS5 -A-01-R	Initials
8/26/09	0	137	182	164	210	KW
9/23/09	28	129	168	175	160	KW

Overlying Water Alkalinity Values for *H. azteca* Sediment Test without Zeolites

Date	Test Day	WBS	LRR-HS1-A01-R	LRR-HS3- A-01	LRR-HS5 -A-01-R	Initials
8/26/09	0	40	80	60	85	KW
9/23/09	28	40	60	64	58	KW

Overlying Water Hardness Values for *H. azteca* Sediment Test without Zeolites

Date	Test Day	WBS	LRR-HS1-A01-R	LRR-HS3- A-01	LRR-HS5 -A-01-R	Initials
8/26/09	0	48	70	64	76	KW
9/23/09	28	40	64	66	58	KW

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Overlying Water Ammonia Values for *C. tentans* Sediment Test without Zeolites

Date	Test Day	WBS	LRR-HS1-A01-R	LRR-HS3- A-01	LRR-HS5 -A-01-R	LRR-HS6-DOWN2-01	LRR-HS6- F-01	Initials
8/25/09	0	0.036	0.052	0.388	3.29	0.135	0.052	KW
8/26/09	1	0.021	0.337	0.850	0.062	0.078	0.080	KW
8/30/09	5	0.023	0.039	0.093	0.020	0.020	0.020	JS
9/4/09	10	0.061	0.048	0.040	0.043	0.051	0.041	KW
9/14/09	20	0.729	0.371	0.137	~~0.151~~ 0.246 recd 9/16	0.159	0.132	KW

Overlying Water pH Values for *C. tentans* Sediment Test without Zeolites

Date	Test Day	WBS	LRR-HS1-A01-R	LRR-HS3- A-01	LRR-HS5 -A-01-R	LRR-HS6-DOWN2-01	LRR-HS6- F-01	Initials
8/25/09	0	8.00	7.76	7.81	7.55	7.76	7.83	KW
8/26/09	1	7.93	7.76	7.71	7.94	7.91	7.91	KW
8/28/09	3	7.14	7.24	7.21	7.27	7.30	7.33	KW
8/30/09	5	7.97	7.95	7.93	7.99	7.99	8.01	JS
9/2/09	8	7.75	7.81	7.87	7.89	7.93	7.97	JS
9/4/09	10	7.96	7.94	7.95	7.95	7.98	7.98	KW
9/7/09	13	8.00	8.01	7.91	7.91	7.95	7.96	JS
9/9/09	15	7.99	7.98	7.95	7.95	7.95	7.96	JS
9/11/09	17	7.80	7.85	7.85	7.87	7.92	7.94	JS
~~9/17/09~~ 9/16/09 recd	20	7.93	7.85	7.92	7.93	7.95	7.99	KW

Overlying Water Ammonia Values for *H. azteca* Sediment Test without Zeolites

Date	Test Day	WBS	LRR-HS1- A01 R	LRR-HS3- A-01	LRR-HS5 -A-01-R	Initials
8/26/09	0	0.069	0.562	2.27	2.53	KW
8/27/09	1	0.075	0.706	2.85	1.28	KW
8/31/09	5	0.050	0.179	0.245	0.354	JB
9/5/09	10	0.042	0.159	0.464	0.924	KW
9/15/09	20	0.072	0.241	0.396	0.411	KW
9/23/09	28	0.0264	0.191	0.731	1.01	KW

Overlying Water pH Values for *H. azteca* Sediment Test without Zeolites

Date	Test Day	WBS	LRR-HS1- A01 R	LRR-HS3- A-01	LRR-HS5 -A-01-R	Initials
8/26/09	0	7.39	7.44	7.42	7.36	KW
8/27/09	1	7.39	7.27	7.23	7.28	KW
8/28/09	2	7.41	7.26	7.25	7.30	KW
8/31/09	5	7.55	7.46	7.45	7.46	JB
9/2/09	7	8.00	7.73	7.68	7.64	JB
9/5/09	10	7.92	7.73	7.71	7.70	KW
9/7/09	12	7.52	7.34	7.36	7.32	JB
9/9/09	14	7.66	7.41	7.57	7.58	JB
9/11/09	16	7.94	7.71	7.67	7.68	JB
9/15/09	20	7.90	7.76	7.72	7.72	JB
9/16/09	21	7.92	7.74	7.69	7.69	JB
9/18/09	23	7.98	7.81	7.73	7.74	KW
9/21/09	26	7.98	7.85	7.82	7.79	JB
9/23/09	28	7.65	7.68	7.64	7.64	KW

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Overlying Water Ammonia Values for *C. tentans* Sediment Test with Zeolites

Date	Test Day	WBS	LRR-HS1-A01-R	LRR-HS3- A-01	LRR-HS5 -A-01-R	LRR-HS6-DOWN2-01	LRR-HS6- F-01	Initials
8/25/09	0	0.027	0.069	0.220	0.690	0.055	0.035	KW
8/26/09	1	0.041	0.049	0.101	0.042	0.037	0.042	KW
8/30/09	5	0.0392	0.029	0.051	0.032	0.025	0.027	JS
9/4/09	10	0.129	0.104	0.102	0.095	0.098	0.109	JS
9/14/09	20	0.696	0.979	1.04	0.946	0.766	0.179	KW

Overlying Water pH Values for *C. tentans* Sediment Test with Zeolites

Date	Test Day	WBS	LRR-HS1-A01-R	LRR-HS3- A-01	LRR-HS5 -A-01-R	LRR-HS6-DOWN2-01	LRR-HS6- F-01	Initials
8/25/09	0	7.90	7.78	7.64	7.48	7.80	7.79	KW
8/26/09	1	8.19	7.92	7.84	7.94	7.86	7.91	KW
8/28/09	3	8.29	8.13	7.99	8.03	8.01	8.06	KW
8/30/09	5	7.83	7.89	7.84	7.92	7.94	7.95	JS
9/2/09	8	~~7.49~~ 7.83	~~8.15~~ 7.55	~~8.15~~ 7.75	8.12	8.13	8.12	JS
9/4/09	10	7.77	7.75	7.78	7.80	7.83	7.84	KW
9/7/09	13	8.02	8.00	7.95	7.91	7.96	8.01	JS
9/9/09	15	7.93	7.96	7.99	7.92	7.87	7.86	JS
9/11/09	17	8.24	8.17	8.12	8.07	8.10	8.12	JS
~~9/17/09~~ 9/14/09	20	7.93	7.78	7.78	7.75	7.80	7.75	KW

Overlying Water Ammonia Values for *H. azteca* Sediment Test with Zeolites

Date	Test Day	WBS	LRR-HS1- A01 R	LRR-HS3- A-01	LRR-HS5 -A-01-R	Initials
8/26/09	0	0.027	0.191	0.217	1.32	KW
8/27/09	1	0.061	0.109	0.041	0.664	KW
8/31/09	5	0.912	0.023	0.021	0.419	JB
9/5/09	10	0.311	0.234	0.105	1.02	JB
9/15/09	20	0.221	0.209	0.129	0.878	KW
9/23/09	28	0.0814	0.110	0.0644	0.159	KW

Overlying Water pH Values for *H. azteca* Sediment Test with Zeolites

Date	Test Day	WBS	LRR-HS1- A01 R	LRR-HS3- A-01	LRR-HS5 -A-01-R	Initials
8/26/09	0	7.63	7.34	7.36	7.27	KW
8/27/09	1	8.09	7.88	7.80	7.81	KW
8/28/09	2	8.05	7.91	7.85	7.89	KW
8/31/09	5	7.63	7.55	7.73	7.74	JB
9/2/09	7	7.88	7.72	7.76	7.53	JB
9/5/09	10	7.84	7.70	7.71	7.64	KW
9/7/09	12	7.80	7.66	7.63	7.45	JB
9/9/09	14	7.83	7.69	7.68	7.55	JB
9/11/09	16	7.90	7.75	7.76	7.73	JB
9/15/09	20	8.03	7.76	7.83	7.89	JB
9/16/09	21	7.97	7.76	7.79	7.79	JB
~~9/18/09~~ 9/19/09 Repeated	23	8.01	8.00	7.85	7.82	KW
9/21/09	26	8.19	8.01	7.99	8.00	JB
9/23/09	28	7.70	7.57	7.52	7.59	KW

H. azteca 28-day Survival and Growth

Site I.D.: WBS without Zeolites

Weight

Rep	Number of Organisms			Dried Pan Weight (mg)	Dried Pan + Dried *H. azteca* (mg)
	Alive	Dead	Weighed		
1	10	ϕ	10	1284.42	1284.81
2	10	ϕ	10	1288.02	1288.52
3	9	1	9	1284.93	1285.44

Length (mm)

REPLICATE	ORG 1	ORG 2	ORG 3	ORG 4	ORG 5	ORG 6	ORG 7	ORG 8	ORG 9	ORG 10
A	2.8	2.7	3.1	3.3	3.9	4.2	2.3	3.6	1.8	2.1
B	2.3	2.8	2.8	3.2	3.3	2.9	2.5	2.3	2.4	2.6
C	3.8	2.8	2.7	3.1	2.9	2.6	3.2	2.5	2.0	–

H. azteca 28-day Survival and Growth

Site I.D.: WBS with Zeolites

Weight

Rep	Number of Organisms			Dried Pan Weight (mg)	Dried Pan + Dried *H. azteca* (mg)
	Alive	Dead	Weighed		
1	9	1	9	1277.34	1277.82
2	9	1	9	1278.96	~~1288.39~~ 1279.39
3	10	ϕ	10	1278.90	~~1288.~~ 1279.35
4	10	ϕ	10	1277.26	~~1278.~~ 1277.68
5	10	ϕ	10	1287.27	1287.73
6	10	ϕ	10	1280.93	1281.42
7	9	1	9	1288.68	1289.15
8	~~9~~ 10	1	9	1277.92	1278.53

Length (mm)

REPLICATE	ORG 1	ORG 2	ORG 3	ORG 4	ORG 5	ORG 6	ORG 7	ORG 8	ORG 9	ORG 10
A	2.6	3.8	3.2	3.3	3.6	3.2	2.5	2.8	3.5	—
B	2.4	2.2	3.4	2.1	3.1	2.3	3.5	3.2	2.8	—
C	2.9	2.8	3.1	3.0	2.8	2.6	2.4	3.0	2.5	2.8
D	2.0	2.9	3.0	2.6	2.3	2.4	2.2	2.8	2.1	2.4
E	3.4	2.8	2.4	1.8	2.7	2.1	2.6	2.3	2.4	2.5
F	2.6	3.1	3.3	2.8	3.6	2.7	2.8	3.0	2.6	3.0
G	3.2	2.9	2.5	3.0	4.8	2.4	2.2	2.8	2.0	—
H	3.4	3.2	2.8	3.0	2.2	1.8	2.8	3.3	1.8	—

H. azteca 28-day Survival and Growth

Site I.D.: LRR-HS1-A-01-R

Weight

Rep	Number of Organisms			Dried Pan Weight (mg)	Dried Pan + Dried *H. azteca* (mg)
	Alive	Dead	Weighed		
1	9	1	9	1276.47	1277.00
2	8	2	8	1274.88	1275.28
3	8	2	8	1282.35	1282.78
4	7	3	7	1280.16	1280.95
5	7	3	7	1276.10	1276.66
6	6	4	6	1287.13	1287.68
7	10	ø	10	1297.36	1297.99
8	4	6	4	1275.76	1276.30

Length (mm)

REPLICATE	ORG 1	ORG 2	ORG 3	ORG 4	ORG 5	ORG 6	ORG 7	ORG 8	ORG 9	ORG 10
A	2.6	~~3.8~~ 3.2	3.1	2.2	2.1	2.3	2.4	2.6	2.4	—
B	2.2	2.7	3.3	2.8	2.1	2.4	2.8	3.1	—	—
C	2.4	2.8	3.0	3.1	2.7	2.1	2.3	2.5	—	—
D	4.1	4.3	4.1	2.5	2.0	3.8	2.6	—	—	—
E	3.1	3.0	3.2	3.6	2.8	3.2	3.6	—	—	—
F	3.4	3.6	3.0	3.8	3.3	2.8	—	—	—	—
G	2.8	~~2~~ 3.5	3.1	2.7	3.2	2.8	2.3	2.8	3.1	3.3
H	3.2	3.0	3.0	4.0	~~2.8~~ RE READ	—	—	—	—	—

H. azteca 28-day Survival and Growth

Site I.D.: LRR-HS3-A-01

Weight

Rep	Number of Organisms			Dried Pan Weight (mg)	Dried Pan + Dried *H. azteca* (mg)
	Alive	Dead	Weighed		
1	8	2	8	1287.18	1287.64
2	4	6	4	1264.74	1265.11
3	6	4	6	1284.58	1285.32
4	7	3	7	1289.15	1289.70
5	8	2	8	1280.90	1281.32
6	4	6	4	1276.65	1277.30
7	5	5	5	1285.97	1286.41
8	5	5	5	1287.69	1288.15

Length (mm)

REPLICATE	ORG 1	ORG 2	ORG 3	ORG 4	ORG 5	ORG 6	ORG 7	ORG 8	ORG 9	ORG 10
A	3.3	2.4	3.0	3.2	3.0	3.1	3.5	2.8	–	–
B	3.2	2.8	4.1	2.8	~~3.3~~	~~4.2~~	~~4.1~~	~~2.6~~	~~3.0~~	–
C	3.3	4.2	4.1	2.6	3.0	3.2	–	–	–	–
D	2.3	3.3	2.5	5.2	2.6	2.4	3.3	–	–	–
E	3.8	4.1	1.8	2.1	2.6	3.0	2.0	2.7	–	–
F	4.5	3.8	3.8	3.2	–	–	–	–	–	–
G	4.8	2.5	3.5	3.0	2.6	–	–	–	–	–
H	3.3	4.3	3.1	3.2	4.1	–	–	–	–	–

H. azteca 28-day Survival and Growth

Site I.D.: LRR-HS5-A-01-R

Weight

Rep	Number of Organisms			Dried Pan Weight (mg)	Dried Pan + Dried *H. azteca* (mg)
	Alive	Dead	Weighed		
1	5	5	5	1284.80	1285.49
2	3	7	3	1283.26	1283.44
3	2	8	2	1288.37	1288.50
4	4	6	4	1281.48	1281.83
5	0	10	0	1279.40	———
6	4	6	4	1281.94	1282.30
7	5	5	5	1287.06	1287.59
8	3	8	3	1286.86	1287.14

Length (mm)

REPLICATE	ORG 1	ORG 2	ORG 3	ORG 4	ORG 5	ORG 6	ORG 7	ORG 8	ORG 9	ORG 10
A	4.8	3.5	3.6	3.1	3.3	–	–	–	–	–
B	2.6	2.0	3.1	–	–	–	–	–	–	–
C	3.8	2.4	–	–	–	–	–	–	–	–
D	3.1	3.6	2.3	4.1	–	–	–	–	–	–
E	~~2.4~~	~~3.0~~	~~3.6~~	~~3.6~~	–	–	–	–	–	–
F	2.4	3.0	3.6	3.6	–	–	–	–	–	–
G	3.0	3.2	4.9	3.4	2.3	–	–	–	–	–
H	2.8	3.1	3.6	–	–	–	–	–	–	–

Chironomus tentans 20-day Survival and Growth Data

Site ID # **WBS without Zeolites**

Rep	# Organisms			Ashed Pan Wt. (mg)	Pan + Dried Org. Wt. (mg)	Pan + Ashed Org. Wt. (mg)
	Alive	Dead	Weighed			
A	12	Ø	12	1267.21	1274.43	1268.94
B	12	Ø	12	1267.84	1273.98	1268.19
C	11	1	11	1279.98	1286.27	1280.28
~~D~~						

KW

Chironomus tentans 20-day Survival and Growth Data

Site ID # **WBS with Zeolites**

Rep	# Organisms			Ashed Pan Wt. (mg)	Pan + Dried Org. Wt. (mg)	Pan + Ashed Org. Wt. (mg)
	Alive	Dead	Weighed			
A	11	1	11	1267.24	1272.83	1268.57
B	10	2	10	1278.50	1289.21	1281.45
C	8	4	8	1277.73	1286.35	1279.44
D	5	7	5	1282.10	1283.70	1282.92
E	8	4	8	1272.15	1280.75	1275.22
F	9	3	9	1275.52	1284.26	1278.10
G	6	6	6	1285.72	1288.45	1286.60
H	12	∅	12	1279.45	1287.79	1281.58

ASci-Environmental Testing Laboratory
Weston Solutions Sediment Toxicity Test
ASci-ETL ID# 5010-253

Chironomus tentans 20-day Survival and Growth Data

Site ID # LRR-HS1-A01-R With Zeolites DM

Rep	# Organisms			Ashed Pan Wt. (mg)	Pan + Dried Org. Wt. (mg)	Pan + Ashed Org. Wt. (mg)
	Alive	Dead	Weighed			
A	ϕ	12	ϕ	1303.33	—	—
B				1293.41	—	—
C				1302.60	—	—
D				1285.85	—	—
E				1293.11	—	—
F				1304.36	—	—
G				1298.86	—	—
H				1290.69	—	—
~~HS1-A01-R without Zeolites~~						

KW

ASci-Environmental Testing Laboratory
Weston Solutions Sediment Toxicity Test
ASci-ETL ID# 5010-253

Chironomus tentans 20-day Survival and Growth Data

Site ID # LRR-HS3-A-01 with Zeolite

Rep	# Organisms			Ashed Pan Wt. (mg)	Pan + Dried Org. Wt. (mg)	Pan + Ashed Org. Wt. (mg)
	Alive	Dead	Weighed			
A	ϕ	12	ϕ	1280.44	—	—
B				1307.68	—	—
C				1297.00	—	—
D				1294.17	—	—
E				1293.81	—	—
F				1291.75	—	—
G				1298.22	—	—
H				1292.24	—	—
~~HS3-1-01 without Zeolites~~						

KW

ASci-Environmental Testing Laboratory
Weston Solutions Sediment Toxicity Test
ASci-ETL ID# 5010-253

Chironomus tentans 20-day Survival and Growth Data

Site ID # LRR-HS5-A-01-R with Zeolites DH

Rep	# Organisms			Ashed Pan Wt. (mg)	Pan + Dried Org. Wt. (mg)	Pan + Ashed Org. Wt. (mg)
	Alive	Dead	Weighed			
A	∅	12	∅	1273.52	—	—
B				1302.12	—	—
C				1292.35	—	—
D				1283.94	—	—
E				1276.40	—	—
F				1300.94	—	—
G				1299.20	—	—
H				1294.27	—	—
~~HS5-A-01-R without Zeolites~~						

KW

Chironomus tentans 20-day Survival and Growth Data

Site ID # LRR-HS6-DOWN2-01 With Zeolites

Rep	# Organisms			Ashed Pan Wt. (mg)	Pan + Dried Org. Wt. (mg)	Pan + Ashed Org. Wt. (mg)
	Alive	Dead	Weighed			
A	~~12~~ Ø	12	Ø	1292.70	—	—
B	2	10	2	1292.83	1293.54	1293.49
C	Ø	12	Ø	1301.94	—	—
D	2	10	2	1284.69	1284.88	1285.20
E	Ø	12	Ø	1290.00	—	—
F	2	10	2	1288.05	1288.69	1288.64
G	6	6	6	1279.26	1280.44	1279.88
H	2	10	2	1295.25	1295.81	1295.74
~~HS6-DOWN2 without Zeolites~~						

KW

Chironomus tentans 20-day Survival and Growth Data

Site ID # LRR-HS6-F-01 with Zeolites

Rep	# Organisms			Ashed Pan Wt. (mg)	Pan + Dried Org. Wt. (mg)	Pan + Ashed Org. Wt. (mg)
	Alive	Dead	Weighed			
A	12	ϕ	12	1284.33	1285.99	1285.12
B	3	9	3	1292.05	1292.69	1292.53
C	3	9	3	1291.95	1292.87	1292.62
D	6	6	6	1293.29	1294.82	1294.13
E	6	6	6	1292.47	1295.29	1293.85
F	4	8	4	1285.77	1286.73	1286.67
G	7	5	7	1294.73	1296.53	1295.61
H	ϕ	12	ϕ	1289.10		
~~HS6-F-01 without Zeolites~~						

KW

APPENDIX C

Statistical Analysis

Evaluation of Dredge Materials for Bioaccumulation-20-Day AFDW (Ash Free)

Start Date: ~~9/3/2009~~ 8/25/09 Test ID: WestCT Sample ID: Weston
End Date: ~~9/23/2009~~ 9/14/09 Lab ID: Sample Type: sediment
Sample Date: Protocol: EPADM91-EPA 503/8-91/001 Test Species: CT-Chironomus tentas
Comments:

Conc-	1	2	3	4	5	6	7	8
WBS	0.3873	0.7760	0.8637	0.1560	0.6912	0.6844	0.3083	0.5175
Blank	0.4575	0.4825	0.5445					
36-DOWN2-01	0.0250	0.0000	0.0250	0.0933	0.0350			
HS6-F-01	0.0725	0.0533	0.0833	0.1150	0.2400	0.0150	0.1314	

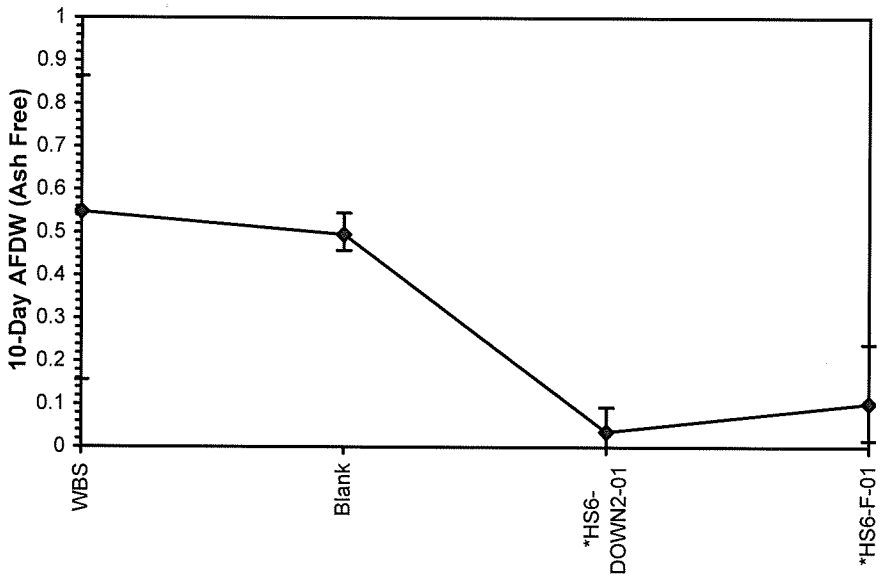
			Transform: Untransformed					Rank	1-Tailed
Conc-	Mean	N-Mean	Mean	Min	Max	CV%	N	Sum	Critical
WBS	0.5481	1.0000	0.5481	0.1560	0.8637	45.153	8		
Blank	0.4948	0.9029	0.4948	0.4575	0.5445	9.057	3	16.00	7.00
36-DOWN2-01	0.0357	0.0651	0.0357	0.0000	0.0933	97.383	5	15.00	20.00
*HS6-F-01	0.1015	0.1852	0.1015	0.0150	0.2400	71.074	7	29.00	37.00

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates normal distribution (p > 0.01)	0.93059	0.881	-0.4378	1.99699
Bartlett's Test indicates unequal variances (p = 4.31E-04)	18.0416	11.3449		

Hypothesis Test (1-tail, 0.05)

Wilcoxon Rank Sum Test indicates significant differences
Treatments vs WBS

Dose-Response Plot



Reviewed by:

Evaluation of Dredge Materials for Bioaccumulation-20-Day Survival

Start Date: ~~9/3/2009~~ 8/25/09 Test ID: WestCT Sample ID: Weston
End Date: ~~9/23/2009~~ 9/14/09 Lab ID: Sample Type: sediment
Sample Date: Protocol: EPADM91-EPA 503/8-91/001 Test Species: CT-Chironomus tentas
Comments:

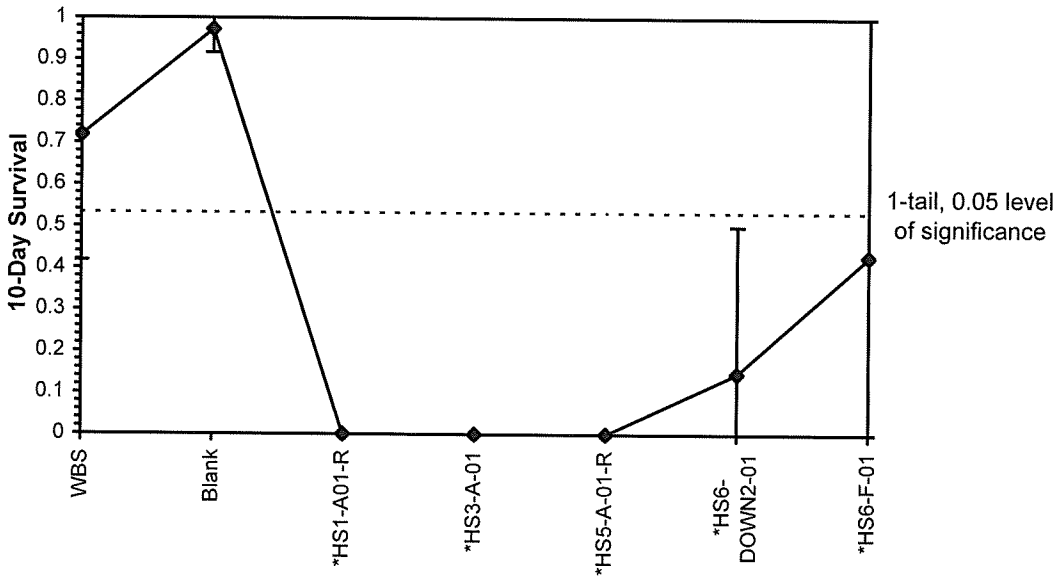
Conc-	1	2	3	4	5	6	7	8
WBS	0.9167	0.8333	0.6667	0.4167	0.6667	0.7500	0.5000	1.0000
Blank	1.0000	1.0000	0.9167					
HS1-A01-R	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
HS3-A-01	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
HS5-A-01-R	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
S6-DOWN2-01	0.0000	0.1667	0.0000	0.1667	0.0000	0.1667	0.5000	0.1667
HS6-F-01	1.0000	0.2500	0.2500	0.5000	0.5000	0.3333	0.5833	0.0000

			Transform: Untransformed					1-Tailed		
Conc-	Mean	N-Mean	Mean	Min	Max	CV%	N	t-Stat	Critical	MSD
WBS	0.7188	1.0000	0.7188	0.4167	1.0000	27.672	8			
Blank	0.9722	1.3527	0.9722	0.9167	1.0000	4.949	3	-2.379	2.365	0.2519
*HS1-A01-R	0.0000	0.0000	0.0000	0.0000	0.0000	0.000	8	9.134	2.365	0.1861
*HS3-A-01	0.0000	0.0000	0.0000	0.0000	0.0000	0.000	8	9.134	2.365	0.1861
*HS5-A-01-R	0.0000	0.0000	0.0000	0.0000	0.0000	0.000	8	9.134	2.365	0.1861
S6-DOWN2-01	0.1458	0.2029	0.1458	0.0000	0.5000	113.261	8	7.281	2.365	0.1861
*HS6-F-01	0.4271	0.5942	0.4271	0.0000	1.0000	69.526	8	3.707	2.365	0.1861

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Kolmogorov D Test indicates non-normal distribution (p <= 0.01)	1.91924	1.035	0.84792	5.3289
Equality of variance cannot be confirmed				

Hypothesis Test (1-tail, 0.05)	MSDu	MSDp	MSB	MSE	F-Prob	df
Dunnett's Test indicates significant differences	0.18606	0.25886	0.85923	0.02477	4.0E-15	6, 44
Treatments vs WBS						

Dose-Response Plot



Reviewed by: KW

Hyallela azteca 28 Day Survival Test

Start Date:	8/27/2008	Test ID:	Weston	Sample ID:	
End Date:	9/23/2009	Lab ID:	5010	Sample Type:	SEDIMENT
Sample Date:		Protocol:	EPAM 94-EPA/600/4-91/003	Test Species:	HA-Hyallela azteca
Comments:					

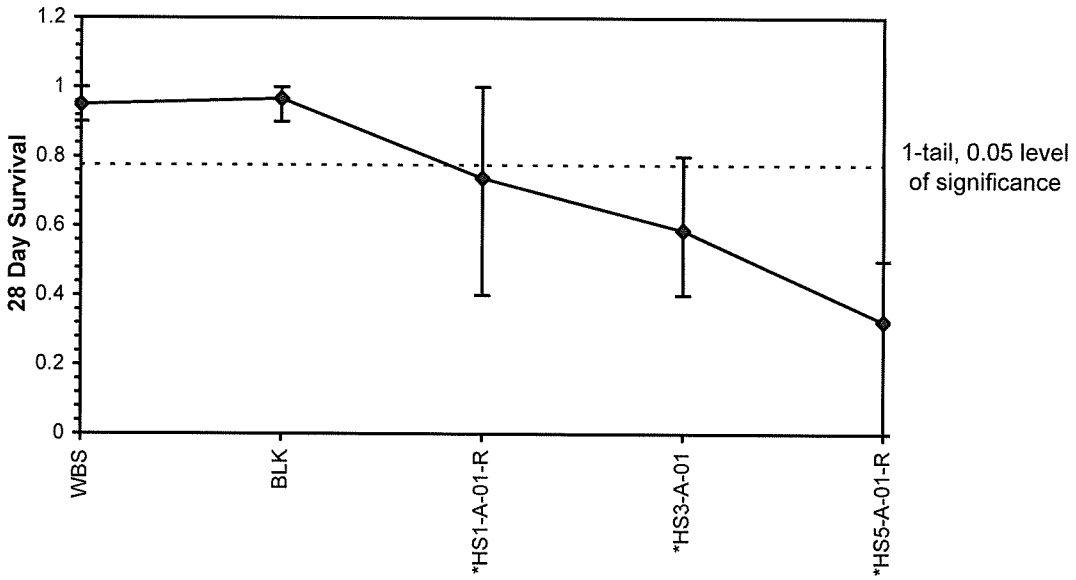
Conc-%	1	2	3	4	5	6	7	8
WBS	0.9000	0.9000	1.0000	1.0000	1.0000	1.0000	0.9000	0.9000
BLK	1.0000	1.0000	0.9000					
HS1-A-01-R	0.9000	0.8000	0.8000	0.7000	0.7000	0.6000	1.0000	0.4000
HS3-A-01	0.8000	0.4000	0.6000	0.7000	0.8000	0.4000	0.5000	0.5000
HS5-A-01-R	0.5000	0.3000	0.2000	0.4000	0.0000	0.4000	0.5000	0.3000

			Transform: Untransformed					1-Tailed		
Conc-%	Mean	N-Mean	Mean	Min	Max	CV%	N	t-Stat	Critical	MSD
WBS	0.9500	1.0000	0.9500	0.9000	1.0000	5.627	8			
BLK	0.9667	1.0175	0.9667	0.9000	1.0000	5.973	3	-0.167	2.360	0.2350
*HS1-A-01-R	0.7375	0.7763	0.7375	0.4000	1.0000	25.042	8	2.889	2.360	0.1735
*HS3-A-01	0.5875	0.6184	0.5875	0.4000	0.8000	27.950	8	4.929	2.360	0.1735
*HS5-A-01-R	0.3250	0.3421	0.3250	0.0000	0.5000	51.355	8	8.498	2.360	0.1735

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates normal distribution (p > 0.01)	0.96377	0.91	-0.4394	0.47532
Bartlett's Test indicates equal variances (p = 0.03)	10.511	13.2767		

Hypothesis Test (1-tail, 0.05)	MSDu	MSDp	MSB	MSE	F-Prob	df
Bonferroni t Test indicates significant differences Treatments vs WBS	0.17355	0.18268	0.48314	0.02164	1.2E-08	4, 30

Dose-Response Plot



Reviewed by: HW

Hyallela azteca Survival and Growth Test-Dry weight

Start Date:	8/27/2008	Test ID:	Weston	Sample ID:	
End Date:	9/23/2009	Lab ID:	5010	Sample Type:	SEDIMENT
Sample Date:		Protocol:	EPAM 94-EPA/600/4-91/003	Test Species:	HA-Hyallela azteca
Comments:					

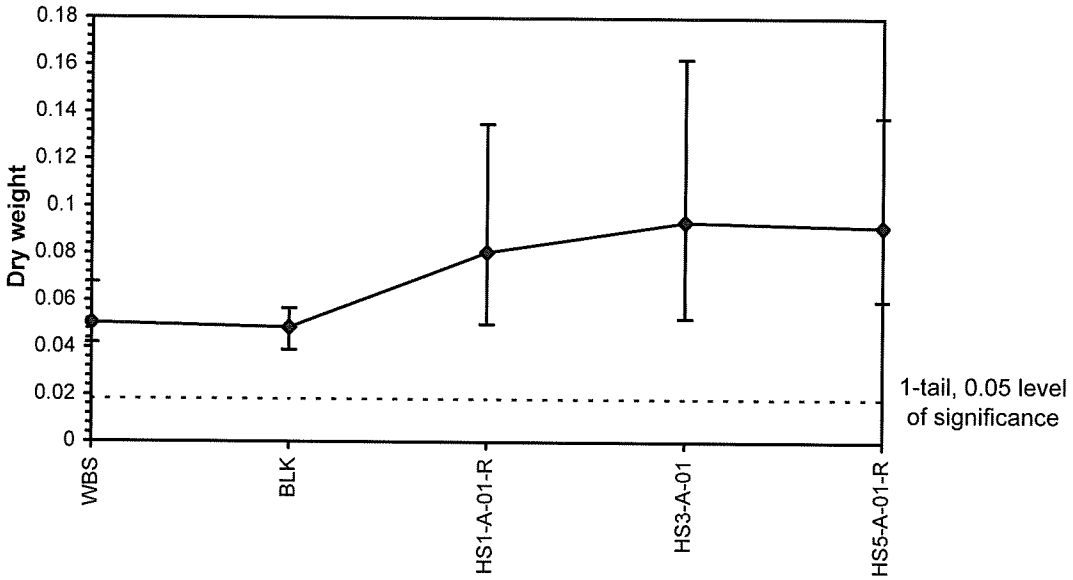
Conc-%	1	2	3	4	5	6	7	8
WBS	0.0533	0.0478	0.0450	0.0420	0.0460	0.0490	0.0522	0.0678
BLK	0.0390	0.0500	0.0567					
HS1-A-01-R	0.0589	0.0500	0.0538	0.1129	0.0800	0.0917	0.0630	0.1350
HS3-A-01	0.0575	0.0925	0.1233	0.0786	0.0525	0.1625	0.0880	0.0920
HS5-A-01-R	0.1380	0.0600	0.0650	0.0875	0.0900	0.1060	0.0933	

			Transform: Untransformed					1-Tailed		
Conc-%	Mean	N-Mean	Mean	Min	Max	CV%	N	t-Stat	Critical	MSD
WBS	0.0504	1.0000	0.0504	0.0420	0.0678	15.767	8			
BLK	0.0486	0.9636	0.0486	0.0390	0.0567	18.374	3	0.103	2.364	0.0422
HS1-A-01-R	0.0806	1.6005	0.0806	0.0500	0.1350	37.963	8	-2.297	2.364	0.0311
HS3-A-01	0.0934	1.8529	0.0934	0.0525	0.1625	38.158	8	-3.262	2.364	0.0311
HS5-A-01-R	0.0914	1.8140	0.0914	0.0600	0.1380	28.559	7	-3.008	2.364	0.0322

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates normal distribution (p > 0.01)	0.92624	0.908	0.91838	1.2003
Bartlett's Test indicates unequal variances (p = 8.33E-03)	13.6959	13.2767		

Hypothesis Test (1-tail, 0.05)	MSDu	MSDp	MSB	MSE	F-Prob	df
Bonferroni t Test indicates no significant differences Treatments vs WBS	0.03224	0.63975	0.00294	0.00069	0.00808	4, 29

Dose-Response Plot



Reviewed by:_____

Hyallela azteca Survival and Growth Test-Length

Start Date:	8/27/2008	Test ID:	Weston	Sample ID:	
End Date:	9/23/2009	Lab ID:	5010	Sample Type:	SEDIMENT
Sample Date:		Protocol:	EPAM 94-EPA/600/4-91/003	Test Species:	HA-Hyallela azteca
Comments:					

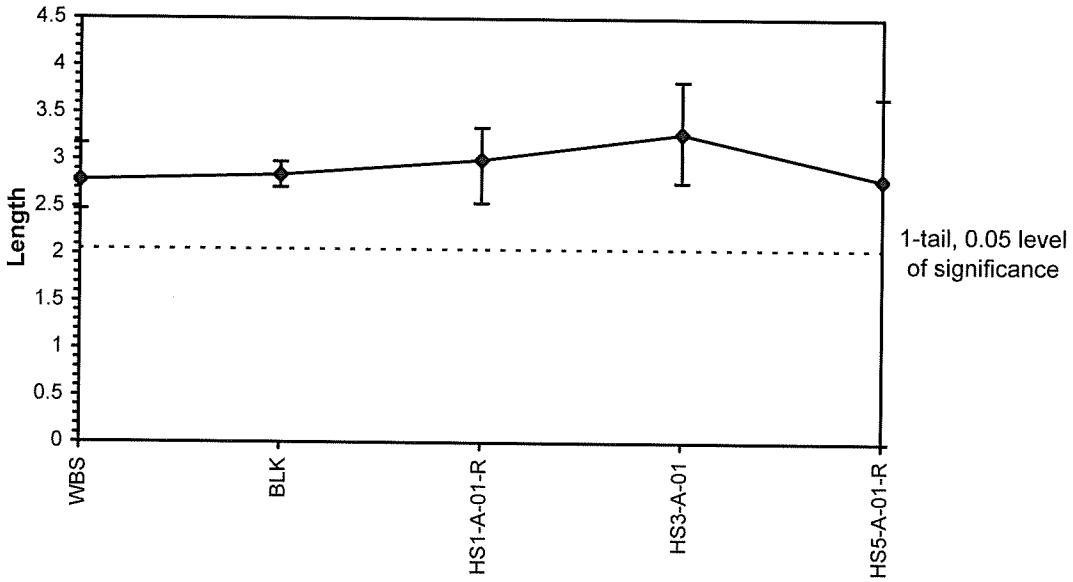
Conc-%	1	2	3	4	5	6	7	8
WBS	3.1700	2.7800	2.7900	2.4700	2.5000	2.9500	2.8700	2.7000
BLK	2.9800	2.7100	2.8400					
HS1-A-01-R	2.5400	2.6800	2.6100	3.3400	3.2100	3.3200	2.9600	3.3000
HS3-A-01	3.0400	3.2300	3.4000	3.0900	2.7600	3.8300	3.2800	3.6000
HS5-A-01-R	3.6600	2.5700	3.1000	3.2800	0.0000	3.1500	3.3600	3.1700

			Transform: Untransformed					1-Tailed		
Conc-%	Mean	N-Mean	Mean	Min	Max	CV%	N	t-Stat	Critical	MSD
WBS	2.7788	1.0000	2.7788	2.4700	3.1700	8.275	8			
BLK	2.8433	1.0232	2.8433	2.7100	2.9800	4.749	3	-0.154	2.360	0.9906
HS1-A-01-R	2.9950	1.0778	2.9950	2.5400	3.3400	11.425	8	-0.697	2.360	0.7316
HS3-A-01	3.2788	1.1799	3.2788	2.7600	3.8300	10.219	8	-1.613	2.360	0.7316
HS5-A-01-R	2.7863	1.0027	2.7863	0.0000	3.6600	41.865	8	-0.024	2.360	0.7316

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates non-normal distribution (p <= 0.01)	0.718	0.91	-3.2419	15.4318
Bartlett's Test indicates unequal variances (p = 3.40E-05)	25.8481	13.2767		

Hypothesis Test (1-tail, 0.05)	MSDu	MSDp	MSB	MSE	F-Prob	df
Bonferroni t Test indicates no significant differences Treatments vs WBS	0.7316	0.26329	0.34102	0.38455	0.48374	4, 30

Dose-Response Plot



Reviewed by:_____

APPENDIX D

ASci's Ammonium Chloride Reference Toxicant Testing

STUDY TITLE

ACUTE TOXICITY OF TOTAL AMMONIA USING AMMONIUM CHLORIDE ON
Chironomus tentans
and
Hyallela azteca

DATA STANDARDS

United States Environmental Protection Agency (USEPA)

STUDY COMPLETED

Sept. 1, 2009

TESTING FACILITY

ASci Corporation
Environmental Testing Laboratory
4444 Airpark Boulevard
Duluth, MN 55811

Tel. No. (218) 722-4040
Fax No. (218) 722-2592

1.0 GENERAL INFORMATION

Study Title	ACUTE TOXICITY OF AMMONIUM CHLORIDE TO *Chironomus tentans* and *Hyallela azteca*
Data Standards	USEPA
Sponsor	Weston Solutions, Inc. 750 East Bunker Court Suite 500 Vernon Hills, IL 60061-1450
Testing Facility	ASci Corporation's Environmental Testing Laboratory, 4444 Airpark Boulevard, Duluth, MN 55811; Tel. No. (218) 722-4040.
Principal Investigator	Jennifer J. Berglund
Quality Assurance Officer	Katherine A. Wormer
Project and Testing Facility Director	Dennis L. Hansen
Chironomus tentans Definitive Test Dates	Aug. 28th – Sept. 1, 2009
Hyallela azteca Definitive Test Dates	Aug. 28th – Sept. 1, 2009
Chironomus tentans Test Results (Parenthetic Values are Confidence Intervals)	*96-h* LC_{50}: 509.21 mg/L (476.17- 544.53 mg/L) *96-h NOEC*: 391 mg/L *96-h LOEC*: 730 mg/L
Hyallela azteca Test Results (Parenthetic Values are Confidence Intervals)	*96-h* LC_{50}: 16.068 mg/L (13.469- 19.169 mg/L) *96-h NOEC*: 6.61 mg/L *96-h LOEC*: 15.3 mg/L

Data Validation and Report Review	Katherine Wormer	Report Signature:
Report Approval	Dennis Hansen	Report Signature:
Retention of Raw Data and Final Report	Ten years from the date study is completed.	
Location of Raw Data and Final Report	ASci Corporation Environmental Testing Laboratory, 4444 Airpark Boulevard, Duluth, MN 55811; Tel. No. (218) 722-4040.	

2.0 OBJECTIVE(S)

To determine the 96-hour LC_{50}, LOEC (lowest observed effect concentration) and NOEC (no observed effect concentration) of the test item, Ammonium Chloride, for *Chironomus tentans* and *Hyallela azteca* under static test conditions.

This study was conducted according to USEPA standards.

3.0 TEST METHODS

Test Item	***Properties***: Ammonium Chloride, solid chemical ***Test concentrations***: ***Chironomus tentans***: 0 (dilution water control), 39.8, 98.5, 167, 391, and 730 mg/L. A stock concentration (730 mg/L) was prepared by addition of 1000 mg to 1000 mL of dilution water. This solution was allowed to mix for 30 minutes. The stock solution and concentrations were exactly measured with the Orion ammonia meter for total ammonia. ***Hyallela azteca***: 0 (dilution water control), 1.81, 3.28, 6.61, 15.3, and 28.7 mg/L. A stock concentration (730 mg/L) was prepared by addition of 1000 mg to 1000 mL of dilution water. This solution was allowed to mix for 30 minutes. The stock solution and concentrations were exactly measured with the Orion ammonia meter for total ammonia. Concentrations and result numbers reported are of total ammonia measurements.		
Dilution Water	***Source***: Lake Superior, City of Duluth, MN; de-ionized tap water. **PC *Characteristics***: At test initiation, the water had a hardness of 40 mg/L (as $CaCO_3$) and a pH of 8.21. Aerated for more than 24 h prior to using in the test.		
Exposure Chambers	*Species:* *Chironomus tentans* *Hyallela azteca*	Chamber: 250 mL plastic cups 250 mL plastic cups	Solution Volume: 200 mL 200 mL

	Chambers were kept covered during testing, except when experimental observations were made.
Incubation	*Duration*: *Chironomus tentans* and *Hyallela azteca* : 96 hours *Daily photoperiod*: 16 h light and 8 h dark, maintained using cool-white fluorescent lamps. *Temperatures*: *Chironomus tentans* and *Hyallela azteca:* 23° ± 1.0° C
Observations	*Biological* : Daily, Test organisms with abnormal behavior and signs of stress, and dead test organisms. *Water chemistry*: (1) At test initiation: specific conductivity, total hardness and alkalinity, (2) daily: temperature, conductivity, DO, and pH. All determinations were made according to APHA methods (1998).
Endpoint Calculations	96-hour lethal/effective concentrations (LC_{50}'s) and NOEC/LOEC values determined via TOXCALC statistical program, Tidepool Scientific Software, 2006, Version 5.0.23.

4.0 RESULTS

Test Item Toxicity (Parenthetic Values are 95% Confidence Intervals)	**Ranges of Water Chemistry Parameters**
Chironomus tentans *96-h LC50: 509.21 mg/L (476.17- 544.53 mg/L)* *96-h NOEC: 391 mg/L* *96-h LOEC: 730 mg/L*	***Chironomus tentans*** *Total hardness (as $CaCO_3$ mg/L)*: 40 *Alkalinity (as $CaCO_3$ mg/L)*: 40 *Temperature (°C)*: 22.9- 23.5 *DO (mg/L)*: 8.5- 7.9 *pH*: 6.78- 8.22 *Specific conductivity (µmhos/cm)*: 149-8900
Hyallela azteca *96-h LC50: 16.068 mg/L (13.469- 19.169 mg/L)* *96-h NOEC: 6.61 mg/L* *96-h LOEC: 15.3 mg/L*	***Hyallela azteca*** *Total hardness (as $CaCO_3$ mg/L)*: 40 *Alkalinity (as $CaCO_3$ mg/L)*: 40 *Temperature (°C)*: 22.9- 23.5 *DO (mg/L)*: 8.5- 8.0 *pH*: 7.38- 8.21 *Specific conductivity (µmhos/cm)*: 131- 285

5.0 TEST QA/QC

QA/QC Criteria	Data
Mortality in control exposure must not be more than 10%.	***Chironomus tentans*** - 0% mortality ***Hyallela azteca*** - 0% mortality
The lowest DO concentration at test termination must be at greater than 2.5 mg/L.	The lowest DO concentration measured was 7.9 mg/L.
Test duration must be 96 hours.	The durations was 96 hours.
Reference Substance Toxicity Test must indicate acceptable organism health.	Endpoints for the sodium chloride laboratory reference tests are attached.

6.0 REFERENCES

American Public Health Association (APHA). 1998. Standard Methods for the Examination of Water and Wastewater. APHA, Washington, D.C.

Hamilton, M.A., R.C. Russo, and R.V. Thurston. 1977. Trimmed Spearman-Karber Method for Estimating Median Lethal Concentrations in Toxicity Bioassays. Environ. Sci. Technol. 11(7): 714-719; Correction 12 (4): 417 (1978).

TOXCALC statistical program, Tidepool Scientific Software, 2006, Version 5.0.23.

USEPA. 2002. Methods for Measuring the Acute Toxicity of Effluents and Receiving Waters to Freshwater and Marine Organisms. Fifth Edition. EPA/821-R-02-012.

USEPA. EPA Probit Analysis Program Used for Calculating EC Values. Version 1.4.

RAW DATA PACKAGES

ASci-Environmental Test Laboratory
C. tentans Reference
Revised 8/09
Page 1 of 4

ASci Corporation

TEST Acute Reference Toxicity Test

TOXICANT Ammonium Chloride

SPECIES *Chironomus tentans*

TEST DATES 8/28-9/1/2009

TECHNICIAN(S) JB, KW

Statistics	
96 Hour LC50:	509.21
Confidence Limits:	476.17 - 544.53
NOEC:	391 mg/L
LOEC:	730 mg/L
~~Test Results:~~	~~Pass or Retest~~ NA KW 9/10/09

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C. tentans Reference
Revised 8/09
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BIOLOGICAL TESTING INFORMATION FORM

BIOLOGICAL TESTING INFORMATION FORM

Chironomid Reference Test	Analyst: JB, KW
NaCl Log Number(s): RG-010308-IV	Test Method SOP#(s): TXT-21
Test Dates: 8/28-9/1/2009	
Test Type: Acute Static Non-Renewal Test	
Dilution Water: PC (post-carbonated)	Chemistry Measurement SOP#s: INM-18-P, PHY-04-C, INM-17-O PHY-02-A, PHY-03-H, INM-20-C INM-19-A, INM-21-L
Test Conc.: PC, 50, 100, 200, 400, 730 mg/L	
Test Site: BIO VI	
Light Intensity: 50-100 Foot Candles	
Photo Period: 16 Hour Light/8 Hour Dark	
Temperature: 23°C ± 1°C	

TEST ORGANISM INFORMATION

Organism	*Chironomus tentas*
Organism Source	ECT
Age/ Log # or Generation#	2nd to 3rd Instar
Culture Medium	PC
Renewal Frequency	At 48 hours
Feeding source/ regime	Slurry/ daily 1.5mL of 6mg slurry
# of Replicates	3
# Organisms per Rep.	10
Chamber size/ Solution Vol.	250mL plastic / 200 mL
Template # Used	2
Test Acceptability Criteria in Controls	**1. ≥ 90% survival**

Note: PC = Post-Carbon (City of Duluth Carbon Treated Tap water)

TOXICITY TEST RENEWAL KW 8/28/09

TEST DAY	0 Test Initiation	1	2	3	4
DATE	8/28/09	8/29/09	8/30/09	8/31/09	9/1/09
TIME OF READING	0730	1345	1330	1000	0800
TIME OF FEEDING	1200	1400	1400	1030	NA
DILUTION WATER BATCH #	PC 142	NA	NA	NA	NA
INITIALS	KW	KW	KW	KW	KW

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ASci-ETL ID# 5010-253-002-09
Lower Rouge River

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Chironomus tentas CHEMISTRIES

TEST: REFERENCE

ORGANISM: *Chironomus tentas* TEST DATES: 8/28-9/1/2009

INITIAL CHEMISTRIES

	DAY 0	
CONCENTRATION: PC		
pH	8.21	
DO (mg/L)	8.5	
Conductivity	159	
Temperature	23.5	
Ammonia (mg/L)	0.270	
Hardness	40	
Alkalinity	40	
CONCENTRATION: 50 mg/L		
pH	8.22	
DO (mg/L)	8.5	
Conductivity	~~242~~ 350	
Temperature	~~39.8~~ 23.5	
Ammonia (mg/L)	39.8	
CONCENTRATION: 100 mg/L		
pH	7.63	
DO (mg/L)	8.5	
Conductivity	607	
Temperature	23.5	
Ammonia (mg/L)	98.5	
CONCENTRATION: 200 mg/L		
pH	7.52	
DO (mg/L)	8.5	
Conductivity	1069	
Temperature	23.5	
Ammonia (mg/L)	167	
CONCENTRATION: 400 mg/L		
pH	7.39	
DO (mg/L)	8.5	
Conductivity	1520	
Temperature	23.5	
Ammonia (mg/L)	391	
CONCENTRATION: 730 mg/L		
pH	6.95	
DO (mg/L)	8.4	
Conductivity	8490	
Temperature	23.5	
Ammonia (mg/L)	730	
Dated Initials	KW 8/28/09	

FINAL CHEMISTRIES

DAY 1	DAY 2	DAY 3	DAY 4	REMARKS
CONCENTRATION: PC				
8.22	8.17	8.02	8.12	
8.1	8.1	8.1	7.9	
152	149	164	149	
22.9	23.0	23.2	23.0	
CONCENTRATION: 50 mg/L				
7.81	7.81	7.70	7.72	
8.2	8.1	8.1	7.9	
350	337	331	336	
22.9	23.0	23.2	23.0	
CONCENTRATION: 100 mg/L				
7.64	7.66	7.54	7.52	
8.0	7.9	8.1	7.9	
574	565	569	589	
22.9	23.0	23.2	23.0	
CONCENTRATION: 200 mg/L				
7.51	7.49	7.31	7.29	
8.2	8.0	8.0	7.9	
1048	1030	1038	1046	
22.9	23.0	23.2	23.0	
CONCENTRATION: 400 mg/L				
7.38	7.36	7.18	7.12	
8.2	8.0	8.0	7.9	
1466	1439	1469	1518	
22.9	23.0	23.2	23.0	
CONCENTRATION: 730 mg/L				
6.98	6.78			
8.3	8.2			
8520	8900			
22.9	23.0			
KW 8/29/09	KW 8/30/09	KW 8/31/09	KW 9/1/09	

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Lower Rouge River

ASci-Environmental Test Laboratory
C. tentans Reference
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GENERAL ACUTE DATA FORM

Investigator(s): JB, KW	Species: *Chironomus tentas*
Test Type: Acute Non- Renewal	Age: 2nd to 3rd instar
Test Initiation (Date & Time): 8/28/09@0730	No. Animals/No. Reps: 10/3
Sample Name: Reference Test	Sources of Organisms: ECT
Temperature: 23 ±1ºC	Organism ID No.: See p. 2
Other Information:	Dilution Water/Control: PC
	Test Chamber / Volume: 250mL plastic/ 200 mL

Concentration (mg/L)	Analyst Initials: KW 24 h Survival Reading A B C	Analyst Initials: KW 48 h Survival Reading A B C	Analyst Initials: KW 72 h Survival Reading A B C	Analyst Initials: KW 96 h Survival Reading A B C
PC	10 10 10	10 10 10	10 10 10	10 10 10
50	10 10 10	10 10 10	10 10 10	10 10 10
100	10 10 10	10 10 9	10 10 9	10 10 9
200	10 10 10	10 10 10	10 10 10	10 10 10
400	10 10 10	10 10 10	10 9 10	10 9 10
730	7 5 7	Ø Ø Ø	Ø Ø Ø	Ø Ø Ø

Observations:

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ASci Corporation

TEST Acute Reference Toxicity Test

TOXICANT Ammonium Chloride

SPECIES *Hyallela azteca*

TEST DATES 8/28-9/1/2009

TECHNICIAN(S) JB, KW

Statistics	
96 Hour LC50:	16.068
Confidence Limits:	13.469 - 19.169
NOEC:	6.61
LOEC:	15.3
~~Test Results:~~	~~Pass or Retest~~ NA

fw 2/10/09

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Page 2 of 4

BIOLOGICAL TESTING INFORMATION FORM

BIOLOGICAL TESTING INFORMATION FORM

Chironomid Reference Test	Analyst: JB, KW
NaCl Log Number(s): RG-010308 ~~=IV~~	Test Method SOP#(s):
Test Dates: 8/28-9/1/2009	TXT-21
Test Type: Acute Static Renewal Test	
Dilution Water: PC (post-carbonated)	Chemistry Measurement SOP#s:
Test Conc.: PC, 2, 4, 8, 16, and 32 mg/L	INM-18-P, PHY-04-C, INM-17-O
Test Site: BIO ✓1	PHY-02-A, PHY-03-H, INM-20-C
Light Intensity: 50-100 Foot Candles	INM-19-A, INM-21-L
Photo Period: 16 Hour Light/8 Hour Dark	
Temperature: 23°C ± 1°C	

TEST ORGANISM INFORMATION

Organism	*Hyallela azteca*
Organism Source	ECT
Age/ Log # or Generation#	6-7days
Culture Medium	PC
Renewal Frequency	At 48 hours
Feeding source/ regime	YCT/ daily 1.5mL
# of Replicates	3
# Organisms per Rep.	10
Chamber size/ Solution Vol.	250mL plastic / 200 mL
Template # Used	NA
Test Acceptability Criteria in Controls	**1. ≥ 90% survival**

Note: PC = Post-Carbon (City of Duluth Carbon Treated Tap water)

TOXICITY TEST ~~RENEWAL~~ KW 8/28/09

TEST DAY	0 Test Initiation	1	2	3	4
DATE	8/28 ~~8/29~~ KW 8/31	8/29 ~~8/30~~ KW 8/31	8/30 ~~8/31/09~~ KW 8/31	8/31/09	9/1/09
TIME OF READING	0730	1345	1330	1000	0800
TIME OF FEEDING	0730	1345	1330	1000	—
DILUTION WATER BATCH #	PC	NA	PC —	NA	NA
INITIALS	JS	JS	JS	KW	KW

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Lower Rouge River

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Page 3 of 4

Hyallela azteca CHEMISTRIES

TEST: REFERENCE

ORGANISM: *Hyallela azteca* TEST DATES: 8/28-9/1/2009

INITIAL CHEMISTRIES

	DAY 0	DAY 2
CONCENTRATION: PC		
pH	8.21	
DO (mg/L)	8.5	
Conductivity	159	
Temperature	23.5	
Ammonia	0.270	
Hardness	40	
Alkalinity	40	
CONCENTRATION: 2 mg/L		
pH	7.61	
DO (mg/L)	8.5	
Conductivity	131	
Temperature	23.5	
Ammonia	1.81	
CONCENTRATION: 4 mg/L		
pH	7.62	
DO (mg/L)	8.5	
Conductivity	150	
Temperature	23.5	
Ammonia	3.28	
CONCENTRATION: 8 mg/L		
pH	7.66	
DO (mg/L)	8.5	
Conductivity	167	
Temperature	23.5	
Ammonia	6.61	
CONCENTRATION: 16 mg/L		
pH	7.72	
DO (mg/L)	8.5	
Conductivity	210	
Temperature	23.5	
Ammonia	15.3	
CONCENTRATION: 32 mg/L		
pH	7.71	
DO (mg/L)	8.5	
Conductivity	285	
Temperature	23.5	
Ammonia	28.7	
Dated Initials	KW 8/28/09	

FINAL CHEMISTRIES

DAY 1	DAY 2	DAY 3	DAY 4	REMARKS
CONCENTRATION: PC				
7.96	7.38	7.54	8.10	
8.4	8.3	8.2	8.0	
144	137	148	148	
23.0	23.0	23.1	22.9	
CONCENTRATION: 2 mg/L				
7.62	7.62	7.64	8.06	
8.4	8.3	8.3	8.0	
137	144	207	152	
23.0	23.0	23.1	22.9	
CONCENTRATION: 4 mg/L				
7.65	7.70	7.70	8.02	
8.5	8.4	8.3	8.0	
150	151	158	156	
23.0	23.0	23.1	22.9	
CONCENTRATION: 8 mg/L				
7.69	7.76	7.75	7.97	
8.4	8.3	8.5	8.0	
167	166	154	170	
23.0	23.0	23.1	22.9	
CONCENTRATION: 16 mg/L				
7.79	7.80	7.77	7.91	
8.4	8.4	8.3	8.0	
209	202	147	204	
23.0	23.0	23.1	22.9	
CONCENTRATION: 32 mg/L				
7.76	7.80	7.81	7.82	
8.5	8.4	8.4	8.0	
277	268	141	269	
23.0	23.0	23.1	22.9	
JS 8/29/09	JS 8/30/09	JS 8/31/09	KW 9/1/09	

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ASci-ETL ID# 5010-253-002-09
Lower Rouge River

ASci-Environmental Test Laboratory
H.azteca Reference
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GENERAL ACUTE DATA FORM

Investigator(s): JB, KW
Test Type: Acute 48hour Renewal
Test Initiation (Date & Time): 8/28/09@0730
Sample Name: Reference Test
Temperature: 23 ±1ºC
Other Information:

Species: *Hyallela azteca*
Age: 6-7 days
No. Animals/No. Reps: 10/3
Sources of Organisms: ECT
Organism ID No.: See p. 2
Dilution Water/Control: PC
Test Chamber / Volume: 250mL plastic/ 200 mL

Concentration (mg/L)	Analyst Initials: JD 24 h Survival Reading A B C	Analyst Initials: JB 48 h Survival Reading A B C	Analyst Initials: JB 72 h Survival Reading A B C	Analyst Initials: KW 96 h Survival Reading A B C
PC	10 10 10	10 10 10	10 10 10	10 10 10
2	10 10 10	10 10 10	10 10 10	10 10 10
4	10 10 10	10 10 10	10 10 10	10 10 10
8	10 10 10	10 10 10	10 10 10	10 10 10
16	10 10 10	6 6 7	5 6 7	5 5 7
32	9 8 7	2 3 2	1 3 1	1 2 ϕ

Observations:

STATISTICAL ANALYSES

Ammonum Chloride Acute Test-96 Hr Survival

Start Date:	8/28/2009	Test ID:	CTamm	Sample ID:	CTACUTE
End Date:	9/1/2009	Lab ID:		Sample Type:	REFERENCE
Sample Date:		Protocol:	EPAAC09-EPA/821/R-02-01	Test Species:	CT-Chironomus tentas
Comments:	Measured total ammonia concentrations				

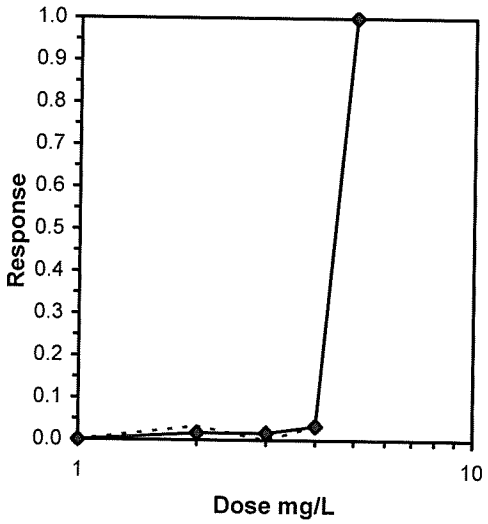
Conc-mg/L	1	2	3
PC	1.0000	1.0000	1.0000
39.8	1.0000	1.0000	1.0000
98.5	1.0000	1.0000	0.9000
167	1.0000	1.0000	1.0000
391	1.0000	0.9000	1.0000
730	0.0000	0.0000	0.0000

			Transform: Arcsin Square Root					Number	Total
Conc-mg/L	Mean	N-Mean	Mean	Min	Max	CV%	N	Resp	Number
PC	1.0000	1.0000	1.4120	1.4120	1.4120	0.000	3	0	30
39.8	1.0000	1.0000	1.4120	1.4120	1.4120	0.000	3	0	30
98.5	0.9667	0.9667	1.3577	1.2490	1.4120	6.930	3	1	30
167	1.0000	1.0000	1.4120	1.4120	1.4120	0.000	3	0	30
391	0.9667	0.9667	1.3577	1.2490	1.4120	6.930	3	1	30
730	0.0000	0.0000	0.1588	0.1588	0.1588	0.000	3	30	30

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates non-normal distribution (p <= 0.01)	0.73711	0.835	-1.2463	1.61538
Equality of variance cannot be confirmed				

Trimmed Spearman-Karber

Trim Level	EC50	95% CL	
0.0%	509.21	476.17	544.53
5.0%	528.54	517.09	540.24
10.0%	528.54	517.09	540.24
20.0%	528.54	517.09	540.24
Auto-0.0%	509.21	476.17	544.53

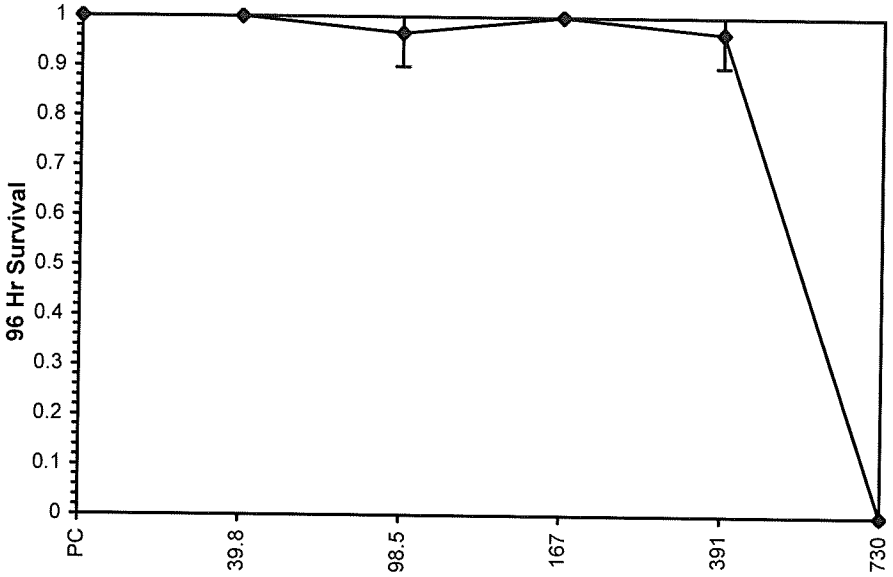


Reviewed by:

Ammonum Chloride Acute Test-96 Hr Survival

Start Date:	8/28/2009	Test ID:	CTamm	Sample ID:	CTACUTE
End Date:	9/1/2009	Lab ID:		Sample Type:	REFERENCE
Sample Date:		Protocol:	EPAAC09-EPA/821/R-02-01	Test Species:	CT-Chironomus tentas
Comments:	Measured total ammonia concentrations				

Dose-Response Plot



Reviewed by: KW

Ammonium chloride Acute Test-96 Hr Survival

Start Date:	8/28/2009	Test ID:	HAamm	Sample ID:	HAACUTE
End Date:	9/1/2009	Lab ID:		Sample Type:	REFERENCE
Sample Date:		Protocol:	EPAAC09-EPA/821/R-02-01	Test Species:	HA-Hyallela azteca
Comments:	Measured total ammonia concentrations				

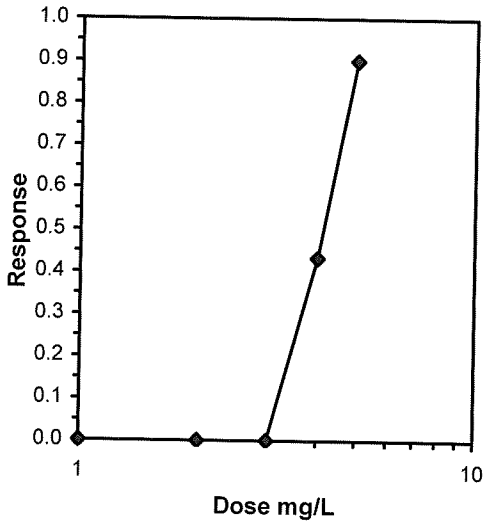
Conc-mg/L	1	2	3
PC	1.0000	1.0000	1.0000
1.81	1.0000	1.0000	1.0000
3.28	1.0000	1.0000	1.0000
6.61	1.0000	1.0000	1.0000
15.3	0.5000	0.5000	0.7000
28.7	0.1000	0.2000	0.0000

			Transform: Arcsin Square Root					Number	Total
Conc-mg/L	Mean	N-Mean	Mean	Min	Max	CV%	N	Resp	Number
PC	1.0000	1.0000	1.4120	1.4120	1.4120	0.000	3	0	30
1.81	1.0000	1.0000	1.4120	1.4120	1.4120	0.000	3	0	30
3.28	1.0000	1.0000	1.4120	1.4120	1.4120	0.000	3	0	30
6.61	1.0000	1.0000	1.4120	1.4120	1.4120	0.000	3	0	30
15.3	0.5667	0.5667	0.8540	0.7854	0.9912	13.911	3	13	30
28.7	0.1000	0.1000	0.3147	0.1588	0.4636	48.472	3	27	30

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates non-normal distribution (p <= 0.01)	0.73982	0.858	0.32815	2.80739
Equality of variance cannot be confirmed				

Trimmed Spearman-Karber

Trim Level	EC50	95% CL	
0.0%			
5.0%			
10.0%	16.068	13.469	19.169
20.0%	16.297	12.736	20.854
Auto-10.0%	16.068	13.469	19.169

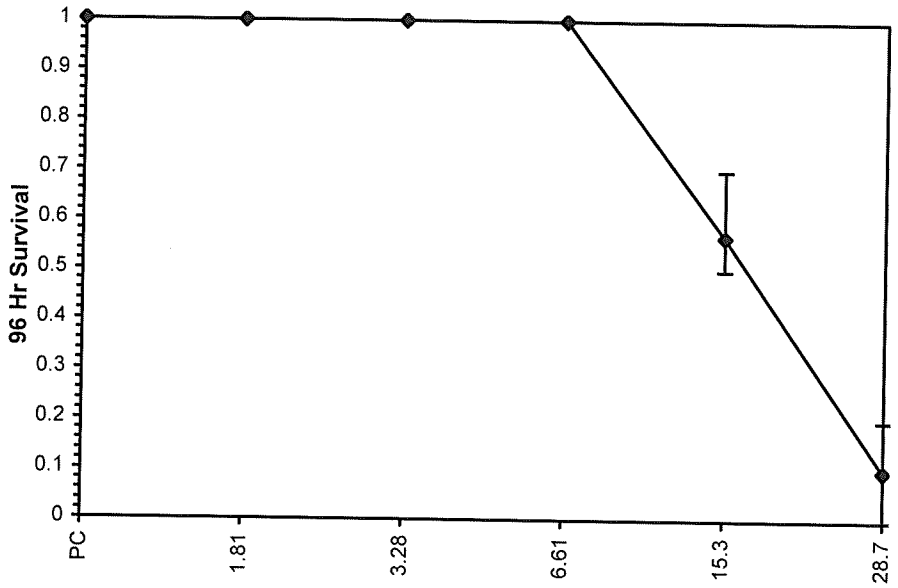


Reviewed by: KW

Ammonium chloride Acute Test-96 Hr Survival

Start Date:	8/28/2009	Test ID:	HAamm	Sample ID:	HAACUTE
End Date:	9/1/2009	Lab ID:		Sample Type:	REFERENCE
Sample Date:		Protocol:	EPAAC09-EPA/821/R-02-01	Test Species:	HA-Hyallela azteca
Comments:	Measured total ammonia concentrations				

Dose-Response Plot



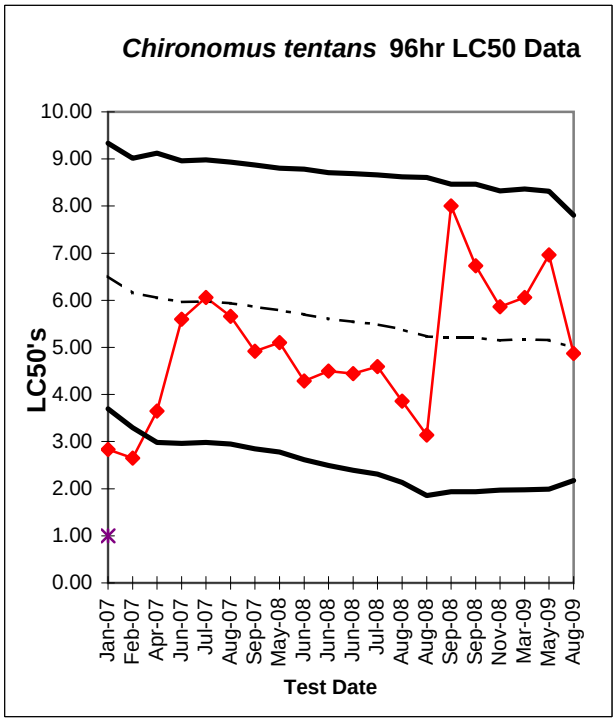
Reviewed by: KW

REFERENCE DATA

ASci Corporation Environmental Testing Laboratory Precision of *Chironomus tentans* NaCl Reference Toxicant Testing at 23°C

Test	Date	LC50	+2SD	-2SD	MEAN
1	Jan-07	2.83	9.33	3.70	6.52
2	Feb-07	2.65	9.02	3.29	6.16
3	Apr-07	3.65	9.12	2.99	6.05
4	Jun-07	5.60	8.96	2.96	5.96
5	Jul-07	6.06	8.98	2.98	5.98
6	Aug-07	5.66	8.93	2.95	5.94
7	Sep-07	4.92	8.87	2.85	5.86
8	May-08	5.10	8.81	2.78	5.79
9	Jun-08	4.29	8.79	2.62	5.70
10	Jun-08	4.50	8.71	2.50	5.60
11	Jun-08	4.44	8.69	2.39	5.54
12	Jul-08	4.59	8.66	2.31	5.49
13	Aug-08	3.86	8.62	2.13	5.38
14	Aug-08	3.14	8.61	1.86	5.23
15	Sep-08	8.00	8.47	1.94	5.20
16	Sep-08	6.73	8.47	1.94	5.20
17	Nov-08	5.86	8.32	1.97	5.15
18	Mar-09	6.06	8.36	1.97	5.17
19	May-09	6.96	8.32	1.99	5.16
20	Aug-09	4.87	7.81	2.17	4.99

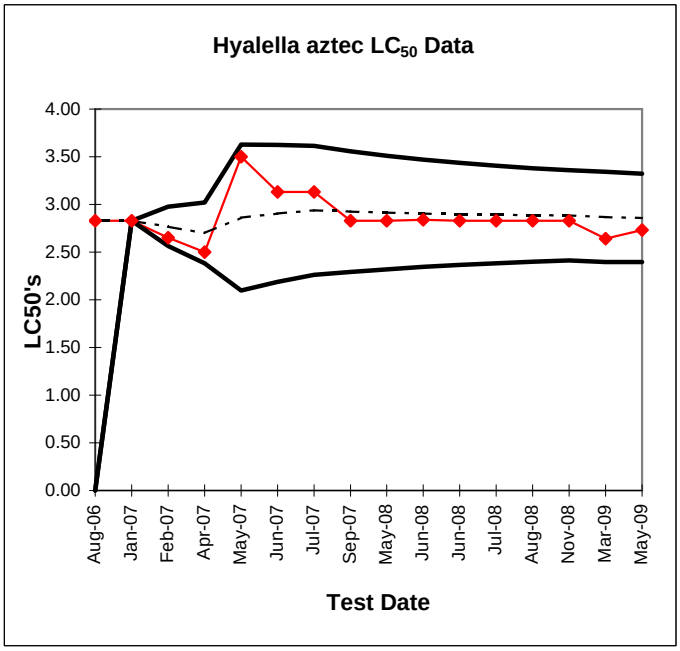
STD DEV	1.41
CV	28%



ASci Corporation Environmental Testing Laboratory
Precision of Hyalella aztec NaCl Reference Toxicant Testing

Test	Date	LC50	+2SD	-2SD	MEAN
1	Aug-06	2.83	#DIV/0!	#DIV/0!	2.83
2	Jan-07	2.83	2.83	2.83	2.83
3	Feb-07	2.65	2.98	2.56	2.77
4	Apr-07	2.50	3.02	2.38	2.70
5	May-07	3.50	3.63	2.10	2.86
6	Jun-07	3.13	3.62	2.19	2.91
7	Jul-07	3.13	3.62	2.26	2.94
8	Sep-07	2.83	3.56	2.29	2.93
9	May-08	2.83	3.51	2.32	2.91
10	Jun-08	2.84	3.47	2.34	2.91
11	Jun-08	2.83	3.44	2.36	2.90
12	Jul-08	2.83	3.41	2.38	2.89
13	Aug-08	2.83	3.38	2.40	2.89
14	Nov-08	2.83	3.36	2.41	2.89
15	Mar-09	2.64	3.34	2.40	2.87
16	May-09	2.73	3.32	2.40	2.86
17	Aug-09	2.46	3.32	2.35	2.84
18					
19					
20					

STDDEV	0.24
CV	8.6%



APPENDIX D
DATA VALIDATION REPORTS

Weston Solutions, Inc.
20 North Wacker Drive, Suite 1210
Chicago, IL 60606
(312) 424-3300 ● Fax: (312) 424-3330
www.westonsolutions.com

The Trusted Integrator for Sustainable Solutions

December 4, 2009

Ms. Diana Mally
Great Lakes National Program Office
United States Environmental Protection Agency, Region V
77 West Jackson Boulevard, Mail Code: G-17J
Chicago, Illinois 60604-3507

Re: Data Review of Atterberg Limits and Particle Size Analyses
For Sediment Samples Collected in October 2008 and May 2009
Lower Rouge River Sediment Investigation
Detroit, Wayne County, Michigan
Technical Direction Document Number: S05-0008-0805-012
Document Control Number: 451-2A-AEQA
Work Order Number: 20405.012.008.0451.00

Dear Ms. Mally:

The United States Environmental Protection Agency (U.S. EPA) tasked Weston Solutions, Inc., (WESTON®) to perform data validation for sediment samples collected from October 21, 2008, to May 16, 2009 for the Great Lakes National Program Office Lower Rouge River Sediment Investigation (LRR) Site. This data review is for Atterberg Limits and Particle Size analyses of 39 sediment samples that include 2 field duplicate samples and 2 field replicate samples that were collected by the WESTON Superfund Technical Assessment and Response Team (START). The samples were validated in accordance with the "Quality Assurance Project Plan (QAPP), Lower Rouge River Sediment Investigation" dated October 17, 2008, which included using the U.S. EPA Contract Laboratory Program National Functional Guidance for Organic Data Review. Table 1 provides a summary of the samples included in this review. All tables are presented at the end of this report.

The samples listed in Table 1 were analyzed by Columbia Analytical Services (CAS) located in Kelso, Washington under the following 10 work orders:

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- K0810413
- K0810422
- K0810423
- K0810463
- K0810465
- K0904268
- K0904301
- K0904356
- K0904451
- K0904454

The samples were analyzed for Atterberg Limits by American Society for Testing and Materials (ASTM) Method D4318 and particle size by ASTM Method D422. Standard data validation was not performed for the Atterberg Limits and particle size analyses. Most of the standard quality control (QC) indicators are not applicable to these analyses. Below is a summary of the data quality indicators which apply. Attachment A to this report contains the Atterberg Limit results and Attachment B contains the particle size results.

ATTERBERG LIMITS AND PARTICLE SIZE DATA REVIEW

The results for Atterberg Limits and particle size were determined based on a dry weight basis. Typical QC samples do not apply to Atterberg Limit and particle size analyses as for chemical analytical parameters. Therefore, the only QC samples evaluated were the field replicate and field duplicate results. Additionally, laboratory duplicates were analyzed with five of the work orders for particle size analyses. These are discussed below.

There are two field replicate and two field duplicate samples associated with the 35 investigative samples collected (see Table 1 for a list of samples and which are field replicates and duplicates). Although the QAPP did not require that field replicates be collected for the Atterberg Limits and particle size analyses, two field replicates were collected. The QAPP did state that field duplicate samples would be collected at a rate of 5 percent for these analyses. Two field duplicate samples were collected; therefore, this frequency for field duplicate collection was met.

Tables 2 and 3 summarize the field replicate and duplicate results and calculated RPDs. The RPDs for field replicates and duplicates ranged from 3 to 49 percent for Atterberg Limits and from 0 to 21 percent for particle size. Field precision was evaluated and found to be acceptable.

The laboratory duplicate RPDs for particle size analysis ranged from 0 to 10 percent which is acceptable. Laboratory duplicates were not analyzed with the Atterberg Limits analysis.

DATA QUALITY INDICATORS REVIEW

Many the data quality indicators (sensitivity, precision, accuracy, and completeness) were evaluated through the data validation procedures which are summarized above and discussed in detail in the attachment.

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Sensitivity. The QAPP did not state a sensitivity limit for the Atterberg Limits and particle size analyses other than the results would be in percent. Sensitivity was acceptable.

Precision. Field precision was determined by evaluating the RPDs for the field replicate and field duplicate results. Because there was no QC limit stated in the QAPP for field replicates, a standard QC limit of 50 RPD between the parent and replicate result was used for the evaluation. The field replicate and duplicate RPDs were less than 50. Table 4 summarizes the mean replicate and duplicate RPDs. Field precision was acceptable.

For the particle size analyses, CAS analyzed five laboratory duplicates. Table 4 summarizes the mean laboratory duplicate RPDs which ranged from 0 to 5 percent. Laboratory precision was acceptable.

For the Atterberg Limits analyses, there were no specific QC samples for laboratory precision which is in accordance with the QAPP.

Accuracy/Bias. Accuracy is a measure of the agreement between an observed value and an accepted reference value. There were no specific QC samples for laboratory accuracy which is in accordance with the QAPP.

Completeness. Completeness is a measure of the amount of valid data obtained compared to the amount of data that was planned to be collected under normal conditions. All samples results were received.

In summary, the Atterberg Limits and particle size data are usable. No qualification of the Atterberg Limits and particle size data was required.

If there are any questions or comments regarding this report, please do not hesitate to contact WESTON START at 312-424-3300.

Very truly yours,
Weston Solutions, Inc.

Lisa Graczyk
WESTON START Team

Tonya Balla
WESTON START Project Manager

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Attachments:
Tables
A - Analytical Data Summary Sheets for Atterberg Limits
B - Analytical Data Summary Sheets for Particle Size

cc: project file

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TABLES

TABLE 1 SAMPLES INCLUDED IN DATA REVIEW			
Sample ID	**Lab ID**	**Date Collected**	**Comment**
LRR-017-A-01	K0810413-001	10/21/2008	
LRR-017-A-02	K0810413-002	10/21/2008	
LRR-017-A-03	K0810413-003	10/21/2008	
LRR-017-A-04	K0810413-004	10/21/2008	
LRR-017-A-05	K0810413-005	10/21/2008	
LRR-OF2-A-01	K0810413-008	10/21/2008	
LRR-WJB-A-01	K0810413-009	10/21/2008	
LRR-WJB-A-02	K0810413-010	10/21/2008	
LRR-HS1-A-01	K0810422-001	10/21/2008	
LRR-HS1-A-02	K0810422-002	10/21/2008	
LRR-HSI-A-03	K0810422-003	10/21/2008	
LRR-HS1-A-04	K0810422-004	10/21/2008	
LRR-OF2-B-01	K0810423-001	10/22/2008	
LRR-OF2-B-02	K0810423-002	10/22/2008	
LRR-OF2-B-03	K0810423-003	10/22/2008	
LRR-OF2-B-04	K0810423-004	10/22/2008	
LRR-OF2-B-05	K0810423-005	10/22/2008	
LRR-HS5-A-01	K0810423-011	10/23/2008	
LRR-HS5-A-02	K0810423-012	10/23/2008	
LRR-HS5-A-02-FS	K0810423-013	10/23/2008	Field replicate of LRR-HS5-A-02
LRR-HS5-A-03	K0810423-014	10/23/2008	
LRR-HS4-B-01	K0810463-007	10/23/2008	
LRR-HS4-B-02	K0810463-008	10/23/2008	
LRR-HS4-B-03	K0810463-009	10/23/2008	
LRR-OBC-B-01	K0810465-004	10/23/2008	
LRR-OBC-B-02	K0810465-005	10/23/2008	
LRR-OBC-B-03	K0810465-006	10/23/2008	
LRR-HS6-B-01	K0904268-004	5/11/2009	
LRR-HS6-B-02	K0904268-005	5/11/2009	
LRR-HS6-B-03	K0904268-006	5/11/2009	
LRR-HS6-F-01	K0904301-005	5/12/2009	
LRR-HS6-F-01-DP	K0904301-006	5/12/2009	Field duplicate of LRR-HS6-F-01
LRR-HS6-DOWN2-01	K0904356-014	5/13/2009	
LRR-HS3-A-01	K0904451-002	5/16/2009	
LRR-HS3-A-01-FS	K0904451-004	5/16/2009	Field replicate of LRR-HS3-A-01
LRR-HS3-A-02	K0904451-005	5/16/2009	
LRR-HS3-A-02-DP	K0904451-006	5/16/2009	Field duplicate of LRR-HS3-A-02
LRR-HS3-A-03	K0904451-007	5/16/2009	
LRR-ZIC-C-01-TOX	K0904454-009	5/15/2009	

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TABLE 2 FIELD REPLICATE RESULTS FOR ATTERBERG LIMITS AND PARTICLE SIZE ANALYSES						
	Sample: LLR-HS5-A-02-FS			Sample: LRR-HS3-A-01-FS		
Analyte	Sample Result	Replicate Result	RPD	Sample Result	Replicate Result	RPD
Atterberg Limits						
Liquid Limit	58	53	9	57	63.4	11
Plastic Limit	32	26	21	35.2	40.1	13
Plasticity Index	26	27	4	14.1	23.3	49
Particle Size (Percent Passing)						
Gravel (19mm)	100	100	0	100	100	0.0
Gravel (9.5mm)	100	100	0	100	100	0.0
Gravel, medium	100	100	0	100	100	0.0
Gravel, fine	99.7	100	0	100	100	0.0
Sand, very coarse	98.8	99.9	1	99.4	99.7	0.3
Sand, coarse	96.6	98.9	2	98.1	98.6	0.5
Sand, medium	94.9	97.2	2	96.5	96.9	0.4
Sand, fine	89.1	91.1	2	91.5	91.6	0.1
Sand, very fine	86.7	88.2	2	88.7	88.3	0.5

Notes:

RPD - Relative Percent Difference

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TABLE 3 FIELD DUPLICATE RESULTS FOR ATTERBERG LIMITS AND PARTICLE SIZE ANALYSES						
	Sample: LLR-HS6-F-01-DP			Sample: LRR-HS3-A-02-DP		
Analyte	Sample Result	Duplicate Result	RPD	Sample Result	Duplicate Result	RPD
Atterberg Limits						
Liquid Limit	29.1	32.4	11	63.4	61.5	3.0
Plastic Limit	21.7	23.1	6	38.1	39.1	2.6
Plasticity Index	7.3	9.4	25	25.4	22.4	12.6
Particle Size (Percent Passing)						
Gravel (19mm)	100	100	0	100	100	0
Gravel (9.5mm)	91.9	88.5	4	100	100	0
Gravel, medium	87.1	83.9	4	100	100	0
Gravel, fine	82.2	78.3	5	100	100	0
Sand, very coarse	78.1	67.5	15	99.6	99	0.6
Sand, coarse	72.7	59.8	19	98.8	96.2	2.7
Sand, medium	57.6	47.6	19	96.7	92.8	4.1
Sand, fine	40.3	34.1	17	91	87.1	4.4
Sand, very fine	39.3	31.7	21	88.1	84.8	3.8

Notes:

RPD - Relative Percent Difference

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TABLE 4 QUANTITATIVE DATA ASSESSMENT FOR ATTERBERG LIMITS AND PARTICLE SIZE			
	Field Precision		Laboratory Precision
Parameter	Mean Field Replicate RPD (%) (n=2)	Mean Field Duplicate RPD (%) (n=2)	Mean Laboratory Duplicate RPD (%) (n=5)
Atterberg Limits			
Liquid Limit	10	7	NA
Plastic Limit	17	4	NA
Plasticity Index	26	19	NA
Particle Size (Percent Passing)			
Gravel (19mm)	0	0	0
Gravel (9.5mm)	0	2	0
Gravel, medium	0	2	1
Gravel, fine	0	2	1
Sand, very coarse	1	8	2
Sand, coarse	1	11	2
Sand, medium	1	12	3
Sand, fine	1	11	4
Sand, very fine	1	13	5

Notes:

% - Percent
NA - Not Analyzed
RPD - Relative Percent Difference

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ATTACHMENT A
ANALYTICAL DATA SUMMARY SHEETS
FOR ATTERBERG LIMITS

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client : Weston Solutions, Incorporated
Project Name : Lower Rogue River - 451
Project Number : 20405.016.008.0451.00
Sample Matrix : SEDIMENT

Service Request : K0810413
Date Collected : 10/21/2008
Date Received : 10/23/2008

Inorganic Parameters

Sample Name : LRR-017-A-01
Lab Code : K0810413-001
Test Notes :

Basis : Air Dry

Analyte	Units	Analysis Method	MRL	MDL	Dilution Factor	Date Analyzed	Result	Result Notes
Liquid Limit	NONE	ASTM D4318	1	1	1	11/02/08	49	
Plastic Limit	NONE	ASTM D4318	1	1	1	11/02/08	29	
Plasticity Index	NONE	ASTM D4318	1	1	1	11/02/08	20	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client : Weston Solutions, Incorporated
Project Name : Lower Rogue River - 451
Project Number : 20405.016.008.0451.00
Sample Matrix : SEDIMENT

Service Request : K0810413
Date Collected : 10/21/2008
Date Received : 10/23/2008

Inorganic Parameters

Sample Name : LRR-017-A-02
Lab Code : K0810413-002
Test Notes :

Basis : Air Dry

Analyte	Units	Analysis Method	MRL	MDL	Dilution Factor	Date Analyzed	Result	Result Notes
Liquid Limit	NONE	ASTM D4318	1	1	1	11/02/08	56	
Plastic Limit	NONE	ASTM D4318	1	1	1	11/02/08	33	
Plasticity Index	NONE	ASTM D4318	1	1	1	11/02/08	23	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client : Weston Solutions, Incorporated
Project Name : Lower Rogue River - 451
Project Number : 20405.016.008.0451.00
Sample Matrix : SEDIMENT

Service Request : K0810413
Date Collected : 10/21/2008
Date Received : 10/23/2008

Inorganic Parameters

Sample Name : LRR-017-A-03
Lab Code : K0810413-003
Test Notes :

Basis : Air Dry

Analyte	Units	Analysis Method	MRL	MDL	Dilution Factor	Date Analyzed	Result	Result Notes
Liquid Limit	NONE	ASTM D4318	1	1	1	11/02/08	46	
Plastic Limit	NONE	ASTM D4318	1	1	1	11/02/08	34	
Plasticity Index	NONE	ASTM D4318	1	1	1	11/02/08	12	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client : Weston Solutions, Incorporated
Project Name : Lower Rogue River - 451
Project Number : 20405.016.008.0451.00
Sample Matrix : SEDIMENT

Service Request : K0810413
Date Collected : 10/21/2008
Date Received : 10/23/2008

Inorganic Parameters

Sample Name : LRR-017-A-04
Lab Code : K0810413-004
Test Notes :

Basis : Air Dry

Analyte	Units	Analysis Method	MRL	MDL	Dilution Factor	Date Analyzed	Result	Result Notes
Liquid Limit	NONE	ASTM D4318	1	1	1	11/02/08	62	
Plastic Limit	NONE	ASTM D4318	1	1	1	11/02/08	45	
Plasticity Index	NONE	ASTM D4318	1	1	1	11/02/08	16	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client : Weston Solutions, Incorporated
Project Name : Lower Rogue River - 451
Project Number : 20405.016.008.0451.00
Sample Matrix : SEDIMENT

Service Request : K0810413
Date Collected : 10/21/2008
Date Received : 10/23/2008

Inorganic Parameters

Sample Name : LRR-017-A-05
Lab Code : K0810413-005
Test Notes :

Basis : Air Dry

Analyte	Units	Analysis Method	MRL	MDL	Dilution Factor	Date Analyzed	Result	Result Notes
Liquid Limit	NONE	ASTM D4318	1	1	1	11/02/08	ND	
Plastic Limit	NONE	ASTM D4318	1	1	1	11/02/08	ND	
Plasticity Index	NONE	ASTM D4318	1	1	1	11/02/08	ND	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client : Weston Solutions, Incorporated
Project Name : Lower Rogue River - 451
Project Number : 20405.016.008.0451.00
Sample Matrix : SEDIMENT

Service Request : K0810413
Date Collected : 10/21/2008
Date Received : 10/23/2008

Inorganic Parameters

Sample Name : LRR-OF2-A-01
Lab Code : K0810413-008
Test Notes :

Basis : Air Dry

Analyte	Units	Analysis Method	MRL	MDL	Dilution Factor	Date Analyzed	Result	Result Notes
Liquid Limit	NONE	ASTM D4318	1	1	1	11/02/08	ND	
Plastic Limit	NONE	ASTM D4318	1	1	1	11/02/08	ND	
Plasticity Index	NONE	ASTM D4318	1	1	1	11/02/08	ND	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client : Weston Solutions, Incorporated
Project Name : Lower Rogue River - 451
Project Number : 20405.016.008.0451.00
Sample Matrix : SEDIMENT

Service Request : K0810413
Date Collected : 10/21/2008
Date Received : 10/23/2008

Inorganic Parameters

Sample Name : LRR-WJB-A-01
Lab Code : K0810413-009
Test Notes :

Basis : Air Dry

Analyte	Units	Analysis Method	MRL	MDL	Dilution Factor	Date Analyzed	Result	Result Notes
Liquid Limit	NONE	ASTM D4318	1	1	1	11/02/08	ND	
Plastic Limit	NONE	ASTM D4318	1	1	1	11/02/08	ND	
Plasticity Index	NONE	ASTM D4318	1	1	1	11/02/08	ND	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client : Weston Solutions, Incorporated
Project Name : Lower Rogue River - 451
Project Number : 20405.016.008.0451.00
Sample Matrix : SEDIMENT

Service Request : K0810413
Date Collected : 10/21/2008
Date Received : 10/23/2008

Inorganic Parameters

Sample Name : LRR-WJB-A-02
Lab Code : K0810413-010
Test Notes :

Basis : Air Dry

Analyte	Units	Analysis Method	MRL	MDL	Dilution Factor	Date Analyzed	Result	Result Notes
Liquid Limit	NONE	ASTM D4318	1	1	1	11/02/08	35	
Plastic Limit	NONE	ASTM D4318	1	1	1	11/02/08	18	
Plasticity Index	NONE	ASTM D4318	1	1	1	11/02/08	17	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client : Weston Solutions, Incorporated
Project Name : Lower Rogue River - 451
Project Number : 20405.016.008.0451.00
Sample Matrix : SEDIMENT

Service Request : K0810422
Date Collected : 10/21/2008
Date Received : 10/24/2008

Inorganic Parameters

Sample Name : LRR-HS1-A-01
Lab Code : K0810422-001
Test Notes :

Basis : Air Dry

Analyte	Units	Analysis Method	MRL	MDL	Dilution Factor	Date Analyzed	Result	Result Notes
Liquid Limit	NONE	ASTM D4318	1	1	1	10/30/08	42	
Plastic Limit	NONE	ASTM D4318	1	1	1	10/30/08	28	
Plasticity Index	NONE	ASTM D4318	1	1	1	10/30/08	14	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client : Weston Solutions, Incorporated
Project Name : Lower Rogue River - 451
Project Number : 20405.016.008.0451.00
Sample Matrix : SEDIMENT

Service Request : K0810422
Date Collected : 10/21/2008
Date Received : 10/24/2008

Inorganic Parameters

Sample Name : LRR-HS1-A-02
Lab Code : K0810422-002
Test Notes :

Basis : Air Dry

Analyte	Units	Analysis Method	MRL	MDL	Dilution Factor	Date Analyzed	Result	Result Notes
Liquid Limit	NONE	ASTM D4318	1	1	1	10/30/08	46	
Plastic Limit	NONE	ASTM D4318	1	1	1	10/30/08	30	
Plasticity Index	NONE	ASTM D4318	1	1	1	10/30/08	16	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client : Weston Solutions, Incorporated
Project Name : Lower Rogue River - 451
Project Number : 20405.016.008.0451.00
Sample Matrix : SEDIMENT

Service Request : K0810422
Date Collected : 10/21/2008
Date Received : 10/24/2008

Inorganic Parameters

Sample Name : LRR-HS1-A-03
Lab Code : K0810422-003
Test Notes :

Basis : Air Dry

Analyte	Units	Analysis Method	MRL	MDL	Dilution Factor	Date Analyzed	Result	Result Notes
Liquid Limit	NONE	ASTM D4318	1	1	1	10/30/08	Nonplastic	
Plastic Limit	NONE	ASTM D4318	1	1	1	10/30/08	Nonplastic	
Plasticity Index	NONE	ASTM D4318	1	1	1	10/30/08	Nonplastic	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client : Weston Solutions, Incorporated
Project Name : Lower Rogue River - 451
Project Number : 20405.016.008.0451.00
Sample Matrix : SEDIMENT

Service Request : K0810422
Date Collected : 10/21/2008
Date Received : 10/24/2008

Inorganic Parameters

Sample Name : LRR-HS1-A-04
Lab Code : K0810422-004
Test Notes :

Basis : Air Dry

Analyte	Units	Analysis Method	MRL	MDL	Dilution Factor	Date Analyzed	Result	Result Notes
Liquid Limit	NONE	ASTM D4318	1	1	1	10/30/08	Nonplastic	
Plastic Limit	NONE	ASTM D4318	1	1	1	10/30/08	Nonplastic	
Plasticity Index	NONE	ASTM D4318	1	1	1	10/30/08	Nonplastic	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client : Weston Solutions, Incorporated
Project Name : Lower Rogue River - 451
Project Number : 20405.016.008.0451.00
Sample Matrix : SEDIMENT

Service Request : K0810423
Date Collected : 10/22/2008
Date Received : 10/24/2008

Inorganic Parameters

Sample Name : LRR-OF2-B-01
Lab Code : K0810423-001
Test Notes :

Basis : Air Dry

Analyte	Units	Analysis Method	MRL	MDL	Dilution Factor	Date Analyzed	Result	Result Notes
Liquid Limit	NONE	ASTM D4318	1	1	1	11/03/08	55	
Plastic Limit	NONE	ASTM D4318	1	1	1	11/03/08	32	
Plasticity Index	NONE	ASTM D4318	1	1	1	11/03/08	23	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client : Weston Solutions, Incorporated
Project Name : Lower Rogue River - 451
Project Number : 20405.016.008.0451.00
Sample Matrix : SEDIMENT

Service Request : K0810423
Date Collected : 10/22/2008
Date Received : 10/24/2008

Inorganic Parameters

Sample Name : LRR-OF2-B-02
Lab Code : K0810423-002
Test Notes :

Basis : Air Dry

Analyte	Units	Analysis Method	MRL	MDL	Dilution Factor	Date Analyzed	Result	Result Notes
Liquid Limit	NONE	ASTM D4318	1	1	1	11/03/08	54	
Plastic Limit	NONE	ASTM D4318	1	1	1	11/03/08	27	
Plasticity Index	NONE	ASTM D4318	1	1	1	11/03/08	26	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client : Weston Solutions, Incorporated
Project Name : Lower Rogue River - 451
Project Number : 20405.016.008.0451.00
Sample Matrix : SEDIMENT

Service Request : K0810423
Date Collected : 10/22/2008
Date Received : 10/24/2008

Inorganic Parameters

Sample Name : LRR-OF2-B-03
Lab Code : K0810423-003
Test Notes :

Basis : Air Dry

Analyte	Units	Analysis Method	MRL	MDL	Dilution Factor	Date Analyzed	Result	Result Notes
Liquid Limit	NONE	ASTM D4318	1	1	1	11/03/08	58	
Plastic Limit	NONE	ASTM D4318	1	1	1	11/03/08	27	
Plasticity Index	NONE	ASTM D4318	1	1	1	11/03/08	31	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client : Weston Solutions, Incorporated
Project Name : Lower Rogue River - 451
Project Number : 20405.016.008.0451.00
Sample Matrix : SEDIMENT

Service Request : K0810423
Date Collected : 10/22/2008
Date Received : 10/24/2008

Inorganic Parameters

Sample Name : LRR-OF2-B-04
Lab Code : K0810423-004
Test Notes :

Basis : Air Dry

Analyte	Units	Analysis Method	MRL	MDL	Dilution Factor	Date Analyzed	Result	Result Notes
Liquid Limit	NONE	ASTM D4318	1	1	1	11/03/08	59	
Plastic Limit	NONE	ASTM D4318	1	1	1	11/03/08	31	
Plasticity Index	NONE	ASTM D4318	1	1	1	11/03/08	28	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client : Weston Solutions, Incorporated
Project Name : Lower Rogue River - 451
Project Number : 20405.016.008.0451.00
Sample Matrix : SEDIMENT

Service Request : K0810423
Date Collected : 10/22/2008
Date Received : 10/24/2008

Inorganic Parameters

Sample Name : LRR-OF2-B-05
Lab Code : K0810423-005
Test Notes :

Basis : Air Dry

Analyte	Units	Analysis Method	MRL	MDL	Dilution Factor	Date Analyzed	Result	Result Notes
Liquid Limit	NONE	ASTM D4318	1	1	1	11/03/08	55	
Plastic Limit	NONE	ASTM D4318	1	1	1	11/03/08	29	
Plasticity Index	NONE	ASTM D4318	1	1	1	11/03/08	27	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client : Weston Solutions, Incorporated
Project Name : Lower Rogue River - 451
Project Number : 20405.016.008.0451.00
Sample Matrix : SEDIMENT

Service Request : K0810423
Date Collected : 10/22/2008
Date Received : 10/24/2008

Inorganic Parameters

Sample Name : LRR-HS5-A-01
Lab Code : K0810423-011
Test Notes :

Basis : Air Dry

Analyte	Units	Analysis Method	MRL	MDL	Dilution Factor	Date Analyzed	Result	Result Notes
Liquid Limit	NONE	ASTM D4318	1	1	1	11/03/08	51	
Plastic Limit	NONE	ASTM D4318	1	1	1	11/03/08	31	
Plasticity Index	NONE	ASTM D4318	1	1	1	11/03/08	20	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client : Weston Solutions, Incorporated
Project Name : Lower Rogue River - 451
Project Number : 20405.016.008.0451.00
Sample Matrix : SEDIMENT

Service Request : K0810423
Date Collected : 10/23/2008
Date Received : 10/24/2008

Inorganic Parameters

Sample Name : LRR-HS5-A-02
Lab Code : K0810423-012
Test Notes :

Basis : Air Dry

Analyte	Units	Analysis Method	MRL	MDL	Dilution Factor	Date Analyzed	Result	Result Notes
Liquid Limit	NONE	ASTM D4318	1	1	1	11/03/08	58	
Plastic Limit	NONE	ASTM D4318	1	1	1	11/03/08	32	
Plasticity Index	NONE	ASTM D4318	1	1	1	11/03/08	26	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client : Weston Solutions, Incorporated
Project Name : Lower Rogue River - 451
Project Number : 20405.016.008.0451.00
Sample Matrix : SEDIMENT

Service Request : K0810423
Date Collected : 10/23/2008
Date Received : 10/24/2008

Inorganic Parameters

Sample Name : LRR-HS5-A-02-FS
Lab Code : K0810423-013
Test Notes :

Basis : Air Dry

Analyte	Units	Analysis Method	MRL	MDL	Dilution Factor	Date Analyzed	Result	Result Notes
Liquid Limit	NONE	ASTM D4318	1	1	1	11/03/08	53	
Plastic Limit	NONE	ASTM D4318	1	1	1	11/03/08	26	
Plasticity Index	NONE	ASTM D4318	1	1	1	11/03/08	27	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client : Weston Solutions, Incorporated
Project Name : Lower Rogue River - 451
Project Number : 20405.016.008.0451.00
Sample Matrix : SEDIMENT

Service Request : K0810423
Date Collected : 10/23/2008
Date Received : 10/24/2008

Inorganic Parameters

Sample Name : LRR-HS5-A-03
Lab Code : K0810423-014
Test Notes :

Basis : Air Dry

Analyte	Units	Analysis Method	MRL	MDL	Dilution Factor	Date Analyzed	Result	Result Notes
Liquid Limit	NONE	ASTM D4318	1	1	1	11/03/08	58	
Plastic Limit	NONE	ASTM D4318	1	1	1	11/03/08	30	
Plasticity Index	NONE	ASTM D4318	1	1	1	11/03/08	28	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client : Weston Solutions, Incorporated
Project Name : Lower Rogue River - 451
Project Number : 20405.016.008.0451.00
Sample Matrix : SEDIMENT

Service Request : K0810463
Date Collected : 10/23/2008
Date Received : 10/25/2008

Inorganic Parameters

Sample Name : LRR-HS4-B-01
Lab Code : K0810463-007
Test Notes :

Basis : Air Dry

Analyte	Units	Analysis Method	MRL	MDL	Dilution Factor	Date Analyzed	Result	Result Notes
Liquid Limit	NONE	ASTM D4318	1	1	1	11/02/08	55	
Plastic Limit	NONE	ASTM D4318	1	1	1	11/02/08	31	
Plasticity Index	NONE	ASTM D4318	1	1	1	11/02/08	24	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client : Weston Solutions, Incorporated
Project Name : Lower Rogue River - 451
Project Number : 20405.016.008.0451.00
Sample Matrix : SEDIMENT

Service Request : K0810463
Date Collected : 10/23/2008
Date Received : 10/25/2008

Inorganic Parameters

Sample Name : LRR-HS4-B-02
Lab Code : K0810463-008
Test Notes :

Basis : Air Dry

Analyte	Units	Analysis Method	MRL	MDL	Dilution Factor	Date Analyzed	Result	Result Notes
Liquid Limit	NONE	ASTM D4318	1	1	1	11/02/08	28	
Plastic Limit	NONE	ASTM D4318	1	1	1	11/02/08	22	
Plasticity Index	NONE	ASTM D4318	1	1	1	11/02/08	5	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client : Weston Solutions, Incorporated
Project Name : Lower Rogue River - 451
Project Number : 20405.016.008.0451.00
Sample Matrix : SEDIMENT

Service Request : K0810463
Date Collected : 10/23/2008
Date Received : 10/25/2008

Inorganic Parameters

Sample Name : LRR-HS4-B-03
Lab Code : K0810463-009
Test Notes :

Basis : Air Dry

Analyte	Units	Analysis Method	MRL	MDL	Dilution Factor	Date Analyzed	Result	Result Notes
Liquid Limit	NONE	ASTM D4318	1	1	1	11/02/08	32	
Plastic Limit	NONE	ASTM D4318	1	1	1	11/02/08	43	
Plasticity Index	NONE	ASTM D4318	1	1	1	11/02/08	Nonplastic	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client : Weston Solutions, Incorporated
Project Name : Lower Rogue River - 451
Project Number : 20405.016.008.0451.00
Sample Matrix : SEDIMENT

Service Request : K0810465
Date Collected : 10/23/2008
Date Received : 10/25/2008

Inorganic Parameters

Sample Name : LRR-OBC-B-01
Lab Code : K0810465-004
Test Notes :

Basis : Air Dry

Analyte	Units	Analysis Method	MRL	MDL	Dilution Factor	Date Analyzed	Result	Result Notes
Liquid Limit	NONE	ASTM D4318	1	1	1	10/30/08	27	
Plastic Limit	NONE	ASTM D4318	1	1	1	10/30/08	23	
Plasticity Index	NONE	ASTM D4318	1	1	1	10/30/08	4	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client : Weston Solutions, Incorporated
Project Name : Lower Rogue River - 451
Project Number : 20405.016.008.0451.00
Sample Matrix : SEDIMENT

Service Request : K0810465
Date Collected : 10/23/2008
Date Received : 10/25/2008

Inorganic Parameters

Sample Name : LRR-OBC-B-02
Lab Code : K0810465-005
Test Notes :

Basis : Air Dry

Analyte	Units	Analysis Method	MRL	MDL	Dilution Factor	Date Analyzed	Result	Result Notes
Liquid Limit	NONE	ASTM D4318	1	1	1	10/30/08	32	
Plastic Limit	NONE	ASTM D4318	1	1	1	10/30/08	22	
Plasticity Index	NONE	ASTM D4318	1	1	1	10/30/08	11	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client : Weston Solutions, Incorporated
Project Name : Lower Rogue River - 451
Project Number : 20405.016.008.0451.00
Sample Matrix : SEDIMENT

Service Request : K0810465
Date Collected : 10/23/2008
Date Received : 10/25/2008

Inorganic Parameters

Sample Name : LRR-OBC-B-03
Lab Code : K0810465-006
Test Notes :

Basis : Air Dry

Analyte	Units	Analysis Method	MRL	MDL	Dilution Factor	Date Analyzed	Result	Result Notes
Liquid Limit	NONE	ASTM D4318	1	1	1	10/30/08	ND	
Plastic Limit	NONE	ASTM D4318	1	1	1	10/30/08	ND	
Plasticity Index	NONE	ASTM D4318	1	1	1	10/30/08	ND	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client : Weston Solutions, Incorporated
Project Name : Lower Rogue River - 451
Project Number : 20405.016.008.0451.00
Sample Matrix : SEDIMENT

Service Request : K0904268
Date Collected : 5/11/2009
Date Received : 5/13/2009

Inorganic Parameters

Sample Name : LRR-HS6-B-01
Lab Code : K0904268-004
Test Notes :

Basis : Air Dried

Analyte	Units	Analysis Method	MRL	MDL	Dilution Factor	Date Analyzed	Result	Result Notes
Liquid Limit	NONE	ASTM D4318	-	-	1	05/26/09	39.9	
Plastic Limit	NONE	ASTM D4318	-	-	1	05/26/09	25.6	
Plasticity Index	NONE	ASTM D4318	-	-	1	05/26/09	14.4	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client : Weston Solutions, Incorporated
Project Name : Lower Rogue River - 451
Project Number : 20405.016.008.0451.00
Sample Matrix : SEDIMENT

Service Request : K0904268
Date Collected : 5/11/2009
Date Received : 5/13/2009

Inorganic Parameters

Sample Name : LRR-HS6-B-02
Lab Code : K0904268-005
Test Notes :

Basis : Air Dried

Analyte	Units	Analysis Method	MRL	MDL	Dilution Factor	Date Analyzed	Result	Result Notes
Liquid Limit	NONE	ASTM D4318	-	-	1	05/26/09	ND	
Plastic Limit	NONE	ASTM D4318	-	-	1	05/26/09	ND	
Plasticity Index	NONE	ASTM D4318	-	-	1	05/26/09	ND	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client : Weston Solutions, Incorporated
Project Name : Lower Rogue River - 451
Project Number : 20405.016.008.0451.00
Sample Matrix : SEDIMENT

Service Request : K0904268
Date Collected : 5/11/2009
Date Received : 5/13/2009

Inorganic Parameters

Sample Name : LRR-HS6-B-03
Lab Code : K0904268-006
Test Notes :

Basis : Air Dried

Analyte	Units	Analysis Method	MRL	MDL	Dilution Factor	Date Analyzed	Result	Result Notes
Liquid Limit	NONE	ASTM D4318	-	-	1	05/26/09	ND	
Plastic Limit	NONE	ASTM D4318	-	-	1	05/26/09	ND	
Plasticity Index	NONE	ASTM D4318	-	-	1	05/26/09	ND	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client : Weston Solutions, Incorporated
Project Name : Lower Rogue River - 451
Project Number : 20405.016.008.0451.00
Sample Matrix : SEDIMENT

Service Request : K0904301
Date Collected : 5/12/2009
Date Received : 5/14/2009

Inorganic Parameters

Sample Name : LRR-HS6-F-01
Lab Code : K0904301-005
Test Notes :

Basis : Air Dried

Analyte	Units	Analysis Method	MRL	MDL	Dilution Factor	Date Analyzed	Result	Result Notes
Liquid Limit	NONE	ASTM D4318	-	-	1	05/27/09	29.1	
Plastic Limit	NONE	ASTM D4318	-	-	1	05/27/09	21.7	
Plasticity Index	NONE	ASTM D4318	-	-	1	05/27/09	7.30	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client : Weston Solutions, Incorporated
Project Name : Lower Rogue River - 451
Project Number : 20405.016.008.0451.00
Sample Matrix : SEDIMENT

Service Request : K0904301
Date Collected : 5/12/2009
Date Received : 5/14/2009

Inorganic Parameters

Sample Name : LRR-HS6-F-01-DP
Lab Code : K0904301-006
Test Notes :

Basis : Air Dried

Analyte	Units	Analysis Method	MRL	MDL	Dilution Factor	Date Analyzed	Result	Result Notes
Liquid Limit	NONE	ASTM D4318	-	-	1	05/27/09	32.4	
Plastic Limit	NONE	ASTM D4318	-	-	1	05/27/09	23.1	
Plasticity Index	NONE	ASTM D4318	-	-	1	05/27/09	9.40	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client : Weston Solutions, Incorporated
Project Name : Lower Rogue River - 451
Project Number : 20405.016.008.0451.00
Sample Matrix : SEDIMENT

Service Request : K0904356
Date Collected : 5/13/2009
Date Received : 5/15/2009

Inorganic Parameters

Sample Name : LRR-HS6-DOWN2-01
Lab Code : K0904356-014
Test Notes :

Basis : Air Dried

Analyte	Units	Analysis Method	MRL	MDL	Dilution Factor	Date Analyzed	Result	Result Notes
Liquid Limit	NONE	ASTM D4318	-	-	1	05/27/09	53.1	
Plastic Limit	NONE	ASTM D4318	-	-	1	05/27/09	29.4	
Plasticity Index	NONE	ASTM D4318	-	-	1	05/27/09	23.7	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client : Weston Solutions, Incorporated
Project Name : Lower Rogue River - 451
Project Number : 20405.016.008.0451.00
Sample Matrix : SEDIMENT

Service Request : K0904451
Date Collected : 5/16/2009
Date Received : 5/19/2009

Inorganic Parameters

Sample Name : LRR-HS3-A-01
Lab Code : K0904451-002
Test Notes :

Basis : Air Dried

Analyte	Units	Analysis Method	MRL	MDL	Dilution Factor	Date Analyzed	Result	Result Notes
Liquid Limit	NONE	ASTM D4318	-	-	1	06/08/09	57.0	
Plastic Limit	NONE	ASTM D4318	-	-	1	06/08/09	35.2	
Plasticity Index	NONE	ASTM D4318	-	-	1	06/08/09	14.1	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client : Weston Solutions, Incorporated
Project Name : Lower Rogue River - 451
Project Number : 20405.016.008.0451.00
Sample Matrix : SEDIMENT

Service Request : K0904451
Date Collected : 5/16/2009
Date Received : 5/19/2009

Inorganic Parameters

Sample Name : LRR-HS3-A-01-FS
Lab Code : K0904451-004
Test Notes :

Basis : Air Dried

Analyte	Units	Analysis Method	MRL	MDL	Dilution Factor	Date Analyzed	Result	Result Notes
Liquid Limit	NONE	ASTM D4318	-	-	1	06/08/09	63.4	
Plastic Limit	NONE	ASTM D4318	-	-	1	06/08/09	40.1	
Plasticity Index	NONE	ASTM D4318	-	-	1	06/08/09	23.3	

Report By: MKANALY

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client : Weston Solutions, Incorporated
Project Name : Lower Rogue River - 451
Project Number : 20405.016.008.0451.00
Sample Matrix : SEDIMENT

Service Request : K0904451
Date Collected : 5/16/2009
Date Received : 5/19/2009

Inorganic Parameters

Sample Name : LRR-HS3-A-02
Lab Code : K0904451-005
Test Notes :

Basis : Air Dried

Analyte	Units	Analysis Method	MRL	MDL	Dilution Factor	Date Analyzed	Result	Result Notes
Liquid Limit	NONE	ASTM D4318	-	-	1	06/08/09	63.4	
Plastic Limit	NONE	ASTM D4318	-	-	1	06/08/09	38.1	
Plasticity Index	NONE	ASTM D4318	-	-	1	06/08/09	25.4	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client : Weston Solutions, Incorporated
Project Name : Lower Rogue River - 451
Project Number : 20405.016.008.0451.00
Sample Matrix : SEDIMENT

Service Request : K0904451
Date Collected : 5/16/2009
Date Received : 5/19/2009

Inorganic Parameters

Sample Name : LRR-HS3-A-02-DP
Lab Code : K0904451-006
Test Notes :

Basis : Air Dried

Analyte	Units	Analysis Method	MRL	MDL	Dilution Factor	Date Analyzed	Result	Result Notes
Liquid Limit	NONE	ASTM D4318	-	-	1	06/08/09	61.5	
Plastic Limit	NONE	ASTM D4318	-	-	1	06/08/09	39.1	
Plasticity Index	NONE	ASTM D4318	-	-	1	06/08/09	22.4	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client : Weston Solutions, Incorporated
Project Name : Lower Rogue River - 451
Project Number : 20405.016.008.0451.00
Sample Matrix : SEDIMENT

Service Request : K0904451
Date Collected : 5/16/2009
Date Received : 5/19/2009

Inorganic Parameters

Sample Name : LRR-HS3-A-03
Lab Code : K0904451-007
Test Notes :

Basis : Air Dried

Analyte	Units	Analysis Method	MRL	MDL	Dilution Factor	Date Analyzed	Result	Result Notes
Liquid Limit	NONE	ASTM D4318	-	-	1	06/08/09	62.8	
Plastic Limit	NONE	ASTM D4318	-	-	1	06/08/09	37.8	
Plasticity Index	NONE	ASTM D4318	-	-	1	06/08/09	11.4	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client : Weston Solutions, Incorporated
Project Name : Lower Rogue River - 451
Project Number : 20405.016.008.0451.00
Sample Matrix : SEDIMENT

Service Request : K0904454
Date Collected : 5/16/2009
Date Received : 5/19/2009

Inorganic Parameters

Sample Name : LRR-ZIC-C-01-TOX
Lab Code : K0904454-009
Test Notes :

Basis : Air Dried

Analyte	Units	Analysis Method	MRL	MDL	Dilution Factor	Date Analyzed	Result	Result Notes
Liquid Limit	NONE	ASTM D4318	-	-	1	06/08/09	49.2	
Plastic Limit	NONE	ASTM D4318	-	-	1	06/08/09	30.4	
Plasticity Index	NONE	ASTM D4318	-	-	1	06/08/09	18.8	

Report By: MKANALY

ATTACHMENT B
ANALYTICAL DATA SUMMARY SHEETS
FOR PARTICLE SIZE

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: Weston Solutions, Incorporated
Project: Lower Rogue River - 451/20405.016.008.0451.00
Sample Matrix: Sediment

Service Request: K0810413
Date Collected: 10/21/2008
Date Received: 10/23/2008
Date Analyzed: 10/30/2008

Particle Size Determination
ASTM Method D 422

Sample Name: LRR-017-A-01
Lab Code: K0810413-001

Gravel and Sand
(Sieve Analysis)

Description	Sieve Size	Weight (g)	Percent Passing
Gravel	No.3/4"(19.0 mm)	0.0000	100
Gravel	No.3/8"(9.50 mm)	0.0000	100
Gravel, Medium	No.4 (4.75 mm)	0.0603	99.9
Gravel, Fine	No.10 (2.00 mm)	0.1946	99.5
Sand, Very Coarse	No.20 (0.850 mm)	2.3731	94.7
Sand, Coarse	No.40 (0.425 mm)	4.9104	84.9
Sand, Medium	No.60 (0.250 mm)	5.3114	74.3
Sand, Fine	No.140 (0.106 mm)	7.4586	59.3
Sand, Very Fine	No.200 (0.0750 mm)	1.4130	56.5

Silt and Clay
(Hydrometer Analysis)

Particle Diameter	Percent Passing
0.074 mm	57.0
0.005 mm	17.0
0.001 mm	0.00

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	Weston Solutions, Incorporated	**Service Request:**	K0810413
Project:	Lower Rogue River - 451/20405.016.008.0451.00	**Date Collected:**	10/21/2008
Sample Matrix:	Sediment	**Date Received:**	10/23/2008
		Date Analyzed:	10/30/2008

Particle Size Determination
ASTM Method D 422

Sample Name: LRR-017-A-02
Lab Code: K0810413-002

Gravel and Sand
(Sieve Analysis)

Description	Sieve Size	Weight (g)	Percent Passing
Gravel	No.3/4"(19.0 mm)	0.0000	100
Gravel	No.3/8"(9.50 mm)	0.0000	100
Gravel, Medium	No.4 (4.75 mm)	0.0000	100
Gravel, Fine	No.10 (2.00 mm)	0.0347	99.9
Sand, Very Coarse	No.20 (0.850 mm)	0.5066	98.9
Sand, Coarse	No.40 (0.425 mm)	1.5876	95.7
Sand, Medium	No.60 (0.250 mm)	2.8881	89.8
Sand, Fine	No.140 (0.106 mm)	5.6862	78.2
Sand, Very Fine	No.200 (0.0750 mm)	1.8977	74.4

Silt and Clay
(Hydrometer Analysis)

Particle Diameter	Percent Passing
0.074 mm	74.4
0.005 mm	23.8
0.001 mm	0.00

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	Weston Solutions, Incorporated	**Service Request:**	K0810413
Project:	Lower Rogue River - 451/20405.016.008.0451.00	**Date Collected:**	10/21/2008
Sample Matrix:	Sediment	**Date Received:**	10/23/2008
		Date Analyzed:	10/30/2008

Particle Size Determination
ASTM Method D 422

Sample Name: LRR-017-A-03
Lab Code: K0810413-003

Gravel and Sand
(Sieve Analysis)

Description	Sieve Size	Weight (g)	Percent Passing
Gravel	No.3/4"(19.0 mm)	0.0000	100
Gravel	No.3/8"(9.50 mm)	0.0000	100
Gravel, Medium	No.4 (4.75 mm)	0.0000	100
Gravel, Fine	No.10 (2.00 mm)	0.0000	100
Sand, Very Coarse	No.20 (0.850 mm)	3.5061	92.7
Sand, Coarse	No.40 (0.425 mm)	6.6866	78.7
Sand, Medium	No.60 (0.250 mm)	3.4161	71.5
Sand, Fine	No.140 (0.106 mm)	6.1612	58.6
Sand, Very Fine	No.200 (0.0750 mm)	2.7210	52.9

Silt and Clay
(Hydrometer Analysis)

Particle Diameter	Percent Passing
0.074 mm	50.4
0.005 mm	7.94
0.001 mm	0.00

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: Weston Solutions, Incorporated
Project: Lower Rogue River - 451/20405.016.008.0451.00
Sample Matrix: Sediment

Service Request: K0810413
Date Collected: 10/21/2008
Date Received: 10/23/2008
Date Analyzed: 10/30/2008

Particle Size Determination
ASTM Method D 422

Sample Name: LRR-017-A-04
Lab Code: K0810413-004

Gravel and Sand
(Sieve Analysis)

Description	Sieve Size	Weight (g)	Percent Passing
Gravel	No.3/4"(19.0 mm)	0.0000	100
Gravel	No.3/8"(9.50 mm)	0.0000	100
Gravel, Medium	No.4 (4.75 mm)	0.0000	100
Gravel, Fine	No.10 (2.00 mm)	0.0000	100
Sand, Very Coarse	No.20 (0.850 mm)	7.8728	82.8
Sand, Coarse	No.40 (0.425 mm)	6.7073	68.1
Sand, Medium	No.60 (0.250 mm)	3.1607	61.2
Sand, Fine	No.140 (0.106 mm)	5.0063	50.2
Sand, Very Fine	No.200 (0.0750 mm)	2.1052	45.6

Silt and Clay
(Hydrometer Analysis)

Particle Diameter	Percent Passing
0.074 mm	45.5
0.005 mm	9.79
0.001 mm	0.00

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	Weston Solutions, Incorporated	**Service Request:**	K0810413
Project:	Lower Rogue River - 451/20405.016.008.0451.00	**Date Collected:**	10/21/2008
Sample Matrix:	Sediment	**Date Received:**	10/23/2008
		Date Analyzed:	10/30/2008

Particle Size Determination
ASTM Method D 422

Sample Name: LRR-017-A-05
Lab Code: K0810413-005

Gravel and Sand
(Sieve Analysis)

Description	Sieve Size	Weight (g)	Percent Passing
Gravel	No.3/4"(19.0 mm)	0.0000	100
Gravel	No.3/8"(9.50 mm)	0.0000	100
Gravel, Medium	No.4 (4.75 mm)	0.0000	100
Gravel, Fine	No.10 (2.00 mm)	0.0000	100
Sand, Very Coarse	No.20 (0.850 mm)	8.2760	82.7
Sand, Coarse	No.40 (0.425 mm)	5.8209	70.6
Sand, Medium	No.60 (0.250 mm)	3.4711	63.3
Sand, Fine	No.140 (0.106 mm)	5.3685	52.1
Sand, Very Fine	No.200 (0.0750 mm)	2.1330	47.7

Silt and Clay
(Hydrometer Analysis)

Particle Diameter	Percent Passing
0.074 mm	47.7
0.005 mm	12.0
0.001 mm	0.00

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	Weston Solutions, Incorporated	**Service Request:**	K0810413
Project:	Lower Rogue River - 451/20405.016.008.0451.00	**Date Collected:**	10/21/2008
Sample Matrix:	Sediment	**Date Received:**	10/23/2008
		Date Analyzed:	10/30/2008

Particle Size Determination
ASTM Method D 422

Sample Name: LRR-OF2-A-01
Lab Code: K0810413-008

Gravel and Sand
(Sieve Analysis)

Description	Sieve Size	Weight (g)	Percent Passing
Gravel	No.3/4"(19.0 mm)	0.0000	100
Gravel	No.3/8"(9.50 mm)	0.0704	99.9
Gravel, Medium	No.4 (4.75 mm)	0.1231	99.6
Gravel, Fine	No.10 (2.00 mm)	3.4576	92.9
Sand, Very Coarse	No.20 (0.850 mm)	7.2719	78.4
Sand, Coarse	No.40 (0.425 mm)	8.0680	62.3
Sand, Medium	No.60 (0.250 mm)	9.4234	43.5
Sand, Fine	No.140 (0.106 mm)	10.6557	22.3
Sand, Very Fine	No.200 (0.0750 mm)	1.9511	18.4

Silt and Clay
(Hydrometer Analysis)

Particle Diameter	Percent Passing
0.074 mm	16.1
0.005 mm	5.91
0.001 mm	0.00

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	Weston Solutions, Incorporated	**Service Request:**	K0810413
Project:	Lower Rogue River - 451/20405.016.008.0451.00	**Date Collected:**	10/21/2008
Sample Matrix:	Sediment	**Date Received:**	10/23/2008
		Date Analyzed:	10/30/2008

Particle Size Determination
ASTM Method D 422

Sample Name: LRR-WJB-A-01
Lab Code: K0810413-009

Gravel and Sand
(Sieve Analysis)

Description	Sieve Size	Weight (g)	Percent Passing
Gravel	No.3/4"(19.0 mm)	0.0000	100
Gravel	No.3/8"(9.50 mm)	4.1960	95.8
Gravel, Medium	No.4 (4.75 mm)	8.5545	87.4
Gravel, Fine	No.10 (2.00 mm)	18.3301	69.3
Sand, Very Coarse	No.20 (0.850 mm)	16.3114	53.1
Sand, Coarse	No.40 (0.425 mm)	16.9088	36.3
Sand, Medium	No.60 (0.250 mm)	13.4910	23.0
Sand, Fine	No.140 (0.106 mm)	8.7086	14.3
Sand, Very Fine	No.200 (0.0750 mm)	1.8959	12.5

Silt and Clay
(Hydrometer Analysis)

Particle Diameter	Percent Passing
0.074 mm	11.9
0.005 mm	1.55
0.001 mm	0.00

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	Weston Solutions, Incorporated	**Service Request:**	K0810413
Project:	Lower Rogue River - 451/20405.016.008.0451.00	**Date Collected:**	10/21/2008
Sample Matrix:	Sediment	**Date Received:**	10/23/2008
		Date Analyzed:	10/30/2008

Particle Size Determination
ASTM Method D 422

Sample Name: LRR-WJB-A-02
Lab Code: K0810413-010

Gravel and Sand
(Sieve Analysis)

Description	Sieve Size	Weight (g)	Percent Passing
Gravel	No.3/4"(19.0 mm)	0.0000	100
Gravel	No.3/8"(9.50 mm)	6.2317	93.8
Gravel, Medium	No.4 (4.75 mm)	12.9352	81.1
Gravel, Fine	No.10 (2.00 mm)	16.3902	64.9
Sand, Very Coarse	No.20 (0.850 mm)	9.5174	55.3
Sand, Coarse	No.40 (0.425 mm)	7.5359	47.8
Sand, Medium	No.60 (0.250 mm)	9.2079	38.6
Sand, Fine	No.140 (0.106 mm)	7.8340	30.8
Sand, Very Fine	No.200 (0.0750 mm)	1.3730	29.4

Silt and Clay
(Hydrometer Analysis)

Particle Diameter	Percent Passing
0.074 mm	29.2
0.005 mm	8.49
0.001 mm	0.00

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: Weston Solutions, Incorporated
Project: Lower Rogue River - 451/20405.016.008.0451.00
Sample Matrix: Sediment

Service Request: K0810413
Date Collected: 10/21/2008
Date Received: 10/23/2008
Date Analyzed: 10/30/2008

Particle Size Determination
ASTM Method D 422

Sample Name: LRR-017-A-05
Lab Code: K0810413-005DUP

Gravel and Sand
(Sieve Analysis)

Description	Sieve Size	Weight (g)	Percent Passing
Gravel	No.3/4"(19.0 mm)	0.0000	100
Gravel	No.3/8"(9.50 mm)	0.0000	100
Gravel, Medium	No.4 (4.75 mm)	0.0000	100
Gravel, Fine	No.10 (2.00 mm)	0.0000	100
Sand, Very Coarse	No.20 (0.850 mm)	6.7302	85.7
Sand, Coarse	No.40 (0.425 mm)	6.4561	71.9
Sand, Medium	No.60 (0.250 mm)	3.7766	63.8
Sand, Fine	No.140 (0.106 mm)	5.5587	52.0
Sand, Very Fine	No.200 (0.0750 mm)	2.0407	47.6

Silt and Clay
(Hydrometer Analysis)

Particle Diameter	Percent Passing
0.074 mm	47.8
0.005 mm	13.7
0.001 mm	0.00

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	Weston Solutions, Incorporated	**Service Request:**	K0810422
Project:	Lower Rogue River - 451/20405.016.008.0451.00	**Date Collected:**	10/21/2008
Sample Matrix:	Sediment	**Date Received:**	10/24/2008
		Date Analyzed:	10/27/2008

Particle Size Determination
ASTM Method D 422

Sample Name: LRR-HS1-A-01
Lab Code: K0810422-001

Gravel and Sand
(Sieve Analysis)

Description	Sieve Size	Weight (g)	Percent Passing
Gravel	No.3/4"(19.0 mm)	0.0000	100
Gravel	No.3/8"(9.50 mm)	0.0000	100
Gravel, Medium	No.4 (4.75 mm)	0.0000	100
Gravel, Fine	No.10 (2.00 mm)	0.0056	100
Sand, Very Coarse	No.20 (0.850 mm)	0.5873	98.9
Sand, Coarse	No.40 (0.425 mm)	1.0453	96.9
Sand, Medium	No.60 (0.250 mm)	1.6134	93.8
Sand, Fine	No.140 (0.106 mm)	5.4813	83.3
Sand, Very Fine	No.200 (0.0750 mm)	2.9612	77.6

Silt and Clay
(Hydrometer Analysis)

Particle Diameter	Percent Passing
0.074 mm	71.3
0.005 mm	18.1
0.001 mm	0.00

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	Weston Solutions, Incorporated	**Service Request:**	K0810422
Project:	Lower Rogue River - 451/20405.016.008.0451.00	**Date Collected:**	10/21/2008
Sample Matrix:	Sediment	**Date Received:**	10/24/2008
		Date Analyzed:	10/27/2008

Particle Size Determination
ASTM Method D 422

Sample Name: LRR-HS1-A-02
Lab Code: K0810422-002

Gravel and Sand
(Sieve Analysis)

Description	Sieve Size	Weight (g)	Percent Passing
Gravel	No.3/4"(19.0 mm)	0.0000	100
Gravel	No.3/8"(9.50 mm)	0.0000	100
Gravel, Medium	No.4 (4.75 mm)	0.2300	99.6
Gravel, Fine	No.10 (2.00 mm)	0.0827	99.4
Sand, Very Coarse	No.20 (0.850 mm)	0.4096	98.6
Sand, Coarse	No.40 (0.425 mm)	0.6930	97.3
Sand, Medium	No.60 (0.250 mm)	1.6718	94.1
Sand, Fine	No.140 (0.106 mm)	5.8545	82.9
Sand, Very Fine	No.200 (0.0750 mm)	2.5540	78.0

Silt and Clay
(Hydrometer Analysis)

Particle Diameter	Percent Passing
0.074 mm	73.4
0.005 mm	22.7
0.001 mm	0.00

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	Weston Solutions, Incorporated	**Service Request:**	K0810422
Project:	Lower Rogue River - 451/20405.016.008.0451.00	**Date Collected:**	10/21/2008
Sample Matrix:	Sediment	**Date Received:**	10/24/2008
		Date Analyzed:	10/27/2008

Particle Size Determination
ASTM Method D 422

Sample Name: LRR-HS1-A-02
Lab Code: K0810422-002DUP

Gravel and Sand
(Sieve Analysis)

Description	Sieve Size	Weight (g)	Percent Passing
Gravel	No.3/4"(19.0 mm)	0.0000	100
Gravel	No.3/8"(9.50 mm)	0.0000	100
Gravel, Medium	No.4 (4.75 mm)	1.0442	98.0
Gravel, Fine	No.10 (2.00 mm)	0.1416	97.7
Sand, Very Coarse	No.20 (0.850 mm)	1.1432	95.5
Sand, Coarse	No.40 (0.425 mm)	0.7370	94.1
Sand, Medium	No.60 (0.250 mm)	1.4973	91.2
Sand, Fine	No.140 (0.106 mm)	6.0906	79.5
Sand, Very Fine	No.200 (0.0750 mm)	2.8464	74.0

Silt and Clay
(Hydrometer Analysis)

Particle Diameter	Percent Passing
0.074 mm	69.1
0.005 mm	19.4
0.001 mm	0.00

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: Weston Solutions, Incorporated
Project: Lower Rogue River - 451/20405.016.008.0451.00
Sample Matrix: Sediment

Service Request: K0810422
Date Collected: 10/21/2008
Date Received: 10/24/2008
Date Analyzed: 10/27/2008

Particle Size Determination
ASTM Method D 422

Sample Name: LRR-HS1-A-03
Lab Code: K0810422-003

Gravel and Sand
(Sieve Analysis)

Description	Sieve Size	Weight (g)	Percent Passing
Gravel	No.3/4"(19.0 mm)	0.0000	100
Gravel	No.3/8"(9.50 mm)	0.0000	100
Gravel, Medium	No.4 (4.75 mm)	0.0000	100
Gravel, Fine	No.10 (2.00 mm)	0.1111	99.8
Sand, Very Coarse	No.20 (0.850 mm)	0.1336	99.5
Sand, Coarse	No.40 (0.425 mm)	0.3077	99.0
Sand, Medium	No.60 (0.250 mm)	0.6272	97.8
Sand, Fine	No.140 (0.106 mm)	3.8534	90.5
Sand, Very Fine	No.200 (0.0750 mm)	2.0887	86.5

Silt and Clay
(Hydrometer Analysis)

Particle Diameter	Percent Passing
0.074 mm	86.9
0.005 mm	31.4
0.001 mm	0.00

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	Weston Solutions, Incorporated	**Service Request:**	K0810422
Project:	Lower Rogue River - 451/20405.016.008.0451.00	**Date Collected:**	10/21/2008
Sample Matrix:	Sediment	**Date Received:**	10/24/2008
		Date Analyzed:	10/27/2008

Particle Size Determination
ASTM Method D 422

Sample Name: LRR-HS1-A-04
Lab Code: K0810422-004

Gravel and Sand
(Sieve Analysis)

Description	Sieve Size	Weight (g)	Percent Passing
Gravel	No.3/4"(19.0 mm)	0.0000	100
Gravel	No.3/8"(9.50 mm)	0.0000	100
Gravel, Medium	No.4 (4.75 mm)	0.0000	100
Gravel, Fine	No.10 (2.00 mm)	0.0755	99.9
Sand, Very Coarse	No.20 (0.850 mm)	1.7441	96.4
Sand, Coarse	No.40 (0.425 mm)	2.2986	91.9
Sand, Medium	No.60 (0.250 mm)	0.8189	90.3
Sand, Fine	No.140 (0.106 mm)	1.9309	86.5
Sand, Very Fine	No.200 (0.0750 mm)	1.1431	84.2

Silt and Clay
(Hydrometer Analysis)

Particle Diameter	Percent Passing
0.074 mm	83.5
0.005 mm	29.2
0.001 mm	0.00

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	Weston Solutions, Incorporated	**Service Request:**	K0810423
Project:	Lower Rogue River - 451/20405.016.008.0451.00	**Date Collected:**	10/22/2008
Sample Matrix:	Sediment	**Date Received:**	10/24/2008
		Date Analyzed:	10/30/2008

Particle Size Determination
ASTM Method D 422

Sample Name: LRR-OF2-B-01
Lab Code: K0810423-001

Gravel and Sand
(Sieve Analysis)

Description	Sieve Size	Weight (g)	Percent Passing
Gravel	No.3/4"(19.0 mm)	0.0000	100
Gravel	No.3/8"(9.50 mm)	0.0000	100
Gravel, Medium	No.4 (4.75 mm)	0.0000	100
Gravel, Fine	No.10 (2.00 mm)	0.0000	100
Sand, Very Coarse	No.20 (0.850 mm)	0.3363	99.3
Sand, Coarse	No.40 (0.425 mm)	1.1103	97.1
Sand, Medium	No.60 (0.250 mm)	1.5818	94.0
Sand, Fine	No.140 (0.106 mm)	9.3244	75.4
Sand, Very Fine	No.200 (0.0750 mm)	4.3213	66.8

Silt and Clay
(Hydrometer Analysis)

Particle Diameter	Percent Passing
0.074 mm	67.0
0.005 mm	14.9
0.001 mm	0.00

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	Weston Solutions, Incorporated	**Service Request:**	K0810423
Project:	Lower Rogue River - 451/20405.016.008.0451.00	**Date Collected:**	10/22/2008
Sample Matrix:	Sediment	**Date Received:**	10/24/2008
		Date Analyzed:	10/30/2008

Particle Size Determination
ASTM Method D 422

Sample Name: LRR-OF2-B-01
Lab Code: K0810423-001DUP

Gravel and Sand
(Sieve Analysis)

Description	Sieve Size	Weight (g)	Percent Passing
Gravel	No.3/4"(19.0 mm)	0.0000	100
Gravel	No.3/8"(9.50 mm)	0.0000	100
Gravel, Medium	No.4 (4.75 mm)	0.0000	100
Gravel, Fine	No.10 (2.00 mm)	0.0000	100
Sand, Very Coarse	No.20 (0.850 mm)	0.6097	98.8
Sand, Coarse	No.40 (0.425 mm)	1.9404	95.1
Sand, Medium	No.60 (0.250 mm)	2.1556	90.9
Sand, Fine	No.140 (0.106 mm)	8.7465	73.9
Sand, Very Fine	No.200 (0.0750 mm)	3.9260	66.3

Silt and Clay
(Hydrometer Analysis)

Particle Diameter	Percent Passing
0.074 mm	65.6
0.005 mm	16.3
0.001 mm	0.00

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	Weston Solutions, Incorporated	**Service Request:**	K0810423
Project:	Lower Rogue River - 451/20405.016.008.0451.00	**Date Collected:**	10/22/2008
Sample Matrix:	Sediment	**Date Received:**	10/24/2008
		Date Analyzed:	10/30/2008

Particle Size Determination
ASTM Method D 422

Sample Name: LRR-OF2-B-02
Lab Code: K0810423-002

Gravel and Sand
(Sieve Analysis)

Description	Sieve Size	Weight (g)	Percent Passing
Gravel	No.3/4"(19.0 mm)	0.0000	100
Gravel	No.3/8"(9.50 mm)	0.0000	100
Gravel, Medium	No.4 (4.75 mm)	0.0000	100
Gravel, Fine	No.10 (2.00 mm)	0.0000	100
Sand, Very Coarse	No.20 (0.850 mm)	0.1332	99.7
Sand, Coarse	No.40 (0.425 mm)	0.2560	99.2
Sand, Medium	No.60 (0.250 mm)	0.5318	98.2
Sand, Fine	No.140 (0.106 mm)	3.9885	90.3
Sand, Very Fine	No.200 (0.0750 mm)	2.4872	85.4

Silt and Clay
(Hydrometer Analysis)

Particle Diameter	Percent Passing
0.074 mm	83.3
0.005 mm	33.4
0.001 mm	3.53

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	Weston Solutions, Incorporated	**Service Request:**	K0810423
Project:	Lower Rogue River - 451/20405.016.008.0451.00	**Date Collected:**	10/22/2008
Sample Matrix:	Sediment	**Date Received:**	10/24/2008
		Date Analyzed:	10/30/2008

Particle Size Determination
ASTM Method D 422

Sample Name: LRR-OF2-B-03
Lab Code: K0810423-003

Gravel and Sand
(Sieve Analysis)

Description	Sieve Size	Weight (g)	Percent Passing
Gravel	No.3/4"(19.0 mm)	0.0000	100
Gravel	No.3/8"(9.50 mm)	0.0000	100
Gravel, Medium	No.4 (4.75 mm)	0.0000	100
Gravel, Fine	No.10 (2.00 mm)	0.0000	100
Sand, Very Coarse	No.20 (0.850 mm)	0.0910	99.8
Sand, Coarse	No.40 (0.425 mm)	0.5064	98.8
Sand, Medium	No.60 (0.250 mm)	0.9020	97.0
Sand, Fine	No.140 (0.106 mm)	1.8431	93.3
Sand, Very Fine	No.200 (0.0750 mm)	1.0657	91.2

Silt and Clay
(Hydrometer Analysis)

Particle Diameter	Percent Passing
0.074 mm	91.9
0.005 mm	51.3
0.001 mm	27.0

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	Weston Solutions, Incorporated	**Service Request:**	K0810423
Project:	Lower Rogue River - 451/20405.016.008.0451.00	**Date Collected:**	10/22/2008
Sample Matrix:	Sediment	**Date Received:**	10/24/2008
		Date Analyzed:	10/30/2008

Particle Size Determination
ASTM Method D 422

Sample Name: LRR-OF2-B-04
Lab Code: K0810423-004

Gravel and Sand
(Sieve Analysis)

Description	Sieve Size	Weight (g)	Percent Passing
Gravel	**No.3/4"(19.0 mm)**	0.0000	100
Gravel	**No.3/8"(9.50 mm)**	0.0000	100
Gravel, Medium	**No.4 (4.75 mm)**	0.0000	100
Gravel, Fine	**No.10 (2.00 mm)**	0.0000	100
Sand, Very Coarse	**No.20 (0.850 mm)**	0.7527	98.5
Sand, Coarse	**No.40 (0.425 mm)**	0.7509	97.0
Sand, Medium	**No.60 (0.250 mm)**	1.1607	94.8
Sand, Fine	**No.140 (0.106 mm)**	2.6983	89.5
Sand, Very Fine	**No.200 (0.0750 mm)**	2.0932	85.4

Silt and Clay
(Hydrometer Analysis)

Particle Diameter	Percent Passing
0.074 mm	85.1
0.005 mm	37.4
0.001 mm	8.93

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	Weston Solutions, Incorporated	**Service Request:**	K0810423
Project:	Lower Rogue River - 451/20405.016.008.0451.00	**Date Collected:**	10/22/2008
Sample Matrix:	Sediment	**Date Received:**	10/24/2008
		Date Analyzed:	10/30/2008

Particle Size Determination
ASTM Method D 422

Sample Name: LRR-OF2-B-05
Lab Code: K0810423-005

Gravel and Sand
(Sieve Analysis)

Description	Sieve Size	Weight (g)	Percent Passing
Gravel	No.3/4"(19.0 mm)	0.0000	100
Gravel	No.3/8"(9.50 mm)	0.0000	100
Gravel, Medium	No.4 (4.75 mm)	0.0000	100
Gravel, Fine	No.10 (2.00 mm)	0.0000	100
Sand, Very Coarse	No.20 (0.850 mm)	0.4937	99.0
Sand, Coarse	No.40 (0.425 mm)	0.4325	98.2
Sand, Medium	No.60 (0.250 mm)	0.4522	97.3
Sand, Fine	No.140 (0.106 mm)	2.5707	92.2
Sand, Very Fine	No.200 (0.0750 mm)	2.2057	87.8

Silt and Clay
(Hydrometer Analysis)

Particle Diameter	Percent Passing
0.074 mm	85.0
0.005 mm	24.0
0.001 mm	0.00

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	Weston Solutions, Incorporated	**Service Request:**	K0810423
Project:	Lower Rogue River - 451/20405.016.008.0451.00	**Date Collected:**	10/22/2008
Sample Matrix:	Sediment	**Date Received:**	10/24/2008
		Date Analyzed:	10/30/2008

Particle Size Determination
ASTM Method D 422

Sample Name: LRR-HS5-A-01
Lab Code: K0810423-011

Gravel and Sand
(Sieve Analysis)

Description	Sieve Size	Weight (g)	Percent Passing
Gravel	No.3/4"(19.0 mm)	0.0000	100
Gravel	No.3/8"(9.50 mm)	0.0000	100
Gravel, Medium	No.4 (4.75 mm)	0.0000	100
Gravel, Fine	No.10 (2.00 mm)	0.0000	100
Sand, Very Coarse	No.20 (0.850 mm)	0.1488	99.7
Sand, Coarse	No.40 (0.425 mm)	0.4236	98.9
Sand, Medium	No.60 (0.250 mm)	1.2647	96.3
Sand, Fine	No.140 (0.106 mm)	4.2325	87.9
Sand, Very Fine	No.200 (0.0750 mm)	2.0631	83.8

Silt and Clay
(Hydrometer Analysis)

Particle Diameter	Percent Passing
0.074 mm	81.8
0.005 mm	28.8
0.001 mm	0.00

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	Weston Solutions, Incorporated	**Service Request:**	K0810423
Project:	Lower Rogue River - 451/20405.016.008.0451.00	**Date Collected:**	10/23/2008
Sample Matrix:	Sediment	**Date Received:**	10/24/2008
		Date Analyzed:	10/30/2008

Particle Size Determination
ASTM Method D 422

Sample Name: LRR-HS5-A-02
Lab Code: K0810423-012

Gravel and Sand
(Sieve Analysis)

Description	Sieve Size	Weight (g)	Percent Passing
Gravel	**No.3/4"(19.0 mm)**	0.0000	100
Gravel	**No.3/8"(9.50 mm)**	0.0000	100
Gravel, Medium	**No.4 (4.75 mm)**	0.0000	100
Gravel, Fine	**No.10 (2.00 mm)**	0.1649	99.7
Sand, Very Coarse	**No.20 (0.850 mm)**	0.4300	98.8
Sand, Coarse	**No.40 (0.425 mm)**	1.1020	96.6
Sand, Medium	**No.60 (0.250 mm)**	0.8966	94.9
Sand, Fine	**No.140 (0.106 mm)**	2.9095	89.1
Sand, Very Fine	**No.200 (0.0750 mm)**	1.2034	86.7

Silt and Clay
(Hydrometer Analysis)

Particle Diameter	Percent Passing
0.074 mm	86.4
0.005 mm	27.9
0.001 mm	0.00

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	Weston Solutions, Incorporated	**Service Request:**	K0810423
Project:	Lower Rogue River - 451/20405.016.008.0451.00	**Date Collected:**	10/23/2008
Sample Matrix:	Sediment	**Date Received:**	10/24/2008
		Date Analyzed:	10/30/2008

Particle Size Determination
ASTM Method D 422

Sample Name: LRR-HS5-A-02-FS
Lab Code: K0810423-013

Gravel and Sand
(Sieve Analysis)

Description	Sieve Size	Weight (g)	Percent Passing
Gravel	**No.3/4"(19.0 mm)**	0.0000	100
Gravel	**No.3/8"(9.50 mm)**	0.0000	100
Gravel, Medium	**No.4 (4.75 mm)**	0.0000	100
Gravel, Fine	**No.10 (2.00 mm)**	0.0000	100
Sand, Very Coarse	**No.20 (0.850 mm)**	0.0754	99.9
Sand, Coarse	**No.40 (0.425 mm)**	0.4857	98.9
Sand, Medium	**No.60 (0.250 mm)**	0.8868	97.2
Sand, Fine	**No.140 (0.106 mm)**	3.1347	91.1
Sand, Very Fine	**No.200 (0.0750 mm)**	1.4857	88.2

Silt and Clay
(Hydrometer Analysis)

Particle Diameter	Percent Passing
0.074 mm	87.8
0.005 mm	30.8
0.001 mm	0.00

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	Weston Solutions, Incorporated	**Service Request:**	K0810423
Project:	Lower Rogue River - 451/20405.016.008.0451.00	**Date Collected:**	10/23/2008
Sample Matrix:	Sediment	**Date Received:**	10/24/2008
		Date Analyzed:	10/30/2008

Particle Size Determination
ASTM Method D 422

Sample Name: LRR-HS5-A-03
Lab Code: K0810423-014

Gravel and Sand
(Sieve Analysis)

Description	Sieve Size	Weight (g)	Percent Passing
Gravel	No.3/4"(19.0 mm)	0.0000	100
Gravel	No.3/8"(9.50 mm)	0.0000	100
Gravel, Medium	No.4 (4.75 mm)	0.0000	100
Gravel, Fine	No.10 (2.00 mm)	0.0000	100
Sand, Very Coarse	No.20 (0.850 mm)	0.2379	99.5
Sand, Coarse	No.40 (0.425 mm)	0.8600	97.9
Sand, Medium	No.60 (0.250 mm)	1.0718	95.8
Sand, Fine	No.140 (0.106 mm)	3.2457	89.5
Sand, Very Fine	No.200 (0.0750 mm)	1.1934	87.1

Silt and Clay
(Hydrometer Analysis)

Particle Diameter	Percent Passing
0.074 mm	85.7
0.005 mm	35.8
0.001 mm	5.92

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	Weston Solutions, Incorporated	**Service Request:**	K0810463
Project:	Lower Rogue River - 451/20405.016.008.0451.00	**Date Collected:**	10/23/2008
Sample Matrix:	Sediment	**Date Received:**	10/25/2008
		Date Analyzed:	10/27/2008

Particle Size Determination
ASTM Method D 422

Sample Name: LRR-HS4-B-01
Lab Code: K0810463-007

Gravel and Sand
(Sieve Analysis)

Description	Sieve Size	Weight (g)	Percent Passing
Gravel	No.3/4"(19.0 mm)	0.0000	100
Gravel	No.3/8"(9.50 mm)	0.0000	100
Gravel, Medium	No.4 (4.75 mm)	0.3853	98.6
Gravel, Fine	No.10 (2.00 mm)	0.5655	96.6
Sand, Very Coarse	No.20 (0.850 mm)	0.9786	93.1
Sand, Coarse	No.40 (0.425 mm)	1.4801	87.8
Sand, Medium	No.60 (0.250 mm)	3.7534	74.3
Sand, Fine	No.140 (0.106 mm)	2.9450	63.7
Sand, Very Fine	No.200 (0.0750 mm)	0.7429	61.0

Silt and Clay
(Hydrometer Analysis)

Particle Diameter	Percent Passing
0.074 mm	61.9
0.005 mm	32.3
0.001 mm	14.7

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	Weston Solutions, Incorporated	**Service Request:**	K0810463
Project:	Lower Rogue River - 451/20405.016.008.0451.00	**Date Collected:**	10/23/2008
Sample Matrix:	Sediment	**Date Received:**	10/25/2008
		Date Analyzed:	10/27/2008

Particle Size Determination
ASTM Method D 422

Sample Name: LRR-HS4-B-01
Lab Code: K0810463-007DUP

Gravel and Sand
(Sieve Analysis)

Description	Sieve Size	Weight (g)	Percent Passing
Gravel	No.3/4"(19.0 mm)	0.0000	100
Gravel	No.3/8"(9.50 mm)	0.0000	100
Gravel, Medium	No.4 (4.75 mm)	0.9332	97.2
Gravel, Fine	No.10 (2.00 mm)	0.7604	94.9
Sand, Very Coarse	No.20 (0.850 mm)	1.0415	91.7
Sand, Coarse	No.40 (0.425 mm)	1.6476	86.7
Sand, Medium	No.60 (0.250 mm)	2.6895	78.5
Sand, Fine	No.140 (0.106 mm)	3.3991	68.2
Sand, Very Fine	No.200 (0.0750 mm)	0.9712	65.2

Silt and Clay
(Hydrometer Analysis)

Particle Diameter	Percent Passing
0.074 mm	65.3
0.005 mm	26.2
0.001 mm	2.77

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	Weston Solutions, Incorporated	**Service Request:**	K0810463
Project:	Lower Rogue River - 451/20405.016.008.0451.00	**Date Collected:**	10/23/2008
Sample Matrix:	Sediment	**Date Received:**	10/25/2008
		Date Analyzed:	10/27/2008

Particle Size Determination
ASTM Method D 422

Sample Name: LRR-HS4-B-02
Lab Code: K0810463-008

Gravel and Sand
(Sieve Analysis)

Description	Sieve Size	Weight (g)	Percent Passing
Gravel	No.3/4"(19.0 mm)	0.0000	100
Gravel	No.3/8"(9.50 mm)	0.0000	100
Gravel, Medium	No.4 (4.75 mm)	0.0000	100
Gravel, Fine	No.10 (2.00 mm)	0.0000	100
Sand, Very Coarse	No.20 (0.850 mm)	1.0520	98.4
Sand, Coarse	No.40 (0.425 mm)	2.9461	93.7
Sand, Medium	No.60 (0.250 mm)	4.4214	86.8
Sand, Fine	No.140 (0.106 mm)	4.9782	79.0
Sand, Very Fine	No.200 (0.0750 mm)	1.7354	76.3

Silt and Clay
(Hydrometer Analysis)

Particle Diameter	Percent Passing
0.074 mm	75.4
0.005 mm	33.8
0.001 mm	8.98

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	Weston Solutions, Incorporated	**Service Request:**	K0810463
Project:	Lower Rogue River - 451/20405.016.008.0451.00	**Date Collected:**	10/23/2008
Sample Matrix:	Sediment	**Date Received:**	10/25/2008
		Date Analyzed:	10/27/2008

Particle Size Determination
ASTM Method D 422

Sample Name: LRR-HS4-B-03
Lab Code: K0810463-009

Gravel and Sand
(Sieve Analysis)

Description	Sieve Size	Weight (g)	Percent Passing
Gravel	No.3/4"(19.0 mm)	0.0000	100
Gravel	No.3/8"(9.50 mm)	0.0000	100
Gravel, Medium	No.4 (4.75 mm)	2.9304	96.7
Gravel, Fine	No.10 (2.00 mm)	2.3903	94.0
Sand, Very Coarse	No.20 (0.850 mm)	2.9404	90.7
Sand, Coarse	No.40 (0.425 mm)	2.6867	87.6
Sand, Medium	No.60 (0.250 mm)	3.5729	83.6
Sand, Fine	No.140 (0.106 mm)	7.2661	75.3
Sand, Very Fine	No.200 (0.0750 mm)	2.5884	72.4

Silt and Clay
(Hydrometer Analysis)

Particle Diameter	Percent Passing
0.074 mm	69.1
0.005 mm	17.0
0.001 mm	0.00

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	Weston Solutions, Incorporated	**Service Request:**	K0810465
Project:	Lower Rogue River - 451/20405.016.008.0451.00	**Date Collected:**	10/23/2008
Sample Matrix:	Sediment	**Date Received:**	10/25/2008
		Date Analyzed:	10/27/2008

Particle Size Determination
ASTM Method D 422

Sample Name: LRR-OBC-B-01
Lab Code: K0810465-004

Gravel and Sand
(Sieve Analysis)

Description	Sieve Size	Weight (g)	Percent Passing
Gravel	No.3/4"(19.0 mm)	0.0000	100
Gravel	No.3/8"(9.50 mm)	0.0000	100
Gravel, Medium	No.4 (4.75 mm)	0.2053	99.7
Gravel, Fine	No.10 (2.00 mm)	1.4066	97.7
Sand, Very Coarse	No.20 (0.850 mm)	3.1940	93.1
Sand, Coarse	No.40 (0.425 mm)	4.5219	86.6
Sand, Medium	No.60 (0.250 mm)	8.5691	74.3
Sand, Fine	No.140 (0.106 mm)	21.2624	43.6
Sand, Very Fine	No.200 (0.0750 mm)	3.2202	39.0

Silt and Clay
(Hydrometer Analysis)

Particle Diameter	Percent Passing
0.074 mm	41.6
0.005 mm	7.68
0.001 mm	0.00

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: Weston Solutions, Incorporated
Project: Lower Rogue River - 451/20405.016.008.0451.00
Sample Matrix: Sediment

Service Request: K0810465
Date Collected: 10/23/2008
Date Received: 10/25/2008
Date Analyzed: 10/27/2008

Particle Size Determination
ASTM Method D 422

Sample Name: LRR-OBC-B-01
Lab Code: K0810465-004DUP

Gravel and Sand
(Sieve Analysis)

Description	Sieve Size	Weight (g)	Percent Passing
Gravel	No.3/4"(19.0 mm)	0.0000	100
Gravel	No.3/8"(9.50 mm)	0.0000	100
Gravel, Medium	No.4 (4.75 mm)	0.1181	99.8
Gravel, Fine	No.10 (2.00 mm)	0.7783	98.8
Sand, Very Coarse	No.20 (0.850 mm)	3.6094	93.7
Sand, Coarse	No.40 (0.425 mm)	5.0458	86.5
Sand, Medium	No.60 (0.250 mm)	9.8615	72.6
Sand, Fine	No.140 (0.106 mm)	23.0346	40.0
Sand, Very Fine	No.200 (0.0750 mm)	3.3282	35.3

Silt and Clay
(Hydrometer Analysis)

Particle Diameter	Percent Passing
0.074 mm	36.6
0.005 mm	16.1
0.001 mm	3.90

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	Weston Solutions, Incorporated	**Service Request:**	K0810465
Project:	Lower Rogue River - 451/20405.016.008.0451.00	**Date Collected:**	10/23/2008
Sample Matrix:	Sediment	**Date Received:**	10/25/2008
		Date Analyzed:	10/27/2008

Particle Size Determination
ASTM Method D 422

Sample Name: LRR-OBC-B-02
Lab Code: K0810465-005

Gravel and Sand
(Sieve Analysis)

Description	Sieve Size	Weight (g)	Percent Passing
Gravel	No.3/4"(19.0 mm)	0.0000	100
Gravel	No.3/8"(9.50 mm)	0.5820	99.2
Gravel, Medium	No.4 (4.75 mm)	0.3807	98.7
Gravel, Fine	No.10 (2.00 mm)	1.3303	96.8
Sand, Very Coarse	No.20 (0.850 mm)	3.7954	91.5
Sand, Coarse	No.40 (0.425 mm)	4.1012	85.7
Sand, Medium	No.60 (0.250 mm)	7.2001	75.6
Sand, Fine	No.140 (0.106 mm)	14.8412	54.7
Sand, Very Fine	No.200 (0.0750 mm)	2.6753	51.0

Silt and Clay
(Hydrometer Analysis)

Particle Diameter	Percent Passing
0.074 mm	50.7
0.005 mm	14.2
0.001 mm	0.00

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	Weston Solutions, Incorporated	**Service Request:**	K0810465
Project:	Lower Rogue River - 451/20405.016.008.0451.00	**Date Collected:**	10/23/2008
Sample Matrix:	Sediment	**Date Received:**	10/25/2008
		Date Analyzed:	10/27/2008

Particle Size Determination
ASTM Method D 422

Sample Name: LRR-OBC-B-03
Lab Code: K0810465-006

Gravel and Sand
(Sieve Analysis)

Description	Sieve Size	Weight (g)	Percent Passing
Gravel	No.3/4"(19.0 mm)	0.0000	100
Gravel	No.3/8"(9.50 mm)	0.0000	100
Gravel, Medium	No.4 (4.75 mm)	0.0000	100
Gravel, Fine	No.10 (2.00 mm)	0.4885	99.4
Sand, Very Coarse	No.20 (0.850 mm)	0.5306	98.8
Sand, Coarse	No.40 (0.425 mm)	0.4074	98.3
Sand, Medium	No.60 (0.250 mm)	0.5829	97.7
Sand, Fine	No.140 (0.106 mm)	1.2138	96.2
Sand, Very Fine	No.200 (0.0750 mm)	0.5495	95.6

Silt and Clay
(Hydrometer Analysis)

Particle Diameter	Percent Passing
0.074 mm	95.5
0.005 mm	50.1
0.001 mm	22.9

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	Weston Solutions, Incorporated	**Service Request:**	K0904268
Project:	Lower Rogue River - 451/20405.016.008.0451.00	**Date Collected:**	5/11/2009
Sample Matrix:	Sediment	**Date Received:**	5/13/2009
		Date Analyzed:	5/20/2009

Particle Size Determination
ASTM Method D 422

Sample Name: LRR-HS6-B-01
Lab Code: K0904268-004

Gravel and Sand
(Sieve Analysis)

Description	Sieve Size	Weight (g)	Percent Passing
Gravel	**No.3/4"(19.0 mm)**	0.0000	100
Gravel	**No.3/8"(9.50 mm)**	0.0000	100
Gravel, Medium	**No.4 (4.75 mm)**	0.0000	100
Gravel, Fine	**No.10 (2.00 mm)**	0.0000	100
Sand, Very Coarse	**No.20 (0.850 mm)**	0.8985	98.2
Sand, Coarse	**No.40 (0.425 mm)**	1.7368	94.8
Sand, Medium	**No.60 (0.250 mm)**	2.6183	89.6
Sand, Fine	**No.140 (0.106 mm)**	9.5713	70.7
Sand, Very Fine	**No.200 (0.0750 mm)**	3.8681	63.1

Silt and Clay
(Hydrometer Analysis)

Particle Diameter	Percent Passing
0.074 mm	63.9
0.005 mm	22.0
0.001 mm	0.00

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	Weston Solutions, Incorporated	**Service Request:**	K0904268
Project:	Lower Rogue River - 451/20405.016.008.0451.00	**Date Collected:**	5/11/2009
Sample Matrix:	Sediment	**Date Received:**	5/13/2009
		Date Analyzed:	5/20/2009

Particle Size Determination
ASTM Method D 422

Sample Name: LRR-HS6-B-02
Lab Code: K0904268-005

Gravel and Sand
(Sieve Analysis)

Description	Sieve Size	Weight (g)	Percent Passing
Gravel	No.3/4"(19.0 mm)	0.0000	100
Gravel	No.3/8"(9.50 mm)	0.0000	100
Gravel, Medium	No.4 (4.75 mm)	2.1248	96.2
Gravel, Fine	No.10 (2.00 mm)	4.0114	89.0
Sand, Very Coarse	No.20 (0.850 mm)	6.1034	78.1
Sand, Coarse	No.40 (0.425 mm)	7.7167	64.3
Sand, Medium	No.60 (0.250 mm)	7.2016	51.4
Sand, Fine	No.140 (0.106 mm)	13.7606	26.7
Sand, Very Fine	No.200 (0.0750 mm)	0.6420	25.6

Silt and Clay
(Hydrometer Analysis)

Particle Diameter	Percent Passing
0.074 mm	24.8
0.005 mm	0.00
0.001 mm	0.00

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: Weston Solutions, Incorporated
Project: Lower Rogue River - 451/20405.016.008.0451.00
Sample Matrix: Sediment

Service Request: K0904268
Date Collected: 5/11/2009
Date Received: 5/13/2009
Date Analyzed: 5/20/2009

Particle Size Determination
ASTM Method D 422

Sample Name: LRR-HS6-B-03
Lab Code: K0904268-006

Gravel and Sand
(Sieve Analysis)

Description	Sieve Size	Weight (g)	Percent Passing
Gravel	No.3/4"(19.0 mm)	0.0000	100
Gravel	No.3/8"(9.50 mm)	0.0000	100
Gravel, Medium	No.4 (4.75 mm)	0.0000	100
Gravel, Fine	No.10 (2.00 mm)	0.0000	100
Sand, Very Coarse	No.20 (0.850 mm)	0.6140	98.8
Sand, Coarse	No.40 (0.425 mm)	0.5967	97.6
Sand, Medium	No.60 (0.250 mm)	0.6020	96.4
Sand, Fine	No.140 (0.106 mm)	1.0247	94.4
Sand, Very Fine	No.200 (0.0750 mm)	0.4408	93.5

Silt and Clay
(Hydrometer Analysis)

Particle Diameter	Percent Passing
0.074 mm	93.2
0.005 mm	69.8
0.001 mm	55.9

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	Weston Solutions, Incorporated	**Service Request:**	K0904301
Project:	Lower Rogue River - 451/20405.016.008.0451.00	**Date Collected:**	5/12/2009
Sample Matrix:	Sediment	**Date Received:**	5/14/2009
		Date Analyzed:	5/20/2009

Particle Size Determination
ASTM Method D 422

Sample Name: LRR-HS6-F-01-DP
Lab Code: K0904301-006

Gravel and Sand
(Sieve Analysis)

Description	Sieve Size	Weight (g)	Percent Passing
Gravel	No.3/4"(19.0 mm)	0.0000	100
Gravel	No.3/8"(9.50 mm)	10.8251	88.5
Gravel, Medium	No.4 (4.75 mm)	4.4270	83.9
Gravel, Fine	No.10 (2.00 mm)	5.3038	78.3
Sand, Very Coarse	No.20 (0.850 mm)	10.1337	67.5
Sand, Coarse	No.40 (0.425 mm)	7.3510	59.8
Sand, Medium	No.60 (0.250 mm)	11.5010	47.6
Sand, Fine	No.140 (0.106 mm)	12.7870	34.1
Sand, Very Fine	No.200 (0.0750 mm)	2.2998	31.7

Silt and Clay
(Hydrometer Analysis)

Particle Diameter	Percent Passing
0.074 mm	31.7
0.005 mm	2.92
0.001 mm	0.00

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: Weston Solutions, Incorporated
Project: Lower Rogue River - 451/20405.016.008.0451.00
Sample Matrix: Sediment

Service Request: K0904301
Date Collected: 5/12/2009
Date Received: 5/14/2009
Date Analyzed: 5/20/2009

Particle Size Determination
ASTM Method D 422

Sample Name: LRR-HS6-F-01
Lab Code: K0904301-005

Gravel and Sand
(Sieve Analysis)

Description	Sieve Size	Weight (g)	Percent Passing
Gravel	No.3/4"(19.0 mm)	0.0000	100
Gravel	No.3/8"(9.50 mm)	4.0966	91.9
Gravel, Medium	No.4 (4.75 mm)	2.4499	87.1
Gravel, Fine	No.10 (2.00 mm)	2.5102	82.2
Sand, Very Coarse	No.20 (0.850 mm)	2.0649	78.1
Sand, Coarse	No.40 (0.425 mm)	2.7458	72.7
Sand, Medium	No.60 (0.250 mm)	7.6241	57.6
Sand, Fine	No.140 (0.106 mm)	8.7582	40.3
Sand, Very Fine	No.200 (0.0750 mm)	0.5326	39.3

Silt and Clay
(Hydrometer Analysis)

Particle Diameter	Percent Passing
0.074 mm	36.6
0.005 mm	0.00
0.001 mm	0.00

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	Weston Solutions, Incorporated	**Service Request:**	K0904356
Project:	Lower Rogue River - 451/20405.016.008.0451.00	**Date Collected:**	5/13/2009
Sample Matrix:	Sediment	**Date Received:**	5/15/2009
		Date Analyzed:	5/20/2009

Particle Size Determination
ASTM Method D 422

Sample Name: LRR-HS6-DOWN2-01
Lab Code: K0904356-014

Gravel and Sand
(Sieve Analysis)

Description	Sieve Size	Weight (g)	Percent Passing
Gravel	No.3/4"(19.0 mm)	4.4527	92.6
Gravel	No.3/8"(9.50 mm)	5.3506	83.7
Gravel, Medium	No.4 (4.75 mm)	9.2790	68.4
Gravel, Fine	No.10 (2.00 mm)	3.5634	62.4
Sand, Very Coarse	No.20 (0.850 mm)	6.5648	51.5
Sand, Coarse	No.40 (0.425 mm)	2.6494	47.1
Sand, Medium	No.60 (0.250 mm)	1.7769	44.2
Sand, Fine	No.140 (0.106 mm)	1.7706	41.2
Sand, Very Fine	No.200 (0.0750 mm)	0.5678	40.3

Silt and Clay
(Hydrometer Analysis)

Particle Diameter	Percent Passing
0.074 mm	38.0
0.005 mm	10.7
0.001 mm	0.00

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	Weston Solutions, Incorporated	**Service Request:**	K0904451
Project:	Lower Rogue River - 451/20405.016.008.0451.00	**Date Collected:**	5/16/2009
Sample Matrix:	Sediment	**Date Received:**	5/19/2009
		Date Analyzed:	5/20/2009

Particle Size Determination
ASTM Method D 422

Sample Name: LRR-HS3-A-01
Lab Code: K0904451-002

Gravel and Sand
(Sieve Analysis)

Description	Sieve Size	Weight (g)	Percent Passing
Gravel	No.3/4"(19.0 mm)	0.0000	100
Gravel	No.3/8"(9.50 mm)	0.0000	100
Gravel, Medium	No.4 (4.75 mm)	0.0000	100
Gravel, Fine	No.10 (2.00 mm)	0.0000	100
Sand, Very Coarse	No.20 (0.850 mm)	0.3135	99.4
Sand, Coarse	No.40 (0.425 mm)	0.6327	98.1
Sand, Medium	No.60 (0.250 mm)	0.8146	96.5
Sand, Fine	No.140 (0.106 mm)	2.5101	91.5
Sand, Very Fine	No.200 (0.0750 mm)	1.3883	88.7

Silt and Clay
(Hydrometer Analysis)

Particle Diameter	Percent Passing
0.074 mm	88.0
0.005 mm	23.8
0.001 mm	0.00

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: Weston Solutions, Incorporated
Project: Lower Rogue River - 451/20405.016.008.0451.00
Sample Matrix: Sediment

Service Request: K0904451
Date Collected: 5/16/2009
Date Received: 5/19/2009
Date Analyzed: 5/20/2009

Particle Size Determination
ASTM Method D 422

Sample Name: LRR-HS3-A-01-FS
Lab Code: K0904451-004

Gravel and Sand
(Sieve Analysis)

Description	Sieve Size	Weight (g)	Percent Passing
Gravel	No.3/4"(19.0 mm)	0.0000	100
Gravel	No.3/8"(9.50 mm)	0.0000	100
Gravel, Medium	No.4 (4.75 mm)	0.0000	100
Gravel, Fine	No.10 (2.00 mm)	0.0000	100
Sand, Very Coarse	No.20 (0.850 mm)	0.1403	99.7
Sand, Coarse	No.40 (0.425 mm)	0.5790	98.6
Sand, Medium	No.60 (0.250 mm)	0.8420	96.9
Sand, Fine	No.140 (0.106 mm)	2.6640	91.6
Sand, Very Fine	No.200 (0.0750 mm)	1.6753	88.3

Silt and Clay
(Hydrometer Analysis)

Particle Diameter	Percent Passing
0.074 mm	88.7
0.005 mm	26.1
0.001 mm	0.00

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	Weston Solutions, Incorporated	**Service Request:**	K0904451
Project:	Lower Rogue River - 451/20405.016.008.0451.00	**Date Collected:**	5/16/2009
Sample Matrix:	Sediment	**Date Received:**	5/19/2009
		Date Analyzed:	5/20/2009

Particle Size Determination
ASTM Method D 422

Sample Name: LRR-HS3-A-02
Lab Code: K0904451-005

Gravel and Sand
(Sieve Analysis)

Description	Sieve Size	Weight (g)	Percent Passing
Gravel	No.3/4"(19.0 mm)	0.0000	100
Gravel	No.3/8"(9.50 mm)	0.0000	100
Gravel, Medium	No.4 (4.75 mm)	0.0000	100
Gravel, Fine	No.10 (2.00 mm)	0.0000	100
Sand, Very Coarse	No.20 (0.850 mm)	0.2228	99.6
Sand, Coarse	No.40 (0.425 mm)	0.3850	98.8
Sand, Medium	No.60 (0.250 mm)	1.0553	96.7
Sand, Fine	No.140 (0.106 mm)	2.7862	91.0
Sand, Very Fine	No.200 (0.0750 mm)	1.4393	88.1

Silt and Clay
(Hydrometer Analysis)

Particle Diameter	Percent Passing
0.074 mm	88.8
0.005 mm	29.2
0.001 mm	0.00

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: Weston Solutions, Incorporated
Project: Lower Rogue River - 451/20405.016.008.0451.00
Sample Matrix: Sediment

Service Request: K0904451
Date Collected: 5/16/2009
Date Received: 5/19/2009
Date Analyzed: 5/20/2009

Particle Size Determination
ASTM Method D 422

Sample Name: LRR-HS3-A-02-DP
Lab Code: K0904451-006

Gravel and Sand
(Sieve Analysis)

Description	Sieve Size	Weight (g)	Percent Passing
Gravel	No.3/4"(19.0 mm)	0.0000	100
Gravel	No.3/8"(9.50 mm)	0.0000	100
Gravel, Medium	No.4 (4.75 mm)	0.0000	100
Gravel, Fine	No.10 (2.00 mm)	0.0000	100
Sand, Very Coarse	No.20 (0.850 mm)	0.5166	99.0
Sand, Coarse	No.40 (0.425 mm)	1.3814	96.2
Sand, Medium	No.60 (0.250 mm)	1.7102	92.8
Sand, Fine	No.140 (0.106 mm)	2.8556	87.1
Sand, Very Fine	No.200 (0.0750 mm)	1.1268	84.8

Silt and Clay
(Hydrometer Analysis)

Particle Diameter	Percent Passing
0.074 mm	82.4
0.005 mm	23.6
0.001 mm	0.00

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: Weston Solutions, Incorporated
Project: Lower Rogue River - 451/20405.016.008.0451.00
Sample Matrix: Sediment

Service Request: K0904451
Date Collected: 5/16/2009
Date Received: 5/19/2009
Date Analyzed: 5/20/2009

Particle Size Determination
ASTM Method D 422

Sample Name: LRR-HS3-A-03
Lab Code: K0904451-007

Gravel and Sand
(Sieve Analysis)

Description	Sieve Size	Weight (g)	Percent Passing
Gravel	No.3/4"(19.0 mm)	0.0000	100
Gravel	No.3/8"(9.50 mm)	0.0000	100
Gravel, Medium	No.4 (4.75 mm)	0.0000	100
Gravel, Fine	No.10 (2.00 mm)	0.0000	100
Sand, Very Coarse	No.20 (0.850 mm)	0.1760	99.6
Sand, Coarse	No.40 (0.425 mm)	0.7172	98.2
Sand, Medium	No.60 (0.250 mm)	0.7842	96.6
Sand, Fine	No.140 (0.106 mm)	2.4510	91.7
Sand, Very Fine	No.200 (0.0750 mm)	1.4102	88.9

Silt and Clay
(Hydrometer Analysis)

Particle Diameter	Percent Passing
0.074 mm	89.4
0.005 mm	30.5
0.001 mm	0.00

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	Weston Solutions, Incorporated	**Service Request:**	K0904454
Project:	Lower Rogue River - 451/20405.016.008.0451.00	**Date Collected:**	5/16/2009
Sample Matrix:	Sediment	**Date Received:**	5/19/2009
		Date Analyzed:	5/29/2009

Particle Size Determination
ASTM Method D 422

Sample Name: LRR-ZIC-C-01-TOX
Lab Code: K0904454-009

Gravel and Sand
(Sieve Analysis)

Description	Sieve Size	Weight (g)	Percent Passing
Gravel	No.3/4"(19.0 mm)	0.0000	100
Gravel	No.3/8"(9.50 mm)	0.0000	100
Gravel, Medium	No.4 (4.75 mm)	0.4546	99.1
Gravel, Fine	No.10 (2.00 mm)	1.9012	95.3
Sand, Very Coarse	No.20 (0.850 mm)	1.8921	91.5
Sand, Coarse	No.40 (0.425 mm)	1.0572	89.4
Sand, Medium	No.60 (0.250 mm)	1.0517	87.3
Sand, Fine	No.140 (0.106 mm)	1.9378	83.5
Sand, Very Fine	No.200 (0.0750 mm)	0.6463	82.2

Silt and Clay
(Hydrometer Analysis)

Particle Diameter	Percent Passing
0.074 mm	81.5
0.005 mm	49.0
0.001 mm	29.6

Weston Solutions, Inc.
20 North Wacker Drive, Suite 1210
Chicago, IL 60606
(312) 424-3300 ● Fax: (312) 424-3330
www.westonsolutions.com

The Trusted Integrator for Sustainable Solutions

December 4, 2009

Ms. Diana Mally
Great Lakes National Program Office
United States Environmental Protection Agency, Region V
77 West Jackson Boulevard, Mail Code: G-17J
Chicago, Illinois 60604-3507

Re: Data Review of Acid Volatile Sulfide (AVS) and Simultaneously Extracted Metals (SEM) Analysis
For Sediment Samples Collected in October 2008 and May 2009
Lower Rouge River Sediment Investigation
Detroit, Wayne County, Michigan
Technical Direction Document Number: S05-0008-0805-012
Document Control Number: 451-2A-AEQA
Work Order Number: 20405.012.008.0451.00

Dear Ms. Mally:

The United States Environmental Protection Agency (U.S. EPA) tasked Weston Solutions, Inc., (WESTON®) to perform data validation for sediment samples collected from October 21, 2008, to May 16, 2009 for the Great Lakes National Program Office Lower Rouge River Sediment Investigation (LRR) Site. This data review is for AVS and SEM analysis of 14 sediment samples that includes one field replicate sample that were collected by the WESTON Superfund Technical Assessment and Response Team (START). The samples were validated in accordance with the "Quality Assurance Project Plan (QAPP), Lower Rouge River Sediment Investigation" dated October 17, 2008, which included using the U.S. EPA Contract Laboratory Program National Functional Guidance for Organic Data Review. Table 1 provides a summary of the samples included in this review. All tables are presented at the end of this report.

The samples listed in Table 1 were analyzed by Columbia Analytical Services (CAS) located in Kelso, Washington under the following nine work orders:

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- K0810413
- K0810422
- K0810423
- K0810463
- K0810465
- K0904301
- K0904356
- K0904451
- K0904454

The samples were analyzed for AVS using U.S. EPA Method 821/R-91-100 and for SEM using U.S. EPA Method 821/R-91-100 and SW-846 Method 6010B. Table 2 summarizes the SEMs that were analyzed. Data validation was performed for each work order. CAS provided WESTON with a Staged Electronic Data Deliverable that was used in conjunction with the Automated Data Review (ADR) software to assist in reviewing the data.

Attachment A to this report contains the individual Quality Assurance/Quality Control (QA/QC) Analysis Checklist for Sediment Chemistry Analysis for each work order. Attachment B to this report contains a printed report from ADR that provides a summary of results with applied data qualifiers. The QC limits utilized were those stated in the QAPP. If there was not a QC limit specified in the QAPP, then the method or laboratory-determined QC limits were used. Below is a data review summary.

SUMMARY OF METALS DATA REVIEW

All samples were analyzed within the holding time requirement of 14 days from collection to analysis for AVS, 28 days from collection to analysis for mercury, and 180 days from collection to analysis for all other metals.

For the AVS analyses, the following QC samples were within control limits: method blanks, field replicate, matrix spike (MS), laboratory duplicate samples, and laboratory control samples (LCS). AVS sample results were reported on a dry weight basis.

For the SEM analyses, the following QC samples were within control limits: field replicate, method blanks, continuing calibration verifications (CCV), and interference check samples. All sample results were reported on a dry weight basis.

In the SEM analyses, there were some minor problems with the QC checks. The MS recoveries for one or most metals were outside QC limits. There were minor problems with the serial dilutions for four of the nine work orders which required some qualification of sample results.

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The relative percent differences (RPD) for copper and/or nickel were outside the QC limits in the laboratory duplicates. Below are a description of the minor problems with QC failures and a review of the data quality indicators.

MINOR PROBLEMS

Minor problems with QC failures are noted below.

Laboratory Duplicates. CAS analyzed a total of three laboratory duplicates with all the work orders included in this data summary report. Precision requirements were 20 RPD for metals and 45 RPD for AVS, as stated in the QAPP. A summary of the QC exceedances for the work orders that each of the three laboratory duplicates is associated with is summarized below.

- Work Orders K0810413, K0810422, K0810423, K0810463, and K0810465. There was one laboratory duplicate associated with these five work orders. The RPD QC limit of 20 was exceeded for copper only. The RPD for copper was 22.1 percent. All copper results in these five work orders were flagged "J" as estimated due to a minor problem with laboratory precision for this analyte. The RPDs for AVS, cadmium, lead, mercury, nickel, silver, and zinc were less than 20 percent.
- Work Orders K0904301 and K0904356. There was one laboratory duplicate associated with these two work orders. The RPD QC limit of 20 was exceeded for nickel only. The RPD for nickel was 24.1 percent. All nickel results in these two work orders were flagged "J" as estimated due to a minor problem with laboratory precision for this analyte. The RPDs for AVS, cadmium, copper, lead, silver, and zinc were less than 20 percent.
- Work Orders K0904451 and K0904454. There was one laboratory duplicate associated with these two work orders. The RPD QC limit of 20 was exceeded for copper and nickel only. The RPD for copper was 33.8 percent and for nickel was 158.6 percent. All copper and nickel results in these two work orders were flagged "J" as estimated due to a minor problem with laboratory precision for these analytes. The RPDs for AVS, cadmium, lead, silver, and zinc were less than 20 percent.

Matrix Spike Results. There are a total of three MS samples associated with the nine work orders. A summary of the QC exceedances for the work orders that each of the three laboratory duplicates is associated with is summarized below.

- Work Orders K0810413, K0810422, K0810423, K0810463, and K0810465. There was one MS sample associated with these five work orders. The percent recoveries for copper (82.6 percent) and zinc (64.8 percent) were below the QC limits. All copper and zinc results in these five work orders were flagged "J" as estimated due to the possibility of minor matrix interferences.

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- Work Order K0904356. There was one MS sample associated with this work order. The percent recovery for nickel (75.3 percent) was below the QC limit. All nickel results in this work order were flagged "J" as estimated due to the possibility of minor matrix interferences.
- Work Order K0904451. There was one MS sample associated with this work order. The percent recovery for nickel (75.2 percent) and zinc (68.7 percent) were below the QC limits. All nickel and zinc results in this work order were flagged "J" as estimated due to the possibility of minor matrix interferences.

Serial Dilutions. For some of the work orders, the serial dilutions were outside QC limits and required data qualifications. The minor problems for serial dilutions are summarized below by work order.

- Work Order K0904301. The percent difference for the serial dilution exceeded the 10 percent difference QC limit for cadmium, lead, nickel, selenium, and zinc. The following metals required qualification because they were detected at greater than 50 times the detection limit: nickel and zinc in sample LRR-HS6-F-01. The nickel and zinc results were flagged "J" as estimated.
- Work Order K0904356. The percent difference for the serial dilution exceeded the 10 percent difference QC limit for cadmium, lead, nickel, silver, and zinc. The following metal required qualification because it was detected at greater than 50 times the detection limit: cadmium in sample LRR-HS6-DOWN2-01. The cadmium result was flagged "J" as estimated.
- Work Order K0904451. The percent difference for the serial dilution exceeded the 10 percent difference QC limit for cadmium, lead, nickel, and zinc. The following metal required qualification because it was detected at greater than 50 times the detection limit: zinc in samples LRR-HS3-A-01, LRR-HS3-A-01-FS, and LRR-HS3-A-01-R. The zinc results were flagged "J" as estimated.
- Work Order K0904454. The percent difference for the serial dilution exceeded the 10 percent difference QC limit for cadmium, lead, nickel, and zinc. The following metal required qualification because it was detected at greater than 50 times the detection limit: zinc in samples LRR-ZIC-C-01-TOX and LRR-HS1-A-01-R. The zinc results were flagged "J" as estimated.

DATA QUALITY INDICATORS REVIEW

Many the data quality indicators (sensitivity, precision, accuracy, and completeness) were evaluated through the data validation procedures which are summarized above and discussed in detail in the attachments.

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Sensitivity. In several instances, the reporting limits achieved by CAS slightly exceeded the reporting limits stated in the QAPP. In each instance where the reporting limit was exceeded, there was a detection of the analyte in the sample. Therefore, data usability is not affected based on the slight reporting limit exceedances.

Precision. Field precision was evaluated by evaluating the RPDs between field replicate and investigative sample result. There was one field replicate associated with the 13 investigative samples collected for AVS/SEM analyses. The QAPP stated that field replicate samples would be collected at a rate of 5 percent for AVS/SEM analysis. This frequency for field replicate collection was met.

The RPDs for AVS and metals in the one field replicate ranged from 10 to 39 percent which is acceptable. Field precision was evaluated and found to be acceptable. Table 3 summarizes the replicate results and RPDs.

Laboratory precision was determined by evaluating the RPD values between the laboratory duplicate and parent sample results. There were minor problems with laboratory precision. See the more detailed discussion for laboratory duplicates in the previous section. Table 4 summarizes the mean RPDs for laboratory duplicates. The laboratory precision was acceptable for the AVS and SEM analyses except for nickel. The average RPD for nickel was 62 because of one RPD result of 158.6. This one outlier RPD result is specific to the work order in which it was analyzed and is not related to all nickel analyses.

Accuracy. Accuracy is a measure of the agreement between an observed value and an accepted reference value. Laboratory accuracy was evaluated by reviewing the QC criteria for percent recovery for MS and LCS results. The LCS recoveries were within the QC limits for all samples. Some MS recoveries were below the QC limits (see discussion is section above). Table 4 summarizes the accuracy estimates for this project. The mean recoveries for the LCSs and MSs are within the QC limits stated in the QAPP except for the nickel MS mean recovery. The nickel MS mean recovery was 80 percent which is below the QC limit of 87 to 121 percent recovery. This slightly low recovery will not affect data usability. Laboratory accuracy was acceptable. Based on the mean recoveries for both the LCSs and MSs, there appears to be a slightly low bias associated with the AVS and SEM analyses.

Completeness. Completeness is a measure of the amount of valid data obtained compared to the amount of data that was planned to be collected under normal conditions. All sample results were received.

In summary, there were minor problems with QC failures and the data are usable. Table 5 summarizes data qualifiers applied during the data review.

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If there are any questions or comments regarding this report, please do not hesitate to contact WESTON START at 312-424-3300.

Very truly yours,
Weston Solutions, Inc.

Lisa Graczyk
WESTON START Team

Tonya Balla
WESTON START Project Manager

Attachments:

Tables
A - Checklists for AVS/SEM Analytical Data
B - Analytical Data Summary Sheets with Qualifiers

cc: project file

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TABLES

TABLE 1 SAMPLES INCLUDED IN DATA REVIEW			
Sample ID	**Lab ID**	**Date Collected**	**Comment**
LRR-017-A-01	K0810413-001	10/21/2008	
LRR-WJB-A-01	K0810413-009	10/21/2008	
LRR-HS1-A-01	K0810422-001	10/21/2008	
LRR-OF2-B-01	K0810423-001	10/22/2008	
LRR-HS5-A-01	K0810423-011	10/23/2008	
LRR-HS4-B-01	K0810463-007	10/23/2008	
LRR-OBC-B-01	K0810465-004	10/23/2008	
LRR-HS6-F-01	K0904301-005	5/12/2009	
LRR-HS6-DOWN2-01	K0904356-014	5/13/2009	
LRR-HS3-A-01	K0904451-002	5/16/2009	
LRR-HS3-A-01-FS	K0904451-004	5/16/2009	Field replicate of LRR-HS3-A-01
LRR-HS5-A-01-R	K0904451-020	5/15/2009	
LRR-HS1-A-01-R	K0904454-001	5/15/2009	
LRR-ZIC-C-01-TOX	K0904454-009	5/15/2009	

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TABLE 2 METAL ANALYTES	
CAS #	**Analyte**
7440-43-9	Cadmium
7440-50-8	Copper
7439-92-1	Lead
7440-02-0	Nickel
7440-22-4	Silver
7440-66-6	Zinc
7439-97-6	Mercury*

* Mercury was only analyzed for in work orders K0810413, K0810422, K0810423, K0810463, and K0810465.

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TABLE 3 FIELD REPLICATE RESULTS			
	Sample: LRR-HS3-A-01-FS		
Analyte	Sample Result (mg/kg)	Replicate Result (mg/kg)	RPD
Cadmium	1.7	1.5	13
Copper	54	41.8	25
Lead	74.6	54.6	31
Nickel	19.4	17.6	10
Silver	<0.5	<0.4	NA
Zinc	257	221	15
AVS	1130	761	39

Notes:

AVS - Acid Volatile Sulfide
mg/kg - Milligram per Kilogram
NA - Not Applicable
RPD - Relative Percent Difference

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TABLE 4 QUANTITATIVE DATA ASSESSMENT			
	Analytical Precision	**Analytical Accuracy/Bias**	
Parameter	**Laboratory Duplicate RPD (%) (n=3)[1]**	**Mean MS Recovery (%) (n=3)[1]**	**Mean LCS Recovery (%)(n=3)[1]**
Cadmium	2	82	98
Copper	20	88	100
Lead	5	81	97
Nickel	62	80	96
Silver	0	94	97
Zinc	4	76	99
Mercury	0	91	84
AVS	16	98	90

Notes:

[1] n=1 for mercury
LCS - Laboratory Control Sample
MS - Matrix Spike
NA - Not Applicable (both results were non-detect for silver)
RPD - Relative Percent Difference

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TABLE 5 SUMMARY OF DATA QUALIFICATION				
Sample ID	**Sampling Date**	**Analyte**	**Qualification**	**Reason**
Work Order K0810413				
LRR-017-A-01 LRR-WJB-A-01	10/21/2008	Copper	Sample result should be considered estimated.	The RPD in the laboratory duplicate was above the QC limit of 20 indicating a minor problem with laboratory precision.
		Copper, Zinc	Sample result should be considered estimated.	The MS percent recovery was outside the QC limit.
Work Order K0810422				
LRR-HS1-A-01	10/21/2008	Copper	Sample result should be considered estimated.	The RPD in the laboratory duplicate was above the QC limit of 20 indicating a minor problem with laboratory precision.
		Copper, Zinc	Sample result should be considered estimated.	The MS percent recovery was outside the QC limit.
Work Order K0810423				
LRR-HS5-A-01 LRR-OF2-B-01	10/22/2008	Copper	Sample result should be considered estimated.	The RPD in the laboratory duplicate was above the QC limit of 20 indicating a minor problem with laboratory precision.
		Copper, Zinc	Sample result should be considered estimated.	The MS percent recovery was outside the QC limit.
Work Order K0810463				
LRR-HS4-B-01	10/23/2008	Copper	Sample result should be considered estimated.	The RPD in the laboratory duplicate was above the QC limit of 20 indicating a minor problem with laboratory precision.
		Copper, Zinc	Sample result should be considered estimated.	The MS percent recovery was outside the QC limit.

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TABLE 5 SUMMARY OF DATA QUALIFICATION				
Sample ID	**Sampling Date**	**Analyte**	**Qualification**	**Reason**
Work Order K0810465				
LRR-OBC-B-01	10/23/2008	Copper	Sample result should be considered estimated.	The RPD in the laboratory duplicate was above the QC limit of 20 indicating a minor problem with laboratory precision.
		Copper, Zinc	Sample result should be considered estimated.	The MS percent recovery was outside the QC limit.
Work Order K0904301				
LRR-HS6-F-01	05/12/2009	Nickel	Sample result should be considered estimated.	The RPD in the laboratory duplicate was above the QC limit of 20 indicating a minor problem with laboratory precision.
		Zinc	Sample result should be considered estimated.	The percent difference for the serial dilution exceeded the 10 percent difference and the analyte was detected at greater than 50 times the detection limit.
Work Order K0904356				
LRR-HS6-DOWN2-01	05/13/2009	Cadmium	Sample result should be considered estimated.	The percent difference for the serial dilution exceeded the 10 percent difference and the analyte was detected at greater than 50 times the detection limit.
		Nickel	Sample result should be considered estimated.	The RPD in the laboratory duplicate was above the QC limit of 20 indicating a minor problem with laboratory precision.
		Nickel	Sample result should be considered estimated.	The MS percent recovery was outside the QC limit.
Work Order K0904451				

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ATTACHMENT A
CHECKLISTS FOR AVS AND SEM ANALYTICAL DATA

ACID VOLATILE SULFIDE (AVS) BY METHOD 821/R-91-100 AND SIMULTANEOUSLY EXTRACTED METALS (SEM) BY U.S. EPA METHODS SW-846 METHOD 6010B AND 7470A

CAS Work Order #: K0810413

QA/QC Analysis Checklist for Sediment Chemistry Analysis

GRANT/IAG NUMBER: Not Applicable
PROJECT NAME: Lower Rouge River
REVIEWER: Lisa Graczyk, WESTON START
DATE: January 15, 2009

1. What sediment chemistry data has been collected (CHECK ALL THAT APPLY)?

Total Metals ___	PCBs _____	pH _____	TOC _____
Dioxins/Furans _____	PAHs _____	Pesticides _____	DO _____
AVS __X___	SEM Metals _X_	Particle Size _____	Other _____

2. Were the target detection limits met for each parameter?

Yes	X (SEM)	
No	X (AVS)	(EXPLAIN)

The sediment reporting limit for AVS as stated in the QAPP was not met due to sample dilution and high percent moisture.

3. Were the method blanks less than the established MDL for each parameter?

Yes	X	
No		(EXPLAIN)

AVS SEMs were not detected in the method blank above the reporting limit.

4. Did the results of Field Replicate Analysis vary by less than the % RPD specified in the QAPP?

Yes	Not Applicable	
No		(EXPLAIN)

There is no field replicate sample associated with this work order for the AVS analysis.

5. Did the results of the Field Duplicates Analysis vary by less than the % RPD specified in the QAPP?

Yes	Not Applicable	
No		(EXPLAIN)

There is no field duplicate sample associated with this work order for the AVS analysis.

6. Did the surrogate spike/internal standards recoveries meet the limits set forth in the QAPP?

Yes	Not Applicable	
No		(EXPLAIN)

Surrogates and internal standards are not applicable to the AVS and SEM analyses.

7. Did the MS/MSD recoveries meet the limits set forth in the QAPP?

Yes	X (AVS, Cd, Pb, Hg, Ni, and Ag)	
No	X (Cu, Zn)	(EXPLAIN)

The matrix spike (MS) recovery was within the QAPP-specified QC limits for AVS, cadmium, lead, mercury, nickel and silver. Copper had a percent recovery of 82.6 and zinc had a percent recovery of 64.8 in the MS which is below their respective QC limits. The results for copper and zinc in the two sediment samples were flagged "J" as estimated.

8. Did the RPD (%) of the MS/MSD sample set meet the limits set forth in the QAPP?

Yes	Not Applicable	
No		(EXPLAIN)

A matrix spike duplicate (MSD) was not analyzed with the AVS and SEM analyses, therefore, an MS/MSD RPD was not evaluated.

9. Did the LCS recoveries meet the limits set forth in the QAPP?

Yes	X	
No		(EXPLAIN)

The LCS recovery met the QAPP QC limits for the AVS and SEM analyses.

10. Did the calibration verification standards (ICVs and CCVs) meet the requirements set forth in the QAPP?

Yes	X	
No		(EXPLAIN)

The continuing calibration verification (CCV) standards were within QC limits.

11. Did the calibration blanks (ICBs and CCBs) meet the limits set forth in the QAPP?

Yes	X	
No		(EXPLAIN)

Continuing calibration blanks (CCB) contained no detections above the reporting limits.

12. Did the interference check samples meet the limits set forth in the QAPP?

Yes	X	
No		(EXPLAIN)

Interference check samples are not applicable to the AVS method.

13. Did the serial dilution samples meet the limits set forth in the QAPP?

Yes	X	
No		(EXPLAIN)

Serial dilution is not applicable to the AVS method.

14. Were any level of contaminants detected above the MDL for the trip blanks and storage blanks?

Yes	Not Applicable	
No		(EXPLAIN)

15. Did all required analyses take place within the required holding time protocols set forth in the QAPP?

Yes	X	
No		(EXPLAIN)

16. Did the laboratory duplicates vary by less than the % RPD specified in the QAPP?

Yes	X (AVS, Cd, Pb, Ni, Ag, Zn)	
No	X (Cu)	(EXPLAIN)

The RPD for Copper in the laboratory duplicate is 22.1. This is slightly above the QC limit of 20 RPD. Results for copper in the samples was flagged "J" as estimated.

17. Are measured dry-weight contaminant concentrations reported?

Yes	X	
No		(EXPLAIN)

Dry-weight concentrations are reported.

18. Please provide details for all of the "EXPLAIN" marked above. Include details on the specific analytes affected by any QA/QC discrepancies, and recommendations regarding usability of data.

Any items with “EXPLAIN” marked above are described immediately following the “EXPLAIN” marking in the corresponding item above.

The data are acceptable for use as qualified.

ACID VOLATILE SULFIDE (AVS) BY METHOD 821/R-91-100 AND SIMULTANEOUSLY EXTRACTED METALS (SEM) BY U.S. EPA METHODS SW-846 METHOD 6010B AND 7470A

CAS Work Order #: K0810422

QA/QC Analysis Checklist for Sediment Chemistry Analysis

GRANT/IAG NUMBER: Not Applicable
PROJECT NAME: Lower Rouge River
REVIEWER: Lisa Graczyk, WESTON START
DATE: January 19, 2009

1. What sediment chemistry data has been collected (CHECK ALL THAT APPLY)?

Total Metals ___	PCBs _____	pH _____	TOC _____
Dioxins/Furans _____	PAHs _____	Pesticides _____	DO _____
AVS __X___	SEM Metals _X_	Particle Size _____	Other _____

2. Were the target detection limits met for each parameter?

Yes	X (SEM)	
No	X (AVS)	(EXPLAIN)

The sediment reporting limit for AVS as stated in the QAPP was not met due to sample dilution and high percent moisture.

3. Were the method blanks less than the established MDL for each parameter?

Yes	X	
No		(EXPLAIN)

AVS SEMs were not detected in the method blank above the reporting limit.

4. Did the results of Field Replicate Analysis vary by less than the % RPD specified in the QAPP?

Yes	Not Applicable	
No		(EXPLAIN)

There is no field replicate sample associated with this work order for the AVS and SEM analysis.

5. Did the results of the Field Duplicates Analysis vary by less than the % RPD specified in the QAPP?

Yes	Not Applicable	
No		(EXPLAIN)

There is no field duplicate sample associated with this work order for the AVS and SEM analysis.

6. Did the surrogate spike/internal standards recoveries meet the limits set forth in the QAPP?

Yes	Not Applicable	
No		(EXPLAIN)

Surrogates and internal standards are not applicable to the AVS and SEM analyses.

7. Did the MS/MSD recoveries meet the limits set forth in the QAPP?

Yes	X (AVS, Cd, Pb, Hg, Ni, and Ag)	
No	X (Cu, Zn)	(EXPLAIN)

The matrix spike (MS) recovery was within the QAPP-specified QC limits for AVS, cadmium, lead, mercury, nickel and silver. Copper had a percent recovery of 82.6 and zinc had a percent recovery of 64.8 in the MS which is below their respective QC limits. The results for copper and zinc in the two sediment samples were flagged "J" as estimated.

8. Did the RPD (%) of the MS/MSD sample set meet the limits set forth in the QAPP?

Yes	Not Applicable
No	_____ (EXPLAIN)

A matrix spike duplicate (MSD) was not analyzed with the AVS and SEM analyses; therefore, an MS/MSD RPD was not evaluated.

9. Did the LCS recoveries meet the limits set forth in the QAPP?

Yes	X
No	_____ (EXPLAIN)

The LCS recovery met the QAPP QC limits for the AVS and SEM analyses.

10. Did the calibration verification standards (ICVs and CCVs) meet the requirements set forth in the QAPP?

Yes	X
No	_____ (EXPLAIN)

The continuing calibration verification (CCV) standards were within QC limits.

11. Did the calibration blanks (ICBs and CCBs) meet the limits set forth in the QAPP?

Yes	X
No	_____ (EXPLAIN)

Continuing calibration blanks (CCB) contained no detections above the reporting limits.

12. Did the interference check samples meet the limits set forth in the QAPP?

Yes	X
No	_____ (EXPLAIN)

Interference check samples are not applicable to the AVS method.

13. Did the serial dilution samples meet the limits set forth in the QAPP?

Yes	X	
No		(EXPLAIN)

Serial dilution is not applicable to the AVS method.

14. Were any level of contaminants detected above the MDL for the trip blanks and storage blanks?

Yes	Not Applicable	
No		(EXPLAIN)

15. Did all required analyses take place within the required holding time protocols set forth in the QAPP?

Yes	X	
No		(EXPLAIN)

16. Did the laboratory duplicates vary by less than the % RPD specified in the QAPP?

Yes	X (AVS, Cd, Pb, Ni, Ag, Zn)	
No	X (Cu)	(EXPLAIN)

The RPD for Copper in the laboratory duplicate is 22.1. This is slightly above the QC limit of 20 RPD. The result for copper in the sample is flagged "J" as estimated.

17. Are measured dry-weight contaminant concentrations reported?

Yes	X	
No		(EXPLAIN)

Dry-weight concentrations are reported.

18. Please provide details for all of the "EXPLAIN" marked above. Include details on the specific analytes affected by any QA/QC discrepancies, and recommendations regarding usability of data.

Any items with “EXPLAIN” marked above are described immediately following the “EXPLAIN” marking in the corresponding item above.

The data are acceptable for use as qualified.

ACID VOLATILE SULFIDE (AVS) BY METHOD 821/R-91-100 AND SIMULTANEOUSLY EXTRACTED METALS (SEM) BY U.S. EPA METHODS SW-846 METHOD 6010B AND 7470A

CAS Work Order #: K0810423

QA/QC Analysis Checklist for Sediment Chemistry Analysis

GRANT/IAG NUMBER: Not Applicable
PROJECT NAME: Lower Rouge River
REVIEWER: Lisa Graczyk, WESTON START
DATE: January 20, 2009

1. What sediment chemistry data has been collected (CHECK ALL THAT APPLY)?

Total Metals ___	PCBs _____	pH _____	TOC _____
Dioxins/Furans _____	PAHs _____	Pesticides _____	DO _____
AVS __X___	SEM Metals _X_	Particle Size _____	Other _____

2. Were the target detection limits met for each parameter?

Yes	X (SEM)	
No	X (AVS)	(EXPLAIN)

The sediment reporting limit for AVS as stated in the QAPP was not met due to sample dilution and high percent moisture.

3. Were the method blanks less than the established MDL for each parameter?

Yes	X	
No		(EXPLAIN)

AVS and SEMs were not detected in the method blank above the reporting limit.

4. Did the results of Field Replicate Analysis vary by less than the % RPD specified in the QAPP?

Yes	Not Applicable	
No		(EXPLAIN)

There is no field replicate sample associated with this work order for the AVS and SEM analysis.

5. Did the results of the Field Duplicates Analysis vary by less than the % RPD specified in the QAPP?

Yes	Not Applicable	
No		(EXPLAIN)

There is no field duplicate sample associated with this work order for the AVS and SEM analysis.

6. Did the surrogate spike/internal standards recoveries meet the limits set forth in the QAPP?

Yes	Not Applicable	
No		(EXPLAIN)

Surrogates and internal standards are not applicable to the AVS and SEM analyses.

7. Did the MS/MSD recoveries meet the limits set forth in the QAPP?

Yes	X (AVS, Cd, Pb, Hg, Ni, and Ag)	
No	X (Cu, Zn)	(EXPLAIN)

The matrix spike (MS) recovery was within the QAPP-specified QC limits for AVS, cadmium, lead, mercury, nickel and silver. Copper had a percent recovery of 82.6 and zinc had a percent recovery of 64.8 in the MS which is below their respective QC limits. The results for copper and zinc in the two sediment samples were flagged "J" as estimated.

8. Did the RPD (%) of the MS/MSD sample set meet the limits set forth in the QAPP?

Yes	Not Applicable	
No		(EXPLAIN)

A matrix spike duplicate (MSD) was not analyzed with the AVS and SEM analyses; therefore, an MS/MSD RPD was not evaluated.

9. Did the LCS recoveries meet the limits set forth in the QAPP?

Yes	X	
No		(EXPLAIN)

The LCS recovery met the QAPP QC limits for the AVS and SEM analyses.

10. Did the calibration verification standards (ICVs and CCVs) meet the requirements set forth in the QAPP?

Yes	X	
No		(EXPLAIN)

The continuing calibration verification (CCV) standards were within QC limits.

11. Did the calibration blanks (ICBs and CCBs) meet the limits set forth in the QAPP?

Yes	X	
No		(EXPLAIN)

Continuing calibration blanks (CCB) contained no detections above the reporting limits.

12. Did the interference check samples meet the limits set forth in the QAPP?

Yes	X	
No		(EXPLAIN)

Interference check samples are not applicable to the AVS method.

13. Did the serial dilution samples meet the limits set forth in the QAPP?

Yes	X	
No		(EXPLAIN)

Serial dilution is not applicable to the AVS method.

14. Were any level of contaminants detected above the MDL for the trip blanks and storage blanks?

Yes	Not Applicable	
No		(EXPLAIN)

15. Did all required analyses take place within the required holding time protocols set forth in the QAPP?

Yes	X	
No		(EXPLAIN)

16. Did the laboratory duplicates vary by less than the % RPD specified in the QAPP?

Yes	X (AVS, Cd, Pb, Ni, Ag, Zn)	
No	X (Cu)	(EXPLAIN)

The RPD for Copper in the laboratory duplicate is 22.1. This is slightly above the QC limit of 20 RPD. The result for copper in the samples are flagged "J" as estimated.

17. Are measured dry-weight contaminant concentrations reported?

Yes	X	
No		(EXPLAIN)

Dry-weight concentrations are reported.

18. Please provide details for all of the "EXPLAIN" marked above. Include details on the specific analytes affected by any QA/QC discrepancies, and recommendations regarding usability of data.

Any items with “EXPLAIN” marked above are described immediately following the “EXPLAIN” marking in the corresponding item above.

The data are acceptable for use as qualified.

ACID VOLATILE SULFIDE (AVS) BY METHOD 821/R-91-100 AND SIMULTANEOUSLY EXTRACTED METALS (SEM) BY U.S. EPA METHODS SW-846 METHOD 6010B AND 7470A

CAS Work Order #: K0810463

QA/QC Analysis Checklist for Sediment Chemistry Analysis

GRANT/IAG NUMBER: Not Applicable
PROJECT NAME: Lower Rouge River
REVIEWER: Lisa Graczyk, WESTON START
DATE: January 28, 2009

1. What sediment chemistry data has been collected (CHECK ALL THAT APPLY)?

Total Metals ___	PCBs _____	pH _____	TOC _____
Dioxins/Furans _____	PAHs _____	Pesticides _____	DO _____
AVS __X___	SEM Metals _X_	Particle Size _____	Other _____

2. Were the target detection limits met for each parameter?

Yes	X (SEM)	
No	X (AVS)	(EXPLAIN)

The sediment reporting limit for AVS as stated in the QAPP was not met due to sample dilution and high percent moisture.

3. Were the method blanks less than the established MDL for each parameter?

Yes	X	
No		(EXPLAIN)

AVS and SEMs were not detected in the method blank above the reporting limit.

4. Did the results of Field Replicate Analysis vary by less than the % RPD specified in the QAPP?

Yes	Not Applicable	
No		(EXPLAIN)

There is no field replicate sample associated with this work order for the AVS and SEM analysis.

5. Did the results of the Field Duplicates Analysis vary by less than the % RPD specified in the QAPP?

Yes	Not Applicable	
No		(EXPLAIN)

There is no field duplicate sample associated with this work order for the AVS and SEM analysis.

6. Did the surrogate spike/internal standards recoveries meet the limits set forth in the QAPP?

Yes	Not Applicable	
No		(EXPLAIN)

Surrogates and internal standards are not applicable to the AVS and SEM analyses.

7. Did the MS/MSD recoveries meet the limits set forth in the QAPP?

Yes	X (AVS, Cd, Pb, Hg, Ni, and Ag)	
No	X (Cu, Zn)	(EXPLAIN)

The matrix spike (MS) recovery was within the QAPP-specified QC limits for AVS, cadmium, lead, mercury, nickel and silver. Copper had a percent recovery of 82.6 and zinc had a percent recovery of 64.8 in the MS which is below their respective QC limits. The results for copper and zinc in the two sediment samples were flagged "J" as estimated.

8. Did the RPD (%) of the MS/MSD sample set meet the limits set forth in the QAPP?

Yes	Not Applicable	
No		(EXPLAIN)

A matrix spike duplicate (MSD) was not analyzed with the AVS and SEM analyses; therefore, an MS/MSD RPD was not evaluated.

9. Did the LCS recoveries meet the limits set forth in the QAPP?

Yes	X	
No		(EXPLAIN)

The LCS recovery met the QAPP QC limits for the AVS and SEM analyses.

10. Did the calibration verification standards (ICVs and CCVs) meet the requirements set forth in the QAPP?

Yes	X	
No		(EXPLAIN)

The continuing calibration verification (CCV) standards were within QC limits.

11. Did the calibration blanks (ICBs and CCBs) meet the limits set forth in the QAPP?

Yes	X	
No		(EXPLAIN)

Continuing calibration blanks (CCB) contained no detections above the reporting limits.

12. Did the interference check samples meet the limits set forth in the QAPP?

Yes	X	
No		(EXPLAIN)

Interference check samples are not applicable to the AVS method.

13. Did the serial dilution samples meet the limits set forth in the QAPP?

Yes	X	
No		(EXPLAIN)

Serial dilution is not applicable to the AVS method.

14. Were any level of contaminants detected above the MDL for the trip blanks and storage blanks?

Yes	Not Applicable	
No		(EXPLAIN)

15. Did all required analyses take place within the required holding time protocols set forth in the QAPP?

Yes	X	
No		(EXPLAIN)

16. Did the laboratory duplicates vary by less than the % RPD specified in the QAPP?

Yes	X (AVS, Cd, Pb, Ni, Ag, Zn)	
No	X (Cu)	(EXPLAIN)

The RPD for Copper in the laboratory duplicate is 22.1. This is slightly above the QC limit of 20 RPD. The result for copper in the samples are flagged "J" as estimated.

17. Are measured dry-weight contaminant concentrations reported?

Yes	X	
No		(EXPLAIN)

Dry-weight concentrations are reported.

18. Please provide details for all of the "EXPLAIN" marked above. Include details on the specific analytes affected by any QA/QC discrepancies, and recommendations regarding usability of data.

Any items with “EXPLAIN” marked above are described immediately following the “EXPLAIN” marking in the corresponding item above.

The data are acceptable for use as qualified.

ACID VOLATILE SULFIDE (AVS) BY METHOD 821/R-91-100 AND SIMULTANEOUSLY EXTRACTED METALS (SEM) BY U.S. EPA METHODS SW-846 METHOD 6010B AND 7470A

CAS Work Order #: K0904301

QA/QC Analysis Checklist for Sediment Chemistry Analysis

GRANT/IAG NUMBER: Not Applicable
PROJECT NAME: Lower Rouge River
REVIEWER: Lisa Graczyk, WESTON START
DATE: August 20, 2009

1. What sediment chemistry data has been collected (CHECK ALL THAT APPLY)?

Total Metals ___	PCBs _____	pH _____	TOC _____
Dioxins/Furans _____	PAHs _____	Pesticides _____	DO _____
AVS __X___	SEM Metals _X_	Particle Size _____	Other _____

2. Were the target detection limits met for each parameter?

Yes	X (SEM)	
No	X (AVS)	(EXPLAIN)

The sediment reporting limit for AVS slightly exceeded the QAPP stated reporting limit due to sample dilution and higher concentration of analyte in sample. Because AVS was detected in the sample, data is usable.

3. Were the method blanks less than the established MDL for each parameter?

Yes	X	
No		(EXPLAIN)

AVS and SEMs were not detected in the method blank above the reporting limit.

4. Did the results of Field Replicate Analysis vary by less than the % RPD specified in the QAPP?

Yes
Not Applicable
No (EXPLAIN)

There is no field replicate sample associated with this work order for the AVS and SEM analysis.

5. Did the results of the Field Duplicates Analysis vary by less than the % RPD specified in the QAPP?

Yes
Not Applicable
No (EXPLAIN)

There is no field duplicate sample associated with this work order for the AVS and SEM analysis.

6. Did the surrogate spike/internal standards recoveries meet the limits set forth in the QAPP?

Yes
Not Applicable
No (EXPLAIN)

Surrogates and internal standards are not applicable to the AVS and SEM analyses.

7. Did the MS/MSD recoveries meet the limits set forth in the QAPP?

Yes
Not Applicable
No (EXPLAIN)

An MS associated with this work order was not analyzed.

8. Did the RPD (%) of the MS/MSD sample set meet the limits set forth in the QAPP?

Yes	Not Applicable	
No		(EXPLAIN)

A matrix spike duplicate (MSD) was not analyzed with the AVS and SEM analyses; therefore, an MS/MSD RPD was not evaluated.

9. Did the LCS recoveries meet the limits set forth in the QAPP?

Yes	X	
No		(EXPLAIN)

The LCS recovery met the QAPP QC limits for the AVS and SEM analyses.

10. Did the calibration verification standards (ICVs and CCVs) meet the requirements set forth in the QAPP?

Yes	X	
No		(EXPLAIN)

The continuing calibration verification (CCV) standards were within QC limits.

11. Did the calibration blanks (ICBs and CCBs) meet the limits set forth in the QAPP?

Yes	X	
No		(EXPLAIN)

Continuing calibration blanks (CCB) contained no detections above the reporting limits.

12. Did the interference check samples meet the limits set forth in the QAPP?

Yes	X	
No		(EXPLAIN)

Interference check samples are not applicable to the AVS method.

13. Did the serial dilution samples meet the limits set forth in the QAPP?

Yes		
No	X	(EXPLAIN)

Serial dilution is not applicable to the AVS method. The percent difference for the serial dilution exceeded the 10 percent difference QC limit for cadmium, lead, nickel, selenium, and zinc. The following required qualification because it was detected at greater than 50 times the detection limit: nickel and zinc in sample LRR-HS6-F-01. The nickel and zinc results were flagged "J" as estimated.

14. Were any level of contaminants detected above the MDL for the trip blanks and storage blanks?

Yes	Not Applicable	
No		(EXPLAIN)

15. Did all required analyses take place within the required holding time protocols set forth in the QAPP?

Yes	X	
No		(EXPLAIN)

16. Did the laboratory duplicates vary by less than the % RPD specified in the QAPP?

Yes	X (AVS)	
No	X (SEM)	(EXPLAIN)

The QC limit was exceeded for nickel. The nickel result was flagged "J" as estimated.

17. Are measured dry-weight contaminant concentrations reported?

Yes	X	
No		(EXPLAIN)

Dry-weight concentrations are reported.

18. Please provide details for all of the "EXPLAIN" marked above. Include details on the specific analytes affected by any QA/QC discrepancies, and recommendations regarding usability of data.

Any items with "EXPLAIN" marked above are described immediately following the "EXPLAIN" marking in the corresponding item above.

The data are acceptable for use as qualified.

ACID VOLATILE SULFIDE (AVS) BY METHOD 821/R-91-100 AND SIMULTANEOUSLY EXTRACTED METALS (SEM) BY U.S. EPA METHODS SW-846 METHOD 6010B AND 7470A

CAS Work Order #: K0904356

QA/QC Analysis Checklist for Sediment Chemistry Analysis

GRANT/IAG NUMBER: Not Applicable
PROJECT NAME: Lower Rouge River
REVIEWER: Lisa Graczyk, WESTON START
DATE: August 20, 2009

1. What sediment chemistry data has been collected (CHECK ALL THAT APPLY)?

Total Metals ___	PCBs _____	pH _____	TOC _____
Dioxins/Furans _____	PAHs _____	Pesticides _____	DO _____
AVS __X___	SEM Metals _X_	Particle Size _____	Other _____

2. Were the target detection limits met for each parameter?

Yes _____
No X (EXPLAIN)

The sediment reporting limit for AVS and SEM exceeded the QAPP stated reporting limit. The AVS reporting limit was raised due to sample dilution and the SEM reporting limits only slightly exceeded the QAPP limits and the SEM metals that exceeded the reporting limit were detected in the sample. Therefore, data usability is not affected.

3. Were the method blanks less than the established MDL for each parameter?

Yes X
No _____ (EXPLAIN)

AVS and SEMs were not detected in the method blank above the reporting limit.

4. Did the results of Field Replicate Analysis vary by less than the % RPD specified in the QAPP?

Yes	Not Applicable	
No		(EXPLAIN)

There is no field replicate sample associated with this work order for the AVS and SEM analysis.

5. Did the results of the Field Duplicates Analysis vary by less than the % RPD specified in the QAPP?

Yes	Not Applicable	
No		(EXPLAIN)

There is no field duplicate sample associated with this work order for the AVS and SEM analysis.

6. Did the surrogate spike/internal standards recoveries meet the limits set forth in the QAPP?

Yes	Not Applicable	
No		(EXPLAIN)

Surrogates and internal standards are not applicable to the AVS and SEM analyses.

7. Did the MS/MSD recoveries meet the limits set forth in the QAPP?

Yes	X(AVS)	
No	X(SEM)	(EXPLAIN)

The percent recovery for nickel (75.3%) was slightly below the QC limit in the QAPP. The result for nickel was flagged "J" as estimated.

8. Did the RPD (%) of the MS/MSD sample set meet the limits set forth in the QAPP?

Yes	Not Applicable	
No		(EXPLAIN)

A matrix spike duplicate (MSD) was not analyzed with the AVS and SEM analyses; therefore, an MS/MSD RPD was not evaluated.

9. Did the LCS recoveries meet the limits set forth in the QAPP?

Yes	X	
No		(EXPLAIN)

The LCS recovery met the QAPP QC limits for the AVS and SEM analyses.

10. Did the calibration verification standards (ICVs and CCVs) meet the requirements set forth in the QAPP?

Yes	X	
No		(EXPLAIN)

The continuing calibration verification (CCV) standards were within QC limits.

11. Did the calibration blanks (ICBs and CCBs) meet the limits set forth in the QAPP?

Yes	X	
No		(EXPLAIN)

Continuing calibration blanks (CCB) contained no detections above the reporting limits.

12. Did the interference check samples meet the limits set forth in the QAPP?

Yes	X	
No		(EXPLAIN)

Interference check samples are not applicable to the AVS method.

13. Did the serial dilution samples meet the limits set forth in the QAPP?

Yes		
No	X	(EXPLAIN)

Serial dilution is not applicable to the AVS method. The percent difference for the serial dilution exceeded the 10 percent difference QC limit for cadmium, lead, nickel, silver, and zinc. The following required qualification because it was detected at greater than 50 times the detection limit: cadmium in sample LRR-HS6-DOWN2-01. The cadmium result was flagged "J" as estimated.

14. Were any level of contaminants detected above the MDL for the trip blanks and storage blanks?

Yes	Not Applicable	
No		(EXPLAIN)

15. Did all required analyses take place within the required holding time protocols set forth in the QAPP?

Yes	X	
No		(EXPLAIN)

16. Did the laboratory duplicates vary by less than the % RPD specified in the QAPP?

Yes	X (AVS)	
No	X (SEM)	(EXPLAIN)

The QC limit was exceeded for nickel. The nickel result was flagged "J" as estimated.

17. Are measured dry-weight contaminant concentrations reported?

Yes	X	
No		(EXPLAIN)

Dry-weight concentrations are reported.

18. Please provide details for all of the "EXPLAIN" marked above. Include details on the specific analytes affected by any QA/QC discrepancies, and recommendations regarding usability of data.

Any items with “EXPLAIN” marked above are described immediately following the “EXPLAIN” marking in the corresponding item above.

The data are acceptable for use as qualified.

ACID VOLATILE SULFIDE (AVS) BY METHOD 821/R-91-100 AND SIMULTANEOUSLY EXTRACTED METALS (SEM) BY U.S. EPA METHODS SW-846 METHOD 6010B AND 7470A

CAS Work Order #: K0904451

QA/QC Analysis Checklist for Sediment Chemistry Analysis

GRANT/IAG NUMBER: Not Applicable
PROJECT NAME: Lower Rouge River
REVIEWER: Lisa Graczyk, WESTON START
DATE: August 21, 2009

1. What sediment chemistry data has been collected (CHECK ALL THAT APPLY)?

Total Metals ___	PCBs _____	pH _____	TOC _____
Dioxins/Furans _____	PAHs _____	Pesticides _____	DO _____
AVS __X___	SEM Metals _X_	Particle Size _____	Other _____

2. Were the target detection limits met for each parameter?

Yes		
No	X	(EXPLAIN)

The sediment reporting limits for AVS and SEM as stated in the QAPP were slightly exceeded due to sample dilution and high percent moisture.

3. Were the method blanks less than the established MDL for each parameter?

Yes	X	
No		(EXPLAIN)

AVS and SEMs were not detected in the method blank above the reporting limit.

4. Did the results of Field Replicate Analysis vary by less than the % RPD specified in the QAPP?

Yes	X	
No		(EXPLAIN)

There was one field replicate sample associated with this work order for the AVS and SEM analysis. The RPDs between the replicate and parent sample were acceptable (less than 50).

5. Did the results of the Field Duplicates Analysis vary by less than the % RPD specified in the QAPP?

Yes	Not Applicable	
No		(EXPLAIN)

There is no field duplicate sample associated with this work order for the AVS and SEM analysis.

6. Did the surrogate spike/internal standards recoveries meet the limits set forth in the QAPP?

Yes	Not Applicable	
No		(EXPLAIN)

Surrogates and internal standards are not applicable to the AVS and SEM analyses.

7. Did the MS/MSD recoveries meet the limits set forth in the QAPP?

Yes	X (AVS, Cd, Cu, Pb, and Ag)	
No	X (Ni, Zn)	(EXPLAIN)

The matrix spike (MS) recovery was within the QAPP-specified QC limits for AVS, cadmium, copper, lead, and silver. Nickel had a percent recovery of 75.2 and zinc had a percent recovery of 68.7 in the MS which is below their respective QC limits. The results for copper and zinc in the two sediment samples were flagged "J" as estimated.

8. Did the RPD (%) of the MS/MSD sample set meet the limits set forth in the QAPP?

Yes	Not Applicable	
No		(EXPLAIN)

A matrix spike duplicate (MSD) was not analyzed with the AVS and SEM analyses; therefore, an MS/MSD RPD was not evaluated.

9. Did the LCS recoveries meet the limits set forth in the QAPP?

Yes	X	
No		(EXPLAIN)

The LCS recovery met the QAPP QC limits for the AVS and SEM analyses.

10. Did the calibration verification standards (ICVs and CCVs) meet the requirements set forth in the QAPP?

Yes	X	
No		(EXPLAIN)

The continuing calibration verification (CCV) standards were within QC limits.

11. Did the calibration blanks (ICBs and CCBs) meet the limits set forth in the QAPP?

Yes	X	
No		(EXPLAIN)

Continuing calibration blanks (CCB) contained no detections above the reporting limits.

12. Did the interference check samples meet the limits set forth in the QAPP?

Yes	X	
No		(EXPLAIN)

Interference check samples are not applicable to the AVS method.

13. Did the serial dilution samples meet the limits set forth in the QAPP?

Yes		
No	X	(EXPLAIN)

Serial dilution is not applicable to the AVS method. The percent difference for the serial dilution exceeded the 10 percent difference QC limit for cadmium, lead, nickel, and zinc. The following required qualification because it was detected at greater than 50 times the detection limit: zinc in samples LRR-HS3-A-01, LRR-HS3-A-01-FS, and LRR-HS3-A-01-R. The zinc results were flagged "J" as estimated.

14. Were any level of contaminants detected above the MDL for the trip blanks and storage blanks?

Yes	Not Applicable	
No		(EXPLAIN)

15. Did all required analyses take place within the required holding time protocols set forth in the QAPP?

Yes	X	
No		(EXPLAIN)

16. Did the laboratory duplicates vary by less than the % RPD specified in the QAPP?

Yes	X (AVS)	
No	X (SEM)	(EXPLAIN)

The QC limit was exceeded for copper and nickel. Copper and nickel results were flagged "J" as estimated.

17. Are measured dry-weight contaminant concentrations reported?

Yes	X	
No		(EXPLAIN)

Dry-weight concentrations are reported.

18. Please provide details for all of the "EXPLAIN" marked above. Include details on the specific analytes affected by any QA/QC discrepancies, and recommendations regarding usability of data.

Any items with "EXPLAIN" marked above are described immediately following the "EXPLAIN" marking in the corresponding item above.

The data are acceptable for use as qualified.

ACID VOLATILE SULFIDE (AVS) BY METHOD 821/R-91-100 AND SIMULTANEOUSLY EXTRACTED METALS (SEM) BY U.S. EPA METHODS SW-846 METHOD 6010B AND 7470A

CAS Work Order #: K0904454

QA/QC Analysis Checklist for Sediment Chemistry Analysis

GRANT/IAG NUMBER: Not Applicable
PROJECT NAME: Lower Rouge River
REVIEWER: Lisa Graczyk, WESTON START
DATE: August 20, 2009

1. What sediment chemistry data has been collected (CHECK ALL THAT APPLY)?

Total Metals ___	PCBs _____	pH _____	TOC _____
Dioxins/Furans _____	PAHs _____	Pesticides _____	DO _____
AVS __X___	SEM Metals _X_	Particle Size _____	Other _____

2. Were the target detection limits met for each parameter?

Yes _____
No X (EXPLAIN)

The sediment reporting limits for AVS and SEM as stated in the QAPP were slightly exceeded due to sample dilution and high percent moisture. Note the SEM reporting limits achieved for sample LRR-ZIC-C-01-TOC met the QAPP reporting limits.

3. Were the method blanks less than the established MDL for each parameter?

Yes X
No _____ (EXPLAIN)

AVS and SEMs were not detected in the method blank above the reporting limit.

4. Did the results of Field Replicate Analysis vary by less than the % RPD specified in the QAPP?

Yes
Not Applicable
No (EXPLAIN)

There is no field replicate sample associated with this work order for the AVS and SEM analysis.

5. Did the results of the Field Duplicates Analysis vary by less than the % RPD specified in the QAPP?

Yes
Not Applicable
No (EXPLAIN)

There is no field duplicate sample associated with this work order for the AVS and SEM analysis.

6. Did the surrogate spike/internal standards recoveries meet the limits set forth in the QAPP?

Yes
Not Applicable
No (EXPLAIN)

Surrogates and internal standards are not applicable to the AVS and SEM analyses.

7. Did the MS/MSD recoveries meet the limits set forth in the QAPP?

Yes
Not Applicable
No (EXPLAIN)

An MS associated with this work order was not analyzed.

8. Did the RPD (%) of the MS/MSD sample set meet the limits set forth in the QAPP?

Yes	Not Applicable	
No		(EXPLAIN)

A matrix spike duplicate (MSD) was not analyzed with the AVS and SEM analyses; therefore, an MS/MSD RPD was not evaluated.

9. Did the LCS recoveries meet the limits set forth in the QAPP?

Yes	X	
No		(EXPLAIN)

The LCS recovery met the QAPP QC limits for the AVS and SEM analyses.

10. Did the calibration verification standards (ICVs and CCVs) meet the requirements set forth in the QAPP?

Yes	X	
No		(EXPLAIN)

The continuing calibration verification (CCV) standards were within QC limits.

11. Did the calibration blanks (ICBs and CCBs) meet the limits set forth in the QAPP?

Yes	X	
No		(EXPLAIN)

Continuing calibration blanks (CCB) contained no detections above the reporting limits.

12. Did the interference check samples meet the limits set forth in the QAPP?

Yes	X	
No		(EXPLAIN)

Interference check samples are not applicable to the AVS method.

13. Did the serial dilution samples meet the limits set forth in the QAPP?

Yes		
No	X	(EXPLAIN)

Serial dilution is not applicable to the AVS method. The percent difference for the serial dilution exceeded the 10 percent difference QC limit for cadmium, lead, nickel, and zinc. The following required qualification because it was detected at greater than 50 times the detection limit: zinc in samples LRR-ZIC-C-01-TOX and LRR-HS1-A-01-R. The zinc results were flagged "J" as estimated.

14. Were any level of contaminants detected above the MDL for the trip blanks and storage blanks?

Yes	Not Applicable	
No		(EXPLAIN)

15. Did all required analyses take place within the required holding time protocols set forth in the QAPP?

Yes	X	
No		(EXPLAIN)

16. Did the laboratory duplicates vary by less than the % RPD specified in the QAPP?

Yes	X (AVS)	
No	X (SEM)	(EXPLAIN)

The QC limit was exceeded for copper and nickel. Copper and nickel results were flagged "J" as estimated.

17. Are measured dry-weight contaminant concentrations reported?

Yes	X	
No		(EXPLAIN)

Dry-weight concentrations are reported.

18. Please provide details for all of the "EXPLAIN" marked above. Include details on the specific analytes affected by any QA/QC discrepancies, and recommendations regarding usability of data.

Any items with "EXPLAIN" marked above are described immediately following the "EXPLAIN" marking in the corresponding item above.

The data are acceptable for use as qualified.

ATTACHMENT B
ANALYTICAL DATA SUMMARY SHEETS WITH QAULIFIERS FOR AVS AND SEM ANALYSES

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-017-A-01 **Lab Report Batch :** K0810413 **Lab ID :** CAS_K

Sample Date : 10/21/2008 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0810413-001

Reviewed By / Date : LG 1/19/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 6010B					**Dilution: 1**															
Cadmium	1.7		mg/Kg		YES															
Copper	97.6		mg/Kg		YES	**J**					J	J								
Lead	150		mg/Kg		YES															
Nickel	28.3		mg/Kg		YES															
Silver	0.3		mg/Kg	U	YES															
Zinc	678		mg/Kg		YES	**J**					J									
Analysis Method : 7470A					**Dilution: 4**															
Mercury	0.03		mg/Kg	U	YES															
Analysis Method : Draft 1991					**Dilution: 40**															
Sulfide, Acid-Volatile	678		mg/Kg		YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-WJB-A-01 **Lab Report Batch :** K0810413 **Lab ID :** CAS_K

Sample Date : 10/21/2008 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0810413-009

Reviewed By / Date : LG 1/19/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 6010B					**Dilution: 1**															
Cadmium	1.5		mg/Kg		YES															
Copper	34.6		mg/Kg		YES	**J**					J	J								
Lead	67.7		mg/Kg		YES															
Nickel	14.1		mg/Kg		YES															
Silver	0.2		mg/Kg	U	YES															
Zinc	258		mg/Kg		YES	**J**					J									
Analysis Method : 7470A					**Dilution: 4**															
Mercury	0.02		mg/Kg	U	YES															
Analysis Method : Draft 1991					**Dilution: 40**															
Sulfide, Acid-Volatile	314		mg/Kg		YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-HS1-A-01 **Lab Report Batch :** K0810422 **Lab ID :** CAS_K

Sample Date : 10/21/2008 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0810422-001

Reviewed By / Date : LG 1/20/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 6010B					**Dilution: 1**															
Cadmium	1.6		mg/Kg		YES															
Copper	54.7		mg/Kg		YES	**J**					J	J								
Lead	54.9		mg/Kg		YES															
Nickel	16.6		mg/Kg		YES															
Silver	0.3		mg/Kg	U	YES															
Zinc	269		mg/Kg		YES	**J**					J									
Analysis Method : 7470A					**Dilution: 4**															
Mercury	0.02		mg/Kg	U	YES															
Analysis Method : Draft 1991					**Dilution: 20**															
Sulfide, Acid-Volatile	356		mg/Kg		YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-HS5-A-01 **Lab Report Batch :** K0810423 **Lab ID :** CAS_K

Sample Date : 10/22/2008 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0810423-011

Reviewed By / Date : LG 1/20/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 6010B					**Dilution: 1**															
Cadmium	2.1		mg/Kg		YES															
Copper	82.4		mg/Kg		YES	**J**					J	J								
Lead	86.8		mg/Kg		YES															
Nickel	24.4		mg/Kg		YES															
Silver	0.4		mg/Kg	U	YES															
Zinc	398		mg/Kg		YES	**J**					J									
Analysis Method : 7470A					**Dilution: 4**															
Mercury	0.03		mg/Kg	U	YES															
Analysis Method : Draft 1991					**Dilution: 40**															
Sulfide, Acid-Volatile	761		mg/Kg		YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-OF2-B-01 **Lab Report Batch :** K0810423 **Lab ID :** CAS_K

Sample Date : 10/22/2008 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0810423-001

Reviewed By / Date : LG 1/20/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 6010B					**Dilution: 1**															
Cadmium	5.1		mg/Kg		YES															
Copper	68.2		mg/Kg		YES	**J**					J	J								
Lead	161		mg/Kg		YES															
Nickel	19.2		mg/Kg		YES															
Silver	0.3		mg/Kg	U	YES															
Zinc	830		mg/Kg		YES	**J**					J									
Analysis Method : 7470A					**Dilution: 4**															
Mercury	0.02		mg/Kg	U	YES															
Analysis Method : Draft 1991					**Dilution: 20**															
Sulfide, Acid-Volatile	161		mg/Kg		YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-HS4-B-01 **Lab Report Batch :** K0810463 **Lab ID :** CAS_K

Sample Date : 10/23/2008 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0810463-007

Reviewed By / Date : LG 1/28/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 6010B					**Dilution: 1**															
Cadmium	1.7		mg/Kg		YES															
Copper	61.4		mg/Kg		YES	**J**					J	J								
Lead	71.1		mg/Kg		YES															
Nickel	17.6		mg/Kg		YES															
Silver	0.3		mg/Kg	U	YES															
Zinc	320		mg/Kg		YES	**J**					J									
Analysis Method : 7470A					**Dilution: 4**															
Mercury	0.02		mg/Kg	U	YES															
Analysis Method : Draft 1991					**Dilution: 100**															
Sulfide, Acid-Volatile	755		mg/Kg		YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-OBC-B-01 **Lab Report Batch :** K0810465 **Lab ID :** CAS_K

Sample Date : 10/23/2008 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0810465-004

Reviewed By / Date : LG 1/29/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 6010B					**Dilution: 1**															
Cadmium	2.3		mg/Kg		YES															
Copper	2.6		mg/Kg		YES	**J**					J	J								
Lead	68		mg/Kg		YES															
Nickel	13		mg/Kg		YES															
Silver	0.1		mg/Kg	U	YES															
Zinc	653		mg/Kg		YES	**J**					J									
Analysis Method : 7470A					**Dilution: 4**															
Mercury	0.01		mg/Kg	U	YES															
Analysis Method : Draft 1991					**Dilution: 400**															
Sulfide, Acid-Volatile	1630		mg/Kg		YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-HS6-F-01 **Lab Report Batch :** K0904301 **Lab ID :** CAS_K

Sample Date : 05/12/2009 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0904301-005

Reviewed By / Date : LG 8/20/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 6010B					**Dilution: 1**															
Cadmium	0.53		mg/Kg		YES															
Copper	23.6		mg/Kg		YES															
Lead	16.2		mg/Kg		YES															
Nickel	23.9		mg/Kg		YES	**J**						J								
Silver	0.2		mg/Kg	U	YES															
Zinc	50.4		mg/Kg		YES	**J**														
Analysis Method : Draft 1991					**Dilution: 20**															
Sulfide, Acid-Volatile	93		mg/Kg		YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-HS6-DOWN2-01 **Lab Report Batch :** K0904356 **Lab ID :** CAS_K

Sample Date : 05/13/2009 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0904356-014

Reviewed By / Date : LG 8/20/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 6010B					**Dilution: 1**															
Cadmium	13.6		mg/Kg		YES	**J**														
Copper	48.6		mg/Kg		YES															
Lead	155		mg/Kg		YES															
Nickel	12.8		mg/Kg		YES	**J**					J	J								
Silver	0.5		mg/Kg	U	YES															
Zinc	746		mg/Kg		YES															
Analysis Method : Draft 1991					**Dilution: 100**															
Sulfide, Acid-Volatile	885		mg/Kg		YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-HS3-A-01 **Lab Report Batch :** K0904451 **Lab ID :** CAS_K

Sample Date : 05/16/2009 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0904451-002

Reviewed By / Date : LG 8/21/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 6010B					**Dilution: 1**															
Cadmium	1.7		mg/Kg		YES															
Copper	54		mg/Kg	*	YES	**J**						J								
Lead	74.6		mg/Kg		YES															
Nickel	19.4		mg/Kg	*	YES	**J**					J	J								
Silver	0.5		mg/Kg	U	YES															
Zinc	257		mg/Kg		YES	**J**					J									
Analysis Method : Draft 1991					**Dilution: 100**															
Sulfide, Acid-Volatile	1130		mg/Kg		YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-HS3-A-01-FS **Lab Report Batch :** K0904451 **Lab ID :** CAS_K

Sample Date : 05/16/2009 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0904451-004

Reviewed By / Date : LG 8/21/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 6010B					**Dilution: 1**															
Cadmium	1.5		mg/Kg		YES															
Copper	41.8		mg/Kg	*	YES	**J**						J								
Lead	54.6		mg/Kg		YES															
Nickel	17.6		mg/Kg	*	YES	**J**					J	J								
Silver	0.4		mg/Kg	U	YES															
Zinc	221		mg/Kg		YES	**J**					J									
Analysis Method : Draft 1991					**Dilution: 100**															
Sulfide, Acid-Volatile	761		mg/Kg		YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-HS5-A-01-R
Lab Report Batch : K0904451
Lab ID : CAS_K
Sample Date : 05/15/2009
Analysis Type: 1RES
Sample Matrix : SED
Lab Sample ID: K0904451-020

Reviewed By / Date : LG 8/21/2009
Approved By / Date :

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 6010B					**Dilution: 1**															
Cadmium	1.9		mg/Kg		YES															
Copper	61.3		mg/Kg	*	YES	**J**						J								
Lead	77.4		mg/Kg		YES															
Nickel	18		mg/Kg	*	YES	**J**					J	J								
Silver	0.6		mg/Kg	U	YES															
Zinc	305		mg/Kg		YES	**J**					J									
Analysis Method : Draft 1991					**Dilution: 100**															
Sulfide, Acid-Volatile	864		mg/Kg		YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-HS1-A-01-R **Lab Report Batch :** K0904454 **Lab ID :** CAS_K

Sample Date : 05/15/2009 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0904454-001

Reviewed By / Date : LG 8/20/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 6010B					**Dilution: 1**															
Cadmium	1.4		mg/Kg		YES															
Copper	32.1		mg/Kg	*	YES	**J**						J								
Lead	42.1		mg/Kg		YES															
Nickel	10.3		mg/Kg	*	YES	**J**						J								
Silver	0.4		mg/Kg	U	YES															
Zinc	157		mg/Kg		YES	**J**														
Analysis Method : Draft 1991					**Dilution: 100**															
Sulfide, Acid-Volatile	925		mg/Kg		YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-ZIC-C-01-TOX **Lab Report Batch :** K0904454 **Lab ID :** CAS_K

Sample Date : 05/16/2009 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0904454-009

Reviewed By / Date : LG 8/20/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 6010B					**Dilution: 1**															
Cadmium	0.31		mg/Kg		YES															
Copper	10.9		mg/Kg	*	YES	**J**						J								
Lead	4.5		mg/Kg		YES															
Nickel	7.1		mg/Kg	*	YES	**J**						J								
Silver	0.2		mg/Kg	U	YES															
Zinc	17.7		mg/Kg		YES	**J**														
Analysis Method : Draft 1991					**Dilution: 1**															
Sulfide, Acid-Volatile	2.5		mg/Kg		YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Weston Solutions, Inc.
20 North Wacker Drive, Suite 1210
Chicago, IL 60606
(312) 424-3300 ● Fax: (312) 424-3330
www.westonsolutions.com

The Trusted Integrator for Sustainable Solutions

December 4, 2009

Ms. Diana Mally
Great Lakes National Program Office
United States Environmental Protection Agency, Region V
77 West Jackson Boulevard, Mail Code: G-17J
Chicago, Illinois 60604-3507

Re: Data Review of Bulk Density Analysis
For Sediment Samples Collected in October 2008 and May 2009
Lower Rouge River Sediment Investigation
Detroit, Wayne County, Michigan
Technical Direction Document Number: S05-0008-0805-012
Document Control Number: 451-2A-AEQA
Work Order Number: 20405.012.008.0451.00

Dear Ms. Mally:

The United States Environmental Protection Agency (U.S. EPA) tasked Weston Solutions, Inc., (WESTON®) to perform data validation for sediment samples collected from October 21, 2008, to May 16, 2009 for the Great Lakes National Program Office Lower Rouge River Sediment Investigation Site. This data review is for total organic carbon analysis of 40 sediment samples that include 2 field duplicate samples and 2 field replicate samples that were collected by the WESTON Superfund Technical Assessment and Response Team (START). The samples were validated in accordance with the "Quality Assurance Project Plan (QAPP), Lower Rouge River Sediment Investigation" dated October 17, 2008, which included using the U.S. EPA Contract Laboratory Program National Functional Guidance for Organic Data Review. Table 1 provides a summary of the samples included in this review. All tables are presented at the end of this report.

The samples listed in Table 1 were analyzed by Columbia Analytical Services located in Kelso, Washington under the following 10 work orders:

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- K0810413
- K0810422
- K0810423
- K0810463
- K0810465
- K0904268
- K0904301
- K0904356
- K0904451
- K0904454

The samples were analyzed for bulk density using American Society for Testing and Materials (ASTM) Method D4531-86 and E1109-86. Standard data validation was not performed for the bulk density analysis. Most of the standard quality control (QC) indicators are not applicable to the bulk density analysis. Below is a summary of the data quality indicators which apply. The attachment to this report contains a printed report from Automated Data Review that provides a summary of results.

DATA QUALITY INDICATORS REVIEW

Sensitivity. There were no sensitivity requirements stated in the QAPP for the bulk density analysis.

Precision. Field precision is determined by evaluating the relative percent differences (RPD) for the field replicate and field duplicate results. Although the QAPP did not require that field replicates be collected for the bulk density analysis, two field replicates were collected. The QAPP did state that field duplicate samples would be collected at a rate of 5 percent for bulk density analysis. Two field duplicate samples were collected; therefore, this frequency for field duplicate collection was met.

Tables 2 and 3 summarize the field replicate and duplicate results and calculated RPDs. The mean RPDs for field replicates and duplicates ranged from 3 to 15 percent. Field precision was evaluated and found to be acceptable.

Laboratory precision was not evaluated for the bulk density analysis as data QC indicators for precision are not applicable to this analysis.

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Accuracy/Bias. Accuracy is a measure of the agreement between an observed value and an accepted reference value. Laboratory accuracy was not evaluated for the bulk density analysis as data QC indicators for accuracy are not applicable to this analysis.

Completeness. Completeness is a measure of the amount of valid data obtained compared to the amount of data that was planned to be collected under normal conditions. All samples results were received.

In summary, the bulk density data is usable.

If there are any questions or comments regarding this report, please do not hesitate to contact WESTON START at 312-424-3300.

Very truly yours,
Weston Solutions, Inc.

Lisa Graczyk
WESTON START Team

Tonya Balla
WESTON START Project Manager

Attachments:
Tables
A - Analytical Data Summary Sheets

cc: project file

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TABLES

TABLE 1 SAMPLES INCLUDED IN DATA REVIEW			
Sample ID	**Lab ID**	**Date Collected**	**Comment**
LRR-017-A-01	K0810413-001	10/21/2008	
LRR-017-A-02	K0810413-002	10/21/2008	
LRR-017-A-03	K0810413-003	10/21/2008	
LRR-017-A-04	K0810413-004	10/21/2008	
LRR-017-A-05	K0810413-005	10/21/2008	
LRR-OF2-A-01	K0810413-008	10/21/2008	
LRR-WJB-A-01	K0810413-009	10/21/2008	
LRR-WJB-A-02	K0810413-010	10/21/2008	
LRR-HS1-A-01	K0810422-001	10/21/2008	
LRR-HS1-A-02	K0810422-002	10/21/2008	
LRR-HSI-A-03	K0810422-003	10/21/2008	
LRR-HS1-A-04	K0810422-004	10/21/2008	
LRR-OF2-B-01	K0810423-001	10/22/2008	
LRR-OF2-B-02	K0810423-002	10/22/2008	
LRR-OF2-B-03	K0810423-003	10/22/2008	
LRR-OF2-B-04	K0810423-004	10/22/2008	
LRR-OF2-B-05	K0810423-005	10/22/2008	
LRR-HS5-A-01	K0810423-011	10/23/2008	
LRR-HS5-A-02	K0810423-012	10/23/2008	
LRR-HS5-A-02-FS	K0810423-013	10/23/2008	Field replicate of LRR-HS5-A-02
LRR-HS5-A-03	K0810423-014	10/23/2008	
LRR-HS4-B-01	K0810463-007	10/23/2008	
LRR-HS4-B-02	K0810463-008	10/23/2008	
LRR-HS4-B-03	K0810463-009	10/23/2008	
LRR-OBC-B-01	K0810465-004	10/23/2008	
LRR-OBC-B-02	K0810465-005	10/23/2008	
LRR-OBC-B-03	K0810465-006	10/23/2008	
LRR-HS6-B-01	K0904268-004	5/11/2009	
LRR-HS6-B-02	K0904268-005	5/11/2009	
LRR-HS6-B-03	K0904268-006	5/11/2009	
LRR-HS6-F-01	K0904301-005	5/12/2009	
LRR-HS6-F-01-DP	K0904301-006	5/12/2009	Field duplicate of LRR-HS6-F-01
LRR-HS6-DOWN2-01	K0904356-014	5/13/2009	
LRR-HS3-A-01	K0904451-002	5/16/2009	
LRR-HS3-A-01-FS	K0904451-004	5/16/2009	Field replicate of LRR-HS3-A-01
LRR-HS3-A-02	K0904451-005	5/16/2009	
LRR-HS3-A-02-DP	K0904451-006	5/16/2009	Field duplicate of LRR-HS3-A-02
LRR-HS3-A-03	K0904451-007	5/16/2009	
LRR-ZIC-C-01-TOX	K0904454-009	5/15/2009	

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TABLE 2 FIELD REPLICATE RESULTS						
	Sample: LRR-HS5-A-02-FS			Sample: LRR-HS3-A-01-FS		
Analyte	Sample Result (g/cm^3)	Replicate Result (g/cm^3)	RPD	Sample Result (g/cm^3)	Replicate Result (g/cm^3)	RPD
Bulk Density	1.53	1.49	3	1.23	1.27	3

Notes:

g/cm^3 - Gram per cubic meter
RPD - Relative Percent Difference

TABLE 3 FIELD DUPLICATE RESULTS						
	Sample: LRR-HS6-F-01-DP			Sample: LRR-HS3-A-03-DP		
Analyte	Sample Result (g/cm^3)	Replicate Result (g/cm^3)	RPD	Sample Result (g/cm^3)	Replicate Result (g/cm^3)	RPD
Bulk Density	1.55	1.80	15	1.47	1.51	3

Notes:

g/cm^3 - Gram per cubic meter
RPD - Relative Percent Difference

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ATTACHMENT
ANALYTICAL DATA SUMMARY SHEETS

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-017-A-01 **Lab Report Batch :** K0810413 **Lab ID :** CAS_K

Sample Date : 10/21/2008 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0810413-001

Reviewed By / Date : LG 1/19/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : ASTM D4531-86					**Dilution: 1**															
Density	1.31		g/cm3		YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-017-A-02 **Lab Report Batch :** K0810413 **Lab ID :** CAS_K

Sample Date : 10/21/2008 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0810413-002

Reviewed By / Date : LG 1/19/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : ASTM D4531-86					**Dilution: 1**															
Density	1.23		g/cm3		YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-017-A-03 **Lab Report Batch :** K0810413 **Lab ID :** CAS_K

Sample Date : 10/21/2008 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0810413-003

Reviewed By / Date : LG 1/19/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : ASTM D4531-86					**Dilution: 1**															
Density	1.09		g/cm3		YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-017-A-04 **Lab Report Batch :** K0810413 **Lab ID :** CAS_K

Sample Date : 10/21/2008 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0810413-004

Reviewed By / Date : LG 1/19/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : ASTM D4531-86					**Dilution: 1**															
Density	1.14		g/cm3		YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-017-A-05 **Lab Report Batch :** K0810413 **Lab ID :** CAS_K

Sample Date : 10/21/2008 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0810413-005

Reviewed By / Date : LG 1/19/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : ASTM D4531-86					**Dilution: 1**															
Density	1.15		g/cm3		YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-OF2-A-01 **Lab Report Batch :** K0810413 **Lab ID :** CAS_K

Sample Date : 10/21/2008 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0810413-008

Reviewed By / Date : LG 1/19/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : ASTM D4531-86					**Dilution: 1**															
Density	1.52		g/cm3		YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-WJB-A-01 **Lab Report Batch :** K0810413 **Lab ID :** CAS_K

Sample Date : 10/21/2008 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0810413-009

Reviewed By / Date : LG 1/19/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : ASTM D4531-86					**Dilution: 1**															
Density	1.92		g/cm3		YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-WJB-A-02 **Lab Report Batch :** K0810413 **Lab ID :** CAS_K

Sample Date : 10/21/2008 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0810413-010

Reviewed By / Date : LG 1/19/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : ASTM D4531-86					**Dilution: 1**															
Density	1.83		g/cm3		YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-HS1-A-01 **Lab Report Batch :** K0810422 **Lab ID :** CAS_K

Sample Date : 10/21/2008 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0810422-001

Reviewed By / Date : LG 1/20/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : ASTM D4531-86					**Dilution: 1**															
Density	1.36		g/cm3		YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-HS1-A-02 **Lab Report Batch :** K0810422 **Lab ID :** CAS_K

Sample Date : 10/21/2008 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0810422-002

Reviewed By / Date : LG 1/20/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : ASTM D4531-86					**Dilution: 1**															
Density	1.37		g/cm3		YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-HS1-A-03 **Lab Report Batch :** K0810422 **Lab ID :** CAS_K

Sample Date : 10/21/2008 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0810422-003

Reviewed By / Date : LG 1/20/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : ASTM D4531-86					**Dilution: 1**															
Density	1.26		g/cm3		YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-HS1-A-04 **Lab Report Batch :** K0810422 **Lab ID :** CAS_K

Sample Date : 10/21/2008 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0810422-004

Reviewed By / Date : LG 1/20/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : ASTM D4531-86					**Dilution: 1**															
Density	1.36		g/cm3		YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-HS5-A-01 **Lab Report Batch :** K0810423 **Lab ID :** CAS_K

Sample Date : 10/22/2008 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0810423-011

Reviewed By / Date : LG 1/20/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : ASTM D4531-86					**Dilution: 1**															
Density	1.52		g/cm3		YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-HS5-A-02 **Lab Report Batch :** K0810423 **Lab ID :** CAS_K

Sample Date : 10/23/2008 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0810423-012

Reviewed By / Date : LG 1/20/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : ASTM D4531-86					**Dilution: 1**															
Density	1.53		g/cm3		YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-HS5-A-02-FS
Lab Report Batch : K0810423
Lab ID : CAS_K
Sample Date : 10/23/2008
Analysis Type: 1RES
Sample Matrix : SED
Lab Sample ID: K0810423-013

Reviewed By / Date : LG 1/20/2009
Approved By / Date :

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : ASTM D4531-86					**Dilution: 1**															
Density	1.49		g/cm3		YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-HS5-A-03 **Lab Report Batch :** K0810423 **Lab ID :** CAS_K

Sample Date : 10/23/2008 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0810423-014

Reviewed By / Date : LG 1/20/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : ASTM D4531-86					**Dilution: 1**															
Density	1.37		g/cm3		YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-OF2-B-01 **Lab Report Batch :** K0810423 **Lab ID :** CAS_K

Sample Date : 10/22/2008 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0810423-001

Reviewed By / Date : LG 1/20/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : ASTM D4531-86					**Dilution: 1**															
Density	1.46		g/cm3		YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-OF2-B-02 **Lab Report Batch :** K0810423 **Lab ID :** CAS_K

Sample Date : 10/22/2008 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0810423-002

Reviewed By / Date : LG 1/20/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : ASTM D4531-86					**Dilution: 1**															
Density	1.52		g/cm3		YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-OF2-B-03 **Lab Report Batch :** K0810423 **Lab ID :** CAS_K

Sample Date : 10/22/2008 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0810423-003

Reviewed By / Date : LG 1/20/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : ASTM D4531-86					**Dilution: 1**															
Density	1.33		g/cm3		YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-OF2-B-04 **Lab Report Batch :** K0810423 **Lab ID :** CAS_K

Sample Date : 10/22/2008 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0810423-004

Reviewed By / Date : LG 1/20/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : ASTM D4531-86					**Dilution: 1**															
Density	1.31		g/cm3		YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-OF2-B-05 **Lab Report Batch :** K0810423 **Lab ID :** CAS_K

Sample Date : 10/22/2008 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0810423-005

Reviewed By / Date : LG 1/20/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : ASTM D4531-86					**Dilution: 1**															
Density	1.23		g/cm3		YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-HS4-B-01 **Lab Report Batch :** K0810463 **Lab ID :** CAS_K

Sample Date : 10/23/2008 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0810463-007

Reviewed By / Date : LG 1/28/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : ASTM D4531-86					**Dilution: 1**															
Density	1.36		g/cm3		YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-HS4-B-02 **Lab Report Batch :** K0810463 **Lab ID :** CAS_K

Sample Date : 10/23/2008 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0810463-008

Reviewed By / Date : LG 1/28/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : ASTM D4531-86					**Dilution: 1**															
Density	1.32		g/cm3		YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-HS4-B-03 **Lab Report Batch :** K0810463 **Lab ID :** CAS_K

Sample Date : 10/23/2008 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0810463-009

Reviewed By / Date : LG 1/28/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : ASTM D4531-86					**Dilution: 1**															
Density	1.51		g/cm3		YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-OBC-B-01 **Lab Report Batch :** K0810465 **Lab ID :** CAS_K

Sample Date : 10/23/2008 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0810465-004

Reviewed By / Date : LG 1/29/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : ASTM D4531-86					**Dilution: 1**															
Density	1.67		g/cm3		YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-OBC-B-02 **Lab Report Batch :** K0810465 **Lab ID :** CAS_K

Sample Date : 10/23/2008 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0810465-005

Reviewed By / Date : LG 1/29/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : ASTM D4531-86					**Dilution: 1**															
Density	1.37		g/cm3		YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-OBC-B-03 **Lab Report Batch :** K0810465 **Lab ID :** CAS_K

Sample Date : 10/23/2008 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0810465-006

Reviewed By / Date : LG 1/29/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : ASTM D4531-86					**Dilution: 1**															
Density	1.17		g/cm3		YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-HS6-B-01 **Lab Report Batch :** K0904268 **Lab ID :** CAS_K

Sample Date : 05/11/2009 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0904268-004

Reviewed By / Date : LG 8/18/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : ASTM E1109-86					**Dilution: 1**															
Bulk Density	1.50		g/cm3		YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-HS6-B-02 **Lab Report Batch :** K0904268 **Lab ID :** CAS_K

Sample Date : 05/11/2009 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0904268-005

Reviewed By / Date : LG 8/18/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : ASTM E1109-86					**Dilution: 1**															
Bulk Density	1.98		g/cm3		YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-HS6-B-03 **Lab Report Batch :** K0904268 **Lab ID :** CAS_K

Sample Date : 05/11/2009 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0904268-006

Reviewed By / Date : LG 8/18/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : ASTM E1109-86					**Dilution: 1**															
Bulk Density	1.76		g/cm3		YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-HS6-F-01 **Lab Report Batch :** K0904301 **Lab ID :** CAS_K

Sample Date : 05/12/2009 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0904301-005

Reviewed By / Date : LG 8/20/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : ASTM E1109-86					**Dilution: 1**															
Bulk Density	1.55		g/cm3		YES															

Project Number and Name: **20405.016.008.0451.0 - Lower Rogue River** **Library Used:** **LRR**

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-HS6-F-01-DP
Lab Report Batch : K0904301
Lab ID : CAS_K
Sample Date : 05/12/2009
Analysis Type: 1RES
Sample Matrix : SED
Lab Sample ID: K0904301-006

Reviewed By / Date : LG 8/20/2009
Approved By / Date :

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : ASTM E1109-86					**Dilution: 1**															
Bulk Density	1.80		g/cm3		YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-HS6-DOWN2-01 **Lab Report Batch :** K0904356 **Lab ID :** CAS_K

Sample Date : 05/13/2009 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0904356-014

Reviewed By / Date : LG 8/20/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : ASTM E1109-86					**Dilution: 1**															
Bulk Density	1.42		g/cm3		YES															

Project Number and Name: **20405.016.008.0451.0 - Lower Rogue River** **Library Used:** **LRR**

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-HS3-A-01 **Lab Report Batch :** K0904451 **Lab ID :** CAS_K

Sample Date : 05/16/2009 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0904451-002

Reviewed By / Date : LG 8/21/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : ASTM E1109-86					**Dilution: 1**															
Bulk Density	1.23		g/cm3		YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-HS3-A-01-FS
Lab Report Batch : K0904451
Lab ID : CAS_K
Sample Date : 05/16/2009
Analysis Type: 1RES
Sample Matrix : SED
Lab Sample ID: K0904451-004

Reviewed By / Date : LG 8/21/2009
Approved By / Date :

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : ASTM E1109-86					**Dilution: 1**															
Bulk Density	1.27		g/cm3		YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-HS3-A-02 **Lab Report Batch :** K0904451 **Lab ID :** CAS_K

Sample Date : 05/16/2009 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0904451-005

Reviewed By / Date : LG 8/21/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : ASTM E1109-86					**Dilution: 1**															
Bulk Density	1.47		g/cm3		YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-HS3-A-02-DP
Lab Report Batch : K0904451
Lab ID : CAS_K
Sample Date : 05/16/2009
Analysis Type: 1RES
Sample Matrix : SED
Lab Sample ID: K0904451-006

Reviewed By / Date : LG 8/21/2009
Approved By / Date :

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : ASTM E1109-86					**Dilution: 1**															
Bulk Density	1.51		g/cm3		YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-HS3-A-03 **Lab Report Batch :** K0904451 **Lab ID :** CAS_K

Sample Date : 05/16/2009 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0904451-007

Reviewed By / Date : LG 8/21/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : ASTM E1109-86					**Dilution: 1**															
Bulk Density	1.41		g/cm3		YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-ZIC-C-01-TOX
Lab Report Batch : K0904454
Lab ID : CAS_K
Sample Date : 05/16/2009
Analysis Type: 1RES
Sample Matrix : SED
Lab Sample ID: K0904454-009

Reviewed By / Date : LG 8/20/2009
Approved By / Date :

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : ASTM E1109-86					**Dilution: 1**															
Bulk Density	1.55		g/cm3		YES															

Project Number and Name: **20405.016.008.0451.0 - Lower Rogue River** **Library Used:** **LRR**

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Weston Solutions, Inc.
20 North Wacker Drive, Suite 1210
Chicago, IL 60606
(312) 424-3300 ● Fax: (312) 424-3330
www.westonsolutions.com

The Trusted Integrator for Sustainable Solutions

December 4, 2009

Ms. Diana Mally
Great Lakes National Program Office
United States Environmental Protection Agency, Region V
77 West Jackson Boulevard, Mail Code: G-17J
Chicago, Illinois 60604-3507

Re: Data Review of Diesel Range Organics (DRO) and Residual Range Organics (RRO) Analysis
For Sediment Samples Collected in October 2008 and May 2009
Lower Rouge River Sediment Investigation
Detroit, Wayne County, Michigan
Technical Direction Document Number: S05-0008-0805-012
Document Control Number: 451-2A-AEQA
Work Order Number: 20405.012.008.0451.00

Dear Ms. Mally:

The United States Environmental Protection Agency (U.S. EPA) tasked Weston Solutions, Inc., (WESTON®) to perform data validation for sediment samples collected from October 21, 2008, to May 16, 2009 for the Great Lakes National Program Office Lower Rouge River Sediment Investigation (LRR) Site. This data review is for DRO and RRO analysis of 208 sediment samples that include 11 field duplicate samples and 9 field replicate samples that were collected by the WESTON Superfund Technical Assessment and Response Team (START). The samples were validated in accordance with the "Quality Assurance Project Plan (QAPP), Lower Rouge River Sediment Investigation" dated October 17, 2008, which included using the U.S. EPA Contract Laboratory Program National Functional Guidance for Organic Data Review. Table 1 provides a summary of the samples included in this review. All tables are presented at the end of this report.

The samples listed in Table 1 were analyzed by Columbia Analytical Services (CAS) located in Kelso, Washington under the following 12 work orders:

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- K0810413
- K0810422
- K0810423
- K0810463
- K0810465
- K0904268
- K0904301
- K0904351
- K0904356
- K0904403
- K0904451
- K0904454

The samples were analyzed for DRO and RRO using SW-846 Method 8015B. Data validation was performed for each work order. CAS provided WESTON with a Staged Electronic Data Deliverable that was used in conjunction with the Automated Data Review (ADR) software to assist in reviewing the data.

Attachment A to this report contains the individual Quality Assurance/Quality Control (QA/QC) Analysis Checklist for Sediment Chemistry Analysis for each work order. Attachment B to this report contains a printed report from ADR that provides a summary of results with applied data qualifiers. The QC limits utilized were those stated in the QAPP. If there was not a QC limit specified in the QAPP, then the method or laboratory-determined QC limits were used. Below is a data review summary.

SUMMARY OF DRO AND RRO DATA REVIEW

The holding times and laboratory control sample (LCS) results, initial calibration results, and continuing calibration results were all within the QC limits. All sample results were based on a dry weight for DRO and RRO analyses.

There were some minor problems with the quality control indicators. In 11 of the 12 work orders, there were detections of some target compounds in the method blanks. In each instance, the detection in the method blank was below the reporting limit. In six work orders, the percent recoveries for the matrix spike (MS) and/or matrix spike duplicate (MSD) were outside the QC limits. In two work orders, the relative percent difference (RPD) between the MS and MSD was outside the QC limits for one or more target compounds.

In four work orders, either the field replicate or field duplicate results were outside the standard QC limit utilized. In four work orders, field duplicate results were outside the standard QC limit utilized.

In 10 work orders, surrogates were outside QC limits due to sample dilutions required because of high concentrations of target compounds in the samples. In addition, the laboratory qualified most results to state that the sample chromatograms were not exact matches to the standards used for the analyses.

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Below are a description of the minor problems with QC failures and a review of the data quality indicators. All tables are included at the end of this report including a data qualification table. The attachment contains the standardized QA/QC Analysis Checklist for Sediment Chemistry Analysis for each work order and the data summary sheets with data qualifiers applied during data validation.

MINOR PROBLEMS

Minor problems with QC failures are noted below.

Method Blanks. In all but one of the work orders, method blanks contained detections of target compounds below the reporting limit. In each of these work orders, the sample concentrations were much greater than the method blank concentration and no qualifications were required. For RRO, the method blank concentrations ranged from 3.2 to 7.4 milligrams per kilogram (mg/kg). For DRO, the method blank concentrations ranged from 1.7 to 10 mg/kg. The method blank contamination did not affect the data usability of the DRO and RRO analyses.

MS and MSDs. In six work orders, the percent recoveries (%R) for MS and MSDs were outside the specified QC limits. In two work orders the RPD between the MS and MSD were outside the QC limits. Below is a summary of the QC limit exceedances by work order.

- K0810422. The percent recoveries for the MS and MSD were outside the QC limits specified in the QAPP. Because the sample concentrations were more than four times the spike amount, no qualifications were required for this discrepancy.
- K0810423. The percent recoveries for the MS and MSD were outside the QC limits specified in the QAPP. Because the sample concentrations were more than four times the spike amount, no qualifications were applied for this discrepancy.

  The RPD between the MS and the MSD was within the QC limit of 40 percent or less except for RRO which had an RPD of 41 percent. Because the sample concentrations were more than four times the spike amount, no qualifications were applied for this discrepancy.
- K0810463. The percent recoveries for the MS and MSD were outside the QC limits specified in the QAPP. Because the sample concentrations were more than four times the spike amount, no qualifications were required for this discrepancy.
- K0904268. The MSD spike recoveries were low; therefore, all DRO and RRO results in the parent sample (LRR-HS6-A-01) were flagged "J" as estimated due to possible matrix interference.

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The RPDs between the MS and MSD were outside the QAPP QC limits. The DRO and RRO results in the parent sample (LRR-HS6-A-01) were flagged "J" as estimated due to possible matrix interference.

- K0904451. The percent recoveries for the MS and MSD were outside the QC limits specified in the QAPP. Because the sample concentrations were more than four times the spike amount, no qualifications were required for this discrepancy.
- K0904454. Two MS/MSDs are associated with this work order. For one MS/MSD pair, all percent recoveries were with QAPP QC limits. For the second MS/MSD pair, RRO was detected high. Because the sample concentration was greater than four times the spike amount, no qualification was required for this discrepancy.

Surrogate Results. Several samples had surrogate recoveries outside of the QC limits. In each of these instances there were high concentrations of target analytes in the samples and dilutions were required by the laboratories. No qualification was required because of the dilutions affecting surrogate recovery. The poor surrogate recoveries in some samples do not affect data usability.

Field Replicate Results. The field replicates were collected from the same homogenized material as the associated investigative sample. Nine field replicate pairs are associated with the sediment samples collected from October 21, 2008, to May 16, 2009 (see Table 1 for which samples were designated as field replicates). The QAPP stated that field replicates would be collected at a rate of 5 percent for investigative samples collected. A total of 188 investigative samples were collected; therefore, approximately 4.8 percent of the samples were collected for field replicates which is very close to the stated 5 percent.

Because a QC limit for field replicates was not stated in the QAPP, a default QC limit of 50 RPD was used to evaluate field replicate results. Table 2 summarizes the field replicate results and RPDs. Of the nine replicate pairs associated with the DRO and RRO analyses, one field replicate pair slightly exceeded the QC limit with RPDs of 68 and 70. The field replicate results indicate acceptable field precision.

Field Duplicate Results. The field duplicates were collected adjacent to an investigative sample and are not of the same homogenized material. Eleven field duplicate pairs are associated with the sediment samples collected from October 21, 2008, to May 16, 2009 (see Table 1 for which samples were designated as field duplicates). The QAPP stated that field duplicates would be collected at a rate of 5 percent for investigative samples collected. A total of 188 investigative samples were collected; therefore, approximately 5.8 percent of the samples were collected for field duplicates which is within the stated 5 percent.
Because a QC limit for field duplicates was not stated in the QAPP, a default QC limit of 50 RPD was used to evaluate field replicate results. Table 3 summarizes the field duplicate results and RPDs. Of the 11 field duplicate pairs associated with the DRO and RRO analyses,

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three field duplicate pairs slightly exceeded the QC limit with RPDs ranging from 51 to 73 (see Table 3). The field duplicate results indicate acceptable field precision and indicate some heterogeneity in a few of the samples.

Target Compound Identification

Target compound identification followed the method and was acceptable; however, the chromatograms for the petroleum product identified in the samples were not exact matches to the chromatograms for the DRO and RRO standards. CAS qualified most sample results to provide further details regarding the chromatograms. The qualifiers used were "Z", "H", "L", "O", and "Y" and are defined as follows:

- A "Z" qualifier indicates that the chromatographic fingerprint does not resemble a petroleum product.
- An "H" qualifier indicates that the chromatographic fingerprint does resemble a petroleum product but the elution pattern indicates a greater amount of heavier molecular weight constituents than the calibration standard.
- An "L" qualifier indicates that the chromatographic fingerprint does resemble a petroleum product but the elution pattern indicates a greater amount of lighter molecular weight constituents than the calibration standard.
- An "O" qualifier indicates that the chromatographic fingerprint resembles an oil product, but does not match the calibration standard.
- A "Y" qualifier indicates that the chromatographic fingerprint resembles a petroleum product eluting in approximately the correct carbon range, but the elution pattern does not match the calibration standard.

DATA QUALITY INDICATORS REVIEW

Many the data quality indicators (sensitivity, precision, accuracy, and completeness) were evaluated through the data validation procedures which are summarized above and discussed in detail in the attachment.

Sensitivity. The laboratory reporting limit of 10 mg/kg for DRO and 100 mg/kg for RRO as stated in the QAPP was not met for most samples. In these instances where the detection limit was not met, there were detections of DRO and RRO in the samples and in many of these instances the detections were high requiring dilutions. In addition, the laboratory reported down to method detection limits which were lower than the reporting limits (all sample results reported below the reporting limit were qualified "J" as estimated). The elevated reporting limits do not affect data usability because there were detections of DRO and RRO in the samples. Therefore, sensitivity was adequate for the DRO and RRO analyses of sediment samples collected from October 21, 2008, to May 16, 2009.

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Precision. Field precision was determined by evaluating the RPDs for the field replicate and field duplicate results (see discussion of Field Replicate and Field Duplicate Results under Minor Problems). The field duplicate RPDs were higher than the field replicate RPDs. This is to be expected because the duplicate sample was not from the same homogenized sample aliquot as the investigative sample. Field precision was evaluated and found to be acceptable in most instances. Minor discrepancies are noted under Minor Problems above and these are likely due to sample heterogeneity. Table 4 summarizes the mean field replicate and duplicate RPDs for each analyte.

Laboratory precision was determined by evaluating the RPD values between MS and MSD results. There were minor problems with laboratory precision. See the more detailed discussion above for MS/MSDs in the previous section. All mean MS/MSD RPDs were within the QAPP QC limits. Table 4 summarizes the mean RPDs for MS/MSDs. The MS/MSD mean RPDs were 17 and 18 for DRO and RRO, respectively.

Accuracy/Bias. Accuracy is a measure of the agreement between an observed value and an accepted reference value. Laboratory accuracy was evaluated by reviewing the QC criteria for percent recovery for LCS results. All LCS mean percent recoveries were within the QAPP QC limits. Table 4 summarizes the accuracy estimates for the DRO and RRO analyses. The mean percent recoveries for LCSs were 84 and 102 percent for DRO and RRO, respectively. Laboratory accuracy was acceptable as indicated by the LCS percent recoveries. The mean LCS recoveries indicate a slightly low bias for DRO and no bias for RRO.

MS/MSD recoveries can also be used to evaluate accuracy; however, these were not used to evaluate DRO and RRO accuracy for the following reasons. In general, the MS/MSD percent recoveries were outside QC limits due to elevated DRO and RRO concentrations in the samples. Because of the elevated DRO and RRO concentrations, the spikes, which were much lower than the sample concentrations, were not adequately recovered. This is to be expected in these situations. The MS/MSD recoveries could therefore not be used to evaluate laboratory accuracy because of the high concentrations of DRO and RRO in the samples.

Completeness. Completeness is a measure of the amount of valid data obtained compared to the amount of data that was planned to be collected under normal conditions. All samples results were received.

In summary, there were some minor problems with QC failures and the DRO and RRO data are usable. Table 5 summarizes data qualifiers applied during the data review. Table 5 does not include the laboratory qualifiers applied concerning "fingerprint" matching to the chromatograms.

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If there are any questions or comments regarding this report, please do not hesitate to contact WESTON START at 312-424-3300.

Very truly yours,
Weston Solutions, Inc.

Lisa Graczyk
WESTON START Team

Tonya Balla
WESTON START Project Manager

Attachments:
Tables
A - Checklists for DRO and RRO Analytical Data
B - Analytical Data Summary Sheets with Qualifiers

cc: project file

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TABLES

TABLE 1 SAMPLES INCLUDED IN DATA REVIEW			
Sample ID	**Lab ID**	**Date Collected**	**Comment**
LRR-017-A-01	K0810413-001	10/21/2008	
LRR-017-A-02	K0810413-002	10/21/2008	
LRR-017-A-03	K0810413-003	10/21/2008	
LRR-017-A-04	K0810413-004	10/21/2008	
LRR-017-A-05	K0810413-005	10/21/2008	
LRR-OBC-D-01	K0810413-006	10/21/2008	
LRR-OBC-D-01-DP	K0810413-007	10/21/2008	Field duplicate of LRR-OBC-D-01
LRR-OF2-A-01	K0810413-008	10/21/2008	
LRR-WJB-A-01	K0810413-009	10/21/2008	
LRR-WJB-A-02	K0810413-010	10/21/2008	
LRR-HS1-A-01	K0810422-001	10/21/2008	
LRR-HS1-A-02	K0810422-002	10/21/2008	
LRR-HSI-A-03	K0810422-003	10/21/2008	
LRR-HS1-A-04	K0810422-004	10/21/2008	
LRR-OF2-D-01	K0810422-005	10/22/2008	
LRR-OF2-D-02	K0810422-006	10/22/2008	
LRR-OF2-D-03	K0810422-007	10/22/2008	
LRR-OF2-D-04	K0810422-008	10/22/2008	
LRR-OF2-D-05	K0810422-009	10/15/2008	
LRR-OF2-E-01	K0810422-010	10/22/2008	
LRR-OF2-E-02	K0810422-011	10/22/2008	
LRR-OF2-E-03	K0810422-012	10/22/2008	
LRR-OF2-E-04	K0810422-013	10/22/2008	
LRR-OF2-E-05	K0810422-014	10/22/2008	
LRR-HS5-C-03	K0810422-015	10/23/2008	
LRR-OF2-B-01	K0810423-001	10/22/2008	
LRR-OF2-B-02	K0810423-002	10/22/2008	
LRR-OF2-B-03	K0810423-003	10/22/2008	
LRR-OF2-B-04	K0810423-004	10/22/2008	
LRR-OF2-B-05	K0810423-005	10/22/2008	
LRR-OF2-C-01	K0810423-006	10/22/2008	
LRR-OF2-C-02	K0810423-007	10/22/2008	
LRR-OF2-C-03	K0810423-008	10/22/2008	
LRR-OF2-C-04	K0810423-009	10/22/2008	
LRR-OF2-C-05	K0810423-010	10/22/2008	
LRR-HS5-A-01	K0810423-011	10/23/2008	
LRR-HS5-A-02	K0810423-012	10/23/2008	
LRR-HS5-A-02-FS	K0810423-013	10/23/2008	Field replicate of LRR-HS5-A-02
LRR-HS5-A-03	K0810423-014	10/23/2008	
LRR-HS5-B-01	K0810423-015	10/23/2008	

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TABLE 1 SAMPLES INCLUDED IN DATA REVIEW			
Sample ID	**Lab ID**	**Date Collected**	**Comment**
LRR-HS5-B-02	K0810423-016	10/23/2008	
LRR-HS5-B-03	K0810423-017	10/23/2008	
LRR-HS5-B-03-FS	K0810423-018	10/23/2008	Field replicate of LRR-HS5-B-03
LRR-HS5-C-01	K0810423-019	10/23/2008	
LRR-HS5-C-02	K0810423-020	10/23/2008	
LRR-HS4-A-01	K0810463-001	10/23/2008	
LRR-HS4-A-01-DP	K0810463-002	10/23/2008	Field duplicate of LRR-HS4-A-01
LRR-HS4-A-02	K0810463-003	10/23/2008	
LRR-HS4-A-02-DP	K0810463-004	10/23/2008	Field duplicate of LRR-HS4-A-02
LRR-HS4-A-03	K0810463-005	10/23/2008	
LRR-HS4-A-03-DP	K0810463-006	10/23/2008	Field duplicate of LRR-HS4-A-03
LRR-HS4-B-01	K0810463-007	10/23/2008	
LRR-HS4-B-02	K0810463-008	10/23/2008	
LRR-HS4-B-03	K0810463-009	10/23/2008	
LRR-HS5-D-01	K0810463-010	10/23/2008	
LRR-HS5-D-02	K0810463-011	10/23/2008	
LRR-HS5-D-03	K0810463-012	10/23/2008	
LRR-HS4-C-01	K0810463-013	10/23/2008	
LRR-HS4-C-02	K0810463-014	10/23/2008	
LRR-HS4-C-03	K0810463-015	10/23/2008	
LRR-HS4-D-01	K0810463-016	10/23/2008	
LRR-HS4-D-02	K0810463-017	10/23/2008	
LRR-HS4-D-03	K0810463-018	10/23/2008	
LRR-HS4-E-01	K0810463-019	10/23/2008	
LRR-HS4-E-02	K0810463-020	10/24/2008	
LRR-OBC-A-01	K0810465-001	10/23/2008	
LRR-OBC-A-02	K0810465-002	10/23/2008	
LRR-OBC-A-03	K0810465-003	10/23/2008	
LRR-OBC-B-01	K0810465-004	10/23/2008	
LRR-OBC-B-02	K0810465-005	10/23/2008	
LRR-OBC-B-03	K0810465-006	10/23/2008	
LRR-OBC-C-01	K0810465-007	10/23/2008	
LRR-OBC-C-02	K0810465-008	10/23/2008	
LRR-OBC-C-03	K0810465-009	10/23/2008	
LRR-HS6-A-01	K0904268-001	5/11/2009	
LRR-HS6-A-02	K0904268-002	5/11/2009	
LRR-HS6-A-03	K0904268-003	5/11/2009	
LRR-HS6-B-01	K0904268-004	5/11/2009	
LRR-HS6-B-02	K0904268-005	5/11/2009	
LRR-HS6-B-03	K0904268-006	5/11/2009	
LRR-HS6-C-01	K0904268-007	5/11/2009	

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TABLE 1 SAMPLES INCLUDED IN DATA REVIEW			
Sample ID	**Lab ID**	**Date Collected**	**Comment**
LRR-HS6-C-02	K0904268-008	5/11/2009	
LRR-HS6-C-03	K0904268-009	5/11/2009	
LRR-HS6-C-04	K0904268-010	5/11/2009	
LRR-HS6-D-01	K0904268-011	5/11/2009	
LRR-ZIC-A-01	K0904268-012	5/11/2009	
LRR-ZIC-A-02	K0904268-013	5/11/2009	
LRR-ZIC-A-03	K0904268-014	5/11/2009	
LRR-ZIC-A-04	K0904268-015	5/11/2009	
LRR-ZIC-A-05	K0904268-016	5/11/2009	
LRR-ZIC-B-01	K0904268-017	5/11/2009	
LRR-ZIC-A-01-FS	K0904268-018	5/11/2009	Field replicate of LRR-ZIC-A-01
LRR-ZIC-A-02-FS	K0904268-019	5/11/2009	Field replicate of LRR-ZIC-A-02
LRR-ZIC-B-02	K0904268-020	5/11/2009	
LRR-ZIC-B-03	K0904268-021	5/11/2009	
LRR-HS6-E-01	K0904301-001	5/12/2009	
LRR-HS6-E-02	K0904301-002	5/12/2009	
LRR-HS6-E-03	K0904301-003	5/12/2009	
LRR-HS6-E-04	K0904301-004	5/12/2009	
LRR-HS6-F-01	K0904301-005	5/12/2009	
LRR-HS6-F-01-DP	K0904301-006	5/12/2009	Field duplicate of LRR-HS6-F-01
LRR-HS6-G-01	K0904301-007	5/12/2009	
LRR-HS6-UP1-01	K0904301-008	5/12/2009	
LRR-HS6-UP1-02	K0904301-009	5/12/2009	
LRR-HS6-UP2-01	K0904301-010	5/12/2009	
LRR-ZIC-D-01	K0904301-011	5/12/2009	
LRR-ZIC-D-01-DP	K0904301-012	5/12/2009	Field duplicate of LRR-ZIC-D-01
LRR-HS6-UP3-01	K0904301-013	5/12/2009	
LRR-HS6-UP3-02	K0904301-014	5/12/2009	
LRR-HS6-UP4-03	K0904301-015	5/12/2009	
LRR-HS6-UP4-04	K0904301-016	5/12/2009	
LRR-ZIC-C-01	K0904301-017	5/12/2009	
LRR-ZIC-C-02	K0904301-018	5/12/2009	
LRR-ZIC-C-03	K0904301-019	5/12/2009	
LRR-HS6-UP3-03	K0904301-020	5/12/2009	
LRR-ZIC-D-04	K0904351-001	5/13/2009	
LRR-ZIC-D-05	K0904351-002	5/13/2009	
LRR-ZIC-E-01	K0904351-003	5/13/2009	
LRR-ZIC-E-02	K0904351-004	5/13/2009	
LRR-ZIC-E-03	K0904351-005	5/13/2009	
LRR-ZIC-E-04	K0904351-006	5/13/2009	
LRR-ZIC-E-05	K0904351-007	5/13/2009	

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TABLE 1 SAMPLES INCLUDED IN DATA REVIEW			
Sample ID	**Lab ID**	**Date Collected**	**Comment**
LRR-ZIC-F-02	K0904351-008	5/13/2009	
LRR-ZIC-F-03	K0904351-009	5/13/2009	
LRR-ZIC-F-04	K0904351-010	5/13/2009	
LRR-ZIC-F-01	K0904351-011	5/13/2009	
LRR-ZIC-F-02-DP	K0904351-012	5/13/2009	Field duplicate of LRR-ZIC-F-02
LRR-HS6-X2-01	K0904351-013	5/14 /2009	
LRR-HS6-X2-02	K0904351-014	5/14/2009	
LRR-HS6-X2-02-FS	K0904351-015	5/14/2009	Field replicate of LRR-HS6-X2-02
LRR-HS6-UP3-04	K0904356-001	5/12/2009	
LRR-HS6-UP4-01	K0904356-002	5/12/2009	
LRR-HS6-UP4-02	K0904356-003	5/12/2009	
LRR-HS6-UP1-02-FS	K0904356-004	5/12/2009	Field replicate of LRR-HS6-UP1-02
LRR-HS6-UP1-03	K0904356-005	5/12/2009	
LRR-HS6-UP2-02	K0904356-006	5/12/2009	
LRR-HS6-UP2-03	K0904356-007	5/12/2009	
LRR-HS6-UP2-04	K0904356-008	5/12/2009	
LRR-HS6-DOWN1-01	K0904356-009	5/13/2009	
LRR-HS6-DOWN1-02	K0904356-010	5/13/2009	
LRR-HS6-DOWN1-02-FS	K0904356-011	5/13/2009	Field replicate of LRR-DOWN1-02
LRR-HS6-DOWN1-03	K0904356-012	5/13/2009	
LRR-HS6-DOWN1-04	K0904356-013	5/13/2009	
LRR-HS6-DOWN2-01	K0904356-014	5/13/2009	
LRR-HS6-X1-01	K0904356-015	5/13/2009	
LRR-HS6-X1-02	K0904356-016	5/13/2009	
LRR-HS6-X1-03	K0904356-017	5/13/2009	
LRR-HS6-X1-04	K0904356-018	5/13/2009	
LRR-ZIC-D-02	K0904356-019	5/13/2009	
LRR-ZIC-D-03	K0904356-020	5/13/2009	
LRR-HS6-X2-03	K0904403-001	5/14/2009	
LRR-HS6-X2-04	K0904403-002	5/14/2009	
LRR-HS6-X3-01	K0904403-003	5/14/2009	
LRR-HS6-X4-01	K0904403-004	5/14/2009	
LRR-HS6-X4-02	K0904403-005	5/14/2009	
LRR-HS6-X5-01	K0904403-006	5/14/2009	

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TABLE 1 SAMPLES INCLUDED IN DATA REVIEW			
Sample ID	**Lab ID**	**Date Collected**	**Comment**
LRR-HS6-X5-02	K0904403-007	5/14/2009	
LRR-HS6-UP5-01	K0904403-008	5/14/2009	
LRR-HS6-UP5-02	K0904403-009	5/14/2009	
LRR-HS6-UP5-03	K0904403-010	5/14/2009	
LRR-HS6-UP5-04	K0904403-011	5/14/2009	
LRR-HS6-UP6-01	K0904403-012	5/14/2009	
LRR-HS6-UP6-02	K0904403-013	5/14/2009	
LRR-HS6-UP7-01	K0904403-014	5/14/2009	
LRR-HS6-UP7-02	K0904403-015	5/14/2009	
LRR-ZIC-G-01	K0904403-016	5/13/2009	
LRR-ZIC-G-02	K0904403-017	5/13/2009	
LRR-ZIC-G-03	K0904403-018	5/13/2009	
LRR-ZIC-H-01	K0904403-019	5/13/2009	
LRR-ZIC-H-02	K0904403-020	5/13/2009	
LRR-HS1-F-05	K0904451-001	5/15/2009	
LRR-HS3-A-01	K0904451-002	5/16/2009	
LRR-HS3-A-01-DP	K0904451-003	5/16/2009	Field duplicate of LRR-HS3-A-01
LRR-HS3-A-01-FS	K0904451-004	5/16/2009	Field replicate of LRR-HS3-A-01
LRR-HS3-A-02	K0904451-005	5/16/2009	
LRR-HS3-A-02-DP	K0904451-006	5/16/2009	Field duplicate of LRR-HS3-A-02
LRR-HS3-A-03	K0904451-007	5/16/2009	
LRR-HS3-B-01	K0904451-008	5/16/2009	
LRR-HS3-B-02	K0904451-009	5/16/2009	
LRR-HS3-B-03	K0904451-010	5/16/2009	
LRR-HS3-C-01	K0904451-011	5/16/2009	
LRR-HS3-C-02	K0904451-012	5/16/2009	
LRR-HS3-C-03	K0904451-013	5/16/2009	
LRR-HS3-D-01	K0904451-014	5/16/2009	
LRR-HS3-D-02	K0904451-015	5/16/2009	
LRR-HS3-E-01	K0904451-016	5/16/2009	
LRR-HS3-E-02	K0904451-017	5/16/2009	
LRR-HS4-F-01	K0904451-018	5/15/2009	
LRR-HS4-F-02	K0904451-019	5/15/2009	
LRR-HS1-B-01	K0904454-002	5/15/2009	
LRR-HS1-B-01-DP	K0904454-003	5/15/2009	Field duplicate of LRR-HS1-B-01
LRR-HS1-B-02	K0904454-004	5/15/2009	
LRR-HS1-B-02-DP	K0904454-005	5/15/2009	Field duplicate of LRR-HS1-B-02
LRR-HS1-B-03	K0904454-006	5/15/2009	
LRR-HS1-B-04	K0904454-007	5/15/2009	
LRR-HS1-B-05	K0904454-008	5/15/2009	
LRR-ZIC-C-01-TOX	K0904454-009	5/15/2009	

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TABLE 1 SAMPLES INCLUDED IN DATA REVIEW			
Sample ID	**Lab ID**	**Date Collected**	**Comment**
LRR-HS1-C-01	K0904454-010	5/15/2009	
LRR-HS1-C-02	K0904454-011	5/15/2009	
LRR-HS1-D-01	K0904454-012	5/15/2009	
LRR-HS1-D-02	K0904454-013	5/15/2009	
LRR-HS1-D-02-FS	K0904454-014	5/15/2009	Field replicate of LRR-HS1-D-02
LRR-HS1-E-01	K0904454-015	5/15/2009	
LRR-HS1-E-02	K0904454-016	5/15/2009	
LRR-HS1-F-01	K0904454-017	5/15/2009	
LRR-HS1-F-02	K0904454-018	5/15/2009	
LRR-HS1-F-03	K0904454-019	5/15/2009	
LRR-HS1-F-04	K0904454-020	5/15/2009	

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TABLE 2
FIELD REPLICATE RESULTS
FOR DRO and RRO ANALYSES

	Sample: LRR-HS5-A-02-FS			Sample: LRR-HS5-B-03-FS			Sample:LRR-ZIC-A-01-FS			Sample: LRR-ZIC-A-02-FS		
Analyte	**Sample Result (mg/kg)**	**Replicate Result (mg/kg)**	**RPD**	**Sample Result (mg/kg)**	**Replicate Result (mg/kg)**	**RPD**	**Sample Result (mg/kg)**	**Replicate Result (mg/kg)**	**RPD**	**Sample Result (mg/kg)**	**Replicate Result (mg/kg)**	**RPD**
DRO	3,600	4,100	13	3,600	4,400	20	570	660	15	940	870	8
RRO	9,100	10,000	9	8,400	11,000	27	1,400	1,600	13	2,300	2,000	14
	Sample: LRR-HS6-X2-02-FS			**Sample: LRR-HS6-UP1-02-FS**			**Sample: LRR-HS6-DOWN1-02-FS**			**Sample: LRR-HS3-A-01-FS**		
Analyte	**Sample Result (mg/kg)**	**Replicate Result (mg/kg)**	**RPD**	**Sample Result (mg/kg)**	**Replicate Result (mg/kg)**	**RPD**	**Sample Result (mg/kg)**	**Replicate Result (mg/kg)**	**RPD**	**Sample Result (mg/kg)**	**Replicate Result (mg/kg)**	**RPD**
DRO	89	44	68	76	49	43	69	76	10	2,900	2,700	7
RRO	100	48	70	220	180	20	130	150	14	8,800	8,300	6
	Sample: LRR-HS1-D-02-FS			**Sample:**			**Sample:**			**Sample:**		
Analyte	**Sample Result (mg/kg)**	**Replicate Result (mg/kg)**	**RPD**	**Sample Result (mg/kg)**	**Replicate Result (mg/kg)**	**RPD**	**Sample Result (mg/kg)**	**Replicate Result (mg/kg)**	**RPD**	**Sample Result (mg/kg)**	**Replicate Result (mg/kg)**	**RPD**
DRO	1,700	1,700	0									
RRO	5,200	5,400	4									

Notes:

DRO - Diesel Range Organics
Highlighted RPD values exceed the comparison value of 50 RPD.
mg/kg - Milligram per Kilogram
NA -Not Applicable
RPD - Relative Percent Difference
RRO - Residual Range Organics

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TABLE 3
FIELD DUPLICATE RESULTS
FOR DRO and RRO ANALYSES

Analyte	Sample: LRR-OBC-D-01-DP			Sample: LRR-HS4-A-01-DP			Sample:LRR-HS4-A-02-DP			Sample: LRR-HS4-A-03-DP		
	Sample Result (mg/kg)	**Replicate Result (mg/kg)**	**RPD**	**Sample Result (mg/kg)**	**Replicate Result (mg/kg)**	**RPD**	**Sample Result (mg/kg)**	**Replicate Result (mg/kg)**	**RPD**	**Sample Result (mg/kg)**	**Replicate Result (mg/kg)**	**RPD**
DRO	4,400	2,800	44	2,200	2,200	0	1,800	3,800	71	7,300	8,400	14
RRO	8,400	5,000	51	5,500	5,600	2	4,600	8,700	62	15,000	16,000	6
Analyte	**Sample: LRR-HS6-F-01-DP**			**Sample: LRR-ZIC-D-01-DP**			**Sample: LRR-ZIC-F-02-DP**			**Sample: LRR-HS3-A-01-DP**		
	Sample Result (mg/kg)	**Replicate Result (mg/kg)**	**RPD**	**Sample Result (mg/kg)**	**Replicate Result (mg/kg)**	**RPD**	**Sample Result (mg/kg)**	**Replicate Result (mg/kg)**	**RPD**	**Sample Result (mg/kg)**	**Replicate Result (mg/kg)**	**RPD**
DRO	2,600	3,400	27	85	180	72	32	31	3	2,900	2,900	0
RRO	5,600	7,100	24	210	450	73	70	68	3	8,800	7,400	17
Analyte	**Sample: LRR-HS3-A-02-DP**			**Sample: LRR-HS1-B-01-DP**			**Sample: LRR-HS1-B-02-DP**			**Sample:**		
	Sample Result (mg/kg)	**Replicate Result (mg/kg)**	**RPD**	**Sample Result (mg/kg)**	**Replicate Result (mg/kg)**	**RPD**	**Sample Result (mg/kg)**	**Replicate Result (mg/kg)**	**RPD**	**Sample Result (mg/kg)**	**Replicate Result (mg/kg)**	**RPD**
DRO	4,200	4,500	7	2,100	2,500	17	250	300	18			
RRO	11,000	12,000	9	5,700	6,500	13	570	650	13			

Notes:

DRO - Diesel Range Organics
Highlighted RPD values exceed the comparison value of 50 RPD.
mg/kg - Milligram per Kilogram
NA - Not Applicable
RPD - Relative Percent Difference
RRO - Residual Range Organics

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TABLE 4 QUANTITATIVE DATA ASSESSMENT FOR DRO AND RRO				
	Field Precision		Analytical Precision	Analytical Accuracy/Bias
Parameter	Mean Field Replicate RPD (%) (n=9)	Mean Field Duplicate RPD (%) (n=11)	Mean MS/MSD RPD (%) (n=13)	Mean LCS Recovery (%) (n=11)
DRO	20	25	17	84
RRO	20	25	18	102

Notes:

DRO - Diesel Range Organics
LCS - Laboratory Control Sample
LCSD - Laboratory Control Sample Duplicate
MS - Matrix Spike
MSD - Matrix Spike Duplicate
RPD - Relative Percent Difference
RRO - Residual Range Organics

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TABLE 5 SUMMARY OF DATA QUALIFICATION				
Sample ID	**Sampling Date**	**Analyte**	**Qualification**	**Reason**
WORK ORDER # K0904268				
LRR-HS6-A-01	05/11/2009	DRO RRO	Sample result should be considered estimated.	The MSD spike recoveries were low; therefore, the DRO and RRO results in sample LRR-HS6-A-01, the parent sample, should be considered estimated due to possible matrix interference.
LRR-HS6-A-02	05/11/2009	DRO	Sample result should be considered estimated.	The result was detected below the reporting limit and above the method detection limit.
LRR-HS6-A-03	05/11/2009			
LRR-HS6-C-02	05/11/2009			
LRR-HS6-C-03	05/11/2009			
LRR-HS6-C-04	05/11/2009			
LRR-ZIC-A-04	05/11/2009			
WORK ORDER # K0904351				
LRR-ZIC-D-04	5/13/2009	DRO	Sample result should be considered estimated.	The result was detected below the reporting limit and above the method detection limit.
LRR-ZIC-D-05	5/13/2009			
LRR-ZIC-F-02	5/13/2009			
LRR-ZIC-F-02-DP	5/13/2009			
LRR-ZIC-F-03	5/13/2009			
LRR-ZIC-F-04	5/13/2009			
WORK ORDER # K0904403				
LRR-HS6-UP7-02	5/14/2009	RRO	Sample result should be considered estimated.	The result was detected below the reporting limit and above the method detection limit.
LRR-ZIC-H-01	5/13/2009	DRO RRO	Sample result should be considered estimated.	The result was detected above the method detection limit but below the reporting limit.
LRR-ZIC-H-02	5/13/2009			

Notes:

DRO - Diesel Range Organics
MSD - Matrix Spike Duplicate
RRO - Residual Range Organics

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ATTACHMENT A
CHECKLISTS FOR DRO AND RRO ANALYTICAL DATA

DRO AND RRO BY SW-846 METHOD 8015B

CAS Work Order #: K0810413

QA/QC Analysis Checklist for Sediment Chemistry Analysis

GRANT/IAG NUMBER: Not Applicable
PROJECT NAME: Lower Rouge River
REVIEWER: Lisa Graczyk, WESTON START
DATE: January 15, 2009

1. What sediment chemistry data has been collected (CHECK ALL THAT APPLY)?

Total Metals ____	PCBs _____	pH _____	TOC _____
Dioxins/Furans _____	PAHs _____	Pesticides _____	DO _____
AVS _____	SEM Metals _____	Particle Size _____	Other __X (DRO, RRO)

2. Were the target detection limits met for each parameter?

Yes		
No	X	(EXPLAIN)

The reporting limits as stated in the QAPP were not met due to the high concentrations of the target analytes in the samples.

3. Were the method blanks less than the established MDL for each parameter?

Yes		
No	X	(EXPLAIN)

The method blank contained RRO at 6.9 mg/kg which was below the reporting limit and greater than the method detection limit. Because the RRO detections in the samples were much greater than the blank concentration, no qualification is required and data usability is not affected.

4. Did the results of Field Replicate Analysis vary by less than the % RPD specified in the QAPP?

Yes	Not Applicable	
No		(EXPLAIN)

5. Did the results of the Field Duplicates Analysis vary by less than the % RPD specified in the QAPP?

Yes		
No	X	(EXPLAIN)

There is one field duplicate associated with this work order (identified with a "DP" suffix). The field duplicate results and investigative sample results were within a standard quality control (QC) limit of 50 RPD or less except for RRO which had an RPD of 51. Qualifications were not applied for this minor discrepancy.

6. Did the surrogate spike/internal standards recoveries meet the limits set forth in the QAPP?

Yes		
No	X	(EXPLAIN)

In some instances, one of the two surrogates was outside the QC limits due to sample dilutions. No qualifications are required for this discrepancy.

7. Did the MS/MSD recoveries meet the limits set forth in the QAPP?

Yes	X	
No		(EXPLAIN)

8. Did the RPD (%) of the MS/MSD sample set meet the limits set forth in the QAPP?

Yes	X	
No		(EXPLAIN)

9. Did the LCS recoveries meet the limits set forth in the QAPP?

Yes	X	
No		(EXPLAIN)

10. Did the calibration verification standards (ICVs and CCVs) meet the requirements set forth in the QAPP?

Yes	X	
No		(EXPLAIN)

11. Did the calibration blanks (ICBs and CCBs) meet the limits set forth in the QAPP?

Yes	Not Applicable	
No		

The instrument blanks were free of target compounds.

12. Did the interference check samples meet the limits set forth in the QAPP?

Yes	Not Applicable	
No		(EXPLAIN)

13. Did the serial dilution samples meet the limits set forth in the QAPP?

Yes	Not Applicable	
No		(EXPLAIN)

14. Were any level of contaminants detected above the MDL for the trip blanks and storage blanks?

Yes	Not Applicable	
No		(EXPLAIN)

15. Did all required analyses take place within the required holding time protocols set forth in the QAPP?

Yes	X	
No		(EXPLAIN)

16. Did the laboratory duplicates vary by less than the % RPD specified in the QAPP?

Yes	Not Applicable	
No		(EXPLAIN)

17. Are measured dry-weight contaminant concentrations reported?

Yes	X	
No		(EXPLAIN)

18. Please provide details for all of the "EXPLAIN" marked above. Include details on the specific analytes affected by any QA/QC discrepancies, and recommendations regarding usability of data.

Any items with "EXPLAIN" marked above are described immediately following the "EXPLAIN" marking in the corresponding item above.

Note that the laboratory qualified many of the sample results with a "J", "Z", "H", "O", and "Y" and are defined as follows:

- A "J" qualifier indicates that the sample result should be considered estimated because it was detected below the reporting limit.
- A "Z" qualifier indicates that the chromatographic fingerprint does not resemble a petroleum product.
- An "H" qualifier indicates that the chromatographic fingerprint does resemble a petroleum product but the elution pattern indicates a greater amount of heavier molecular constituents than the calibration standard.
- An "O" qualifier indicates that the chromatographic fingerprint resembles an oil product, but does not match the calibration standard.
- A "Y" qualifier indicates that the chromatographic fingerprint resembles a petroleum product eluting in approximately the correct carbon range, but the elution pattern does not match the calibration standard.

All of these results should be considered estimated. Note that the sample chromatographic patterns not matching up to the standards is to be expected because of the weathering/degrading of the petroleum products over time.

In addition, some results were flagged by the laboratory with a "D" to indicate that the sample result is from a dilution.

The data are acceptable for use as qualified.

Data Validation Report
Lower Rouge River
Columbia Analytical Services
Laboratory Work Order #: K0904454

DRO AND RRO BY SW-846 METHOD 8015B

CAS Work Order #: K0810422

QA/QC Analysis Checklist for Sediment Chemistry Analysis

GRANT/IAG NUMBER: Not Applicable
PROJECT NAME: Lower Rouge River
REVIEWER: Lisa Graczyk, WESTON START
DATE: January 19, 2009

1. What sediment chemistry data has been collected (CHECK ALL THAT APPLY)?

Total Metals ____	PCBs _____	pH _____	TOC _____
Dioxins/Furans _____	PAHs _____	Pesticides _____	DO _____
AVS _____	SEM Metals _____	Particle Size _____	Other __X (DRO, RRO)

2. Were the target detection limits met for each parameter?

Yes		
No	X	(EXPLAIN)

The reporting limits as stated in the QAPP were not met due to the high concentrations of the target analytes in the samples.

3. Were the method blanks less than the established MDL for each parameter?

Yes		
No	X	(EXPLAIN)

The method blank contained RRO at 3.46 mg/kg which was below the reporting limit and greater than the method detection limit. Because the RRO detections in the samples were much greater than the blank concentration, no qualification is required and data usability is not affected.

4. Did the results of Field Replicate Analysis vary by less than the % RPD specified in the QAPP?

Yes	Not Applicable	
No		(EXPLAIN)

5. Did the results of the Field Duplicates Analysis vary by less than the % RPD specified in the QAPP?

Yes	Not Applicable	
No		(EXPLAIN)

6. Did the surrogate spike/internal standards recoveries meet the limits set forth in the QAPP?

Yes		
No	X	(EXPLAIN)

In some instances, the surrogates were outside the QC limits due to sample dilutions. No qualifications are required for this discrepancy.

7. Did the MS/MSD recoveries meet the limits set forth in the QAPP?

Yes		
No	X	(EXPLAIN)

The percent recoveries for the MS and MSD were outside the QC limits specified in the QAPP. Because the sample concentrations were more than 4 times the spike amount, no qualifications were applied for this discrepancy.

8. Did the RPD (%) of the MS/MSD sample set meet the limits set forth in the QAPP?

Yes	X	
No		(EXPLAIN)

9. Did the LCS recoveries meet the limits set forth in the QAPP?

Yes	X	
No		(EXPLAIN)

10. Did the calibration verification standards (ICVs and CCVs) meet the requirements set forth in the QAPP?

Yes	X	
No		(EXPLAIN)

11. Did the calibration blanks (ICBs and CCBs) meet the limits set forth in the QAPP?

Yes	Not Applicable	
No		

The instrument blanks were free of target compounds.

12. Did the interference check samples meet the limits set forth in the QAPP?

Yes	Not Applicable	
No		(EXPLAIN)

13. Did the serial dilution samples meet the limits set forth in the QAPP?

Yes	Not Applicable	
No		(EXPLAIN)

14. Were any level of contaminants detected above the MDL for the trip blanks and storage blanks?

Yes	Not Applicable	
No		(EXPLAIN)

15. Did all required analyses take place within the required holding time protocols set forth in the QAPP?

Yes	X	
No		(EXPLAIN)

16. Did the laboratory duplicates vary by less than the % RPD specified in the QAPP?

Yes	Not Applicable	
No		(EXPLAIN)

17. Are measured dry-weight contaminant concentrations reported?

Yes	X	
No		(EXPLAIN)

18. Please provide details for all of the "EXPLAIN" marked above. Include details on the specific analytes affected by any QA/QC discrepancies, and recommendations regarding usability of data.

Any items with “EXPLAIN” marked above are described immediately following the “EXPLAIN” marking in the corresponding item above.

Note that the laboratory qualified many of the sample results with a “J”, “Z”, “H”, “O”, and “Y” and are defined as follows:

- A “J” qualifier indicates that the sample result should be considered estimated because it was detected below the reporting limit.
- A “Z” qualifier indicates that the chromatographic fingerprint does not resemble a petroleum product.
- An “H” qualifier indicates that the chromatographic fingerprint does resemble a petroleum product but the elution pattern indicates a greater amount of heavier molecular constituents than the calibration standard.
- An “O” qualifier indicates that the chromatographic fingerprint resembles an oil product, but does not match the calibration standard.

- A “Y” qualifier indicates that the chromatographic fingerprint resembles a petroleum product eluting in approximately the correct carbon range, but the elution pattern does not match the calibration standard.

All of these results should be considered estimated. Note that the sample chromatographic patterns not matching up to the standards is to be expected because of the weathering/degrading of the petroleum products over time.

In addition, some results were flagged by the laboratory with a “D” to indicate that the sample result is from a dilution.

The data are acceptable for use as qualified.

Data Validation Report
Lower Rouge River
Columbia Analytical Services
Laboratory Work Order #: K0810422

DRO AND RRO BY SW-846 METHOD 8015B

CAS Work Order #: K0810423

QA/QC Analysis Checklist for Sediment Chemistry Analysis

GRANT/IAG NUMBER: Not Applicable
PROJECT NAME: Lower Rouge River
REVIEWER: Lisa Graczyk, WESTON START
DATE: January 20, 2009

1. What sediment chemistry data has been collected (CHECK ALL THAT APPLY)?

Total Metals ____	PCBs _____	pH _____	TOC _____
Dioxins/Furans _____	PAHs _____	Pesticides _____	DO _____
AVS _____	SEM Metals _____	Particle Size _____	Other __X (DRO, RRO)

2. Were the target detection limits met for each parameter?

Yes		
No	X	(EXPLAIN)

The reporting limits as stated in the QAPP were not met due to the high concentrations of the target analytes in the samples and dilutions required.

3. Were the method blanks less than the established MDL for each parameter?

Yes		
No	X	(EXPLAIN)

The method blank contained DRO at 2.0 mg/kg and RRO at 3.46 mg/kg which are below the reporting limit and greater than the method detection limit. Because the DRO and RRO detections in the samples were much greater than the blank concentrations, no qualification is required and data usability is not affected.

4. Did the results of Field Replicate Analysis vary by less than the % RPD specified in the QAPP?

Yes	X	
No		(EXPLAIN)

There are two field replicates associated with this work order (identified with a "FS" suffix) for the DRO/RRO parameter. The field replicate results and investigative sample results were within a standard quality control (QC) limit of 50 RPD or less.

5. Did the results of the Field Duplicates Analysis vary by less than the % RPD specified in the QAPP?

Yes	Not Applicable	
No		(EXPLAIN)

6. Did the surrogate spike/internal standards recoveries meet the limits set forth in the QAPP?

Yes		
No	X	(EXPLAIN)

In four samples, one of the two surrogates were outside the QC limits due to sample dilutions and high concentrations of analytes in the sample. No qualifications are required for this discrepancy.

7. Did the MS/MSD recoveries meet the limits set forth in the QAPP?

Yes		
No	X	(EXPLAIN)

The percent recoveries for the MS and MSD were outside the QC limits specified in the QAPP. Because the sample concentrations were more than 4 times the spike amount, no qualifications were applied for this discrepancy.

8. Did the RPD (%) of the MS/MSD sample set meet the limits set forth in the QAPP?

Yes		
No	X	(EXPLAIN)

The RPD between the MS and the MSD was within the QC limit of 40 percent or less except for RRO which had an RPD of 41 percent. Because the sample concentrations were more than 4 times the spike amount, no qualifications were applied for this discrepancy.

9. Did the LCS recoveries meet the limits set forth in the QAPP?

Yes	X	
No		(EXPLAIN)

10. Did the calibration verification standards (ICVs and CCVs) meet the requirements set forth in the QAPP?

Yes	X	
No		(EXPLAIN)

11. Did the calibration blanks (ICBs and CCBs) meet the limits set forth in the QAPP?

Yes	Not Applicable	
No		

The instrument blanks were free of target compounds.

12. Did the interference check samples meet the limits set forth in the QAPP?

Yes	Not Applicable	
No		(EXPLAIN)

13. Did the serial dilution samples meet the limits set forth in the QAPP?

Yes	Not Applicable	
No		(EXPLAIN)

14. Were any level of contaminants detected above the MDL for the trip blanks and storage blanks?

Yes	Not Applicable	
No		(EXPLAIN)

15. Did all required analyses take place within the required holding time protocols set forth in the QAPP?

Yes	X	
No		(EXPLAIN)

16. Did the laboratory duplicates vary by less than the % RPD specified in the QAPP?

Yes	Not Applicable	
No		(EXPLAIN)

17. Are measured dry-weight contaminant concentrations reported?

Yes	X	
No		(EXPLAIN)

18. Please provide details for all of the "EXPLAIN" marked above. Include details on the specific analytes affected by any QA/QC discrepancies, and recommendations regarding usability of data.

Any items with "EXPLAIN" marked above are described immediately following the "EXPLAIN" marking in the corresponding item above.

Note that the laboratory qualified many of the sample results with a "J", "Z", "H", "O", and "Y" and are defined as follows:

- A "J" qualifier indicates that the sample result should be considered estimated because it was detected below the reporting limit.
- A "Z" qualifier indicates that the chromatographic fingerprint does not resemble a petroleum product.
- An "H" qualifier indicates that the chromatographic fingerprint does resemble a petroleum product but the elution pattern indicates a greater amount of heavier molecular constituents than the calibration standard.
- An "O" qualifier indicates that the chromatographic fingerprint resembles an oil product, but does not match the calibration standard.
- A "Y" qualifier indicates that the chromatographic fingerprint resembles a petroleum product eluting in approximately the correct carbon range, but the elution pattern does not match the calibration standard.

All of these results should be considered estimated. Note that the sample chromatographic patterns not matching up to the standards is to be expected because of the weathering/degrading of the petroleum products over time.

In addition, some results were flagged by the laboratory with a "D" to indicate that the sample result is from a dilution.

The data are acceptable for use as qualified.

Data Validation Report
Lower Rouge River
Columbia Analytical Services
Laboratory Work Order #: K0810423

DRO AND RRO BY SW-846 METHOD 8015B

CAS Work Order #: K0810463

QA/QC Analysis Checklist for Sediment Chemistry Analysis

GRANT/IAG NUMBER: Not Applicable
PROJECT NAME: Lower Rouge River
REVIEWER: Lisa Graczyk, WESTON START
DATE: January 28, 2009

1. What sediment chemistry data has been collected (CHECK ALL THAT APPLY)?

Total Metals ____	PCBs _____	pH _____	TOC _____
Dioxins/Furans _____	PAHs _____	Pesticides _____	DO _____
AVS _____	SEM Metals _____	Particle Size _____	Other __X (DRO, RRO)

2. Were the target detection limits met for each parameter?

Yes		
No	X	(EXPLAIN)

The reporting limits as stated in the QAPP were not met due to the high concentrations of the target analytes in the samples and dilutions required.

3. Were the method blanks less than the established MDL for each parameter?

Yes	X	
No		(EXPLAIN)

4. Did the results of Field Replicate Analysis vary by less than the % RPD specified in the QAPP?

Yes	Not Applicable	
No		(EXPLAIN)

5. Did the results of the Field Duplicates Analysis vary by less than the % RPD specified in the QAPP?

Yes		
No	X	(EXPLAIN)

There are three field duplicates associated with this work order (identified with a "DP" suffix) for the DRO/RRO parameter. The field duplicate results and investigative sample results were within a standard quality control (QC) limit of 50 RPD or less for two of the field duplicate pairs (LRR-HS4-A-01 and LRR-HS4-A-03). The field duplicate pair associated with sample LRR-HS4-A-02 had RPDs of 71.4 and 61.7 for DRO and RRO, respectively. Because the other two field duplicate pairs had acceptable RPDs, no qualifications were applied. It appears that the sample collected was heterogeneous and the RPD discrepancy is not related to laboratory precision.

6. Did the surrogate spike/internal standards recoveries meet the limits set forth in the QAPP?

Yes		
No	X	(EXPLAIN)

In twelve of the samples, one of the two surrogates was outside the QC limits due to sample dilutions and high concentrations of analytes in the sample. No qualifications are required for this discrepancy.

7. Did the MS/MSD recoveries meet the limits set forth in the QAPP?

Yes		
No	X	(EXPLAIN)

The percent recoveries for the MS and MSD were outside the QC limits specified in the QAPP. Because the sample concentrations were more than 4 times the spike amount, no qualifications were applied for this discrepancy.

8. Did the RPD (%) of the MS/MSD sample set meet the limits set forth in the QAPP?

Yes	X	
No		(EXPLAIN)

9. Did the LCS recoveries meet the limits set forth in the QAPP?

Yes	X	
No		(EXPLAIN)

10. Did the calibration verification standards (ICVs and CCVs) meet the requirements set forth in the QAPP?

Yes	X	
No		(EXPLAIN)

11. Did the calibration blanks (ICBs and CCBs) meet the limits set forth in the QAPP?

Yes	Not Applicable	
No		

The instrument blanks were free of target compounds.

12. Did the interference check samples meet the limits set forth in the QAPP?

Yes	Not Applicable	
No		(EXPLAIN)

13. Did the serial dilution samples meet the limits set forth in the QAPP?

Yes	Not Applicable	
No		(EXPLAIN)

14. Were any level of contaminants detected above the MDL for the trip blanks and storage blanks?

Yes	Not Applicable	
No		(EXPLAIN)

15. Did all required analyses take place within the required holding time protocols set forth in the QAPP?

Yes	X	
No		(EXPLAIN)

16. Did the laboratory duplicates vary by less than the % RPD specified in the QAPP?

Yes	Not Applicable	
No		(EXPLAIN)

17. Are measured dry-weight contaminant concentrations reported?

Yes	X	
No		(EXPLAIN)

18. Please provide details for all of the "EXPLAIN" marked above. Include details on the specific analytes affected by any QA/QC discrepancies, and recommendations regarding usability of data.

Any items with “EXPLAIN” marked above are described immediately following the “EXPLAIN” marking in the corresponding item above.

Note that the laboratory qualified many of the sample results with a “J”, “Z”, “H”, “O”, and “Y” and are defined as follows:

- A “J” qualifier indicates that the sample result should be considered estimated because it was detected below the reporting limit.

- A “Z” qualifier indicates that the chromatographic fingerprint does not resemble a petroleum product.
- An “H” qualifier indicates that the chromatographic fingerprint does resemble a petroleum product but the elution pattern indicates a greater amount of heavier molecular constituents than the calibration standard.
- An “O” qualifier indicates that the chromatographic fingerprint resembles an oil product, but does not match the calibration standard.
- A “Y” qualifier indicates that the chromatographic fingerprint resembles a petroleum product eluting in approximately the correct carbon range, but the elution pattern does not match the calibration standard.

All of these results should be considered estimated. Note that the sample chromatographic patterns not matching up to the standards is to be expected because of the weathering/degrading of the petroleum products over time.

In addition, some results were flagged by the laboratory with a “D” to indicate that the sample result is from a dilution.

The data are acceptable for use as qualified.

Data Validation Report
Lower Rouge River
Columbia Analytical Services
Laboratory Work Order #: K0810463

DRO AND RRO BY SW-846 METHOD 8015B

CAS Work Order #: K0810465

QA/QC Analysis Checklist for Sediment Chemistry Analysis

GRANT/IAG NUMBER: Not Applicable
PROJECT NAME: Lower Rouge River
REVIEWER: Lisa Graczyk, WESTON START
DATE: January 29, 2009

1. What sediment chemistry data has been collected (CHECK ALL THAT APPLY)?

Total Metals ____	PCBs _____	pH _____	TOC _____
Dioxins/Furans _____	PAHs _____	Pesticides _____	DO _____
AVS _____	SEM Metals _____	Particle Size _____	Other __X (DRO, RRO)

2. Were the target detection limits met for each parameter?

Yes		
No	X	(EXPLAIN)

The reporting limits as stated in the QAPP were not met due to the high concentrations of the target analytes in the samples and dilutions required.

3. Were the method blanks less than the established MDL for each parameter?

Yes		
No	X	(EXPLAIN)

The method blank contained RRO at 6.9 mg/kg which is below the reporting limit and greater than the method detection limit. Because the RRO detections in the samples were much greater than the blank concentration, no qualification is required and data usability is not affected.

4. Did the results of Field Replicate Analysis vary by less than the % RPD specified in the QAPP?

Yes	Not Applicable	
No		(EXPLAIN)

5. Did the results of the Field Duplicates Analysis vary by less than the % RPD specified in the QAPP?

Yes	Not Applicable	
No		(EXPLAIN)

6. Did the surrogate spike/internal standards recoveries meet the limits set forth in the QAPP?

Yes		
No	X	(EXPLAIN)

In two samples, surrogates were outside the QC limits due to sample dilutions and high concentrations of analytes in the sample. No qualifications are required for this discrepancy.

7. Did the MS/MSD recoveries meet the limits set forth in the QAPP?

Yes	X	
No		(EXPLAIN)

8. Did the RPD (%) of the MS/MSD sample set meet the limits set forth in the QAPP?

Yes	X	
No		(EXPLAIN)

9. Did the LCS recoveries meet the limits set forth in the QAPP?

Yes	X	
No		(EXPLAIN)

10. Did the calibration verification standards (ICVs and CCVs) meet the requirements set forth in the QAPP?

Yes	X	
No		(EXPLAIN)

11. Did the calibration blanks (ICBs and CCBs) meet the limits set forth in the QAPP?

Yes	Not Applicable	
No		

12. Did the interference check samples meet the limits set forth in the QAPP?

Yes	Not Applicable	
No		(EXPLAIN)

13. Did the serial dilution samples meet the limits set forth in the QAPP?

Yes	Not Applicable	
No		(EXPLAIN)

14. Were any level of contaminants detected above the MDL for the trip blanks and storage blanks?

Yes	Not Applicable	
No		(EXPLAIN)

15. Did all required analyses take place within the required holding time protocols set forth in the QAPP?

Yes	X	
No		(EXPLAIN)

16. Did the laboratory duplicates vary by less than the % RPD specified in the QAPP?

Yes	Not Applicable	
No		(EXPLAIN)

17. Are measured dry-weight contaminant concentrations reported?

Yes	X	
No		(EXPLAIN)

18. Please provide details for all of the "EXPLAIN" marked above. Include details on the specific analytes affected by any QA/QC discrepancies, and recommendations regarding usability of data.

Any items with "EXPLAIN" marked above are described immediately following the "EXPLAIN" marking in the corresponding item above.

Note that the laboratory qualified many of the sample results with a "J", "Z", "H", "O", and "Y" and are defined as follows:

- A "J" qualifier indicates that the sample result should be considered estimated because it was detected below the reporting limit.
- A "Z" qualifier indicates that the chromatographic fingerprint does not resemble a petroleum product.
- An "H" qualifier indicates that the chromatographic fingerprint does resemble a petroleum product but the elution pattern indicates a greater amount of heavier molecular constituents than the calibration standard.
- An "O" qualifier indicates that the chromatographic fingerprint resembles an oil product, but does not match the calibration standard.
- A "Y" qualifier indicates that the chromatographic fingerprint resembles a petroleum product eluting in approximately the correct carbon range, but the elution pattern does not match the calibration standard.

All of these results should be considered estimated. Note that the sample chromatographic patterns not matching up to the standards is to be expected because of the weathering/degrading of the petroleum products over time.

In addition, some results were flagged by the laboratory with a "D" to indicate that the sample result is from a dilution.

Data Validation Report
Lower Rouge River
Columbia Analytical Services
Laboratory Work Order #: K0904454

The data are acceptable for use as qualified.

Data Validation Report
Lower Rouge River
Columbia Analytical Services
Laboratory Work Order #: K0810465

DRO AND RRO BY SW-846 METHOD 8015B

CAS Work Order #: K0904268

QA/QC Analysis Checklist for Sediment Chemistry Analysis

GRANT/IAG NUMBER: Not Applicable
PROJECT NAME: Lower Rouge River
REVIEWER: Lisa Graczyk, WESTON START
DATE: August 18, 2009

1. What sediment chemistry data has been collected (CHECK ALL THAT APPLY)?

Total Metals ____	PCBs _____	pH _____	TOC _____
Dioxins/Furans _____	PAHs _____	Pesticides _____	DO _____
AVS _____	SEM Metals _____	Particle Size _____	Other __X (DRO, RRO)

2. Were the target detection limits met for each parameter?

Yes _____
No X (EXPLAIN)

The reporting limits as stated in the QAPP were not met mostly due to the high concentrations of the target analytes in the samples and dilutions required. In some instances, no dilution was required; however, there were reportable detections of DRO and RRO in the samples. Therefore data usability was not affected by the somewhat elevated reporting limits.

3. Were the method blanks less than the established MDL for each parameter?

Yes _____
No X (EXPLAIN)

The method blanks contained detections of DRO and RRO below the reporting limit. Because the DRO and RRO detections in the samples were much greater than the blank concentration, no qualification is required and data usability is not affected.

4. Did the results of Field Replicate Analysis vary by less than the % RPD specified in the QAPP?

Yes	X	
No		(EXPLAIN)

There are two field replicates associated with this work order (identified with a "FS" suffix). The RPD between field replicate results and investigative sample results were within a standard quality control (QC) limit of 50 RPD or less.

5. Did the results of the Field Duplicates Analysis vary by less than the % RPD specified in the QAPP?

Yes	Not Applicable	
No		(EXPLAIN)

6. Did the surrogate spike/internal standards recoveries meet the limits set forth in the QAPP?

Yes		
No	X	(EXPLAIN)

In one sample, one of the two surrogates was outside the QC limits due to sample dilutions and high concentrations of analytes in the sample. No qualifications are required for this discrepancy.

7. Did the MS/MSD recoveries meet the limits set forth in the QAPP?

Yes		
No	X	(EXPLAIN)

One site-specific MS/MSD pair is associated with this work order. The MSD spike recoveries were low; therefore, all DRO and RRO results in the parent sample were flagged "J" as estimated due to possible matrix interference.

8. Did the RPD (%) of the MS/MSD sample set meet the limits set forth in the QAPP?

Yes		
No	X	(EXPLAIN)

One site-specific MS/MSD pair is associated with this work order. The RPD between the MS and MSDs were outside the QAPP QC limits. All DRO and RRO results in the parent sample were flagged "J" as estimated due to possible matrix interference.

9. Did the LCS recoveries meet the limits set forth in the QAPP?

Yes	X	
No		(EXPLAIN)

10. Did the calibration verification standards (ICVs and CCVs) meet the requirements set forth in the QAPP?

Yes	X	
No		(EXPLAIN)

11. Did the calibration blanks (ICBs and CCBs) meet the limits set forth in the QAPP?

Yes	Not Applicable	
No		

12. Did the interference check samples meet the limits set forth in the QAPP?

Yes	Not Applicable	
No		(EXPLAIN)

13. Did the serial dilution samples meet the limits set forth in the QAPP?

Yes	Not Applicable	
No		(EXPLAIN)

14. Were any level of contaminants detected above the MDL for the trip blanks and storage blanks?

Yes	Not Applicable	
No		(EXPLAIN)

15. Did all required analyses take place within the required holding time protocols set forth in the QAPP?

Yes	X	
No		(EXPLAIN)

16. Did the laboratory duplicates vary by less than the % RPD specified in the QAPP?

Yes	Not Applicable	
No		(EXPLAIN)

17. Are measured dry-weight contaminant concentrations reported?

Yes	X	
No		(EXPLAIN)

18. Please provide details for all of the "EXPLAIN" marked above. Include details on the specific analytes affected by any QA/QC discrepancies, and recommendations regarding usability of data.

Any items with “EXPLAIN” marked above are described immediately following the “EXPLAIN” marking in the corresponding item above.

Note that the laboratory qualified many of the sample results with a “J”, “Z”, “H”, “L”, “O”, and “Y” and are defined as follows:

- A “J” qualifier indicates that the sample result should be considered estimated because it was detected below the reporting limit.

- A “Z” qualifier indicates that the chromatographic fingerprint does not resemble a petroleum product.
- An “H” qualifier indicates that the chromatographic fingerprint does resemble a petroleum product but the elution pattern indicates a greater amount of heavier molecular weight constituents than the calibration standard.
- An “L” qualifier indicates that the chromatographic fingerprint does resemble a petroleum product but the elution pattern indicates a greater amount of lighter molecular weight constituents than the calibration standard.
- An “O” qualifier indicates that the chromatographic fingerprint resembles an oil product, but does not match the calibration standard.
- A “Y” qualifier indicates that the chromatographic fingerprint resembles a petroleum product eluting in approximately the correct carbon range, but the elution pattern does not match the calibration standard.

All of these results should be considered estimated. Note that the sample chromatographic patterns not matching up to the standards is to be expected because of the weathering/degrading of the petroleum products over time.

In addition, some results were flagged by the laboratory with a “D” to indicate that the sample result is from a dilution.

The data are acceptable for use as qualified.

Data Validation Report
Lower Rouge River
Columbia Analytical Services
Laboratory Work Order #: K0904268

DRO AND RRO BY SW-846 METHOD 8015B

CAS Work Order #: K0904301

QA/QC Analysis Checklist for Sediment Chemistry Analysis

GRANT/IAG NUMBER: Not Applicable
PROJECT NAME: Lower Rouge River
REVIEWER: Lisa Graczyk, WESTON START
DATE: August 20, 2009

1. What sediment chemistry data has been collected (CHECK ALL THAT APPLY)?

Total Metals ____	PCBs _____	pH _____	TOC _____
Dioxins/Furans _____	PAHs _____	Pesticides _____	DO _____
AVS _____	SEM Metals _____	Particle Size _____	Other __X (DRO, RRO)

2. Were the target detection limits met for each parameter?

Yes _____
No X (EXPLAIN)

The reporting limits as stated in the QAPP were not met mostly due to the high concentrations of the target analytes in the samples and dilutions required. In some instances, no dilution was required; however, there were reportable detections of DRO and RRO in the samples. Therefore data usability was not affected by the somewhat elevated reporting limits.

3. Were the method blanks less than the established MDL for each parameter?

Yes _____
No X (EXPLAIN)

There were two method blanks associated with this work order. The method blanks contain DRO at 8.2 and 10 mg/kg and RRO at 4.1 and 7.4 mg/kg which are below the reporting limit and greater than the method detection limit. Because the DRO and RRO detections in the samples were much greater than the blank concentration, no qualification is required and data usability is not affected.

4. Did the results of Field Replicate Analysis vary by less than the % RPD specified in the QAPP?

Yes	Not Applicable	
No		(EXPLAIN)

5. Did the results of the Field Duplicates Analysis vary by less than the % RPD specified in the QAPP?

Yes		
No	X	(EXPLAIN)

There are two field duplicates associated with this work order (identified by a "DP" suffix). The RPDs were calculated for field duplicate results and compared to a standard QC limit of 50 RPD or less. The results for one field duplicate had acceptable RPDs while the duplicate associated with sample LRR-ZIC-D-01 has elevated RPDs of 72 and 73 for DRO and RRO, respectively. It is expected that this difference is due to sample heterogeneity and/or weathering of the petroleum products.

6. Did the surrogate spike/internal standards recoveries meet the limits set forth in the QAPP?

Yes		
No	X	(EXPLAIN)

In three samples, the two surrogates were outside the QC limits due to sample dilutions and high concentrations of analytes in the sample. No qualifications are required for this discrepancy.

7. Did the MS/MSD recoveries meet the limits set forth in the QAPP?

Yes	X	
No		(EXPLAIN)

8. Did the RPD (%) of the MS/MSD sample set meet the limits set forth in the QAPP?

Yes	X	
No		(EXPLAIN)

9. Did the LCS recoveries meet the limits set forth in the QAPP?

Yes	X	
No		(EXPLAIN)

10. Did the calibration verification standards (ICVs and CCVs) meet the requirements set forth in the QAPP?

Yes	X	
No		(EXPLAIN)

11. Did the calibration blanks (ICBs and CCBs) meet the limits set forth in the QAPP?

Yes	Not Applicable	
No		

12. Did the interference check samples meet the limits set forth in the QAPP?

Yes	Not Applicable	
No		(EXPLAIN)

13. Did the serial dilution samples meet the limits set forth in the QAPP?

Yes	Not Applicable	
No		(EXPLAIN)

14. Were any level of contaminants detected above the MDL for the trip blanks and storage blanks?

Yes	Not Applicable	
No		(EXPLAIN)

15. Did all required analyses take place within the required holding time protocols set forth in the QAPP?

Yes	X	
No		(EXPLAIN)

16. Did the laboratory duplicates vary by less than the % RPD specified in the QAPP?

Yes	Not Applicable	
No		(EXPLAIN)

17. Are measured dry-weight contaminant concentrations reported?

Yes	X	
No		(EXPLAIN)

18. Please provide details for all of the "EXPLAIN" marked above. Include details on the specific analytes affected by any QA/QC discrepancies, and recommendations regarding usability of data.

Any items with “EXPLAIN” marked above are described immediately following the “EXPLAIN” marking in the corresponding item above.

Note that the laboratory qualified many of the sample results with a “J”, “Z”, “H”, “O”, and “Y” and are defined as follows:

- A “J” qualifier indicates that the sample result should be considered estimated because it was detected below the reporting limit.
- A “Z” qualifier indicates that the chromatographic fingerprint does not resemble a petroleum product.
- An “H” qualifier indicates that the chromatographic fingerprint does resemble a petroleum product but the elution pattern indicates a greater amount of heavier molecular constituents than the calibration standard.
- An “O” qualifier indicates that the chromatographic fingerprint resembles an oil product, but does not match the calibration standard.

- A “Y” qualifier indicates that the chromatographic fingerprint resembles a petroleum product eluting in approximately the correct carbon range, but the elution pattern does not match the calibration standard.

All of these results should be considered estimated. Note that the sample chromatographic patterns not matching up to the standards is to be expected because of the weathering/degrading of the petroleum products over time.

In addition, some results were flagged by the laboratory with a “D” to indicate that the sample result is from a dilution.

The data are acceptable for use as qualified.

Data Validation Report
Lower Rouge River
Columbia Analytical Services
Laboratory Work Order #: K0904301

DRO AND RRO BY SW-846 METHOD 8015B

CAS Work Order #: K0904351

QA/QC Analysis Checklist for Sediment Chemistry Analysis

GRANT/IAG NUMBER: Not Applicable
PROJECT NAME: Lower Rouge River
REVIEWER: Lisa Graczyk, WESTON START
DATE: August 17, 2009

1. What sediment chemistry data has been collected (CHECK ALL THAT APPLY)?

Total Metals ____	PCBs _____	pH _____	TOC _____
Dioxins/Furans _____	PAHs _____	Pesticides _____	DO _____
AVS _____	SEM Metals _____	Particle Size _____	Other __X (DRO, RRO)

2. Were the target detection limits met for each parameter?

Yes		
No	X	(EXPLAIN)

The reporting limits as stated in the QAPP were not met mostly due to the high concentrations of the target analytes in the samples and dilutions required. In some instances, no dilution was required; however, there were reportable detections of DRO and RRO in the samples. Therefore data usability was not affected by the somewhat elevated reporting limits.

3. Were the method blanks less than the established MDL for each parameter?

Yes		
No	X	(EXPLAIN)

The method blank contained DRO at 3.6 mg/kg and RRO at 6.9 mg/kg which are below the reporting limit and greater than the method detection limit. Because the DRO and RRO detections in the samples were much greater than the blank concentration, no qualification is required and data usability is not affected.

4. Did the results of Field Replicate Analysis vary by less than the % RPD specified in the QAPP?

Yes		
No	X	(EXPLAIN)

There is one field replicate associated with this work order (identified with a "FS" suffix). The RPD between field replicate results and investigative sample results were not within a standard quality control (QC) limit of 50 RPD or less. The RPDs for DRO and RRO are 68 and 70, respectively. The samples are somewhat heterogeneous.

5. Did the results of the Field Duplicates Analysis vary by less than the % RPD specified in the QAPP?

Yes	X	
No		(EXPLAIN)

There is one field duplicate associated with this work order (identified with a "DP" suffix). The field duplicate results and investigative sample results were within a standard QC limit of 50 RPD or less.

6. Did the surrogate spike/internal standards recoveries meet the limits set forth in the QAPP?

Yes	X	
No		(EXPLAIN)

7. Did the MS/MSD recoveries meet the limits set forth in the QAPP?

Yes	X	
No		(EXPLAIN)

8. Did the RPD (%) of the MS/MSD sample set meet the limits set forth in the QAPP?

Yes	X	
No		(EXPLAIN)

9. Did the LCS recoveries meet the limits set forth in the QAPP?

Yes	X	
No		(EXPLAIN)

10. Did the calibration verification standards (ICVs and CCVs) meet the requirements set forth in the QAPP?

Yes	X	
No		(EXPLAIN)

11. Did the calibration blanks (ICBs and CCBs) meet the limits set forth in the QAPP?

Yes	Not Applicable	
No		

12. Did the interference check samples meet the limits set forth in the QAPP?

Yes	Not Applicable	
No		(EXPLAIN)

13. Did the serial dilution samples meet the limits set forth in the QAPP?

Yes	Not Applicable	
No		(EXPLAIN)

14. Were any level of contaminants detected above the MDL for the trip blanks and storage blanks?

Yes	Not Applicable	
No		(EXPLAIN)

15. Did all required analyses take place within the required holding time protocols set forth in the QAPP?

Yes	X	
No		(EXPLAIN)

16. Did the laboratory duplicates vary by less than the % RPD specified in the QAPP?

Yes	Not Applicable	
No		(EXPLAIN)

17. Are measured dry-weight contaminant concentrations reported?

Yes	X	
No		(EXPLAIN)

18. Please provide details for all of the "EXPLAIN" marked above. Include details on the specific analytes affected by any QA/QC discrepancies, and recommendations regarding usability of data.

Any items with “EXPLAIN” marked above are described immediately following the “EXPLAIN” marking in the corresponding item above.

Note that the laboratory qualified many of the sample results with a “J”, “Z”, “H”, “O”, and “Y” and are defined as follows:

- A “J” qualifier indicates that the sample result should be considered estimated because it was detected below the reporting limit.
- A “Z” qualifier indicates that the chromatographic fingerprint does not resemble a petroleum product.
- An “H” qualifier indicates that the chromatographic fingerprint does resemble a petroleum product but the elution pattern indicates a greater amount of heavier molecular constituents than the calibration standard.
- An “O” qualifier indicates that the chromatographic fingerprint resembles an oil product, but does not match the calibration standard.

- A “Y” qualifier indicates that the chromatographic fingerprint resembles a petroleum product eluting in approximately the correct carbon range, but the elution pattern does not match the calibration standard.

All of these results should be considered estimated. Note that the sample chromatographic patterns not matching up to the standards is to be expected because of the weathering/degrading of the petroleum products over time.

In addition, some results were flagged by the laboratory with a “D” to indicate that the sample result is from a dilution.

The data are acceptable for use as qualified.

Data Validation Report
Lower Rouge River
Columbia Analytical Services
Laboratory Work Order #: K0904351

DRO AND RRO BY SW-846 METHOD 8015B

CAS Work Order #: K0904356

QA/QC Analysis Checklist for Sediment Chemistry Analysis

GRANT/IAG NUMBER: Not Applicable
PROJECT NAME: Lower Rouge River
REVIEWER: Lisa Graczyk, WESTON START
DATE: August 20, 2009

1. What sediment chemistry data has been collected (CHECK ALL THAT APPLY)?

Total Metals ____	PCBs _____	pH _____	TOC _____
Dioxins/Furans _____	PAHs _____	Pesticides _____	DO _____
AVS _____	SEM Metals _____	Particle Size _____	Other __X (DRO, RRO)

2. Were the target detection limits met for each parameter?

Yes _____
No X (EXPLAIN)

The reporting limits as stated in the QAPP were not met mostly due to the high concentrations of the target analytes in the samples and dilutions required. In some instances, no dilution was required; however, there were reportable detections of DRO and RRO in the samples. Therefore data usability was not affected by the somewhat elevated reporting limits.

3. Were the method blanks less than the established MDL for each parameter?

Yes _____
No X (EXPLAIN)

The method blanks contain RRO at 4.1 mg/kg which is below the reporting limit and greater than the method detection limit. Because the RRO detections in the samples were much greater than the blank concentration, no qualification is required and data usability is not affected.

4. Did the results of Field Replicate Analysis vary by less than the % RPD specified in the QAPP?

Yes	X	
No		(EXPLAIN)

5. Did the results of the Field Duplicates Analysis vary by less than the % RPD specified in the QAPP?

Yes	Not Applicable	
No		(EXPLAIN)

6. Did the surrogate spike/internal standards recoveries meet the limits set forth in the QAPP?

Yes	X	
No		(EXPLAIN)

7. Did the MS/MSD recoveries meet the limits set forth in the QAPP?

Yes	X	
No		(EXPLAIN)

8. Did the RPD (%) of the MS/MSD sample set meet the limits set forth in the QAPP?

Yes	X	
No		(EXPLAIN)

9. Did the LCS recoveries meet the limits set forth in the QAPP?

Yes	X	
No		(EXPLAIN)

10. Did the calibration verification standards (ICVs and CCVs) meet the requirements set forth in the QAPP?

Yes	X	
No		(EXPLAIN)

11. Did the calibration blanks (ICBs and CCBs) meet the limits set forth in the QAPP?

Yes	Not Applicable	
No		

12. Did the interference check samples meet the limits set forth in the QAPP?

Yes	Not Applicable	
No		(EXPLAIN)

13. Did the serial dilution samples meet the limits set forth in the QAPP?

Yes	Not Applicable	
No		(EXPLAIN)

14. Were any level of contaminants detected above the MDL for the trip blanks and storage blanks?

Yes	Not Applicable	
No		(EXPLAIN)

15. Did all required analyses take place within the required holding time protocols set forth in the QAPP?

Yes	X	
No		(EXPLAIN)

16. Did the laboratory duplicates vary by less than the % RPD specified in the QAPP?

Yes	Not Applicable	
No		(EXPLAIN)

17. Are measured dry-weight contaminant concentrations reported?

Yes	X	
No		(EXPLAIN)

18. Please provide details for all of the "EXPLAIN" marked above. Include details on the specific analytes affected by any QA/QC discrepancies, and recommendations regarding usability of data.

Any items with “EXPLAIN” marked above are described immediately following the “EXPLAIN” marking in the corresponding item above.

Note that the laboratory qualified many of the sample results with a “J”, “Z”, “H”, “O”, and “Y” and are defined as follows:

- A “J” qualifier indicates that the sample result should be considered estimated because it was detected below the reporting limit.
- A “Z” qualifier indicates that the chromatographic fingerprint does not resemble a petroleum product.
- An “H” qualifier indicates that the chromatographic fingerprint does resemble a petroleum product but the elution pattern indicates a greater amount of heavier molecular constituents than the calibration standard.
- An “O” qualifier indicates that the chromatographic fingerprint resembles an oil product, but does not match the calibration standard.

- A “Y” qualifier indicates that the chromatographic fingerprint resembles a petroleum product eluting in approximately the correct carbon range, but the elution pattern does not match the calibration standard.

All of these results should be considered estimated. Note that the sample chromatographic patterns not matching up to the standards is to be expected because of the weathering/degrading of the petroleum products over time.

In addition, some results were flagged by the laboratory with a “D” to indicate that the sample result is from a dilution.

The data are acceptable for use as qualified.

Data Validation Report
Lower Rouge River
Columbia Analytical Services
Laboratory Work Order #: K0904356

DRO AND RRO BY SW-846 METHOD 8015B

CAS Work Order #: K0904403

QA/QC Analysis Checklist for Sediment Chemistry Analysis

GRANT/IAG NUMBER: Not Applicable
PROJECT NAME: Lower Rouge River
REVIEWER: Lisa Graczyk, WESTON START
DATE: August 19, 2009

1. What sediment chemistry data has been collected (CHECK ALL THAT APPLY)?

Total Metals ____	PCBs _____	pH _____	TOC _____
Dioxins/Furans _____	PAHs _____	Pesticides _____	DO _____
AVS _____	SEM Metals _____	Particle Size _____	Other __X (DRO, RRO)

2. Were the target detection limits met for each parameter?

Yes _____
No X (EXPLAIN)

The reporting limits as stated in the QAPP were not met mostly due to the high concentrations of the target analytes in the samples and dilutions required. In some instances, no dilution was required; however, there were reportable detections of DRO and RRO in the samples. Therefore data usability was not affected by the somewhat elevated reporting limits.

3. Were the method blanks less than the established MDL for each parameter?

Yes _____
No X (EXPLAIN)

The method blank contained DRO at 1.9 mg/kg and RRO at 3.7 mg/kg which are below the reporting limit and greater than the method detection limit. Because the DRO and RRO detections in the samples were much greater than the blank concentration, no qualification is required and data usability is not affected.

4. Did the results of Field Replicate Analysis vary by less than the % RPD specified in the QAPP?

Yes	Not Applicable	
No		(EXPLAIN)

5. Did the results of the Field Duplicates Analysis vary by less than the % RPD specified in the QAPP?

Yes	Not Applicable	
No		(EXPLAIN)

6. Did the surrogate spike/internal standards recoveries meet the limits set forth in the QAPP?

Yes		
No	X	(EXPLAIN)

In one sample, the surrogates were outside the QC limits due to high sample dilutions. No qualifications are required for this discrepancy.

7. Did the MS/MSD recoveries meet the limits set forth in the QAPP?

Yes	X	
No		(EXPLAIN)

8. Did the RPD (%) of the MS/MSD sample set meet the limits set forth in the QAPP?

Yes	X	
No		(EXPLAIN)

9. Did the LCS recoveries meet the limits set forth in the QAPP?

Yes	X	
No		(EXPLAIN)

10. Did the calibration verification standards (ICVs and CCVs) meet the requirements set forth in the QAPP?

Yes	X	
No		(EXPLAIN)

11. Did the calibration blanks (ICBs and CCBs) meet the limits set forth in the QAPP?

Yes	Not Applicable	
No		

12. Did the interference check samples meet the limits set forth in the QAPP?

Yes	Not Applicable	
No		(EXPLAIN)

13. Did the serial dilution samples meet the limits set forth in the QAPP?

Yes	Not Applicable	
No		(EXPLAIN)

14. Were any level of contaminants detected above the MDL for the trip blanks and storage blanks?

Yes	Not Applicable	
No		(EXPLAIN)

15. Did all required analyses take place within the required holding time protocols set forth in the QAPP?

Yes	X	
No		(EXPLAIN)

16. Did the laboratory duplicates vary by less than the % RPD specified in the QAPP?

Yes	Not Applicable	
No		(EXPLAIN)

17. Are measured dry-weight contaminant concentrations reported?

Yes	X	
No		(EXPLAIN)

18. Please provide details for all of the "EXPLAIN" marked above. Include details on the specific analytes affected by any QA/QC discrepancies, and recommendations regarding usability of data.

Any items with “EXPLAIN” marked above are described immediately following the “EXPLAIN” marking in the corresponding item above.

Note that the laboratory qualified many of the sample results with a “J”, “Z”, “H”, “O”, and “Y” and are defined as follows:

- A “J” qualifier indicates that the sample result should be considered estimated because it was detected below the reporting limit.
- A “Z” qualifier indicates that the chromatographic fingerprint does not resemble a petroleum product.
- An “H” qualifier indicates that the chromatographic fingerprint does resemble a petroleum product but the elution pattern indicates a greater amount of heavier molecular constituents than the calibration standard.
- An “O” qualifier indicates that the chromatographic fingerprint resembles an oil product, but does not match the calibration standard.

- A “Y” qualifier indicates that the chromatographic fingerprint resembles a petroleum product eluting in approximately the correct carbon range, but the elution pattern does not match the calibration standard.

All of these results should be considered estimated. Note that the sample chromatographic patterns not matching up to the standards is to be expected because of the weathering/degrading of the petroleum products over time.

In addition, some results were flagged by the laboratory with a “D” to indicate that the sample result is from a dilution.

The data are acceptable for use as qualified.

Data Validation Report
Lower Rouge River
Columbia Analytical Services
Laboratory Work Order #: K0904403

DRO AND RRO BY SW-846 METHOD 8015B

CAS Work Order #: K0904451

QA/QC Analysis Checklist for Sediment Chemistry Analysis

GRANT/IAG NUMBER: Not Applicable
PROJECT NAME: Lower Rouge River
REVIEWER: Lisa Graczyk, WESTON START
DATE: August 21, 2009

1. What sediment chemistry data has been collected (CHECK ALL THAT APPLY)?

Total Metals ____	PCBs _____	pH _____	TOC _____
Dioxins/Furans _____	PAHs _____	Pesticides _____	DO _____
AVS _____	SEM Metals _____	Particle Size _____	Other __X (DRO, RRO)

2. Were the target detection limits met for each parameter?

Yes _____
No X (EXPLAIN)

The reporting limits as stated in the QAPP were not met mostly due to the high concentrations of the target analytes in the samples and dilutions required. In some instances, no dilution was required; however, there were reportable detections of DRO and RRO in the samples. Therefore data usability was not affected by the somewhat elevated reporting limits.

3. Were the method blanks less than the established MDL for each parameter?

Yes _____
No X (EXPLAIN)

The method blank contained RRO at 4.8 mg/kg which is below the reporting limit and greater than the method detection limit. Because the RRO detections in the samples were much greater than the blank concentration, no qualification is required and data usability is not affected.

4. Did the results of Field Replicate Analysis vary by less than the % RPD specified in the QAPP?

Yes	X	
No		(EXPLAIN)

5. Did the results of the Field Duplicates Analysis vary by less than the % RPD specified in the QAPP?

Yes	X	
No		(EXPLAIN)

6. Did the surrogate spike/internal standards recoveries meet the limits set forth in the QAPP?

Yes		
No	X	(EXPLAIN)

In six samples, one of the two surrogates was outside the QC limits due to sample dilutions and high concentrations of analytes in the sample. No qualifications are required for this discrepancy.

7. Did the MS/MSD recoveries meet the limits set forth in the QAPP?

Yes		
No	X	(EXPLAIN)

One MS/MSD pair is associated with this work order. The percent recoveries were outside the QC limits. Because the sample concentration was greater than four times the spike amount, no qualification was required for this discrepancy.

8. Did the RPD (%) of the MS/MSD sample set meet the limits set forth in the QAPP?

Yes	X	
No		(EXPLAIN)

9. Did the LCS recoveries meet the limits set forth in the QAPP?

Yes	X	
No		(EXPLAIN)

10. Did the calibration verification standards (ICVs and CCVs) meet the requirements set forth in the QAPP?

Yes	X	
No		(EXPLAIN)

11. Did the calibration blanks (ICBs and CCBs) meet the limits set forth in the QAPP?

Yes	Not Applicable	
No		

12. Did the interference check samples meet the limits set forth in the QAPP?

Yes	Not Applicable	
No		(EXPLAIN)

13. Did the serial dilution samples meet the limits set forth in the QAPP?

Yes	Not Applicable	
No		(EXPLAIN)

14. Were any level of contaminants detected above the MDL for the trip blanks and storage blanks?

Yes	Not Applicable	
No		(EXPLAIN)

15. Did all required analyses take place within the required holding time protocols set forth in the QAPP?

Yes	X	
No		(EXPLAIN)

16. Did the laboratory duplicates vary by less than the % RPD specified in the QAPP?

Yes	Not Applicable	
No		(EXPLAIN)

17. Are measured dry-weight contaminant concentrations reported?

Yes	X	
No		(EXPLAIN)

18. Please provide details for all of the "EXPLAIN" marked above. Include details on the specific analytes affected by any QA/QC discrepancies, and recommendations regarding usability of data.

Any items with “EXPLAIN” marked above are described immediately following the “EXPLAIN” marking in the corresponding item above.

Note that the laboratory qualified many of the sample results with a “J”, “Z”, “H”, “O”, and “Y” and are defined as follows:

- A “J” qualifier indicates that the sample result should be considered estimated because it was detected below the reporting limit.
- A “Z” qualifier indicates that the chromatographic fingerprint does not resemble a petroleum product.
- An “H” qualifier indicates that the chromatographic fingerprint does resemble a petroleum product but the elution pattern indicates a greater amount of heavier molecular constituents than the calibration standard.
- An “O” qualifier indicates that the chromatographic fingerprint resembles an oil product, but does not match the calibration standard.

- A “Y” qualifier indicates that the chromatographic fingerprint resembles a petroleum product eluting in approximately the correct carbon range, but the elution pattern does not match the calibration standard.

All of these results should be considered estimated. Note that the sample chromatographic patterns not matching up to the standards is to be expected because of the weathering/degrading of the petroleum products over time.

In addition, some results were flagged by the laboratory with a “D” to indicate that the sample result is from a dilution.

The data are acceptable for use as qualified.

Data Validation Report
Lower Rouge River
Columbia Analytical Services
Laboratory Work Order #: K0904451

DRO AND RRO BY SW-846 METHOD 8015B

CAS Work Order #: K0904454

QA/QC Analysis Checklist for Sediment Chemistry Analysis

GRANT/IAG NUMBER: Not Applicable
PROJECT NAME: Lower Rouge River
REVIEWER: Lisa Graczyk, WESTON START
DATE: August 20, 2009

1. What sediment chemistry data has been collected (CHECK ALL THAT APPLY)?

Total Metals ____	PCBs _____	pH _____	TOC _____
Dioxins/Furans _____	PAHs _____	Pesticides _____	DO _____
AVS _____	SEM Metals _____	Particle Size _____	Other __X (DRO, RRO)

2. Were the target detection limits met for each parameter?

Yes		
No	X	(EXPLAIN)

The reporting limits as stated in the QAPP were not met mostly due to the high concentrations of the target analytes in the samples and dilutions required. In some instances, no dilution was required; however, there were reportable detections of DRO and RRO in the samples. Therefore data usability was not affected by the somewhat elevated reporting limits.

3. Were the method blanks less than the established MDL for each parameter?

Yes		
No	X	(EXPLAIN)

The method blank contained DRO at 1.7 mg/kg and RRO at 3.2 mg/kg which are below the reporting limit and greater than the method detection limit. Because the DRO and RRO detections in the samples were much greater than the blank concentration, no qualification is required and data usability is not affected.

4. Did the results of Field Replicate Analysis vary by less than the % RPD specified in the QAPP?

Yes	X	
No		(EXPLAIN)

5. Did the results of the Field Duplicates Analysis vary by less than the % RPD specified in the QAPP?

Yes	X	
No		(EXPLAIN)

6. Did the surrogate spike/internal standards recoveries meet the limits set forth in the QAPP?

Yes		
No	X	(EXPLAIN)

In two samples, one of the two surrogates was outside the QC limits due to sample dilutions and high concentrations of analytes in the sample. No qualifications are required for this discrepancy.

7. Did the MS/MSD recoveries meet the limits set forth in the QAPP?

Yes		
No	X	(EXPLAIN)

Two MS/MSDs are associated with this work order. For one MS/MSD pair, all percent recoveries were with QAPP QC limits. For the second MS/MSD pair, RRO was detected high. Because the sample concentration was greater than four times the spike amount, no qualification was required for this discrepancy.

8. Did the RPD (%) of the MS/MSD sample set meet the limits set forth in the QAPP?

Yes	X	
No		(EXPLAIN)

9. Did the LCS recoveries meet the limits set forth in the QAPP?

Yes	X	
No		(EXPLAIN)

10. Did the calibration verification standards (ICVs and CCVs) meet the requirements set forth in the QAPP?

Yes	X	
No		(EXPLAIN)

11. Did the calibration blanks (ICBs and CCBs) meet the limits set forth in the QAPP?

Yes	Not Applicable	
No		

12. Did the interference check samples meet the limits set forth in the QAPP?

Yes	Not Applicable	
No		(EXPLAIN)

13. Did the serial dilution samples meet the limits set forth in the QAPP?

Yes	Not Applicable	
No		(EXPLAIN)

14. Were any level of contaminants detected above the MDL for the trip blanks and storage blanks?

Yes	Not Applicable	
No		(EXPLAIN)

15. Did all required analyses take place within the required holding time protocols set forth in the QAPP?

Yes	X	
No		(EXPLAIN)

16. Did the laboratory duplicates vary by less than the % RPD specified in the QAPP?

Yes	Not Applicable	
No		(EXPLAIN)

17. Are measured dry-weight contaminant concentrations reported?

Yes	X	
No		(EXPLAIN)

18. Please provide details for all of the "EXPLAIN" marked above. Include details on the specific analytes affected by any QA/QC discrepancies, and recommendations regarding usability of data.

Any items with “EXPLAIN” marked above are described immediately following the “EXPLAIN” marking in the corresponding item above.

Note that the laboratory qualified many of the sample results with a “J”, “Z”, “H”, “O”, and “Y” and are defined as follows:

- A “J” qualifier indicates that the sample result should be considered estimated because it was detected below the reporting limit.
- A “Z” qualifier indicates that the chromatographic fingerprint does not resemble a petroleum product.
- An “H” qualifier indicates that the chromatographic fingerprint does resemble a petroleum product but the elution pattern indicates a greater amount of heavier molecular constituents than the calibration standard.
- An “O” qualifier indicates that the chromatographic fingerprint resembles an oil product, but does not match the calibration standard.

- A “Y” qualifier indicates that the chromatographic fingerprint resembles a petroleum product eluting in approximately the correct carbon range, but the elution pattern does not match the calibration standard.

All of these results should be considered estimated. Note that the sample chromatographic patterns not matching up to the standards is to be expected because of the weathering/degrading of the petroleum products over time.

In addition, some results were flagged by the laboratory with a “D” to indicate that the sample result is from a dilution.

The data are acceptable for use as qualified.

Data Validation Report
Lower Rouge River
Columbia Analytical Services
Laboratory Work Order #: K0904454

ATTACHMENT B
ANALYTICAL DATA SUMMARY SHEETS WITH QUALIFIERS

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-017-A-01 **Lab Report Batch :** K0810413 **Lab ID :** CAS_K

Sample Date : 10/21/2008 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0810413-001

Reviewed By / Date : LG 1/19/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8015B					**Dilution: 10**															
Diesel Range Organics (DRO)	3200		mg/Kg	DH	YES															
Residual Range Organics (RRO)	8200		mg/Kg	DO	YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-017-A-02 **Lab Report Batch :** K0810413 **Lab ID :** CAS_K

Sample Date : 10/21/2008 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0810413-002

Reviewed By / Date : LG 1/19/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8015B					**Dilution: 10**															
Diesel Range Organics (DRO)	18000		mg/Kg	DH	YES															
Residual Range Organics (RRO)	30000		mg/Kg	DO	YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-017-A-03 **Lab Report Batch :** K0810413 **Lab ID :** CAS_K

Sample Date : 10/21/2008 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0810413-003

Reviewed By / Date : LG 1/19/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8015B					**Dilution: 25**															
Diesel Range Organics (DRO)	39000		mg/Kg	DYH	YES															
Residual Range Organics (RRO)	55000		mg/Kg	DO	YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-017-A-04 **Lab Report Batch :** K0810413 **Lab ID :** CAS_K

Sample Date : 10/21/2008 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0810413-004

Reviewed By / Date : LG 1/19/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8015B					**Dilution: 30**															
Diesel Range Organics (DRO)	61000		mg/Kg	DYH	YES															
Residual Range Organics (RRO)	77000		mg/Kg	DO	YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-017-A-05 **Lab Report Batch :** K0810413 **Lab ID :** CAS_K

Sample Date : 10/21/2008 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0810413-005

Reviewed By / Date : LG 1/19/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8015B					**Dilution: 30**															
Diesel Range Organics (DRO)	52000		mg/Kg	DYH	YES															
Residual Range Organics (RRO)	64000		mg/Kg	DO	YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-OBC-D-01 **Lab Report Batch :** K0810413 **Lab ID :** CAS_K

Sample Date : 10/21/2008 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0810413-006

Reviewed By / Date : LG 1/19/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8015B					**Dilution: 10**															
Diesel Range Organics (DRO)	4400		mg/Kg	DH	YES															
Residual Range Organics (RRO)	8400		mg/Kg	DO	YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-OBC-D-01-DP
Lab Report Batch : K0810413
Lab ID : CAS_K
Sample Date : 10/21/2008
Analysis Type: 1RES
Sample Matrix : SED
Lab Sample ID: K0810413-007

Reviewed By / Date : LG 1/19/2009
Approved By / Date :

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8015B					**Dilution: 10**															
Diesel Range Organics (DRO)	2800		mg/Kg	DH	YES															
Residual Range Organics (RRO)	5000		mg/Kg	DO	YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-OF2-A-01 **Lab Report Batch :** K0810413 **Lab ID :** CAS_K

Sample Date : 10/21/2008 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0810413-008

Reviewed By / Date : LG 1/19/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8015B					**Dilution: 2**															
Diesel Range Organics (DRO)	630		mg/Kg	DH	YES															
Residual Range Organics (RRO)	2300		mg/Kg	DO	YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-WJB-A-01 **Lab Report Batch :** K0810413 **Lab ID :** CAS_K

Sample Date : 10/21/2008 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0810413-009

Reviewed By / Date : LG 1/19/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8015B					**Dilution: 2**															
Diesel Range Organics (DRO)	870		mg/Kg	DH	YES															
Residual Range Organics (RRO)	2100		mg/Kg	DO	YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-WJB-A-02 **Lab Report Batch :** K0810413 **Lab ID :** CAS_K

Sample Date : 10/21/2008 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0810413-010

Reviewed By / Date : LG 1/19/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8015B					**Dilution: 10**															
Diesel Range Organics (DRO)	5700		mg/Kg	DH	YES															
Residual Range Organics (RRO)	9700		mg/Kg	DO	YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-HS1-A-01 **Lab Report Batch :** K0810422 **Lab ID :** CAS_K

Sample Date : 10/21/2008 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0810422-001

Reviewed By / Date : LG 1/20/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8015B					**Dilution: 5**															
Diesel Range Organics (DRO)	1400		mg/Kg	DH	YES															
Residual Range Organics (RRO)	4900		mg/Kg	DO	YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-HS1-A-02 **Lab Report Batch :** K0810422 **Lab ID :** CAS_K

Sample Date : 10/21/2008 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0810422-002

Reviewed By / Date : LG 1/20/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8015B					**Dilution: 10**															
Diesel Range Organics (DRO)	2400		mg/Kg	DH	YES															
Residual Range Organics (RRO)	7400		mg/Kg	DO	YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-HS1-A-03 **Lab Report Batch :** K0810422 **Lab ID :** CAS_K

Sample Date : 10/21/2008 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0810422-003

Reviewed By / Date : LG 1/20/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8015B					**Dilution: 10**															
Diesel Range Organics (DRO)	5100		mg/Kg	DH	YES															
Residual Range Organics (RRO)	12000		mg/Kg	DO	YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-HS1-A-04 **Lab Report Batch :** K0810422 **Lab ID :** CAS_K

Sample Date : 10/21/2008 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0810422-004

Reviewed By / Date : LG 1/20/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8015B					**Dilution: 10**															
Diesel Range Organics (DRO)	16000		mg/Kg	DH	YES															
Residual Range Organics (RRO)	28000		mg/Kg	DO	YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-HS5-C-03 **Lab Report Batch :** K0810422 **Lab ID :** CAS_K

Sample Date : 10/23/2008 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0810422-015

Reviewed By / Date : LG 1/20/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8015B					**Dilution: 10**															
Diesel Range Organics (DRO)	8600		mg/Kg	DH	YES															
Residual Range Organics (RRO)	18000		mg/Kg	DO	YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-OF2-D-01 **Lab Report Batch :** K0810422 **Lab ID :** CAS_K

Sample Date : 10/22/2008 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0810422-005

Reviewed By / Date : LG 1/20/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8015B					**Dilution: 2**															
Diesel Range Organics (DRO)	1000		mg/Kg	DH	YES															
Residual Range Organics (RRO)	2600		mg/Kg	DO	YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-OF2-D-02 **Lab Report Batch :** K0810422 **Lab ID :** CAS_K

Sample Date : 10/22/2008 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0810422-006

Reviewed By / Date : LG 1/20/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8015B					**Dilution: 10**															
Diesel Range Organics (DRO)	3200		mg/Kg	DH	YES															
Residual Range Organics (RRO)	8400		mg/Kg	DO	YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-OF2-D-03 **Lab Report Batch :** K0810422 **Lab ID :** CAS_K

Sample Date : 10/22/2008 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0810422-007

Reviewed By / Date : LG 1/20/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8015B					**Dilution: 10**															
Diesel Range Organics (DRO)	8800		mg/Kg	DH	YES															
Residual Range Organics (RRO)	22000		mg/Kg	DO	YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-OF2-D-04 **Lab Report Batch :** K0810422 **Lab ID :** CAS_K

Sample Date : 10/22/2008 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0810422-008

Reviewed By / Date : LG 1/20/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8015B					**Dilution: 10**															
Diesel Range Organics (DRO)	6500		mg/Kg	DH	YES															
Residual Range Organics (RRO)	17000		mg/Kg	DO	YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-OF2-D-05 **Lab Report Batch :** K0810422 **Lab ID :** CAS_K

Sample Date : 10/15/2008 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0810422-009

Reviewed By / Date : LG 1/20/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8015B					**Dilution: 10**															
Diesel Range Organics (DRO)	6000		mg/Kg	DH	YES															
Residual Range Organics (RRO)	15000		mg/Kg	DO	YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-OF2-E-01 **Lab Report Batch :** K0810422 **Lab ID :** CAS_K

Sample Date : 10/22/2008 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0810422-010

Reviewed By / Date : LG 1/20/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8015B					**Dilution: 10**															
Diesel Range Organics (DRO)	9100		mg/Kg	DH	YES															
Residual Range Organics (RRO)	24000		mg/Kg	DO	YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-OF2-E-02 **Lab Report Batch :** K0810422 **Lab ID :** CAS_K

Sample Date : 10/22/2008 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0810422-011

Reviewed By / Date : LG 1/20/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8015B					**Dilution: 10**															
Diesel Range Organics (DRO)	7900		mg/Kg	DH	YES															
Residual Range Organics (RRO)	21000		mg/Kg	DO	YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-OF2-E-03 **Lab Report Batch :** K0810422 **Lab ID :** CAS_K

Sample Date : 10/22/2008 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0810422-012

Reviewed By / Date : LG 1/20/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8015B					**Dilution: 10**															
Diesel Range Organics (DRO)	4700		mg/Kg	DH	YES															
Residual Range Organics (RRO)	12000		mg/Kg	DO	YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-OF2-E-04 **Lab Report Batch :** K0810422 **Lab ID :** CAS_K

Sample Date : 10/22/2008 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0810422-013

Reviewed By / Date : LG 1/20/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8015B					**Dilution: 10**															
Diesel Range Organics (DRO)	6700		mg/Kg	DH	YES															
Residual Range Organics (RRO)	16000		mg/Kg	DO	YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-OF2-E-05 **Lab Report Batch :** K0810422 **Lab ID :** CAS_K

Sample Date : 10/22/2008 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0810422-014

Reviewed By / Date : LG 1/20/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8015B					**Dilution: 10**															
Diesel Range Organics (DRO)	6400		mg/Kg	DH	YES															
Residual Range Organics (RRO)	17000		mg/Kg	DO	YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-HS5-A-01 **Lab Report Batch :** K0810423 **Lab ID :** CAS_K

Sample Date : 10/22/2008 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0810423-011

Reviewed By / Date : LG 1/20/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8015B					**Dilution: 10**															
Diesel Range Organics (DRO)	2600		mg/Kg	DH	YES															
Residual Range Organics (RRO)	6800		mg/Kg	DO	YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-HS5-A-02 **Lab Report Batch :** K0810423 **Lab ID :** CAS_K

Sample Date : 10/23/2008 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0810423-012

Reviewed By / Date : LG 1/20/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8015B					**Dilution: 10**															
Diesel Range Organics (DRO)	3600		mg/Kg	DH	YES															
Residual Range Organics (RRO)	9100		mg/Kg	DO	YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-HS5-A-02-FS
Lab Report Batch : K0810423
Lab ID : CAS_K
Sample Date : 10/23/2008
Analysis Type: 1RES
Sample Matrix : SED
Lab Sample ID: K0810423-013

Reviewed By / Date : LG 1/20/2009
Approved By / Date :

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8015B					**Dilution: 10**															
Diesel Range Organics (DRO)	4100		mg/Kg	DH	YES															
Residual Range Organics (RRO)	10000		mg/Kg	DO	YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-HS5-A-03 **Lab Report Batch :** K0810423 **Lab ID :** CAS_K

Sample Date : 10/23/2008 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0810423-014

Reviewed By / Date : LG 1/20/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8015B					**Dilution: 10**															
Diesel Range Organics (DRO)	5000		mg/Kg	DH	YES															
Residual Range Organics (RRO)	12000		mg/Kg	DO	YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-HS5-B-01 **Lab Report Batch :** K0810423 **Lab ID :** CAS_K

Sample Date : 10/23/2008 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0810423-015

Reviewed By / Date : LG 1/20/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8015B					**Dilution: 10**															
Diesel Range Organics (DRO)	2700		mg/Kg	DH	YES															
Residual Range Organics (RRO)	6900		mg/Kg	DO	YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-HS5-B-02 **Lab Report Batch :** K0810423 **Lab ID :** CAS_K

Sample Date : 10/23/2008 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0810423-016

Reviewed By / Date : LG 1/20/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8015B					**Dilution: 10**															
Diesel Range Organics (DRO)	2900		mg/Kg	DH	YES															
Residual Range Organics (RRO)	7100		mg/Kg	DO	YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-HS5-B-03 **Lab Report Batch :** K0810423 **Lab ID :** CAS_K

Sample Date : 10/23/2008 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0810423-017

Reviewed By / Date : LG 1/20/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8015B					**Dilution: 10**															
Diesel Range Organics (DRO)	3600		mg/Kg	DH	YES															
Residual Range Organics (RRO)	8400		mg/Kg	DO	YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-HS5-B-03-FS
Lab Report Batch : K0810423
Lab ID : CAS_K
Sample Date : 10/23/2008
Analysis Type: 1RES
Sample Matrix : SED
Lab Sample ID: K0810423-018

Reviewed By / Date : LG 1/20/2009
Approved By / Date :

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8015B					**Dilution: 10**															
Diesel Range Organics (DRO)	4400		mg/Kg	DH	YES															
Residual Range Organics (RRO)	11000		mg/Kg	DO	YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-HS5-C-01 **Lab Report Batch :** K0810423 **Lab ID :** CAS_K

Sample Date : 10/23/2008 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0810423-019

Reviewed By / Date : LG 1/20/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8015B					**Dilution: 10**															
Diesel Range Organics (DRO)	4400		mg/Kg	DH	YES															
Residual Range Organics (RRO)	11000		mg/Kg	DO	YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-HS5-C-02 **Lab Report Batch :** K0810423 **Lab ID :** CAS_K

Sample Date : 10/23/2008 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0810423-020

Reviewed By / Date : LG 1/20/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8015B					**Dilution: 10**															
Diesel Range Organics (DRO)	5600		mg/Kg	DH	YES															
Residual Range Organics (RRO)	13000		mg/Kg	DO	YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-OF2-B-01 **Lab Report Batch :** K0810423 **Lab ID :** CAS_K

Sample Date : 10/22/2008 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0810423-001

Reviewed By / Date : LG 1/20/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8015B					**Dilution: 10**															
Diesel Range Organics (DRO)	8200		mg/Kg	DH	YES															
Residual Range Organics (RRO)	18000		mg/Kg	DO	YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-OF2-B-02 **Lab Report Batch :** K0810423 **Lab ID :** CAS_K

Sample Date : 10/22/2008 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0810423-002

Reviewed By / Date : LG 1/20/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8015B					**Dilution: 10**															
Diesel Range Organics (DRO)	5200		mg/Kg	DH	YES															
Residual Range Organics (RRO)	13000		mg/Kg	DO	YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-OF2-B-03 **Lab Report Batch :** K0810423 **Lab ID :** CAS_K

Sample Date : 10/22/2008 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0810423-003

Reviewed By / Date : LG 1/20/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8015B					**Dilution: 10**															
Diesel Range Organics (DRO)	6800		mg/Kg	DH	YES															
Residual Range Organics (RRO)	14000		mg/Kg	DO	YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-OF2-B-04 **Lab Report Batch :** K0810423 **Lab ID :** CAS_K

Sample Date : 10/22/2008 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0810423-004

Reviewed By / Date : LG 1/20/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8015B					**Dilution: 10**															
Diesel Range Organics (DRO)	9600		mg/Kg	DH	YES															
Residual Range Organics (RRO)	22000		mg/Kg	DO	YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-OF2-B-05 **Lab Report Batch :** K0810423 **Lab ID :** CAS_K

Sample Date : 10/22/2008 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0810423-005

Reviewed By / Date : LG 1/20/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8015B					**Dilution: 10**															
Diesel Range Organics (DRO)	7600		mg/Kg	DH	YES															
Residual Range Organics (RRO)	19000		mg/Kg	DO	YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-OF2-C-01 **Lab Report Batch :** K0810423 **Lab ID :** CAS_K

Sample Date : 10/22/2008 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0810423-006

Reviewed By / Date : LG 1/20/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8015B					**Dilution: 10**															
Diesel Range Organics (DRO)	3100		mg/Kg	DH	YES															
Residual Range Organics (RRO)	8400		mg/Kg	DO	YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-OF2-C-02 **Lab Report Batch :** K0810423 **Lab ID :** CAS_K

Sample Date : 10/22/2008 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0810423-007

Reviewed By / Date : LG 1/20/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8015B					**Dilution: 10**															
Diesel Range Organics (DRO)	8500		mg/Kg	DH	YES															
Residual Range Organics (RRO)	22000		mg/Kg	DO	YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-OF2-C-03 **Lab Report Batch :** K0810423 **Lab ID :** CAS_K

Sample Date : 10/22/2008 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0810423-008

Reviewed By / Date : LG 1/20/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8015B					**Dilution: 10**															
Diesel Range Organics (DRO)	4700		mg/Kg	DH	YES															
Residual Range Organics (RRO)	11000		mg/Kg	DO	YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-OF2-C-04 **Lab Report Batch :** K0810423 **Lab ID :** CAS_K

Sample Date : 10/22/2008 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0810423-009

Reviewed By / Date : LG 1/20/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8015B					**Dilution: 10**															
Diesel Range Organics (DRO)	8200		mg/Kg	DH	YES															
Residual Range Organics (RRO)	16000		mg/Kg	DO	YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-OF2-C-05 **Lab Report Batch :** K0810423 **Lab ID :** CAS_K

Sample Date : 10/22/2008 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0810423-010

Reviewed By / Date : LG 1/20/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8015B					**Dilution: 10**															
Diesel Range Organics (DRO)	11000		mg/Kg	DH	YES															
Residual Range Organics (RRO)	26000		mg/Kg	DO	YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-HS4-A-01 **Lab Report Batch :** K0810463 **Lab ID :** CAS_K

Sample Date : 10/23/2008 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0810463-001

Reviewed By / Date : LG 1/28/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8015B					**Dilution: 3**															
Diesel Range Organics (DRO)	2200		mg/Kg	DH	YES															
Residual Range Organics (RRO)	5500		mg/Kg	DO	YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-HS4-A-01-DP
Lab Report Batch : K0810463
Lab ID : CAS_K
Sample Date : 10/23/2008
Analysis Type: 1RES
Sample Matrix : SED
Lab Sample ID: K0810463-002

Reviewed By / Date : LG 1/28/2009
Approved By / Date :

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8015B					**Dilution: 3**															
Diesel Range Organics (DRO)	2200		mg/Kg	DH	YES															
Residual Range Organics (RRO)	5600		mg/Kg	DO	YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-HS4-A-02 **Lab Report Batch :** K0810463 **Lab ID :** CAS_K

Sample Date : 10/23/2008 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0810463-003

Reviewed By / Date : LG 1/28/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8015B					**Dilution: 3**															
Diesel Range Organics (DRO)	1800		mg/Kg	DH	YES															
Residual Range Organics (RRO)	4600		mg/Kg	DO	YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-HS4-A-02-DP
Lab Report Batch : K0810463
Lab ID : CAS_K
Sample Date : 10/23/2008
Analysis Type: 1RES
Sample Matrix : SED
Lab Sample ID: K0810463-004

Reviewed By / Date : LG 1/28/2009
Approved By / Date :

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8015B					**Dilution: 10**															
Diesel Range Organics (DRO)	3800		mg/Kg	DH	YES															
Residual Range Organics (RRO)	8700		mg/Kg	DO	YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-HS4-A-03 **Lab Report Batch :** K0810463 **Lab ID :** CAS_K

Sample Date : 10/23/2008 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0810463-005

Reviewed By / Date : LG 1/28/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8015B					**Dilution: 10**															
Diesel Range Organics (DRO)	7300		mg/Kg	DH	YES															
Residual Range Organics (RRO)	15000		mg/Kg	DO	YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-HS4-A-03-DP
Lab Report Batch : K0810463
Lab ID : CAS_K
Sample Date : 10/23/2008
Analysis Type: 1RES
Sample Matrix : SED
Lab Sample ID: K0810463-006

Reviewed By / Date : LG 1/28/2009
Approved By / Date :

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8015B					**Dilution: 10**															
Diesel Range Organics (DRO)	8400		mg/Kg	DH	YES															
Residual Range Organics (RRO)	16000		mg/Kg	DO	YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-HS4-B-01 **Lab Report Batch :** K0810463 **Lab ID :** CAS_K

Sample Date : 10/23/2008 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0810463-007

Reviewed By / Date : LG 1/28/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8015B					**Dilution: 3**															
Diesel Range Organics (DRO)	2000		mg/Kg	DH	YES															
Residual Range Organics (RRO)	5200		mg/Kg	DO	YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-HS4-B-02 **Lab Report Batch :** K0810463 **Lab ID :** CAS_K

Sample Date : 10/23/2008 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0810463-008

Reviewed By / Date : LG 1/28/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8015B					**Dilution: 10**															
Diesel Range Organics (DRO)	4300		mg/Kg	DH	YES															
Residual Range Organics (RRO)	11000		mg/Kg	DO	YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-HS4-B-03 **Lab Report Batch :** K0810463 **Lab ID :** CAS_K

Sample Date : 10/23/2008 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0810463-009

Reviewed By / Date : LG 1/28/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8015B					**Dilution: 3**															
Diesel Range Organics (DRO)	1600		mg/Kg	DH	YES															
Residual Range Organics (RRO)	3500		mg/Kg	DO	YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-HS4-C-01 **Lab Report Batch :** K0810463 **Lab ID :** CAS_K

Sample Date : 10/23/2008 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0810463-013

Reviewed By / Date : LG 1/28/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8015B					**Dilution: 10**															
Diesel Range Organics (DRO)	3000		mg/Kg	DH	YES															
Residual Range Organics (RRO)	7900		mg/Kg	DO	YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-HS4-C-02 **Lab Report Batch :** K0810463 **Lab ID :** CAS_K

Sample Date : 10/23/2008 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0810463-014

Reviewed By / Date : LG 1/28/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8015B					**Dilution: 10**															
Diesel Range Organics (DRO)	3800		mg/Kg	DH	YES															
Residual Range Organics (RRO)	9300		mg/Kg	DO	YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-HS4-C-03 **Lab Report Batch :** K0810463 **Lab ID :** CAS_K

Sample Date : 10/23/2008 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0810463-015

Reviewed By / Date : LG 1/28/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8015B					**Dilution: 10**															
Diesel Range Organics (DRO)	3700		mg/Kg	DH	YES															
Residual Range Organics (RRO)	9200		mg/Kg	DO	YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-HS4-D-01 **Lab Report Batch :** K0810463 **Lab ID :** CAS_K

Sample Date : 10/23/2008 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0810463-016

Reviewed By / Date : LG 1/28/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8015B					**Dilution: 10**															
Diesel Range Organics (DRO)	3100		mg/Kg	DH	YES															
Residual Range Organics (RRO)	7700		mg/Kg	DO	YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-HS4-D-02 **Lab Report Batch :** K0810463 **Lab ID :** CAS_K

Sample Date : 10/23/2008 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0810463-017

Reviewed By / Date : LG 1/28/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8015B					**Dilution: 10**															
Diesel Range Organics (DRO)	3900		mg/Kg	DH	YES															
Residual Range Organics (RRO)	9900		mg/Kg	DO	YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-HS4-D-03 **Lab Report Batch :** K0810463 **Lab ID :** CAS_K

Sample Date : 10/23/2008 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0810463-018

Reviewed By / Date : LG 1/28/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8015B					**Dilution: 10**															
Diesel Range Organics (DRO)	4100		mg/Kg	DH	YES															
Residual Range Organics (RRO)	11000		mg/Kg	DO	YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-HS4-E-01 **Lab Report Batch :** K0810463 **Lab ID :** CAS_K

Sample Date : 10/23/2008 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0810463-019

Reviewed By / Date : LG 1/28/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8015B					**Dilution: 10**															
Diesel Range Organics (DRO)	4100		mg/Kg	DH	YES															
Residual Range Organics (RRO)	11000		mg/Kg	DO	YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-HS4-E-02 **Lab Report Batch :** K0810463 **Lab ID :** CAS_K

Sample Date : 10/24/2008 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0810463-020

Reviewed By / Date : LG 1/28/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8015B					**Dilution: 10**															
Diesel Range Organics (DRO)	4900		mg/Kg	DH	YES															
Residual Range Organics (RRO)	13000		mg/Kg	DO	YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-HS5-D-01 **Lab Report Batch :** K0810463 **Lab ID :** CAS_K

Sample Date : 10/23/2008 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0810463-010

Reviewed By / Date : LG 1/28/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8015B					**Dilution: 10**															
Diesel Range Organics (DRO)	4100		mg/Kg	DH	YES															
Residual Range Organics (RRO)	11000		mg/Kg	DO	YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-HS5-D-02 **Lab Report Batch :** K0810463 **Lab ID :** CAS_K

Sample Date : 10/23/2008 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0810463-011

Reviewed By / Date : LG 1/28/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8015B					**Dilution: 10**															
Diesel Range Organics (DRO)	4900		mg/Kg	DH	YES															
Residual Range Organics (RRO)	12000		mg/Kg	DO	YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-HS5-D-03 **Lab Report Batch :** K0810463 **Lab ID :** CAS_K

Sample Date : 10/23/2008 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0810463-012

Reviewed By / Date : LG 1/28/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8015B					**Dilution: 10**															
Diesel Range Organics (DRO)	6100		mg/Kg	DH	YES															
Residual Range Organics (RRO)	15000		mg/Kg	DO	YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-OBC-A-01 **Lab Report Batch :** K0810465 **Lab ID :** CAS_K

Sample Date : 10/23/2008 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0810465-001

Reviewed By / Date : LG 1/29/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8015B					**Dilution: 10**															
Diesel Range Organics (DRO)	6100		mg/Kg	DH	YES															
Residual Range Organics (RRO)	10000		mg/Kg	DO	YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-OBC-A-02 **Lab Report Batch :** K0810465 **Lab ID :** CAS_K

Sample Date : 10/23/2008 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0810465-002

Reviewed By / Date : LG 1/29/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8015B					**Dilution: 10**															
Diesel Range Organics (DRO)	5500		mg/Kg	DH	YES															
Residual Range Organics (RRO)	12000		mg/Kg	DO	YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-OBC-A-03 **Lab Report Batch :** K0810465 **Lab ID :** CAS_K

Sample Date : 10/23/2008 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0810465-003

Reviewed By / Date : LG 1/29/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8015B					**Dilution: 10**															
Diesel Range Organics (DRO)	12000		mg/Kg	DH	YES															
Residual Range Organics (RRO)	24000		mg/Kg	DO	YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-OBC-B-01 **Lab Report Batch :** K0810465 **Lab ID :** CAS_K

Sample Date : 10/23/2008 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0810465-004

Reviewed By / Date : LG 1/29/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8015B					**Dilution: 10**															
Diesel Range Organics (DRO)	11000		mg/Kg	DH	YES															
Residual Range Organics (RRO)	16000		mg/Kg	DO	YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-OBC-B-02 **Lab Report Batch :** K0810465 **Lab ID :** CAS_K

Sample Date : 10/23/2008 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0810465-005

Reviewed By / Date : LG 1/29/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8015B					**Dilution: 10**															
Diesel Range Organics (DRO)	14000		mg/Kg	DH	YES															
Residual Range Organics (RRO)	21000		mg/Kg	DO	YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-OBC-B-03 **Lab Report Batch :** K0810465 **Lab ID :** CAS_K

Sample Date : 10/23/2008 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0810465-006

Reviewed By / Date : LG 1/29/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8015B					**Dilution: 1**															
Diesel Range Organics (DRO)	490		mg/Kg	YH	YES															
Residual Range Organics (RRO)	760		mg/Kg	O	YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-OBC-C-01 **Lab Report Batch :** K0810465 **Lab ID :** CAS_K

Sample Date : 10/23/2008 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0810465-007

Reviewed By / Date : LG 1/29/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8015B					**Dilution: 10**															
Diesel Range Organics (DRO)	8700		mg/Kg	DH	YES															
Residual Range Organics (RRO)	14000		mg/Kg	DO	YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-OBC-C-02 **Lab Report Batch :** K0810465 **Lab ID :** CAS_K

Sample Date : 10/23/2008 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0810465-008

Reviewed By / Date : LG 1/29/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8015B					**Dilution: 10**															
Diesel Range Organics (DRO)	5900		mg/Kg	DH	YES															
Residual Range Organics (RRO)	10000		mg/Kg	DO	YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-OBC-C-03 **Lab Report Batch :** K0810465 **Lab ID :** CAS_K

Sample Date : 10/23/2008 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0810465-009

Reviewed By / Date : LG 1/29/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8015B					**Dilution: 1**															
Diesel Range Organics (DRO)	58		mg/Kg	H	YES															
Residual Range Organics (RRO)	110		mg/Kg	O	YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-HS6-A-01 **Lab Report Batch :** K0904268 **Lab ID :** CAS_K

Sample Date : 05/11/2009 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0904268-001

Reviewed By / Date : LG 8/18/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8015B						**Dilution: 1**														
Diesel Range Organics (DRO)	44		mg/Kg	H	YES	**J**					J									
Residual Range Organics (RRO)	94		mg/Kg	Z	YES	**J**					J									

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-HS6-A-02 **Lab Report Batch :** K0904268 **Lab ID :** CAS_K

Sample Date : 05/11/2009 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0904268-002

Reviewed By / Date : LG 8/18/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8015B					**Dilution: 1**															
Diesel Range Organics (DRO)	29		mg/Kg	J	YES	**J**								J						
Residual Range Organics (RRO)	52		mg/Kg	Z	YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-HS6-A-03 **Lab Report Batch :** K0904268 **Lab ID :** CAS_K

Sample Date : 05/11/2009 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0904268-003

Reviewed By / Date : LG 8/18/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8015B					**Dilution: 1**															
Diesel Range Organics (DRO)	30		mg/Kg	J	YES	**J**								J						
Residual Range Organics (RRO)	60		mg/Kg	Z	YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-HS6-B-01 **Lab Report Batch :** K0904268 **Lab ID :** CAS_K

Sample Date : 05/11/2009 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0904268-004

Reviewed By / Date : LG 8/18/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8015B					**Dilution: 1**															
Diesel Range Organics (DRO)	410		mg/Kg	H	YES															
Residual Range Organics (RRO)	900		mg/Kg	O	YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-HS6-B-02 **Lab Report Batch :** K0904268 **Lab ID :** CAS_K

Sample Date : 05/11/2009 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0904268-005

Reviewed By / Date : LG 8/18/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8015B					**Dilution: 1**															
Diesel Range Organics (DRO)	250		mg/Kg	H	YES															
Residual Range Organics (RRO)	550		mg/Kg	O	YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-HS6-B-03 **Lab Report Batch :** K0904268 **Lab ID :** CAS_K

Sample Date : 05/11/2009 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0904268-006

Reviewed By / Date : LG 8/18/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8015B					**Dilution: 1**															
Diesel Range Organics (DRO)	52		mg/Kg	Y	YES															
Residual Range Organics (RRO)	40		mg/Kg	L	YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-HS6-C-01 **Lab Report Batch :** K0904268 **Lab ID :** CAS_K

Sample Date : 05/11/2009 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0904268-007

Reviewed By / Date : LG 8/18/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8015B					**Dilution: 1**															
Diesel Range Organics (DRO)	350		mg/Kg	H	YES															
Residual Range Organics (RRO)	800		mg/Kg	O	YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-HS6-C-02 **Lab Report Batch :** K0904268 **Lab ID :** CAS_K

Sample Date : 05/11/2009 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0904268-008

Reviewed By / Date : LG 8/18/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8015B					**Dilution: 1**															
Diesel Range Organics (DRO)	38		mg/Kg	J	YES	**J**								J						
Residual Range Organics (RRO)	98		mg/Kg	Z	YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-HS6-C-03 **Lab Report Batch :** K0904268 **Lab ID :** CAS_K

Sample Date : 05/11/2009 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0904268-009

Reviewed By / Date : LG 8/18/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8015B					**Dilution: 1**															
Diesel Range Organics (DRO)	34		mg/Kg	J	YES	**J**								J						
Residual Range Organics (RRO)	100		mg/Kg	Z	YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-HS6-C-04 **Lab Report Batch :** K0904268 **Lab ID :** CAS_K

Sample Date : 05/11/2009 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0904268-010

Reviewed By / Date : LG 8/18/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8015B					**Dilution: 1**															
Diesel Range Organics (DRO)	37		mg/Kg	J	YES	**J**								J						
Residual Range Organics (RRO)	110		mg/Kg	Z	YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-HS6-D-01 **Lab Report Batch :** K0904268 **Lab ID :** CAS_K

Sample Date : 05/11/2009 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0904268-011

Reviewed By / Date : LG 8/18/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8015B					**Dilution: 20**															
Diesel Range Organics (DRO)	10000		mg/Kg	DZ	YES															
Residual Range Organics (RRO)	23000		mg/Kg	DZ	YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-ZIC-A-01 **Lab Report Batch :** K0904268 **Lab ID :** CAS_K

Sample Date : 05/11/2009 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0904268-012

Reviewed By / Date : LG 8/18/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8015B					**Dilution: 1**															
Diesel Range Organics (DRO)	570		mg/Kg	H	YES															
Residual Range Organics (RRO)	1400		mg/Kg	O	YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-ZIC-A-01-FS
Lab Report Batch : K0904268
Lab ID : CAS_K
Sample Date : 05/11/2009
Analysis Type: 1RES
Sample Matrix : SED
Lab Sample ID: K0904268-018

Reviewed By / Date : LG 8/18/2009
Approved By / Date :

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8015B					**Dilution: 1**															
Diesel Range Organics (DRO)	660		mg/Kg	H	YES															
Residual Range Organics (RRO)	1600		mg/Kg	O	YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-ZIC-A-02 **Lab Report Batch :** K0904268 **Lab ID :** CAS_K

Sample Date : 05/11/2009 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0904268-013

Reviewed By / Date : LG 8/18/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8015B					**Dilution: 1**															
Diesel Range Organics (DRO)	940		mg/Kg	H	YES															
Residual Range Organics (RRO)	2300		mg/Kg	O	YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-ZIC-A-02-FS
Lab Report Batch : K0904268
Lab ID : CAS_K
Sample Date : 05/11/2009
Analysis Type: 1RES
Sample Matrix : SED
Lab Sample ID: K0904268-019

Reviewed By / Date : LG 8/18/2009
Approved By / Date :

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8015B					**Dilution: 1**															
Diesel Range Organics (DRO)	870		mg/Kg	H	YES															
Residual Range Organics (RRO)	2000		mg/Kg	O	YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-ZIC-A-03 **Lab Report Batch :** K0904268 **Lab ID :** CAS_K

Sample Date : 05/11/2009 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0904268-014

Reviewed By / Date : LG 8/18/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8015B					**Dilution: 1**															
Diesel Range Organics (DRO)	370		mg/Kg	H	YES															
Residual Range Organics (RRO)	670		mg/Kg	O	YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-ZIC-A-04 **Lab Report Batch :** K0904268 **Lab ID :** CAS_K

Sample Date : 05/11/2009 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0904268-015

Reviewed By / Date : LG 8/18/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8015B					**Dilution: 1**															
Diesel Range Organics (DRO)	82		mg/Kg	Y	YES															
Residual Range Organics (RRO)	110		mg/Kg	O	YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-ZIC-A-05 **Lab Report Batch :** K0904268 **Lab ID :** CAS_K

Sample Date : 05/11/2009 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0904268-016

Reviewed By / Date : LG 8/18/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8015B					**Dilution: 1**															
Diesel Range Organics (DRO)	100		mg/Kg	Y	YES															
Residual Range Organics (RRO)	140		mg/Kg	O	YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-ZIC-B-01 **Lab Report Batch :** K0904268 **Lab ID :** CAS_K

Sample Date : 05/11/2009 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0904268-017

Reviewed By / Date : LG 8/18/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8015B					**Dilution: 1**															
Diesel Range Organics (DRO)	78		mg/Kg	H	YES															
Residual Range Organics (RRO)	200		mg/Kg	Z	YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-ZIC-B-02 **Lab Report Batch :** K0904268 **Lab ID :** CAS_K

Sample Date : 05/11/2009 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0904268-020

Reviewed By / Date : LG 8/18/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8015B					**Dilution: 1**															
Diesel Range Organics (DRO)	41		mg/Kg	H	YES															
Residual Range Organics (RRO)	88		mg/Kg	Z	YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-ZIC-B-03 **Lab Report Batch :** K0904268 **Lab ID :** CAS_K

Sample Date : 05/11/2009 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0904268-021

Reviewed By / Date : LG 8/18/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8015B					**Dilution: 1**															
Diesel Range Organics (DRO)	43		mg/Kg	H	YES															
Residual Range Organics (RRO)	76		mg/Kg	Z	YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-HS6-E-01 **Lab Report Batch :** K0904301 **Lab ID :** CAS_K

Sample Date : 05/12/2009 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0904301-001

Reviewed By / Date : LG 8/20/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8015B					**Dilution: 1**															
Diesel Range Organics (DRO)	1600		mg/Kg	H	YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-HS6-E-01 **Lab Report Batch :** K0904301 **Lab ID :** CAS_K

Sample Date : 05/12/2009 **Analysis Type: 2RES** **Sample Matrix :** SED

Lab Sample ID: K0904301-001

Reviewed By / Date : LG 8/20/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8015B					**Dilution: 10**															
Residual Range Organics (RRO)	3400		mg/Kg	DO	YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-HS6-E-02 **Lab Report Batch :** K0904301 **Lab ID :** CAS_K

Sample Date : 05/12/2009 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0904301-002

Reviewed By / Date : LG 8/20/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8015B					**Dilution: 1**															
Diesel Range Organics (DRO)	95		mg/Kg	H	YES															
Residual Range Organics (RRO)	240		mg/Kg	O	YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-HS6-E-03 **Lab Report Batch :** K0904301 **Lab ID :** CAS_K

Sample Date : 05/12/2009 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0904301-003

Reviewed By / Date : LG 8/20/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8015B					**Dilution: 1**															
Diesel Range Organics (DRO)	52		mg/Kg	H	YES															
Residual Range Organics (RRO)	140		mg/Kg	Z	YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-HS6-E-04 **Lab Report Batch :** K0904301 **Lab ID :** CAS_K

Sample Date : 05/12/2009 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0904301-004

Reviewed By / Date : LG 8/20/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8015B					**Dilution: 1**															
Diesel Range Organics (DRO)	47		mg/Kg	H	YES															
Residual Range Organics (RRO)	110		mg/Kg	Z	YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-HS6-F-01 **Lab Report Batch :** K0904301 **Lab ID :** CAS_K

Sample Date : 05/12/2009 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0904301-005

Reviewed By / Date : LG 8/20/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8015B					**Dilution: 10**															
Diesel Range Organics (DRO)	2600		mg/Kg	DZ	YES															
Residual Range Organics (RRO)	5600		mg/Kg	DZ	YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-HS6-F-01-DP
Lab Report Batch : K0904301
Lab ID : CAS_K
Sample Date : 05/12/2009
Analysis Type: 1RES
Sample Matrix : SED
Lab Sample ID: K0904301-006

Reviewed By / Date : LG 8/20/2009
Approved By / Date :

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8015B					**Dilution: 10**															
Diesel Range Organics (DRO)	3400		mg/Kg	DZ	YES															
Residual Range Organics (RRO)	7100		mg/Kg	DZ	YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-HS6-G-01 **Lab Report Batch :** K0904301 **Lab ID :** CAS_K

Sample Date : 05/12/2009 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0904301-007

Reviewed By / Date : LG 8/20/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8015B					**Dilution: 20**															
Diesel Range Organics (DRO)	590000		mg/Kg	DZ	YES															
Residual Range Organics (RRO)	21000		mg/Kg	DZ	YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-HS6-UP1-01 **Lab Report Batch :** K0904301 **Lab ID :** CAS_K

Sample Date : 05/12/2009 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0904301-008

Reviewed By / Date : LG 8/20/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8015B					**Dilution: 1**															
Diesel Range Organics (DRO)	220		mg/Kg	H	YES															
Residual Range Organics (RRO)	660		mg/Kg	O	YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-HS6-UP1-02 **Lab Report Batch :** K0904301 **Lab ID :** CAS_K

Sample Date : 05/12/2009 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0904301-009

Reviewed By / Date : LG 8/20/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8015B					**Dilution: 1**															
Diesel Range Organics (DRO)	76		mg/Kg	H	YES															
Residual Range Organics (RRO)	220		mg/Kg	Z	YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-HS6-UP2-01 **Lab Report Batch :** K0904301 **Lab ID :** CAS_K

Sample Date : 05/12/2009 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0904301-010

Reviewed By / Date : LG 8/20/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8015B					**Dilution: 1**															
Diesel Range Organics (DRO)	170		mg/Kg	H	YES															
Residual Range Organics (RRO)	360		mg/Kg	O	YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-HS6-UP3-01 **Lab Report Batch :** K0904301 **Lab ID :** CAS_K

Sample Date : 05/12/2009 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0904301-013

Reviewed By / Date : LG 8/20/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8015B					**Dilution: 10**															
Diesel Range Organics (DRO)	2300		mg/Kg	DH	YES															
Residual Range Organics (RRO)	3800		mg/Kg	DO	YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-HS6-UP3-02 **Lab Report Batch :** K0904301 **Lab ID :** CAS_K

Sample Date : 05/12/2009 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0904301-014

Reviewed By / Date : LG 8/20/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8015B					**Dilution: 1**															
Diesel Range Organics (DRO)	96		mg/Kg	H	YES															
Residual Range Organics (RRO)	220		mg/Kg	Z	YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-HS6-UP3-03 **Lab Report Batch :** K0904301 **Lab ID :** CAS_K

Sample Date : 05/12/2009 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0904301-020

Reviewed By / Date : LG 8/20/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8015B					**Dilution: 1**															
Diesel Range Organics (DRO)	50		mg/Kg	Z	YES															
Residual Range Organics (RRO)	130		mg/Kg	Z	YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-HS6-UP4-03 **Lab Report Batch :** K0904301 **Lab ID :** CAS_K

Sample Date : 05/12/2009 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0904301-015

Reviewed By / Date : LG 8/20/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8015B					**Dilution: 1**															
Diesel Range Organics (DRO)	140		mg/Kg	Y	YES															
Residual Range Organics (RRO)	99		mg/Kg	O	YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-HS6-UP4-04 **Lab Report Batch :** K0904301 **Lab ID :** CAS_K

Sample Date : 05/12/2009 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0904301-016

Reviewed By / Date : LG 8/20/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8015B					**Dilution: 1**															
Diesel Range Organics (DRO)	160		mg/Kg	Y	YES															
Residual Range Organics (RRO)	130		mg/Kg	O	YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-ZIC-C-01 **Lab Report Batch :** K0904301 **Lab ID :** CAS_K

Sample Date : 05/12/2009 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0904301-017

Reviewed By / Date : LG 8/20/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8015B					**Dilution: 1**															
Diesel Range Organics (DRO)	70		mg/Kg	Y	YES															
Residual Range Organics (RRO)	78		mg/Kg	O	YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-ZIC-C-02 **Lab Report Batch :** K0904301 **Lab ID :** CAS_K

Sample Date : 05/12/2009 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0904301-018

Reviewed By / Date : LG 8/20/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8015B					**Dilution: 1**															
Diesel Range Organics (DRO)	100		mg/Kg	Y	YES															
Residual Range Organics (RRO)	91		mg/Kg	O	YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-ZIC-C-03 **Lab Report Batch :** K0904301 **Lab ID :** CAS_K

Sample Date : 05/12/2009 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0904301-019

Reviewed By / Date : LG 8/20/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8015B					**Dilution: 1**															
Diesel Range Organics (DRO)	120		mg/Kg	Y	YES															
Residual Range Organics (RRO)	98		mg/Kg	O	YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-ZIC-D-01 **Lab Report Batch :** K0904301 **Lab ID :** CAS_K

Sample Date : 05/13/2009 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0904301-011

Reviewed By / Date : LG 8/20/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8015B					**Dilution: 1**															
Diesel Range Organics (DRO)	85		mg/Kg	H	YES															
Residual Range Organics (RRO)	210		mg/Kg	O	YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-ZIC-D-01-DP
Lab Report Batch : K0904301
Lab ID : CAS_K
Sample Date : 05/13/2009
Analysis Type: 1RES
Sample Matrix : SED
Lab Sample ID: K0904301-012

Reviewed By / Date : LG 8/20/2009
Approved By / Date :

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8015B					**Dilution: 1**															
Diesel Range Organics (DRO)	180		mg/Kg	H	YES															
Residual Range Organics (RRO)	450		mg/Kg	O	YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-HS6-X2-01 **Lab Report Batch :** K0904351 **Lab ID :** CAS_K

Sample Date : 05/14/2009 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0904351-013

Reviewed By / Date : LG 8/18/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8015B					**Dilution: 1**															
Diesel Range Organics (DRO)	720		mg/Kg	H	YES															
Residual Range Organics (RRO)	820		mg/Kg	O	YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-HS6-X2-02 **Lab Report Batch :** K0904351 **Lab ID :** CAS_K

Sample Date : 05/14/2009 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0904351-014

Reviewed By / Date : LG 8/18/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8015B					**Dilution: 1**															
Diesel Range Organics (DRO)	89		mg/Kg	H	YES															
Residual Range Organics (RRO)	100		mg/Kg	O	YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-HS6-X2-02-FS
Lab Report Batch : K0904351
Lab ID : CAS_K
Sample Date : 05/14/2009
Analysis Type: 1RES
Sample Matrix : SED
Lab Sample ID: K0904351-015

Reviewed By / Date : LG 8/18/2009
Approved By / Date :

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8015B					**Dilution: 1**															
Diesel Range Organics (DRO)	44		mg/Kg	Y	YES															
Residual Range Organics (RRO)	48		mg/Kg	O	YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-ZIC-D-04 **Lab Report Batch :** K0904351 **Lab ID :** CAS_K

Sample Date : 05/13/2009 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0904351-001

Reviewed By / Date : LG 8/18/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8015B					**Dilution: 1**															
Diesel Range Organics (DRO)	33		mg/Kg	J	YES	**J**								J						
Residual Range Organics (RRO)	77		mg/Kg	Z	YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-ZIC-D-05 **Lab Report Batch :** K0904351 **Lab ID :** CAS_K

Sample Date : 05/13/2009 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0904351-002

Reviewed By / Date : LG 8/18/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8015B					**Dilution: 1**															
Diesel Range Organics (DRO)	33		mg/Kg	J	YES	**J**								J						
Residual Range Organics (RRO)	72		mg/Kg	Z	YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-ZIC-E-01 **Lab Report Batch :** K0904351 **Lab ID :** CAS_K

Sample Date : 05/13/2009 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0904351-003

Reviewed By / Date : LG 8/18/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8015B					**Dilution: 1**															
Diesel Range Organics (DRO)	680		mg/Kg	H	YES															
Residual Range Organics (RRO)	1500		mg/Kg	O	YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-ZIC-E-02 **Lab Report Batch :** K0904351 **Lab ID :** CAS_K

Sample Date : 05/13/2009 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0904351-004

Reviewed By / Date : LG 8/18/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8015B					**Dilution: 1**															
Diesel Range Organics (DRO)	910		mg/Kg	H	YES															
Residual Range Organics (RRO)	1900		mg/Kg	O	YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-ZIC-E-03 **Lab Report Batch :** K0904351 **Lab ID :** CAS_K

Sample Date : 05/13/2009 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0904351-005

Reviewed By / Date : LG 8/18/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8015B					**Dilution: 1**															
Diesel Range Organics (DRO)	700		mg/Kg	H	YES															
Residual Range Organics (RRO)	1400		mg/Kg	O	YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-ZIC-E-04 **Lab Report Batch :** K0904351 **Lab ID :** CAS_K

Sample Date : 05/13/2009 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0904351-006

Reviewed By / Date : LG 8/18/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8015B					**Dilution: 10**															
Diesel Range Organics (DRO)	1300		mg/Kg	DH	YES															
Residual Range Organics (RRO)	3100		mg/Kg	DO	YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-ZIC-E-05 **Lab Report Batch :** K0904351 **Lab ID :** CAS_K

Sample Date : 05/13/2009 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0904351-007

Reviewed By / Date : LG 8/18/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8015B					**Dilution: 10**															
Diesel Range Organics (DRO)	1100		mg/Kg	DH	YES															
Residual Range Organics (RRO)	2500		mg/Kg	DO	YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-ZIC-F-01 **Lab Report Batch :** K0904351 **Lab ID :** CAS_K

Sample Date : 05/13/2009 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0904351-011

Reviewed By / Date : LG 8/18/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8015B					**Dilution: 1**															
Diesel Range Organics (DRO)	130		mg/Kg	H	YES															
Residual Range Organics (RRO)	280		mg/Kg	O	YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-ZIC-F-02 **Lab Report Batch :** K0904351 **Lab ID :** CAS_K

Sample Date : 05/13/2009 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0904351-008

Reviewed By / Date : LG 8/18/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8015B					**Dilution: 1**															
Diesel Range Organics (DRO)	32		mg/Kg	J	YES	**J**								J						
Residual Range Organics (RRO)	70		mg/Kg	Z	YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-ZIC-F-02-DP
Lab Report Batch : K0904351
Lab ID : CAS_K
Sample Date : 05/13/2009
Analysis Type: 1RES
Sample Matrix : SED
Lab Sample ID: K0904351-012

Reviewed By / Date : LG 8/18/2009
Approved By / Date :

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8015B					**Dilution: 1**															
Diesel Range Organics (DRO)	31		mg/Kg	J	YES	**J**								J						
Residual Range Organics (RRO)	68		mg/Kg	Z	YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-ZIC-F-03 **Lab Report Batch :** K0904351 **Lab ID :** CAS_K

Sample Date : 05/13/2009 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0904351-009

Reviewed By / Date : LG 8/18/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8015B					**Dilution: 1**															
Diesel Range Organics (DRO)	28		mg/Kg	J	YES	**J**								J						
Residual Range Organics (RRO)	46		mg/Kg	Z	YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-ZIC-F-04 **Lab Report Batch :** K0904351 **Lab ID :** CAS_K

Sample Date : 05/13/2009 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0904351-010

Reviewed By / Date : LG 8/18/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8015B					**Dilution: 1**															
Diesel Range Organics (DRO)	22		mg/Kg	J	YES	**J**								J						
Residual Range Organics (RRO)	35		mg/Kg	Z	YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-HS6-DOWN1-01 **Lab Report Batch :** K0904356 **Lab ID :** CAS_K

Sample Date : 05/13/2009 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0904356-009

Reviewed By / Date : LG 8/20/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8015B					**Dilution: 1**															
Diesel Range Organics (DRO)	360		mg/Kg	H	YES															
Residual Range Organics (RRO)	580		mg/Kg	O	YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-HS6-DOWN1-02 **Lab Report Batch :** K0904356 **Lab ID :** CAS_K

Sample Date : 05/13/2009 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0904356-010

Reviewed By / Date : LG 8/20/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8015B					**Dilution: 1**															
Diesel Range Organics (DRO)	69		mg/Kg	H	YES															
Residual Range Organics (RRO)	130		mg/Kg	O	YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-HS6-DOWN1-02-FS **Lab Report Batch :** K0904356 **Lab ID :** CAS_K

Sample Date : 05/13/2009 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0904356-011

Reviewed By / Date : LG 8/20/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8015B					**Dilution: 1**															
Diesel Range Organics (DRO)	76		mg/Kg	H	YES															
Residual Range Organics (RRO)	150		mg/Kg	O	YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-HS6-DOWN1-03 **Lab Report Batch :** K0904356 **Lab ID :** CAS_K

Sample Date : 05/13/2009 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0904356-012

Reviewed By / Date : LG 8/20/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8015B					**Dilution: 1**															
Diesel Range Organics (DRO)	59		mg/Kg	H	YES															
Residual Range Organics (RRO)	110		mg/Kg	O	YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-HS6-DOWN1-04 **Lab Report Batch :** K0904356 **Lab ID :** CAS_K

Sample Date : 05/13/2009 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0904356-013

Reviewed By / Date : LG 8/20/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8015B					**Dilution: 1**															
Diesel Range Organics (DRO)	45		mg/Kg	H	YES															
Residual Range Organics (RRO)	76		mg/Kg	O	YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-HS6-DOWN1-04MS **Lab Report Batch :** K0904356 **Lab ID :** CAS_K

Sample Date : 05/13/2009 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: KWG0904111-1

Reviewed By / Date : LG 8/20/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8015B					**Dilution: 1**															
Diesel Range Organics (DRO)	297		mg/Kg		YES		OutX													
Residual Range Organics (RRO)	236		mg/Kg		YES		OutX													

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-HS6-DOWN1-04MSD **Lab Report Batch :** K0904356 **Lab ID :** CAS_K

Sample Date : 05/13/2009 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: KWG0904111-2

Reviewed By / Date : LG 8/20/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8015B					**Dilution: 1**															
Diesel Range Organics (DRO)	230		mg/Kg	*	YES		OutX													
Residual Range Organics (RRO)	193		mg/Kg		YES		OutX													

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-HS6-DOWN2-01 **Lab Report Batch :** K0904356 **Lab ID :** CAS_K

Sample Date : 05/13/2009 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0904356-014

Reviewed By / Date : LG 8/20/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8015B					**Dilution: 10**															
Diesel Range Organics (DRO)	2400		mg/Kg	DH	YES															
Residual Range Organics (RRO)	4000		mg/Kg	DO	YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-HS6-UP1-02-FS **Lab Report Batch :** K0904356 **Lab ID :** CAS_K

Sample Date : 05/12/2009 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0904356-004

Reviewed By / Date : LG 8/20/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8015B					**Dilution: 1**															
Diesel Range Organics (DRO)	49		mg/Kg	H	YES															
Residual Range Organics (RRO)	180		mg/Kg	O	YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-HS6-UP1-03 **Lab Report Batch :** K0904356 **Lab ID :** CAS_K

Sample Date : 05/12/2009 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0904356-005

Reviewed By / Date : LG 8/20/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8015B					**Dilution: 1**															
Diesel Range Organics (DRO)	56		mg/Kg	H	YES															
Residual Range Organics (RRO)	160		mg/Kg	O	YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-HS6-UP2-02 **Lab Report Batch :** K0904356 **Lab ID :** CAS_K

Sample Date : 05/12/2009 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0904356-006

Reviewed By / Date : LG 8/20/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8015B					**Dilution: 1**															
Diesel Range Organics (DRO)	44		mg/Kg	H	YES															
Residual Range Organics (RRO)	120		mg/Kg	O	YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-HS6-UP2-03 **Lab Report Batch :** K0904356 **Lab ID :** CAS_K

Sample Date : 05/12/2009 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0904356-007

Reviewed By / Date : LG 8/20/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8015B					**Dilution: 1**															
Diesel Range Organics (DRO)	59		mg/Kg	H	YES															
Residual Range Organics (RRO)	210		mg/Kg	O	YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-HS6-UP2-04 **Lab Report Batch :** K0904356 **Lab ID :** CAS_K

Sample Date : 05/12/2009 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0904356-008

Reviewed By / Date : LG 8/20/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8015B					**Dilution: 1**															
Diesel Range Organics (DRO)	56		mg/Kg	H	YES															
Residual Range Organics (RRO)	160		mg/Kg	O	YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-HS6-UP3-04 **Lab Report Batch :** K0904356 **Lab ID :** CAS_K

Sample Date : 05/12/2009 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0904356-001

Reviewed By / Date : LG 8/20/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8015B					**Dilution: 1**															
Diesel Range Organics (DRO)	36		mg/Kg	H	YES															
Residual Range Organics (RRO)	92		mg/Kg	O	YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-HS6-UP4-01 **Lab Report Batch :** K0904356 **Lab ID :** CAS_K

Sample Date : 05/12/2009 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0904356-002

Reviewed By / Date : LG 8/20/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8015B					**Dilution: 1**															
Diesel Range Organics (DRO)	1300		mg/Kg	Z	YES															
Residual Range Organics (RRO)	1100		mg/Kg	Z	YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-HS6-UP4-02 **Lab Report Batch :** K0904356 **Lab ID :** CAS_K

Sample Date : 05/12/2009 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0904356-003

Reviewed By / Date : LG 8/20/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8015B					**Dilution: 1**															
Diesel Range Organics (DRO)	290		mg/Kg	Z	YES															
Residual Range Organics (RRO)	220		mg/Kg	Z	YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-HS6-X1-01 **Lab Report Batch :** K0904356 **Lab ID :** CAS_K

Sample Date : 05/13/2009 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0904356-015

Reviewed By / Date : LG 8/20/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8015B					**Dilution: 1**															
Diesel Range Organics (DRO)	150		mg/Kg	H	YES															
Residual Range Organics (RRO)	270		mg/Kg	O	YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-HS6-X1-02 **Lab Report Batch :** K0904356 **Lab ID :** CAS_K

Sample Date : 05/13/2009 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0904356-016

Reviewed By / Date : LG 8/20/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8015B					**Dilution: 1**															
Diesel Range Organics (DRO)	63		mg/Kg	Y	YES															
Residual Range Organics (RRO)	67		mg/Kg	O	YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-HS6-X1-03 **Lab Report Batch :** K0904356 **Lab ID :** CAS_K

Sample Date : 05/13/2009 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0904356-017

Reviewed By / Date : LG 8/20/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8015B					**Dilution: 1**															
Diesel Range Organics (DRO)	72		mg/Kg	Y	YES															
Residual Range Organics (RRO)	72		mg/Kg	O	YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-HS6-X1-04 **Lab Report Batch :** K0904356 **Lab ID :** CAS_K

Sample Date : 05/13/2009 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0904356-018

Reviewed By / Date : LG 8/20/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8015B					**Dilution: 1**															
Diesel Range Organics (DRO)	110		mg/Kg	Y	YES															
Residual Range Organics (RRO)	83		mg/Kg	O	YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-ZIC-D-02 **Lab Report Batch :** K0904356 **Lab ID :** CAS_K

Sample Date : 05/13/2009 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0904356-019

Reviewed By / Date : LG 8/20/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8015B					**Dilution: 1**															
Diesel Range Organics (DRO)	44		mg/Kg	H	YES															
Residual Range Organics (RRO)	92		mg/Kg	O	YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-ZIC-D-03 **Lab Report Batch :** K0904356 **Lab ID :** CAS_K

Sample Date : 05/13/2009 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0904356-020

Reviewed By / Date : LG 8/20/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8015B					**Dilution: 1**															
Diesel Range Organics (DRO)	49		mg/Kg	H	YES															
Residual Range Organics (RRO)	130		mg/Kg	O	YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-HS6-UP5-01 **Lab Report Batch :** K0904403 **Lab ID :** CAS_K

Sample Date : 05/14/2009 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0904403-008

Reviewed By / Date : LG 8/19/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8015B					**Dilution: 1**															
Diesel Range Organics (DRO)	3900		mg/Kg	H	YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-HS6-UP5-01 **Lab Report Batch :** K0904403 **Lab ID :** CAS_K

Sample Date : 05/14/2009 **Analysis Type: 2RES** **Sample Matrix :** SED

Lab Sample ID: K0904403-008

Reviewed By / Date : LG 8/19/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8015B					**Dilution: 10**															
Residual Range Organics (RRO)	6300		mg/Kg	DO	YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-HS6-UP5-02 **Lab Report Batch :** K0904403 **Lab ID :** CAS_K

Sample Date : 05/14/2009 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0904403-009

Reviewed By / Date : LG 8/19/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8015B					**Dilution: 1**															
Diesel Range Organics (DRO)	420		mg/Kg	H	YES															
Residual Range Organics (RRO)	620		mg/Kg	O	YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-HS6-UP5-03 **Lab Report Batch :** K0904403 **Lab ID :** CAS_K

Sample Date : 05/14/2009 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0904403-010

Reviewed By / Date : LG 8/19/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8015B					**Dilution: 1**															
Diesel Range Organics (DRO)	110		mg/Kg	H	YES															
Residual Range Organics (RRO)	140		mg/Kg	O	YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-HS6-UP5-04 **Lab Report Batch :** K0904403 **Lab ID :** CAS_K

Sample Date : 05/14/2009 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0904403-011

Reviewed By / Date : LG 8/19/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8015B					**Dilution: 1**															
Diesel Range Organics (DRO)	90		mg/Kg	H	YES															
Residual Range Organics (RRO)	110		mg/Kg	O	YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-HS6-UP6-01 **Lab Report Batch :** K0904403 **Lab ID :** CAS_K

Sample Date : 05/14/2009 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0904403-012

Reviewed By / Date : LG 8/19/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8015B					**Dilution: 1**															
Diesel Range Organics (DRO)	260		mg/Kg	H	YES															
Residual Range Organics (RRO)	300		mg/Kg	O	YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-HS6-UP6-02 **Lab Report Batch :** K0904403 **Lab ID :** CAS_K

Sample Date : 05/14/2009 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0904403-013

Reviewed By / Date : LG 8/19/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8015B					**Dilution: 1**															
Diesel Range Organics (DRO)	46		mg/Kg	Y	YES															
Residual Range Organics (RRO)	47		mg/Kg	O	YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-HS6-UP7-01 **Lab Report Batch :** K0904403 **Lab ID :** CAS_K

Sample Date : 05/14/2009 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0904403-014

Reviewed By / Date : LG 8/19/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8015B					**Dilution: 1**															
Diesel Range Organics (DRO)	920		mg/Kg	H	YES															
Residual Range Organics (RRO)	720		mg/Kg	O	YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-HS6-UP7-02 **Lab Report Batch :** K0904403 **Lab ID :** CAS_K

Sample Date : 05/14/2009 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0904403-015

Reviewed By / Date : LG 8/19/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8015B					**Dilution: 1**															
Diesel Range Organics (DRO)	40		mg/Kg	Y	YES															
Residual Range Organics (RRO)	29		mg/Kg	J	YES	**J**								J						

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-HS6-X2-03 **Lab Report Batch :** K0904403 **Lab ID :** CAS_K

Sample Date : 05/14/2009 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0904403-001

Reviewed By / Date : LG 8/19/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8015B					**Dilution: 1**															
Diesel Range Organics (DRO)	82		mg/Kg	Y	YES															
Residual Range Organics (RRO)	74		mg/Kg	O	YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-HS6-X2-04 **Lab Report Batch :** K0904403 **Lab ID :** CAS_K

Sample Date : 05/14/2009 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0904403-002

Reviewed By / Date : LG 8/19/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8015B					**Dilution: 1**															
Diesel Range Organics (DRO)	130		mg/Kg	Y	YES															
Residual Range Organics (RRO)	120		mg/Kg	O	YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-HS6-X3-01 **Lab Report Batch :** K0904403 **Lab ID :** CAS_K

Sample Date : 05/14/2009 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0904403-003

Reviewed By / Date : LG 8/19/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8015B					**Dilution: 1**															
Diesel Range Organics (DRO)	650		mg/Kg	H	YES															
Residual Range Organics (RRO)	1400		mg/Kg	O	YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-HS6-X4-01 **Lab Report Batch :** K0904403 **Lab ID :** CAS_K

Sample Date : 05/14/2009 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0904403-004

Reviewed By / Date : LG 8/19/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8015B					**Dilution: 50**															
Diesel Range Organics (DRO)	20000		mg/Kg	DZ	YES															
Residual Range Organics (RRO)	34000		mg/Kg	DZ	YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-HS6-X4-02 **Lab Report Batch :** K0904403 **Lab ID :** CAS_K

Sample Date : 05/14/2009 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0904403-005

Reviewed By / Date : LG 8/19/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8015B					**Dilution: 10**															
Diesel Range Organics (DRO)	2000		mg/Kg	DH	YES															
Residual Range Organics (RRO)	2500		mg/Kg	DO	YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-HS6-X5-01 **Lab Report Batch :** K0904403 **Lab ID :** CAS_K

Sample Date : 05/14/2009 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0904403-006

Reviewed By / Date : LG 8/19/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8015B					**Dilution: 1**															
Diesel Range Organics (DRO)	970		mg/Kg	H	YES															
Residual Range Organics (RRO)	1700		mg/Kg	O	YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-HS6-X5-02 **Lab Report Batch :** K0904403 **Lab ID :** CAS_K

Sample Date : 05/14/2009 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0904403-007

Reviewed By / Date : LG 8/19/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8015B					**Dilution: 10**															
Diesel Range Organics (DRO)	1300		mg/Kg	DH	YES															
Residual Range Organics (RRO)	2300		mg/Kg	DO	YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-ZIC-G-01 **Lab Report Batch :** K0904403 **Lab ID :** CAS_K

Sample Date : 05/13/2009 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0904403-016

Reviewed By / Date : LG 8/19/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8015B					**Dilution: 1**															
Diesel Range Organics (DRO)	780		mg/Kg	H	YES															
Residual Range Organics (RRO)	1900		mg/Kg	O	YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-ZIC-G-02 **Lab Report Batch :** K0904403 **Lab ID :** CAS_K

Sample Date : 05/13/2009 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0904403-017

Reviewed By / Date : LG 8/19/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8015B					**Dilution: 1**															
Diesel Range Organics (DRO)	660		mg/Kg	H	YES															
Residual Range Organics (RRO)	1400		mg/Kg	O	YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-ZIC-G-03 **Lab Report Batch :** K0904403 **Lab ID :** CAS_K

Sample Date : 05/13/2009 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0904403-018

Reviewed By / Date : LG 8/19/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8015B					**Dilution: 1**															
Diesel Range Organics (DRO)	1000		mg/Kg	H	YES															
Residual Range Organics (RRO)	2100		mg/Kg	O	YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-ZIC-H-01 **Lab Report Batch :** K0904403 **Lab ID :** CAS_K

Sample Date : 05/13/2009 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0904403-019

Reviewed By / Date : LG 8/19/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8015B						**Dilution: 1**														
Diesel Range Organics (DRO)	18		mg/Kg	J	YES	**J**								J						
Residual Range Organics (RRO)	32		mg/Kg	J	YES	**J**								J						

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-ZIC-H-02 **Lab Report Batch :** K0904403 **Lab ID :** CAS_K

Sample Date : 05/13/2009 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0904403-020

Reviewed By / Date : LG 8/19/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8015B						**Dilution: 1**														
Diesel Range Organics (DRO)	16		mg/Kg	J	YES	**J**								J						
Residual Range Organics (RRO)	28		mg/Kg	J	YES	**J**								J						

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-HS1-F-05 **Lab Report Batch :** K0904451 **Lab ID :** CAS_K

Sample Date : 05/15/2009 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0904451-001

Reviewed By / Date : LG 8/21/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8015B					**Dilution: 1**															
Diesel Range Organics (DRO)	13000		mg/Kg	H	YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-HS1-F-05 **Lab Report Batch :** K0904451 **Lab ID :** CAS_K

Sample Date : 05/15/2009 **Analysis Type: 2RES** **Sample Matrix :** SED

Lab Sample ID: K0904451-001

Reviewed By / Date : LG 8/21/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8015B					**Dilution: 10**															
Residual Range Organics (RRO)	22000		mg/Kg	DO	YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-HS3-A-01 **Lab Report Batch :** K0904451 **Lab ID :** CAS_K

Sample Date : 05/16/2009 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0904451-002

Reviewed By / Date : LG 8/21/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8015B					**Dilution: 5**															
Diesel Range Organics (DRO)	2900		mg/Kg	DH	YES															
Residual Range Organics (RRO)	8800		mg/Kg	DO	YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-HS3-A-01-DP
Lab Report Batch : K0904451
Lab ID : CAS_K
Sample Date : 05/16/2009
Analysis Type: 1RES
Sample Matrix : SED
Lab Sample ID: K0904451-003

Reviewed By / Date : LG 8/21/2009
Approved By / Date :

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8015B					**Dilution: 1**															
Diesel Range Organics (DRO)	2900		mg/Kg	H	YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-HS3-A-01-DP
Lab Report Batch : K0904451
Lab ID : CAS_K
Sample Date : 05/16/2009
Analysis Type: 2RES
Sample Matrix : SED
Lab Sample ID: K0904451-003

Reviewed By / Date : LG 8/21/2009
Approved By / Date :

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8015B					**Dilution: 10**															
Residual Range Organics (RRO)	7400		mg/Kg	DO	YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-HS3-A-01-FS **Lab Report Batch :** K0904451 **Lab ID :** CAS_K

Sample Date : 05/16/2009 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0904451-004

Reviewed By / Date : LG 8/21/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8015B					**Dilution: 5**															
Diesel Range Organics (DRO)	2700		mg/Kg	DH	YES															
Residual Range Organics (RRO)	8300		mg/Kg	DO	YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-HS3-A-02 **Lab Report Batch :** K0904451 **Lab ID :** CAS_K

Sample Date : 05/16/2009 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0904451-005

Reviewed By / Date : LG 8/21/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8015B					**Dilution: 1**															
Diesel Range Organics (DRO)	4200		mg/Kg	H	YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-HS3-A-02 **Lab Report Batch :** K0904451 **Lab ID :** CAS_K

Sample Date : 05/16/2009 **Analysis Type: 2RES** **Sample Matrix :** SED

Lab Sample ID: K0904451-005

Reviewed By / Date : LG 8/21/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8015B					**Dilution: 10**															
Residual Range Organics (RRO)	11000		mg/Kg	DO	YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-HS3-A-02-DP
Lab Report Batch : K0904451
Lab ID : CAS_K
Sample Date : 05/16/2009
Analysis Type: 1RES
Sample Matrix : SED
Lab Sample ID: K0904451-006

Reviewed By / Date : LG 8/21/2009
Approved By / Date :

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8015B					**Dilution: 5**															
Diesel Range Organics (DRO)	4500		mg/Kg	DH	YES															
Residual Range Organics (RRO)	12000		mg/Kg	DO	YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-HS3-A-03 **Lab Report Batch :** K0904451 **Lab ID :** CAS_K

Sample Date : 05/16/2009 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0904451-007

Reviewed By / Date : LG 8/21/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8015B					**Dilution: 5**															
Diesel Range Organics (DRO)	5700		mg/Kg	DH	YES															
Residual Range Organics (RRO)	14000		mg/Kg	DO	YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-HS3-B-01 **Lab Report Batch :** K0904451 **Lab ID :** CAS_K

Sample Date : 05/16/2009 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0904451-008

Reviewed By / Date : LG 8/21/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8015B					**Dilution: 1**															
Diesel Range Organics (DRO)	3500		mg/Kg	H	YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-HS3-B-01 **Lab Report Batch :** K0904451 **Lab ID :** CAS_K

Sample Date : 05/16/2009 **Analysis Type: 2RES** **Sample Matrix :** SED

Lab Sample ID: K0904451-008

Reviewed By / Date : LG 8/21/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8015B					**Dilution: 10**															
Residual Range Organics (RRO)	9900		mg/Kg	DO	YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-HS3-B-02 **Lab Report Batch :** K0904451 **Lab ID :** CAS_K

Sample Date : 05/16/2009 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0904451-009

Reviewed By / Date : LG 8/21/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8015B					**Dilution: 10**															
Diesel Range Organics (DRO)	2900		mg/Kg	DH	YES															
Residual Range Organics (RRO)	8300		mg/Kg	DO	YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-HS3-B-03 **Lab Report Batch :** K0904451 **Lab ID :** CAS_K

Sample Date : 05/16/2009 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0904451-010

Reviewed By / Date : LG 8/21/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8015B					**Dilution: 10**															
Diesel Range Organics (DRO)	3900		mg/Kg	DH	YES															
Residual Range Organics (RRO)	11000		mg/Kg	DO	YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-HS3-C-01 **Lab Report Batch :** K0904451 **Lab ID :** CAS_K

Sample Date : 05/16/2009 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0904451-011

Reviewed By / Date : LG 8/21/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8015B					**Dilution: 50**															
Diesel Range Organics (DRO)	13000		mg/Kg	DH	YES															
Residual Range Organics (RRO)	23000		mg/Kg	DO	YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-HS3-C-02 **Lab Report Batch :** K0904451 **Lab ID :** CAS_K

Sample Date : 05/16/2009 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0904451-012

Reviewed By / Date : LG 8/21/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8015B					**Dilution: 20**															
Diesel Range Organics (DRO)	12000		mg/Kg	DH	YES															
Residual Range Organics (RRO)	17000		mg/Kg	DO	YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-HS3-C-03 **Lab Report Batch :** K0904451 **Lab ID :** CAS_K

Sample Date : 05/16/2009 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0904451-013

Reviewed By / Date : LG 8/21/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8015B					**Dilution: 50**															
Diesel Range Organics (DRO)	25000		mg/Kg	DYH	YES															
Residual Range Organics (RRO)	34000		mg/Kg	DO	YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-HS3-D-01 **Lab Report Batch :** K0904451 **Lab ID :** CAS_K

Sample Date : 05/16/2009 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0904451-014

Reviewed By / Date : LG 8/21/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8015B					**Dilution: 10**															
Diesel Range Organics (DRO)	3000		mg/Kg	DH	YES															
Residual Range Organics (RRO)	8500		mg/Kg	DO	YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-HS3-D-02 **Lab Report Batch :** K0904451 **Lab ID :** CAS_K

Sample Date : 05/16/2009 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0904451-015

Reviewed By / Date : LG 8/21/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8015B					**Dilution: 20**															
Diesel Range Organics (DRO)	17000		mg/Kg	DH	YES															
Residual Range Organics (RRO)	34000		mg/Kg	DO	YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-HS3-E-01 **Lab Report Batch :** K0904451 **Lab ID :** CAS_K

Sample Date : 05/16/2009 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0904451-016

Reviewed By / Date : LG 8/21/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8015B					**Dilution: 10**															
Diesel Range Organics (DRO)	2300		mg/Kg	DH	YES															
Residual Range Organics (RRO)	6700		mg/Kg	DO	YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-HS3-E-02 **Lab Report Batch :** K0904451 **Lab ID :** CAS_K

Sample Date : 05/16/2009 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0904451-017

Reviewed By / Date : LG 8/21/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8015B					**Dilution: 1**															
Diesel Range Organics (DRO)	53		mg/Kg	H	YES															
Residual Range Organics (RRO)	120		mg/Kg	O	YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-HS4-F-01 **Lab Report Batch :** K0904451 **Lab ID :** CAS_K

Sample Date : 05/15/2009 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0904451-018

Reviewed By / Date : LG 8/21/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8015B					**Dilution: 10**															
Diesel Range Organics (DRO)	5000		mg/Kg	DH	YES															
Residual Range Organics (RRO)	11000		mg/Kg	DO	YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-HS4-F-02 **Lab Report Batch :** K0904451 **Lab ID :** CAS_K

Sample Date : 05/15/2009 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0904451-019

Reviewed By / Date : LG 8/21/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8015B					**Dilution: 10**															
Diesel Range Organics (DRO)	3700		mg/Kg	DH	YES															
Residual Range Organics (RRO)	8500		mg/Kg	DO	YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-HS1-B-01 **Lab Report Batch :** K0904454 **Lab ID :** CAS_K

Sample Date : 05/15/2009 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0904454-002

Reviewed By / Date : LG 8/20/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8015B					**Dilution: 10**															
Diesel Range Organics (DRO)	2100		mg/Kg	DH	YES															
Residual Range Organics (RRO)	5700		mg/Kg	DO	YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-HS1-B-01-DP
Lab Report Batch : K0904454
Lab ID : CAS_K
Sample Date : 05/15/2009
Analysis Type: 1RES
Sample Matrix : SED
Lab Sample ID: K0904454-003

Reviewed By / Date : LG 8/20/2009
Approved By / Date :

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8015B					**Dilution: 10**															
Diesel Range Organics (DRO)	2500		mg/Kg	DH	YES															
Residual Range Organics (RRO)	6500		mg/Kg	DO	YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-HS1-B-02 **Lab Report Batch :** K0904454 **Lab ID :** CAS_K

Sample Date : 05/15/2009 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0904454-004

Reviewed By / Date : LG 8/20/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8015B					**Dilution: 1**															
Diesel Range Organics (DRO)	250		mg/Kg	H	YES															
Residual Range Organics (RRO)	570		mg/Kg	O	YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-HS1-B-02-DP
Lab Report Batch : K0904454
Lab ID : CAS_K
Sample Date : 05/15/2009
Analysis Type: 1RES
Sample Matrix : SED
Lab Sample ID: K0904454-005

Reviewed By / Date : LG 8/20/2009
Approved By / Date :

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8015B					**Dilution: 1**															
Diesel Range Organics (DRO)	300		mg/Kg	H	YES															
Residual Range Organics (RRO)	650		mg/Kg	O	YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-HS1-B-03 **Lab Report Batch :** K0904454 **Lab ID :** CAS_K

Sample Date : 05/15/2009 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0904454-006

Reviewed By / Date : LG 8/20/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8015B					**Dilution: 1**															
Diesel Range Organics (DRO)	110		mg/Kg	HY	YES															
Residual Range Organics (RRO)	160		mg/Kg	O	YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-HS1-B-04 **Lab Report Batch :** K0904454 **Lab ID :** CAS_K

Sample Date : 05/15/2009 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0904454-007

Reviewed By / Date : LG 8/20/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8015B					**Dilution: 1**															
Diesel Range Organics (DRO)	130		mg/Kg	HY	YES															
Residual Range Organics (RRO)	150		mg/Kg	O	YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-HS1-B-05 **Lab Report Batch :** K0904454 **Lab ID :** CAS_K

Sample Date : 05/15/2009 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0904454-008

Reviewed By / Date : LG 8/20/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8015B					**Dilution: 1**															
Diesel Range Organics (DRO)	180		mg/Kg	Y	YES															
Residual Range Organics (RRO)	160		mg/Kg	O	YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-HS1-C-01 **Lab Report Batch :** K0904454 **Lab ID :** CAS_K

Sample Date : 05/15/2009 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0904454-010

Reviewed By / Date : LG 8/20/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8015B					**Dilution: 10**															
Diesel Range Organics (DRO)	1600		mg/Kg	DYH	YES															
Residual Range Organics (RRO)	4800		mg/Kg	DO	YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-HS1-C-02 **Lab Report Batch :** K0904454 **Lab ID :** CAS_K

Sample Date : 05/15/2009 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0904454-011

Reviewed By / Date : LG 8/20/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8015B					**Dilution: 10**															
Diesel Range Organics (DRO)	5300		mg/Kg	DH	YES															
Residual Range Organics (RRO)	10000		mg/Kg	DO	YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-HS1-D-01 **Lab Report Batch :** K0904454 **Lab ID :** CAS_K

Sample Date : 05/15/2009 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0904454-012

Reviewed By / Date : LG 8/20/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8015B					**Dilution: 10**															
Diesel Range Organics (DRO)	1500		mg/Kg	DH	YES															
Residual Range Organics (RRO)	4700		mg/Kg	DO	YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-HS1-D-02 **Lab Report Batch :** K0904454 **Lab ID :** CAS_K

Sample Date : 05/15/2009 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0904454-013

Reviewed By / Date : LG 8/20/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8015B					**Dilution: 10**															
Diesel Range Organics (DRO)	1700		mg/Kg	DYH	YES															
Residual Range Organics (RRO)	5200		mg/Kg	DO	YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-HS1-D-02-FS
Lab Report Batch : K0904454
Lab ID : CAS_K
Sample Date : 05/15/2009
Analysis Type: 1RES
Sample Matrix : SED
Lab Sample ID: K0904454-014

Reviewed By / Date : LG 8/20/2009
Approved By / Date :

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8015B					**Dilution: 10**															
Diesel Range Organics (DRO)	1700		mg/Kg	DYH	YES															
Residual Range Organics (RRO)	5400		mg/Kg	DO	YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-HS1-E-01 **Lab Report Batch :** K0904454 **Lab ID :** CAS_K

Sample Date : 05/15/2009 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0904454-015

Reviewed By / Date : LG 8/20/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8015B					**Dilution: 10**															
Diesel Range Organics (DRO)	1500		mg/Kg	DH	YES															
Residual Range Organics (RRO)	5100		mg/Kg	DO	YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-HS1-E-02 **Lab Report Batch :** K0904454 **Lab ID :** CAS_K

Sample Date : 05/15/2009 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0904454-016

Reviewed By / Date : LG 8/20/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8015B					**Dilution: 10**															
Diesel Range Organics (DRO)	1600		mg/Kg	DYH	YES															
Residual Range Organics (RRO)	4600		mg/Kg	DO	YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-HS1-F-01 **Lab Report Batch :** K0904454 **Lab ID :** CAS_K

Sample Date : 05/15/2009 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0904454-017

Reviewed By / Date : LG 8/20/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8015B					**Dilution: 10**															
Diesel Range Organics (DRO)	1500		mg/Kg	DYH	YES															
Residual Range Organics (RRO)	4800		mg/Kg	DO	YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-HS1-F-02 **Lab Report Batch :** K0904454 **Lab ID :** CAS_K

Sample Date : 05/15/2009 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0904454-018

Reviewed By / Date : LG 8/20/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8015B					**Dilution: 10**															
Diesel Range Organics (DRO)	3000		mg/Kg	DH	YES															
Residual Range Organics (RRO)	7300		mg/Kg	DO	YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-HS1-F-03 **Lab Report Batch :** K0904454 **Lab ID :** CAS_K

Sample Date : 05/15/2009 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0904454-019

Reviewed By / Date : LG 8/20/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8015B					**Dilution: 10**															
Diesel Range Organics (DRO)	7900		mg/Kg	DH	YES															
Residual Range Organics (RRO)	18000		mg/Kg	DO	YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-HS1-F-04 **Lab Report Batch :** K0904454 **Lab ID :** CAS_K

Sample Date : 05/15/2009 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0904454-020

Reviewed By / Date : LG 8/20/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8015B					**Dilution: 10**															
Diesel Range Organics (DRO)	7800		mg/Kg	DH	YES															
Residual Range Organics (RRO)	17000		mg/Kg	DO	YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-ZIC-C-01-TOX
Lab Report Batch : K0904454
Lab ID : CAS_K
Sample Date : 05/16/2009
Analysis Type: 1RES
Sample Matrix : SED
Lab Sample ID: K0904454-009

Reviewed By / Date : LG 8/20/2009
Approved By / Date :

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8015B					**Dilution: 1**															
Diesel Range Organics (DRO)	150		mg/Kg	Y	YES															
Residual Range Organics (RRO)	190		mg/Kg	O	YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Weston Solutions, Inc.
20 North Wacker Drive, Suite 1210
Chicago, IL 60606
(312) 424-3300 ● Fax: (312) 424-3330
www.westonsolutions.com

The Trusted Integrator for Sustainable Solutions

December 4, 2009

Ms. Diana Mally
Great Lakes National Program Office
United States Environmental Protection Agency, Region V
77 West Jackson Boulevard, Mail Code: G-17J
Chicago, Illinois 60604-3507

Re: Data Review of Polynuclear Aromatic Hydrocarbon (PAH) Analysis
For Sediment Samples Collected in October 2008 and May 2009
Lower Rouge River Sediment Investigation
Toledo, Lucas County, Ohio
Technical Direction Document Number: S05-0008-0805-012
Document Control Number: 451-2A-AEQA
Work Order Number: 20405.012.008.0451.00

Dear Ms. Mally:

The United States Environmental Protection Agency (U.S. EPA) tasked Weston Solutions, Inc., (WESTON®) to perform data validation for sediment samples collected from October 21, 2008, to May 16, 2009 for the Great Lakes National Program Office (GLNPO) Lower Rouge River Sediment Investigation (LRR) Site. This data review is for PAH analysis of 177 sediment samples that include 7 field duplicate samples and 7 field replicate samples that were collected by the WESTON Superfund Technical Assessment and Response Team (START). Of the 177 samples, 25 were analyzed for an expanded list of PAHs that included alkylated homologs. The samples were validated in accordance with the "Quality Assurance Project Plan (QAPP), Lower Rouge River Sediment Investigation" dated October 17, 2008, which included using the U.S. EPA Contract Laboratory Program National Functional Guidance for Organic Data Review. Table 1 provides a summary of the samples included in this review. Tables 2A and 2B present the lists of the PAH analytes included in this review. All tables are presented at the end of this report.

The samples listed in Table 1 were analyzed by Columbia Analytical Services (CAS) located in Kelso, Washington under the following 11 work orders:

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- K0810413
- K0810422
- K0810423
- K0810465
- K0904268
- K0904301
- K0904351
- K0904356
- K0904403
- K0904451
- K0904454

The samples were analyzed for PAHs using SW-846 Method 8270C Selective Ion Monitoring. Data validation was performed for each work order. Data validation was performed for each work order. CAS provided WESTON with a Staged Electronic Data Deliverable that was used in conjunction with the Automated Data Review (ADR) software to assist in reviewing the data.

Attachment A to this report contains the individual Quality Assurance/Quality Control (QA/QC) Analysis Checklist for Sediment Chemistry Analysis for each work order. Attachment B to this report contains a printed report from ADR that provides a summary of results with applied data qualifiers. The QC limits utilized were those stated in the QAPP. If there was not a QC limit specified in the QAPP, then the method or laboratory-determined QC limits were used. Below is a data review summary.

SUMMARY OF PAH DATA REVIEW

The holding times and laboratory control samples (LCS) were all within the QC limits. All sample results were based on a dry weight for total PAH analyses.

There were some minor problems with the QC indicators. In all 11 work orders, there were detections of some target compounds in the method blanks. In each instance, the detection in the method blank was below the reporting limit.

In nine work orders, the percent recoveries for the matrix spike (MS) and/or matrix spike duplicate (MSD) were outside the QC limits. In one work order, the relative percent difference (RPD) between the MS and MSD was outside the QC limits for one or more target compounds.

In three work orders, field replicate results were outside the standard QC limit utilized. In four work orders, field duplicate results were outside the standard QC limit utilized.

In six work orders, surrogates were outside QC limits. In five of the work orders associated with the May 2009 samples, pyrene was outside the QC limit in the initial calibration. In addition, three work orders associated with the May 2009 samples contained continuing calibration verification (CCV) results that were outside QC limits.

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Below are a description of the minor problems with QC failures and a review of the data quality indicators. All tables are included at the end of this report including a data qualification table. The attachment contains the standardized QA/QC Analysis Checklist for Sediment Chemistry Analysis for each work order and the data summary sheets with hand-written qualifiers applied during data validation.

MINOR PROBLEMS

Minor problems with QC failures are noted below.

Method Blanks. In all 11 work orders, method blanks contained detections of target compounds below the reporting limit. In six of the work orders, no qualifications were required because the sample concentration was at least 5 times greater than the method blank concentration. Below is a summary of the method blank detections that required qualifications by work order.

- K0904268. Most PAH compounds detected in the method blank were detected at much higher levels in the samples and therefore, no qualifications were required. The exceptions were benzo(a) pyrene; benzo(k)fluoranthene; and indeno(1,2,3-cd)pyrene in sample LRR-HS6-A-03. These results were flagged "U" as not detected because the sample concentration was similar to the method blank concentration.
- K0904301. Most PAH compounds detected in the method blank were detected at much higher levels in the samples and no qualifications were needed. The exception was anthracene in sample LRR-HS6-UP3-03 which was flagged "U" as not detected because it was detected in this sample at a similar concentration as the method blank.
- K0904351. Most PAH compounds detected in the method blank were detected at much higher levels in the samples and therefore, no qualifications were required. The exception was naphthalene in samples LRR-ZIC-D-04, LRR-ZIC-D-05, LRR-ZIC-F-02-DP, and LRR-ZIC-F-03 which was flagged "U" as not detected because the sample concentration was similar to the method blank concentration.
- K0904403. Most PAH compounds detected in the method blank were detected at much higher levels in the samples and therefore, no qualifications were required. The exceptions were 2-methylnapthalene; benzo(a)pyrene; benzo(k)fluoranthene; dibenz(a,h)anthracene; and napthalene in sample LRR-ZIC-H-01. These results were flagged "U" as not detected because the sample concentration was similar to the method blank concentration.
- K0904451. Most PAH compounds detected in the method blank were detected at much higher levels in the samples and no qualifications were needed. The exceptions were anthracene; fluoranthene; fluorene; and phenanthrene in sample LRR-HS3-E-01. These results were flagged "U" as not detected because the sample concentration was similar to the method blank concentration.

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MS and MSDs. In nine work orders, the percent recoveries (%R) for MS and MSDs were outside the specified QC limits. In one work order the RPD between the MS and MSD were outside the QC limits. Below is a summary of the QC limit exceedances by work order.

- K0810413. CAS analyzed an MS and MSD using sample LRR-OBC-D-01-DP as the spiked sample. Several compounds in either or both the MS and MSD were outside the QC limits stated in the QAPP. In each instance, the sample concentration was greater than for times the spike amount added to the sample. In these instances, no qualification is required.

  In some instances, the RPDs between the MS and MSD were outside the QAPP QC limits when the sample concentration was greater than four times the sample result. No qualifications were applied for these discrepancies.
- K0810422. CAS analyzed an MS and MSD using sample LRR-OF2-E-05 as the spiked sample. Several compounds in either or both the MS and MSD were outside the QC limits stated in the QAPP. In most instances, the sample concentration was greater than four times the spike amount added to the sample and therefore, no qualifications were required in accordance with data validation guidelines. The exceptions were the following: acenaphthylene; dibenzofuran; and dibenzo(a,h)anthracene. The results for these three compounds in the parent sample were flagged "J" as estimated due to potential matrix interferences.
- K0810423. CAS analyzed an MS and MSD using sample LRR-OF2-C-05 as the spiked sample. Several compounds in either or both the MS and MSD were outside the QC limits stated in the QAPP. In most instances, the sample concentration was greater than four times the spike amount added to the sample and therefore, no qualifications were required in accordance with data validation guidelines. The exceptions were the following: acenaphthylene; dibenzofuran; and dibenzo(a,h)anthracene. The results for these three compounds in the parent sample were flagged "J" as estimated due to possible matrix interferences.
- K0904268. CAS analyzed an MS and MSD using sample LRR-HS6-B-02 as the spiked sample. Several compounds in either or both the MS and MSD were outside the QC limits stated in the QAPP. In most of these instances, the sample concentration was greater than four times the spike amount added to the sample and sample qualification was not required. The exceptions were acenatphylene and dibenz(a,h)anthracene which were detected low in the MS and MSD. The results for these two compounds in the parent sample were flagged "J" as estimated due to possible matrix interference.
- K0904301. One MS/MSD pair is associated with this work order. Ten of the 19 PAH compounds were detected outside the QC limit. In four instances, the sample concentration was greater than four times the spike amount and no qualification was required. For the remaining six PAH compounds, the results were flagged "J" as

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estimated in the parent sample, LRR-HS6-UP4-04 due to possible matrix interference in this sample.

- K0904351. Two MS/MSDs are associated with this work order. For one MS/MSD pair, all percent recoveries were with QAPP QC limits. For the second MS/MSD pair, the following compounds were detected low in the MS and/or MSD: fluoranthene, phenanthrene, acenapthene, dibenzofuran, naphthalene, and pyrene. In sample LRR-HS6-X2-02, the results for these compounds were flagged "J" as estimated due to possible matrix interference in the parent sample.
- K0904403. One site-specific MS/MSD pair is associated with this work order. The percent recovery was outside the QC limit in the MS and/or MSD for the following compounds: naphthalene, 1-methylnaphthalene; acenapthene; phenanthrene; and fluoranthene. The percent recoveries only slightly exceeded the QC limit in these instances. These compounds were flagged "J" as estimated in the parent sample, LRR-HS6-UP7-02, due to possible matrix interference.
- K0904451. One MS/MSD pair is associated with this work order. Four of the 19 PAH compounds were detected outside the QC limit. For three of these compounds, the sample concentration was greater than four times the spike amount and no qualification was required. The exception was anthracene. The result for anthracene in sample LRR-HS5-A-01-R (the parent sample) was flagged "J" as estimated.
- K0904454. Two MS/MSDs are associated with this work order. For one MS/MSD pair, all percent recoveries were with QAPP QC limits. For the second MS/MSD pair, nine of the 19 PAH compounds were detected outside the QC limit. In each instance, the sample concentration was greater than four times the spike amount and no qualification was required.

Surrogate Results. Surrogate results were outside the QC limits for percent recovery in the following six work orders: K0810413, K0904268, K0904301, K0904356, K0904403, and K090451. In each instance, the surrogates were not recovered due to a higher concentration of target PAH compounds in the samples and dilutions required. No qualification was required because of the dilutions affecting surrogate recovery. For each work order except one, only one to two samples had poor surrogate recoveries and in many instances only one of the three surrogates was affected. In work order K0904451, seven samples had one to two surrogates outside the QC limits. In summary, the poor surrogate recoveries in some samples do not affect data usability.

Initial Calibration Results. In the initial calibration associated with the samples collected in May 2009 and analyzed before June 1, 2009, pyrene exceeded the QC limit of 15 RPD with an RPD of 18.9. Detected pyrene results in all samples associated with this calibration were flagged "J" as estimated.

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CCV Results. In three work orders, the CCVs had some compounds slightly outside the QC limits as follows.

- K0904301. For samples analyzed on May 22, 2009, the CCV percent difference was outside the QC limit for indeno(1,2,3-cd)pyrene. Detected indeno(1,2,3-cd)pyrene results in samples analyzed on May 22, 2009, were flagged "J" as estimated.
- K0904356. For samples analyzed on May 30, 2009, the continuing calibration verification percent difference was outside the QC limit for indeno(1,2,3-cd)pyrene. Detected indeno(1,2,3-cd)pyrene results in samples analyzed on May 30, 2009, were flagged "J" as estimated.
- K0904403. For samples analyzed on May 30 and 31, 2009, the CCV percent difference was outside the QC limit for indeno(1,2,3-cd)pyrene and dibenz(a,h)anthracene. Detected indeno(1,2,3-cd)pyrene and dibenz(a,h)anthracene results in samples analyzed on May 30 and 31, 2009, were flagged "J" as estimated.

Field Replicate Results. The field replicates were collected from the same homogenized material as the associated investigative sample. Seven field replicate pairs are associated with the sediment samples collected from October 21, 2008, to May 16, 2009 (see Table 1 for which samples were designated as field replicates). The QAPP stated that field replicates would be collected at a rate of 5 percent for investigative samples collected. A total of 163 investigative samples were collected; therefore, approximately 4.3 percent of the samples were collected for field replicates which is slightly below the stated 5 percent. This is not expected to affect data usability because the samples collected as field replicates were similar to the investigative samples.

Of the seven replicate pairs associated with the PAH analyses, four had minor QC issues associated with them and these are summarized below. Because a QC limit for field replicates was not stated in the QAPP, a default QC limit of 50 RPD was used to evaluate field replicate results. Table 3 summarizes the field replicate results and RPDs.

- Replicate pair LRR-HS6-X2-02 and LRR-HS6-X2-02-FS. Eleven of the 19 PAH compounds had RPDs greater than 50; however, the exceedance wasn't that great. The RPDs outside the QC limit ranged from 51 to 67.
- Replicate pair LRR-ZIC-A-01 and LRR-ZIC-A-01-FS. For the field replicate of sample LRR-ZIC-A-01, 15 of the 19 PAH compounds had an RPD greater than 50. The RPDs greater than 50 ranged from 60 to 76 RPD. This sample and the replicate were analyzed with a dilution factor of 10. The elevated RPDs likely indicate either a heterogeneous sample mixture, inadequate homogenization of the sample in the field, or inaccurate precision with the sample dilution process.

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- Replicate pair LRR-HS6-UP1-02 and LRR-HS6-UP1-02-FS. Seven of the 19 PAH compounds exceeded this QC limit in both replicates. The elevated RPDs are likely due to sample heterogeneity.
- Replicate pair LRR-HS6-DOWN1-02 and LRR-HS6-DOWN1-02-FS. Seven of the 19 PAH compounds exceeded this QC limit in both replicates. The elevated RPDs are likely due to sample heterogeneity.

Field Duplicate Results. The field duplicates were collected adjacent to an investigative sample and are not of the same homogenized material. Seven field duplicate pairs are associated with the sediment samples collected from October 21, 2008, to May 16, 2009 (see Table 1 for which samples were designated as field duplicates). The QAPP stated that field duplicates would be collected at a rate of 5 percent for investigative samples collected. A total of 163 investigative samples were collected; therefore, approximately 4.3 percent of the samples were collected for field duplicates which is slightly below the stated 5 percent. This is not expected to affect data usability because the samples collected as field duplicates were similar to the investigative samples.

All seven duplicate pairs associated with the PAH analyses had minor QC issues associated with them as summarized below. Because a QC limit for field duplicates was not stated in the QAPP, a default QC limit of 50 RPD was used to evaluate field duplicate results. Table 4 summarizes the field duplicate results and RPDs.

- Duplicate pair LRR-OBC-D-01 and LRR-OBC-D-01-DP. All PAH compounds except one were outside this RPD limit. The RPDs ranged from 51 to 158 percent. For C4-Chrysenes, both the duplicate and parent sample contained no detection above the reporting limit. The elevated RPDs are indicative a very heterogeneous matrix.
- Duplicate pair LRR-HS6-F-01 and LRR-HS6-F-01-DP. All PAH compounds in this field duplicate pair had RPDs that greatly exceeded the QC limit. The elevated RPDs are likely due to sample heterogeneity.
- Duplicate pair LRR-HS3-A-02 and LRR-HS3-A-02-DP. All RPDs were within a standard RPD limit of 50 or less except for two compounds which only slightly exceeded the QC limit. The field duplicate results for sample LRR-HS3-A-02-DP were acceptable.
- Duplicate pair LRR-ZIC-F-02 and LRR-ZIC-F-02-DP. Four of the 19 PAH compounds had RPDs greater than 50; however, the exceedance wasn't that great. The RPDs outside the QC limit ranged from 51 to 66. The field duplicate results for sample LRR-ZIC-F-02-DP were acceptable.
- Duplicate pair LRR-ZIC-D-01 and LRR-ZIC-D-01-DP. Fifteen of the 19 PAH compounds had RPDs greater than 50. The RPDs outside the QC limit ranged from 57 to 131. The elevated RPDs are likely due to sample heterogeneity.

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- Duplicate pair LRR-HS1-B-01 and LRR-HS1-B-01-DP. All RPDs were within a standard RPD limit of 50 or less except for one compound which had an RPD of 56. The field duplicate results for sample LRR-HS1-B-01-DP were acceptable.
- Duplicate pair LRR-HS1-B-02 and LRR-HS1-B-02-DP. All RPDs were within a standard RPD limit of 50 or less except for one compound which had an RPD of 53. The field duplicate results for sample LRR-HS1-B-02-DP were acceptable.

DATA QUALITY INDICATORS REVIEW

Many the data quality indicators (sensitivity, precision, accuracy, and completeness) were evaluated through the data validation procedures which are summarized above and discussed in detail in the attachment.

Sensitivity. The laboratory reporting limit of 5 µg/kg as stated in the QAPP was not met for several samples. In all instances where the detection limit was not met, there were detections of target PAHs in the samples and in many of these instances the detections were high requiring dilutions. In addition, the laboratory reported down to method detection limits which were much lower than the reporting limits (all sample results reported below the reporting limit were qualified "J" as estimated). The elevated reporting limits do not affect data usability because there were detected PAHs in the samples. Therefore, sensitivity was adequate for the PAH analyses of sediment samples collected from October 21, 2008, to May 16, 2009.

Precision. Field precision was determined by evaluating the RPDs for the field replicate and field duplicate results (see discussion of Field Replicate and Field Duplicate Results under Minor Problems). The field duplicate RPDs were higher than the field replicate RPDs. This is to be expected because the duplicate sample was not from the same homogenized sample aliquot as the investigative sample. Field precision was evaluated and found to be acceptable in most instances. Major discrepancies are noted under Minor Problems above and these are likely due to sample heterogeneity. Table 5 summarizes the mean field replicate and duplicate RPDs for each analyte.

Laboratory precision was determined by evaluating the RPD values between MS and MSD and LCS and LCS duplicate (LCSD) results. There were minor problems with laboratory precision. See the more detailed discussion above for MS/MSDs in the previous section. All mean LCS RPDs were within the QAPP QC limits. Some of the mean MS/MSD RPDs were above the QAPP QC limit of 40 RPD. These exceedances were not large and do not affect data usability. Table 5 summarizes the mean RPDs for MS/MSDs and LCS/LCSDs. The MS/MSD mean RPDs ranged from 1 to 48 and the LCS/LCSD mean RPDs ranged from 3 to 14. The laboratory precision was acceptable for all work orders.

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Accuracy/Bias. Accuracy is a measure of the agreement between an observed value and an accepted reference value. Laboratory accuracy was evaluated by reviewing the QC criteria for percent recovery for MS, MSD, LCS, and LCSD results. These items are discussed in detail in the previous section. In general, the mean MS/MSD percent recoveries were very low indicating matrix interference due to high concentrations of target analytes in the sample. In most instances where there were extremely low percent recoveries, the spike amount was less than four times the sample concentration resulting in the low spike recovery. All LCS mean percent recoveries were within the QAPP QC limits. Table 5 summarizes the accuracy estimates for the total PAH analyses. The mean percent recoveries for MS/MSDs ranged from -298 to 59 percent and for LCS/LCSDs ranged from 66 to 86 percent. Laboratory accuracy was acceptable as indicated by the LCS/LCSD percent recoveries. The mean MS/MSD and LCS/LCSD recoveries indicate a low bias for the PAH analyses due to a low bias for laboratory precision and matrix interferences in the samples.

Completeness. Completeness is a measure of the amount of valid data obtained compared to the amount of data that was planned to be collected under normal conditions. All samples results were received.

In summary, there were some minor problems with QC failures and the data are usable for comparison to the total PAH value stated in the QAPP. Table 6 summarizes data qualifiers applied during the data review.

If there are any questions or comments regarding this report, please do not hesitate to contact WESTON START at 312-424-3300.

Very truly yours,
Weston Solutions, Inc.

Lisa Graczyk
WESTON START Team

Tonya Balla
WESTON START Project Manager

Attachments:
Tables

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A - Checklists for PAH Analytical Data
B - Analytical Data Summary Sheets with Qualifiers

cc: project file

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TABLES

TABLE 1 SAMPLES INCLUDED IN DATA REVIEW			
Sample ID	**Lab ID**	**Date Collected**	**Comment**
LRR-017-A-01	K0810413-001	10/21/2008	
LRR-017-A-02	K0810413-002	10/21/2008	
LRR-017-A-03	K0810413-003	10/21/2008	
LRR-017-A-04	K0810413-004	10/21/2008	
LRR-017-A-05	K0810413-005	10/21/2008	
LRR-OBC-D-01	K0810413-006	10/21/2008	
LRR-OBC-D-01-DP	K0810413-007	10/21/2008	Field duplicate of LRR-OBC-D-01
LRR-OF2-A-01	K0810413-008	10/21/2008	
LRR-WJB-A-01	K0810413-009	10/21/2008	
LRR-WJB-A-02	K0810413-010	10/21/2008	
LRR-HS1-A-01	K0810422-001	10/21/2008	
LRR-HS1-A-02	K0810422-002	10/21/2008	
LRR-HSI-A-03	K0810422-003	10/21/2008	
LRR-HS1-A-04	K0810422-004	10/21/2008	
LRR-OF2-D-01	K0810422-005	10/22/2008	
LRR-OF2-D-02	K0810422-006	10/22/2008	
LRR-OF2-D-03	K0810422-007	10/22/2008	
LRR-OF2-D-04	K0810422-008	10/22/2008	
LRR-OF2-D-05	K0810422-009	10/15/2008	
LRR-OF2-E-01	K0810422-010	10/22/2008	
LRR-OF2-E-02	K0810422-011	10/22/2008	
LRR-OF2-E-03	K0810422-012	10/22/2008	
LRR-OF2-E-04	K0810422-013	10/22/2008	
LRR-OF2-E-05	K0810422-014	10/22/2008	
LRR-OF2-B-01	K0810423-001	10/22/2008	
LRR-OF2-B-02	K0810423-002	10/22/2008	
LRR-OF2-B-03	K0810423-003	10/22/2008	
LRR-OF2-B-04	K0810423-004	10/22/2008	
LRR-OF2-B-05	K0810423-005	10/22/2008	
LRR-OF2-C-01	K0810423-006	10/22/2008	
LRR-OF2-C-02	K0810423-007	10/22/2008	
LRR-OF2-C-03	K0810423-008	10/22/2008	
LRR-OF2-C-04	K0810423-009	10/22/2008	
LRR-OF2-C-05	K0810423-010	10/22/2008	
LRR-HS5-A-01	K0810423-011	10/23/2008	
LRR-OBC-A-01	K0810465-001	10/23/2008	
LRR-OBC-A-02	K0810465-002	10/23/2008	
LRR-OBC-A-03	K0810465-003	10/23/2008	
LRR-OBC-B-01	K0810465-004	10/23/2008	

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TABLE 1 SAMPLES INCLUDED IN DATA REVIEW			
Sample ID	**Lab ID**	**Date Collected**	**Comment**
LRR-OBC-B-02	K0810465-005	10/23/2008	
LRR-OBC-B-03	K0810465-006	10/23/2008	
LRR-OBC-C-01	K0810465-007	10/23/2008	
LRR-OBC-C-02	K0810465-008	10/23/2008	
LRR-OBC-C-03	K0810465-009	10/23/2008	
LRR-HS6-A-01	K0904268-001	5/11/2009	
LRR-HS6-A-02	K0904268-002	5/11/2009	
LRR-HS6-A-03	K0904268-003	5/11/2009	
LRR-HS6-B-01	K0904268-004	5/11/2009	
LRR-HS6-B-02	K0904268-005	5/11/2009	
LRR-HS6-B-03	K0904268-006	5/11/2009	
LRR-HS6-C-01	K0904268-007	5/11/2009	
LRR-HS6-C-02	K0904268-008	5/11/2009	
LRR-HS6-C-03	K0904268-009	5/11/2009	
LRR-HS6-C-04	K0904268-010	5/11/2009	
LRR-HS6-D-01	K0904268-011	5/11/2009	
LRR-ZIC-A-01	K0904268-012	5/11/2009	
LRR-ZIC-A-02	K0904268-013	5/11/2009	
LRR-ZIC-A-03	K0904268-014	5/11/2009	
LRR-ZIC-A-04	K0904268-015	5/11/2009	
LRR-ZIC-A-05	K0904268-016	5/11/2009	
LRR-ZIC-B-01	K0904268-017	5/11/2009	
LRR-ZIC-A-01-FS	K0904268-018	5/11/2009	Field replicate of LRR-ZIC-A-01
LRR-ZIC-A-02-FS	K0904268-019	5/11/2009	Field replicate of LRR-ZIC-A-02
LRR-ZIC-B-02	K0904268-020	5/11/2009	
LRR-ZIC-B-03	K0904268-021	5/11/2009	
LRR-HS6-E-01	K0904301-001	5/12/2009	
LRR-HS6-E-02	K0904301-002	5/12/2009	
LRR-HS6-E-03	K0904301-003	5/12/2009	
LRR-HS6-E-04	K0904301-004	5/12/2009	
LRR-HS6-F-01	K0904301-005	5/12/2009	
LRR-HS6-F-01-DP	K0904301-006	5/12/2009	Field duplicate of LRR-HS6-F-01
LRR-HS6-G-01	K0904301-007	5/12/2009	
LRR-HS6-UP1-01	K0904301-008	5/12/2009	
LRR-HS6-UP1-02	K0904301-009	5/12/2009	
LRR-HS6-UP2-01	K0904301-010	5/12/2009	
LRR-ZIC-D-01	K0904301-011	5/12/2009	
LRR-ZIC-D-01-DP	K0904301-012	5/12/2009	Field duplicate of LRR-ZIC-D-01
LRR-HS6-UP3-01	K0904301-013	5/12/2009	

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TABLE 1 SAMPLES INCLUDED IN DATA REVIEW			
Sample ID	**Lab ID**	**Date Collected**	**Comment**
LRR-HS6-UP3-02	K0904301-014	5/12/2009	
LRR-HS6-UP4-03	K0904301-015	5/12/2009	
LRR-HS6-UP4-04	K0904301-016	5/12/2009	
LRR-ZIC-C-01	K0904301-017	5/12/2009	
LRR-ZIC-C-02	K0904301-018	5/12/2009	
LRR-ZIC-C-03	K0904301-019	5/12/2009	
LRR-HS6-UP3-03	K0904301-020	5/12/2009	
LRR-ZIC-D-04	K0904351-001	5/13/2009	
LRR-ZIC-D-05	K0904351-002	5/13/2009	
LRR-ZIC-E-01	K0904351-003	5/13/2009	
LRR-ZIC-E-02	K0904351-004	5/13/2009	
LRR-ZIC-E-03	K0904351-005	5/13/2009	
LRR-ZIC-E-04	K0904351-006	5/13/2009	
LRR-ZIC-E-05	K0904351-007	5/13/2009	
LRR-ZIC-F-02	K0904351-008	5/13/2009	
LRR-ZIC-F-03	K0904351-009	5/13/2009	
LRR-ZIC-F-04	K0904351-010	5/13/2009	
LRR-ZIC-F-01	K0904351-011	5/13/2009	
LRR-ZIC-F-02-DP	K0904351-012	5/13/2009	Field duplicate of LRR-ZIC-F-02
LRR-HS6-X2-01	K0904351-013	5/14 /2009	
LRR-HS6-X2-02	K0904351-014	5/14/2009	
LRR-HS6-X2-02-FS	K0904351-015	5/14/2009	Field replicate of LRR-HS6-X2-02
LRR-HS6-UP3-04	K0904356-001	5/12/2009	
LRR-HS6-UP4-01	K0904356-002	5/12/2009	
LRR-HS6-UP4-02	K0904356-003	5/12/2009	
LRR-HS6-UP1-02-FS	K0904356-004	5/12/2009	Field replicate of LRR-HS6-UP1-02
LRR-HS6-UP1-03	K0904356-005	5/12/2009	
LRR-HS6-UP2-02	K0904356-006	5/12/2009	
LRR-HS6-UP2-03	K0904356-007	5/12/2009	
LRR-HS6-UP2-04	K0904356-008	5/12/2009	
LRR-HS6-DOWN1-01	K0904356-009	5/13/2009	
LRR-HS6-DOWN1-02	K0904356-010	5/13/2009	
LRR-HS6-DOWN1-02-FS	K0904356-011	5/13/2009	Field replicate of LRR-DOWN1-02
LRR-HS6-DOWN1-03	K0904356-012	5/13/2009	
LRR-HS6-DOWN1-04	K0904356-013	5/13/2009	
LRR-HS6-DOWN2-01	K0904356-014	5/13/2009	
LRR-HS6-X1-01	K0904356-015	5/13/2009	
LRR-HS6-X1-02	K0904356-016	5/13/2009	

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TABLE 1 SAMPLES INCLUDED IN DATA REVIEW			
Sample ID	**Lab ID**	**Date Collected**	**Comment**
LRR-HS6-X1-03	K0904356-017	5/13/2009	
LRR-HS6-X1-04	K0904356-018	5/13/2009	
LRR-ZIC-D-02	K0904356-019	5/13/2009	
LRR-ZIC-D-03	K0904356-020	5/13/2009	
LRR-HS6-X2-03	K0904403-001	5/14/2009	
LRR-HS6-X2-04	K0904403-002	5/14/2009	
LRR-HS6-X3-01	K0904403-003	5/14/2009	
LRR-HS6-X4-01	K0904403-004	5/14/2009	
LRR-HS6-X4-02	K0904403-005	5/14/2009	
LRR-HS6-X5-01	K0904403-006	5/14/2009	
LRR-HS6-X5-02	K0904403-007	5/14/2009	
LRR-HS6-UP5-01	K0904403-008	5/14/2009	
LRR-HS6-UP5-02	K0904403-009	5/14/2009	
LRR-HS6-UP5-03	K0904403-010	5/14/2009	
LRR-HS6-UP5-04	K0904403-011	5/14/2009	
LRR-HS6-UP6-01	K0904403-012	5/14/2009	
LRR-HS6-UP6-02	K0904403-013	5/14/2009	
LRR-HS6-UP7-01	K0904403-014	5/14/2009	
LRR-HS6-UP7-02	K0904403-015	5/14/2009	
LRR-ZIC-G-01	K0904403-016	5/13/2009	
LRR-ZIC-G-02	K0904403-017	5/13/2009	
LRR-ZIC-G-03	K0904403-018	5/13/2009	
LRR-ZIC-H-01	K0904403-019	5/13/2009	
LRR-ZIC-H-02	K0904403-020	5/13/2009	
LRR-HS1-F-05	K0904451-001	5/15/2009	
LRR-HS3-A-01	K0904451-002	5/16/2009	
LRR-HS3-A-01-FS	K0904451-004	5/16/2009	Field replicate of LRR-HS3-A-01
LRR-HS3-A-02	K0904451-005	5/16/2009	
LRR-HS3-A-02-DP	K0904451-006	5/16/2009	Field duplicate of LRR-HS3-A-02
LRR-HS3-A-03	K0904451-007	5/16/2009	
LRR-HS3-B-01	K0904451-008	5/16/2009	
LRR-HS3-B-02	K0904451-009	5/16/2009	
LRR-HS3-B-03	K0904451-010	5/16/2009	
LRR-HS3-C-01	K0904451-011	5/16/2009	
LRR-HS3-C-02	K0904451-012	5/16/2009	
LRR-HS3-C-03	K0904451-013	5/16/2009	
LRR-HS3-D-01	K0904451-014	5/16/2009	
LRR-HS3-D-02	K0904451-015	5/16/2009	
LRR-HS3-E-01	K0904451-016	5/16/2009	

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TABLE 1 SAMPLES INCLUDED IN DATA REVIEW			
Sample ID	**Lab ID**	**Date Collected**	**Comment**
LRR-HS3-E-02	K0904451-017	5/16/2009	
LRR-HS5-A-01-R	K0904451-020	5/15/2009	
LRR-HS1-A-01-R	K0904454-001	5/15/2009	
LRR-HS1-B-01	K0904454-002	5/15/2009	
LRR-HS1-B-01-DP	K0904454-003	5/15/2009	Field duplicate of LRR-HS1-B-01
LRR-HS1-B-02	K0904454-004	5/15/2009	
LRR-HS1-B-02-DP	K0904454-005	5/15/2009	Field duplicate of LRR-HS1-B-02
LRR-HS1-B-03	K0904454-006	5/15/2009	
LRR-HS1-B-04	K0904454-007	5/15/2009	
LRR-HS1-B-05	K0904454-008	5/15/2009	
LRR-ZIC-C-01-TOX	K0904454-009	5/15/2009	
LRR-HS1-C-01	K0904454-010	5/15/2009	
LRR-HS1-C-02	K0904454-011	5/15/2009	
LRR-HS1-D-01	K0904454-012	5/15/2009	
LRR-HS1-D-02	K0904454-013	5/15/2009	
LRR-HS1-D-02-FS	K0904454-014	5/15/2009	Field replicate of LRR-HS1-D-02
LRR-HS1-E-01	K0904454-015	5/15/2009	
LRR-HS1-E-02	K0904454-016	5/15/2009	
LRR-HS1-F-01	K0904454-017	5/15/2009	
LRR-HS1-F-02	K0904454-018	5/15/2009	
LRR-HS1-F-03	K0904454-019	5/15/2009	
LRR-HS1-F-04	K0904454-020	5/15/2009	

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TABLE 2A PAH ANALYTES	
CAS #	**Analyte**
91-57-6	2-Methylnaphthalene
83-32-9	Acenaphthene
208-96-8	Acenaphthylene
120-12-7	Anthracene
56-55-3	Benzo[a]anthracene
50-32-8	Benzo[a]pyrene
205-99-2	Benzo[b]fluoranthene
191-24-2	Benzo[g,h,i]perylene
207-08-9	Benzo[k]fluoranthene
218-01-9	Chrysene
53-70-3	Dibenz[a,h]anthracene
132-64-9	Dibenzofuran
206-44-0	Fluoranthene
86-73-7	Fluorene
193-39-5	Indeno(1,2,3-c,d)pyrene
91-20-3	Naphthalene
85-01-8	Phenanthrene
129-00-0	Pyrene

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TABLE 2B PAH ANALYTES WITH ALKYLATED HOMOLOGS	
CAS #	**Analyte**
90-12-0	1-Methylnaphthalene
91-57-6	2-Methylnaphthalene
83-32-9	Acenaphthene
208-96-8	Acenaphthylene
120-12-7	Anthracene
56-55-3	Benzo[a]anthracene
50-32-8	Benzo[a]pyrene
205-99-2	Benzo[b]fluoranthene
191-24-2	Benzo[g,h,i]perylene
207-08-9	Benzo[k]fluoranthene
218-01-9	Chrysene
---	C1-Chrysenes
---	C2-Chrysenes
---	C3-Chrysenes
---	C4-Chrysenes
53-70-3	Dibenz[a,h]anthracene
132-64-9	Dibenzofuran
206-44-0	Fluoranthene
---	C1-Fluoranthenes/Pyrenes
86-73-7	Fluorene
---	C1-Fluorenes
---	C2-Fluorenes
---	C3-Fluorenes
193-39-5	Indeno(1,2,3-c,d)pyrene
91-20-3	Naphthalene
---	C2-Naphthalenes
---	C3-Naphthalenes
---	C4-Naphthalenes
85-01-8	Phenanthrene
---	C1-Phenanthrenes/Anthracenes
---	C2-Phenanthrenes/Anthracenes
---	C3-Phenanthrenes/Anthracenes
---	C4-Phenanthrenes/Anthracenes
129-00-0	Pyrene

Notes:

--- - There is no CAS number for this compound.

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TABLE 3
FIELD REPLICATE RESULTS
FOR TOTAL PAH ANALYSES

	Sample: LRR-HS6-X2-02			Sample: LRR-ZIC-A-01			Sample: LRR-ZIC-A-02			Sample: LRR-HS6-UP1-02		
Analyte	**Sample Result (µg/kg)**	**Replicate Result (µg/kg)**	**RPD**	**Sample Result (µg/kg)**	**Replicate Result (µg/kg)**	**RPD**	**Sample Result (µg/kg)**	**Replicate Result (µg/kg)**	**RPD**	**Sample Result (µg/kg)**	**Replicate Result (µg/kg)**	**RPD**
1-Methylnaphthalene	190	110	53	150	230	42	190	210	10	6.3	2.6	83
2-Methylnaphthalene	290	150	64	280	400	35	370	380	3	11	4.2	89
Acenaphthene	290	150	64	290	540	60	730	810	10	6.6	3.4	64
Acenaphthylene	39	24	48	170	330	64	420	350	18	1.1	0.8	32
Anthracene	290	160	58	790	1,500	62	1,900	1,700	11	20	39	64
Benzo[a]anthracene	240	140	53	1,700	3,500	69	4,600	4,800	4	14	9.5	38
Benzo[a]pyrene	180	110	48	2,100	4,200	67	6,100	6,300	3	15	11	31
Benzo[b]fluoranthene	210	130	47	2,300	4,700	69	6,900	7,200	4	20	15	29
Benzo[g,h,i]perylene	100	73	31	1,500	3,000	67	4,300	4,400	2	11	8.9	21
Benzo[k]fluoranthene	68	43	45	750	1,600	72	2,200	2,300	4	6.0	4.0	40
Chrysene	220	120	59	1,900	4,000	71	4,800	5,200	8	16	13	21
Dibenz[a,h]anthracene	24	15	46	370	740	67	970	990	2	2.6	1.8	36
Dibenzofuran	200	100	67	270	440	48	410	450	9	7.4	8.0	8
Fluoranthene	650	370	55	2,800	6,200	76	7,500	8,800	16	41	38	8
Fluorene	250	140	56	340	680	67	670	740	10	9.4	18	63
Indeno(1,2,3-c,d)pyrene	120	74	47	1,500	3,100	70	5,200	5,300	2	12	8.8	31
Naphthalene	1,100	1,100	0	790	910	14	1,100	1,100	0	150	14	166
Phenanthrene	860	510	51	1,700	3,700	74	3,600	4,400	20	53	120	77
Pyrene	580	340	52	2,600	5,600	73	7,000	8,100	15	32	31	3

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Analyte	Sample: LRR-HS6-DOWN1-02			Sample: LRR-HS1-D-02			Sample: LRR-HS3-A-01			Sample:		
	Sample Result (µg/kg)	Replicate Result (µg/kg)	RPD	Sample Result (µg/kg)	Replicate Result (µg/kg)	RPD	Sample Result (µg/kg)	Replicate Result (µg/kg)	RPD	Sample Result (µg/kg)	Replicate Result (µg/kg)	RPD
1-Methylnaphthalene	3.2	3.3	3	450	520	14	180	170	6			
2-Methylnaphthalene	5.3	6.4	19	720	810	12	350	310	12			
Acenaphthene	3.5	3.6	3	610	660	8	260	230	12			
Acenaphthylene	3.9	1.8	74	810	1,100	30	280	270	4			
Anthracene	110	12	161	1,200	1,300	8	620	570	8			
Benzo[a]anthracene	44	22	67	3,300	3,700	11	2,800	2,200	24			
Benzo[a]pyrene	35	25	33	4,300	5,000	15	3,500	2,900	19			
Benzo[b]fluoranthene	47	29	47	5,000	5,600	11	5,100	4,300	17			
Benzo[g,h,i]perylene	25	18	33	3,600	4,100	13	3,500	2,900	19			
Benzo[k]fluoranthene	15	8.8	52	1,500	1,700	13	1,500	1,300	14			
Chrysene	44	26	51	4,100	4,600	11	3,900	3,300	17			
Dibenz[a,h]anthracene	5.7	3.7	43	550	670	20	570	470	19			
Dibenzofuran	8.1	6.0	30	130	140	7	170	140	19			
Fluoranthene	160	54	99	8,300	9,300	11	7,900	6,800	15			
Fluorene	33	8.3	120	570	600	5	350	280	22			
Indeno(1,2,3-c,d)pyrene	27	19	35	3,900	4,500	14	3,800	3,300	14			
Naphthalene	10	14	33	770	790	3	980	860	13			
Phenanthrene	320	42	154	4,700	5,300	12	3,000	2,500	18			
Pyrene	110	49	77	8,200	9,300	13	6,700	5,700	16			
C1-Chrysenes	NA	NA	NA	NA	NA	NA	1,800	1,400	25			
C1-Fluoranthenes/Pyrenes	NA	NA	NA	NA	NA	NA	3,300	2,800	16			
C1-Fluorenes	NA	NA	NA	NA	NA	NA	250	230	8			
C1-Phenanthrenes/Anthracenes	NA	NA	NA	NA	NA	NA	1,600	1,300	21			
C2-Chrysenes	NA	NA	NA	NA	NA	NA	1,000	850	16			
C2-Fluorenes	NA	NA	NA	NA	NA	NA	560	490	13			
C2-Napththalenes	NA	NA	NA	NA	NA	NA	470	440	7			
C2-Phenanthrenes/Anthracenes	NA	NA	NA	NA	NA	NA	1,800	1,500	18			
C3-Chrysenes	NA	NA	NA	NA	NA	NA	780	720	8			
C3-Fluorenes	NA	NA	NA	NA	NA	NA	1,200	1,400	15			
C3-Napththalenes	NA	NA	NA	NA	NA	NA	670	560	18			
C3-Phenanthrenes/Anthracenes	NA	NA	NA	NA	NA	NA	1,700	1,500	13			
C4-Chrysenes	NA	NA	NA	NA	NA	NA	270	230	16			
C4-Napththalenes	NA	NA	NA	NA	NA	NA	640	430	39			
C4-Phenanthrenes/Anthracenes	NA	NA	NA	NA	NA	NA	1,100	950	15			

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Notes:

Highlighted RPD values exceed the comparison value of 50 RPD.
µg/kg – Microgram per Kilogram
NA – Not Applicable
RPD – Relative Percent Difference

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TABLE 4
FIELD DUPLICATE RESULTS
FOR TOTAL PAH ANALYSES

Analyte	Sample: LRR-ZIC-F-02			Sample: LRR-ZIC-D-01			Sample: LRR-HS1-B-01			Sample: LRR-HS1-B-02		
	Sample Result (µg/kg)	Replicate Result (µg/kg)	RPD	Sample Result (µg/kg)	Replicate Result (µg/kg)	RPD	Sample Result (µg/kg)	Replicate Result (µg/kg)	RPD	Sample Result (µg/kg)	Replicate Result (µg/kg)	RPD
1-Methylnaphthalene	2.4	1.9	23	88	48	59	560	470	17	52	51	2
2-Methylnaphthalene	3.2	2.2	37	69	80	15	780	440	56	56	48	15
Acenaphthene	2.8	1.9	38	180	100	57	1,200	1,000	18	110	120	9
Acenaphthylene	0.83	0.42	66	14	41	98	670	440	41	66	91	32
Anthracene	6.2	3.7	51	92	250	92	1,800	1,300	32	190	180	5
Benzo[a]anthracene	8.9	5.7	44	220	770	111	3,300	2,900	13	340	400	16
Benzo[a]pyrene	9.0	5.4	50	280	1,000	113	3,900	3,200	20	370	500	30
Benzo[b]fluoranthene	11	7.1	43	320	1,200	116	4,300	3,900	10	410	570	33
Benzo[g,h,i]perylene	8.1	5.6	36	190	690	114	3,000	2,700	11	290	400	32
Benzo[k]fluoranthene	3.3	1.9	54	100	400	120	1,400	1,200	15	110	160	37
Chrysene	7.9	6.0	27	220	820	115	3,800	3,500	8	350	480	31
Dibenz[a,h]anthracene	1.7	0.95	57	47	180	117	470	420	11	47	81	53
Dibenzofuran	2.8	1.9	38	91	110	19	190	280	38	27	33	20
Fluoranthene	25	17	38	380	1,200	104	8,600	7,900	8	820	930	13
Fluorene	4.4	2.6	51	120	140	15	900	800	12	99	110	11
Indeno(1,2,3-c,d)pyrene	5.9	3.7	46	230	850	115	3,000	2,900	3	290	440	41
Naphthalene	11	7.3	40	610	450	30	520	560	7	65	60	8
Phenanthrene	21	13	47	310	700	77	7,100	5,500	25	660	640	3
Pyrene	24	16	40	210	1,000	131	9,200	7,400	22	840	910	8

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Analyte	Sample: LRR-OBC-D-01			Sample: LRR-HS6-F-01			Sample: LRR-HS3-A-02-DP			Sample:		
	Sample Result (µg/kg)	Replicate Result (µg/kg)	RPD	Sample Result (µg/kg)	Replicate Result (µg/kg)	RPD	Sample Result (µg/kg)	Replicate Result (µg/kg)	RPD	Sample Result (µg/kg)	Replicate Result (µg/kg)	RPD
1-Methylnapthalene	2,800	1,300	73	2,900	16,000	139	460	550	18			
2-Methylnapthalene	3,100	1,400	76	2,800	18,000	146	760	800	5			
Acenaphthene	1,500	700	73	12,000	69,000	141	600	740	21			
Acenaphthylene	200	100	67	480	1,300	92	500	950	62			
Anthracene	41,000	4,800	158	15,000	76,000	134	1,300	1,600	21			
Benzo[a]anthracene	7,500	3,200	80	27,000	320,000	169	3,800	4,100	8			
Benzo[a]pyrene	4,500	2,600	54	36,000	400,000	167	4,100	4,700	14			
Benzo[b]fluoranthene	5,900	3,400	54	40,000	480,000	169	5,700	6,400	12			
Benzo[g,h,i]perylene	2,900	1,700	52	24,000	220,000	161	3,400	3,800	11			
Benzo[k]fluoranthene	2,600	1,300	67	14,000	130,000	161	1,700	1,900	11			
Chrysene	15,000	3,900	117	27,000	350,000	171	4,400	5,000	13			
Dibenz[a,h]anthracene	650	380	52	5,600	57,000	164	610	740	19			
Dibenzofuran	1,400	610	79	9,300	33,000	112	300	330	10			
Fluoranthene	23,000	12,000	63	54,000	720,000	172	9,800	11,000	12			
Fluorene	4,300	1,600	92	14,000	55,000	119	710	940	28			
Indeno(1,2,3-c,d)pyrene	3,200	1,900	51	30,000	270,000	160	3,800	4,300	12			
Naphthalene	780	380	69	4,700	18,000	117	1,400	1,100	24			
Phenanthrene	21,000	9,200	78	51,000	360,000	150	4,900	6,000	20			
Pyrene	17,000	8,200	70	50,000	690,000	173	9,200	10,000	8			
C1-Chrysenes	4,800	2,100	78	9,500	130,000	173	2,600	2,800	7			
C1-Fluoranthenes/Pyrenes	13,000	4,700	94	22,000	320,000	174	5,700	6,700	16			
C1-Fluorenes	5,000	2,200	78	2,100	10,000	131	640	960	40			
C1-Phenanthrenes/Anthracenes	12,000	5,700	71	10,000	87,000	159	3,300	4,100	22			
C2-Chrysenes	2,900	1,400	70	2,800	32,000	168	1,500	2,000	29			
C2-Fluorenes	5,800	3,200	58	980	5,500	140	1,300	1,900	38			
C2-Napththalenes	17,000	7,300	80	4,600	14,000	101	1,600	2,000	22			
C2-Phenanthrenes/Anthracenes	12,000	6,300	62	3,700	26,000	150	3,800	4,600	19			
C3-Chrysenes	2,600	1,000	89	1,500	19,000	171	1,100	1,800	48			
C3-Fluorenes	9,500	5,500	53	1,200	3,800	104	3,100	4,100	28			
C3-Napththalenes	17,000	8,300	69	2,200	4,700	72	1,900	2,800	38			
C3-Phenanthrenes/Anthracenes	8,500	4,600	60	1,300	8,600	147	3,400	3,600	6			
C4-Chrysenes	<240	<100	NA	360	5,400	175	400	790	66			
C4-Napththalenes	12,000	6,500	59	660	1,500	78	1,800	2,500	33			
C4-Phenanthrenes/Anthracenes	4,100	2,200	60	400	2,800	150	2,200	2,400	9			

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Notes:

Highlighted RPD values exceed the comparison value of 50 RPD.
µg/kg – Microgram per Kilogram
NA – Not Applicable
RPD – Relative Percent Difference

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TABLE 5 QUANTITATIVE DATA ASSESSMENT FOR TOTAL PAHs						
	Field Precision		Analytical Precision		Analytical Accuracy/Bias	
Parameter	Mean Field Replicate RPD (%) (n=7)	Mean Field Duplicate RPD (%) (n=7)	Mean MS/MSD RPD (%) (n=12)	Mean LCS/LCSD RPD (%) (n=11)	Mean MS/MSD Recovery (%) (n=24)	Mean LCS/LCSD Recovery (%) (n=22)
1-Methylnaphthalene	30	47	1	8	58	71
2-Methylnaphthalene	33	50	7	7	11	72
Acenaphthene	32	51	16	7	10	69
Acenaphthylene	38	65	17	7	36	69
Anthracene	53	70	24	5	-14	74
Benzo[a]anthracene	38	63	43	8	-52	79
Benzo[a]pyrene	31	64	45	6	-59	82
Benzo[b]fluoranthene	32	62	43	10	-59	80
Benzo[g,h,i]perylene	27	59	43	14	0	82
Benzo[k]fluoranthene	34	66	41	11	21	79
Chrysene	34	69	40	9	-52	78
Dibenz[a,h]anthracene	33	68	30	12	59	83
Dibenzofuran	27	45	16	7	46	70
Fluoranthene	40	58	33	7	-292	80
Fluorene	49	47	12	8	27	70
Indeno(1,2,3-c,d)pyrene	30	61	48	3	5	86
Naphthalene	33	42	6	6	-86	66
Phenanthrene	58	57	20	7	-298	70
Pyrene	36	64	20	6	-267	82

Notes:

LCS – Laboratory Control Sample
LCSD - Laboratory Control Sample Duplicate
MS – Matrix Spike
MSD – Matrix Spike Duplicate
PAH – Polynuclear Aromatic Hydrocarbon
RPD – Relative Percent Difference

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TABLE 6 SUMMARY OF DATA QUALIFICATION				
Sample ID	**Sampling Date**	**Analyte**	**Qualification**	**Reason**
WORK ORDER # K0810413				
LRR-017-A-01	10/21/2008	Acenaphthylene	Sample result should be considered estimated.	The result was detected below the reporting limit and above the method detection limit.
LRR-OBC-D-01	10/21/2008	Acenaphthylene		
LRR-OBC-D-01-DP	10/21/2008	Benzo(g,h,i)perylene Benzo(k)fluoranthene Indeno(1,2,3-cd)pyrene	Sample result should be considered estimated.	These compounds in the MS/MSD had low percent recoveries. LRR-OBC-D-01-DP was the parent sample.
WORK ORDER # K0810422				
LRR-OF2-E-05	10/22/2008	Acenaphthylene Dibenz(a,h)anthracene Dibenzofuran	Sample result should be considered estimated.	These compounds in the MS/MSD had low percent recoveries. LRR-OF2-E-05 was the parent sample.
WORK ORDER # K0810423				
LRR-OF2-C-05	10/22/2008	Acenaphthylene Dibenz(a,h)anthracene Dibenzofuran	Sample result should be considered estimated.	These compounds in the MS/MSD had low percent recoveries. LRR-OF2-C-05 was the parent sample.
WORK ORDER # K0810465				
LRR-OBC-C-03	10/23/2008	Acenaphthylene Dibenz(a,h)anthracene Dibenzofuran	Sample result should be considered estimated.	The result was detected below the reporting limit and above the method detection limit.
WORK ORDER # K0904268				
LRR-HS6-A-01	05/11/2009	Acenaphthylene	Sample result should be considered estimated.	The result was detected below the reporting limit and above the method detection limit.
		Pyrene	Sample result should be considered estimated.	The QC limit for percent RSD was exceeded for this compound in the initial calibration.
LRR-HS6-A-02	05/11/2009	Acenaphthene Acenaphthylene Dibenzofuran Fluorene	Sample result should be considered estimated.	The result was detected below the reporting limit and above the method detection limit.
		Pyrene	Sample result should be considered estimated.	The QC limit for percent RSD was exceeded for this compound in the initial calibration.

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TABLE 6 SUMMARY OF DATA QUALIFICATION				
Sample ID	**Sampling Date**	**Analyte**	**Qualification**	**Reason**
LRR-HS6-A-03	05/11/2009	1Methylnaphthalene Acenaphthene Anthracene Benz(a)anthracene Benzo(a)pyrene Benzo(b)fluoranthene Benzo(g,h,i)perylene Benzo(k)fluoranthene Chrysene Dibenzofuran Fluoranthene Fluorene Indeno(1,2,3-cd)pyrene Phenanthrene Pyrene	Sample result should be considered estimated. Quantitation limits for non-detected results should be considered estimated.	The result was detected below the reporting limit and above the method detection limit.
		Pyrene	Sample result should be considered estimated.	The QC limit for percent RSD was exceeded for this compound in the initial calibration.
LRR-HS6-B-01	05/11/2009	Pyrene	Sample result should be considered estimated.	The QC limit for percent RSD was exceeded for this compound in the initial calibration.
LRR-HS6-B-02	05/11/2009	Acenaphthylene Dibenz(a,h)anthracene	Sample result should be considered estimated.	The result was detected below the reporting limit and above the method detection limit.
		Pyrene		The QC limit for percent RSD was exceeded for this compound in the initial calibration.
LRR-HS6-B-03	05/11/2009	Acenaphthylene Dibenz(a,h)anthracene Dibenzofuran Fluorene	Sample result should be considered estimated.	The result was detected below the reporting limit and above the method detection limit.
		Pyrene		The QC limit for percent RSD was exceeded for this compound in the initial calibration.
LRR-HS6-C-01	05/11/2009	Pyrene	Sample result should be considered estimated.	The QC limit for percent RSD was exceeded for this compound in the initial calibration.
LRR-HS6-C-02	05/11/2009			
LRR-HS6-C-03	05/11/2009	Acenaphthene Acenaphthylene Dibenz(a,h)anthracene Dibenzofuran Fluorene	Sample result should be considered estimated.	The result was detected below the reporting limit and above the method detection limit.
		Pyrene	Sample result should be	The QC limit for percent RSD was

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TABLE 6 SUMMARY OF DATA QUALIFICATION				
Sample ID	**Sampling Date**	**Analyte**	**Qualification**	**Reason**
			considered estimated.	exceeded for this compound in the initial calibration.
LRR-HS6-C-04	05/11/2009	1Methylnaphthalene Acenaphthene Acenaphthylene Anthracene Benzo(k)fluoranthene Dibenz(a,h)anthracene Dibenzofuran Fluorene	Sample result should be considered estimated.	The result was detected below the reporting limit and above the method detection limit.
		Pyrene	Sample result should be considered estimated.	The QC limit for percent RSD was exceeded for this compound in the initial calibration.
LRR-HS6-D-01	05/11/2009	Acenaphthylene	Sample result should be considered estimated.	The result was detected below the reporting limit and above the method detection limit.
		Pyrene		The QC limit for percent RSD was exceeded for this compound in the initial calibration.
LRR-ZIC-A-01	05/11/2009	Pyrene	Sample result should be considered estimated.	The QC limit for percent RSD was exceeded for this compound in the initial calibration.
LRR-ZIC-A-01-FS	05/11/2009			
LRR-ZIC-A-02	05/11/2009			
LRR-ZIC-A-02-FS	05/11/2009			
LRR-ZIC-A-03	05/11/2009			
LRR-ZIC-A-04	05/11/2009			
LRR-ZIC-A-05	05/11/2009	Acenaphthylene Dibenzofuran	Sample result should be considered estimated.	The result was detected below the reporting limit and above the method detection limit.
		Pyrene	Sample result should be considered estimated.	The QC limit for percent RSD was exceeded for this compound in the initial calibration.

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TABLE 6 SUMMARY OF DATA QUALIFICATION				
Sample ID	**Sampling Date**	**Analyte**	**Qualification**	**Reason**
LRR-ZIC-B-01	05/11/2009	Acenaphthylene	Sample result should be considered estimated.	The result was detected below the reporting limit and above the method detection limit.
		Pyrene	Sample result should be considered estimated.	The QC limit for percent RSD was exceeded for this compound in the initial calibration.
LRR-ZIC-B-02	05/11/2009	1-Methylnaphthalene Acenaphthene Acenaphthylene Anthracene Benzo(k)fluoranthene Dibenz(a,h)anthracene Dibenzofuran Fluorene	Sample result should be considered estimated.	The result was detected below the reporting limit and above the method detection limit.
		Pyrene	Sample result should be considered estimated.	The QC limit for percent RSD was exceeded for this compound in the initial calibration.
LRR-ZIC-B-03	05/11/2009	Acenaphthene Acenaphthylene Anthracene Benz(a)anthracene Benzo(a)pyrene Benzo(k)fluoranthene Dibenz(a,h)anthracene Dibenzofuran Fluorene Indeno(1,2,3-cd)pyrene	Sample result should be considered estimated.	The result was detected below the reporting limit and above the method detection limit.
		Pyrene	Sample result should be considered estimated.	The QC limit for percent RSD was exceeded for this compound in the initial calibration.
WORK ORDER # K0904301				
LRR-HS6-E-01	05/12/2009	Pyrene	Sample result should be considered estimated.	The QC limit for percent RSD was exceeded for this compound in the initial calibration.
LRR-HS6-E-02	05/12/2009			
LRR-HS6-E-03	05/12/2009	Acenaphthylene Dibenz(a,h)anthracene	Sample result should be considered estimated.	The result was detected above the method detection limit but below the reporting limit.
		Pyrene	Sample result should be considered estimated.	The QC limit for percent RSD was exceeded for this compound in the initial calibration.
LRR-HS6-E-04	05/12/2009	1-Methylnaphthalene Acenaphthene Benzo(k)fluoranthene Dibenz(a,h)anthracene	Sample result should be considered estimated.	The result was detected above the method detection limit but below the

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TABLE 6 SUMMARY OF DATA QUALIFICATION				
Sample ID	**Sampling Date**	**Analyte**	**Qualification**	**Reason**
		Acenaphthylene		reporting limit.
		Pyrene	Sample result should be considered estimated.	The QC limit for percent RSD was exceeded for this compound in the initial calibration.
LRR-HS6-F-01	05/12/2009	Pyrene	Sample result should be considered estimated.	The QC limit for percent RSD was exceeded for this compound in the initial calibration.
LRR-HS6-F-01-DP	05/12/2009			
LRR-HS6-G-01	05/12/2009			
LRR-HS6-UP1-01	05/12/2009			
LRR-HS6-UP1-02	05/12/2009	Acenaphthylene Dibenz(a,h)anthracene	Sample result should be considered estimated.	The result was detected above the method detection limit but below the reporting limit.
		Pyrene	Sample result should be considered estimated.	The QC limit for percent RSD was exceeded for this compound in the initial calibration.
LRR-HS6-UP2-01	05/12/2009	Pyrene	Sample result should be considered estimated.	The QC limit for percent RSD was exceeded for this compound in the initial calibration.
LRR-HS6-UP3-01	05/12/2009	Indeno(1,2,3-cd)pyrene	Sample result should be considered estimated.	The percent difference was outside the QC limit in the CCV.
		Pyrene	Sample result should be considered estimated.	The QC limit for percent RSD was exceeded for this compound in the initial calibration.
LRR-HS6-UP3-02	05/12/2009	Pyrene	Sample result should be considered estimated.	The QC limit for percent RSD was exceeded for this compound in the initial calibration.
LRR-HS6-UP3-03	05/12/2009	Anthracene	Sample result should be considered not detected and the quantitation limit should be considered estimated.	Anthracene was detected in the method blank at a similar concentration. In addition, anthracene was detected below the reporting limit.
		1-Methylnaphthalene 2-Methylnaphthalene Acenaphthene Benzo(k)fluoranthene Dibenz(a,h)anthracene Dibenzofuran	Sample result should be considered estimated.	The result was detected above the method detection limit but below the reporting limit.

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TABLE 6 SUMMARY OF DATA QUALIFICATION				
Sample ID	**Sampling Date**	**Analyte**	**Qualification**	**Reason**
		Acenaphthylene Fluorene		
		Pyrene	Sample result should be considered estimated.	The QC limit for percent RSD was exceeded for this compound in the initial calibration.
LRR-HS6-UP4-03	05/12/2009	Pyrene	Sample result should be considered estimated.	The QC limit for percent RSD was exceeded for this compound in the initial calibration.
LRR-HS6-UP4-04	05/12/2009	1-Methylnaphthalene Benz(a)anthracene 2-Methylnaphthalene Dibenzofuran Acenaphthene Fluorene	Sample result should be considered estimated.	The result was detected above the method detection limit but below the reporting limit.
		Pyrene	Sample result should be considered estimated.	The QC limit for percent RSD was exceeded for this compound in the initial calibration.
LRR-ZIC-C-01	05/12/2009	Acenaphthene Benzo(k)fluoranthene Dibenz(a,h)anthracene	Sample result should be considered estimated.	The result was detected above the method detection limit but below the reporting limit.
		Pyrene	Sample result should be considered estimated.	The QC limit for percent RSD was exceeded for this compound in the initial calibration.
LRR-ZIC-C-02	05/12/2009	Acenaphthene Anthracene Benzo(k)fluoranthene Dibenz(a,h)anthracene	Sample result should be considered estimated.	The result was detected above the method detection limit but below the reporting limit.
		Pyrene	Sample result should be considered estimated.	The QC limit for percent RSD was exceeded for this compound in the initial calibration.
LRR-ZIC-C-03	05/12/2009	Acenaphthene Dibenz(a,h)anthracene Benz(a)anthracene Fluoranthene Benzo(b)fluoranthene Indeno(1,2,3-cd)pyrene Benzo(k)fluoranthene	Sample result should be considered estimated.	The result was detected above the method detection limit but below the reporting limit.
		Pyrene	Sample result should be considered estimated.	The QC limit for percent RSD was exceeded for this compound in the initial calibration.
LRR-ZIC-D-01	05/13/2009	Pyrene	Sample result should be	The QC limit for percent RSD was

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TABLE 6 SUMMARY OF DATA QUALIFICATION				
Sample ID	**Sampling Date**	**Analyte**	**Qualification**	**Reason**
LRR-ZIC-D-01-DP	05/13/2009		considered estimated.	exceeded for this compound in the initial calibration.
WORK ORDER # K0904351				
LRR-HS6-X2-01	05/14/2009	Pyrene	Sample result should be considered estimated.	The QC limit for percent RSD was exceeded for this compound in the initial calibration.
LRR-HS6-X2-02	05/14/2009	Acenaphthene Anthracene Dibenzofuran Fluoranthene Naphthalene Phenanthrene	Sample result should be considered estimated.	The result was detected above the method detection limit but below the reporting limit.
		Pyrene	Sample result should be considered estimated.	The QC limit for percent RSD was exceeded for this compound in the initial calibration.
LRR-HS6-X2-02-FS	05/14/2009	Pyrene	Sample result should be considered estimated.	The QC limit for percent RSD was exceeded for this compound in the initial calibration.
LRR-ZIC-D-04	5/13/2009	1-Methylnaphthalene 2-Methylnaphthalene Acenaphthene Anthracene Benz(a)anthracene Benzo(a)pyrene Benzo(b)fluoranthene Benzo(k)fluoranthene Chrysene Dibenz(a,h)anthracene Dibenzofuran Fluoranthene Fluorene Indeno(1,2,3-cd)pyrene	Sample result should be considered estimated.	The result was detected above the method detection limit but below the reporting limit.
		Naphthalene	Sample result is considered not detected.	The method blank had a detection of this analyte below the RL. The sample result was below the RL and less than 5 times the blank result.
LRR-ZIC-D-04	5/13/2009	Pyrene	Sample result should be considered estimated.	The QC limit for percent RSD was exceeded for this compound in the initial calibration.
LRR-ZIC-D-05	5/13/2009	1-Methylnaphthalene 2-Methylnaphthalene Acenaphthene Benzo(k)fluoranthene Dibenz(a,h)anthracene Dibenzofuran	Sample result should be considered estimated.	The result was detected above the method detection limit but below the reporting limit.

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TABLE 6 SUMMARY OF DATA QUALIFICATION				
Sample ID	**Sampling Date**	**Analyte**	**Qualification**	**Reason**
		Benz(a)anthracene Benzo(a)pyrene Fluorene Indeno(1,2,3-cd)pyrene		
		Naphthalene	Sample result is considered not detected.	The method blank had a detection of this analyte below the RL. The sample result was below the RL and less than 5 times the blank result.
		Pyrene	Sample result should be considered estimated.	The QC limit for percent RSD was exceeded for this compound in the initial calibration.
LRR-ZIC-E-01	5/13/2009	Pyrene	Sample result should be considered estimated.	The QC limit for percent RSD was exceeded for this compound in the initial calibration.
LRR-ZIC-E-02	5/13/2009			
LRR-ZIC-E-03	5/13/2009			
LRR-ZIC-E-04	5/13/2009			
LRR-ZIC-E-05	5/13/2009			
LRR-ZIC-F-01	5/13/2009			
LRR-ZIC-F-02	5/13/2009	1-Methylnaphthalene 2-Methylnaphthalene Acenaphthene Acenaphthylene Benzo(k)fluoranthene Dibenz(a,h)anthracene Dibenzofuran	Sample result should be considered estimated.	The result was detected above the method detection limit but below the reporting limit.
		Pyrene	Sample result should be considered estimated.	The QC limit for percent RSD was exceeded for this compound in the initial calibration.
LRR-ZIC-F-02-DP	5/13/2009	1-Methylnaphthalene 2-Methylnaphthalene Acenaphthene Acenaphthylene Benzo(k)fluoranthene Dibenz(a,h)anthracene Dibenzofuran Fluorene	Sample result should be considered estimated.	The result was detected above the method detection limit but below the reporting limit.
		Pyrene	Sample result should be considered estimated.	The QC limit for percent RSD was exceeded for this compound in the initial calibration.
		Naphthalene	Sample result is considered not detected.	The method blank had a detection of this analyte below the RL. The sample result was below the RL and less than 5 times the blank result.

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TABLE 6 SUMMARY OF DATA QUALIFICATION					
Sample ID	**Sampling Date**	**Analyte**		**Qualification**	**Reason**
LRR-ZIC-F-03	5/13/2009	1-Methylnaphthalene 2-Methylnaphthalene Acenaphthene Anthracene Benz(a)anthracene Benzo(a)pyrene Benzo(b)fluoranthene	Benzo(g,h,i)perylene Benzo(k)fluoranthene Chrysene Dibenz(a,h)anthracene Fluoranthene Fluorene Indeno(1,2,3-cd)pyrene	Sample result should be considered estimated.	The result was detected above the method detection limit but below the reporting limit.
		Pyrene		Sample result should be considered estimated.	The QC limit for percent RSD was exceeded for this compound in the initial calibration.
		Naphthalene		Sample result is considered not detected.	The method blank had a detection of this analyte below the RL. The sample result was below the RL and less than 5 times the blank result.
LRR-ZIC-F-04	5/13/2009	1-Methylnaphthalene 2-Methylnaphthalene Acenaphthene Acenaphthylene Anthracene Benz(a)anthracene	Benzo(k)fluoranthene Dibenz(a,h)anthracene Dibenzofuran Fluorene Indeno(1,2,3-cd)pyrene	Sample result should be considered estimated.	The result was detected above the method detection limit but below the reporting limit.
		Pyrene		Sample result should be considered estimated.	The QC limit for percent RSD was exceeded for this compound in the initial calibration.
WORK ORDER # K0904356					
LRR-HS6-DOWN1-01	5/13/2009	Pyrene		Sample result should be considered estimated.	The QC limit for percent RSD was exceeded for this compound in the initial calibration.

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TABLE 6 SUMMARY OF DATA QUALIFICATION				
Sample ID	**Sampling Date**	**Analyte**	**Qualification**	**Reason**
LRR-HS6-DOWN1-02	5/13/2009	1-Methylnaphthalene Acenaphthene	Sample result should be considered estimated.	The result was detected above the method detection limit but below the reporting limit.
		Pyrene	Sample result should be considered estimated.	The QC limit for percent RSD was exceeded for this compound in the initial calibration.
LRR-HS6-DOWN1-02-FS	5/13/2009	1-Methylnaphthalene Acenaphthene Acenaphthylene Dibenz(a,h)anthracene	Sample result should be considered estimated.	The result was detected above the method detection limit but below the reporting limit.
		Pyrene	Sample result should be considered estimated.	The QC limit for percent RSD was exceeded for this compound in the initial calibration.
LRR-HS6-DOWN1-03	5/13/2009	Benzo(k)fluoranthene Dibenz(a,h)anthracene	Sample result should be considered estimated.	The result was detected above the method detection limit but below the reporting limit.
		Pyrene	Sample result should be considered estimated.	The QC limit for percent RSD was exceeded for this compound in the initial calibration.
LRR-HS6-DOWN1-04	5/13/2009	1-Methylnaphthalene 2-Methylnaphthalene Acenaphthene Acenaphthylene Anthracene Benz(a)anthracene Benzo(k)fluoranthene Dibenz(a,h)anthracene Dibenzofuran Fluorene Indeno(1,2,3-cd)pyrene	Sample result should be considered estimated.	The result was detected above the method detection limit but below the reporting limit.
		Pyrene	Sample result should be considered estimated.	The QC limit for percent RSD was exceeded for this compound in the initial calibration.
LRR-HS6-DOWN2-01	5/13/2009	Pyrene	Sample result should be considered estimated.	The QC limit for percent RSD was exceeded for this compound in the initial calibration.

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TABLE 6 SUMMARY OF DATA QUALIFICATION				
Sample ID	**Sampling Date**	**Analyte**	**Qualification**	**Reason**
LRR-HS6-UP1-02-FS	5/12/2009	1-Methylnaphthalene 2-Methylnaphthalene Acenaphthene Acenaphthylene Benzo(k)fluoranthene Dibenz(a,h)anthracene	Sample result should be considered estimated.	The result was detected above the method detection limit but below the reporting limit.
		Pyrene	Sample result should be considered estimated.	The QC limit for percent RSD was exceeded for this compound in the initial calibration.
LRR-HS6-UP1-03	5/12/2009	1-Methylnaphthalene Acenaphthene Acenaphthylene Benzo(a)pyrene Benzo(k)fluoranthene Benzo(g,h,i)perylene Dibenz(a,h)anthracene Indeno(1,2,3-cd)pyrene	Sample result should be considered estimated.	The result was detected above the method detection limit but below the reporting limit.
		Pyrene	Sample result should be considered estimated.	The QC limit for percent RSD was exceeded for this compound in the initial calibration.
LRR-HS6-UP2-02	5/12/2009	Pyrene	Sample result should be considered estimated.	The QC limit for percent RSD was exceeded for this compound in the initial calibration.
LRR-HS6-UP2-03	5/12/2009	1-Methylnaphthalene 2-Methylnaphthalene Acenaphthene Acenaphthylene	Sample result should be considered estimated.	The result was detected above the method detection limit but below the reporting limit.
		Pyrene	Sample result should be considered estimated.	The QC limit for percent RSD was exceeded for this compound in the initial calibration.
LRR-HS6-UP2-04	5/12/2009	1-Methylnaphthalene 2-Methylnaphthalene Acenaphthene Acenaphthylene Dibenz(a,h)anthracene	Sample result should be considered estimated.	The result was detected above the method detection limit but below the reporting limit.
		Pyrene	Sample result should be considered estimated.	The QC limit for percent RSD was exceeded for this compound in the initial calibration.
LRR-HS6-UP3-04	5/12/2009	1-Methylnaphthalene 2-Methylnaphthalene Acenaphthene Acenaphthylene Dibenz(a,h)anthracene Dibenzofuran Fluorene	Sample result should be considered estimated.	The result was detected above the method detection limit but below the reporting limit.

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TABLE 6 SUMMARY OF DATA QUALIFICATION				
Sample ID	**Sampling Date**	**Analyte**	**Qualification**	**Reason**
		Pyrene	Sample result should be considered estimated.	The QC limit for percent RSD was exceeded for this compound in the initial calibration.
LRR-HS6-UP4-01	5/12/2009	Pyrene	Sample result should be considered estimated.	The QC limit for percent RSD was exceeded for this compound in the initial calibration.
LRR-HS6-UP4-02	5/12/2009			
LRR-HS6-X1-01	5/13/2009			
LRR-HS6-X1-02	5/13/2009	Naphthalene	Sample result should be considered estimated.	The percent difference was outside the QC limit in the CCV.
LRR-HS6-X1-03 LRR-HS6-X1-04		Pyrene	Sample result should be considered estimated.	The QC limit for percent RSD was exceeded for this compound in the initial calibration.
LRR-ZIC-D-02	5/13/2009	Acenaphthylene Dibenz(a,h)anthracene	Sample result should be considered estimated.	The result was detected above the method detection limit but below the reporting limit.
		Naphthalene	Sample result should be considered estimated.	The percent difference was outside the QC limit in the CCV.
		Pyrene	Sample result should be considered estimated.	The QC limit for percent RSD was exceeded for this compound in the initial calibration.
LRR-ZIC-D-03	5/13/2009	1-Methylnaphthalene 2-Methylnaphthalene Acenaphthene Acenaphthylene Anthracene Benzo(k)fluoranthene Dibenz(a,h)anthracene Dibenzofuran Fluorene		
		Naphthalene	Sample result should be considered estimated.	The percent difference was outside the QC limit in the CCV.
		Pyrene	Sample result should be considered estimated.	The QC limit for percent RSD was exceeded for this compound in the initial calibration.

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TABLE 6 SUMMARY OF DATA QUALIFICATION				
Sample ID	**Sampling Date**	**Analyte**	**Qualification**	**Reason**
WORK ORDER # K0904403				
LRR-HS6-UP5-01	5/14/2009	Pyrene	Sample result should be considered estimated.	The QC limit for percent RSD was exceeded for this compound in the initial calibration.
LRR-HS6-UP5-02	5/14/2009	Dibenz(a,h)anthracene	Sample result should be considered estimated.	The percent difference was outside the QC limit in the CCV.
LRR-HS6-UP7-01	5/14/2009	Dibenz(a,h)anthracene	Sample result should be considered estimated.	The percent difference was outside the QC limit in the CCV.
LRR-HS6-UP7-02	5/14/2009	1-Methylnaphthalene Acenaphthene Fluoranthene Naphthalene Phenanthrene	Sample result should be considered estimated.	These compounds in the MS/MSD had high percent recoveries. LRR-HS6-UP7-01 was the sample used for the spike.
LRR-HS6-X3-01	5/14/2009	Dibenz(a,h)anthracene	Sample result should be considered estimated.	The percent difference was outside the QC limit in the CCV.
LRR-HS6-X4-01	5/14/2009	Dibenz(a,h)anthracene Indeno(1,2,3-cd)pyrene	Sample result should be considered estimated.	The percent difference was outside the QC limit in the CCV.
LRR-HS6-X5-01		Pyrene	Sample result should be considered estimated.	The QC limit for percent RSD was exceeded for this compound in the initial calibration.
LRR-HS6-X5-02	5/14/2009	Dibenz(a,h)anthracene	Sample result should be considered estimated.	The percent difference was outside the QC limit in the CCV.
LRR-ZIC-H-01	5/13/2009	1-Methylnaphthalene 2-Methylnaphthalene Anthracene Benzo(g,h,i)perylene Benzo(k)fluoranthene Dibenz(a,h)anthracene Dibenzofuran Fluorene Indeno(1,2,3-cd)pyrene	Sample result should be considered estimated.	The result was detected above the method detection limit but below the reporting limit.
		2-Methylnaphthalene Benzo(a)pyrene Benzo(k)fluoranthene Dibenz(a,h)anthracene Naphthalene	Sample result should be considered not detected.	These compounds were detected in the method blank at a similar concentration to the sample result.

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TABLE 6 SUMMARY OF DATA QUALIFICATION				
Sample ID	**Sampling Date**	**Analyte**	**Qualification**	**Reason**
LRR-ZIC-H-02	5/13/2009	1-Methylnaphthalene 2-Methylnaphthalene Acenaphthene Acenaphthylene Anthracene Dibenzofuran Fluorene	Sample result should be considered estimated.	The result was detected above the method detection limit but below the reporting limit.
WORK ORDER # K0904451				
LRR-HS3-E-02	5/16/2009	1-Methylnaphthalene 2-Methylnaphthalene Acenaphthene Acenaphthylene Anthracene Dibenz(a,h)anthracene Dibenzofuran Fluorene	Sample result should be considered estimated.	The result was detected above the method detection limit but below the reporting limit.
		Anthracene Fluoranthene Fluorene Phenanthrene	Sample result should be considered not detected.	These compounds were detected in the method blank at a similar concentration to the sample result.
LRR-HS5-A-01-R	5/15/2009	Anthracene	Sample result should be considered estimated.	This compound in the MS/MSD had low percent recoveries. LRR-HS5-A-01-R was the sample used for the spike.
WORK ORDER # K0904454				
LRR-HS1-A-01-R	5/15/2009	Dibenzofuran	Sample result should be considered estimated.	The result was detected above the method detection limit but below the reporting limit.
LRR-HS1-B-05	5/15/2009	Acenaphthylene Benzo(k)fluoranthene Dibenz(a,h)anthracene	Sample result is considered not detected.	The result was detected above the method detection limit but below the reporting limit.

Notes:

CCV – Continuing Calibration Verification
MS – Matrix Spike
MSD – Matrix Spike Duplicate
RL – Reporting Limit

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ATTACHMENT A
CHECKLISTS FOR PAH ANALYTICAL DATA

PAHs AND PAHs WITH ALKYLATED HOMOLOGS BY SW-846 METHOD 8270C SIM

CAS Work Order #: K0810413

QA/QC Analysis Checklist for Sediment Chemistry Analysis

GRANT/IAG NUMBER: Not Applicable
PROJECT NAME: Lower Rouge River
REVIEWER: Lisa Graczyk, WESTON START
DATE: January 19, 2009

1. What sediment chemistry data has been collected (CHECK ALL THAT APPLY)?

Total Metals ____	PCBs _____	pH _____	TOC ____
Dioxins/Furans _____	PAHs __X__	Pesticides _____	DO _____
AVS _____	SEM Metals _____	Particle Size _____	Other _____

2. Were the target detection limits met for each parameter?

Yes		
No	X	(EXPLAIN)

The reporting limits stated in the QAPP for PAHs was not met due to sample dilution because of elevated levels of PAHs in the samples. All PAH compounds were detected at elevated levels in all samples.

3. Were the method blanks less than the established MDL for each parameter?

Yes		
No	X	(EXPLAIN)

Several target PAH compounds were detected in the method blank above the method detection limit but below the reporting limit. Because PAH compounds were detected at much higher levels in the samples, no qualifications were needed and sample usability is not affected.

4. Did the results of Field Replicate Analysis vary by less than the % RPD specified in the QAPP?

Yes	Not Applicable	
No		(EXPLAIN)

5. Did the results of the Field Duplicates Analysis vary by less than the % RPD specified in the QAPP?

Yes		
No	X	(EXPLAIN)

There is one field duplicate associated with this work order (identified with a "DP" suffix). The field duplicate results and investigative sample results were compared to a standard quality control (QC) limit of 50 RPD or less. All PAH compounds except one were outside this RPD limit. The RPDs ranged from 51 to 158 percent. For C4-Chrysenes, both the duplicate and parent sample contained no detection above the reporting limit. The elevated RPDs are indicative a very heterogeneous matrix.

6. Did the surrogate spike/internal standards recoveries meet the limits set forth in the QAPP?

Yes		
No	X	(EXPLAIN)

There were two instances when one of the three surrogates was outside the QC limits. However, in each of these instances, the surrogate was likely not recovered due to sample dilution and no qualification was applied.

7. Did the MS/MSD recoveries meet the limits set forth in the QAPP?

Yes		
No	X	(EXPLAIN)

CAS analyzed an MS and MSD using sample LRR-OBC-D-01-DP as the spiked sample. Several compounds in either or both the MS and MSD were outside the QC limits stated in the QAPP. In each instance, the sample concentration was greater than for times the spike amount added to the sample. Therefore, no qualification was required for this discrepancy.

8. Did the RPD (%) of the MS/MSD sample set meet the limits set forth in the QAPP?

Yes		
No	X	(EXPLAIN)

In some instances, the RPDs between the MS and MSD were outside the QAPP QC limits when the sample concentration was greater than four times the sample result. No qualifications were applied for these discrepancies.

For the following compounds the RPDs were outside the QC limits and the sample result was less than four times the spike amount: benzo(k) flouranthene; indeno(1,2,3-cd)pyrene; and benzo(g,h,i)perylene. For these three compounds, the results in the parent sample were flagged "J" as estimated.

9. Did the LCS recoveries meet the limits set forth in the QAPP?

Yes	X	
No		(EXPLAIN)

The LCS recoveries are within the QAPP-specified QC limit.

10. Did the calibration verification standards (ICVs and CCVs) meet the requirements set forth in the QAPP?

Yes	X	
No		(EXPLAIN)

11. Did the calibration blanks (ICBs and CCBs) meet the limits set forth in the QAPP?

Yes	Not Applicable
No	

12. Did the interference check samples meet the limits set forth in the QAPP?

Yes	Not Applicable	
No		(EXPLAIN)

13. Did the serial dilution samples meet the limits set forth in the QAPP?

Yes	Not Applicable	
No		(EXPLAIN)

Serial dilutions are not applicable to the TCLP SVOC analysis.

14. Were any level of contaminants detected above the MDL for the trip blanks and storage blanks?

Yes	Not Applicable	
No		(EXPLAIN)

15. Did all required analyses take place within the required holding time protocols set forth in the QAPP?

Yes	X	
No		(EXPLAIN)

The analyses were performed in the holding time limit of 14 days from collection to extraction and 40 days from extraction to analysis.

16. Did the laboratory duplicates vary by less than the % RPD specified in the QAPP?

Yes	Not Applicable	
No		(EXPLAIN)

The RPDs between the LCS and LCS duplicate were within the QC limits.

17. Are measured dry-weight contaminant concentrations reported?

Yes	X	
No		(EXPLAIN)

18. Please provide details for all of the "EXPLAIN" marked above. Include details on the specific analytes affected by any QA/QC discrepancies, and recommendations regarding usability of data.

Any items with “EXPLAIN” marked above are described immediately following the “EXPLAIN” marking in the corresponding item above.

The data are acceptable for use.

Data Validation Report
Lower Rouge River
Columbia Analytical Services
Laboratory Work Order #: K0810413

PAHs AND PAHs WITH ALKYLATED HOMOLOGS BY SW-846 METHOD 8270C SIM

CAS Work Order #: K0810422

QA/QC Analysis Checklist for Sediment Chemistry Analysis

GRANT/IAG NUMBER: Not Applicable
PROJECT NAME: Lower Rouge River
REVIEWER: Lisa Graczyk, WESTON START
DATE: January 20, 2009

1. What sediment chemistry data has been collected (CHECK ALL THAT APPLY)?

Total Metals ____	PCBs _____	pH _____	TOC ____
Dioxins/Furans _____	PAHs __X__	Pesticides _____	DO _____
AVS _____	SEM Metals _____	Particle Size _____	Other _____

2. Were the target detection limits met for each parameter?

Yes		
No	X	(EXPLAIN)

The reporting limits stated in the QAPP for PAHs were not met due to sample dilution because of elevated levels of PAHs in the samples requiring dilutions. All PAH compounds, except for C4-Chrysenes, were detected at elevated levels in all samples.

3. Were the method blanks less than the established MDL for each parameter?

Yes		
No	X	(EXPLAIN)

Some target PAH compounds were detected in the method blank above the method detection limit but below the reporting limit. Because these PAH compounds were detected at much higher levels in the samples, no qualifications were needed and sample usability is not affected.

4. Did the results of Field Replicate Analysis vary by less than the % RPD specified in the QAPP?

Yes	Not Applicable	
No		(EXPLAIN)

5. Did the results of the Field Duplicates Analysis vary by less than the % RPD specified in the QAPP?

Yes	Not Applicable	
No		(EXPLAIN)

6. Did the surrogate spike/internal standards recoveries meet the limits set forth in the QAPP?

Yes	X	
No		(EXPLAIN)

7. Did the MS/MSD recoveries meet the limits set forth in the QAPP?

Yes		
No	X	(EXPLAIN)

CAS analyzed an MS and MSD using sample LRR-OF2-E-05 as the spiked sample. Several compounds in either or both the MS and MSD were outside the QC limits stated in the QAPP. In most instances, the sample concentration was greater than for times the spike amount added to the sample and therefore, no qualifications were required in accordance with data validation guidelines. The exceptions were the following: acenaphthylene; dibenzofuran; and dibenzo(a,h)anthracene. The results for these three compounds in the parent sample were flagged "J" as estimated due to matrix interferences.

8. Did the RPD (%) of the MS/MSD sample set meet the limits set forth in the QAPP?

Yes	X	
No		(EXPLAIN)

9. Did the LCS recoveries meet the limits set forth in the QAPP?

Yes	X	
No		(EXPLAIN)

The LCS recoveries are within the QAPP-specified QC limit.

10. Did the calibration verification standards (ICVs and CCVs) meet the requirements set forth in the QAPP?

Yes	X	
No		(EXPLAIN)

11. Did the calibration blanks (ICBs and CCBs) meet the limits set forth in the QAPP?

Yes	Not Applicable	
No		

12. Did the interference check samples meet the limits set forth in the QAPP?

Yes	Not Applicable	
No		(EXPLAIN)

13. Did the serial dilution samples meet the limits set forth in the QAPP?

Yes	Not Applicable	
No		(EXPLAIN)

Serial dilutions are not applicable to the TCLP SVOC analysis.

14. Were any level of contaminants detected above the MDL for the trip blanks and storage blanks?

Yes	Not Applicable	
No		(EXPLAIN)

15. Did all required analyses take place within the required holding time protocols set forth in the QAPP?

Yes	X	
No		(EXPLAIN)

The analyses were performed in the holding time limit of 14 days from collection to extraction and 40 days from extraction to analysis.

16. Did the laboratory duplicates vary by less than the % RPD specified in the QAPP?

Yes	Not Applicable	
No		(EXPLAIN)

The RPDs between the LCS and LCS duplicate were within the QC limits.

17. Are measured dry-weight contaminant concentrations reported?

Yes	X	
No		(EXPLAIN)

18. Please provide details for all of the "EXPLAIN" marked above. Include details on the specific analytes affected by any QA/QC discrepancies, and recommendations regarding usability of data.

Any items with “EXPLAIN” marked above are described immediately following the “EXPLAIN” marking in the corresponding item above.

The data are acceptable for use.

Data Validation Report
Lower Rouge River
Columbia Analytical Services
Laboratory Work Order #: K0810422

PAHs AND PAHs WITH ALKYLATED HOMOLOGS BY SW-846 METHOD 8270C SIM

CAS Work Order #: K0810423

QA/QC Analysis Checklist for Sediment Chemistry Analysis

GRANT/IAG NUMBER: Not Applicable
PROJECT NAME: Lower Rouge River
REVIEWER: Lisa Graczyk, WESTON START
DATE: January 20, 2009

1. What sediment chemistry data has been collected (CHECK ALL THAT APPLY)?

Total Metals ____	PCBs _____	pH _____	TOC ____
Dioxins/Furans _____	PAHs __X__	Pesticides _____	DO _____
AVS _____	SEM Metals _____	Particle Size _____	Other _____

2. Were the target detection limits met for each parameter?

Yes		
No	X	(EXPLAIN)

The reporting limits stated in the QAPP for PAHs were not met due to sample dilution because of elevated levels of PAHs in the samples requiring dilutions. All PAH compounds, except for C4-Chrysenes, were detected at elevated levels in all samples.

3. Were the method blanks less than the established MDL for each parameter?

Yes		
No	X	(EXPLAIN)

Some target PAH compounds were detected in the method blank above the method detection limit but below the reporting limit. Because these PAH compounds were detected at much higher levels in the samples, no qualifications were needed and sample usability is not affected.

4. Did the results of Field Replicate Analysis vary by less than the % RPD specified in the QAPP?

Yes	Not Applicable	
No		(EXPLAIN)

5. Did the results of the Field Duplicates Analysis vary by less than the % RPD specified in the QAPP?

Yes	Not Applicable	
No		(EXPLAIN)

6. Did the surrogate spike/internal standards recoveries meet the limits set forth in the QAPP?

Yes	X	
No		(EXPLAIN)

7. Did the MS/MSD recoveries meet the limits set forth in the QAPP?

Yes		
No	X	(EXPLAIN)

CAS analyzed an MS and MSD using sample LRR-OF2-C-05 as the spiked sample. Several compounds in either or both the MS and MSD were outside the QC limits stated in the QAPP. In most instances, the sample concentration was greater than for times the spike amount added to the sample and therefore, no qualifications were required in accordance with data validation guidelines. The exceptions were the following: acenaphthylene; dibenzofuran; and dibenzo(a,h)anthracene. The results for these three compounds in the parent sample were flagged "J" as estimated due to matrix interferences.

8. Did the RPD (%) of the MS/MSD sample set meet the limits set forth in the QAPP?

Yes	X	
No		(EXPLAIN)

9. Did the LCS recoveries meet the limits set forth in the QAPP?

Yes	X	
No		(EXPLAIN)

The LCS recoveries are within the QAPP-specified QC limit.

10. Did the calibration verification standards (ICVs and CCVs) meet the requirements set forth in the QAPP?

Yes	X	
No		(EXPLAIN)

11. Did the calibration blanks (ICBs and CCBs) meet the limits set forth in the QAPP?

Yes	Not Applicable	
No		

12. Did the interference check samples meet the limits set forth in the QAPP?

Yes	Not Applicable	
No		(EXPLAIN)

13. Did the serial dilution samples meet the limits set forth in the QAPP?

Yes	Not Applicable	
No		(EXPLAIN)

Serial dilutions are not applicable to the TCLP SVOC analysis.

14. Were any level of contaminants detected above the MDL for the trip blanks and storage blanks?

Yes	Not Applicable	
No		(EXPLAIN)

15. Did all required analyses take place within the required holding time protocols set forth in the QAPP?

Yes	X	
No		(EXPLAIN)

The analyses were performed in the holding time limit of 14 days from collection to extraction and 40 days from extraction to analysis.

16. Did the laboratory duplicates vary by less than the % RPD specified in the QAPP?

Yes	Not Applicable	
No		(EXPLAIN)

The RPDs between the LCS and LCS duplicate were within the QC limits.

17. Are measured dry-weight contaminant concentrations reported?

Yes	X	
No		(EXPLAIN)

18. Please provide details for all of the "EXPLAIN" marked above. Include details on the specific analytes affected by any QA/QC discrepancies, and recommendations regarding usability of data.

Any items with “EXPLAIN” marked above are described immediately following the “EXPLAIN” marking in the corresponding item above.

The data are acceptable for use.

Data Validation Report
Lower Rouge River
Columbia Analytical Services
Laboratory Work Order #: K0810423

PAHs AND PAHs WITH ALKYLATED HOMOLOGS BY SW-846 METHOD 8270C SIM

CAS Work Order #: K0810465

QA/QC Analysis Checklist for Sediment Chemistry Analysis

GRANT/IAG NUMBER: Not Applicable
PROJECT NAME: Lower Rouge River
REVIEWER: Lisa Graczyk, WESTON START
DATE: January 29, 2009

1. What sediment chemistry data has been collected (CHECK ALL THAT APPLY)?

Total Metals ____	PCBs _____	pH _____	TOC ____
Dioxins/Furans _____	PAHs __X__	Pesticides _____	DO _____
AVS _____	SEM Metals _____	Particle Size _____	Other _____

2. Were the target detection limits met for each parameter?

Yes		
No	X	(EXPLAIN)

The reporting limits stated in the QAPP for PAHs were not met due to sample dilution because of elevated levels of PAHs in the samples requiring dilutions.

3. Were the method blanks less than the established MDL for each parameter?

Yes		
No	X	(EXPLAIN)

Some target PAH compounds were detected in the method blank above the method detection limit but below the reporting limit. Because these PAH compounds were detected at much higher levels in the samples, no qualifications were needed and sample usability is not affected.

4. Did the results of Field Replicate Analysis vary by less than the % RPD specified in the QAPP?

Yes	Not Applicable	
No		(EXPLAIN)

5. Did the results of the Field Duplicates Analysis vary by less than the % RPD specified in the QAPP?

Yes	Not Applicable	
No		(EXPLAIN)

6. Did the surrogate spike/internal standards recoveries meet the limits set forth in the QAPP?

Yes	X	
No		(EXPLAIN)

7. Did the MS/MSD recoveries meet the limits set forth in the QAPP?

Yes	X	
No		(EXPLAIN)

8. Did the RPD (%) of the MS/MSD sample set meet the limits set forth in the QAPP?

Yes	X	
No		(EXPLAIN)

9. Did the LCS recoveries meet the limits set forth in the QAPP?

Yes	X	
No		(EXPLAIN)

The LCS recoveries are within the QAPP-specified QC limit.

10. Did the calibration verification standards (ICVs and CCVs) meet the requirements set forth in the QAPP?

Yes	X	
No		(EXPLAIN)

11. Did the calibration blanks (ICBs and CCBs) meet the limits set forth in the QAPP?

Yes	Not Applicable	
No		

12. Did the interference check samples meet the limits set forth in the QAPP?

Yes	Not Applicable	
No		(EXPLAIN)

13. Did the serial dilution samples meet the limits set forth in the QAPP?

Yes	Not Applicable	
No		(EXPLAIN)

Serial dilutions are not applicable to the TCLP SVOC analysis.

14. Were any level of contaminants detected above the MDL for the trip blanks and storage blanks?

Yes	Not Applicable	
No		(EXPLAIN)

15. Did all required analyses take place within the required holding time protocols set forth in the QAPP?

Yes	X	
No		(EXPLAIN)

The analyses were performed in the holding time limit of 14 days from collection to extraction and 40 days from extraction to analysis.

16. Did the laboratory duplicates vary by less than the % RPD specified in the QAPP?

Yes	Not Applicable	
No		(EXPLAIN)

The RPDs between the LCS and LCS duplicate were within the QC limits.

17. Are measured dry-weight contaminant concentrations reported?

Yes	X	
No		(EXPLAIN)

18. Please provide details for all of the "EXPLAIN" marked above. Include details on the specific analytes affected by any QA/QC discrepancies, and recommendations regarding usability of data.

Any items with “EXPLAIN” marked above are described immediately following the “EXPLAIN” marking in the corresponding item above.

The data are acceptable for use.

Data Validation Report
Lower Rouge River
Columbia Analytical Services
Laboratory Work Order #: K0810465

PAHs BY SW-846 METHOD 8270C SIM

CAS Work Order #: K0904268

QA/QC Analysis Checklist for Sediment Chemistry Analysis

GRANT/IAG NUMBER: Not Applicable
PROJECT NAME: Lower Rouge River
REVIEWER: Lisa Graczyk, WESTON START
DATE: August 18, 2009

1. What sediment chemistry data has been collected (CHECK ALL THAT APPLY)?

Total Metals ____	PCBs _____	pH _____	TOC ____
Dioxins/Furans _____	PAHs __X__	Pesticides _____	DO _____
AVS _____	SEM Metals _____	Particle Size _____	Other _____

2. Were the target detection limits met for each parameter?

Yes		
No	X	(EXPLAIN)

The reporting limits stated in the QAPP for PAHs were not met in some instances because of required sample dilutions. Because PAHs were detected at elevated concentrations in these samples, data usability is not affected.

3. Were the method blanks less than the established MDL for each parameter?

Yes		
No	X	(EXPLAIN)

Some target PAH compounds were detected in the method blank above the method detection limit but below the reporting limit. In most instances, these PAH compounds were detected at much higher levels in the samples and therefore, no qualifications were required. The exceptions were benzo(a) pyrene; benzo(k)fluoranthene; and indeno(1,2,3-cd)pyrene in sample LRR-HS6-A-03. These results were flagged "U" as not detected because the sample concentration was similar to the method blank concentration.

4. Did the results of Field Replicate Analysis vary by less than the % RPD specified in the QAPP?

Yes		
No	X	(EXPLAIN)

There are two field replicates associated with this work order (identified with a "FS" suffix). The RPD between field replicate results and investigative sample results were within a standard quality control (QC) limit of 50 RPD or less for one of the field replicate samples. For the field replicate of sample LRR-ZIC-A-01, 15 of the 19 PAH compounds had an RPD greater than 50. The RPDs greater than 50 ranged from 60 to 76 RPD. This sample and the replicate were analyzed with a dilution factor of 10. The elevated RPDs likely indicate either a heterogeneous sample mixture, inadequate homogenization of the sample in the field, or inaccurate precision with the sample dilution process.

5. Did the results of the Field Duplicates Analysis vary by less than the % RPD specified in the QAPP?

Yes	Not Applicable	
No		(EXPLAIN)

6. Did the surrogate spike/internal standards recoveries meet the limits set forth in the QAPP?

Yes		
No	X	(EXPLAIN)

In one sample, the surrogates were not adequately recovered due to high sample dilutions and high concentrations of analytes in the sample. No qualifications are required for this discrepancy.

7. Did the MS/MSD recoveries meet the limits set forth in the QAPP?

Yes		
No	X	(EXPLAIN)

CAS analyzed an MS and MSD using sample LRR-HS6-B-02 as the spiked sample. Several compounds in either or both the MS and MSD were outside the QC limits stated in the QAPP. In most of these instances, the sample concentration was greater than for times the spike amount added to the sample and sample qualification was not required. The exceptions were acenatphylene and dibenz(a,h)anthracene

which were detected low in the MS and MSD. The results for these two compounds were flagged "J" as estimated due to matrix interference.

8. Did the RPD (%) of the MS/MSD sample set meet the limits set forth in the QAPP?

Yes	X	
No		(EXPLAIN)

9. Did the LCS recoveries meet the limits set forth in the QAPP?

Yes	X	
No		(EXPLAIN)

The LCS recoveries are within the QAPP-specified QC limit.

10. Did the calibration verification standards (ICVs and CCVs) meet the requirements set forth in the QAPP?

Yes		
No	X	(EXPLAIN)

In the initial calibration, pyrene exceeded the QC limit of 15 RPD with an RPD of 18.9. Detected pyrene results were flagged "J" as estimated. Continuing calibration verification was acceptable.

11. Did the calibration blanks (ICBs and CCBs) meet the limits set forth in the QAPP?

Yes	Not Applicable	
No		

12. Did the interference check samples meet the limits set forth in the QAPP?

Yes	Not Applicable	
No		(EXPLAIN)

13. Did the serial dilution samples meet the limits set forth in the QAPP?

Yes	Not Applicable	
No		(EXPLAIN)

Serial dilutions are not applicable to the TCLP SVOC analysis.

14. Were any level of contaminants detected above the MDL for the trip blanks and storage blanks?

Yes	Not Applicable	
No		(EXPLAIN)

15. Did all required analyses take place within the required holding time protocols set forth in the QAPP?

Yes	X	
No		(EXPLAIN)

The analyses were performed in the holding time limit of 14 days from collection to extraction and 40 days from extraction to analysis.

16. Did the laboratory duplicates vary by less than the % RPD specified in the QAPP?

Yes	Not Applicable	
No		(EXPLAIN)

The RPDs between the LCS and LCS duplicate were within the QC limits.

17. Are measured dry-weight contaminant concentrations reported?

Yes	X	
No		(EXPLAIN)

18. Please provide details for all of the "EXPLAIN" marked above. Include details on the specific analytes affected by any QA/QC discrepancies, and recommendations regarding usability of data.

Any items with “EXPLAIN” marked above are described immediately following the “EXPLAIN” marking in the corresponding item above.

The data are acceptable for use.

Data Validation Report
Lower Rouge River
Columbia Analytical Services
Laboratory Work Order #: K0904268

PAHs AND PAHs WITH ALKYLATED HOMOLOGS BY SW-846 METHOD 8270C SIM

CAS Work Order #: K0904301

QA/QC Analysis Checklist for Sediment Chemistry Analysis

GRANT/IAG NUMBER: Not Applicable
PROJECT NAME: Lower Rouge River
REVIEWER: Lisa Graczyk, WESTON START
DATE: August 20, 2009

1. What sediment chemistry data has been collected (CHECK ALL THAT APPLY)?

Total Metals ____	PCBs _____	pH _____	TOC ____
Dioxins/Furans _____	PAHs __X__	Pesticides _____	DO _____
AVS _____	SEM Metals _____	Particle Size _____	Other _____

2. Were the target detection limits met for each parameter?

Yes		
No	X	(EXPLAIN)

The reporting limits stated in the QAPP of 5 micrograms per kilogram (µg/kg) for PAHs were not met in some instances because of required sample dilutions. Because PAHs were detected at elevated concentrations in these samples, data usability is not affected.

3. Were the method blanks less than the established MDL for each parameter?

Yes		
No	X	(EXPLAIN)

Some target PAH compounds were detected in the method blank above the method detection limit but below the reporting limit. In most instances, these PAH compounds were detected at much higher levels in the samples and no qualifications were needed. The exception was anthracene in sample LRR-HS6-UP3-03 which was flagged "U" as not detected because it was detected in this sample at a similar concentration as the method blank.

4. Did the results of Field Replicate Analysis vary by less than the % RPD specified in the QAPP?

Yes	X	
No		(EXPLAIN)

5. Did the results of the Field Duplicates Analysis vary by less than the % RPD specified in the QAPP?

Yes		
No	X	(EXPLAIN)

There are two field duplicates associated with this work order (identified by a "DP" suffix). The RPDs were calculated for field duplicate results and compared to a standard QC limit of 50 RPD or less. All PAH compounds in one field duplicate and half in the other field duplicate exceeded this QC limit. The elevated RPDs are likely due to sample heterogeneity and/or weathering of the petroleum products.

6. Did the surrogate spike/internal standards recoveries meet the limits set forth in the QAPP?

Yes		
No	X	(EXPLAIN)

In one sample, the surrogates were outside the QC limits due to sample dilutions and high concentrations of analytes in the sample. No qualifications are required for this discrepancy.

7. Did the MS/MSD recoveries meet the limits set forth in the QAPP?

Yes		
No	X	(EXPLAIN)

One MS/MSD pair is associated with this work order. Ten of the 19 PAH compounds were detected outside the QC limit. In four instances, the sample concentration was greater than four times the spike amount and no qualification was required. For the remaining six PAH compounds, the results were flagged "J" as estimated in the parent sample, LRR-HS6-UP4-04 due to possible matrix interference in this sample.

8. Did the RPD (%) of the MS/MSD sample set meet the limits set forth in the QAPP?

Yes	X	
No		(EXPLAIN)

9. Did the LCS recoveries meet the limits set forth in the QAPP?

Yes	X	
No		(EXPLAIN)

The LCS recoveries are within the QAPP-specified QC limit.

10. Did the calibration verification standards (ICVs and CCVs) meet the requirements set forth in the QAPP?

Yes		
No	X	(EXPLAIN)

In the initial calibration associated with samples analyzed before June 1, 2009, pyrene exceeded the QC limit of 15 RPD with an RPD of 18.9. Detected pyrene results in all samples were flagged "J" as estimated. For samples analyzed on May 22, 2009, the continuing calibration verification percent difference was outside the QC limit for indeno(1,2,3-cd)pyrene. Detected indeno(1,2,3-cd)pyrene results in samples analyzed on May 22, 2009, were flagged "J" as estimated.

11. Did the calibration blanks (ICBs and CCBs) meet the limits set forth in the QAPP?

Yes	Not Applicable	
No		

12. Did the interference check samples meet the limits set forth in the QAPP?

Yes	Not Applicable	
No		(EXPLAIN)

13. Did the serial dilution samples meet the limits set forth in the QAPP?

Yes	Not Applicable	
No		(EXPLAIN)

14. Were any level of contaminants detected above the MDL for the trip blanks and storage blanks?

Yes	Not Applicable	
No		(EXPLAIN)

15. Did all required analyses take place within the required holding time protocols set forth in the QAPP?

Yes	X	
No		(EXPLAIN)

The analyses were performed in the holding time limit of 14 days from collection to extraction and 40 days from extraction to analysis.

16. Did the laboratory duplicates vary by less than the % RPD specified in the QAPP?

Yes	Not Applicable	
No		(EXPLAIN)

The RPDs between the LCS and LCS duplicate were within the QC limits.

17. Are measured dry-weight contaminant concentrations reported?

Yes	X	
No		(EXPLAIN)

18. Please provide details for all of the "EXPLAIN" marked above. Include details on the specific analytes affected by any QA/QC discrepancies, and recommendations regarding usability of data.

Any items with “EXPLAIN” marked above are described immediately following the “EXPLAIN” marking in the corresponding item above.

The data are acceptable for use.

Data Validation Report
Lower Rouge River
Columbia Analytical Services
Laboratory Work Order #: K0904301

PAHs BY SW-846 METHOD 8270C SIM

CAS Work Order #: K0904351

QA/QC Analysis Checklist for Sediment Chemistry Analysis

GRANT/IAG NUMBER: Not Applicable
PROJECT NAME: Lower Rouge River
REVIEWER: Lisa Graczyk, WESTON START
DATE: August 18, 2009

1. What sediment chemistry data has been collected (CHECK ALL THAT APPLY)?

Total Metals ____	PCBs _____	pH _____	TOC ____
Dioxins/Furans _____	PAHs __X__	Pesticides _____	DO _____
AVS _____	SEM Metals _____	Particle Size _____	Other _____

2. Were the target detection limits met for each parameter?

Yes		
No	X	(EXPLAIN)

The reporting limits stated in the QAPP for PAHs were not met in some instances because of required sample dilutions. Because PAHs were detected at elevated concentrations in these samples, data usability is not affected.

3. Were the method blanks less than the established MDL for each parameter?

Yes		
No	X	(EXPLAIN)

Some target PAH compounds were detected in the method blank above the method detection limit but below the reporting limit. In most instances, these PAH compounds were detected at much higher levels in the samples and therefore, no qualifications were required. The exception was naphthalene in samples LRR-ZIC-D-04, LRR-ZIC-D-05, LRR-ZIC-F-02-DP, and LRR-ZIC-F-03 which was flagged "U" as not detected because the sample concentration was similar to the method blank concentration.

4. Did the results of Field Replicate Analysis vary by less than the % RPD specified in the QAPP?

Yes		
No	X	(EXPLAIN)

There is one field replicate associated with this work order (identified with a "FS" suffix). The field replicate results and investigative sample results were compared to a standard quality control (QC) limit of 50 RPD or less. Eleven of the 19 PAH compounds had RPDs greater than 50; however, the exceedance wasn't that great. The RPDs outside the QC limit ranged from 51 to 67.

5. Did the results of the Field Duplicates Analysis vary by less than the % RPD specified in the QAPP?

Yes		
No	X	(EXPLAIN)

There is one field duplicate associated with this work order (identified with a "DP" suffix). The field duplicate results and investigative sample results were compared to a standard QC limit of 50 RPD or less. Four of the 19 PAH compounds had RPDs greater than 50; however, the exceedance wasn't that great. The RPDs outside the QC limit ranged from 51 to 66.

6. Did the surrogate spike/internal standards recoveries meet the limits set forth in the QAPP?

Yes	X	
No		(EXPLAIN)

7. Did the MS/MSD recoveries meet the limits set forth in the QAPP?

Yes		
No	X	(EXPLAIN)

Two MS/MSDs are associated with this work order. For one MS/MSD pair, all percent recoveries were with QAPP QC limits. For the second MS/MSD pair, the following compounds were detected low in the MS and/or MSD: fluoranthene, phenanthrene, acenapthene, dibenzofuran, naphthalene, and pyrene. In sample LRR-HS6-X2-02, the results for these compounds were flagged "J" as estimated due to possible matrix interference in sample. Only the parent sample was flagged because the other MS/MSD had acceptable recoveries indicating that the matrix problems may only relate to this sample.

8. Did the RPD (%) of the MS/MSD sample set meet the limits set forth in the QAPP?

Yes	X	
No		(EXPLAIN)

9. Did the LCS recoveries meet the limits set forth in the QAPP?

Yes	X	
No		(EXPLAIN)

The LCS recoveries are within the QAPP-specified QC limit.

10. Did the calibration verification standards (ICVs and CCVs) meet the requirements set forth in the QAPP?

Yes		
No	X	(EXPLAIN)

In the initial calibration, pyrene exceeded the QC limit of 15 RPD with an RPD of 18.9. Detected pyrene results were flagged "J" as estimated. Continuing calibration verification was acceptable.

11. Did the calibration blanks (ICBs and CCBs) meet the limits set forth in the QAPP?

Yes	Not Applicable	
No		

12. Did the interference check samples meet the limits set forth in the QAPP?

Yes	Not Applicable	
No		(EXPLAIN)

13. Did the serial dilution samples meet the limits set forth in the QAPP?

Yes	Not Applicable	
No		(EXPLAIN)

Serial dilutions are not applicable to the TCLP SVOC analysis.

14. Were any level of contaminants detected above the MDL for the trip blanks and storage blanks?

Yes	Not Applicable	
No		(EXPLAIN)

15. Did all required analyses take place within the required holding time protocols set forth in the QAPP?

Yes	X	
No		(EXPLAIN)

The analyses were performed in the holding time limit of 14 days from collection to extraction and 40 days from extraction to analysis.

16. Did the laboratory duplicates vary by less than the % RPD specified in the QAPP?

Yes	Not Applicable	
No		(EXPLAIN)

The RPDs between the LCS and LCS duplicate were within the QC limits.

17. Are measured dry-weight contaminant concentrations reported?

Yes	X	
No		(EXPLAIN)

18. Please provide details for all of the "EXPLAIN" marked above. Include details on the specific analytes affected by any QA/QC discrepancies, and recommendations regarding usability of data.

Any items with “EXPLAIN” marked above are described immediately following the “EXPLAIN” marking in the corresponding item above.

The data are acceptable for use.

Data Validation Report
Lower Rouge River
Columbia Analytical Services
Laboratory Work Order #: K0904351

PAHs AND PAHs WITH ALKYLATED HOMOLOGS BY SW-846 METHOD 8270C SIM

CAS Work Order #: K0904356

QA/QC Analysis Checklist for Sediment Chemistry Analysis

GRANT/IAG NUMBER: Not Applicable
PROJECT NAME: Lower Rouge River
REVIEWER: Lisa Graczyk, WESTON START
DATE: August 20, 2009

1. What sediment chemistry data has been collected (CHECK ALL THAT APPLY)?

Total Metals ____	PCBs _____	pH _____	TOC ____
Dioxins/Furans _____	PAHs __X__	Pesticides _____	DO _____
AVS _____	SEM Metals _____	Particle Size _____	Other _____

2. Were the target detection limits met for each parameter?

Yes	
No	X (EXPLAIN)

The reporting limits stated in the QAPP of 5 micrograms per kilogram (µg/kg) for PAHs were not met in some instances because of required sample dilutions. Because PAHs were detected at elevated concentrations in these samples, data usability is not affected.

3. Were the method blanks less than the established MDL for each parameter?

Yes	
No	X (EXPLAIN)

Some target PAH compounds were detected in the method blank above the method detection limit but below the reporting limit. In these instances, these PAH compounds were detected at much higher levels in the samples and no qualifications were needed.

4. Did the results of Field Replicate Analysis vary by less than the % RPD specified in the QAPP?

Yes	X	
No		(EXPLAIN)

There are two field replicates associated with this work order (identified by a "FS" suffix). The RPDs were calculated for field replicate results and compared to a standard QC limit of 50 RPD or less. Seven of the 19 PAH compounds exceeded this QC limit in both replicates. The elevated RPDs are likely due to sample heterogeneity.

5. Did the results of the Field Duplicates Analysis vary by less than the % RPD specified in the QAPP?

Yes	Not Applicable	
No		(EXPLAIN)

6. Did the surrogate spike/internal standards recoveries meet the limits set forth in the QAPP?

Yes		
No	X	(EXPLAIN)

In one sample, one of the three surrogates was outside the QC limits due to sample dilutions and high concentrations of analytes in the sample. No qualifications are required for this discrepancy.

7. Did the MS/MSD recoveries meet the limits set forth in the QAPP?

Yes	X	
No		(EXPLAIN)

8. Did the RPD (%) of the MS/MSD sample set meet the limits set forth in the QAPP?

Yes	X	
No		(EXPLAIN)

9. Did the LCS recoveries meet the limits set forth in the QAPP?

Yes	X	
No		(EXPLAIN)

The LCS recoveries are within the QAPP-specified QC limit.

10. Did the calibration verification standards (ICVs and CCVs) meet the requirements set forth in the QAPP?

Yes		
No	X	(EXPLAIN)

In the initial calibration associated with samples analyzed before June 1, 2009, pyrene exceeded the QC limit of 15 RPD with an RPD of 18.9. Detected pyrene results in all samples were flagged "J" as estimated. For samples analyzed on May 30, 2009, the continuing calibration verification percent difference was outside the QC limit for indeno(1,2,3-cd)pyrene. Detected indeno(1,2,3-cd)pyrene results in samples analyzed on May 30, 2009, were flagged "J" as estimated.

11. Did the calibration blanks (ICBs and CCBs) meet the limits set forth in the QAPP?

Yes	Not Applicable	
No		

12. Did the interference check samples meet the limits set forth in the QAPP?

Yes	Not Applicable	
No		(EXPLAIN)

13. Did the serial dilution samples meet the limits set forth in the QAPP?

Yes	Not Applicable	
No		(EXPLAIN)

14. Were any level of contaminants detected above the MDL for the trip blanks and storage blanks?

Yes	Not Applicable	
No		(EXPLAIN)

15. Did all required analyses take place within the required holding time protocols set forth in the QAPP?

Yes	X	
No		(EXPLAIN)

The analyses were performed in the holding time limit of 14 days from collection to extraction and 40 days from extraction to analysis.

16. Did the laboratory duplicates vary by less than the % RPD specified in the QAPP?

Yes	Not Applicable	
No		(EXPLAIN)

The RPDs between the LCS and LCS duplicate were within the QC limits.

17. Are measured dry-weight contaminant concentrations reported?

Yes	X	
No		(EXPLAIN)

18. Please provide details for all of the "EXPLAIN" marked above. Include details on the specific analytes affected by any QA/QC discrepancies, and recommendations regarding usability of data.

Any items with “EXPLAIN” marked above are described immediately following the “EXPLAIN” marking in the corresponding item above.

The data are acceptable for use.

Data Validation Report
Lower Rouge River
Columbia Analytical Services
Laboratory Work Order #: K0904356

PAHs BY SW-846 METHOD 8270C SIM

CAS Work Order #: K0904403

QA/QC Analysis Checklist for Sediment Chemistry Analysis

GRANT/IAG NUMBER: Not Applicable
PROJECT NAME: Lower Rouge River
REVIEWER: Lisa Graczyk, WESTON START
DATE: August 19, 2009

1. What sediment chemistry data has been collected (CHECK ALL THAT APPLY)?

Total Metals ____	PCBs _____	pH _____	TOC ____
Dioxins/Furans _____	PAHs __X__	Pesticides _____	DO _____
AVS _____	SEM Metals _____	Particle Size _____	Other _____

2. Were the target detection limits met for each parameter?

Yes	
No	X (EXPLAIN)

The reporting limits stated in the QAPP of 5 micrograms per kilogram (µg/kg) for PAHs were not met in some instances because of required sample dilutions. Because PAHs were detected at elevated concentrations in these samples, data usability is not affected.

3. Were the method blanks less than the established MDL for each parameter?

Yes	
No	X (EXPLAIN)

Some target PAH compounds were detected in the method blank above the method detection limit but below the reporting limit. In most instances, these PAH compounds were detected at much higher levels in the samples and therefore, no qualifications were required. The exceptions were 2-methylnapthalene; benzo(a) pyrene; benzo(k)fluoranthene; dibenz(a,h)anthracene; and napthalene in sample LRR-ZIC-H-01. These results were flagged "U" as not detected because the sample concentration was similar to the method blank concentration.

4. Did the results of Field Replicate Analysis vary by less than the % RPD specified in the QAPP?

Yes	Not Applicable	
No		(EXPLAIN)

5. Did the results of the Field Duplicates Analysis vary by less than the % RPD specified in the QAPP?

Yes	Not Applicable	
No		(EXPLAIN)

6. Did the surrogate spike/internal standards recoveries meet the limits set forth in the QAPP?

Yes		
No	X	(EXPLAIN)

In one sample, one of the three surrogates was outside the QC limit due to high sample dilution. No qualification is required in this instance.

7. Did the MS/MSD recoveries meet the limits set forth in the QAPP?

Yes		
No	X	(EXPLAIN)

One site-specific MS/MSD pair is associated with this work order. The percent recovery was outside the QC limit in the MS and/or MSD fir the following compounds: naphthalene, 1-methylnaphthalene; acenapthene; phenanthrene; and fluoranthene. The percent recoveries only slightly exceeded the QC limit in these instances. These compounds were flagged "J" as estimated in the parent sample, LRR-HS6-UP7-02, due to possible matrix interference.

8. Did the RPD (%) of the MS/MSD sample set meet the limits set forth in the QAPP?

Yes	X	
No		(EXPLAIN)

9. Did the LCS recoveries meet the limits set forth in the QAPP?

Yes	X	
No		(EXPLAIN)

The LCS recoveries are within the QAPP-specified QC limit.

10. Did the calibration verification standards (ICVs and CCVs) meet the requirements set forth in the QAPP?

Yes		
No	X	(EXPLAIN)

In the initial calibration associated with samples analyzed before June 1, 2009, pyrene exceeded the QC limit of 15 RPD with an RPD of 18.9. For samples analyzed on May 30 and 31, 2009, the continuing calibration verification percent difference was outside the QC limit for indeno(1,2,3-cd)pyrene and dibenz(a,h)anthracene. Detected pyrene, indeno(1,2,3-cd)pyrene, and dibenz(a,h)anthracene results in samples analyzed before June 1, 2009, were flagged "J" as estimated.

11. Did the calibration blanks (ICBs and CCBs) meet the limits set forth in the QAPP?

Yes	Not Applicable	
No		

12. Did the interference check samples meet the limits set forth in the QAPP?

Yes	Not Applicable	
No		(EXPLAIN)

13. Did the serial dilution samples meet the limits set forth in the QAPP?

Yes	Not Applicable	
No		(EXPLAIN)

Serial dilutions are not applicable to the TCLP SVOC analysis.

14. Were any level of contaminants detected above the MDL for the trip blanks and storage blanks?

Yes	Not Applicable	
No		(EXPLAIN)

15. Did all required analyses take place within the required holding time protocols set forth in the QAPP?

Yes	X	
No		(EXPLAIN)

The analyses were performed in the holding time limit of 14 days from collection to extraction and 40 days from extraction to analysis.

16. Did the laboratory duplicates vary by less than the % RPD specified in the QAPP?

Yes	Not Applicable	
No		(EXPLAIN)

The RPDs between the LCS and LCS duplicate were within the QC limits.

17. Are measured dry-weight contaminant concentrations reported?

Yes	X	
No		(EXPLAIN)

18. Please provide details for all of the "EXPLAIN" marked above. Include details on the specific analytes affected by any QA/QC discrepancies, and recommendations regarding usability of data.

Any items with “EXPLAIN” marked above are described immediately following the “EXPLAIN” marking in the corresponding item above.

The data are acceptable for use.

Data Validation Report
Lower Rouge River
Columbia Analytical Services
Laboratory Work Order #: K0904403

PAHs AND PAHs WITH ALKYLATED HOMOLOGS BY SW-846 METHOD 8270C SIM

CAS Work Order #: K0904451

QA/QC Analysis Checklist for Sediment Chemistry Analysis

GRANT/IAG NUMBER: Not Applicable
PROJECT NAME: Lower Rouge River
REVIEWER: Lisa Graczyk, WESTON START
DATE: August 21, 2009

1. What sediment chemistry data has been collected (CHECK ALL THAT APPLY)?

Total Metals ____	PCBs _____	pH _____	TOC ____
Dioxins/Furans _____	PAHs __X__	Pesticides _____	DO _____
AVS _____	SEM Metals _____	Particle Size _____	Other _____

2. Were the target detection limits met for each parameter?

Yes		
No	X	(EXPLAIN)

The reporting limits stated in the QAPP of 5 micrograms per kilogram (µg/kg) for PAHs were not met because of required sample dilutions. Because PAHs were detected at elevated concentrations in these samples, data usability is not affected.

3. Were the method blanks less than the established MDL for each parameter?

Yes		
No	X	(EXPLAIN)

Some target PAH compounds were detected in the method blank above the method detection limit but below the reporting limit. In most instances, these PAH compounds were detected at much higher levels in the samples and no qualifications were needed. The exceptions were anthracene; fluoranthene; fluorene; and phenanthrene in sample LRR-HS3-E-01. These results were flagged "U" as not detected because the sample concentration was similar to the method blank concentration.

4. Did the results of Field Replicate Analysis vary by less than the % RPD specified in the QAPP?

Yes	X	
No		(EXPLAIN)

5. Did the results of the Field Duplicates Analysis vary by less than the % RPD specified in the QAPP?

Yes		
No	X	(EXPLAIN)

There was one field duplicate associated with this work (identified with a "DP" suffix). All RPDs were within a standard RPD limit of 50 or less except for two compounds which only slightly exceeded the QC limit. The field duplicate results were acceptable.

6. Did the surrogate spike/internal standards recoveries meet the limits set forth in the QAPP?

Yes		
No	X	(EXPLAIN)

In seven samples, one to two of the three surrogates was outside the QC limits due to sample dilutions and high concentrations of analytes in the sample. No qualifications are required for this discrepancy.

7. Did the MS/MSD recoveries meet the limits set forth in the QAPP?

Yes		
No	X	(EXPLAIN)

One MS/MSD pair is associated with this work order. Four of the 19 PAH compounds were detected outside the QC limit. For three of these compounds, the sample concentration was greater than four times the spike amount and no qualification was required. The exception was anthracene. The result for anthracene in sample LRR-HS5-A-01-R (the parent sample) was flagged "J" as estimated.

8. Did the RPD (%) of the MS/MSD sample set meet the limits set forth in the QAPP?

Yes	X	
No		(EXPLAIN)

9. Did the LCS recoveries meet the limits set forth in the QAPP?

Yes	X	
No		(EXPLAIN)

The LCS recoveries are within the QAPP-specified QC limit.

10. Did the calibration verification standards (ICVs and CCVs) meet the requirements set forth in the QAPP?

Yes	X	
No		(EXPLAIN)

11. Did the calibration blanks (ICBs and CCBs) meet the limits set forth in the QAPP?

Yes	Not Applicable	
No		

12. Did the interference check samples meet the limits set forth in the QAPP?

Yes	Not Applicable	
No		(EXPLAIN)

13. Did the serial dilution samples meet the limits set forth in the QAPP?

Yes	Not Applicable	
No		(EXPLAIN)

Serial dilutions are not applicable to the TCLP SVOC analysis.

14. Were any level of contaminants detected above the MDL for the trip blanks and storage blanks?

Yes	Not Applicable	
No		(EXPLAIN)

15. Did all required analyses take place within the required holding time protocols set forth in the QAPP?

Yes	X	
No		(EXPLAIN)

The analyses were performed in the holding time limit of 14 days from collection to extraction and 40 days from extraction to analysis.

16. Did the laboratory duplicates vary by less than the % RPD specified in the QAPP?

Yes	Not Applicable	
No		(EXPLAIN)

The RPDs between the LCS and LCS duplicate were within the QC limits.

17. Are measured dry-weight contaminant concentrations reported?

Yes	X	
No		(EXPLAIN)

18. Please provide details for all of the "EXPLAIN" marked above. Include details on the specific analytes affected by any QA/QC discrepancies, and recommendations regarding usability of data.

Any items with “EXPLAIN” marked above are described immediately following the “EXPLAIN” marking in the corresponding item above.

The data are acceptable for use as qualified.

Data Validation Report
Lower Rouge River
Columbia Analytical Services
Laboratory Work Order #: K0904451

PAHs AND PAHs WITH ALKYLATED HOMOLOGS BY SW-846 METHOD 8270C SIM

CAS Work Order #: K0904454

QA/QC Analysis Checklist for Sediment Chemistry Analysis

GRANT/IAG NUMBER: Not Applicable
PROJECT NAME: Lower Rouge River
REVIEWER: Lisa Graczyk, WESTON START
DATE: August 20, 2009

1. What sediment chemistry data has been collected (CHECK ALL THAT APPLY)?

Total Metals ____	PCBs _____	pH _____	TOC ____
Dioxins/Furans _____	PAHs __X__	Pesticides _____	DO _____
AVS _____	SEM Metals _____	Particle Size _____	Other _____

2. Were the target detection limits met for each parameter?

Yes		
No	X	(EXPLAIN)

The reporting limits stated in the QAPP of 5 micrograms per kilogram (µg/kg) for PAHs were not met in some instances because of required sample dilutions. Because PAHs were detected at elevated concentrations in these samples, data usability is not affected.

3. Were the method blanks less than the established MDL for each parameter?

Yes		
No	X	(EXPLAIN)

Some target PAH compounds were detected in the method blank above the method detection limit but below the reporting limit. Because these PAH compounds were detected at much higher levels in the samples, no qualifications were needed and sample usability is not affected.

4. Did the results of Field Replicate Analysis vary by less than the % RPD specified in the QAPP?

Yes	X	
No		(EXPLAIN)

5. Did the results of the Field Duplicates Analysis vary by less than the % RPD specified in the QAPP?

Yes		
No	X	(EXPLAIN)

There were two field duplicates associated with this work (identified with a "DP" suffix). All RPDs were within a standard RPD limit of 50 or less except for one compound in each of the two field duplicate samples which only slightly exceeded the QC limit. The field duplicate results were acceptable.

6. Did the surrogate spike/internal standards recoveries meet the limits set forth in the QAPP?

Yes	X	
No		(EXPLAIN)

7. Did the MS/MSD recoveries meet the limits set forth in the QAPP?

Yes		
No	X	(EXPLAIN)

Two MS/MSDs are associated with this work order. For one MS/MSD pair, all percent recoveries were with QAPP QC limits. For the second MS/MSD pair, 9 of the 19 PAH compounds were detected outside the QC limit. In each instance, the sample concentration was greater than four times the spike amount and no qualification was required.

8. Did the RPD (%) of the MS/MSD sample set meet the limits set forth in the QAPP?

Yes	X	
No		(EXPLAIN)

9. Did the LCS recoveries meet the limits set forth in the QAPP?

Yes	X	
No		(EXPLAIN)

The LCS recoveries are within the QAPP-specified QC limit.

10. Did the calibration verification standards (ICVs and CCVs) meet the requirements set forth in the QAPP?

Yes	X	
No		(EXPLAIN)

11. Did the calibration blanks (ICBs and CCBs) meet the limits set forth in the QAPP?

Yes	Not Applicable	
No		

12. Did the interference check samples meet the limits set forth in the QAPP?

Yes	Not Applicable	
No		(EXPLAIN)

13. Did the serial dilution samples meet the limits set forth in the QAPP?

Yes	Not Applicable	
No		(EXPLAIN)

Serial dilutions are not applicable to the TCLP SVOC analysis.

14. Were any level of contaminants detected above the MDL for the trip blanks and storage blanks?

Yes	Not Applicable	
No		(EXPLAIN)

15. Did all required analyses take place within the required holding time protocols set forth in the QAPP?

Yes	X	
No		(EXPLAIN)

The analyses were performed in the holding time limit of 14 days from collection to extraction and 40 days from extraction to analysis.

16. Did the laboratory duplicates vary by less than the % RPD specified in the QAPP?

Yes	Not Applicable	
No		(EXPLAIN)

The RPDs between the LCS and LCS duplicate were within the QC limits.

17. Are measured dry-weight contaminant concentrations reported?

Yes	X	
No		(EXPLAIN)

18. Please provide details for all of the "EXPLAIN" marked above. Include details on the specific analytes affected by any QA/QC discrepancies, and recommendations regarding usability of data.

Any items with “EXPLAIN” marked above are described immediately following the “EXPLAIN” marking in the corresponding item above.

The data are acceptable for use.

Data Validation Report
Lower Rouge River
Columbia Analytical Services
Laboratory Work Order #: K0904454

ATTACHMENT B
ANALYTICAL DATA SUMMARY SHEETS WITH QUALIFIERS

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-017-A-01 **Lab Report Batch :** K0810413 **Lab ID :** CAS_K

Sample Date : 10/21/2008 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0810413-001

Reviewed By / Date : LG 1/19/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8270C SIM					**Dilution: 20**															
1-Methylnaphthalene	250		ug/Kg	D	YES															
2-Methylnaphthalene	430		ug/Kg	D	YES															
Acenaphthene	350		ug/Kg	D	YES															
Acenaphthylene	85		ug/Kg	JD	YES	**J**								J						
Anthracene	920		ug/Kg	D	YES															
Benz(a)anthracene	2700		ug/Kg	D	YES															
Benzo(a)pyrene	3200		ug/Kg	D	YES															
Benzo(b)fluoranthene	4200		ug/Kg	D	YES															
Benzo(g,h,i)perylene	2500		ug/Kg	D	YES															
Benzo(k)fluoranthene	1500		ug/Kg	D	YES															
C1-Chrysenes	2100		ug/Kg	D	YES															
C1-Fluoranthenes/Pyrenes	3400		ug/Kg	D	YES															
C1-Fluorenes	510		ug/Kg	D	YES															
C1-Phenanthrenes/Anthracenes	2200		ug/Kg	D	YES															
C2-Chrysenes	1300		ug/Kg	D	YES															
C2-Fluorenes	1200		ug/Kg	D	YES															
C2-Naphthalenes	1100		ug/Kg	D	YES															
C2-Phenanthrenes/Anthracenes	2800		ug/Kg	D	YES															
C3-Chrysenes	1000		ug/Kg	D	YES															
C3-Fluorenes	2700		ug/Kg	D	YES															
C3-Naphthalenes	1100		ug/Kg	D	YES															
C3-Phenanthrenes/Anthracenes	2500		ug/Kg	D	YES															
C4-Chrysenes	99		ug/Kg	U	YES															
C4-Naphthalenes	1100		ug/Kg	D	YES															
C4-Phenanthrenes/Anthracenes	1600		ug/Kg	D	YES															
Chrysene	3800		ug/Kg	D	YES															
Dibenz(a,h)anthracene	530		ug/Kg	D	YES															
Dibenzofuran	210		ug/Kg	D	YES															

Project Number and Name: **20405.016.008.0451.0 - Lower Rogue River** **Library Used:** **LRR**

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-017-A-01 **Lab Report Batch :** K0810413 **Lab ID :** CAS_K

Sample Date : 10/21/2008 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0810413-001

Reviewed By / Date : LG 1/19/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8270C SIM					**Dilution: 20**															
Fluoranthene	6400		ug/Kg	D	YES															
Fluorene	450		ug/Kg	D	YES															
Indeno(1,2,3-cd)pyrene	2600		ug/Kg	D	YES															
Naphthalene	720		ug/Kg	D	YES															
Phenanthrene	3300		ug/Kg	D	YES															
Pyrene	5200		ug/Kg	D	YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-017-A-02 **Lab Report Batch :** K0810413 **Lab ID :** CAS_K

Sample Date : 10/21/2008 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0810413-002

Reviewed By / Date : LG 1/19/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8270C SIM					**Dilution: 20**															
2-Methylnaphthalene	2300		ug/Kg	D	YES															
Acenaphthene	880		ug/Kg	D	YES															
Acenaphthylene	280		ug/Kg	D	YES															
Anthracene	1400		ug/Kg	D	YES															
Benz(a)anthracene	3300		ug/Kg	D	YES															
Benzo(a)pyrene	3600		ug/Kg	D	YES															
Benzo(b)fluoranthene	4700		ug/Kg	D	YES															
Benzo(g,h,i)perylene	3000		ug/Kg	D	YES															
Benzo(k)fluoranthene	1600		ug/Kg	D	YES															
Chrysene	4200		ug/Kg	D	YES															
Dibenz(a,h)anthracene	620		ug/Kg	D	YES															
Dibenzofuran	590		ug/Kg	D	YES															
Fluoranthene	8500		ug/Kg	D	YES															
Fluorene	1200		ug/Kg	D	YES															
Indeno(1,2,3-cd)pyrene	3100		ug/Kg	D	YES															
Naphthalene	1300		ug/Kg	D	YES															
Phenanthrene	5800		ug/Kg	D	YES															
Pyrene	7000		ug/Kg	D	YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-017-A-03 **Lab Report Batch :** K0810413 **Lab ID :** CAS_K

Sample Date : 10/21/2008 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0810413-003

Reviewed By / Date : LG 1/19/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8270C SIM					**Dilution: 20**															
2-Methylnaphthalene	7400		ug/Kg	D	YES															
Acenaphthene	2100		ug/Kg	D	YES															
Acenaphthylene	750		ug/Kg	D	YES															
Anthracene	3000		ug/Kg	D	YES															
Benz(a)anthracene	5300		ug/Kg	D	YES															
Benzo(a)pyrene	5500		ug/Kg	D	YES															
Benzo(b)fluoranthene	6400		ug/Kg	D	YES															
Benzo(g,h,i)perylene	3800		ug/Kg	D	YES															
Benzo(k)fluoranthene	2500		ug/Kg	D	YES															
Chrysene	5700		ug/Kg	D	YES															
Dibenz(a,h)anthracene	980		ug/Kg	D	YES															
Dibenzofuran	1400		ug/Kg	D	YES															
Fluoranthene	14000		ug/Kg	D	YES															
Fluorene	3000		ug/Kg	D	YES															
Indeno(1,2,3-cd)pyrene	4000		ug/Kg	D	YES															
Naphthalene	3000		ug/Kg	D	YES															
Phenanthrene	12000		ug/Kg	D	YES															
Pyrene	12000		ug/Kg	D	YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-017-A-04 **Lab Report Batch :** K0810413 **Lab ID :** CAS_K

Sample Date : 10/21/2008 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0810413-004

Reviewed By / Date : LG 1/19/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8270C SIM					**Dilution: 20**															
2-Methylnaphthalene	6000		ug/Kg	D	YES															
Acenaphthene	2000		ug/Kg	D	YES															
Acenaphthylene	720		ug/Kg	D	YES															
Anthracene	3000		ug/Kg	D	YES															
Benz(a)anthracene	4500		ug/Kg	D	YES															
Benzo(a)pyrene	4400		ug/Kg	D	YES															
Benzo(b)fluoranthene	5100		ug/Kg	D	YES															
Benzo(g,h,i)perylene	3100		ug/Kg	D	YES															
Benzo(k)fluoranthene	1800		ug/Kg	D	YES															
Chrysene	4800		ug/Kg	D	YES															
Dibenz(a,h)anthracene	870		ug/Kg	D	YES															
Dibenzofuran	1400		ug/Kg	D	YES															
Fluoranthene	12000		ug/Kg	D	YES															
Fluorene	3600		ug/Kg	D	YES															
Indeno(1,2,3-cd)pyrene	3200		ug/Kg	D	YES															
Naphthalene	2900		ug/Kg	D	YES															
Phenanthrene	11000		ug/Kg	D	YES															
Pyrene	11000		ug/Kg	D	YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-017-A-05 **Lab Report Batch :** K0810413 **Lab ID :** CAS_K

Sample Date : 10/21/2008 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0810413-005

Reviewed By / Date : LG 1/19/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8270C SIM					**Dilution: 20**															
2-Methylnaphthalene	5400		ug/Kg	D	YES															
Acenaphthene	2300		ug/Kg	D	YES															
Acenaphthylene	540		ug/Kg	D	YES															
Anthracene	3000		ug/Kg	D	YES															
Benz(a)anthracene	5400		ug/Kg	D	YES															
Benzo(a)pyrene	5800		ug/Kg	D	YES															
Benzo(b)fluoranthene	6900		ug/Kg	D	YES															
Benzo(g,h,i)perylene	4000		ug/Kg	D	YES															
Benzo(k)fluoranthene	2400		ug/Kg	D	YES															
Chrysene	5700		ug/Kg	D	YES															
Dibenz(a,h)anthracene	1000		ug/Kg	D	YES															
Dibenzofuran	1700		ug/Kg	D	YES															
Fluoranthene	15000		ug/Kg	D	YES															
Fluorene	3900		ug/Kg	D	YES															
Indeno(1,2,3-cd)pyrene	4400		ug/Kg	D	YES															
Naphthalene	3100		ug/Kg	D	YES															
Phenanthrene	12000		ug/Kg	D	YES															
Pyrene	12000		ug/Kg	D	YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-OBC-D-01 **Lab Report Batch :** K0810413 **Lab ID :** CAS_K

Sample Date : 10/21/2008 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0810413-006

Reviewed By / Date : LG 1/19/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8270C SIM					**Dilution: 50**															
1-Methylnaphthalene	2800		ug/Kg	D	YES															
2-Methylnaphthalene	3100		ug/Kg	D	YES															
Acenaphthene	1500		ug/Kg	D	YES															
Acenaphthylene	200		ug/Kg	JD	YES	**J**								J						
Anthracene	41000		ug/Kg	D	YES															
Benz(a)anthracene	7500		ug/Kg	D	YES															
Benzo(a)pyrene	4500		ug/Kg	D	YES															
Benzo(b)fluoranthene	5900		ug/Kg	D	YES															
Benzo(g,h,i)perylene	2900		ug/Kg	D	YES															
Benzo(k)fluoranthene	2600		ug/Kg	D	YES															
C1-Chrysenes	4800		ug/Kg	D	YES															
C1-Fluoranthenes/Pyrenes	13000		ug/Kg	D	YES															
C1-Fluorenes	5000		ug/Kg	D	YES															
C1-Phenanthrenes/Anthracenes	12000		ug/Kg	D	YES															
C2-Chrysenes	2900		ug/Kg	D	YES															
C2-Fluorenes	5800		ug/Kg	D	YES															
C2-Naphthalenes	17000		ug/Kg	D	YES															
C2-Phenanthrenes/Anthracenes	12000		ug/Kg	D	YES															
C3-Chrysenes	2600		ug/Kg	D	YES															
C3-Fluorenes	9500		ug/Kg	D	YES															
C3-Naphthalenes	17000		ug/Kg	D	YES															
C3-Phenanthrenes/Anthracenes	8500		ug/Kg	D	YES															
C4-Chrysenes	240		ug/Kg	U	YES															
C4-Naphthalenes	12000		ug/Kg	D	YES															
C4-Phenanthrenes/Anthracenes	4100		ug/Kg	D	YES															
Chrysene	15000		ug/Kg	D	YES															
Dibenz(a,h)anthracene	650		ug/Kg	D	YES															
Dibenzofuran	1400		ug/Kg	D	YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-OBC-D-01 **Lab Report Batch :** K0810413 **Lab ID :** CAS_K

Sample Date : 10/21/2008 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0810413-006

Reviewed By / Date : LG 1/19/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8270C SIM					**Dilution: 50**															
Fluoranthene	23000		ug/Kg	D	YES															
Fluorene	4300		ug/Kg	D	YES															
Indeno(1,2,3-cd)pyrene	3200		ug/Kg	D	YES															
Naphthalene	780		ug/Kg	D	YES															
Phenanthrene	21000		ug/Kg	D	YES															
Pyrene	17000		ug/Kg	D	YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-OBC-D-01-DP **Lab Report Batch :** K0810413 **Lab ID :** CAS_K

Sample Date : 10/21/2008 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0810413-007

Reviewed By / Date : LG 1/19/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8270C SIM					**Dilution: 20**															
1-Methylnaphthalene	1300		ug/Kg	D	YES															
2-Methylnaphthalene	1400		ug/Kg	D	YES															
Acenaphthene	700		ug/Kg	D	YES															
Acenaphthylene	100		ug/Kg	JD	YES															
Anthracene	4800		ug/Kg	D	YES															
Benz(a)anthracene	3200		ug/Kg	D	YES															
Benzo(a)pyrene	2600		ug/Kg	D	YES															
Benzo(b)fluoranthene	3400		ug/Kg	D	YES															
Benzo(g,h,i)perylene	1700		ug/Kg	D	YES	**J**					J									
Benzo(k)fluoranthene	1300		ug/Kg	D	YES	**J**					J									
C1-Chrysenes	2100		ug/Kg	D	YES															
C1-Fluoranthenes/Pyrenes	4700		ug/Kg	D	YES															
C1-Fluorenes	2200		ug/Kg	D	YES															
C1-Phenanthrenes/Anthracenes	5700		ug/Kg	D	YES															
C2-Chrysenes	1400		ug/Kg	D	YES															
C2-Fluorenes	3200		ug/Kg	D	YES															
C2-Naphthalenes	7300		ug/Kg	D	YES															
C2-Phenanthrenes/Anthracenes	6300		ug/Kg	D	YES															
C3-Chrysenes	1000		ug/Kg	D	YES															
C3-Fluorenes	5500		ug/Kg	D	YES															
C3-Naphthalenes	8300		ug/Kg	D	YES															
C3-Phenanthrenes/Anthracenes	4600		ug/Kg	D	YES															
C4-Chrysenes	100		ug/Kg	U	YES															
C4-Naphthalenes	6500		ug/Kg	D	YES															
C4-Phenanthrenes/Anthracenes	2200		ug/Kg	D	YES															
Chrysene	3900		ug/Kg	D	YES															
Dibenz(a,h)anthracene	380		ug/Kg	D	YES															
Dibenzofuran	610		ug/Kg	D	YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-OBC-D-01-DP **Lab Report Batch :** K0810413 **Lab ID :** CAS_K

Sample Date : 10/21/2008 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0810413-007

Reviewed By / Date : LG 1/19/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8270C SIM					**Dilution: 20**															
Fluoranthene	12000		ug/Kg	D	YES															
Fluorene	1600		ug/Kg	D	YES															
Indeno(1,2,3-cd)pyrene	1900		ug/Kg	D	YES	**J**					J									
Naphthalene	380		ug/Kg	D	YES															
Phenanthrene	9200		ug/Kg	D	YES															
Pyrene	8200		ug/Kg	D	YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-OF2-A-01 **Lab Report Batch :** K0810413 **Lab ID :** CAS_K

Sample Date : 10/21/2008 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0810413-008

Reviewed By / Date : LG 1/19/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8270C SIM					**Dilution: 20**															
Benzo(a)pyrene	2100		ug/Kg	D	YES															
Benzo(b)fluoranthene	2300		ug/Kg	D	YES															
Chrysene	2100		ug/Kg	D	YES															
Fluoranthene	3300		ug/Kg	D	YES															
Phenanthrene	2200		ug/Kg	D	YES															
Pyrene	3800		ug/Kg	D	YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-OF2-A-01 **Lab Report Batch :** K0810413 **Lab ID :** CAS_K

Sample Date : 10/21/2008 **Analysis Type: 2RES** **Sample Matrix :** SED

Lab Sample ID: K0810413-008

Reviewed By / Date : LG 1/19/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8270C SIM					**Dilution: 1**															
1-Methylnaphthalene	240		ug/Kg		YES															
2-Methylnaphthalene	410		ug/Kg		YES															
Acenaphthene	180		ug/Kg		YES															
Acenaphthylene	490		ug/Kg		YES															
Anthracene	790		ug/Kg		YES															
Benz(a)anthracene	1800		ug/Kg		YES															
Benzo(g,h,i)perylene	1600		ug/Kg		YES															
Benzo(k)fluoranthene	790		ug/Kg		YES															
C1-Chrysenes	1400		ug/Kg		YES															
C1-Fluoranthenes/Pyrenes	2600		ug/Kg	E	YES															
C1-Fluorenes	320		ug/Kg		YES															
C1-Phenanthrenes/Anthracenes	1600		ug/Kg		YES															
C2-Chrysenes	610		ug/Kg		YES															
C2-Fluorenes	370		ug/Kg		YES															
C2-Naphthalenes	490		ug/Kg		YES															
C2-Phenanthrenes/Anthracenes	1300		ug/Kg		YES															
C3-Chrysenes	370		ug/Kg		YES															
C3-Fluorenes	720		ug/Kg		YES															
C3-Naphthalenes	420		ug/Kg		YES															
C3-Phenanthrenes/Anthracenes	880		ug/Kg		YES															
C4-Chrysenes	110		ug/Kg		YES															
C4-Naphthalenes	330		ug/Kg		YES															
C4-Phenanthrenes/Anthracenes	490		ug/Kg		YES															
Dibenz(a,h)anthracene	320		ug/Kg		YES															
Dibenzofuran	120		ug/Kg		YES															
Fluorene	340		ug/Kg		YES															
Indeno(1,2,3-cd)pyrene	1600		ug/Kg		YES															
Naphthalene	940		ug/Kg		YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-WJB-A-01 **Lab Report Batch :** K0810413 **Lab ID :** CAS_K

Sample Date : 10/21/2008 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0810413-009

Reviewed By / Date : LG 1/19/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8270C SIM					**Dilution: 1**															
1-Methylnaphthalene	84		ug/Kg		YES															
2-Methylnaphthalene	110		ug/Kg		YES															
Acenaphthene	95		ug/Kg		YES															
Acenaphthylene	46		ug/Kg		YES															
Anthracene	230		ug/Kg		YES															
Benz(a)anthracene	620		ug/Kg		YES															
Benzo(a)pyrene	670		ug/Kg		YES															
Benzo(b)fluoranthene	890		ug/Kg		YES															
Benzo(g,h,i)perylene	510		ug/Kg		YES															
Benzo(k)fluoranthene	330		ug/Kg		YES															
C1-Chrysenes	590		ug/Kg		YES															
C1-Fluoranthenes/Pyrenes	1000		ug/Kg		YES															
C1-Fluorenes	210		ug/Kg		YES															
C1-Phenanthrenes/Anthracenes	750		ug/Kg		YES															
C2-Chrysenes	370		ug/Kg		YES															
C2-Fluorenes	420		ug/Kg		YES															
C2-Naphthalenes	450		ug/Kg		YES															
C2-Phenanthrenes/Anthracenes	1100		ug/Kg		YES															
C3-Chrysenes	250		ug/Kg		YES															
C3-Fluorenes	1000		ug/Kg		YES															
C3-Naphthalenes	630		ug/Kg		YES															
C3-Phenanthrenes/Anthracenes	1100		ug/Kg		YES															
C4-Chrysenes	5.0		ug/Kg	U	YES															
C4-Naphthalenes	670		ug/Kg		YES															
C4-Phenanthrenes/Anthracenes	670		ug/Kg		YES															
Chrysene	850		ug/Kg		YES															
Dibenz(a,h)anthracene	120		ug/Kg		YES															
Dibenzofuran	72		ug/Kg		YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-WJB-A-01 **Lab Report Batch :** K0810413 **Lab ID :** CAS_K

Sample Date : 10/21/2008 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0810413-009

Reviewed By / Date : LG 1/19/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8270C SIM					**Dilution: 1**															
Fluoranthene	1600		ug/Kg		YES															
Fluorene	110		ug/Kg		YES															
Indeno(1,2,3-cd)pyrene	560		ug/Kg		YES															
Naphthalene	220		ug/Kg		YES															
Phenanthrene	730		ug/Kg		YES															
Pyrene	1500		ug/Kg		YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-WJB-A-02 **Lab Report Batch :** K0810413 **Lab ID :** CAS_K

Sample Date : 10/21/2008 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0810413-010

Reviewed By / Date : LG 1/19/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8270C SIM					**Dilution: 20**															
2-Methylnaphthalene	550		ug/Kg	D	YES															
Acenaphthene	1500		ug/Kg	D	YES															
Acenaphthylene	210		ug/Kg	D	YES															
Anthracene	1800		ug/Kg	D	YES															
Benz(a)anthracene	3200		ug/Kg	D	YES															
Benzo(a)pyrene	3200		ug/Kg	D	YES															
Benzo(b)fluoranthene	3700		ug/Kg	D	YES															
Benzo(g,h,i)perylene	2100		ug/Kg	D	YES															
Benzo(k)fluoranthene	1500		ug/Kg	D	YES															
Chrysene	3000		ug/Kg	D	YES															
Dibenz(a,h)anthracene	470		ug/Kg	D	YES															
Dibenzofuran	580		ug/Kg	D	YES															
Fluoranthene	9500		ug/Kg	D	YES															
Fluorene	1200		ug/Kg	D	YES															
Indeno(1,2,3-cd)pyrene	2300		ug/Kg	D	YES															
Naphthalene	1100		ug/Kg	D	YES															
Phenanthrene	6800		ug/Kg	D	YES															
Pyrene	7200		ug/Kg	D	YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-HS1-A-01 **Lab Report Batch :** K0810422 **Lab ID :** CAS_K

Sample Date : 10/21/2008 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0810422-001

Reviewed By / Date : LG 1/20/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8270C SIM					**Dilution: 10**															
1-Methylnaphthalene	480		ug/Kg	D	YES															
2-Methylnaphthalene	730		ug/Kg	D	YES															
Acenaphthene	610		ug/Kg	D	YES															
Acenaphthylene	720		ug/Kg	D	YES															
Anthracene	1600		ug/Kg	D	YES															
Benz(a)anthracene	4400		ug/Kg	D	YES															
Benzo(a)pyrene	5900		ug/Kg	D	YES															
Benzo(b)fluoranthene	6200		ug/Kg	D	YES															
Benzo(g,h,i)perylene	4700		ug/Kg	D	YES															
Benzo(k)fluoranthene	2200		ug/Kg	D	YES															
C1-Chrysenes	2800		ug/Kg	D	YES															
C1-Fluoranthenes/Pyrenes	5400		ug/Kg	D	YES															
C1-Fluorenes	390		ug/Kg	D	YES															
C1-Phenanthrenes/Anthracenes	3200		ug/Kg	D	YES															
C2-Chrysenes	940		ug/Kg	D	YES															
C2-Fluorenes	670		ug/Kg	D	YES															
C2-Naphthalenes	830		ug/Kg	D	YES															
C2-Phenanthrenes/Anthracenes	2000		ug/Kg	D	YES															
C3-Chrysenes	440		ug/Kg	D	YES															
C3-Fluorenes	1300		ug/Kg	D	YES															
C3-Naphthalenes	710		ug/Kg	D	YES															
C3-Phenanthrenes/Anthracenes	1400		ug/Kg	D	YES															
C4-Chrysenes	50		ug/Kg	U	YES															
C4-Naphthalenes	610		ug/Kg	D	YES															
C4-Phenanthrenes/Anthracenes	740		ug/Kg	D	YES															
Chrysene	5500		ug/Kg	D	YES															
Dibenz(a,h)anthracene	830		ug/Kg	D	YES															
Dibenzofuran	150		ug/Kg	D	YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-HS1-A-01 **Lab Report Batch :** K0810422 **Lab ID :** CAS_K

Sample Date : 10/21/2008 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0810422-001

Reviewed By / Date : LG 1/20/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8270C SIM					**Dilution: 10**															
Fluoranthene	9300		ug/Kg	D	YES															
Fluorene	610		ug/Kg	D	YES															
Indeno(1,2,3-cd)pyrene	4700		ug/Kg	D	YES															
Naphthalene	780		ug/Kg	D	YES															
Phenanthrene	5700		ug/Kg	D	YES															
Pyrene	9500		ug/Kg	D	YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-HS1-A-02 **Lab Report Batch :** K0810422 **Lab ID :** CAS_K

Sample Date : 10/21/2008 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0810422-002

Reviewed By / Date : LG 1/20/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8270C SIM					**Dilution: 10**															
2-Methylnaphthalene	1400		ug/Kg	D	YES															
Acenaphthene	1300		ug/Kg	D	YES															
Acenaphthylene	850		ug/Kg	D	YES															
Anthracene	2700		ug/Kg	D	YES															
Benz(a)anthracene	4700		ug/Kg	D	YES															
Benzo(a)pyrene	5800		ug/Kg	D	YES															
Benzo(b)fluoranthene	5900		ug/Kg	D	YES															
Benzo(g,h,i)perylene	4300		ug/Kg	D	YES															
Benzo(k)fluoranthene	2000		ug/Kg	D	YES															
Chrysene	5500		ug/Kg	D	YES															
Dibenz(a,h)anthracene	770		ug/Kg	D	YES															
Dibenzofuran	230		ug/Kg	D	YES															
Fluoranthene	10000		ug/Kg	D	YES															
Fluorene	1100		ug/Kg	D	YES															
Indeno(1,2,3-cd)pyrene	4300		ug/Kg	D	YES															
Naphthalene	710		ug/Kg	D	YES															
Phenanthrene	8600		ug/Kg	D	YES															
Pyrene	11000		ug/Kg	D	YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-HS1-A-03 **Lab Report Batch :** K0810422 **Lab ID :** CAS_K

Sample Date : 10/21/2008 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0810422-003

Reviewed By / Date : LG 1/20/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8270C SIM					**Dilution: 10**															
2-Methylnaphthalene	650		ug/Kg	D	YES															
Acenaphthene	610		ug/Kg	D	YES															
Acenaphthylene	460		ug/Kg	D	YES															
Anthracene	1400		ug/Kg	D	YES															
Benz(a)anthracene	3000		ug/Kg	D	YES															
Benzo(a)pyrene	3800		ug/Kg	D	YES															
Benzo(b)fluoranthene	4200		ug/Kg	D	YES															
Benzo(g,h,i)perylene	3000		ug/Kg	D	YES															
Benzo(k)fluoranthene	1400		ug/Kg	D	YES															
Chrysene	3900		ug/Kg	D	YES															
Dibenz(a,h)anthracene	610		ug/Kg	D	YES															
Dibenzofuran	260		ug/Kg	D	YES															
Fluoranthene	7300		ug/Kg	D	YES															
Fluorene	680		ug/Kg	D	YES															
Indeno(1,2,3-cd)pyrene	2900		ug/Kg	D	YES															
Naphthalene	860		ug/Kg	D	YES															
Phenanthrene	5300		ug/Kg	D	YES															
Pyrene	7400		ug/Kg	D	YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-HS1-A-04 **Lab Report Batch :** K0810422 **Lab ID :** CAS_K

Sample Date : 10/21/2008 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0810422-004

Reviewed By / Date : LG 1/20/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8270C SIM					**Dilution: 10**															
2-Methylnaphthalene	2300		ug/Kg	D	YES															
Acenaphthene	1600		ug/Kg	D	YES															
Acenaphthylene	880		ug/Kg	D	YES															
Anthracene	3200		ug/Kg	D	YES															
Benz(a)anthracene	5600		ug/Kg	D	YES															
Benzo(a)pyrene	5900		ug/Kg	D	YES															
Benzo(b)fluoranthene	6000		ug/Kg	D	YES															
Benzo(g,h,i)perylene	4000		ug/Kg	D	YES															
Benzo(k)fluoranthene	2100		ug/Kg	D	YES															
Chrysene	5800		ug/Kg	D	YES															
Dibenz(a,h)anthracene	880		ug/Kg	D	YES															
Dibenzofuran	960		ug/Kg	D	YES															
Fluoranthene	13000		ug/Kg	D	YES															
Fluorene	2200		ug/Kg	D	YES															
Indeno(1,2,3-cd)pyrene	4100		ug/Kg	D	YES															
Naphthalene	12000		ug/Kg	D	YES															
Phenanthrene	12000		ug/Kg	D	YES															
Pyrene	13000		ug/Kg	D	YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-OF2-D-01 **Lab Report Batch :** K0810422 **Lab ID :** CAS_K

Sample Date : 10/22/2008 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0810422-005

Reviewed By / Date : LG 1/20/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8270C SIM					**Dilution: 10**															
1-Methylnaphthalene	2300		ug/Kg	D	YES															
2-Methylnaphthalene	3000		ug/Kg	D	YES															
Acenaphthene	3000		ug/Kg	D	YES															
Acenaphthylene	1100		ug/Kg	D	YES															
Anthracene	3700		ug/Kg	D	YES															
Benz(a)anthracene	5300		ug/Kg	D	YES															
Benzo(a)pyrene	6900		ug/Kg	D	YES															
Benzo(b)fluoranthene	5600		ug/Kg	D	YES															
Benzo(g,h,i)perylene	4700		ug/Kg	D	YES															
Benzo(k)fluoranthene	1900		ug/Kg	D	YES															
C1-Chrysenes	3200		ug/Kg	D	YES															
C1-Fluoranthenes/Pyrenes	7200		ug/Kg	D	YES															
C1-Fluorenes	1000		ug/Kg	D	YES															
C1-Phenanthrenes/Anthracenes	5700		ug/Kg	D	YES															
C2-Chrysenes	980		ug/Kg	D	YES															
C2-Fluorenes	900		ug/Kg	D	YES															
C2-Naphthalenes	2500		ug/Kg	D	YES															
C2-Phenanthrenes/Anthracenes	2700		ug/Kg	D	YES															
C3-Chrysenes	350		ug/Kg	D	YES															
C3-Fluorenes	1100		ug/Kg	D	YES															
C3-Naphthalenes	1100		ug/Kg	D	YES															
C3-Phenanthrenes/Anthracenes	1200		ug/Kg	D	YES															
C4-Chrysenes	43		ug/Kg	U	YES															
C4-Naphthalenes	610		ug/Kg	D	YES															
C4-Phenanthrenes/Anthracenes	570		ug/Kg	D	YES															
Chrysene	5600		ug/Kg	D	YES															
Dibenz(a,h)anthracene	770		ug/Kg	D	YES															
Dibenzofuran	140		ug/Kg	D	YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-OF2-D-01 **Lab Report Batch :** K0810422 **Lab ID :** CAS_K

Sample Date : 10/22/2008 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0810422-005

Reviewed By / Date : LG 1/20/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8270C SIM					**Dilution: 10**															
Fluoranthene	8900		ug/Kg	D	YES															
Fluorene	1900		ug/Kg	D	YES															
Indeno(1,2,3-cd)pyrene	4400		ug/Kg	D	YES															
Naphthalene	4800		ug/Kg	D	YES															
Phenanthrene	12000		ug/Kg	D	YES															
Pyrene	12000		ug/Kg	D	YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-OF2-D-02 **Lab Report Batch :** K0810422 **Lab ID :** CAS_K

Sample Date : 10/22/2008 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0810422-006

Reviewed By / Date : LG 1/20/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8270C SIM					**Dilution: 1**															
2-Methylnaphthalene	770		ug/Kg		YES															
Acenaphthene	630		ug/Kg		YES															
Acenaphthylene	180		ug/Kg		YES															
Anthracene	800		ug/Kg		YES															
Benzo(g,h,i)perylene	1700		ug/Kg		YES															
Benzo(k)fluoranthene	1000		ug/Kg		YES															
Dibenz(a,h)anthracene	410		ug/Kg		YES															
Dibenzofuran	130		ug/Kg		YES															
Fluorene	590		ug/Kg		YES															
Indeno(1,2,3-cd)pyrene	1800		ug/Kg		YES															
Naphthalene	730		ug/Kg		YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-OF2-D-02 **Lab Report Batch :** K0810422 **Lab ID :** CAS_K

Sample Date : 10/22/2008 **Analysis Type: 2RES** **Sample Matrix :** SED

Lab Sample ID: K0810422-006

Reviewed By / Date : LG 1/20/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8270C SIM					**Dilution: 10**															
Benz(a)anthracene	1900		ug/Kg	D	YES															
Benzo(a)pyrene	2200		ug/Kg	D	YES															
Benzo(b)fluoranthene	2500		ug/Kg	D	YES															
Chrysene	2500		ug/Kg	D	YES															
Fluoranthene	4700		ug/Kg	D	YES															
Phenanthrene	3700		ug/Kg	D	YES															
Pyrene	4800		ug/Kg	D	YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-OF2-D-03 **Lab Report Batch :** K0810422 **Lab ID :** CAS_K

Sample Date : 10/22/2008 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0810422-007

Reviewed By / Date : LG 1/20/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8270C SIM					**Dilution: 10**															
2-Methylnaphthalene	1900		ug/Kg	D	YES															
Acenaphthene	1800		ug/Kg	D	YES															
Acenaphthylene	570		ug/Kg	D	YES															
Anthracene	2300		ug/Kg	D	YES															
Benz(a)anthracene	3700		ug/Kg	D	YES															
Benzo(a)pyrene	4100		ug/Kg	D	YES															
Benzo(b)fluoranthene	4200		ug/Kg	D	YES															
Benzo(g,h,i)perylene	3100		ug/Kg	D	YES															
Benzo(k)fluoranthene	1400		ug/Kg	D	YES															
Chrysene	4100		ug/Kg	D	YES															
Dibenz(a,h)anthracene	570		ug/Kg	D	YES															
Dibenzofuran	340		ug/Kg	D	YES															
Fluoranthene	8600		ug/Kg	D	YES															
Fluorene	1500		ug/Kg	D	YES															
Indeno(1,2,3-cd)pyrene	3000		ug/Kg	D	YES															
Naphthalene	1400		ug/Kg	D	YES															
Phenanthrene	9200		ug/Kg	D	YES															
Pyrene	9500		ug/Kg	D	YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-OF2-D-04 **Lab Report Batch :** K0810422 **Lab ID :** CAS_K

Sample Date : 10/22/2008 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0810422-008

Reviewed By / Date : LG 1/20/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8270C SIM					**Dilution: 10**															
2-Methylnaphthalene	4400		ug/Kg	D	YES															
Acenaphthene	4600		ug/Kg	D	YES															
Acenaphthylene	720		ug/Kg	D	YES															
Anthracene	4500		ug/Kg	D	YES															
Benz(a)anthracene	4900		ug/Kg	D	YES															
Benzo(a)pyrene	5400		ug/Kg	D	YES															
Benzo(b)fluoranthene	4900		ug/Kg	D	YES															
Benzo(g,h,i)perylene	3600		ug/Kg	D	YES															
Benzo(k)fluoranthene	1700		ug/Kg	D	YES															
Chrysene	5300		ug/Kg	D	YES															
Dibenz(a,h)anthracene	670		ug/Kg	D	YES															
Dibenzofuran	480		ug/Kg	D	YES															
Fluoranthene	11000		ug/Kg	D	YES															
Fluorene	3000		ug/Kg	D	YES															
Indeno(1,2,3-cd)pyrene	3400		ug/Kg	D	YES															
Naphthalene	2200		ug/Kg	D	YES															
Phenanthrene	18000		ug/Kg	D	YES															
Pyrene	15000		ug/Kg	D	YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-OF2-D-05 **Lab Report Batch :** K0810422 **Lab ID :** CAS_K

Sample Date : 10/15/2008 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0810422-009

Reviewed By / Date : LG 1/20/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8270C SIM					**Dilution: 10**															
2-Methylnaphthalene	2900		ug/Kg	D	YES															
Acenaphthene	2400		ug/Kg	D	YES															
Acenaphthylene	500		ug/Kg	D	YES															
Anthracene	2700		ug/Kg	D	YES															
Benz(a)anthracene	3900		ug/Kg	D	YES															
Benzo(a)pyrene	4300		ug/Kg	D	YES															
Benzo(b)fluoranthene	4300		ug/Kg	D	YES															
Benzo(g,h,i)perylene	3000		ug/Kg	D	YES															
Benzo(k)fluoranthene	1600		ug/Kg	D	YES															
Chrysene	4300		ug/Kg	D	YES															
Dibenz(a,h)anthracene	600		ug/Kg	D	YES															
Dibenzofuran	580		ug/Kg	D	YES															
Fluoranthene	9100		ug/Kg	D	YES															
Fluorene	1900		ug/Kg	D	YES															
Indeno(1,2,3-cd)pyrene	3000		ug/Kg	D	YES															
Naphthalene	2300		ug/Kg	D	YES															
Phenanthrene	11000		ug/Kg	D	YES															
Pyrene	10000		ug/Kg	D	YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-OF2-E-01 **Lab Report Batch :** K0810422 **Lab ID :** CAS_K

Sample Date : 10/22/2008 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0810422-010

Reviewed By / Date : LG 1/20/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8270C SIM					**Dilution: 10**															
1-Methylnaphthalene	350		ug/Kg	D	YES															
2-Methylnaphthalene	300		ug/Kg	D	YES															
Acenaphthene	420		ug/Kg	D	YES															
Acenaphthylene	450		ug/Kg	D	YES															
Anthracene	800		ug/Kg	D	YES															
Benz(a)anthracene	3300		ug/Kg	D	YES															
Benzo(a)pyrene	3800		ug/Kg	D	YES															
Benzo(b)fluoranthene	4300		ug/Kg	D	YES															
Benzo(g,h,i)perylene	3200		ug/Kg	D	YES															
Benzo(k)fluoranthene	1400		ug/Kg	D	YES															
C1-Chrysenes	3500		ug/Kg	D	YES															
C1-Fluoranthenes/Pyrenes	6000		ug/Kg	D	YES															
C1-Fluorenes	1100		ug/Kg	D	YES															
C1-Phenanthrenes/Anthracenes	6100		ug/Kg	D	YES															
C2-Chrysenes	2000		ug/Kg	D	YES															
C2-Fluorenes	4100		ug/Kg	D	YES															
C2-Naphthalenes	2800		ug/Kg	D	YES															
C2-Phenanthrenes/Anthracenes	9100		ug/Kg	D	YES															
C3-Chrysenes	1200		ug/Kg	D	YES															
C3-Fluorenes	7000		ug/Kg	D	YES															
C3-Naphthalenes	5200		ug/Kg	D	YES															
C3-Phenanthrenes/Anthracenes	8200		ug/Kg	D	YES															
C4-Chrysenes	56		ug/Kg	U	YES															
C4-Naphthalenes	8200		ug/Kg	D	YES															
C4-Phenanthrenes/Anthracenes	5800		ug/Kg	D	YES															
Chrysene	4300		ug/Kg	D	YES															
Dibenz(a,h)anthracene	610		ug/Kg	D	YES															
Dibenzofuran	160		ug/Kg	D	YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-OF2-E-01 **Lab Report Batch :** K0810422 **Lab ID :** CAS_K

Sample Date : 10/22/2008 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0810422-010

Reviewed By / Date : LG 1/20/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8270C SIM					**Dilution: 10**															
Fluoranthene	7600		ug/Kg	D	YES															
Fluorene	690		ug/Kg	D	YES															
Indeno(1,2,3-cd)pyrene	3000		ug/Kg	D	YES															
Naphthalene	340		ug/Kg	D	YES															
Phenanthrene	4800		ug/Kg	D	YES															
Pyrene	8200		ug/Kg	D	YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-OF2-E-02 **Lab Report Batch :** K0810422 **Lab ID :** CAS_K

Sample Date : 10/22/2008 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0810422-011

Reviewed By / Date : LG 1/20/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8270C SIM					**Dilution: 10**															
2-Methylnaphthalene	3100		ug/Kg	D	YES															
Acenaphthene	3100		ug/Kg	D	YES															
Acenaphthylene	670		ug/Kg	D	YES															
Anthracene	3500		ug/Kg	D	YES															
Benz(a)anthracene	5300		ug/Kg	D	YES															
Benzo(a)pyrene	5300		ug/Kg	D	YES															
Benzo(b)fluoranthene	5200		ug/Kg	D	YES															
Benzo(g,h,i)perylene	3800		ug/Kg	D	YES															
Benzo(k)fluoranthene	1700		ug/Kg	D	YES															
Chrysene	6500		ug/Kg	D	YES															
Dibenz(a,h)anthracene	820		ug/Kg	D	YES															
Dibenzofuran	470		ug/Kg	D	YES															
Fluoranthene	12000		ug/Kg	D	YES															
Fluorene	2500		ug/Kg	D	YES															
Indeno(1,2,3-cd)pyrene	3600		ug/Kg	D	YES															
Naphthalene	2400		ug/Kg	D	YES															
Phenanthrene	17000		ug/Kg	D	YES															
Pyrene	15000		ug/Kg	D	YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-OF2-E-03 **Lab Report Batch :** K0810422 **Lab ID :** CAS_K

Sample Date : 10/22/2008 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0810422-012

Reviewed By / Date : LG 1/20/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8270C SIM					**Dilution: 10**															
2-Methylnaphthalene	1800		ug/Kg	D	YES															
Acenaphthene	1700		ug/Kg	D	YES															
Acenaphthylene	340		ug/Kg	D	YES															
Anthracene	2200		ug/Kg	D	YES															
Benz(a)anthracene	2900		ug/Kg	D	YES															
Benzo(a)pyrene	3200		ug/Kg	D	YES															
Benzo(b)fluoranthene	3000		ug/Kg	D	YES															
Benzo(g,h,i)perylene	2300		ug/Kg	D	YES															
Benzo(k)fluoranthene	1100		ug/Kg	D	YES															
Chrysene	3200		ug/Kg	D	YES															
Dibenz(a,h)anthracene	460		ug/Kg	D	YES															
Dibenzofuran	450		ug/Kg	D	YES															
Fluoranthene	6800		ug/Kg	D	YES															
Fluorene	1400		ug/Kg	D	YES															
Indeno(1,2,3-cd)pyrene	2200		ug/Kg	D	YES															
Naphthalene	2100		ug/Kg	D	YES															
Phenanthrene	8000		ug/Kg	D	YES															
Pyrene	7500		ug/Kg	D	YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-OF2-E-04 **Lab Report Batch :** K0810422 **Lab ID :** CAS_K

Sample Date : 10/22/2008 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0810422-013

Reviewed By / Date : LG 1/20/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8270C SIM					**Dilution: 10**															
2-Methylnaphthalene	2200		ug/Kg	D	YES															
Acenaphthene	1600		ug/Kg	D	YES															
Acenaphthylene	280		ug/Kg	D	YES															
Anthracene	1700		ug/Kg	D	YES															
Benz(a)anthracene	2700		ug/Kg	D	YES															
Benzo(a)pyrene	2800		ug/Kg	D	YES															
Benzo(b)fluoranthene	3200		ug/Kg	D	YES															
Benzo(g,h,i)perylene	2200		ug/Kg	D	YES															
Benzo(k)fluoranthene	1200		ug/Kg	D	YES															
Chrysene	3200		ug/Kg	D	YES															
Dibenz(a,h)anthracene	440		ug/Kg	D	YES															
Dibenzofuran	540		ug/Kg	D	YES															
Fluoranthene	7300		ug/Kg	D	YES															
Fluorene	1400		ug/Kg	D	YES															
Indeno(1,2,3-cd)pyrene	2200		ug/Kg	D	YES															
Naphthalene	2000		ug/Kg	D	YES															
Phenanthrene	8100		ug/Kg	D	YES															
Pyrene	7400		ug/Kg	D	YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-OF2-E-05 **Lab Report Batch :** K0810422 **Lab ID :** CAS_K

Sample Date : 10/22/2008 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0810422-014

Reviewed By / Date : LG 1/20/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8270C SIM					**Dilution: 10**															
2-Methylnaphthalene	2600		ug/Kg	D	YES															
Acenaphthene	2600		ug/Kg	D	YES															
Acenaphthylene	1500		ug/Kg	D	YES	**J**					J									
Anthracene	3800		ug/Kg	D	YES															
Benz(a)anthracene	5700		ug/Kg	D	YES															
Benzo(a)pyrene	7400		ug/Kg	D	YES															
Benzo(b)fluoranthene	6600		ug/Kg	D	YES															
Benzo(g,h,i)perylene	4900		ug/Kg	D	YES															
Benzo(k)fluoranthene	2200		ug/Kg	D	YES															
Chrysene	6500		ug/Kg	D	YES															
Dibenz(a,h)anthracene	850		ug/Kg	D	YES	**J**					J									
Dibenzofuran	630		ug/Kg	D	YES	**J**					J									
Fluoranthene	12000		ug/Kg	D	YES															
Fluorene	2200		ug/Kg	D	YES															
Indeno(1,2,3-cd)pyrene	4700		ug/Kg	D	YES															
Naphthalene	3500		ug/Kg	D	YES															
Phenanthrene	13000		ug/Kg	D	YES															
Pyrene	13000		ug/Kg	D	YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-HS5-A-01 **Lab Report Batch :** K0810423 **Lab ID :** CAS_K

Sample Date : 10/22/2008 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0810423-011

Reviewed By / Date : LG 1/20/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8270C SIM					**Dilution: 10**															
1-Methylnaphthalene	140		ug/Kg	D	YES															
2-Methylnaphthalene	270		ug/Kg	D	YES															
Acenaphthene	150		ug/Kg	D	YES															
Acenaphthylene	150		ug/Kg	D	YES															
Anthracene	460		ug/Kg	D	YES															
Benz(a)anthracene	1500		ug/Kg	D	YES															
Benzo(a)pyrene	2000		ug/Kg	D	YES															
Benzo(b)fluoranthene	2700		ug/Kg	D	YES															
Benzo(g,h,i)perylene	1900		ug/Kg	D	YES															
Benzo(k)fluoranthene	990		ug/Kg	D	YES															
C1-Chrysenes	1400		ug/Kg	D	YES															
C1-Fluoranthenes/Pyrenes	2100		ug/Kg	D	YES															
C1-Fluorenes	290		ug/Kg	D	YES															
C1-Phenanthrenes/Anthracenes	1300		ug/Kg	D	YES															
C2-Chrysenes	970		ug/Kg	D	YES															
C2-Fluorenes	570		ug/Kg	D	YES															
C2-Naphthalenes	580		ug/Kg	D	YES															
C2-Phenanthrenes/Anthracenes	1700		ug/Kg	D	YES															
C3-Chrysenes	740		ug/Kg	D	YES															
C3-Fluorenes	1800		ug/Kg	D	YES															
C3-Naphthalenes	680		ug/Kg	D	YES															
C3-Phenanthrenes/Anthracenes	2100		ug/Kg	D	YES															
C4-Chrysenes	50		ug/Kg	U	YES															
C4-Naphthalenes	800		ug/Kg	D	YES															
C4-Phenanthrenes/Anthracenes	1600		ug/Kg	D	YES															
Chrysene	2200		ug/Kg	D	YES															
Dibenz(a,h)anthracene	390		ug/Kg	D	YES															
Dibenzofuran	140		ug/Kg	D	YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-HS5-A-01 **Lab Report Batch :** K0810423 **Lab ID :** CAS_K

Sample Date : 10/22/2008 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0810423-011

Reviewed By / Date : LG 1/20/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8270C SIM					**Dilution: 10**															
Fluoranthene	3600		ug/Kg	D	YES															
Fluorene	230		ug/Kg	D	YES															
Indeno(1,2,3-cd)pyrene	2000		ug/Kg	D	YES															
Naphthalene	520		ug/Kg	D	YES															
Phenanthrene	1600		ug/Kg	D	YES															
Pyrene	3100		ug/Kg	D	YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-OF2-B-01 **Lab Report Batch :** K0810423 **Lab ID :** CAS_K

Sample Date : 10/22/2008 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0810423-001

Reviewed By / Date : LG 1/20/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8270C SIM					**Dilution: 10**															
1-Methylnaphthalene	1600		ug/Kg	D	YES															
2-Methylnaphthalene	2200		ug/Kg	D	YES															
Acenaphthene	1700		ug/Kg	D	YES															
Acenaphthylene	570		ug/Kg	D	YES															
Anthracene	2600		ug/Kg	D	YES															
Benz(a)anthracene	4100		ug/Kg	D	YES															
Benzo(a)pyrene	4600		ug/Kg	D	YES															
Benzo(b)fluoranthene	5100		ug/Kg	D	YES															
Benzo(g,h,i)perylene	3300		ug/Kg	D	YES															
Benzo(k)fluoranthene	1600		ug/Kg	D	YES															
C1-Chrysenes	3300		ug/Kg	D	YES															
C1-Fluoranthenes/Pyrenes	6700		ug/Kg	D	YES															
C1-Fluorenes	1800		ug/Kg	D	YES															
C1-Phenanthrenes/Anthracenes	8900		ug/Kg	D	YES															
C2-Chrysenes	1800		ug/Kg	D	YES															
C2-Fluorenes	4900		ug/Kg	D	YES															
C2-Naphthalenes	6300		ug/Kg	D	YES															
C2-Phenanthrenes/Anthracenes	9500		ug/Kg	D	YES															
C3-Chrysenes	1200		ug/Kg	D	YES															
C3-Fluorenes	8300		ug/Kg	D	YES															
C3-Naphthalenes	8800		ug/Kg	D	YES															
C3-Phenanthrenes/Anthracenes	8400		ug/Kg	D	YES															
C4-Chrysenes	600		ug/Kg	D	YES															
C4-Naphthalenes	9000		ug/Kg	D	YES															
C4-Phenanthrenes/Anthracenes	5700		ug/Kg	D	YES															
Chrysene	4700		ug/Kg	D	YES															
Dibenz(a,h)anthracene	720		ug/Kg	D	YES															
Dibenzofuran	370		ug/Kg	D	YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-OF2-B-01 **Lab Report Batch :** K0810423 **Lab ID :** CAS_K

Sample Date : 10/22/2008 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0810423-001

Reviewed By / Date : LG 1/20/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8270C SIM					**Dilution: 10**															
Fluoranthene	9600		ug/Kg	D	YES															
Fluorene	1700		ug/Kg	D	YES															
Indeno(1,2,3-cd)pyrene	3200		ug/Kg	D	YES															
Naphthalene	2000		ug/Kg	D	YES															
Phenanthrene	10000		ug/Kg	D	YES															
Pyrene	10000		ug/Kg	D	YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-OF2-B-02 **Lab Report Batch :** K0810423 **Lab ID :** CAS_K

Sample Date : 10/22/2008 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0810423-002

Reviewed By / Date : LG 1/20/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8270C SIM					**Dilution: 10**															
2-Methylnaphthalene	1500		ug/Kg	D	YES															
Acenaphthene	1100		ug/Kg	D	YES															
Acenaphthylene	330		ug/Kg	D	YES															
Anthracene	1700		ug/Kg	D	YES															
Benz(a)anthracene	2200		ug/Kg	D	YES															
Benzo(a)pyrene	2500		ug/Kg	D	YES															
Benzo(b)fluoranthene	2600		ug/Kg	D	YES															
Benzo(g,h,i)perylene	1900		ug/Kg	D	YES															
Benzo(k)fluoranthene	920		ug/Kg	D	YES															
Chrysene	2700		ug/Kg	D	YES															
Dibenz(a,h)anthracene	400		ug/Kg	D	YES															
Dibenzofuran	320		ug/Kg	D	YES															
Fluoranthene	6000		ug/Kg	D	YES															
Fluorene	1100		ug/Kg	D	YES															
Indeno(1,2,3-cd)pyrene	1800		ug/Kg	D	YES															
Naphthalene	1300		ug/Kg	D	YES															
Phenanthrene	6800		ug/Kg	D	YES															
Pyrene	6200		ug/Kg	D	YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-OF2-B-03 **Lab Report Batch :** K0810423 **Lab ID :** CAS_K

Sample Date : 10/22/2008 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0810423-003

Reviewed By / Date : LG 1/20/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8270C SIM					**Dilution: 10**															
2-Methylnaphthalene	1800		ug/Kg	D	YES															
Acenaphthene	1200		ug/Kg	D	YES															
Acenaphthylene	280		ug/Kg	D	YES															
Anthracene	1400		ug/Kg	D	YES															
Benz(a)anthracene	2300		ug/Kg	D	YES															
Benzo(a)pyrene	2500		ug/Kg	D	YES															
Benzo(b)fluoranthene	3000		ug/Kg	D	YES															
Benzo(g,h,i)perylene	2000		ug/Kg	D	YES															
Benzo(k)fluoranthene	1000		ug/Kg	D	YES															
Chrysene	2800		ug/Kg	D	YES															
Dibenz(a,h)anthracene	420		ug/Kg	D	YES															
Dibenzofuran	590		ug/Kg	D	YES															
Fluoranthene	6900		ug/Kg	D	YES															
Fluorene	1300		ug/Kg	D	YES															
Indeno(1,2,3-cd)pyrene	2000		ug/Kg	D	YES															
Naphthalene	1300		ug/Kg	D	YES															
Phenanthrene	7000		ug/Kg	D	YES															
Pyrene	5900		ug/Kg	D	YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-OF2-B-04 **Lab Report Batch :** K0810423 **Lab ID :** CAS_K

Sample Date : 10/22/2008 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0810423-004

Reviewed By / Date : LG 1/20/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8270C SIM					**Dilution: 10**															
2-Methylnaphthalene	1300		ug/Kg	D	YES															
Acenaphthene	1000		ug/Kg	D	YES															
Acenaphthylene	460		ug/Kg	D	YES															
Anthracene	1300		ug/Kg	D	YES															
Benz(a)anthracene	2900		ug/Kg	D	YES															
Benzo(a)pyrene	3500		ug/Kg	D	YES															
Benzo(b)fluoranthene	3500		ug/Kg	D	YES															
Benzo(g,h,i)perylene	2500		ug/Kg	D	YES															
Benzo(k)fluoranthene	1300		ug/Kg	D	YES															
Chrysene	3200		ug/Kg	D	YES															
Dibenz(a,h)anthracene	570		ug/Kg	D	YES															
Dibenzofuran	360		ug/Kg	D	YES															
Fluoranthene	6300		ug/Kg	D	YES															
Fluorene	920		ug/Kg	D	YES															
Indeno(1,2,3-cd)pyrene	2500		ug/Kg	D	YES															
Naphthalene	1600		ug/Kg	D	YES															
Phenanthrene	5300		ug/Kg	D	YES															
Pyrene	6000		ug/Kg	D	YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-OF2-B-05 **Lab Report Batch :** K0810423 **Lab ID :** CAS_K

Sample Date : 10/22/2008 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0810423-005

Reviewed By / Date : LG 1/20/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8270C SIM					**Dilution: 20**															
2-Methylnaphthalene	7800		ug/Kg	D	YES															
Acenaphthene	8900		ug/Kg	D	YES															
Acenaphthylene	1100		ug/Kg	D	YES															
Anthracene	6200		ug/Kg	D	YES															
Benz(a)anthracene	6300		ug/Kg	D	YES															
Benzo(a)pyrene	6300		ug/Kg	D	YES															
Benzo(b)fluoranthene	5600		ug/Kg	D	YES															
Benzo(g,h,i)perylene	4000		ug/Kg	D	YES															
Benzo(k)fluoranthene	2000		ug/Kg	D	YES															
Chrysene	6300		ug/Kg	D	YES															
Dibenz(a,h)anthracene	850		ug/Kg	D	YES															
Dibenzofuran	1400		ug/Kg	D	YES															
Fluoranthene	16000		ug/Kg	D	YES															
Fluorene	5100		ug/Kg	D	YES															
Indeno(1,2,3-cd)pyrene	3900		ug/Kg	D	YES															
Naphthalene	15000		ug/Kg	D	YES															
Phenanthrene	25000		ug/Kg	D	YES															
Pyrene	17000		ug/Kg	D	YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-OF2-C-01 **Lab Report Batch :** K0810423 **Lab ID :** CAS_K

Sample Date : 10/22/2008 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0810423-006

Reviewed By / Date : LG 1/20/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8270C SIM					**Dilution: 10**															
1-Methylnaphthalene	460		ug/Kg	D	YES															
2-Methylnaphthalene	520		ug/Kg	D	YES															
Acenaphthene	560		ug/Kg	D	YES															
Acenaphthylene	700		ug/Kg	D	YES															
Anthracene	1100		ug/Kg	D	YES															
Benz(a)anthracene	3100		ug/Kg	D	YES															
Benzo(a)pyrene	4200		ug/Kg	D	YES															
Benzo(b)fluoranthene	3800		ug/Kg	D	YES															
Benzo(g,h,i)perylene	3000		ug/Kg	D	YES															
Benzo(k)fluoranthene	1300		ug/Kg	D	YES															
C1-Chrysenes	2200		ug/Kg	D	YES															
C1-Fluoranthenes/Pyrenes	4600		ug/Kg	D	YES															
C1-Fluorenes	960		ug/Kg	D	YES															
C1-Phenanthrenes/Anthracenes	3800		ug/Kg	D	YES															
C2-Chrysenes	950		ug/Kg	D	YES															
C2-Fluorenes	1400		ug/Kg	D	YES															
C2-Naphthalenes	1700		ug/Kg	D	YES															
C2-Phenanthrenes/Anthracenes	3200		ug/Kg	D	YES															
C3-Chrysenes	390		ug/Kg	D	YES															
C3-Fluorenes	2000		ug/Kg	D	YES															
C3-Naphthalenes	2100		ug/Kg	D	YES															
C3-Phenanthrenes/Anthracenes	2700		ug/Kg	D	YES															
C4-Chrysenes	50		ug/Kg	U	YES															
C4-Naphthalenes	2200		ug/Kg	D	YES															
C4-Phenanthrenes/Anthracenes	1700		ug/Kg	D	YES															
Chrysene	3600		ug/Kg	D	YES															
Dibenz(a,h)anthracene	550		ug/Kg	D	YES															
Dibenzofuran	120		ug/Kg	D	YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-OF2-C-01 **Lab Report Batch :** K0810423 **Lab ID :** CAS_K

Sample Date : 10/22/2008 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0810423-006

Reviewed By / Date : LG 1/20/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8270C SIM					**Dilution: 10**															
Fluoranthene	6200		ug/Kg	D	YES															
Fluorene	620		ug/Kg	D	YES															
Indeno(1,2,3-cd)pyrene	2900		ug/Kg	D	YES															
Naphthalene	620		ug/Kg	D	YES															
Phenanthrene	5000		ug/Kg	D	YES															
Pyrene	7000		ug/Kg	D	YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-OF2-C-02 **Lab Report Batch :** K0810423 **Lab ID :** CAS_K

Sample Date : 10/22/2008 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0810423-007

Reviewed By / Date : LG 1/20/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8270C SIM					**Dilution: 10**															
2-Methylnaphthalene	4400		ug/Kg	D	YES															
Acenaphthene	4000		ug/Kg	D	YES															
Acenaphthylene	890		ug/Kg	D	YES															
Anthracene	4300		ug/Kg	D	YES															
Benz(a)anthracene	4200		ug/Kg	D	YES															
Benzo(a)pyrene	4800		ug/Kg	D	YES															
Benzo(b)fluoranthene	4500		ug/Kg	D	YES															
Benzo(g,h,i)perylene	3400		ug/Kg	D	YES															
Benzo(k)fluoranthene	1500		ug/Kg	D	YES															
Chrysene	4700		ug/Kg	D	YES															
Dibenz(a,h)anthracene	660		ug/Kg	D	YES															
Dibenzofuran	480		ug/Kg	D	YES															
Fluoranthene	12000		ug/Kg	D	YES															
Fluorene	3100		ug/Kg	D	YES															
Indeno(1,2,3-cd)pyrene	3200		ug/Kg	D	YES															
Naphthalene	2200		ug/Kg	D	YES															
Phenanthrene	17000		ug/Kg	D	YES															
Pyrene	13000		ug/Kg	D	YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-OF2-C-03 **Lab Report Batch :** K0810423 **Lab ID :** CAS_K

Sample Date : 10/22/2008 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0810423-008

Reviewed By / Date : LG 1/20/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8270C SIM					**Dilution: 10**															
2-Methylnaphthalene	1100		ug/Kg	D	YES															
Acenaphthene	790		ug/Kg	D	YES															
Acenaphthylene	260		ug/Kg	D	YES															
Anthracene	1300		ug/Kg	D	YES															
Benz(a)anthracene	1900		ug/Kg	D	YES															
Benzo(a)pyrene	2200		ug/Kg	D	YES															
Benzo(b)fluoranthene	2500		ug/Kg	D	YES															
Benzo(g,h,i)perylene	1800		ug/Kg	D	YES															
Benzo(k)fluoranthene	900		ug/Kg	D	YES															
Chrysene	2500		ug/Kg	D	YES															
Dibenz(a,h)anthracene	420		ug/Kg	D	YES															
Dibenzofuran	330		ug/Kg	D	YES															
Fluoranthene	5700		ug/Kg	D	YES															
Fluorene	930		ug/Kg	D	YES															
Indeno(1,2,3-cd)pyrene	1700		ug/Kg	D	YES															
Naphthalene	910		ug/Kg	D	YES															
Phenanthrene	5700		ug/Kg	D	YES															
Pyrene	5300		ug/Kg	D	YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-OF2-C-04 **Lab Report Batch :** K0810423 **Lab ID :** CAS_K

Sample Date : 10/22/2008 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0810423-009

Reviewed By / Date : LG 1/20/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8270C SIM					**Dilution: 10**															
2-Methylnaphthalene	2600		ug/Kg	D	YES															
Acenaphthene	2500		ug/Kg	D	YES															
Acenaphthylene	450		ug/Kg	D	YES															
Anthracene	1900		ug/Kg	D	YES															
Benz(a)anthracene	3200		ug/Kg	D	YES															
Benzo(a)pyrene	3800		ug/Kg	D	YES															
Benzo(b)fluoranthene	4300		ug/Kg	D	YES															
Benzo(g,h,i)perylene	2800		ug/Kg	D	YES															
Benzo(k)fluoranthene	1500		ug/Kg	D	YES															
Chrysene	3700		ug/Kg	D	YES															
Dibenz(a,h)anthracene	610		ug/Kg	D	YES															
Dibenzofuran	620		ug/Kg	D	YES															
Fluoranthene	7500		ug/Kg	D	YES															
Fluorene	1600		ug/Kg	D	YES															
Indeno(1,2,3-cd)pyrene	2800		ug/Kg	D	YES															
Naphthalene	4800		ug/Kg	D	YES															
Phenanthrene	8100		ug/Kg	D	YES															
Pyrene	7400		ug/Kg	D	YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-OF2-C-05 **Lab Report Batch :** K0810423 **Lab ID :** CAS_K

Sample Date : 10/22/2008 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0810423-010

Reviewed By / Date : LG 1/20/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8270C SIM					**Dilution: 20**															
2-Methylnaphthalene	8500		ug/Kg	D	YES															
Acenaphthene	9700		ug/Kg	D	YES															
Acenaphthylene	1100		ug/Kg	D	YES	**J**					J									
Anthracene	7400		ug/Kg	D	YES															
Benz(a)anthracene	6600		ug/Kg	D	YES															
Benzo(a)pyrene	6600		ug/Kg	D	YES															
Benzo(b)fluoranthene	6200		ug/Kg	D	YES															
Benzo(g,h,i)perylene	4200		ug/Kg	D	YES															
Benzo(k)fluoranthene	2200		ug/Kg	D	YES															
Chrysene	5600		ug/Kg	D	YES															
Dibenz(a,h)anthracene	880		ug/Kg	D	YES	**J**					J									
Dibenzofuran	1500		ug/Kg	D	YES	**J**					J									
Fluoranthene	18000		ug/Kg	D	YES															
Fluorene	5500		ug/Kg	D	YES															
Indeno(1,2,3-cd)pyrene	4100		ug/Kg	D	YES															
Naphthalene	12000		ug/Kg	D	YES															
Phenanthrene	27000		ug/Kg	D	YES															
Pyrene	18000		ug/Kg	D	YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-OBC-A-01 **Lab Report Batch :** K0810465 **Lab ID :** CAS_K

Sample Date : 10/23/2008 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0810465-001

Reviewed By / Date : LG 1/29/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8270C SIM					**Dilution: 10**															
1-Methylnaphthalene	1400		ug/Kg	D	YES															
2-Methylnaphthalene	1300		ug/Kg	D	YES															
Acenaphthene	1000		ug/Kg	D	YES															
Acenaphthylene	200		ug/Kg	D	YES															
Anthracene	5200		ug/Kg	D	YES															
Benz(a)anthracene	4100		ug/Kg	D	YES															
Benzo(a)pyrene	3200		ug/Kg	D	YES															
Benzo(b)fluoranthene	4200		ug/Kg	D	YES															
Benzo(g,h,i)perylene	2300		ug/Kg	D	YES															
Benzo(k)fluoranthene	1600		ug/Kg	D	YES															
C1-Chrysenes	3900		ug/Kg	D	YES															
C1-Fluoranthenes/Pyrenes	7600		ug/Kg	D	YES															
C1-Fluorenes	4100		ug/Kg	D	YES															
C1-Phenanthrenes/Anthracenes	12000		ug/Kg	D	YES															
C2-Chrysenes	3000		ug/Kg	D	YES															
C2-Fluorenes	6700		ug/Kg	D	YES															
C2-Naphthalenes	16000		ug/Kg	D	YES															
C2-Phenanthrenes/Anthracenes	13000		ug/Kg	D	YES															
C3-Chrysenes	2300		ug/Kg	D	YES															
C3-Fluorenes	11000		ug/Kg	D	YES															
C3-Naphthalenes	20000		ug/Kg	ED	YES															
C3-Phenanthrenes/Anthracenes	9900		ug/Kg	D	YES															
C4-Chrysenes	1700		ug/Kg	D	YES															
C4-Naphthalenes	16000		ug/Kg	D	YES															
C4-Phenanthrenes/Anthracenes	4800		ug/Kg	D	YES															
Chrysene	5100		ug/Kg	D	YES															
Dibenz(a,h)anthracene	510		ug/Kg	D	YES															
Dibenzofuran	400		ug/Kg	D	YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-OBC-A-01 **Lab Report Batch :** K0810465 **Lab ID :** CAS_K

Sample Date : 10/23/2008 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0810465-001

Reviewed By / Date : LG 1/29/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8270C SIM					**Dilution: 10**															
Fluoranthene	14000		ug/Kg	D	YES															
Fluorene	2400		ug/Kg	D	YES															
Indeno(1,2,3-cd)pyrene	2600		ug/Kg	D	YES															
Naphthalene	490		ug/Kg	D	YES															
Phenanthrene	12000		ug/Kg	D	YES															
Pyrene	11000		ug/Kg	D	YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-OBC-A-02 **Lab Report Batch :** K0810465 **Lab ID :** CAS_K

Sample Date : 10/23/2008 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0810465-002

Reviewed By / Date : LG 1/29/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8270C SIM					**Dilution: 10**															
2-Methylnaphthalene	670		ug/Kg	D	YES															
Acenaphthene	610		ug/Kg	D	YES															
Acenaphthylene	190		ug/Kg	D	YES															
Anthracene	2300		ug/Kg	D	YES															
Benz(a)anthracene	3200		ug/Kg	D	YES															
Benzo(a)pyrene	3000		ug/Kg	D	YES															
Benzo(b)fluoranthene	4100		ug/Kg	D	YES															
Benzo(g,h,i)perylene	2300		ug/Kg	D	YES															
Benzo(k)fluoranthene	1500		ug/Kg	D	YES															
Chrysene	4100		ug/Kg	D	YES															
Dibenz(a,h)anthracene	550		ug/Kg	D	YES															
Dibenzofuran	470		ug/Kg	D	YES															
Fluoranthene	9700		ug/Kg	D	YES															
Fluorene	1200		ug/Kg	D	YES															
Indeno(1,2,3-cd)pyrene	2600		ug/Kg	D	YES															
Naphthalene	840		ug/Kg	D	YES															
Phenanthrene	7100		ug/Kg	D	YES															
Pyrene	7300		ug/Kg	D	YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-OBC-A-03 **Lab Report Batch :** K0810465 **Lab ID :** CAS_K

Sample Date : 10/23/2008 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0810465-003

Reviewed By / Date : LG 1/29/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8270C SIM					**Dilution: 10**															
2-Methylnaphthalene	920		ug/Kg	D	YES															
Acenaphthene	840		ug/Kg	D	YES															
Acenaphthylene	270		ug/Kg	D	YES															
Anthracene	2600		ug/Kg	D	YES															
Benz(a)anthracene	3500		ug/Kg	D	YES															
Benzo(a)pyrene	3300		ug/Kg	D	YES															
Benzo(b)fluoranthene	4100		ug/Kg	D	YES															
Benzo(g,h,i)perylene	2400		ug/Kg	D	YES															
Benzo(k)fluoranthene	1400		ug/Kg	D	YES															
Chrysene	4000		ug/Kg	D	YES															
Dibenz(a,h)anthracene	600		ug/Kg	D	YES															
Dibenzofuran	710		ug/Kg	D	YES															
Fluoranthene	10000		ug/Kg	D	YES															
Fluorene	1700		ug/Kg	D	YES															
Indeno(1,2,3-cd)pyrene	2500		ug/Kg	D	YES															
Naphthalene	1600		ug/Kg	D	YES															
Phenanthrene	9000		ug/Kg	D	YES															
Pyrene	8300		ug/Kg	D	YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-OBC-B-01 **Lab Report Batch :** K0810465 **Lab ID :** CAS_K

Sample Date : 10/23/2008 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0810465-004

Reviewed By / Date : LG 1/29/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8270C SIM					**Dilution: 10**															
1-Methylnaphthalene	9900		ug/Kg	D	YES															
2-Methylnaphthalene	12000		ug/Kg	D	YES															
Acenaphthene	2400		ug/Kg	D	YES															
Acenaphthylene	590		ug/Kg	D	YES															
Anthracene	3400		ug/Kg	D	YES															
Benz(a)anthracene	3200		ug/Kg	D	YES															
Benzo(a)pyrene	3000		ug/Kg	D	YES															
Benzo(b)fluoranthene	3300		ug/Kg	D	YES															
Benzo(g,h,i)perylene	2000		ug/Kg	D	YES															
Benzo(k)fluoranthene	1100		ug/Kg	D	YES															
C1-Chrysenes	3800		ug/Kg	D	YES															
C1-Fluoranthenes/Pyrenes	6900		ug/Kg	D	YES															
C1-Fluorenes	8400		ug/Kg	D	YES															
C1-Phenanthrenes/Anthracenes	20000		ug/Kg	ED	YES															
C2-Chrysenes	3100		ug/Kg	D	YES															
C2-Fluorenes	11000		ug/Kg	D	YES															
C2-Naphthalenes	50000		ug/Kg	ED	YES															
C2-Phenanthrenes/Anthracenes	20000		ug/Kg	ED	YES															
C3-Chrysenes	2000		ug/Kg	D	YES															
C3-Fluorenes	14000		ug/Kg	D	YES															
C3-Naphthalenes	43000		ug/Kg	ED	YES															
C3-Phenanthrenes/Anthracenes	15000		ug/Kg	D	YES															
C4-Chrysenes	1300		ug/Kg	D	YES															
C4-Naphthalenes	28000		ug/Kg	ED	YES															
C4-Phenanthrenes/Anthracenes	8600		ug/Kg	D	YES															
Chrysene	3700		ug/Kg	D	YES															
Dibenz(a,h)anthracene	490		ug/Kg	D	YES															
Dibenzofuran	1200		ug/Kg	D	YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-OBC-B-01 **Lab Report Batch :** K0810465 **Lab ID :** CAS_K

Sample Date : 10/23/2008 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0810465-004

Reviewed By / Date : LG 1/29/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8270C SIM					**Dilution: 10**															
Fluoranthene	8400		ug/Kg	D	YES															
Fluorene	3200		ug/Kg	D	YES															
Indeno(1,2,3-cd)pyrene	2100		ug/Kg	D	YES															
Naphthalene	3300		ug/Kg	D	YES															
Phenanthrene	14000		ug/Kg	D	YES															
Pyrene	8200		ug/Kg	D	YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-OBC-B-02 **Lab Report Batch :** K0810465 **Lab ID :** CAS_K

Sample Date : 10/23/2008 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0810465-005

Reviewed By / Date : LG 1/29/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8270C SIM					**Dilution: 10**															
2-Methylnaphthalene	1900		ug/Kg	D	YES															
Acenaphthene	4100		ug/Kg	D	YES															
Acenaphthylene	630		ug/Kg	D	YES															
Anthracene	6200		ug/Kg	D	YES															
Benz(a)anthracene	7700		ug/Kg	D	YES															
Benzo(a)pyrene	6300		ug/Kg	D	YES															
Benzo(b)fluoranthene	7800		ug/Kg	D	YES															
Benzo(g,h,i)perylene	3500		ug/Kg	D	YES															
Benzo(k)fluoranthene	3000		ug/Kg	D	YES															
Chrysene	6100		ug/Kg	D	YES															
Dibenz(a,h)anthracene	1200		ug/Kg	D	YES															
Dibenzofuran	2700		ug/Kg	D	YES															
Fluorene	4600		ug/Kg	D	YES															
Indeno(1,2,3-cd)pyrene	4400		ug/Kg	D	YES															
Naphthalene	3000		ug/Kg	D	YES															
Pyrene	15000		ug/Kg	D	YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-OBC-B-02 **Lab Report Batch :** K0810465 **Lab ID :** CAS_K

Sample Date : 10/23/2008 **Analysis Type: 2RES** **Sample Matrix :** SED

Lab Sample ID: K0810465-005

Reviewed By / Date : LG 1/29/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8270C SIM					**Dilution: 50**															
Fluoranthene	26000		ug/Kg	D	YES															
Phenanthrene	23000		ug/Kg	D	YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-OBC-B-03 **Lab Report Batch :** K0810465 **Lab ID :** CAS_K

Sample Date : 10/23/2008 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0810465-006

Reviewed By / Date : LG 1/29/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8270C SIM					**Dilution: 1**															
2-Methylnaphthalene	72		ug/Kg		YES															
Acenaphthene	190		ug/Kg		YES															
Acenaphthylene	20		ug/Kg		YES															
Anthracene	330		ug/Kg		YES															
Benz(a)anthracene	330		ug/Kg		YES															
Benzo(a)pyrene	220		ug/Kg		YES															
Benzo(b)fluoranthene	290		ug/Kg		YES															
Benzo(g,h,i)perylene	130		ug/Kg		YES															
Benzo(k)fluoranthene	120		ug/Kg		YES															
Chrysene	300		ug/Kg		YES															
Dibenz(a,h)anthracene	37		ug/Kg		YES															
Dibenzofuran	83		ug/Kg		YES															
Fluoranthene	1000		ug/Kg		YES															
Fluorene	210		ug/Kg		YES															
Indeno(1,2,3-cd)pyrene	170		ug/Kg		YES															
Naphthalene	110		ug/Kg		YES															
Phenanthrene	970		ug/Kg		YES															
Pyrene	710		ug/Kg		YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-OBC-C-01 **Lab Report Batch :** K0810465 **Lab ID :** CAS_K

Sample Date : 10/23/2008 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0810465-007

Reviewed By / Date : LG 1/29/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8270C SIM					**Dilution: 10**															
1-Methylnaphthalene	4800		ug/Kg	D	YES															
2-Methylnaphthalene	6000		ug/Kg	D	YES															
Acenaphthene	2600		ug/Kg	D	YES															
Acenaphthylene	260		ug/Kg	D	YES															
Anthracene	13000		ug/Kg	D	YES															
Benz(a)anthracene	6100		ug/Kg	D	YES															
Benzo(a)pyrene	3300		ug/Kg	D	YES															
Benzo(b)fluoranthene	4600		ug/Kg	D	YES															
Benzo(g,h,i)perylene	1600		ug/Kg	D	YES															
Benzo(k)fluoranthene	1800		ug/Kg	D	YES															
C1-Chrysenes	4700		ug/Kg	D	YES															
C1-Fluoranthenes/Pyrenes	12000		ug/Kg	D	YES															
C1-Fluorenes	6400		ug/Kg	D	YES															
C1-Phenanthrenes/Anthracenes	17000		ug/Kg	D	YES															
C2-Chrysenes	2900		ug/Kg	D	YES															
C2-Fluorenes	9100		ug/Kg	D	YES															
C2-Naphthalenes	25000		ug/Kg	ED	YES															
C2-Phenanthrenes/Anthracenes	17000		ug/Kg	D	YES															
C3-Chrysenes	2100		ug/Kg	D	YES															
C3-Fluorenes	16000		ug/Kg	D	YES															
C3-Naphthalenes	25000		ug/Kg	ED	YES															
C3-Phenanthrenes/Anthracenes	12000		ug/Kg	D	YES															
C4-Chrysenes	1100		ug/Kg	D	YES															
C4-Naphthalenes	18000		ug/Kg	D	YES															
C4-Phenanthrenes/Anthracenes	6500		ug/Kg	D	YES															
Chrysene	7600		ug/Kg	D	YES															
Dibenz(a,h)anthracene	480		ug/Kg	D	YES															
Dibenzofuran	1900		ug/Kg	D	YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-OBC-C-01 **Lab Report Batch :** K0810465 **Lab ID :** CAS_K

Sample Date : 10/23/2008 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0810465-007

Reviewed By / Date : LG 1/29/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8270C SIM					**Dilution: 10**															
Fluorene	6400		ug/Kg	D	YES															
Indeno(1,2,3-cd)pyrene	1900		ug/Kg	D	YES															
Naphthalene	460		ug/Kg	D	YES															
Pyrene	18000		ug/Kg	D	YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-OBC-C-01 **Lab Report Batch :** K0810465 **Lab ID :** CAS_K

Sample Date : 10/23/2008 **Analysis Type: 2RES** **Sample Matrix :** SED

Lab Sample ID: K0810465-007

Reviewed By / Date : LG 1/29/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8270C SIM					**Dilution: 50**															
Fluoranthene	29000		ug/Kg	D	YES															
Phenanthrene	33000		ug/Kg	D	YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-OBC-C-02 **Lab Report Batch :** K0810465 **Lab ID :** CAS_K

Sample Date : 10/23/2008 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0810465-008

Reviewed By / Date : LG 1/29/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8270C SIM					**Dilution: 10**															
2-Methylnaphthalene	1400		ug/Kg	D	YES															
Acenaphthene	1400		ug/Kg	D	YES															
Acenaphthylene	230		ug/Kg	D	YES															
Anthracene	4700		ug/Kg	D	YES															
Benz(a)anthracene	4800		ug/Kg	D	YES															
Benzo(a)pyrene	4200		ug/Kg	D	YES															
Benzo(b)fluoranthene	5200		ug/Kg	D	YES															
Benzo(g,h,i)perylene	2800		ug/Kg	D	YES															
Benzo(k)fluoranthene	1900		ug/Kg	D	YES															
Chrysene	5700		ug/Kg	D	YES															
Dibenz(a,h)anthracene	610		ug/Kg	D	YES															
Dibenzofuran	500		ug/Kg	D	YES															
Fluoranthene	15000		ug/Kg	D	YES															
Fluorene	2600		ug/Kg	D	YES															
Indeno(1,2,3-cd)pyrene	3200		ug/Kg	D	YES															
Naphthalene	1200		ug/Kg	D	YES															
Phenanthrene	14000		ug/Kg	D	YES															
Pyrene	12000		ug/Kg	D	YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-OBC-C-03 **Lab Report Batch :** K0810465 **Lab ID :** CAS_K

Sample Date : 10/23/2008 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0810465-009

Reviewed By / Date : LG 1/29/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8270C SIM					**Dilution: 1**															
2-Methylnaphthalene	7.3		ug/Kg		YES															
Acenaphthene	16		ug/Kg		YES															
Acenaphthylene	2.4		ug/Kg	J	YES	**J**								J						
Anthracene	19		ug/Kg		YES															
Benz(a)anthracene	30		ug/Kg		YES															
Benzo(a)pyrene	27		ug/Kg		YES															
Benzo(b)fluoranthene	33		ug/Kg		YES															
Benzo(g,h,i)perylene	22		ug/Kg		YES															
Benzo(k)fluoranthene	13		ug/Kg		YES															
Chrysene	28		ug/Kg		YES															
Dibenz(a,h)anthracene	4.7		ug/Kg	J	YES	**J**								J						
Dibenzofuran	3.1		ug/Kg	J	YES	**J**								J						
Fluoranthene	89		ug/Kg		YES															
Fluorene	9.5		ug/Kg		YES															
Indeno(1,2,3-cd)pyrene	23		ug/Kg		YES															
Naphthalene	17		ug/Kg		YES															
Phenanthrene	44		ug/Kg		YES															
Pyrene	77		ug/Kg		YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-HS6-A-01 **Lab Report Batch :** K0904268 **Lab ID :** CAS_K

Sample Date : 05/11/2009 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0904268-001

Reviewed By / Date : LG 8/18/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8270C SIM					**Dilution: 1**															
1-Methylnaphthalene	4.9		ug/Kg		YES															
2-Methylnaphthalene	6.9		ug/Kg		YES															
Acenaphthene	9.8		ug/Kg		YES															
Acenaphthylene	3.1		ug/Kg	J	YES	**J**								J						
Anthracene	27		ug/Kg		YES															
Benz(a)anthracene	69		ug/Kg		YES															
Benzo(a)pyrene	78		ug/Kg		YES															
Benzo(b)fluoranthene	94		ug/Kg		YES															
Benzo(g,h,i)perylene	60		ug/Kg		YES															
Benzo(k)fluoranthene	31		ug/Kg		YES															
Chrysene	72		ug/Kg		YES															
Dibenz(a,h)anthracene	14		ug/Kg		YES															
Dibenzofuran	8.3		ug/Kg		YES															
Fluoranthene	120		ug/Kg		YES															
Fluorene	12		ug/Kg		YES															
Indeno(1,2,3-cd)pyrene	65		ug/Kg		YES															
Naphthalene	63		ug/Kg		YES															
Phenanthrene	62		ug/Kg		YES															
Pyrene	120		ug/Kg		YES	**J**												J		

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-HS6-A-02 **Lab Report Batch :** K0904268 **Lab ID :** CAS_K

Sample Date : 05/11/2009 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0904268-002

Reviewed By / Date : LG 8/18/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8270C SIM					**Dilution: 1**															
1-Methylnaphthalene	3.5		ug/Kg		YES															
2-Methylnaphthalene	5.2		ug/Kg		YES															
Acenaphthene	2.8		ug/Kg	J	YES	**J**								J						
Acenaphthylene	0.91		ug/Kg	J	YES	**J**								J						
Anthracene	4.0		ug/Kg		YES															
Benz(a)anthracene	15		ug/Kg		YES															
Benzo(a)pyrene	13		ug/Kg		YES															
Benzo(b)fluoranthene	19		ug/Kg		YES															
Benzo(g,h,i)perylene	18		ug/Kg		YES															
Benzo(k)fluoranthene	11		ug/Kg		YES															
Chrysene	16		ug/Kg		YES															
Dibenz(a,h)anthracene	11		ug/Kg		YES															
Dibenzofuran	2.4		ug/Kg	J	YES	**J**								J						
Fluoranthene	16		ug/Kg		YES															
Fluorene	2.3		ug/Kg	J	YES	**J**								J						
Indeno(1,2,3-cd)pyrene	19		ug/Kg		YES															
Naphthalene	67		ug/Kg		YES															
Phenanthrene	7.8		ug/Kg		YES															
Pyrene	16		ug/Kg		YES	**J**												J		

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-HS6-A-03 **Lab Report Batch :** K0904268 **Lab ID :** CAS_K

Sample Date : 05/11/2009 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0904268-003

Reviewed By / Date : LG 8/18/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8270C SIM					**Dilution: 1**															
1-Methylnaphthalene	3.6		ug/Kg	J	YES	**J**								J						
2-Methylnaphthalene	5.7		ug/Kg		YES															
Acenaphthene	2.6		ug/Kg	J	YES	**J**								J						
Acenaphthylene	3.7		ug/Kg	U	YES															
Anthracene	0.54		ug/Kg	J	YES	**J**								J						
Benz(a)anthracene	0.99		ug/Kg	J	YES	**J**								J						
Benzo(a)pyrene	1.4		ug/Kg	J	YES	**UJ**			U					J						
Benzo(b)fluoranthene	1.9		ug/Kg	J	YES	**J**								J						
Benzo(g,h,i)perylene	3.0		ug/Kg	J	YES	**J**								J						
Benzo(k)fluoranthene	0.31		ug/Kg	J	YES	**UJ**			U					J						
Chrysene	1.6		ug/Kg	J	YES	**J**								J						
Dibenz(a,h)anthracene	3.7		ug/Kg	U	YES															
Dibenzofuran	1.6		ug/Kg	J	YES	**J**								J						
Fluoranthene	2.1		ug/Kg	J	YES	**J**								J						
Fluorene	1.2		ug/Kg	J	YES	**J**								J						
Indeno(1,2,3-cd)pyrene	0.93		ug/Kg	J	YES	**UJ**			U					J						
Naphthalene	85		ug/Kg		YES															
Phenanthrene	3.1		ug/Kg	J	YES	**J**								J						
Pyrene	2.6		ug/Kg	J	YES	**J**								J				J		

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-HS6-B-01 **Lab Report Batch :** K0904268 **Lab ID :** CAS_K

Sample Date : 05/11/2009 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0904268-004

Reviewed By / Date : LG 8/18/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8270C SIM					**Dilution: 5**															
1-Methylnaphthalene	130		ug/Kg	D	YES															
2-Methylnaphthalene	240		ug/Kg	D	YES															
Acenaphthene	290		ug/Kg	D	YES															
Acenaphthylene	270		ug/Kg	D	YES															
Anthracene	1000		ug/Kg	D	YES															
Benz(a)anthracene	2300		ug/Kg	D	YES															
Benzo(a)pyrene	2400		ug/Kg	D	YES															
Benzo(b)fluoranthene	2900		ug/Kg	D	YES															
Benzo(g,h,i)perylene	1500		ug/Kg	D	YES															
Benzo(k)fluoranthene	960		ug/Kg	D	YES															
Chrysene	2500		ug/Kg	D	YES															
Dibenz(a,h)anthracene	450		ug/Kg	D	YES															
Dibenzofuran	230		ug/Kg	D	YES															
Fluoranthene	4000		ug/Kg	D	YES															
Fluorene	360		ug/Kg	D	YES															
Indeno(1,2,3-cd)pyrene	1900		ug/Kg	D	YES															
Naphthalene	1100		ug/Kg	D	YES															
Phenanthrene	1900		ug/Kg	D	YES															
Pyrene	3600		ug/Kg	D	YES	**J**												J		

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-HS6-B-02 **Lab Report Batch :** K0904268 **Lab ID :** CAS_K

Sample Date : 05/11/2009 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0904268-005

Reviewed By / Date : LG 8/18/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8270C SIM					**Dilution: 20**															
1-Methylnaphthalene	190		ug/Kg	D	YES															
2-Methylnaphthalene	460		ug/Kg	D	YES															
Acenaphthene	520		ug/Kg	D	YES															
Acenaphthylene	590		ug/Kg	D	YES	**J**					J									
Anthracene	3200		ug/Kg	D	YES															
Benz(a)anthracene	6200		ug/Kg	D	YES															
Benzo(a)pyrene	6000		ug/Kg	D	YES															
Benzo(b)fluoranthene	7100		ug/Kg	D	YES															
Benzo(g,h,i)perylene	3500		ug/Kg	D	YES															
Benzo(k)fluoranthene	2600		ug/Kg	D	YES															
Chrysene	6400		ug/Kg	D	YES															
Dibenz(a,h)anthracene	900		ug/Kg	D	YES	**J**					J									
Dibenzofuran	540		ug/Kg	D	YES															
Fluoranthene	14000		ug/Kg	D	YES															
Fluorene	660		ug/Kg	D	YES															
Indeno(1,2,3-cd)pyrene	4200		ug/Kg	D	YES															
Naphthalene	2300		ug/Kg	D	YES															
Phenanthrene	4500		ug/Kg	D	YES															
Pyrene	12000		ug/Kg	D	YES	**J**												J		

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-HS6-B-03 **Lab Report Batch :** K0904268 **Lab ID :** CAS_K

Sample Date : 05/11/2009 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0904268-006

Reviewed By / Date : LG 8/18/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8270C SIM					**Dilution: 1**															
1-Methylnaphthalene	4.0		ug/Kg		YES															
2-Methylnaphthalene	5.3		ug/Kg		YES															
Acenaphthene	3.7		ug/Kg		YES															
Acenaphthylene	0.88		ug/Kg	J	YES	**J**								J						
Anthracene	6.0		ug/Kg		YES															
Benz(a)anthracene	19		ug/Kg		YES															
Benzo(a)pyrene	17		ug/Kg		YES															
Benzo(b)fluoranthene	20		ug/Kg		YES															
Benzo(g,h,i)perylene	11		ug/Kg		YES															
Benzo(k)fluoranthene	6.4		ug/Kg		YES															
Chrysene	20		ug/Kg		YES															
Dibenz(a,h)anthracene	2.6		ug/Kg	J	YES	**J**								J						
Dibenzofuran	2.6		ug/Kg	J	YES	**J**								J						
Fluoranthene	40		ug/Kg		YES															
Fluorene	3.4		ug/Kg	J	YES	**J**								J						
Indeno(1,2,3-cd)pyrene	11		ug/Kg		YES															
Naphthalene	60		ug/Kg		YES															
Phenanthrene	29		ug/Kg		YES															
Pyrene	39		ug/Kg		YES	**J**												J		

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-HS6-C-01 **Lab Report Batch :** K0904268 **Lab ID :** CAS_K

Sample Date : 05/11/2009 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0904268-007

Reviewed By / Date : LG 8/18/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8270C SIM					**Dilution: 5**															
1-Methylnaphthalene	74		ug/Kg	D	YES															
2-Methylnaphthalene	150		ug/Kg	D	YES															
Acenaphthene	120		ug/Kg	D	YES															
Acenaphthylene	370		ug/Kg	D	YES															
Anthracene	750		ug/Kg	D	YES															
Benz(a)anthracene	3600		ug/Kg	D	YES															
Benzo(a)pyrene	2700		ug/Kg	D	YES															
Benzo(b)fluoranthene	3500		ug/Kg	D	YES															
Benzo(g,h,i)perylene	1400		ug/Kg	D	YES															
Benzo(k)fluoranthene	1200		ug/Kg	D	YES															
Chrysene	3700		ug/Kg	D	YES															
Dibenz(a,h)anthracene	420		ug/Kg	D	YES															
Dibenzofuran	180		ug/Kg	D	YES															
Fluoranthene	10000		ug/Kg	D	YES															
Fluorene	170		ug/Kg	D	YES															
Indeno(1,2,3-cd)pyrene	1800		ug/Kg	D	YES															
Naphthalene	670		ug/Kg	D	YES															
Phenanthrene	790		ug/Kg	D	YES															
Pyrene	8600		ug/Kg	D	YES	**J**												J		

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-HS6-C-02 **Lab Report Batch :** K0904268 **Lab ID :** CAS_K

Sample Date : 05/11/2009 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0904268-008

Reviewed By / Date : LG 8/18/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8270C SIM					**Dilution: 1**															
1-Methylnaphthalene	4.9		ug/Kg		YES															
2-Methylnaphthalene	8.2		ug/Kg		YES															
Acenaphthene	6.2		ug/Kg		YES															
Acenaphthylene	6.1		ug/Kg		YES															
Anthracene	14		ug/Kg		YES															
Benz(a)anthracene	59		ug/Kg		YES															
Benzo(a)pyrene	51		ug/Kg		YES															
Benzo(b)fluoranthene	67		ug/Kg		YES															
Benzo(g,h,i)perylene	30		ug/Kg		YES															
Benzo(k)fluoranthene	24		ug/Kg		YES															
Chrysene	64		ug/Kg		YES															
Dibenz(a,h)anthracene	8.3		ug/Kg		YES															
Dibenzofuran	5.8		ug/Kg		YES															
Fluoranthene	150		ug/Kg		YES															
Fluorene	5.2		ug/Kg		YES															
Indeno(1,2,3-cd)pyrene	37		ug/Kg		YES															
Naphthalene	85		ug/Kg		YES															
Phenanthrene	17		ug/Kg		YES															
Pyrene	120		ug/Kg		YES	**J**												J		

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-HS6-C-03 **Lab Report Batch :** K0904268 **Lab ID :** CAS_K

Sample Date : 05/11/2009 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0904268-009

Reviewed By / Date : LG 8/18/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8270C SIM					**Dilution: 1**															
1-Methylnaphthalene	5.6		ug/Kg		YES															
2-Methylnaphthalene	8.4		ug/Kg		YES															
Acenaphthene	3.2		ug/Kg	J	YES	**J**								J						
Acenaphthylene	1.7		ug/Kg	J	YES	**J**								J						
Anthracene	5.3		ug/Kg		YES															
Benz(a)anthracene	20		ug/Kg		YES															
Benzo(a)pyrene	15		ug/Kg		YES															
Benzo(b)fluoranthene	22		ug/Kg		YES															
Benzo(g,h,i)perylene	11		ug/Kg		YES															
Benzo(k)fluoranthene	6.7		ug/Kg		YES															
Chrysene	22		ug/Kg		YES															
Dibenz(a,h)anthracene	2.5		ug/Kg	J	YES	**J**								J						
Dibenzofuran	2.9		ug/Kg	J	YES	**J**								J						
Fluoranthene	68		ug/Kg		YES															
Fluorene	2.6		ug/Kg	J	YES	**J**								J						
Indeno(1,2,3-cd)pyrene	11		ug/Kg		YES															
Naphthalene	120		ug/Kg		YES															
Phenanthrene	11		ug/Kg		YES															
Pyrene	60		ug/Kg		YES	**J**												J		

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-HS6-C-04 **Lab Report Batch :** K0904268 **Lab ID :** CAS_K

Sample Date : 05/11/2009 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0904268-010

Reviewed By / Date : LG 8/18/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8270C SIM					**Dilution: 1**															
1-Methylnaphthalene	3.9		ug/Kg	J	YES	**J**								J						
2-Methylnaphthalene	5.5		ug/Kg		YES															
Acenaphthene	2.4		ug/Kg	J	YES	**J**								J						
Acenaphthylene	1.1		ug/Kg	J	YES	**J**								J						
Anthracene	3.6		ug/Kg	J	YES	**J**								J						
Benz(a)anthracene	11		ug/Kg		YES															
Benzo(a)pyrene	9.1		ug/Kg		YES															
Benzo(b)fluoranthene	11		ug/Kg		YES															
Benzo(g,h,i)perylene	6.0		ug/Kg		YES															
Benzo(k)fluoranthene	3.4		ug/Kg	J	YES	**J**								J						
Chrysene	13		ug/Kg		YES															
Dibenz(a,h)anthracene	2.0		ug/Kg	J	YES	**J**								J						
Dibenzofuran	2.2		ug/Kg	J	YES	**J**								J						
Fluoranthene	32		ug/Kg		YES															
Fluorene	2.0		ug/Kg	J	YES	**J**								J						
Indeno(1,2,3-cd)pyrene	6.9		ug/Kg		YES															
Naphthalene	67		ug/Kg		YES															
Phenanthrene	7.7		ug/Kg		YES															
Pyrene	27		ug/Kg		YES	**J**												J		

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-HS6-D-01 **Lab Report Batch :** K0904268 **Lab ID :** CAS_K

Sample Date : 05/11/2009 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0904268-011

Reviewed By / Date : LG 8/18/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8270C SIM					**Dilution: 1000**															
1-Methylnaphthalene	21000		ug/Kg	D	YES															
2-Methylnaphthalene	36000		ug/Kg	D	YES															
Acenaphthene	100000		ug/Kg	D	YES															
Acenaphthylene	1900		ug/Kg	JD	YES	**J**								J						
Anthracene	140000		ug/Kg	D	YES															
Benz(a)anthracene	460000		ug/Kg	D	YES															
Benzo(a)pyrene	490000		ug/Kg	D	YES															
Benzo(b)fluoranthene	620000		ug/Kg	D	YES															
Benzo(g,h,i)perylene	250000		ug/Kg	D	YES															
Benzo(k)fluoranthene	210000		ug/Kg	D	YES															
Chrysene	440000		ug/Kg	D	YES															
Dibenz(a,h)anthracene	68000		ug/Kg	D	YES															
Dibenzofuran	47000		ug/Kg	D	YES															
Fluoranthene	980000		ug/Kg	D	YES															
Fluorene	86000		ug/Kg	D	YES															
Indeno(1,2,3-cd)pyrene	320000		ug/Kg	D	YES															
Naphthalene	78000		ug/Kg	D	YES															
Phenanthrene	600000		ug/Kg	D	YES															
Pyrene	920000		ug/Kg	D	YES	**J**												J		

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-ZIC-A-01 **Lab Report Batch :** K0904268 **Lab ID :** CAS_K

Sample Date : 05/11/2009 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0904268-012

Reviewed By / Date : LG 8/18/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8270C SIM					**Dilution: 5**															
1-Methylnaphthalene	150		ug/Kg	D	YES															
2-Methylnaphthalene	280		ug/Kg	D	YES															
Acenaphthene	290		ug/Kg	D	YES															
Acenaphthylene	170		ug/Kg	D	YES															
Anthracene	790		ug/Kg	D	YES															
Benz(a)anthracene	1700		ug/Kg	D	YES															
Benzo(a)pyrene	2100		ug/Kg	D	YES															
Benzo(b)fluoranthene	2300		ug/Kg	D	YES															
Benzo(g,h,i)perylene	1500		ug/Kg	D	YES															
Benzo(k)fluoranthene	750		ug/Kg	D	YES															
Chrysene	1900		ug/Kg	D	YES															
Dibenz(a,h)anthracene	370		ug/Kg	D	YES															
Dibenzofuran	270		ug/Kg	D	YES															
Fluoranthene	2800		ug/Kg	D	YES															
Fluorene	340		ug/Kg	D	YES															
Indeno(1,2,3-cd)pyrene	1500		ug/Kg	D	YES															
Naphthalene	790		ug/Kg	D	YES															
Phenanthrene	1700		ug/Kg	D	YES															
Pyrene	2600		ug/Kg	D	YES	**J**												J		

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-ZIC-A-01-FS **Lab Report Batch :** K0904268 **Lab ID :** CAS_K

Sample Date : 05/11/2009 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0904268-018

Reviewed By / Date : LG 8/18/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8270C SIM					**Dilution: 10**															
1-Methylnaphthalene	230		ug/Kg	D	YES															
2-Methylnaphthalene	400		ug/Kg	D	YES															
Acenaphthene	540		ug/Kg	D	YES															
Acenaphthylene	330		ug/Kg	D	YES															
Anthracene	1500		ug/Kg	D	YES															
Benz(a)anthracene	3500		ug/Kg	D	YES															
Benzo(a)pyrene	4200		ug/Kg	D	YES															
Benzo(b)fluoranthene	4700		ug/Kg	D	YES															
Benzo(g,h,i)perylene	3000		ug/Kg	D	YES															
Benzo(k)fluoranthene	1600		ug/Kg	D	YES															
Chrysene	4000		ug/Kg	D	YES															
Dibenz(a,h)anthracene	740		ug/Kg	D	YES															
Dibenzofuran	440		ug/Kg	D	YES															
Fluoranthene	6200		ug/Kg	D	YES															
Fluorene	680		ug/Kg	D	YES															
Indeno(1,2,3-cd)pyrene	3100		ug/Kg	D	YES															
Naphthalene	910		ug/Kg	D	YES															
Phenanthrene	3700		ug/Kg	D	YES															
Pyrene	5600		ug/Kg	D	YES	**J**												J		

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-ZIC-A-02 **Lab Report Batch :** K0904268 **Lab ID :** CAS_K

Sample Date : 05/11/2009 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0904268-013

Reviewed By / Date : LG 8/18/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8270C SIM					**Dilution: 10**															
1-Methylnaphthalene	190		ug/Kg	D	YES															
2-Methylnaphthalene	370		ug/Kg	D	YES															
Acenaphthene	730		ug/Kg	D	YES															
Acenaphthylene	420		ug/Kg	D	YES															
Anthracene	1900		ug/Kg	D	YES															
Benz(a)anthracene	4600		ug/Kg	D	YES															
Benzo(a)pyrene	6100		ug/Kg	D	YES															
Benzo(b)fluoranthene	6900		ug/Kg	D	YES															
Benzo(g,h,i)perylene	4300		ug/Kg	D	YES															
Benzo(k)fluoranthene	2200		ug/Kg	D	YES															
Chrysene	4800		ug/Kg	D	YES															
Dibenz(a,h)anthracene	970		ug/Kg	D	YES															
Dibenzofuran	410		ug/Kg	D	YES															
Fluoranthene	7500		ug/Kg	D	YES															
Fluorene	670		ug/Kg	D	YES															
Indeno(1,2,3-cd)pyrene	5200		ug/Kg	D	YES															
Naphthalene	1100		ug/Kg	D	YES															
Phenanthrene	3600		ug/Kg	D	YES															
Pyrene	7000		ug/Kg	D	YES	**J**												J		

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-ZIC-A-02-FS **Lab Report Batch :** K0904268 **Lab ID :** CAS_K

Sample Date : 05/11/2009 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0904268-019

Reviewed By / Date : LG 8/18/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8270C SIM					**Dilution: 10**															
1-Methylnaphthalene	210		ug/Kg	D	YES															
2-Methylnaphthalene	380		ug/Kg	D	YES															
Acenaphthene	810		ug/Kg	D	YES															
Acenaphthylene	350		ug/Kg	D	YES															
Anthracene	1700		ug/Kg	D	YES															
Benz(a)anthracene	4800		ug/Kg	D	YES															
Benzo(a)pyrene	6300		ug/Kg	D	YES															
Benzo(b)fluoranthene	7200		ug/Kg	D	YES															
Benzo(g,h,i)perylene	4400		ug/Kg	D	YES															
Benzo(k)fluoranthene	2300		ug/Kg	D	YES															
Chrysene	5200		ug/Kg	D	YES															
Dibenz(a,h)anthracene	990		ug/Kg	D	YES															
Dibenzofuran	450		ug/Kg	D	YES															
Fluoranthene	8800		ug/Kg	D	YES															
Fluorene	740		ug/Kg	D	YES															
Indeno(1,2,3-cd)pyrene	5300		ug/Kg	D	YES															
Naphthalene	1100		ug/Kg	D	YES															
Phenanthrene	4400		ug/Kg	D	YES															
Pyrene	8100		ug/Kg	D	YES	**J**												J		

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-ZIC-A-03 **Lab Report Batch :** K0904268 **Lab ID :** CAS_K

Sample Date : 05/11/2009 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0904268-014

Reviewed By / Date : LG 8/18/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8270C SIM					**Dilution: 2**															
1-Methylnaphthalene	75		ug/Kg	D	YES															
2-Methylnaphthalene	89		ug/Kg	D	YES															
Acenaphthene	160		ug/Kg	D	YES															
Acenaphthylene	59		ug/Kg	D	YES															
Anthracene	230		ug/Kg	D	YES															
Benz(a)anthracene	850		ug/Kg	D	YES															
Benzo(a)pyrene	970		ug/Kg	D	YES															
Benzo(b)fluoranthene	1100		ug/Kg	D	YES															
Benzo(g,h,i)perylene	630		ug/Kg	D	YES															
Benzo(k)fluoranthene	350		ug/Kg	D	YES															
Chrysene	850		ug/Kg	D	YES															
Dibenz(a,h)anthracene	150		ug/Kg	D	YES															
Dibenzofuran	67		ug/Kg	D	YES															
Fluoranthene	1400		ug/Kg	D	YES															
Fluorene	130		ug/Kg	D	YES															
Indeno(1,2,3-cd)pyrene	760		ug/Kg	D	YES															
Naphthalene	270		ug/Kg	D	YES															
Phenanthrene	550		ug/Kg	D	YES															
Pyrene	1400		ug/Kg	D	YES	**J**												J		

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-ZIC-A-04 **Lab Report Batch :** K0904268 **Lab ID :** CAS_K

Sample Date : 05/11/2009 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0904268-015

Reviewed By / Date : LG 8/18/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8270C SIM					**Dilution: 1**															
1-Methylnaphthalene	19		ug/Kg		YES															
2-Methylnaphthalene	25		ug/Kg		YES															
Acenaphthene	32		ug/Kg		YES															
Acenaphthylene	9.5		ug/Kg		YES															
Anthracene	36		ug/Kg		YES															
Benz(a)anthracene	120		ug/Kg		YES															
Benzo(a)pyrene	130		ug/Kg		YES															
Benzo(b)fluoranthene	150		ug/Kg		YES															
Benzo(g,h,i)perylene	96		ug/Kg		YES															
Benzo(k)fluoranthene	52		ug/Kg		YES															
Chrysene	130		ug/Kg		YES															
Dibenz(a,h)anthracene	23		ug/Kg		YES															
Dibenzofuran	15		ug/Kg		YES															
Fluoranthene	230		ug/Kg		YES															
Fluorene	22		ug/Kg		YES															
Indeno(1,2,3-cd)pyrene	100		ug/Kg		YES															
Naphthalene	160		ug/Kg		YES															
Phenanthrene	87		ug/Kg		YES															
Pyrene	220		ug/Kg		YES	**J**												J		

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-ZIC-A-05 **Lab Report Batch :** K0904268 **Lab ID :** CAS_K

Sample Date : 05/11/2009 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0904268-016

Reviewed By / Date : LG 8/18/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8270C SIM					**Dilution: 1**															
1-Methylnaphthalene	5.0		ug/Kg		YES															
2-Methylnaphthalene	6.4		ug/Kg		YES															
Acenaphthene	4.8		ug/Kg		YES															
Acenaphthylene	1.7		ug/Kg	J	YES	**J**								J						
Anthracene	7.0		ug/Kg		YES															
Benz(a)anthracene	25		ug/Kg		YES															
Benzo(a)pyrene	30		ug/Kg		YES															
Benzo(b)fluoranthene	36		ug/Kg		YES															
Benzo(g,h,i)perylene	23		ug/Kg		YES															
Benzo(k)fluoranthene	12		ug/Kg		YES															
Chrysene	34		ug/Kg		YES															
Dibenz(a,h)anthracene	5.1		ug/Kg		YES															
Dibenzofuran	2.6		ug/Kg	J	YES	**J**								J						
Fluoranthene	39		ug/Kg		YES															
Fluorene	4.0		ug/Kg		YES															
Indeno(1,2,3-cd)pyrene	23		ug/Kg		YES															
Naphthalene	70		ug/Kg		YES															
Phenanthrene	20		ug/Kg		YES															
Pyrene	37		ug/Kg		YES	**J**												J		

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-ZIC-B-01 **Lab Report Batch :** K0904268 **Lab ID :** CAS_K

Sample Date : 05/11/2009 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0904268-017

Reviewed By / Date : LG 8/18/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8270C SIM					**Dilution: 1**															
1-Methylnaphthalene	12		ug/Kg		YES															
2-Methylnaphthalene	19		ug/Kg		YES															
Acenaphthene	12		ug/Kg		YES															
Acenaphthylene	4.3		ug/Kg	J	YES	**J**								J						
Anthracene	21		ug/Kg		YES															
Benz(a)anthracene	39		ug/Kg		YES															
Benzo(a)pyrene	48		ug/Kg		YES															
Benzo(b)fluoranthene	50		ug/Kg		YES															
Benzo(g,h,i)perylene	38		ug/Kg		YES															
Benzo(k)fluoranthene	16		ug/Kg		YES															
Chrysene	44		ug/Kg		YES															
Dibenz(a,h)anthracene	9.9		ug/Kg		YES															
Dibenzofuran	11		ug/Kg		YES															
Fluoranthene	64		ug/Kg		YES															
Fluorene	14		ug/Kg		YES															
Indeno(1,2,3-cd)pyrene	31		ug/Kg		YES															
Naphthalene	110		ug/Kg		YES															
Phenanthrene	54		ug/Kg		YES															
Pyrene	63		ug/Kg		YES	**J**												J		

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-ZIC-B-02 **Lab Report Batch :** K0904268 **Lab ID :** CAS_K

Sample Date : 05/11/2009 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0904268-020

Reviewed By / Date : LG 8/18/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8270C SIM					**Dilution: 1**															
1-Methylnaphthalene	3.0		ug/Kg	J	YES	**J**								J						
2-Methylnaphthalene	5.1		ug/Kg		YES															
Acenaphthene	2.9		ug/Kg	J	YES	**J**								J						
Acenaphthylene	0.81		ug/Kg	J	YES	**J**								J						
Anthracene	2.8		ug/Kg	J	YES	**J**								J						
Benz(a)anthracene	6.7		ug/Kg		YES															
Benzo(a)pyrene	8.1		ug/Kg		YES															
Benzo(b)fluoranthene	8.2		ug/Kg		YES															
Benzo(g,h,i)perylene	7.6		ug/Kg		YES															
Benzo(k)fluoranthene	3.4		ug/Kg	J	YES	**J**								J						
Chrysene	8.7		ug/Kg		YES															
Dibenz(a,h)anthracene	3.0		ug/Kg	J	YES	**J**								J						
Dibenzofuran	2.7		ug/Kg	J	YES	**J**								J						
Fluoranthene	10		ug/Kg		YES															
Fluorene	2.8		ug/Kg	J	YES	**J**								J						
Indeno(1,2,3-cd)pyrene	6.0		ug/Kg		YES															
Naphthalene	68		ug/Kg		YES															
Phenanthrene	8.1		ug/Kg		YES															
Pyrene	11		ug/Kg		YES	**J**												J		

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-ZIC-B-03 **Lab Report Batch :** K0904268 **Lab ID :** CAS_K

Sample Date : 05/11/2009 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0904268-021

Reviewed By / Date : LG 8/18/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8270C SIM					**Dilution: 1**															
1-Methylnaphthalene	4.2		ug/Kg		YES															
2-Methylnaphthalene	5.9		ug/Kg		YES															
Acenaphthene	3.2		ug/Kg	J	YES	**J**								J						
Acenaphthylene	0.28		ug/Kg	J	YES	**J**								J						
Anthracene	2.1		ug/Kg	J	YES	**J**								J						
Benz(a)anthracene	3.1		ug/Kg	J	YES	**J**								J						
Benzo(a)pyrene	3.1		ug/Kg	J	YES	**J**								J						
Benzo(b)fluoranthene	5.3		ug/Kg		YES															
Benzo(g,h,i)perylene	5.9		ug/Kg		YES															
Benzo(k)fluoranthene	1.0		ug/Kg	J	YES	**J**								J						
Chrysene	3.8		ug/Kg		YES															
Dibenz(a,h)anthracene	0.74		ug/Kg	J	YES	**J**								J						
Dibenzofuran	2.5		ug/Kg	J	YES	**J**								J						
Fluoranthene	8.5		ug/Kg		YES															
Fluorene	2.8		ug/Kg	J	YES	**J**								J						
Indeno(1,2,3-cd)pyrene	2.4		ug/Kg	J	YES	**J**								J						
Naphthalene	58		ug/Kg		YES															
Phenanthrene	11		ug/Kg		YES															
Pyrene	9.4		ug/Kg		YES	**J**												J		

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-HS6-E-01 **Lab Report Batch :** K0904301 **Lab ID :** CAS_K

Sample Date : 05/12/2009 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0904301-001

Reviewed By / Date : LG 8/20/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8270C SIM					**Dilution: 1**															
1-Methylnaphthalene	250		ug/Kg		YES															
2-Methylnaphthalene	380		ug/Kg		YES															
Acenaphthene	920		ug/Kg		YES															
Acenaphthylene	380		ug/Kg		YES															
Benzo(k)fluoranthene	1400		ug/Kg		YES															
Dibenz(a,h)anthracene	780		ug/Kg		YES															
Dibenzofuran	710		ug/Kg		YES															
Fluorene	1400		ug/Kg		YES															
Naphthalene	930		ug/Kg		YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-HS6-E-01 **Lab Report Batch :** K0904301 **Lab ID :** CAS_K

Sample Date : 05/12/2009 **Analysis Type: 2RES** **Sample Matrix :** SED

Lab Sample ID: K0904301-001

Reviewed By / Date : LG 8/20/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8270C SIM					**Dilution: 10**															
Anthracene	2600		ug/Kg	D	YES															
Benz(a)anthracene	4800		ug/Kg	D	YES															
Benzo(a)pyrene	4900		ug/Kg	D	YES															
Benzo(b)fluoranthene	6300		ug/Kg	D	YES															
Benzo(g,h,i)perylene	3200		ug/Kg	D	YES															
Chrysene	4900		ug/Kg	D	YES															
Fluoranthene	10000		ug/Kg	D	YES															
Indeno(1,2,3-cd)pyrene	4000		ug/Kg	D	YES															
Phenanthrene	7200		ug/Kg	D	YES															
Pyrene	8800		ug/Kg	D	YES	**J**												J		

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-HS6-E-02 **Lab Report Batch :** K0904301 **Lab ID :** CAS_K

Sample Date : 05/12/2009 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0904301-002

Reviewed By / Date : LG 8/20/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8270C SIM					**Dilution: 1**															
1-Methylnaphthalene	11		ug/Kg		YES															
2-Methylnaphthalene	14		ug/Kg		YES															
Acenaphthene	30		ug/Kg		YES															
Acenaphthylene	7.6		ug/Kg		YES															
Anthracene	79		ug/Kg		YES															
Benz(a)anthracene	150		ug/Kg		YES															
Benzo(a)pyrene	150		ug/Kg		YES															
Benzo(b)fluoranthene	190		ug/Kg		YES															
Benzo(g,h,i)perylene	100		ug/Kg		YES															
Benzo(k)fluoranthene	67		ug/Kg		YES															
Chrysene	170		ug/Kg		YES															
Dibenz(a,h)anthracene	28		ug/Kg		YES															
Dibenzofuran	21		ug/Kg		YES															
Fluoranthene	280		ug/Kg		YES															
Fluorene	41		ug/Kg		YES															
Indeno(1,2,3-cd)pyrene	120		ug/Kg		YES															
Naphthalene	120		ug/Kg		YES															
Phenanthrene	210		ug/Kg		YES															
Pyrene	230		ug/Kg		YES	**J**												J		

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-HS6-E-03 **Lab Report Batch :** K0904301 **Lab ID :** CAS_K

Sample Date : 05/12/2009 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0904301-003

Reviewed By / Date : LG 8/20/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8270C SIM					**Dilution: 1**															
1-Methylnaphthalene	13		ug/Kg		YES															
2-Methylnaphthalene	19		ug/Kg		YES															
Acenaphthene	18		ug/Kg		YES															
Acenaphthylene	1.1		ug/Kg	J	YES	**J**								J						
Anthracene	20		ug/Kg		YES															
Benz(a)anthracene	17		ug/Kg		YES															
Benzo(a)pyrene	18		ug/Kg		YES															
Benzo(b)fluoranthene	22		ug/Kg		YES															
Benzo(g,h,i)perylene	14		ug/Kg		YES															
Benzo(k)fluoranthene	6.8		ug/Kg		YES															
Chrysene	20		ug/Kg		YES															
Dibenz(a,h)anthracene	2.9		ug/Kg	J	YES	**J**								J						
Dibenzofuran	14		ug/Kg		YES															
Fluoranthene	50		ug/Kg		YES															
Fluorene	15		ug/Kg		YES															
Indeno(1,2,3-cd)pyrene	13		ug/Kg		YES															
Naphthalene	240		ug/Kg		YES															
Phenanthrene	65		ug/Kg		YES															
Pyrene	41		ug/Kg		YES	**J**												J		

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-HS6-E-04 **Lab Report Batch :** K0904301 **Lab ID :** CAS_K

Sample Date : 05/12/2009 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0904301-004

Reviewed By / Date : LG 8/20/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8270C SIM					**Dilution: 1**															
1-Methylnaphthalene	4.1		ug/Kg	J	YES	**J**								J						
2-Methylnaphthalene	6.6		ug/Kg		YES															
Acenaphthene	3.8		ug/Kg	J	YES	**J**								J						
Acenaphthylene	0.27		ug/Kg	J	YES	**J**								J						
Anthracene	31		ug/Kg		YES															
Benz(a)anthracene	5.0		ug/Kg		YES															
Benzo(a)pyrene	6.3		ug/Kg		YES															
Benzo(b)fluoranthene	7.4		ug/Kg		YES															
Benzo(g,h,i)perylene	4.8		ug/Kg		YES															
Benzo(k)fluoranthene	2.2		ug/Kg	J	YES	**J**								J						
Chrysene	7.1		ug/Kg		YES															
Dibenz(a,h)anthracene	0.99		ug/Kg	J	YES	**J**								J						
Dibenzofuran	6.1		ug/Kg		YES															
Fluoranthene	18		ug/Kg		YES															
Fluorene	14		ug/Kg		YES															
Indeno(1,2,3-cd)pyrene	4.6		ug/Kg		YES															
Naphthalene	95		ug/Kg		YES															
Phenanthrene	85		ug/Kg		YES															
Pyrene	13		ug/Kg		YES	**J**												J		

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-HS6-F-01 **Lab Report Batch :** K0904301 **Lab ID :** CAS_K

Sample Date : 05/12/2009 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0904301-005

Reviewed By / Date : LG 8/20/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8270C SIM					**Dilution: 50**															
1-Methylnaphthalene	2900		ug/Kg	D	YES															
2-Methylnaphthalene	2800		ug/Kg	D	YES															
Acenaphthene	12000		ug/Kg	D	YES															
Acenaphthylene	480		ug/Kg	D	YES															
Anthracene	15000		ug/Kg	D	YES															
Benz(a)anthracene	27000		ug/Kg	D	YES															
Benzo(a)pyrene	36000		ug/Kg	D	YES															
Benzo(b)fluoranthene	40000		ug/Kg	D	YES															
Benzo(g,h,i)perylene	24000		ug/Kg	D	YES															
Benzo(k)fluoranthene	14000		ug/Kg	D	YES															
C1-Chrysenes	9500		ug/Kg	D	YES															
C1-Fluoranthenes/Pyrenes	22000		ug/Kg	D	YES															
C1-Fluorenes	2100		ug/Kg	D	YES															
C1-Phenanthrenes/Anthracenes	10000		ug/Kg	D	YES															
C2-Chrysenes	2800		ug/Kg	D	YES															
C2-Fluorenes	980		ug/Kg	D	YES															
C2-Naphthalenes	4600		ug/Kg	D	YES															
C2-Phenanthrenes/Anthracenes	3700		ug/Kg	D	YES															
C3-Chrysenes	1500		ug/Kg	D	YES															
C3-Fluorenes	1200		ug/Kg	D	YES															
C3-Naphthalenes	2200		ug/Kg	D	YES															
C3-Phenanthrenes/Anthracenes	1300		ug/Kg	D	YES															
C4-Chrysenes	360		ug/Kg	D	YES															
C4-Naphthalenes	660		ug/Kg	D	YES															
C4-Phenanthrenes/Anthracenes	400		ug/Kg	D	YES															
Chrysene	27000		ug/Kg	D	YES															
Dibenz(a,h)anthracene	5600		ug/Kg	D	YES															
Dibenzofuran	9300		ug/Kg	D	YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-HS6-F-01 **Lab Report Batch :** K0904301 **Lab ID :** CAS_K

Sample Date : 05/12/2009 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0904301-005

Reviewed By / Date : LG 8/20/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8270C SIM					**Dilution: 50**															
Fluoranthene	54000		ug/Kg	D	YES															
Fluorene	14000		ug/Kg	D	YES															
Indeno(1,2,3-cd)pyrene	30000		ug/Kg	D	YES															
Naphthalene	4700		ug/Kg	D	YES															
Phenanthrene	51000		ug/Kg	D	YES															
Pyrene	50000		ug/Kg	D	YES	**J**												J		

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-HS6-F-01-DP **Lab Report Batch :** K0904301 **Lab ID :** CAS_K

Sample Date : 05/12/2009 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0904301-006

Reviewed By / Date : LG 8/20/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8270C SIM					**Dilution: 100**															
1-Methylnaphthalene	16000		ug/Kg	D	YES															
2-Methylnaphthalene	18000		ug/Kg	D	YES															
Acenaphthene	69000		ug/Kg	D	YES															
Acenaphthylene	1300		ug/Kg	D	YES															
Anthracene	76000		ug/Kg	D	YES															
Benzo(k)fluoranthene	130000		ug/Kg	D	YES															
C1-Chrysenes	130000		ug/Kg	D	YES															
C1-Fluoranthenes/Pyrenes	320000		ug/Kg	ED	YES															
C1-Fluorenes	10000		ug/Kg	D	YES															
C1-Phenanthrenes/Anthracenes	87000		ug/Kg	D	YES															
C2-Chrysenes	32000		ug/Kg	D	YES															
C2-Fluorenes	5500		ug/Kg	D	YES															
C2-Naphthalenes	14000		ug/Kg	D	YES															
C2-Phenanthrenes/Anthracenes	26000		ug/Kg	D	YES															
C3-Chrysenes	19000		ug/Kg	D	YES															
C3-Fluorenes	3800		ug/Kg	D	YES															
C3-Naphthalenes	4700		ug/Kg	D	YES															
C3-Phenanthrenes/Anthracenes	8600		ug/Kg	D	YES															
C4-Chrysenes	5400		ug/Kg	D	YES															
C4-Naphthalenes	1500		ug/Kg	D	YES															
C4-Phenanthrenes/Anthracenes	2800		ug/Kg	D	YES															
Dibenz(a,h)anthracene	57000		ug/Kg	D	YES															
Dibenzofuran	33000		ug/Kg	D	YES															
Fluorene	55000		ug/Kg	D	YES															
Naphthalene	18000		ug/Kg	D	YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-HS6-F-01-DP
Lab Report Batch : K0904301
Lab ID : CAS_K
Sample Date : 05/12/2009
Analysis Type: 2RES
Sample Matrix : SED
Lab Sample ID: K0904301-006

Reviewed By / Date : LG 8/20/2009
Approved By / Date :

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8270C SIM					**Dilution: 1000**															
Benz(a)anthracene	320000		ug/Kg	D	YES															
Benzo(a)pyrene	400000		ug/Kg	D	YES															
Benzo(b)fluoranthene	480000		ug/Kg	D	YES															
Benzo(g,h,i)perylene	220000		ug/Kg	D	YES															
Chrysene	350000		ug/Kg	D	YES															
Fluoranthene	720000		ug/Kg	D	YES															
Indeno(1,2,3-cd)pyrene	270000		ug/Kg	D	YES															
Phenanthrene	360000		ug/Kg	D	YES															
Pyrene	690000		ug/Kg	D	YES	**J**												J		

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-HS6-G-01 **Lab Report Batch :** K0904301 **Lab ID :** CAS_K

Sample Date : 05/12/2009 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0904301-007

Reviewed By / Date : LG 8/20/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8270C SIM					**Dilution: 50**															
Acenaphthylene	30000		ug/Kg	D	YES															
Benzo(a)pyrene	120000		ug/Kg	D	YES															
Benzo(b)fluoranthene	190000		ug/Kg	D	YES															
Benzo(g,h,i)perylene	43000		ug/Kg	D	YES															
Benzo(k)fluoranthene	62000		ug/Kg	D	YES															
Dibenz(a,h)anthracene	11000		ug/Kg	D	YES															
Indeno(1,2,3-cd)pyrene	55000		ug/Kg	D	YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-HS6-G-01 **Lab Report Batch :** K0904301 **Lab ID :** CAS_K

Sample Date : 05/12/2009 **Analysis Type: 2RES** **Sample Matrix :** SED

Lab Sample ID: K0904301-007

Reviewed By / Date : LG 8/20/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8270C SIM					**Dilution: 5000**															
1-Methylnaphthalene	590000		ug/Kg	D	YES															
2-Methylnaphthalene	1300000		ug/Kg	D	YES															
Acenaphthene	2000000		ug/Kg	D	YES															
Anthracene	7000000		ug/Kg	D	YES															
Benz(a)anthracene	550000		ug/Kg	D	YES															
Chrysene	450000		ug/Kg	D	YES															
Dibenzofuran	2600000		ug/Kg	D	YES															
Fluoranthene	8100000		ug/Kg	D	YES															
Fluorene	4700000		ug/Kg	D	YES															
Naphthalene	6300000		ug/Kg	D	YES															
Phenanthrene	30000000		ug/Kg	D	YES															
Pyrene	6000000		ug/Kg	D	YES	**J**												J		

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-HS6-UP1-01 **Lab Report Batch :** K0904301 **Lab ID :** CAS_K

Sample Date : 05/12/2009 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0904301-008

Reviewed By / Date : LG 8/20/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8270C SIM					**Dilution: 1**															
1-Methylnaphthalene	17		ug/Kg		YES															
2-Methylnaphthalene	28		ug/Kg		YES															
Acenaphthene	24		ug/Kg		YES															
Acenaphthylene	14		ug/Kg		YES															
Anthracene	220		ug/Kg		YES															
Benz(a)anthracene	200		ug/Kg		YES															
Benzo(a)pyrene	200		ug/Kg		YES															
Benzo(b)fluoranthene	270		ug/Kg		YES															
Benzo(g,h,i)perylene	140		ug/Kg		YES															
Benzo(k)fluoranthene	89		ug/Kg		YES															
Chrysene	220		ug/Kg		YES															
Dibenz(a,h)anthracene	33		ug/Kg		YES															
Dibenzofuran	36		ug/Kg		YES															
Fluoranthene	440		ug/Kg		YES															
Fluorene	46		ug/Kg		YES															
Indeno(1,2,3-cd)pyrene	160		ug/Kg		YES															
Naphthalene	210		ug/Kg		YES															
Phenanthrene	250		ug/Kg		YES															
Pyrene	370		ug/Kg		YES	**J**												J		

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-HS6-UP1-02 **Lab Report Batch :** K0904301 **Lab ID :** CAS_K

Sample Date : 05/12/2009 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0904301-009

Reviewed By / Date : LG 8/20/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8270C SIM					**Dilution: 1**															
1-Methylnaphthalene	6.3		ug/Kg		YES															
2-Methylnaphthalene	11		ug/Kg		YES															
Acenaphthene	6.6		ug/Kg		YES															
Acenaphthylene	1.1		ug/Kg	J	YES	**J**								J						
Anthracene	20		ug/Kg		YES															
Benz(a)anthracene	14		ug/Kg		YES															
Benzo(a)pyrene	15		ug/Kg		YES															
Benzo(b)fluoranthene	20		ug/Kg		YES															
Benzo(g,h,i)perylene	11		ug/Kg		YES															
Benzo(k)fluoranthene	6.0		ug/Kg		YES															
Chrysene	16		ug/Kg		YES															
Dibenz(a,h)anthracene	2.6		ug/Kg	J	YES	**J**								J						
Dibenzofuran	7.4		ug/Kg		YES															
Fluoranthene	41		ug/Kg		YES															
Fluorene	9.4		ug/Kg		YES															
Indeno(1,2,3-cd)pyrene	12		ug/Kg		YES															
Naphthalene	150		ug/Kg		YES															
Phenanthrene	53		ug/Kg		YES															
Pyrene	32		ug/Kg		YES	**J**												J		

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-HS6-UP2-01 **Lab Report Batch :** K0904301 **Lab ID :** CAS_K

Sample Date : 05/12/2009 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0904301-010

Reviewed By / Date : LG 8/20/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8270C SIM					**Dilution: 1**															
1-Methylnaphthalene	54		ug/Kg		YES															
2-Methylnaphthalene	68		ug/Kg		YES															
Acenaphthene	120		ug/Kg		YES															
Acenaphthylene	220		ug/Kg		YES															
Anthracene	610		ug/Kg		YES															
Benzo(g,h,i)perylene	1600		ug/Kg		YES															
Benzo(k)fluoranthene	1200		ug/Kg		YES															
Dibenz(a,h)anthracene	510		ug/Kg		YES															
Dibenzofuran	130		ug/Kg		YES															
Fluorene	200		ug/Kg		YES															
Naphthalene	620		ug/Kg		YES															
Phenanthrene	1300		ug/Kg		YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-HS6-UP2-01 **Lab Report Batch :** K0904301 **Lab ID :** CAS_K

Sample Date : 05/12/2009 **Analysis Type: 2RES** **Sample Matrix :** SED

Lab Sample ID: K0904301-010

Reviewed By / Date : LG 8/20/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8270C SIM					**Dilution: 10**															
Benz(a)anthracene	3300		ug/Kg	D	YES															
Benzo(a)pyrene	3300		ug/Kg	D	YES															
Benzo(b)fluoranthene	4400		ug/Kg	D	YES															
Chrysene	3700		ug/Kg	D	YES															
Fluoranthene	7800		ug/Kg	D	YES															
Indeno(1,2,3-cd)pyrene	2400		ug/Kg	D	YES															
Pyrene	6700		ug/Kg	D	YES	**J**												J		

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-HS6-UP3-01 **Lab Report Batch :** K0904301 **Lab ID :** CAS_K

Sample Date : 05/12/2009 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0904301-013

Reviewed By / Date : LG 8/20/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8270C SIM					**Dilution: 1**															
1-Methylnaphthalene	78		ug/Kg		YES															
2-Methylnaphthalene	140		ug/Kg		YES															
Acenaphthene	370		ug/Kg		YES															
Acenaphthylene	290		ug/Kg		YES															
Anthracene	830		ug/Kg		YES															
Benzo(g,h,i)perylene	1200		ug/Kg		YES															
Benzo(k)fluoranthene	850		ug/Kg		YES															
Dibenz(a,h)anthracene	380		ug/Kg		YES															
Dibenzofuran	220		ug/Kg		YES															
Fluorene	260		ug/Kg		YES															
Indeno(1,2,3-cd)pyrene	1600		ug/Kg		YES	**J**														J
Naphthalene	810		ug/Kg		YES															
Phenanthrene	750		ug/Kg		YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-HS6-UP3-01 **Lab Report Batch :** K0904301 **Lab ID :** CAS_K

Sample Date : 05/12/2009 **Analysis Type: 2RES** **Sample Matrix :** SED

Lab Sample ID: K0904301-013

Reviewed By / Date : LG 8/20/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8270C SIM					**Dilution: 10**															
Benz(a)anthracene	2400		ug/Kg	D	YES															
Benzo(a)pyrene	2300		ug/Kg	D	YES															
Benzo(b)fluoranthene	2900		ug/Kg	D	YES															
Chrysene	2500		ug/Kg	D	YES															
Fluoranthene	5700		ug/Kg	D	YES															
Pyrene	5100		ug/Kg	D	YES	**J**												J		

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-HS6-UP3-02 **Lab Report Batch :** K0904301 **Lab ID :** CAS_K

Sample Date : 05/12/2009 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0904301-014

Reviewed By / Date : LG 8/20/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8270C SIM					**Dilution: 1**															
1-Methylnaphthalene	5.1		ug/Kg		YES															
2-Methylnaphthalene	7.5		ug/Kg		YES															
Acenaphthene	15		ug/Kg		YES															
Acenaphthylene	8.4		ug/Kg		YES															
Anthracene	21		ug/Kg		YES															
Benz(a)anthracene	83		ug/Kg		YES															
Benzo(a)pyrene	86		ug/Kg		YES															
Benzo(b)fluoranthene	100		ug/Kg		YES															
Benzo(g,h,i)perylene	57		ug/Kg		YES															
Benzo(k)fluoranthene	34		ug/Kg		YES															
Chrysene	71		ug/Kg		YES															
Dibenz(a,h)anthracene	15		ug/Kg		YES															
Dibenzofuran	10		ug/Kg		YES															
Fluoranthene	180		ug/Kg		YES															
Fluorene	11		ug/Kg		YES															
Indeno(1,2,3-cd)pyrene	68		ug/Kg		YES															
Naphthalene	42		ug/Kg		YES															
Phenanthrene	51		ug/Kg		YES															
Pyrene	120		ug/Kg		YES	**J**												J		

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-HS6-UP3-03 **Lab Report Batch :** K0904301 **Lab ID :** CAS_K

Sample Date : 05/12/2009 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0904301-020

Reviewed By / Date : LG 8/20/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8270C SIM					**Dilution: 1**															
1-Methylnaphthalene	2.1		ug/Kg	J	YES	**J**								J						
2-Methylnaphthalene	2.2		ug/Kg	J	YES	**J**								J						
Acenaphthene	1.4		ug/Kg	J	YES	**J**								J						
Acenaphthylene	0.84		ug/Kg	J	YES	**J**								J						
Anthracene	2.3		ug/Kg	J	YES	**UJ**			U					J						
Benz(a)anthracene	8.3		ug/Kg		YES															
Benzo(a)pyrene	12		ug/Kg		YES															
Benzo(b)fluoranthene	10		ug/Kg		YES															
Benzo(g,h,i)perylene	6.2		ug/Kg		YES															
Benzo(k)fluoranthene	3.3		ug/Kg	J	YES	**J**								J						
Chrysene	8.9		ug/Kg		YES															
Dibenz(a,h)anthracene	1.8		ug/Kg	J	YES	**J**								J						
Dibenzofuran	1.7		ug/Kg	J	YES	**J**								J						
Fluoranthene	16		ug/Kg		YES															
Fluorene	1.9		ug/Kg	J	YES	**J**								J						
Indeno(1,2,3-cd)pyrene	6.1		ug/Kg		YES															
Naphthalene	7.6		ug/Kg		YES															
Phenanthrene	7.3		ug/Kg		YES															
Pyrene	15		ug/Kg		YES	**J**												J		

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-HS6-UP4-03 **Lab Report Batch :** K0904301 **Lab ID :** CAS_K

Sample Date : 05/12/2009 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0904301-015

Reviewed By / Date : LG 8/20/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8270C SIM					**Dilution: 1**															
1-Methylnaphthalene	840		ug/Kg		YES															
Acenaphthene	1300		ug/Kg		YES															
Acenaphthylene	40		ug/Kg		YES															
Anthracene	310		ug/Kg		YES															
Benz(a)anthracene	950		ug/Kg		YES															
Benzo(a)pyrene	520		ug/Kg		YES															
Benzo(b)fluoranthene	670		ug/Kg		YES															
Benzo(g,h,i)perylene	220		ug/Kg		YES															
Benzo(k)fluoranthene	200		ug/Kg		YES															
Chrysene	550		ug/Kg		YES															
Dibenz(a,h)anthracene	59		ug/Kg		YES															
Dibenzofuran	1300		ug/Kg		YES															
Indeno(1,2,3-cd)pyrene	290		ug/Kg		YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-HS6-UP4-03 **Lab Report Batch :** K0904301 **Lab ID :** CAS_K

Sample Date : 05/12/2009 **Analysis Type: 2RES** **Sample Matrix :** SED

Lab Sample ID: K0904301-015

Reviewed By / Date : LG 8/20/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8270C SIM					**Dilution: 10**															
2-Methylnaphthalene	1800		ug/Kg	D	YES															
Fluoranthene	4500		ug/Kg	D	YES															
Fluorene	2000		ug/Kg	D	YES															
Naphthalene	4400		ug/Kg	D	YES															
Phenanthrene	6500		ug/Kg	D	YES															
Pyrene	3800		ug/Kg	D	YES	**J**												J		

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-HS6-UP4-04 **Lab Report Batch :** K0904301 **Lab ID :** CAS_K

Sample Date : 05/12/2009 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0904301-016

Reviewed By / Date : LG 8/20/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8270C SIM					**Dilution: 1**															
1-Methylnaphthalene	700		ug/Kg		YES	**J**					J									
2-Methylnaphthalene	1200		ug/Kg		YES	**J**					J									
Acenaphthene	1100		ug/Kg		YES	**J**					J									
Acenaphthylene	33		ug/Kg		YES															
Anthracene	260		ug/Kg		YES															
Benz(a)anthracene	740		ug/Kg		YES	**J**					J									
Benzo(a)pyrene	470		ug/Kg		YES															
Benzo(b)fluoranthene	580		ug/Kg		YES															
Benzo(g,h,i)perylene	240		ug/Kg		YES															
Benzo(k)fluoranthene	210		ug/Kg		YES															
Chrysene	530		ug/Kg		YES															
Dibenz(a,h)anthracene	65		ug/Kg		YES															
Dibenzofuran	1000		ug/Kg		YES	**J**					J									
Fluorene	1300		ug/Kg		YES	**J**					J									
Indeno(1,2,3-cd)pyrene	290		ug/Kg		YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-HS6-UP4-04 **Lab Report Batch :** K0904301 **Lab ID :** CAS_K

Sample Date : 05/12/2009 **Analysis Type: 2RES** **Sample Matrix :** SED

Lab Sample ID: K0904301-016

Reviewed By / Date : LG 8/20/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8270C SIM					**Dilution: 10**															
Fluoranthene	5300		ug/Kg	D	YES															
Naphthalene	5200		ug/Kg	D	YES															
Phenanthrene	9000		ug/Kg	D	YES															
Pyrene	4500		ug/Kg	D	YES	**J**												J		

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-ZIC-C-01 **Lab Report Batch :** K0904301 **Lab ID :** CAS_K

Sample Date : 05/12/2009 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0904301-017

Reviewed By / Date : LG 8/20/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8270C SIM					**Dilution: 1**															
1-Methylnaphthalene	12		ug/Kg		YES															
2-Methylnaphthalene	10		ug/Kg		YES															
Acenaphthene	1.3		ug/Kg	J	YES	**J**								J						
Acenaphthylene	3.4		ug/Kg	Ui	YES															
Anthracene	3.4		ug/Kg	U	YES															
Benz(a)anthracene	3.6		ug/Kg		YES															
Benzo(a)pyrene	4.8		ug/Kg		YES															
Benzo(b)fluoranthene	7.3		ug/Kg		YES															
Benzo(g,h,i)perylene	18		ug/Kg		YES															
Benzo(k)fluoranthene	1.2		ug/Kg	J	YES	**J**								J						
Chrysene	6.2		ug/Kg		YES															
Dibenz(a,h)anthracene	2.3		ug/Kg	J	YES	**J**								J						
Dibenzofuran	6.1		ug/Kg		YES															
Fluoranthene	6.5		ug/Kg		YES															
Fluorene	3.6		ug/Kg		YES															
Indeno(1,2,3-cd)pyrene	3.6		ug/Kg		YES															
Naphthalene	7.1		ug/Kg		YES															
Phenanthrene	21		ug/Kg		YES															
Pyrene	6.9		ug/Kg		YES	**J**												J		

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-ZIC-C-02 **Lab Report Batch :** K0904301 **Lab ID :** CAS_K

Sample Date : 05/12/2009 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0904301-018

Reviewed By / Date : LG 8/20/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8270C SIM					**Dilution: 1**															
1-Methylnaphthalene	12		ug/Kg		YES															
2-Methylnaphthalene	9.9		ug/Kg		YES															
Acenaphthene	1.9		ug/Kg	J	YES	**J**								J						
Acenaphthylene	3.2		ug/Kg	Ui	YES															
Anthracene	3.1		ug/Kg	J	YES	**J**								J						
Benz(a)anthracene	4.5		ug/Kg		YES															
Benzo(a)pyrene	7.1		ug/Kg		YES															
Benzo(b)fluoranthene	8.3		ug/Kg		YES															
Benzo(g,h,i)perylene	21		ug/Kg		YES															
Benzo(k)fluoranthene	1.3		ug/Kg	J	YES	**J**								J						
Chrysene	8.2		ug/Kg		YES															
Dibenz(a,h)anthracene	2.1		ug/Kg	J	YES	**J**								J						
Dibenzofuran	7.6		ug/Kg		YES															
Fluoranthene	8.4		ug/Kg		YES															
Fluorene	4.6		ug/Kg		YES															
Indeno(1,2,3-cd)pyrene	4.2		ug/Kg		YES															
Naphthalene	8.1		ug/Kg		YES															
Phenanthrene	27		ug/Kg		YES															
Pyrene	12		ug/Kg		YES	**J**												J		

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-ZIC-C-03 **Lab Report Batch :** K0904301 **Lab ID :** CAS_K

Sample Date : 05/12/2009 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0904301-019

Reviewed By / Date : LG 8/20/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8270C SIM					**Dilution: 1**															
1-Methylnaphthalene	5.1		ug/Kg		YES															
2-Methylnaphthalene	4.2		ug/Kg		YES															
Acenaphthene	2.0		ug/Kg	J	YES	**J**								J						
Acenaphthylene	3.0		ug/Kg	Ui	YES															
Anthracene	3.0		ug/Kg	U	YES															
Benz(a)anthracene	1.8		ug/Kg	J	YES	**J**								J						
Benzo(a)pyrene	6.6		ug/Kg		YES															
Benzo(b)fluoranthene	2.8		ug/Kg	J	YES	**J**								J						
Benzo(g,h,i)perylene	8.6		ug/Kg		YES															
Benzo(k)fluoranthene	0.34		ug/Kg	J	YES	**J**								J						
Chrysene	4.4		ug/Kg		YES															
Dibenz(a,h)anthracene	0.51		ug/Kg	J	YES	**J**								J						
Dibenzofuran	6.1		ug/Kg		YES															
Fluoranthene	2.8		ug/Kg	J	YES	**J**								J						
Fluorene	3.8		ug/Kg		YES															
Indeno(1,2,3-cd)pyrene	1.5		ug/Kg	J	YES	**J**								J						
Naphthalene	14		ug/Kg		YES															
Phenanthrene	23		ug/Kg		YES															
Pyrene	3.7		ug/Kg		YES	**J**												J		

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-ZIC-D-01 **Lab Report Batch :** K0904301 **Lab ID :** CAS_K

Sample Date : 05/13/2009 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0904301-011

Reviewed By / Date : LG 8/20/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8270C SIM					**Dilution: 1**															
1-Methylnaphthalene	88		ug/Kg		YES															
2-Methylnaphthalene	69		ug/Kg		YES															
Acenaphthene	180		ug/Kg		YES															
Acenaphthylene	14		ug/Kg		YES															
Anthracene	92		ug/Kg		YES															
Benz(a)anthracene	220		ug/Kg		YES															
Benzo(a)pyrene	280		ug/Kg		YES															
Benzo(b)fluoranthene	320		ug/Kg		YES															
Benzo(g,h,i)perylene	190		ug/Kg		YES															
Benzo(k)fluoranthene	100		ug/Kg		YES															
Chrysene	220		ug/Kg		YES															
Dibenz(a,h)anthracene	47		ug/Kg		YES															
Dibenzofuran	91		ug/Kg		YES															
Fluoranthene	380		ug/Kg		YES															
Fluorene	120		ug/Kg		YES															
Indeno(1,2,3-cd)pyrene	230		ug/Kg		YES															
Naphthalene	610		ug/Kg		YES															
Phenanthrene	310		ug/Kg		YES															
Pyrene	210		ug/Kg		YES	**J**												J		

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-ZIC-D-01-DP
Lab Report Batch : K0904301
Lab ID : CAS_K
Sample Date : 05/13/2009
Analysis Type: 1RES
Sample Matrix : SED
Lab Sample ID: K0904301-012

Reviewed By / Date : LG 8/20/2009
Approved By / Date :

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8270C SIM					**Dilution: 1**															
1-Methylnaphthalene	48		ug/Kg		YES															
2-Methylnaphthalene	80		ug/Kg		YES															
Acenaphthene	100		ug/Kg		YES															
Acenaphthylene	41		ug/Kg		YES															
Anthracene	250		ug/Kg		YES															
Benz(a)anthracene	770		ug/Kg		YES															
Benzo(a)pyrene	1000		ug/Kg		YES															
Benzo(b)fluoranthene	1200		ug/Kg		YES															
Benzo(g,h,i)perylene	690		ug/Kg		YES															
Benzo(k)fluoranthene	400		ug/Kg		YES															
Chrysene	820		ug/Kg		YES															
Dibenz(a,h)anthracene	180		ug/Kg		YES															
Dibenzofuran	110		ug/Kg		YES															
Fluoranthene	1200		ug/Kg		YES															
Fluorene	140		ug/Kg		YES															
Indeno(1,2,3-cd)pyrene	850		ug/Kg		YES															
Naphthalene	450		ug/Kg		YES															
Phenanthrene	700		ug/Kg		YES															
Pyrene	1000		ug/Kg		YES	**J**												J		

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-HS6-X2-01 **Lab Report Batch :** K0904351 **Lab ID :** CAS_K

Sample Date : 05/14/2009 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0904351-013

Reviewed By / Date : LG 8/18/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8270C SIM					**Dilution: 20**															
1-Methylnaphthalene	5000		ug/Kg	D	YES															
2-Methylnaphthalene	7500		ug/Kg	D	YES															
Acenaphthene	9700		ug/Kg	D	YES															
Acenaphthylene	1400		ug/Kg	D	YES															
Anthracene	8200		ug/Kg	D	YES															
Benz(a)anthracene	6700		ug/Kg	D	YES															
Benzo(a)pyrene	5600		ug/Kg	D	YES															
Benzo(b)fluoranthene	6300		ug/Kg	D	YES															
Benzo(g,h,i)perylene	2800		ug/Kg	D	YES															
Benzo(k)fluoranthene	2200		ug/Kg	D	YES															
Chrysene	5700		ug/Kg	D	YES															
Dibenz(a,h)anthracene	710		ug/Kg	D	YES															
Dibenzofuran	6300		ug/Kg	D	YES															
Fluoranthene	17000		ug/Kg	D	YES															
Fluorene	7500		ug/Kg	D	YES															
Indeno(1,2,3-cd)pyrene	3600		ug/Kg	D	YES															
Naphthalene	20000		ug/Kg	D	YES															
Phenanthrene	24000		ug/Kg	D	YES															
Pyrene	16000		ug/Kg	D	YES	**J**												J		

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-HS6-X2-02 **Lab Report Batch :** K0904351 **Lab ID :** CAS_K

Sample Date : 05/14/2009 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0904351-014

Reviewed By / Date : LG 8/18/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8270C SIM					**Dilution: 1**															
1-Methylnaphthalene	190		ug/Kg		YES															
2-Methylnaphthalene	290		ug/Kg		YES															
Acenaphthene	290		ug/Kg		YES	**J**					J									
Acenaphthylene	39		ug/Kg		YES															
Anthracene	290		ug/Kg		YES	**J**					J									
Benz(a)anthracene	240		ug/Kg		YES															
Benzo(a)pyrene	180		ug/Kg		YES															
Benzo(b)fluoranthene	210		ug/Kg		YES															
Benzo(g,h,i)perylene	100		ug/Kg		YES															
Benzo(k)fluoranthene	68		ug/Kg		YES															
Chrysene	220		ug/Kg		YES															
Dibenz(a,h)anthracene	24		ug/Kg		YES															
Dibenzofuran	200		ug/Kg		YES	**J**					J									
Fluoranthene	650		ug/Kg		YES	**J**					J									
Fluorene	250		ug/Kg		YES															
Indeno(1,2,3-cd)pyrene	120		ug/Kg		YES															
Naphthalene	1100		ug/Kg		YES	**J**					J									
Phenanthrene	860		ug/Kg		YES	**J**					J									
Pyrene	580		ug/Kg		YES	**J**					J							J		

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-HS6-X2-02-FS **Lab Report Batch :** K0904351 **Lab ID :** CAS_K

Sample Date : 05/14/2009 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0904351-015

Reviewed By / Date : LG 8/18/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8270C SIM					**Dilution: 1**															
1-Methylnaphthalene	110		ug/Kg		YES															
2-Methylnaphthalene	150		ug/Kg		YES															
Acenaphthene	150		ug/Kg		YES															
Acenaphthylene	24		ug/Kg		YES															
Anthracene	160		ug/Kg		YES															
Benz(a)anthracene	140		ug/Kg		YES															
Benzo(a)pyrene	110		ug/Kg		YES															
Benzo(b)fluoranthene	130		ug/Kg		YES															
Benzo(g,h,i)perylene	73		ug/Kg		YES															
Benzo(k)fluoranthene	43		ug/Kg		YES															
Chrysene	120		ug/Kg		YES															
Dibenz(a,h)anthracene	15		ug/Kg		YES															
Dibenzofuran	100		ug/Kg		YES															
Fluoranthene	370		ug/Kg		YES															
Fluorene	140		ug/Kg		YES															
Indeno(1,2,3-cd)pyrene	74		ug/Kg		YES															
Naphthalene	1100		ug/Kg		YES															
Phenanthrene	510		ug/Kg		YES															
Pyrene	340		ug/Kg		YES	**J**												J		

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-ZIC-D-04 **Lab Report Batch :** K0904351 **Lab ID :** CAS_K

Sample Date : 05/13/2009 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0904351-001

Reviewed By / Date : LG 8/18/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8270C SIM					**Dilution: 1**															
1-Methylnaphthalene	1.9		ug/Kg	J	YES	**J**								J						
2-Methylnaphthalene	2.1		ug/Kg	J	YES	**J**								J						
Acenaphthene	1.3		ug/Kg	J	YES	**J**								J						
Acenaphthylene	3.6		ug/Kg	U	YES															
Anthracene	0.88		ug/Kg	J	YES	**J**								J						
Benz(a)anthracene	1.6		ug/Kg	J	YES	**J**								J						
Benzo(a)pyrene	1.6		ug/Kg	J	YES	**J**								J						
Benzo(b)fluoranthene	3.1		ug/Kg	J	YES	**J**								J						
Benzo(g,h,i)perylene	3.9		ug/Kg		YES															
Benzo(k)fluoranthene	0.56		ug/Kg	J	YES	**J**								J						
Chrysene	2.3		ug/Kg	J	YES	**J**								J						
Dibenz(a,h)anthracene	0.47		ug/Kg	J	YES	**J**								J						
Dibenzofuran	1.1		ug/Kg	J	YES	**J**								J						
Fluoranthene	3.3		ug/Kg	J	YES	**J**								J						
Fluorene	1.2		ug/Kg	J	YES	**J**								J						
Indeno(1,2,3-cd)pyrene	1.5		ug/Kg	J	YES	**J**								J						
Naphthalene	8.2		ug/Kg		YES	**U**			U											
Phenanthrene	4.4		ug/Kg		YES															
Pyrene	5.3		ug/Kg		YES	**J**												J		

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-ZIC-D-05 **Lab Report Batch :** K0904351 **Lab ID :** CAS_K

Sample Date : 05/13/2009 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0904351-002

Reviewed By / Date : LG 8/18/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8270C SIM					**Dilution: 1**															
1-Methylnaphthalene	1.8		ug/Kg	J	YES	**J**								J						
2-Methylnaphthalene	1.9		ug/Kg	J	YES	**J**								J						
Acenaphthene	1.4		ug/Kg	J	YES	**J**								J						
Acenaphthylene	3.4		ug/Kg	U	YES															
Anthracene	4.6		ug/Kg		YES															
Benz(a)anthracene	2.5		ug/Kg	J	YES	**J**								J						
Benzo(a)pyrene	3.2		ug/Kg	J	YES	**J**								J						
Benzo(b)fluoranthene	4.1		ug/Kg		YES															
Benzo(g,h,i)perylene	6.3		ug/Kg		YES															
Benzo(k)fluoranthene	1.3		ug/Kg	J	YES	**J**								J						
Chrysene	3.4		ug/Kg		YES															
Dibenz(a,h)anthracene	1.4		ug/Kg	J	YES	**J**								J						
Dibenzofuran	1.2		ug/Kg	J	YES	**J**								J						
Fluoranthene	6.7		ug/Kg		YES															
Fluorene	2.0		ug/Kg	J	YES	**J**								J						
Indeno(1,2,3-cd)pyrene	3.0		ug/Kg	J	YES	**J**								J						
Naphthalene	6.4		ug/Kg		YES	**U**			U											
Phenanthrene	9.5		ug/Kg		YES															
Pyrene	8.3		ug/Kg		YES	**J**												J		

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-ZIC-E-01 **Lab Report Batch :** K0904351 **Lab ID :** CAS_K

Sample Date : 05/13/2009 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0904351-003

Reviewed By / Date : LG 8/18/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8270C SIM					**Dilution: 20**															
1-Methylnaphthalene	200		ug/Kg	D	YES															
2-Methylnaphthalene	210		ug/Kg	D	YES															
Acenaphthene	480		ug/Kg	D	YES															
Acenaphthylene	510		ug/Kg	D	YES															
Anthracene	1900		ug/Kg	D	YES															
Benz(a)anthracene	4100		ug/Kg	D	YES															
Benzo(a)pyrene	4000		ug/Kg	D	YES															
Benzo(b)fluoranthene	4900		ug/Kg	D	YES															
Benzo(g,h,i)perylene	2700		ug/Kg	D	YES															
Benzo(k)fluoranthene	1600		ug/Kg	D	YES															
Chrysene	4100		ug/Kg	D	YES															
Dibenz(a,h)anthracene	610		ug/Kg	D	YES															
Dibenzofuran	370		ug/Kg	D	YES															
Fluoranthene	7800		ug/Kg	D	YES															
Fluorene	450		ug/Kg	D	YES															
Indeno(1,2,3-cd)pyrene	2900		ug/Kg	D	YES															
Naphthalene	660		ug/Kg	D	YES															
Phenanthrene	3800		ug/Kg	D	YES															
Pyrene	7400		ug/Kg	D	YES	**J**												J		

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-ZIC-E-02 **Lab Report Batch :** K0904351 **Lab ID :** CAS_K

Sample Date : 05/13/2009 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0904351-004

Reviewed By / Date : LG 8/18/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8270C SIM					**Dilution: 20**															
1-Methylnaphthalene	250		ug/Kg	D	YES															
2-Methylnaphthalene	310		ug/Kg	D	YES															
Acenaphthene	600		ug/Kg	D	YES															
Acenaphthylene	210		ug/Kg	D	YES															
Anthracene	1300		ug/Kg	D	YES															
Benz(a)anthracene	2600		ug/Kg	D	YES															
Benzo(a)pyrene	3100		ug/Kg	D	YES															
Benzo(b)fluoranthene	3700		ug/Kg	D	YES															
Benzo(g,h,i)perylene	2200		ug/Kg	D	YES															
Benzo(k)fluoranthene	1300		ug/Kg	D	YES															
Chrysene	2900		ug/Kg	D	YES															
Dibenz(a,h)anthracene	440		ug/Kg	D	YES															
Dibenzofuran	450		ug/Kg	D	YES															
Fluoranthene	5000		ug/Kg	D	YES															
Fluorene	650		ug/Kg	D	YES															
Indeno(1,2,3-cd)pyrene	2400		ug/Kg	D	YES															
Naphthalene	990		ug/Kg	D	YES															
Phenanthrene	3500		ug/Kg	D	YES															
Pyrene	5200		ug/Kg	D	YES	**J**												J		

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-ZIC-E-03 **Lab Report Batch :** K0904351 **Lab ID :** CAS_K

Sample Date : 05/13/2009 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0904351-005

Reviewed By / Date : LG 8/18/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8270C SIM					**Dilution: 1**															
1-Methylnaphthalene	160		ug/Kg		YES															
2-Methylnaphthalene	190		ug/Kg		YES															
Acenaphthene	320		ug/Kg		YES															
Acenaphthylene	100		ug/Kg		YES															
Anthracene	680		ug/Kg		YES															
Benz(a)anthracene	1500		ug/Kg		YES															
Benzo(a)pyrene	1500		ug/Kg		YES															
Benzo(b)fluoranthene	1900		ug/Kg		YES															
Benzo(g,h,i)perylene	960		ug/Kg		YES															
Benzo(k)fluoranthene	560		ug/Kg		YES															
Chrysene	1300		ug/Kg		YES															
Dibenz(a,h)anthracene	280		ug/Kg		YES															
Dibenzofuran	240		ug/Kg		YES															
Fluorene	400		ug/Kg		YES															
Indeno(1,2,3-cd)pyrene	1200		ug/Kg		YES															
Naphthalene	730		ug/Kg		YES															
Phenanthrene	1800		ug/Kg		YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-ZIC-E-03 **Lab Report Batch :** K0904351 **Lab ID :** CAS_K

Sample Date : 05/13/2009 **Analysis Type: 2RES** **Sample Matrix :** SED

Lab Sample ID: K0904351-005

Reviewed By / Date : LG 8/18/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8270C SIM					**Dilution: 5**															
Fluoranthene	2800		ug/Kg	D	YES															
Pyrene	2400		ug/Kg	D	YES	**J**												J		

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-ZIC-E-04 **Lab Report Batch :** K0904351 **Lab ID :** CAS_K

Sample Date : 05/13/2009 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0904351-006

Reviewed By / Date : LG 8/18/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8270C SIM					**Dilution: 50**															
1-Methylnaphthalene	290		ug/Kg	D	YES															
2-Methylnaphthalene	500		ug/Kg	D	YES															
Acenaphthene	1100		ug/Kg	D	YES															
Acenaphthylene	270		ug/Kg	D	YES															
Anthracene	2900		ug/Kg	D	YES															
Benz(a)anthracene	9300		ug/Kg	D	YES															
Benzo(a)pyrene	13000		ug/Kg	D	YES															
Benzo(b)fluoranthene	15000		ug/Kg	D	YES															
Benzo(g,h,i)perylene	9000		ug/Kg	D	YES															
Benzo(k)fluoranthene	5200		ug/Kg	D	YES															
Chrysene	9800		ug/Kg	D	YES															
Dibenz(a,h)anthracene	2000		ug/Kg	D	YES															
Dibenzofuran	690		ug/Kg	D	YES															
Fluoranthene	14000		ug/Kg	D	YES															
Fluorene	1100		ug/Kg	D	YES															
Indeno(1,2,3-cd)pyrene	11000		ug/Kg	D	YES															
Naphthalene	1800		ug/Kg	D	YES															
Phenanthrene	7600		ug/Kg	D	YES															
Pyrene	15000		ug/Kg	D	YES	**J**												J		

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-ZIC-E-05 **Lab Report Batch :** K0904351 **Lab ID :** CAS_K

Sample Date : 05/13/2009 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0904351-007

Reviewed By / Date : LG 8/18/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8270C SIM					**Dilution: 20**															
1-Methylnaphthalene	360		ug/Kg	D	YES															
2-Methylnaphthalene	600		ug/Kg	D	YES															
Acenaphthene	970		ug/Kg	D	YES															
Acenaphthylene	280		ug/Kg	D	YES															
Anthracene	2100		ug/Kg	D	YES															
Benz(a)anthracene	4800		ug/Kg	D	YES															
Benzo(a)pyrene	6000		ug/Kg	D	YES															
Benzo(b)fluoranthene	7000		ug/Kg	D	YES															
Benzo(g,h,i)perylene	3900		ug/Kg	D	YES															
Benzo(k)fluoranthene	2300		ug/Kg	D	YES															
Chrysene	5100		ug/Kg	D	YES															
Dibenz(a,h)anthracene	900		ug/Kg	D	YES															
Dibenzofuran	710		ug/Kg	D	YES															
Fluoranthene	9300		ug/Kg	D	YES															
Fluorene	1100		ug/Kg	D	YES															
Indeno(1,2,3-cd)pyrene	4700		ug/Kg	D	YES															
Naphthalene	1700		ug/Kg	D	YES															
Phenanthrene	6200		ug/Kg	D	YES															
Pyrene	8800		ug/Kg	D	YES	**J**												J		

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-ZIC-F-01 **Lab Report Batch :** K0904351 **Lab ID :** CAS_K

Sample Date : 05/13/2009 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0904351-011

Reviewed By / Date : LG 8/18/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8270C SIM					**Dilution: 1**															
1-Methylnaphthalene	41		ug/Kg		YES															
2-Methylnaphthalene	68		ug/Kg		YES															
Acenaphthene	110		ug/Kg		YES															
Acenaphthylene	57		ug/Kg		YES															
Anthracene	360		ug/Kg		YES															
Benz(a)anthracene	910		ug/Kg		YES															
Benzo(a)pyrene	770		ug/Kg		YES															
Benzo(b)fluoranthene	920		ug/Kg		YES															
Benzo(g,h,i)perylene	430		ug/Kg		YES															
Benzo(k)fluoranthene	300		ug/Kg		YES															
Chrysene	720		ug/Kg		YES															
Dibenz(a,h)anthracene	120		ug/Kg		YES															
Dibenzofuran	110		ug/Kg		YES															
Fluorene	190		ug/Kg		YES															
Indeno(1,2,3-cd)pyrene	520		ug/Kg		YES															
Naphthalene	200		ug/Kg		YES															
Phenanthrene	950		ug/Kg		YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-ZIC-F-01 **Lab Report Batch :** K0904351 **Lab ID :** CAS_K

Sample Date : 05/13/2009 **Analysis Type: 2RES** **Sample Matrix :** SED

Lab Sample ID: K0904351-011

Reviewed By / Date : LG 8/18/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8270C SIM					**Dilution: 5**															
Fluoranthene	2400		ug/Kg	D	YES															
Pyrene	1900		ug/Kg	D	YES	**J**												J		

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-ZIC-F-02 **Lab Report Batch :** K0904351 **Lab ID :** CAS_K

Sample Date : 05/13/2009 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0904351-008

Reviewed By / Date : LG 8/18/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8270C SIM					**Dilution: 1**															
1-Methylnaphthalene	2.4		ug/Kg	J	YES	**J**								J						
2-Methylnaphthalene	3.2		ug/Kg	J	YES	**J**								J						
Acenaphthene	2.8		ug/Kg	J	YES	**J**								J						
Acenaphthylene	0.83		ug/Kg	J	YES	**J**								J						
Anthracene	6.2		ug/Kg		YES															
Benz(a)anthracene	8.9		ug/Kg		YES															
Benzo(a)pyrene	9.0		ug/Kg		YES															
Benzo(b)fluoranthene	11		ug/Kg		YES															
Benzo(g,h,i)perylene	8.1		ug/Kg		YES															
Benzo(k)fluoranthene	3.3		ug/Kg	J	YES	**J**								J						
Chrysene	7.9		ug/Kg		YES															
Dibenz(a,h)anthracene	1.7		ug/Kg	J	YES	**J**								J						
Dibenzofuran	2.8		ug/Kg	J	YES	**J**								J						
Fluoranthene	25		ug/Kg		YES															
Fluorene	4.4		ug/Kg		YES															
Indeno(1,2,3-cd)pyrene	5.9		ug/Kg		YES															
Naphthalene	11		ug/Kg		YES															
Phenanthrene	21		ug/Kg		YES															
Pyrene	24		ug/Kg		YES	**J**												J		

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-ZIC-F-02-DP **Lab Report Batch :** K0904351 **Lab ID :** CAS_K

Sample Date : 05/13/2009 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0904351-012

Reviewed By / Date : LG 8/18/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8270C SIM					**Dilution: 1**															
1-Methylnaphthalene	1.9		ug/Kg	J	YES	**J**								J						
2-Methylnaphthalene	2.2		ug/Kg	J	YES	**J**								J						
Acenaphthene	1.9		ug/Kg	J	YES	**J**								J						
Acenaphthylene	0.42		ug/Kg	J	YES	**J**								J						
Anthracene	3.7		ug/Kg		YES															
Benz(a)anthracene	5.7		ug/Kg		YES															
Benzo(a)pyrene	5.4		ug/Kg		YES															
Benzo(b)fluoranthene	7.1		ug/Kg		YES															
Benzo(g,h,i)perylene	5.6		ug/Kg		YES															
Benzo(k)fluoranthene	1.9		ug/Kg	J	YES	**J**								J						
Chrysene	6.0		ug/Kg		YES															
Dibenz(a,h)anthracene	0.95		ug/Kg	J	YES	**J**								J						
Dibenzofuran	1.9		ug/Kg	J	YES	**J**								J						
Fluoranthene	17		ug/Kg		YES															
Fluorene	2.6		ug/Kg	J	YES	**J**								J						
Indeno(1,2,3-cd)pyrene	3.7		ug/Kg		YES															
Naphthalene	7.3		ug/Kg		YES	**U**			U											
Phenanthrene	13		ug/Kg		YES															
Pyrene	16		ug/Kg		YES	**J**												J		

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-ZIC-F-03 **Lab Report Batch :** K0904351 **Lab ID :** CAS_K

Sample Date : 05/13/2009 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0904351-009

Reviewed By / Date : LG 8/18/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8270C SIM					**Dilution: 1**															
1-Methylnaphthalene	1.3		ug/Kg	J	YES	**J**								J						
2-Methylnaphthalene	1.5		ug/Kg	J	YES	**J**								J						
Acenaphthene	0.58		ug/Kg	J	YES	**J**								J						
Acenaphthylene	3.3		ug/Kg	U	YES															
Anthracene	0.54		ug/Kg	J	YES	**J**								J						
Benz(a)anthracene	1.2		ug/Kg	J	YES	**J**								J						
Benzo(a)pyrene	2.0		ug/Kg	J	YES	**J**								J						
Benzo(b)fluoranthene	2.2		ug/Kg	J	YES	**J**								J						
Benzo(g,h,i)perylene	3.1		ug/Kg	J	YES	**J**								J						
Benzo(k)fluoranthene	0.41		ug/Kg	J	YES	**J**								J						
Chrysene	2.1		ug/Kg	J	YES	**J**								J						
Dibenz(a,h)anthracene	0.45		ug/Kg	J	YES	**J**								J						
Dibenzofuran	3.3		ug/Kg	U	YES															
Fluoranthene	3.0		ug/Kg	J	YES	**J**								J						
Fluorene	0.86		ug/Kg	J	YES	**J**								J						
Indeno(1,2,3-cd)pyrene	1.1		ug/Kg	J	YES	**J**								J						
Naphthalene	5.6		ug/Kg		YES	**U**			U											
Phenanthrene	4.5		ug/Kg		YES															
Pyrene	4.6		ug/Kg		YES	**J**												J		

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-ZIC-F-04 **Lab Report Batch :** K0904351 **Lab ID :** CAS_K

Sample Date : 05/13/2009 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0904351-010

Reviewed By / Date : LG 8/18/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8270C SIM					**Dilution: 1**															
1-Methylnaphthalene	1.4		ug/Kg	J	YES	**J**								J						
2-Methylnaphthalene	1.9		ug/Kg	J	YES	**J**								J						
Acenaphthene	1.2		ug/Kg	J	YES	**J**								J						
Acenaphthylene	0.56		ug/Kg	J	YES	**J**								J						
Anthracene	2.2		ug/Kg	J	YES	**J**								J						
Benz(a)anthracene	3.0		ug/Kg	J	YES	**J**								J						
Benzo(a)pyrene	3.8		ug/Kg		YES															
Benzo(b)fluoranthene	4.4		ug/Kg		YES															
Benzo(g,h,i)perylene	4.0		ug/Kg		YES															
Benzo(k)fluoranthene	1.3		ug/Kg	J	YES	**J**								J						
Chrysene	3.6		ug/Kg		YES															
Dibenz(a,h)anthracene	0.77		ug/Kg	J	YES	**J**								J						
Dibenzofuran	1.0		ug/Kg	J	YES	**J**								J						
Fluoranthene	8.1		ug/Kg		YES															
Fluorene	1.4		ug/Kg	J	YES	**J**								J						
Indeno(1,2,3-cd)pyrene	3.0		ug/Kg	J	YES	**J**								J						
Naphthalene	9.6		ug/Kg		YES															
Phenanthrene	8.1		ug/Kg		YES															
Pyrene	7.4		ug/Kg		YES	**J**												J		

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-HS6-DOWN1-01 **Lab Report Batch :** K0904356 **Lab ID :** CAS_K

Sample Date : 05/13/2009 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0904356-009

Reviewed By / Date : LG 8/20/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8270C SIM					**Dilution: 5**															
1-Methylnaphthalene	90		ug/Kg	D	YES															
2-Methylnaphthalene	160		ug/Kg	D	YES															
Acenaphthene	240		ug/Kg	D	YES															
Acenaphthylene	380		ug/Kg	D	YES															
Anthracene	1300		ug/Kg	D	YES															
Benz(a)anthracene	3200		ug/Kg	D	YES															
Benzo(a)pyrene	3200		ug/Kg	D	YES															
Benzo(b)fluoranthene	3800		ug/Kg	D	YES															
Benzo(g,h,i)perylene	1900		ug/Kg	D	YES															
Benzo(k)fluoranthene	1300		ug/Kg	D	YES															
Chrysene	3100		ug/Kg	D	YES															
Dibenz(a,h)anthracene	490		ug/Kg	D	YES															
Dibenzofuran	300		ug/Kg	D	YES															
Fluoranthene	6200		ug/Kg	D	YES															
Fluorene	620		ug/Kg	D	YES															
Indeno(1,2,3-cd)pyrene	2400		ug/Kg	D	YES															
Naphthalene	290		ug/Kg	D	YES															
Phenanthrene	3500		ug/Kg	D	YES															
Pyrene	5200		ug/Kg	D	YES	**J**												J		

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-HS6-DOWN1-02 **Lab Report Batch :** K0904356 **Lab ID :** CAS_K

Sample Date : 05/13/2009 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0904356-010

Reviewed By / Date : LG 8/20/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8270C SIM					**Dilution: 1**															
1-Methylnaphthalene	3.2		ug/Kg	J	YES	**J**								J						
2-Methylnaphthalene	5.3		ug/Kg		YES															
Acenaphthene	3.5		ug/Kg	J	YES	**J**								J						
Acenaphthylene	3.9		ug/Kg		YES															
Anthracene	110		ug/Kg		YES															
Benz(a)anthracene	44		ug/Kg		YES															
Benzo(a)pyrene	35		ug/Kg		YES															
Benzo(b)fluoranthene	47		ug/Kg		YES															
Benzo(g,h,i)perylene	25		ug/Kg		YES															
Benzo(k)fluoranthene	15		ug/Kg		YES															
Chrysene	44		ug/Kg		YES															
Dibenz(a,h)anthracene	5.7		ug/Kg		YES															
Dibenzofuran	8.1		ug/Kg		YES															
Fluoranthene	160		ug/Kg		YES															
Fluorene	33		ug/Kg		YES															
Indeno(1,2,3-cd)pyrene	27		ug/Kg		YES															
Naphthalene	10		ug/Kg		YES															
Phenanthrene	320		ug/Kg		YES															
Pyrene	110		ug/Kg		YES	**J**												J		

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-HS6-DOWN1-02-FS **Lab Report Batch :** K0904356 **Lab ID :** CAS_K

Sample Date : 05/13/2009 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0904356-011

Reviewed By / Date : LG 8/20/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8270C SIM					**Dilution: 1**															
1-Methylnaphthalene	3.3		ug/Kg	J	YES	**J**								J						
2-Methylnaphthalene	6.4		ug/Kg		YES															
Acenaphthene	3.6		ug/Kg	J	YES	**J**								J						
Acenaphthylene	1.8		ug/Kg	J	YES	**J**								J						
Anthracene	12		ug/Kg		YES															
Benz(a)anthracene	22		ug/Kg		YES															
Benzo(a)pyrene	25		ug/Kg		YES															
Benzo(b)fluoranthene	29		ug/Kg		YES															
Benzo(g,h,i)perylene	18		ug/Kg		YES															
Benzo(k)fluoranthene	8.8		ug/Kg		YES															
Chrysene	26		ug/Kg		YES															
Dibenz(a,h)anthracene	3.7		ug/Kg	J	YES															
Dibenzofuran	6.0		ug/Kg		YES															
Fluoranthene	54		ug/Kg		YES															
Fluorene	8.3		ug/Kg		YES															
Indeno(1,2,3-cd)pyrene	19		ug/Kg		YES															
Naphthalene	14		ug/Kg		YES															
Phenanthrene	42		ug/Kg		YES															
Pyrene	49		ug/Kg		YES	**J**												J		

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-HS6-DOWN1-03 **Lab Report Batch :** K0904356 **Lab ID :** CAS_K

Sample Date : 05/13/2009 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0904356-012

Reviewed By / Date : LG 8/20/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8270C SIM					**Dilution: 1**															
1-Methylnaphthalene	16		ug/Kg		YES															
2-Methylnaphthalene	48		ug/Kg		YES															
Acenaphthene	9.1		ug/Kg		YES															
Acenaphthylene	3.6		ug/Kg		YES															
Anthracene	16		ug/Kg		YES															
Benz(a)anthracene	9.1		ug/Kg		YES															
Benzo(a)pyrene	8.7		ug/Kg		YES															
Benzo(b)fluoranthene	11		ug/Kg		YES															
Benzo(g,h,i)perylene	8.3		ug/Kg		YES															
Benzo(k)fluoranthene	3.3		ug/Kg	J	YES	**J**								J						
Chrysene	12		ug/Kg		YES															
Dibenz(a,h)anthracene	1.9		ug/Kg	J	YES	**J**								J						
Dibenzofuran	35		ug/Kg		YES															
Fluoranthene	29		ug/Kg		YES															
Fluorene	29		ug/Kg		YES															
Indeno(1,2,3-cd)pyrene	6.4		ug/Kg		YES															
Naphthalene	33		ug/Kg		YES															
Phenanthrene	62		ug/Kg		YES															
Pyrene	25		ug/Kg		YES	**J**												J		

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-HS6-DOWN1-04 **Lab Report Batch :** K0904356 **Lab ID :** CAS_K

Sample Date : 05/13/2009 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0904356-013

Reviewed By / Date : LG 8/20/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8270C SIM					**Dilution: 1**															
1-Methylnaphthalene	2.3		ug/Kg	J	YES	**J**								J						
2-Methylnaphthalene	3.0		ug/Kg	J	YES	**J**								J						
Acenaphthene	1.6		ug/Kg	J	YES	**J**								J						
Acenaphthylene	0.40		ug/Kg	J	YES	**J**								J						
Anthracene	2.5		ug/Kg	J	YES	**J**								J						
Benz(a)anthracene	3.3		ug/Kg	J	YES	**J**								J						
Benzo(a)pyrene	4.6		ug/Kg		YES															
Benzo(b)fluoranthene	5.1		ug/Kg		YES															
Benzo(g,h,i)perylene	4.5		ug/Kg		YES															
Benzo(k)fluoranthene	1.1		ug/Kg	J	YES	**J**								J						
Chrysene	3.4		ug/Kg		YES															
Dibenz(a,h)anthracene	0.75		ug/Kg	J	YES	**J**								J						
Dibenzofuran	1.4		ug/Kg	J	YES	**J**								J						
Fluoranthene	7.8		ug/Kg		YES															
Fluorene	2.0		ug/Kg	J	YES	**J**								J						
Indeno(1,2,3-cd)pyrene	2.4		ug/Kg	J	YES	**J**								J						J
Naphthalene	9.0		ug/Kg		YES															
Phenanthrene	11		ug/Kg		YES															
Pyrene	8.2		ug/Kg		YES	**J**												J		

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-HS6-DOWN2-01 **Lab Report Batch :** K0904356 **Lab ID :** CAS_K

Sample Date : 05/13/2009 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0904356-014

Reviewed By / Date : LG 8/20/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8270C SIM					**Dilution: 50**															
1-Methylnaphthalene	1800		ug/Kg	D	YES															
2-Methylnaphthalene	630		ug/Kg	D	YES															
Acenaphthene	7500		ug/Kg	D	YES															
Acenaphthylene	1300		ug/Kg	D	YES															
Anthracene	14000		ug/Kg	D	YES															
Benz(a)anthracene	18000		ug/Kg	D	YES															
Benzo(a)pyrene	17000		ug/Kg	D	YES															
Benzo(b)fluoranthene	21000		ug/Kg	D	YES															
Benzo(g,h,i)perylene	11000		ug/Kg	D	YES															
Benzo(k)fluoranthene	7400		ug/Kg	D	YES															
C1-Chrysenes	7400		ug/Kg	D	YES															
C1-Fluorenes	1900		ug/Kg	D	YES															
C2-Chrysenes	2900		ug/Kg	D	YES															
C2-Fluorenes	1500		ug/Kg	D	YES															
C2-Naphthalenes	2200		ug/Kg	D	YES															
C3-Chrysenes	1900		ug/Kg	D	YES															
C3-Fluorenes	2100		ug/Kg	D	YES															
C3-Naphthalenes	1600		ug/Kg	D	YES															
C4-Chrysenes	710		ug/Kg	D	YES															
C4-Naphthalenes	1000		ug/Kg	D	YES															
Chrysene	18000		ug/Kg	D	YES															
Dibenz(a,h)anthracene	2700		ug/Kg	D	YES															
Dibenzofuran	5400		ug/Kg	D	YES															
Fluoranthene	46000		ug/Kg	D	YES															
Fluorene	6900		ug/Kg	D	YES															
Indeno(1,2,3-cd)pyrene	13000		ug/Kg	D	YES															
Naphthalene	2900		ug/Kg	D	YES															
Phenanthrene	27000		ug/Kg	D	YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-HS6-DOWN2-01 **Lab Report Batch :** K0904356 **Lab ID :** CAS_K

Sample Date : 05/13/2009 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0904356-014

Reviewed By / Date : LG 8/20/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8270C SIM						**Dilution: 50**														
Pyrene	37000		ug/Kg	D	YES	**J**												J		

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-HS6-UP1-02-FS **Lab Report Batch :** K0904356 **Lab ID :** CAS_K

Sample Date : 05/12/2009 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0904356-004

Reviewed By / Date : LG 8/20/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8270C SIM					**Dilution: 1**															
1-Methylnaphthalene	2.6		ug/Kg	J	YES	**J**								J						
2-Methylnaphthalene	4.2		ug/Kg	J	YES	**J**								J						
Acenaphthene	3.4		ug/Kg	J	YES	**J**								J						
Acenaphthylene	0.80		ug/Kg	J	YES	**J**								J						
Anthracene	39		ug/Kg		YES															
Benz(a)anthracene	9.5		ug/Kg		YES															
Benzo(a)pyrene	11		ug/Kg		YES															
Benzo(b)fluoranthene	15		ug/Kg		YES															
Benzo(g,h,i)perylene	8.9		ug/Kg		YES															
Benzo(k)fluoranthene	4.0		ug/Kg	J	YES	**J**								J						
Chrysene	13		ug/Kg		YES															
Dibenz(a,h)anthracene	1.8		ug/Kg	J	YES	**J**								J						
Dibenzofuran	8.0		ug/Kg		YES															
Fluoranthene	38		ug/Kg		YES															
Fluorene	18		ug/Kg		YES															
Indeno(1,2,3-cd)pyrene	8.8		ug/Kg		YES															
Naphthalene	14		ug/Kg		YES															
Phenanthrene	120		ug/Kg		YES															
Pyrene	31		ug/Kg		YES	**J**												J		

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-HS6-UP1-03 **Lab Report Batch :** K0904356 **Lab ID :** CAS_K

Sample Date : 05/12/2009 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0904356-005

Reviewed By / Date : LG 8/20/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8270C SIM					**Dilution: 1**															
1-Methylnaphthalene	3.6		ug/Kg	J	YES	**J**								J						
2-Methylnaphthalene	6.4		ug/Kg		YES															
Acenaphthene	2.7		ug/Kg	J	YES	**J**								J						
Acenaphthylene	0.29		ug/Kg	J	YES	**J**								J						
Anthracene	93		ug/Kg		YES															
Benz(a)anthracene	5.2		ug/Kg		YES															
Benzo(a)pyrene	4.1		ug/Kg	J	YES	**J**								J						
Benzo(b)fluoranthene	6.7		ug/Kg		YES															
Benzo(g,h,i)perylene	4.6		ug/Kg	J	YES															
Benzo(k)fluoranthene	1.3		ug/Kg	J	YES	**J**								J						
Chrysene	5.6		ug/Kg		YES															
Dibenz(a,h)anthracene	0.83		ug/Kg	J	YES	**J**								J						
Dibenzofuran	12		ug/Kg		YES															
Fluoranthene	44		ug/Kg		YES															
Fluorene	34		ug/Kg		YES															
Indeno(1,2,3-cd)pyrene	2.9		ug/Kg	J	YES	**J**								J						
Naphthalene	12		ug/Kg		YES															
Phenanthrene	260		ug/Kg		YES															
Pyrene	26		ug/Kg		YES	**J**												J		

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-HS6-UP2-02 **Lab Report Batch :** K0904356 **Lab ID :** CAS_K

Sample Date : 05/12/2009 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0904356-006

Reviewed By / Date : LG 8/20/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8270C SIM					**Dilution: 1**															
1-Methylnaphthalene	7.9		ug/Kg		YES															
2-Methylnaphthalene	8.2		ug/Kg		YES															
Acenaphthene	10		ug/Kg		YES															
Acenaphthylene	12		ug/Kg		YES															
Anthracene	42		ug/Kg		YES															
Benz(a)anthracene	200		ug/Kg		YES															
Benzo(a)pyrene	200		ug/Kg		YES															
Benzo(b)fluoranthene	270		ug/Kg		YES															
Benzo(g,h,i)perylene	130		ug/Kg		YES															
Benzo(k)fluoranthene	83		ug/Kg		YES															
Chrysene	210		ug/Kg		YES															
Dibenz(a,h)anthracene	33		ug/Kg		YES															
Dibenzofuran	14		ug/Kg		YES															
Fluoranthene	430		ug/Kg		YES															
Fluorene	20		ug/Kg		YES															
Indeno(1,2,3-cd)pyrene	160		ug/Kg		YES															
Naphthalene	69		ug/Kg		YES															
Phenanthrene	120		ug/Kg		YES															
Pyrene	370		ug/Kg		YES	**J**												J		

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-HS6-UP2-03 **Lab Report Batch :** K0904356 **Lab ID :** CAS_K

Sample Date : 05/12/2009 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0904356-007

Reviewed By / Date : LG 8/20/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8270C SIM					**Dilution: 1**															
1-Methylnaphthalene	3.8		ug/Kg	J	YES	**J**								J						
2-Methylnaphthalene	4.2		ug/Kg	J	YES	**J**								J						
Acenaphthene	3.5		ug/Kg	J	YES	**J**								J						
Acenaphthylene	1.8		ug/Kg	J	YES	**J**								J						
Anthracene	12		ug/Kg		YES															
Benz(a)anthracene	31		ug/Kg		YES															
Benzo(a)pyrene	33		ug/Kg		YES															
Benzo(b)fluoranthene	47		ug/Kg		YES															
Benzo(g,h,i)perylene	26		ug/Kg		YES															
Benzo(k)fluoranthene	14		ug/Kg		YES															
Chrysene	36		ug/Kg		YES															
Dibenz(a,h)anthracene	5.9		ug/Kg		YES															
Dibenzofuran	5.0		ug/Kg		YES															
Fluoranthene	74		ug/Kg		YES															
Fluorene	7.2		ug/Kg		YES															
Indeno(1,2,3-cd)pyrene	29		ug/Kg		YES															
Naphthalene	17		ug/Kg		YES															
Phenanthrene	44		ug/Kg		YES															
Pyrene	65		ug/Kg		YES	**J**												J		

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-HS6-UP2-04 **Lab Report Batch :** K0904356 **Lab ID :** CAS_K

Sample Date : 05/12/2009 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0904356-008

Reviewed By / Date : LG 8/20/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8270C SIM					**Dilution: 1**															
1-Methylnaphthalene	3.4		ug/Kg	J	YES	**J**								J						
2-Methylnaphthalene	3.7		ug/Kg	J	YES	**J**								J						
Acenaphthene	3.0		ug/Kg	J	YES	**J**								J						
Acenaphthylene	0.48		ug/Kg	J	YES	**J**								J						
Anthracene	7.7		ug/Kg		YES															
Benz(a)anthracene	9.7		ug/Kg		YES															
Benzo(a)pyrene	11		ug/Kg		YES															
Benzo(b)fluoranthene	15		ug/Kg		YES															
Benzo(g,h,i)perylene	10		ug/Kg		YES															
Benzo(k)fluoranthene	4.3		ug/Kg		YES															
Chrysene	14		ug/Kg		YES															
Dibenz(a,h)anthracene	2.3		ug/Kg	J	YES	**J**								J						
Dibenzofuran	4.2		ug/Kg		YES															
Fluoranthene	28		ug/Kg		YES															
Fluorene	6.2		ug/Kg		YES															
Indeno(1,2,3-cd)pyrene	9.0		ug/Kg		YES															
Naphthalene	12		ug/Kg		YES															
Phenanthrene	35		ug/Kg		YES															
Pyrene	27		ug/Kg		YES	**J**												J		

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-HS6-UP3-04 **Lab Report Batch :** K0904356 **Lab ID :** CAS_K

Sample Date : 05/12/2009 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0904356-001

Reviewed By / Date : LG 8/20/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8270C SIM					**Dilution: 1**															
1-Methylnaphthalene	2.2		ug/Kg	J	YES	**J**								J						
2-Methylnaphthalene	2.6		ug/Kg	J	YES	**J**								J						
Acenaphthene	2.5		ug/Kg	J	YES	**J**								J						
Acenaphthylene	1.4		ug/Kg	J	YES	**J**								J						
Anthracene	4.8		ug/Kg		YES															
Benz(a)anthracene	13		ug/Kg		YES															
Benzo(a)pyrene	13		ug/Kg		YES															
Benzo(b)fluoranthene	17		ug/Kg		YES															
Benzo(g,h,i)perylene	11		ug/Kg		YES															
Benzo(k)fluoranthene	5.4		ug/Kg		YES															
Chrysene	15		ug/Kg		YES															
Dibenz(a,h)anthracene	2.4		ug/Kg	J	YES	**J**								J						
Dibenzofuran	2.5		ug/Kg	J	YES	**J**								J						
Fluoranthene	36		ug/Kg		YES															
Fluorene	3.1		ug/Kg	J	YES	**J**								J						
Indeno(1,2,3-cd)pyrene	11		ug/Kg		YES															
Naphthalene	7.1		ug/Kg		YES															
Phenanthrene	18		ug/Kg		YES															
Pyrene	36		ug/Kg		YES	**J**												J		

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-HS6-UP4-01 **Lab Report Batch :** K0904356 **Lab ID :** CAS_K

Sample Date : 05/12/2009 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0904356-002

Reviewed By / Date : LG 8/20/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8270C SIM					**Dilution: 20**															
1-Methylnaphthalene	7900		ug/Kg	D	YES															
2-Methylnaphthalene	14000		ug/Kg	D	YES															
Acenaphthene	18000		ug/Kg	D	YES															
Acenaphthylene	1300		ug/Kg	D	YES															
Anthracene	9900		ug/Kg	D	YES															
Benz(a)anthracene	23000		ug/Kg	D	YES															
Benzo(a)pyrene	19000		ug/Kg	D	YES															
Benzo(b)fluoranthene	24000		ug/Kg	D	YES															
Benzo(g,h,i)perylene	10000		ug/Kg	D	YES															
Benzo(k)fluoranthene	8800		ug/Kg	D	YES															
Chrysene	20000		ug/Kg	D	YES															
Dibenz(a,h)anthracene	2800		ug/Kg	D	YES															
Dibenzofuran	16000		ug/Kg	D	YES															
Fluorene	22000		ug/Kg	D	YES															
Indeno(1,2,3-cd)pyrene	13000		ug/Kg	D	YES															
Naphthalene	20000		ug/Kg	D	YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-HS6-UP4-01 **Lab Report Batch :** K0904356 **Lab ID :** CAS_K

Sample Date : 05/12/2009 **Analysis Type: 2RES** **Sample Matrix :** SED

Lab Sample ID: K0904356-002

Reviewed By / Date : LG 8/20/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8270C SIM					**Dilution: 200**															
Fluoranthene	79000		ug/Kg	D	YES															
Phenanthrene	83000		ug/Kg	D	YES															
Pyrene	68000		ug/Kg	D	YES	**J**												J		

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-HS6-UP4-02 **Lab Report Batch :** K0904356 **Lab ID :** CAS_K

Sample Date : 05/12/2009 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0904356-003

Reviewed By / Date : LG 8/20/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8270C SIM					**Dilution: 5**															
1-Methylnaphthalene	2000		ug/Kg	D	YES															
2-Methylnaphthalene	3700		ug/Kg	D	YES															
Acenaphthene	3900		ug/Kg	D	YES															
Acenaphthylene	420		ug/Kg	D	YES															
Anthracene	2200		ug/Kg	D	YES															
Benz(a)anthracene	5000		ug/Kg	D	YES															
Benzo(a)pyrene	4500		ug/Kg	D	YES															
Benzo(b)fluoranthene	5200		ug/Kg	D	YES															
Benzo(g,h,i)perylene	2700		ug/Kg	D	YES															
Benzo(k)fluoranthene	1800		ug/Kg	D	YES															
Chrysene	3900		ug/Kg	D	YES															
Dibenz(a,h)anthracene	600		ug/Kg	D	YES															
Dibenzofuran	3600		ug/Kg	D	YES															
Fluorene	5000		ug/Kg	D	YES															
Indeno(1,2,3-cd)pyrene	3400		ug/Kg	D	YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-HS6-UP4-02 **Lab Report Batch :** K0904356 **Lab ID :** CAS_K

Sample Date : 05/12/2009 **Analysis Type: 2RES** **Sample Matrix :** SED

Lab Sample ID: K0904356-003

Reviewed By / Date : LG 8/20/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8270C SIM					**Dilution: 50**															
Fluoranthene	20000		ug/Kg	D	YES															
Naphthalene	8600		ug/Kg	D	YES															
Phenanthrene	23000		ug/Kg	D	YES															
Pyrene	17000		ug/Kg	D	YES	**J**												J		

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-HS6-X1-01 **Lab Report Batch :** K0904356 **Lab ID :** CAS_K

Sample Date : 05/13/2009 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0904356-015

Reviewed By / Date : LG 8/20/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8270C SIM					**Dilution: 5**															
1-Methylnaphthalene	150		ug/Kg	D	YES															
2-Methylnaphthalene	190		ug/Kg	D	YES															
Acenaphthene	630		ug/Kg	D	YES															
Acenaphthylene	210		ug/Kg	D	YES															
Anthracene	1200		ug/Kg	D	YES															
Benz(a)anthracene	3400		ug/Kg	D	YES															
Benzo(a)pyrene	4300		ug/Kg	D	YES															
Benzo(b)fluoranthene	5100		ug/Kg	D	YES															
Benzo(g,h,i)perylene	2900		ug/Kg	D	YES															
Benzo(k)fluoranthene	1700		ug/Kg	D	YES															
Chrysene	3500		ug/Kg	D	YES															
Dibenz(a,h)anthracene	760		ug/Kg	D	YES															
Dibenzofuran	380		ug/Kg	D	YES															
Fluoranthene	6100		ug/Kg	D	YES															
Fluorene	690		ug/Kg	D	YES															
Indeno(1,2,3-cd)pyrene	3700		ug/Kg	D	YES															
Naphthalene	990		ug/Kg	D	YES															
Phenanthrene	3700		ug/Kg	D	YES															
Pyrene	5400		ug/Kg	D	YES	**J**												J		

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-HS6-X1-02 **Lab Report Batch :** K0904356 **Lab ID :** CAS_K

Sample Date : 05/13/2009 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0904356-016

Reviewed By / Date : LG 8/20/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8270C SIM					**Dilution: 1**															
1-Methylnaphthalene	15		ug/Kg		YES															
2-Methylnaphthalene	18		ug/Kg		YES															
Acenaphthene	14		ug/Kg		YES															
Acenaphthylene	7.0		ug/Kg		YES															
Anthracene	99		ug/Kg		YES															
Benz(a)anthracene	110		ug/Kg		YES															
Benzo(a)pyrene	110		ug/Kg		YES															
Benzo(b)fluoranthene	140		ug/Kg		YES															
Benzo(g,h,i)perylene	78		ug/Kg		YES															
Benzo(k)fluoranthene	47		ug/Kg		YES															
Chrysene	120		ug/Kg		YES															
Dibenz(a,h)anthracene	18		ug/Kg		YES															
Dibenzofuran	14		ug/Kg		YES															
Fluoranthene	210		ug/Kg		YES															
Fluorene	26		ug/Kg		YES															
Indeno(1,2,3-cd)pyrene	88		ug/Kg		YES	**J**														J
Naphthalene	48		ug/Kg		YES															
Phenanthrene	130		ug/Kg		YES															
Pyrene	190		ug/Kg		YES	**J**												J		

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-HS6-X1-03 **Lab Report Batch :** K0904356 **Lab ID :** CAS_K

Sample Date : 05/13/2009 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0904356-017

Reviewed By / Date : LG 8/20/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8270C SIM					**Dilution: 1**															
1-Methylnaphthalene	13		ug/Kg		YES															
2-Methylnaphthalene	17		ug/Kg		YES															
Acenaphthene	23		ug/Kg		YES															
Acenaphthylene	8.6		ug/Kg		YES															
Anthracene	160		ug/Kg		YES															
Benz(a)anthracene	110		ug/Kg		YES															
Benzo(a)pyrene	130		ug/Kg		YES															
Benzo(b)fluoranthene	160		ug/Kg		YES															
Benzo(g,h,i)perylene	95		ug/Kg		YES															
Benzo(k)fluoranthene	49		ug/Kg		YES															
Chrysene	120		ug/Kg		YES															
Dibenz(a,h)anthracene	23		ug/Kg		YES															
Dibenzofuran	21		ug/Kg		YES															
Fluoranthene	200		ug/Kg		YES															
Fluorene	39		ug/Kg		YES															
Indeno(1,2,3-cd)pyrene	110		ug/Kg		YES	**J**														J
Naphthalene	51		ug/Kg		YES															
Phenanthrene	160		ug/Kg		YES															
Pyrene	180		ug/Kg		YES	**J**												J		

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-HS6-X1-04 **Lab Report Batch :** K0904356 **Lab ID :** CAS_K

Sample Date : 05/13/2009 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0904356-018

Reviewed By / Date : LG 8/20/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8270C SIM					**Dilution: 1**															
1-Methylnaphthalene	17		ug/Kg		YES															
2-Methylnaphthalene	18		ug/Kg		YES															
Acenaphthene	34		ug/Kg		YES															
Acenaphthylene	12		ug/Kg		YES															
Anthracene	100		ug/Kg		YES															
Benz(a)anthracene	170		ug/Kg		YES															
Benzo(a)pyrene	180		ug/Kg		YES															
Benzo(b)fluoranthene	220		ug/Kg		YES															
Benzo(g,h,i)perylene	130		ug/Kg		YES															
Benzo(k)fluoranthene	70		ug/Kg		YES															
Chrysene	170		ug/Kg		YES															
Dibenz(a,h)anthracene	31		ug/Kg		YES															
Dibenzofuran	28		ug/Kg		YES															
Fluoranthene	350		ug/Kg		YES															
Fluorene	47		ug/Kg		YES															
Indeno(1,2,3-cd)pyrene	150		ug/Kg		YES	**J**														J
Naphthalene	67		ug/Kg		YES															
Phenanthrene	260		ug/Kg		YES															
Pyrene	300		ug/Kg		YES	**J**												J		

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-ZIC-D-02 **Lab Report Batch :** K0904356 **Lab ID :** CAS_K

Sample Date : 05/13/2009 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0904356-019

Reviewed By / Date : LG 8/20/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8270C SIM					**Dilution: 1**															
1-Methylnaphthalene	3.7		ug/Kg		YES															
2-Methylnaphthalene	3.6		ug/Kg		YES															
Acenaphthene	4.9		ug/Kg		YES															
Acenaphthylene	1.2		ug/Kg	J	YES	**J**								J						
Anthracene	5.9		ug/Kg		YES															
Benz(a)anthracene	13		ug/Kg		YES															
Benzo(a)pyrene	13		ug/Kg		YES															
Benzo(b)fluoranthene	18		ug/Kg		YES															
Benzo(g,h,i)perylene	12		ug/Kg		YES															
Benzo(k)fluoranthene	5.9		ug/Kg		YES															
Chrysene	16		ug/Kg		YES															
Dibenz(a,h)anthracene	2.5		ug/Kg	J	YES	**J**								J						
Dibenzofuran	4.0		ug/Kg		YES															
Fluoranthene	23		ug/Kg		YES															
Fluorene	5.3		ug/Kg		YES															
Indeno(1,2,3-cd)pyrene	12		ug/Kg		YES	**J**														J
Naphthalene	18		ug/Kg		YES															
Phenanthrene	18		ug/Kg		YES															
Pyrene	23		ug/Kg		YES	**J**												J		

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-ZIC-D-03 **Lab Report Batch :** K0904356 **Lab ID :** CAS_K

Sample Date : 05/13/2009 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0904356-020

Reviewed By / Date : LG 8/20/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8270C SIM					**Dilution: 1**															
1-Methylnaphthalene	2.0		ug/Kg	J	YES	**J**								J						
2-Methylnaphthalene	2.0		ug/Kg	J	YES	**J**								J						
Acenaphthene	2.0		ug/Kg	J	YES	**J**								J						
Acenaphthylene	0.27		ug/Kg	J	YES	**J**								J						
Anthracene	1.8		ug/Kg	J	YES	**J**								J						
Benz(a)anthracene	5.1		ug/Kg		YES															
Benzo(a)pyrene	7.6		ug/Kg		YES															
Benzo(b)fluoranthene	8.3		ug/Kg		YES															
Benzo(g,h,i)perylene	6.9		ug/Kg		YES															
Benzo(k)fluoranthene	2.2		ug/Kg	J	YES	**J**								J						
Chrysene	7.1		ug/Kg		YES															
Dibenz(a,h)anthracene	1.2		ug/Kg	J	YES	**J**								J						
Dibenzofuran	1.3		ug/Kg	J	YES	**J**								J						
Fluoranthene	9.2		ug/Kg		YES															
Fluorene	2.0		ug/Kg	J	YES	**J**								J						
Indeno(1,2,3-cd)pyrene	5.8		ug/Kg		YES	**J**														J
Naphthalene	7.3		ug/Kg		YES															
Phenanthrene	8.1		ug/Kg		YES															
Pyrene	11		ug/Kg		YES	**J**												J		

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-HS6-UP5-01 **Lab Report Batch :** K0904403 **Lab ID :** CAS_K

Sample Date : 05/14/2009 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0904403-008

Reviewed By / Date : LG 8/19/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8270C SIM					**Dilution: 50**															
Fluoranthene	36000		ug/Kg	D	YES															
Phenanthrene	41000		ug/Kg	D	YES															
Pyrene	31000		ug/Kg	D	YES	**J**												J		

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-HS6-UP5-01 **Lab Report Batch :** K0904403 **Lab ID :** CAS_K

Sample Date : 05/14/2009 **Analysis Type: 2RES** **Sample Matrix :** SED

Lab Sample ID: K0904403-008

Reviewed By / Date : LG 8/19/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8270C SIM					**Dilution: 10**															
1-Methylnaphthalene	3600		ug/Kg	D	YES															
2-Methylnaphthalene	5700		ug/Kg	D	YES															
Acenaphthene	8300		ug/Kg	D	YES															
Acenaphthylene	920		ug/Kg	D	YES															
Anthracene	12000		ug/Kg	D	YES															
Benz(a)anthracene	13000		ug/Kg	D	YES															
Benzo(a)pyrene	8600		ug/Kg	D	YES															
Benzo(b)fluoranthene	10000		ug/Kg	D	YES															
Benzo(g,h,i)perylene	4600		ug/Kg	D	YES															
Benzo(k)fluoranthene	3300		ug/Kg	D	YES															
Chrysene	11000		ug/Kg	D	YES															
Dibenz(a,h)anthracene	1500		ug/Kg	D	YES															
Dibenzofuran	5000		ug/Kg	D	YES															
Fluorene	9800		ug/Kg	D	YES															
Indeno(1,2,3-cd)pyrene	5600		ug/Kg	D	YES															
Naphthalene	8300		ug/Kg	D	YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-HS6-UP5-02 **Lab Report Batch :** K0904403 **Lab ID :** CAS_K

Sample Date : 05/14/2009 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0904403-009

Reviewed By / Date : LG 8/19/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8270C SIM					**Dilution: 1**															
1-Methylnaphthalene	620		ug/Kg		YES															
2-Methylnaphthalene	940		ug/Kg		YES															
Acenaphthene	750		ug/Kg		YES															
Acenaphthylene	200		ug/Kg		YES															
Anthracene	1300		ug/Kg		YES															
Benzo(g,h,i)perylene	840		ug/Kg		YES															
Benzo(k)fluoranthene	490		ug/Kg		YES															
Dibenz(a,h)anthracene	270		ug/Kg		YES	**J**														J
Dibenzofuran	460		ug/Kg		YES															
Fluorene	990		ug/Kg		YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-HS6-UP5-02 **Lab Report Batch :** K0904403 **Lab ID :** CAS_K

Sample Date : 05/14/2009 **Analysis Type: 2RES** **Sample Matrix :** SED

Lab Sample ID: K0904403-009

Reviewed By / Date : LG 8/19/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8270C SIM					**Dilution: 20**															
Benz(a)anthracene	2300		ug/Kg	D	YES															
Benzo(a)pyrene	1800		ug/Kg	D	YES															
Benzo(b)fluoranthene	2100		ug/Kg	D	YES															
Chrysene	2400		ug/Kg	D	YES															
Fluoranthene	5700		ug/Kg	D	YES															
Indeno(1,2,3-cd)pyrene	1200		ug/Kg	D	YES															
Naphthalene	2200		ug/Kg	D	YES															
Phenanthrene	4900		ug/Kg	D	YES															
Pyrene	4300		ug/Kg	D	YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-HS6-UP5-03 **Lab Report Batch :** K0904403 **Lab ID :** CAS_K

Sample Date : 05/14/2009 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0904403-010

Reviewed By / Date : LG 8/19/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8270C SIM					**Dilution: 1**															
1-Methylnaphthalene	110		ug/Kg		YES															
2-Methylnaphthalene	170		ug/Kg		YES															
Acenaphthene	190		ug/Kg		YES															
Acenaphthylene	46		ug/Kg		YES															
Anthracene	350		ug/Kg		YES															
Benz(a)anthracene	560		ug/Kg		YES															
Benzo(a)pyrene	410		ug/Kg		YES															
Benzo(b)fluoranthene	450		ug/Kg		YES															
Benzo(g,h,i)perylene	240		ug/Kg		YES															
Benzo(k)fluoranthene	130		ug/Kg		YES															
Chrysene	460		ug/Kg		YES															
Dibenz(a,h)anthracene	58		ug/Kg		YES															
Dibenzofuran	120		ug/Kg		YES															
Fluoranthene	1200		ug/Kg		YES															
Fluorene	250		ug/Kg		YES															
Indeno(1,2,3-cd)pyrene	270		ug/Kg		YES															
Naphthalene	400		ug/Kg		YES															
Phenanthrene	980		ug/Kg		YES															
Pyrene	970		ug/Kg		YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-HS6-UP5-04 **Lab Report Batch :** K0904403 **Lab ID :** CAS_K

Sample Date : 05/14/2009 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0904403-011

Reviewed By / Date : LG 8/19/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8270C SIM					**Dilution: 1**															
1-Methylnaphthalene	30		ug/Kg		YES															
2-Methylnaphthalene	38		ug/Kg		YES															
Acenaphthene	44		ug/Kg		YES															
Acenaphthylene	9.5		ug/Kg		YES															
Anthracene	84		ug/Kg		YES															
Benz(a)anthracene	100		ug/Kg		YES															
Benzo(a)pyrene	68		ug/Kg		YES															
Benzo(b)fluoranthene	87		ug/Kg		YES															
Benzo(g,h,i)perylene	51		ug/Kg		YES															
Benzo(k)fluoranthene	25		ug/Kg		YES															
Chrysene	98		ug/Kg		YES															
Dibenz(a,h)anthracene	12		ug/Kg		YES															
Dibenzofuran	30		ug/Kg		YES															
Fluoranthene	240		ug/Kg		YES															
Fluorene	54		ug/Kg		YES															
Indeno(1,2,3-cd)pyrene	47		ug/Kg		YES															
Naphthalene	100		ug/Kg		YES															
Phenanthrene	220		ug/Kg		YES															
Pyrene	190		ug/Kg		YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-HS6-UP6-01 **Lab Report Batch :** K0904403 **Lab ID :** CAS_K

Sample Date : 05/14/2009 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0904403-012

Reviewed By / Date : LG 8/19/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8270C SIM					**Dilution: 20**															
1-Methylnaphthalene	1800		ug/Kg	D	YES															
2-Methylnaphthalene	2600		ug/Kg	D	YES															
Acenaphthene	3000		ug/Kg	D	YES															
Acenaphthylene	360		ug/Kg	D	YES															
Anthracene	5300		ug/Kg	D	YES															
Benz(a)anthracene	9200		ug/Kg	D	YES															
Benzo(a)pyrene	5800		ug/Kg	D	YES															
Benzo(b)fluoranthene	7600		ug/Kg	D	YES															
Benzo(g,h,i)perylene	2900		ug/Kg	D	YES															
Benzo(k)fluoranthene	2500		ug/Kg	D	YES															
Chrysene	9000		ug/Kg	D	YES															
Dibenz(a,h)anthracene	1300		ug/Kg	D	YES															
Dibenzofuran	1500		ug/Kg	D	YES															
Fluoranthene	16000		ug/Kg	D	YES															
Fluorene	3300		ug/Kg	D	YES															
Indeno(1,2,3-cd)pyrene	3600		ug/Kg	D	YES															
Naphthalene	15000		ug/Kg	D	YES															
Phenanthrene	13000		ug/Kg	D	YES															
Pyrene	11000		ug/Kg	D	YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-HS6-UP6-02 **Lab Report Batch :** K0904403 **Lab ID :** CAS_K

Sample Date : 05/14/2009 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0904403-013

Reviewed By / Date : LG 8/19/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8270C SIM					**Dilution: 1**															
1-Methylnaphthalene	68		ug/Kg		YES															
2-Methylnaphthalene	110		ug/Kg		YES															
Acenaphthene	110		ug/Kg		YES															
Acenaphthylene	7.8		ug/Kg		YES															
Anthracene	85		ug/Kg		YES															
Benz(a)anthracene	68		ug/Kg		YES															
Benzo(a)pyrene	42		ug/Kg		YES															
Benzo(b)fluoranthene	50		ug/Kg		YES															
Benzo(g,h,i)perylene	31		ug/Kg		YES															
Benzo(k)fluoranthene	16		ug/Kg		YES															
Chrysene	68		ug/Kg		YES															
Dibenz(a,h)anthracene	5.5		ug/Kg		YES															
Dibenzofuran	56		ug/Kg		YES															
Fluoranthene	240		ug/Kg		YES															
Fluorene	110		ug/Kg		YES															
Indeno(1,2,3-cd)pyrene	22		ug/Kg		YES															
Naphthalene	780		ug/Kg		YES															
Phenanthrene	340		ug/Kg		YES															
Pyrene	200		ug/Kg		YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-HS6-UP7-01 **Lab Report Batch :** K0904403 **Lab ID :** CAS_K

Sample Date : 05/14/2009 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0904403-014

Reviewed By / Date : LG 8/19/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8270C SIM					**Dilution: 1**															
Acenaphthylene	1000		ug/Kg		YES															
Benzo(b)fluoranthene	1000		ug/Kg		YES															
Benzo(g,h,i)perylene	510		ug/Kg		YES															
Benzo(k)fluoranthene	280		ug/Kg		YES															
Dibenz(a,h)anthracene	170		ug/Kg		YES	**J**														J
Dibenzofuran	610		ug/Kg		YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-HS6-UP7-01 **Lab Report Batch :** K0904403 **Lab ID :** CAS_K

Sample Date : 05/14/2009 **Analysis Type: 2RES** **Sample Matrix :** SED

Lab Sample ID: K0904403-014

Reviewed By / Date : LG 8/19/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8270C SIM					**Dilution: 20**															
1-Methylnaphthalene	2700		ug/Kg	D	YES															
2-Methylnaphthalene	2300		ug/Kg	D	YES															
Acenaphthene	1900		ug/Kg	D	YES															
Anthracene	2900		ug/Kg	D	YES															
Benz(a)anthracene	1900		ug/Kg	D	YES															
Benzo(a)pyrene	1300		ug/Kg	D	YES															
Chrysene	1600		ug/Kg	D	YES															
Fluoranthene	4600		ug/Kg	D	YES															
Fluorene	2300		ug/Kg	D	YES															
Indeno(1,2,3-cd)pyrene	620		ug/Kg	D	YES															
Naphthalene	4000		ug/Kg	D	YES															
Phenanthrene	9200		ug/Kg	D	YES															
Pyrene	5000		ug/Kg	D	YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-HS6-UP7-02 **Lab Report Batch :** K0904403 **Lab ID :** CAS_K

Sample Date : 05/14/2009 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0904403-015

Reviewed By / Date : LG 8/19/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8270C SIM					**Dilution: 1**															
1-Methylnaphthalene	90		ug/Kg		YES	**J**					J									
2-Methylnaphthalene	77		ug/Kg		YES															
Acenaphthene	57		ug/Kg		YES	**J**					J									
Acenaphthylene	38		ug/Kg		YES															
Anthracene	80		ug/Kg		YES															
Benz(a)anthracene	66		ug/Kg		YES															
Benzo(a)pyrene	46		ug/Kg		YES															
Benzo(b)fluoranthene	36		ug/Kg		YES															
Benzo(g,h,i)perylene	25		ug/Kg		YES															
Benzo(k)fluoranthene	9.7		ug/Kg		YES															
Chrysene	56		ug/Kg		YES															
Dibenz(a,h)anthracene	5.6		ug/Kg		YES															
Dibenzofuran	29		ug/Kg		YES															
Fluoranthene	130		ug/Kg		YES	**J**					J									
Fluorene	73		ug/Kg		YES															
Indeno(1,2,3-cd)pyrene	20		ug/Kg		YES															
Naphthalene	160		ug/Kg		YES	**J**					J									
Phenanthrene	220		ug/Kg		YES	**J**					J									
Pyrene	160		ug/Kg		YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-HS6-X2-03 **Lab Report Batch :** K0904403 **Lab ID :** CAS_K

Sample Date : 05/14/2009 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0904403-001

Reviewed By / Date : LG 8/19/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8270C SIM					**Dilution: 1**															
1-Methylnaphthalene	70		ug/Kg		YES															
2-Methylnaphthalene	110		ug/Kg		YES															
Acenaphthene	110		ug/Kg		YES															
Acenaphthylene	12		ug/Kg		YES															
Anthracene	99		ug/Kg		YES															
Benz(a)anthracene	66		ug/Kg		YES															
Benzo(a)pyrene	42		ug/Kg		YES															
Benzo(b)fluoranthene	51		ug/Kg		YES															
Benzo(g,h,i)perylene	40		ug/Kg		YES															
Benzo(k)fluoranthene	15		ug/Kg		YES															
Chrysene	76		ug/Kg		YES															
Dibenz(a,h)anthracene	6.7		ug/Kg		YES															
Dibenzofuran	79		ug/Kg		YES															
Fluoranthene	200		ug/Kg		YES															
Fluorene	88		ug/Kg		YES															
Indeno(1,2,3-cd)pyrene	29		ug/Kg		YES															
Naphthalene	490		ug/Kg		YES															
Phenanthrene	300		ug/Kg		YES															
Pyrene	160		ug/Kg		YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-HS6-X2-04 **Lab Report Batch :** K0904403 **Lab ID :** CAS_K

Sample Date : 05/14/2009 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0904403-002

Reviewed By / Date : LG 8/19/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8270C SIM					**Dilution: 1**															
1-Methylnaphthalene	90		ug/Kg		YES															
2-Methylnaphthalene	160		ug/Kg		YES															
Acenaphthene	160		ug/Kg		YES															
Acenaphthylene	22		ug/Kg		YES															
Anthracene	280		ug/Kg		YES															
Benz(a)anthracene	150		ug/Kg		YES															
Benzo(a)pyrene	110		ug/Kg		YES															
Benzo(b)fluoranthene	120		ug/Kg		YES															
Benzo(g,h,i)perylene	72		ug/Kg		YES															
Benzo(k)fluoranthene	36		ug/Kg		YES															
Chrysene	130		ug/Kg		YES															
Dibenz(a,h)anthracene	14		ug/Kg		YES															
Dibenzofuran	110		ug/Kg		YES															
Fluoranthene	450		ug/Kg		YES															
Fluorene	150		ug/Kg		YES															
Indeno(1,2,3-cd)pyrene	72		ug/Kg		YES															
Naphthalene	660		ug/Kg		YES															
Phenanthrene	560		ug/Kg		YES															
Pyrene	330		ug/Kg		YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-HS6-X3-01 **Lab Report Batch :** K0904403 **Lab ID :** CAS_K

Sample Date : 05/14/2009 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0904403-003

Reviewed By / Date : LG 8/19/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8270C SIM					**Dilution: 1**															
1-Methylnaphthalene	230		ug/Kg		YES															
2-Methylnaphthalene	330		ug/Kg		YES															
Acenaphthene	560		ug/Kg		YES															
Acenaphthylene	240		ug/Kg		YES															
Anthracene	1100		ug/Kg		YES															
Benz(a)anthracene	1900		ug/Kg		YES															
Benzo(a)pyrene	1800		ug/Kg		YES															
Benzo(b)fluoranthene	2300		ug/Kg		YES															
Benzo(g,h,i)perylene	1100		ug/Kg		YES															
Benzo(k)fluoranthene	740		ug/Kg		YES															
Chrysene	2000		ug/Kg		YES															
Dibenz(a,h)anthracene	320		ug/Kg		YES	**J**														J
Dibenzofuran	420		ug/Kg		YES															
Fluorene	770		ug/Kg		YES															
Naphthalene	890		ug/Kg		YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-HS6-X3-01 **Lab Report Batch :** K0904403 **Lab ID :** CAS_K

Sample Date : 05/14/2009 **Analysis Type: 2RES** **Sample Matrix :** SED

Lab Sample ID: K0904403-003

Reviewed By / Date : LG 8/19/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8270C SIM					**Dilution: 2**															
Indeno(1,2,3-cd)pyrene	1700		ug/Kg	D	YES															
Phenanthrene	3700		ug/Kg	D	YES															
Pyrene	4000		ug/Kg	D	YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-HS6-X3-01 **Lab Report Batch :** K0904403 **Lab ID :** CAS_K

Sample Date : 05/14/2009 **Analysis Type: 3RES** **Sample Matrix :** SED

Lab Sample ID: K0904403-003

Reviewed By / Date : LG 8/19/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8270C SIM					**Dilution: 5**															
Fluoranthene	5600		ug/Kg	D	YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-HS6-X4-01 **Lab Report Batch :** K0904403 **Lab ID :** CAS_K

Sample Date : 05/14/2009 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0904403-004

Reviewed By / Date : LG 8/19/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8270C SIM					**Dilution: 50**															
1-Methylnaphthalene	30000		ug/Kg	D	YES															
2-Methylnaphthalene	40000		ug/Kg	D	YES															
Acenaphthene	49000		ug/Kg	D	YES															
Acenaphthylene	11000		ug/Kg	D	YES															
Anthracene	92000		ug/Kg	D	YES															
Benz(a)anthracene	77000		ug/Kg	D	YES															
Benzo(a)pyrene	64000		ug/Kg	D	YES															
Benzo(b)fluoranthene	79000		ug/Kg	D	YES															
Benzo(g,h,i)perylene	32000		ug/Kg	D	YES															
Benzo(k)fluoranthene	28000		ug/Kg	D	YES															
Chrysene	68000		ug/Kg	D	YES															
Dibenz(a,h)anthracene	11000		ug/Kg	D	YES	**J**														J
Dibenzofuran	38000		ug/Kg	D	YES															
Fluorene	73000		ug/Kg	D	YES															
Indeno(1,2,3-cd)pyrene	43000		ug/Kg	D	YES	**J**														J
Naphthalene	60000		ug/Kg	D	YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-HS6-X4-01 **Lab Report Batch :** K0904403 **Lab ID :** CAS_K

Sample Date : 05/14/2009 **Analysis Type: 2RES** **Sample Matrix :** SED

Lab Sample ID: K0904403-004

Reviewed By / Date : LG 8/19/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8270C SIM					**Dilution: 500**															
Fluoranthene	190000		ug/Kg	D	YES															
Phenanthrene	260000		ug/Kg	D	YES															
Pyrene	160000		ug/Kg	D	YES	**J**												J		

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-HS6-X4-02 **Lab Report Batch :** K0904403 **Lab ID :** CAS_K

Sample Date : 05/14/2009 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0904403-005

Reviewed By / Date : LG 8/19/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8270C SIM					**Dilution: 20**															
1-Methylnaphthalene	4100		ug/Kg	D	YES															
2-Methylnaphthalene	5400		ug/Kg	D	YES															
Acenaphthene	3900		ug/Kg	D	YES															
Acenaphthylene	3600		ug/Kg	D	YES															
Anthracene	13000		ug/Kg	D	YES															
Benz(a)anthracene	9800		ug/Kg	D	YES															
Benzo(a)pyrene	6100		ug/Kg	D	YES															
Benzo(b)fluoranthene	7000		ug/Kg	D	YES															
Benzo(g,h,i)perylene	3300		ug/Kg	D	YES															
Benzo(k)fluoranthene	2400		ug/Kg	D	YES															
Chrysene	8100		ug/Kg	D	YES															
Dibenz(a,h)anthracene	1000		ug/Kg	D	YES															
Dibenzofuran	4500		ug/Kg	D	YES															
Fluoranthene	19000		ug/Kg	D	YES															
Fluorene	8700		ug/Kg	D	YES															
Indeno(1,2,3-cd)pyrene	3800		ug/Kg	D	YES															
Naphthalene	4000		ug/Kg	D	YES															
Phenanthrene	19000		ug/Kg	D	YES															
Pyrene	15000		ug/Kg	D	YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-HS6-X5-01 **Lab Report Batch :** K0904403 **Lab ID :** CAS_K

Sample Date : 05/14/2009 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0904403-006

Reviewed By / Date : LG 8/19/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8270C SIM					**Dilution: 50**															
1-Methylnaphthalene	5800		ug/Kg	D	YES															
2-Methylnaphthalene	3800		ug/Kg	D	YES															
Acenaphthene	12000		ug/Kg	D	YES															
Acenaphthylene	6700		ug/Kg	D	YES															
Anthracene	86000		ug/Kg	D	YES															
Benz(a)anthracene	47000		ug/Kg	D	YES															
Benzo(a)pyrene	42000		ug/Kg	D	YES															
Benzo(b)fluoranthene	51000		ug/Kg	D	YES															
Benzo(g,h,i)perylene	24000		ug/Kg	D	YES															
Benzo(k)fluoranthene	19000		ug/Kg	D	YES															
Chrysene	43000		ug/Kg	D	YES															
Dibenz(a,h)anthracene	7200		ug/Kg	D	YES	**J**														J
Dibenzofuran	13000		ug/Kg	D	YES															
Fluoranthene	96000		ug/Kg	D	YES															
Fluorene	31000		ug/Kg	D	YES															
Indeno(1,2,3-cd)pyrene	32000		ug/Kg	D	YES	**J**														J
Naphthalene	13000		ug/Kg	D	YES															
Phenanthrene	88000		ug/Kg	D	YES															
Pyrene	75000		ug/Kg	D	YES	**J**												J		

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-HS6-X5-02 **Lab Report Batch :** K0904403 **Lab ID :** CAS_K

Sample Date : 05/14/2009 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0904403-007

Reviewed By / Date : LG 8/19/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8270C SIM					**Dilution: 50**															
1-Methylnaphthalene	28000		ug/Kg	D	YES															
2-Methylnaphthalene	11000		ug/Kg	D	YES															
Acenaphthylene	9300		ug/Kg	D	YES															
Benzo(k)fluoranthene	53000		ug/Kg	D	YES															
Dibenz(a,h)anthracene	23000		ug/Kg	D	YES	**J**														J
Dibenzofuran	53000		ug/Kg	D	YES															
Naphthalene	52000		ug/Kg	D	YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-HS6-X5-02 **Lab Report Batch :** K0904403 **Lab ID :** CAS_K

Sample Date : 05/14/2009 **Analysis Type: 2RES** **Sample Matrix :** SED

Lab Sample ID: K0904403-007

Reviewed By / Date : LG 8/19/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8270C SIM					**Dilution: 500**															
Acenaphthene	110000		ug/Kg	D	YES															
Anthracene	210000		ug/Kg	D	YES															
Benz(a)anthracene	220000		ug/Kg	D	YES															
Benzo(a)pyrene	200000		ug/Kg	D	YES															
Benzo(b)fluoranthene	230000		ug/Kg	D	YES															
Benzo(g,h,i)perylene	110000		ug/Kg	D	YES															
Chrysene	190000		ug/Kg	D	YES															
Fluorene	130000		ug/Kg	D	YES															
Indeno(1,2,3-cd)pyrene	140000		ug/Kg	D	YES															
Pyrene	480000		ug/Kg	D	YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-HS6-X5-02 **Lab Report Batch :** K0904403 **Lab ID :** CAS_K

Sample Date : 05/14/2009 **Analysis Type: 3RES** **Sample Matrix :** SED

Lab Sample ID: K0904403-007

Reviewed By / Date : LG 8/19/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8270C SIM					**Dilution: 2500**															
Fluoranthene	800000		ug/Kg	D	YES															
Phenanthrene	770000		ug/Kg	D	YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-ZIC-G-01 **Lab Report Batch :** K0904403 **Lab ID :** CAS_K

Sample Date : 05/13/2009 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0904403-016

Reviewed By / Date : LG 8/19/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8270C SIM					**Dilution: 2**															
1-Methylnaphthalene	130		ug/Kg	D	YES															
2-Methylnaphthalene	250		ug/Kg	D	YES															
Acenaphthene	320		ug/Kg	D	YES															
Acenaphthylene	170		ug/Kg	D	YES															
Anthracene	820		ug/Kg	D	YES															
Benz(a)anthracene	2300		ug/Kg	D	YES															
Benzo(a)pyrene	2500		ug/Kg	D	YES															
Benzo(b)fluoranthene	2800		ug/Kg	D	YES															
Benzo(g,h,i)perylene	1900		ug/Kg	D	YES															
Benzo(k)fluoranthene	940		ug/Kg	D	YES															
Chrysene	2500		ug/Kg	D	YES															
Dibenz(a,h)anthracene	450		ug/Kg	D	YES															
Dibenzofuran	270		ug/Kg	D	YES															
Fluoranthene	4000		ug/Kg	D	YES															
Fluorene	380		ug/Kg	D	YES															
Indeno(1,2,3-cd)pyrene	2000		ug/Kg	D	YES															
Naphthalene	680		ug/Kg	D	YES															
Phenanthrene	1800		ug/Kg	D	YES															
Pyrene	3200		ug/Kg	D	YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-ZIC-G-02 **Lab Report Batch :** K0904403 **Lab ID :** CAS_K

Sample Date : 05/13/2009 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0904403-017

Reviewed By / Date : LG 8/19/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8270C SIM					**Dilution: 20**															
Fluoranthene	6800		ug/Kg	D	YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-ZIC-G-02 **Lab Report Batch :** K0904403 **Lab ID :** CAS_K

Sample Date : 05/13/2009 **Analysis Type: 2RES** **Sample Matrix :** SED

Lab Sample ID: K0904403-017

Reviewed By / Date : LG 8/19/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8270C SIM					**Dilution: 5**															
1-Methylnaphthalene	220		ug/Kg	D	YES															
2-Methylnaphthalene	440		ug/Kg	D	YES															
Acenaphthene	1200		ug/Kg	D	YES															
Acenaphthylene	320		ug/Kg	D	YES															
Anthracene	1500		ug/Kg	D	YES															
Benz(a)anthracene	4100		ug/Kg	D	YES															
Benzo(a)pyrene	4100		ug/Kg	D	YES															
Benzo(b)fluoranthene	4800		ug/Kg	D	YES															
Benzo(g,h,i)perylene	2700		ug/Kg	D	YES															
Benzo(k)fluoranthene	1400		ug/Kg	D	YES															
Chrysene	3800		ug/Kg	D	YES															
Dibenz(a,h)anthracene	620		ug/Kg	D	YES															
Dibenzofuran	520		ug/Kg	D	YES															
Fluorene	920		ug/Kg	D	YES															
Indeno(1,2,3-cd)pyrene	3400		ug/Kg	D	YES															
Naphthalene	1300		ug/Kg	D	YES															
Phenanthrene	4000		ug/Kg	D	YES															
Pyrene	6400		ug/Kg	D	YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-ZIC-G-03 **Lab Report Batch :** K0904403 **Lab ID :** CAS_K

Sample Date : 05/13/2009 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0904403-018

Reviewed By / Date : LG 8/19/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8270C SIM					**Dilution: 20**															
1-Methylnaphthalene	290		ug/Kg	D	YES															
2-Methylnaphthalene	680		ug/Kg	D	YES															
Acenaphthene	3000		ug/Kg	D	YES															
Acenaphthylene	520		ug/Kg	D	YES															
Anthracene	2300		ug/Kg	D	YES															
Benz(a)anthracene	6300		ug/Kg	D	YES															
Benzo(a)pyrene	6900		ug/Kg	D	YES															
Benzo(b)fluoranthene	7800		ug/Kg	D	YES															
Benzo(g,h,i)perylene	5200		ug/Kg	D	YES															
Benzo(k)fluoranthene	2700		ug/Kg	D	YES															
Chrysene	6600		ug/Kg	D	YES															
Dibenz(a,h)anthracene	1100		ug/Kg	D	YES															
Dibenzofuran	860		ug/Kg	D	YES															
Fluoranthene	18000		ug/Kg	D	YES															
Fluorene	1400		ug/Kg	D	YES															
Indeno(1,2,3-cd)pyrene	6000		ug/Kg	D	YES															
Naphthalene	1300		ug/Kg	D	YES															
Phenanthrene	5700		ug/Kg	D	YES															
Pyrene	13000		ug/Kg	D	YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-ZIC-H-01 **Lab Report Batch :** K0904403 **Lab ID :** CAS_K

Sample Date : 05/13/2009 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0904403-019

Reviewed By / Date : LG 8/19/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8270C SIM					**Dilution: 1**															
1-Methylnaphthalene	1.6		ug/Kg	J	YES	**J**								J						
2-Methylnaphthalene	1.3		ug/Kg	J	YES	**UJ**			U					J						
Acenaphthene	4.1		ug/Kg		YES															
Acenaphthylene	3.6		ug/Kg	U	YES															
Anthracene	1.9		ug/Kg	J	YES	**J**								J						
Benz(a)anthracene	3.8		ug/Kg		YES															
Benzo(a)pyrene	4.2		ug/Kg		YES	**U**			U											
Benzo(b)fluoranthene	4.8		ug/Kg		YES															
Benzo(g,h,i)perylene	3.2		ug/Kg	J	YES	**J**								J						
Benzo(k)fluoranthene	1.2		ug/Kg	J	YES	**UJ**			U					J						
Chrysene	3.8		ug/Kg		YES															
Dibenz(a,h)anthracene	0.62		ug/Kg	J	YES	**UJ**			U					J						
Dibenzofuran	1.6		ug/Kg	J	YES	**J**								J						
Fluoranthene	9.5		ug/Kg		YES															
Fluorene	1.9		ug/Kg	J	YES	**J**								J						
Indeno(1,2,3-cd)pyrene	2.5		ug/Kg	J	YES	**J**								J						
Naphthalene	5.3		ug/Kg		YES	**U**			U											
Phenanthrene	7.8		ug/Kg		YES															
Pyrene	8.0		ug/Kg		YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-ZIC-H-02 **Lab Report Batch :** K0904403 **Lab ID :** CAS_K

Sample Date : 05/13/2009 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0904403-020

Reviewed By / Date : LG 8/19/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8270C SIM					**Dilution: 1**															
1-Methylnaphthalene	15		ug/Kg	J	YES	**J**								J						
2-Methylnaphthalene	17		ug/Kg	J	YES	**J**								J						
Acenaphthene	10		ug/Kg	J	YES	**J**								J						
Acenaphthylene	2.8		ug/Kg	J	YES	**J**								J						
Anthracene	17		ug/Kg	J	YES	**J**								J						
Benz(a)anthracene	65		ug/Kg		YES															
Benzo(a)pyrene	50		ug/Kg		YES															
Benzo(b)fluoranthene	74		ug/Kg		YES															
Benzo(g,h,i)perylene	86		ug/Kg		YES															
Benzo(k)fluoranthene	49		ug/Kg		YES															
Chrysene	67		ug/Kg		YES															
Dibenz(a,h)anthracene	68		ug/Kg		YES															
Dibenzofuran	12		ug/Kg	J	YES	**J**								J						
Fluoranthene	77		ug/Kg		YES															
Fluorene	11		ug/Kg	J	YES	**J**								J						
Indeno(1,2,3-cd)pyrene	73		ug/Kg		YES															
Naphthalene	43		ug/Kg		YES															
Phenanthrene	64		ug/Kg		YES															
Pyrene	77		ug/Kg		YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-HS1-F-05 **Lab Report Batch :** K0904451 **Lab ID :** CAS_K

Sample Date : 05/15/2009 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0904451-001

Reviewed By / Date : LG 8/21/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8270C SIM					**Dilution: 20**															
1-Methylnaphthalene	2300		ug/Kg	D	YES															
2-Methylnaphthalene	3600		ug/Kg	D	YES															
Acenaphthene	3300		ug/Kg	D	YES															
Acenaphthylene	1400		ug/Kg	D	YES															
Anthracene	4800		ug/Kg	D	YES															
Benz(a)anthracene	7300		ug/Kg	D	YES															
Benzo(a)pyrene	6000		ug/Kg	D	YES															
Benzo(b)fluoranthene	6400		ug/Kg	D	YES															
Benzo(g,h,i)perylene	3800		ug/Kg	D	YES															
Benzo(k)fluoranthene	1600		ug/Kg	D	YES															
Chrysene	6200		ug/Kg	D	YES															
Dibenz(a,h)anthracene	850		ug/Kg	D	YES															
Dibenzofuran	1800		ug/Kg	D	YES															
Fluoranthene	18000		ug/Kg	D	YES															
Fluorene	3600		ug/Kg	D	YES															
Indeno(1,2,3-cd)pyrene	4300		ug/Kg	D	YES															
Naphthalene	12000		ug/Kg	D	YES															
Phenanthrene	18000		ug/Kg	D	YES															
Pyrene	19000		ug/Kg	D	YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-HS3-A-01 **Lab Report Batch :** K0904451 **Lab ID :** CAS_K

Sample Date : 05/16/2009 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0904451-002

Reviewed By / Date : LG 8/21/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8270C SIM					**Dilution: 20**															
1-Methylnaphthalene	180		ug/Kg	D	YES															
2-Methylnaphthalene	350		ug/Kg	D	YES															
Acenaphthene	260		ug/Kg	D	YES															
Acenaphthylene	280		ug/Kg	D	YES															
Anthracene	620		ug/Kg	D	YES															
Benz(a)anthracene	2800		ug/Kg	D	YES															
Benzo(a)pyrene	3500		ug/Kg	D	YES															
Benzo(b)fluoranthene	5100		ug/Kg	D	YES															
Benzo(g,h,i)perylene	3500		ug/Kg	D	YES															
Benzo(k)fluoranthene	1500		ug/Kg	D	YES															
C1-Chrysenes	1800		ug/Kg	D	YES															
C1-Fluoranthenes/Pyrenes	3300		ug/Kg	D	YES															
C1-Fluorenes	250		ug/Kg	D	YES															
C1-Phenanthrenes/Anthracenes	1600		ug/Kg	D	YES															
C2-Chrysenes	1000		ug/Kg	D	YES															
C2-Fluorenes	560		ug/Kg	D	YES															
C2-Naphthalenes	470		ug/Kg	D	YES															
C2-Phenanthrenes/Anthracenes	1800		ug/Kg	D	YES															
C3-Chrysenes	780		ug/Kg	D	YES															
C3-Fluorenes	1200		ug/Kg	D	YES															
C3-Naphthalenes	670		ug/Kg	D	YES															
C3-Phenanthrenes/Anthracenes	1700		ug/Kg	D	YES															
C4-Chrysenes	270		ug/Kg	D	YES															
C4-Naphthalenes	640		ug/Kg	D	YES															
C4-Phenanthrenes/Anthracenes	1100		ug/Kg	D	YES															
Chrysene	3900		ug/Kg	D	YES															
Dibenz(a,h)anthracene	570		ug/Kg	D	YES															
Dibenzofuran	170		ug/Kg	D	YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-HS3-A-01 **Lab Report Batch :** K0904451 **Lab ID :** CAS_K

Sample Date : 05/16/2009 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0904451-002

Reviewed By / Date : LG 8/21/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8270C SIM					**Dilution: 20**															
Fluoranthene	7900		ug/Kg	D	YES															
Fluorene	350		ug/Kg	D	YES															
Indeno(1,2,3-cd)pyrene	3800		ug/Kg	D	YES															
Naphthalene	980		ug/Kg	D	YES															
Phenanthrene	3000		ug/Kg	D	YES															
Pyrene	6700		ug/Kg	D	YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-HS3-A-01-FS **Lab Report Batch :** K0904451 **Lab ID :** CAS_K

Sample Date : 05/16/2009 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0904451-004

Reviewed By / Date : LG 8/21/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8270C SIM					**Dilution: 20**															
1-Methylnaphthalene	170		ug/Kg	D	YES															
2-Methylnaphthalene	310		ug/Kg	D	YES															
Acenaphthene	230		ug/Kg	D	YES															
Acenaphthylene	270		ug/Kg	D	YES															
Anthracene	570		ug/Kg	D	YES															
Benz(a)anthracene	2200		ug/Kg	D	YES															
Benzo(a)pyrene	2900		ug/Kg	D	YES															
Benzo(b)fluoranthene	4300		ug/Kg	D	YES															
Benzo(g,h,i)perylene	2900		ug/Kg	D	YES															
Benzo(k)fluoranthene	1300		ug/Kg	D	YES															
C1-Chrysenes	1400		ug/Kg	D	YES															
C1-Fluoranthenes/Pyrenes	2800		ug/Kg	D	YES															
C1-Fluorenes	230		ug/Kg	D	YES															
C1-Phenanthrenes/Anthracenes	1300		ug/Kg	D	YES															
C2-Chrysenes	850		ug/Kg	D	YES															
C2-Fluorenes	490		ug/Kg	D	YES															
C2-Naphthalenes	440		ug/Kg	D	YES															
C2-Phenanthrenes/Anthracenes	1500		ug/Kg	D	YES															
C3-Chrysenes	720		ug/Kg	D	YES															
C3-Fluorenes	1400		ug/Kg	D	YES															
C3-Naphthalenes	560		ug/Kg	D	YES															
C3-Phenanthrenes/Anthracenes	1500		ug/Kg	D	YES															
C4-Chrysenes	230		ug/Kg	D	YES															
C4-Naphthalenes	430		ug/Kg	D	YES															
C4-Phenanthrenes/Anthracenes	950		ug/Kg	D	YES															
Chrysene	3300		ug/Kg	D	YES															
Dibenz(a,h)anthracene	470		ug/Kg	D	YES															
Dibenzofuran	140		ug/Kg	D	YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-HS3-A-01-FS **Lab Report Batch :** K0904451 **Lab ID :** CAS_K

Sample Date : 05/16/2009 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0904451-004

Reviewed By / Date : LG 8/21/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8270C SIM					**Dilution: 20**															
Fluoranthene	6800		ug/Kg	D	YES															
Fluorene	280		ug/Kg	D	YES															
Indeno(1,2,3-cd)pyrene	3300		ug/Kg	D	YES															
Naphthalene	860		ug/Kg	D	YES															
Phenanthrene	2500		ug/Kg	D	YES															
Pyrene	5700		ug/Kg	D	YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-HS3-A-02 **Lab Report Batch :** K0904451 **Lab ID :** CAS_K

Sample Date : 05/16/2009 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0904451-005

Reviewed By / Date : LG 8/21/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8270C SIM					**Dilution: 20**															
1-Methylnaphthalene	460		ug/Kg	D	YES															
2-Methylnaphthalene	760		ug/Kg	D	YES															
Acenaphthene	600		ug/Kg	D	YES															
Acenaphthylene	500		ug/Kg	D	YES															
Anthracene	1300		ug/Kg	D	YES															
Benz(a)anthracene	3800		ug/Kg	D	YES															
Benzo(a)pyrene	4100		ug/Kg	D	YES															
Benzo(b)fluoranthene	5700		ug/Kg	D	YES															
Benzo(g,h,i)perylene	3400		ug/Kg	D	YES															
Benzo(k)fluoranthene	1700		ug/Kg	D	YES															
C1-Chrysenes	2600		ug/Kg	D	YES															
C1-Fluoranthenes/Pyrenes	5700		ug/Kg	D	YES															
C1-Fluorenes	640		ug/Kg	D	YES															
C1-Phenanthrenes/Anthracenes	3300		ug/Kg	D	YES															
C2-Chrysenes	1500		ug/Kg	D	YES															
C2-Fluorenes	1300		ug/Kg	D	YES															
C2-Naphthalenes	1600		ug/Kg	D	YES															
C2-Phenanthrenes/Anthracenes	3800		ug/Kg	D	YES															
C3-Chrysenes	1100		ug/Kg	D	YES															
C3-Fluorenes	3100		ug/Kg	D	YES															
C3-Naphthalenes	1900		ug/Kg	D	YES															
C3-Phenanthrenes/Anthracenes	3400		ug/Kg	D	YES															
C4-Chrysenes	400		ug/Kg	D	YES															
C4-Naphthalenes	1800		ug/Kg	D	YES															
C4-Phenanthrenes/Anthracenes	2200		ug/Kg	D	YES															
Chrysene	4400		ug/Kg	D	YES															
Dibenz(a,h)anthracene	610		ug/Kg	D	YES															
Dibenzofuran	300		ug/Kg	D	YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-HS3-A-02 **Lab Report Batch :** K0904451 **Lab ID :** CAS_K

Sample Date : 05/16/2009 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0904451-005

Reviewed By / Date : LG 8/21/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8270C SIM					**Dilution: 20**															
Fluoranthene	9800		ug/Kg	D	YES															
Fluorene	710		ug/Kg	D	YES															
Indeno(1,2,3-cd)pyrene	3800		ug/Kg	D	YES															
Naphthalene	1400		ug/Kg	D	YES															
Phenanthrene	4900		ug/Kg	D	YES															
Pyrene	9200		ug/Kg	D	YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-HS3-A-02-DP **Lab Report Batch :** K0904451 **Lab ID :** CAS_K

Sample Date : 05/16/2009 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0904451-006

Reviewed By / Date : LG 8/21/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8270C SIM					**Dilution: 10**															
1-Methylnaphthalene	550		ug/Kg	D	YES															
2-Methylnaphthalene	800		ug/Kg	D	YES															
Acenaphthene	740		ug/Kg	D	YES															
Acenaphthylene	950		ug/Kg	D	YES															
Anthracene	1600		ug/Kg	D	YES															
Benz(a)anthracene	4100		ug/Kg	D	YES															
Benzo(a)pyrene	4700		ug/Kg	D	YES															
Benzo(b)fluoranthene	6400		ug/Kg	D	YES															
Benzo(g,h,i)perylene	3800		ug/Kg	D	YES															
Benzo(k)fluoranthene	1900		ug/Kg	D	YES															
C1-Chrysenes	2800		ug/Kg	D	YES															
C1-Fluoranthenes/Pyrenes	6700		ug/Kg	D	YES															
C1-Fluorenes	960		ug/Kg	D	YES															
C1-Phenanthrenes/Anthracenes	4100		ug/Kg	D	YES															
C2-Chrysenes	2000		ug/Kg	D	YES															
C2-Fluorenes	1900		ug/Kg	D	YES															
C2-Naphthalenes	2000		ug/Kg	D	YES															
C2-Phenanthrenes/Anthracenes	4600		ug/Kg	D	YES															
C3-Chrysenes	1800		ug/Kg	D	YES															
C3-Fluorenes	4100		ug/Kg	D	YES															
C3-Naphthalenes	2800		ug/Kg	D	YES															
C3-Phenanthrenes/Anthracenes	3600		ug/Kg	D	YES															
C4-Chrysenes	790		ug/Kg	D	YES															
C4-Naphthalenes	2500		ug/Kg	D	YES															
C4-Phenanthrenes/Anthracenes	2400		ug/Kg	D	YES															
Chrysene	5000		ug/Kg	D	YES															
Dibenz(a,h)anthracene	740		ug/Kg	D	YES															
Dibenzofuran	330		ug/Kg	D	YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-HS3-A-02-DP **Lab Report Batch :** K0904451 **Lab ID :** CAS_K

Sample Date : 05/16/2009 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0904451-006

Reviewed By / Date : LG 8/21/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8270C SIM					**Dilution: 10**															
Fluoranthene	11000		ug/Kg	D	YES															
Fluorene	940		ug/Kg	D	YES															
Indeno(1,2,3-cd)pyrene	4300		ug/Kg	D	YES															
Naphthalene	1100		ug/Kg	D	YES															
Phenanthrene	6000		ug/Kg	D	YES															
Pyrene	10000		ug/Kg	D	YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-HS3-A-03 **Lab Report Batch :** K0904451 **Lab ID :** CAS_K

Sample Date : 05/16/2009 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0904451-007

Reviewed By / Date : LG 8/21/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8270C SIM					**Dilution: 20**															
1-Methylnaphthalene	370		ug/Kg	D	YES															
2-Methylnaphthalene	570		ug/Kg	D	YES															
Acenaphthene	450		ug/Kg	D	YES															
Acenaphthylene	320		ug/Kg	D	YES															
Anthracene	1000		ug/Kg	D	YES															
Benz(a)anthracene	3200		ug/Kg	D	YES															
Benzo(a)pyrene	3700		ug/Kg	D	YES															
Benzo(b)fluoranthene	5300		ug/Kg	D	YES															
Benzo(g,h,i)perylene	3100		ug/Kg	D	YES															
Benzo(k)fluoranthene	1600		ug/Kg	D	YES															
C1-Chrysenes	2500		ug/Kg	D	YES															
C1-Fluoranthenes/Pyrenes	4900		ug/Kg	D	YES															
C1-Fluorenes	700		ug/Kg	D	YES															
C1-Phenanthrenes/Anthracenes	3000		ug/Kg	D	YES															
C2-Chrysenes	1500		ug/Kg	D	YES															
C2-Fluorenes	1700		ug/Kg	D	YES															
C2-Naphthalenes	1700		ug/Kg	D	YES															
C2-Phenanthrenes/Anthracenes	4100		ug/Kg	D	YES															
C3-Chrysenes	1200		ug/Kg	D	YES															
C3-Fluorenes	3500		ug/Kg	D	YES															
C3-Naphthalenes	2400		ug/Kg	D	YES															
C3-Phenanthrenes/Anthracenes	4100		ug/Kg	D	YES															
C4-Chrysenes	490		ug/Kg	D	YES															
C4-Naphthalenes	2300		ug/Kg	D	YES															
C4-Phenanthrenes/Anthracenes	2400		ug/Kg	D	YES															
Chrysene	4000		ug/Kg	D	YES															
Dibenz(a,h)anthracene	580		ug/Kg	D	YES															
Dibenzofuran	300		ug/Kg	D	YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-HS3-A-03 **Lab Report Batch :** K0904451 **Lab ID :** CAS_K

Sample Date : 05/16/2009 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0904451-007

Reviewed By / Date : LG 8/21/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8270C SIM					**Dilution: 20**															
Fluoranthene	8900		ug/Kg	D	YES															
Fluorene	620		ug/Kg	D	YES															
Indeno(1,2,3-cd)pyrene	3500		ug/Kg	D	YES															
Naphthalene	1100		ug/Kg	D	YES															
Phenanthrene	4100		ug/Kg	D	YES															
Pyrene	7900		ug/Kg	D	YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-HS3-B-01 **Lab Report Batch :** K0904451 **Lab ID :** CAS_K

Sample Date : 05/16/2009 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0904451-008

Reviewed By / Date : LG 8/21/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8270C SIM					**Dilution: 5**															
1-Methylnaphthalene	160		ug/Kg	D	YES															
2-Methylnaphthalene	310		ug/Kg	D	YES															
Acenaphthene	230		ug/Kg	D	YES															
Acenaphthylene	260		ug/Kg	D	YES															
Anthracene	550		ug/Kg	D	YES															
Benz(a)anthracene	2800		ug/Kg	D	YES															
Benzo(a)pyrene	3400		ug/Kg	D	YES															
Benzo(b)fluoranthene	5200		ug/Kg	D	YES															
Benzo(g,h,i)perylene	3300		ug/Kg	D	YES															
Benzo(k)fluoranthene	1500		ug/Kg	D	YES															
Chrysene	3600		ug/Kg	D	YES															
Dibenz(a,h)anthracene	550		ug/Kg	D	YES															
Dibenzofuran	150		ug/Kg	D	YES															
Fluoranthene	7900		ug/Kg	D	YES															
Fluorene	310		ug/Kg	D	YES															
Indeno(1,2,3-cd)pyrene	3700		ug/Kg	D	YES															
Naphthalene	790		ug/Kg	D	YES															
Phenanthrene	2700		ug/Kg	D	YES															
Pyrene	6600		ug/Kg	D	YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-HS3-B-02 **Lab Report Batch :** K0904451 **Lab ID :** CAS_K

Sample Date : 05/16/2009 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0904451-009

Reviewed By / Date : LG 8/21/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8270C SIM					**Dilution: 20**															
1-Methylnaphthalene	180		ug/Kg	D	YES															
2-Methylnaphthalene	340		ug/Kg	D	YES															
Acenaphthene	280		ug/Kg	D	YES															
Acenaphthylene	240		ug/Kg	D	YES															
Anthracene	680		ug/Kg	D	YES															
Benz(a)anthracene	2700		ug/Kg	D	YES															
Benzo(a)pyrene	3300		ug/Kg	D	YES															
Benzo(b)fluoranthene	5100		ug/Kg	D	YES															
Benzo(g,h,i)perylene	3300		ug/Kg	D	YES															
Benzo(k)fluoranthene	1400		ug/Kg	D	YES															
Chrysene	3700		ug/Kg	D	YES															
Dibenz(a,h)anthracene	500		ug/Kg	D	YES															
Dibenzofuran	180		ug/Kg	D	YES															
Fluoranthene	7300		ug/Kg	D	YES															
Fluorene	340		ug/Kg	D	YES															
Indeno(1,2,3-cd)pyrene	3800		ug/Kg	D	YES															
Naphthalene	790		ug/Kg	D	YES															
Phenanthrene	2800		ug/Kg	D	YES															
Pyrene	6100		ug/Kg	D	YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-HS3-B-03 **Lab Report Batch :** K0904451 **Lab ID :** CAS_K

Sample Date : 05/16/2009 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0904451-010

Reviewed By / Date : LG 8/21/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8270C SIM					**Dilution: 20**															
1-Methylnaphthalene	250		ug/Kg	D	YES															
2-Methylnaphthalene	480		ug/Kg	D	YES															
Acenaphthene	420		ug/Kg	D	YES															
Acenaphthylene	390		ug/Kg	D	YES															
Anthracene	1100		ug/Kg	D	YES															
Benz(a)anthracene	3400		ug/Kg	D	YES															
Benzo(a)pyrene	4000		ug/Kg	D	YES															
Benzo(b)fluoranthene	5700		ug/Kg	D	YES															
Benzo(g,h,i)perylene	3600		ug/Kg	D	YES															
Benzo(k)fluoranthene	1800		ug/Kg	D	YES															
Chrysene	4400		ug/Kg	D	YES															
Dibenz(a,h)anthracene	570		ug/Kg	D	YES															
Dibenzofuran	270		ug/Kg	D	YES															
Fluoranthene	8800		ug/Kg	D	YES															
Fluorene	540		ug/Kg	D	YES															
Indeno(1,2,3-cd)pyrene	4200		ug/Kg	D	YES															
Naphthalene	1200		ug/Kg	D	YES															
Phenanthrene	3600		ug/Kg	D	YES															
Pyrene	8100		ug/Kg	D	YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-HS3-C-01 **Lab Report Batch :** K0904451 **Lab ID :** CAS_K

Sample Date : 05/16/2009 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0904451-011

Reviewed By / Date : LG 8/21/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8270C SIM					**Dilution: 20**															
1-Methylnaphthalene	670		ug/Kg	D	YES															
2-Methylnaphthalene	1700		ug/Kg	D	YES															
Acenaphthene	8000		ug/Kg	D	YES															
Acenaphthylene	630		ug/Kg	D	YES															
Anthracene	5700		ug/Kg	D	YES															
Benz(a)anthracene	6700		ug/Kg	D	YES															
Benzo(a)pyrene	5100		ug/Kg	D	YES															
Benzo(b)fluoranthene	5800		ug/Kg	D	YES															
Benzo(g,h,i)perylene	3100		ug/Kg	D	YES															
Benzo(k)fluoranthene	1900		ug/Kg	D	YES															
Chrysene	5500		ug/Kg	D	YES															
Dibenz(a,h)anthracene	690		ug/Kg	D	YES															
Dibenzofuran	3500		ug/Kg	D	YES															
Fluoranthene	20000		ug/Kg	D	YES															
Fluorene	5700		ug/Kg	D	YES															
Indeno(1,2,3-cd)pyrene	3700		ug/Kg	D	YES															
Naphthalene	3000		ug/Kg	D	YES															
Phenanthrene	20000		ug/Kg	D	YES															
Pyrene	15000		ug/Kg	D	YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-HS3-C-02 **Lab Report Batch :** K0904451 **Lab ID :** CAS_K

Sample Date : 05/16/2009 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0904451-012

Reviewed By / Date : LG 8/21/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8270C SIM					**Dilution: 50**															
1-Methylnaphthalene	3500		ug/Kg	D	YES															
2-Methylnaphthalene	8100		ug/Kg	D	YES															
Acenaphthene	23000		ug/Kg	D	YES															
Acenaphthylene	2100		ug/Kg	D	YES															
Anthracene	22000		ug/Kg	D	YES															
Benz(a)anthracene	22000		ug/Kg	D	YES															
Benzo(a)pyrene	16000		ug/Kg	D	YES															
Benzo(b)fluoranthene	19000		ug/Kg	D	YES															
Benzo(g,h,i)perylene	8800		ug/Kg	D	YES															
Benzo(k)fluoranthene	6100		ug/Kg	D	YES															
Chrysene	18000		ug/Kg	D	YES															
Dibenz(a,h)anthracene	2200		ug/Kg	D	YES															
Dibenzofuran	11000		ug/Kg	D	YES															
Fluoranthene	67000		ug/Kg	D	YES															
Fluorene	19000		ug/Kg	D	YES															
Indeno(1,2,3-cd)pyrene	11000		ug/Kg	D	YES															
Naphthalene	7200		ug/Kg	D	YES															
Phenanthrene	68000		ug/Kg	D	YES															
Pyrene	47000		ug/Kg	D	YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-HS3-C-03 **Lab Report Batch :** K0904451 **Lab ID :** CAS_K

Sample Date : 05/16/2009 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0904451-013

Reviewed By / Date : LG 8/21/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8270C SIM					**Dilution: 50**															
1-Methylnaphthalene	7300		ug/Kg	D	YES															
2-Methylnaphthalene	15000		ug/Kg	D	YES															
Acenaphthene	19000		ug/Kg	D	YES															
Acenaphthylene	2400		ug/Kg	D	YES															
Anthracene	26000		ug/Kg	D	YES															
Benz(a)anthracene	31000		ug/Kg	D	YES															
Benzo(a)pyrene	24000		ug/Kg	D	YES															
Benzo(b)fluoranthene	29000		ug/Kg	D	YES															
Benzo(g,h,i)perylene	13000		ug/Kg	D	YES															
Benzo(k)fluoranthene	10000		ug/Kg	D	YES															
Chrysene	26000		ug/Kg	D	YES															
Dibenz(a,h)anthracene	3400		ug/Kg	D	YES															
Dibenzofuran	11000		ug/Kg	D	YES															
Fluorene	18000		ug/Kg	D	YES															
Indeno(1,2,3-cd)pyrene	17000		ug/Kg	D	YES															
Naphthalene	8800		ug/Kg	D	YES															
Phenanthrene	70000		ug/Kg	D	YES															
Pyrene	57000		ug/Kg	D	YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-HS3-C-03 **Lab Report Batch :** K0904451 **Lab ID :** CAS_K

Sample Date : 05/16/2009 **Analysis Type: 2RES** **Sample Matrix :** SED

Lab Sample ID: K0904451-013

Reviewed By / Date : LG 8/21/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8270C SIM					**Dilution: 100**															
Fluoranthene	94000		ug/Kg	D	YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-HS3-D-01 **Lab Report Batch :** K0904451 **Lab ID :** CAS_K

Sample Date : 05/16/2009 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0904451-014

Reviewed By / Date : LG 8/21/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8270C SIM					**Dilution: 20**															
1-Methylnaphthalene	340		ug/Kg	D	YES															
2-Methylnaphthalene	620		ug/Kg	D	YES															
Acenaphthene	480		ug/Kg	D	YES															
Acenaphthylene	490		ug/Kg	D	YES															
Anthracene	1200		ug/Kg	D	YES															
Benz(a)anthracene	5400		ug/Kg	D	YES															
Benzo(a)pyrene	7200		ug/Kg	D	YES															
Benzo(b)fluoranthene	11000		ug/Kg	D	YES															
Benzo(g,h,i)perylene	7100		ug/Kg	D	YES															
Benzo(k)fluoranthene	3500		ug/Kg	D	YES															
Chrysene	7800		ug/Kg	D	YES															
Dibenz(a,h)anthracene	1100		ug/Kg	D	YES															
Dibenzofuran	290		ug/Kg	D	YES															
Fluoranthene	17000		ug/Kg	D	YES															
Fluorene	650		ug/Kg	D	YES															
Indeno(1,2,3-cd)pyrene	7800		ug/Kg	D	YES															
Naphthalene	1400		ug/Kg	D	YES															
Phenanthrene	6000		ug/Kg	D	YES															
Pyrene	14000		ug/Kg	D	YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-HS3-D-02 **Lab Report Batch :** K0904451 **Lab ID :** CAS_K

Sample Date : 05/16/2009 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0904451-015

Reviewed By / Date : LG 8/21/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8270C SIM					**Dilution: 50**															
1-Methylnaphthalene	20000		ug/Kg	D	YES															
2-Methylnaphthalene	41000		ug/Kg	D	YES															
Acenaphthene	42000		ug/Kg	D	YES															
Acenaphthylene	2600		ug/Kg	D	YES															
Anthracene	22000		ug/Kg	D	YES															
Benz(a)anthracene	20000		ug/Kg	D	YES															
Benzo(a)pyrene	12000		ug/Kg	D	YES															
Benzo(b)fluoranthene	15000		ug/Kg	D	YES															
Benzo(g,h,i)perylene	6800		ug/Kg	D	YES															
Benzo(k)fluoranthene	5400		ug/Kg	D	YES															
Chrysene	16000		ug/Kg	D	YES															
Dibenz(a,h)anthracene	1900		ug/Kg	D	YES															
Dibenzofuran	22000		ug/Kg	D	YES															
Fluoranthene	59000		ug/Kg	D	YES															
Fluorene	31000		ug/Kg	D	YES															
Indeno(1,2,3-cd)pyrene	8700		ug/Kg	D	YES															
Naphthalene	58000		ug/Kg	D	YES															
Phenanthrene	79000		ug/Kg	D	YES															
Pyrene	40000		ug/Kg	D	YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-HS3-E-01 **Lab Report Batch :** K0904451 **Lab ID :** CAS_K

Sample Date : 05/16/2009 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0904451-016

Reviewed By / Date : LG 8/21/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8270C SIM					**Dilution: 20**															
1-Methylnaphthalene	340		ug/Kg	D	YES															
2-Methylnaphthalene	640		ug/Kg	D	YES															
Acenaphthene	520		ug/Kg	D	YES															
Acenaphthylene	640		ug/Kg	D	YES															
Anthracene	1400		ug/Kg	D	YES															
Benz(a)anthracene	6000		ug/Kg	D	YES															
Benzo(a)pyrene	7300		ug/Kg	D	YES															
Benzo(b)fluoranthene	11000		ug/Kg	D	YES															
Benzo(g,h,i)perylene	6800		ug/Kg	D	YES															
Benzo(k)fluoranthene	3100		ug/Kg	D	YES															
Chrysene	7400		ug/Kg	D	YES															
Dibenz(a,h)anthracene	1100		ug/Kg	D	YES															
Dibenzofuran	330		ug/Kg	D	YES															
Fluoranthene	16000		ug/Kg	D	YES															
Fluorene	670		ug/Kg	D	YES															
Indeno(1,2,3-cd)pyrene	7600		ug/Kg	D	YES															
Naphthalene	1700		ug/Kg	D	YES															
Phenanthrene	5800		ug/Kg	D	YES															
Pyrene	14000		ug/Kg	D	YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-HS3-E-02 **Lab Report Batch :** K0904451 **Lab ID :** CAS_K

Sample Date : 05/16/2009 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0904451-017

Reviewed By / Date : LG 8/21/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8270C SIM					**Dilution: 1**															
1-Methylnaphthalene	1.0		ug/Kg	J	YES	**J**								J						
2-Methylnaphthalene	2.0		ug/Kg	J	YES	**J**								J						
Acenaphthene	2.0		ug/Kg	J	YES	**J**								J						
Acenaphthylene	1.3		ug/Kg	J	YES	**J**								J						
Anthracene	2.9		ug/Kg	J	YES	**UJ**			U					J						
Benz(a)anthracene	9.4		ug/Kg		YES															
Benzo(a)pyrene	11		ug/Kg		YES															
Benzo(b)fluoranthene	18		ug/Kg		YES															
Benzo(g,h,i)perylene	12		ug/Kg		YES															
Benzo(k)fluoranthene	5.7		ug/Kg		YES															
Chrysene	15		ug/Kg		YES															
Dibenz(a,h)anthracene	2.0		ug/Kg	J	YES	**J**								J						
Dibenzofuran	1.3		ug/Kg	J	YES	**J**								J						
Fluoranthene	29		ug/Kg	B	YES	**U**			U											
Fluorene	2.0		ug/Kg	J	YES	**UJ**			U					J						
Indeno(1,2,3-cd)pyrene	12		ug/Kg		YES															
Naphthalene	7.4		ug/Kg		YES															
Phenanthrene	14		ug/Kg	B	YES	**U**			U											
Pyrene	26		ug/Kg	B	YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-HS5-A-01-R **Lab Report Batch :** K0904451 **Lab ID :** CAS_K

Sample Date : 05/15/2009 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0904451-020

Reviewed By / Date : LG 8/21/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8270C SIM					**Dilution: 10**															
1-Methylnaphthalene	150		ug/Kg	D	YES															
2-Methylnaphthalene	290		ug/Kg	D	YES															
Acenaphthene	180		ug/Kg	D	YES															
Acenaphthylene	170		ug/Kg	D	YES															
Anthracene	960		ug/Kg	D	YES	**J**					J									
Benz(a)anthracene	2100		ug/Kg	D	YES															
Benzo(a)pyrene	2600		ug/Kg	D	YES															
Benzo(b)fluoranthene	4100		ug/Kg	D	YES															
Benzo(g,h,i)perylene	2600		ug/Kg	D	YES															
Benzo(k)fluoranthene	1100		ug/Kg	D	YES															
C1-Chrysenes	1500		ug/Kg	D	YES															
C1-Fluoranthenes/Pyrenes	2600		ug/Kg	D	YES															
C1-Fluorenes	240		ug/Kg	D	YES															
C1-Phenanthrenes/Anthracenes	1300		ug/Kg	D	YES															
C2-Chrysenes	1000		ug/Kg	D	YES															
C2-Fluorenes	580		ug/Kg	D	YES															
C2-Naphthalenes	720		ug/Kg	D	YES															
C2-Phenanthrenes/Anthracenes	2000		ug/Kg	D	YES															
C3-Chrysenes	850		ug/Kg	D	YES															
C3-Fluorenes	1600		ug/Kg	D	YES															
C3-Naphthalenes	880		ug/Kg	D	YES															
C3-Phenanthrenes/Anthracenes	2200		ug/Kg	D	YES															
C4-Chrysenes	360		ug/Kg	D	YES															
C4-Naphthalenes	820		ug/Kg	D	YES															
C4-Phenanthrenes/Anthracenes	1600		ug/Kg	D	YES															
Chrysene	2900		ug/Kg	D	YES															
Dibenz(a,h)anthracene	460		ug/Kg	D	YES															
Dibenzofuran	170		ug/Kg	D	YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-HS5-A-01-R
Lab Report Batch : K0904451
Lab ID : CAS_K
Sample Date : 05/15/2009
Analysis Type: 1RES
Sample Matrix : SED
Lab Sample ID: K0904451-020

Reviewed By / Date : LG 8/21/2009
Approved By / Date :

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8270C SIM					**Dilution: 10**															
Fluoranthene	5600		ug/Kg	D	YES															
Fluorene	290		ug/Kg	D	YES															
Indeno(1,2,3-cd)pyrene	3000		ug/Kg	D	YES															
Naphthalene	650		ug/Kg	D	YES															
Phenanthrene	2000		ug/Kg	D	YES															
Pyrene	4800		ug/Kg	D	YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-HS1-A-01-R
Lab Report Batch : K0904454
Lab ID : CAS_K
Sample Date : 05/15/2009
Analysis Type: 1RES
Sample Matrix : SED
Lab Sample ID: K0904454-001

Reviewed By / Date : LG 8/20/2009
Approved By / Date :

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8270C SIM					**Dilution: 20**															
1-Methylnaphthalene	300		ug/Kg	D	YES															
2-Methylnaphthalene	450		ug/Kg	D	YES															
Acenaphthene	350		ug/Kg	D	YES															
Acenaphthylene	1000		ug/Kg	D	YES															
Anthracene	1500		ug/Kg	D	YES															
Benz(a)anthracene	4000		ug/Kg	D	YES															
Benzo(a)pyrene	5100		ug/Kg	D	YES															
Benzo(b)fluoranthene	5500		ug/Kg	D	YES															
Benzo(g,h,i)perylene	4200		ug/Kg	D	YES															
Benzo(k)fluoranthene	1700		ug/Kg	D	YES															
C1-Chrysenes	2300		ug/Kg	D	YES															
C1-Fluoranthenes/Pyrenes	5900		ug/Kg	D	YES															
C1-Fluorenes	410		ug/Kg	D	YES															
C1-Phenanthrenes/Anthracenes	3100		ug/Kg	D	YES															
C2-Chrysenes	850		ug/Kg	D	YES															
C2-Fluorenes	470		ug/Kg	D	YES															
C2-Naphthalenes	670		ug/Kg	D	YES															
C2-Phenanthrenes/Anthracenes	2100		ug/Kg	D	YES															
C3-Chrysenes	620		ug/Kg	D	YES															
C3-Fluorenes	770		ug/Kg	D	YES															
C3-Naphthalenes	440		ug/Kg	D	YES															
C3-Phenanthrenes/Anthracenes	1300		ug/Kg	D	YES															
C4-Chrysenes	190		ug/Kg	D	YES															
C4-Naphthalenes	330		ug/Kg	D	YES															
C4-Phenanthrenes/Anthracenes	720		ug/Kg	D	YES															
Chrysene	4700		ug/Kg	D	YES															
Dibenz(a,h)anthracene	610		ug/Kg	D	YES															
Dibenzofuran	86		ug/Kg	JD	YES	**J**								J						

Project Number and Name: **20405.016.008.0451.0 - Lower Rogue River** **Library Used:** **LRR**

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-HS1-A-01-R
Lab Report Batch : K0904454
Lab ID : CAS_K
Sample Date : 05/15/2009
Analysis Type: 1RES
Sample Matrix : SED
Lab Sample ID: K0904454-001

Reviewed By / Date : LG 8/20/2009
Approved By / Date :

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8270C SIM					**Dilution: 20**															
Fluoranthene	10000		ug/Kg	D	YES															
Fluorene	520		ug/Kg	D	YES															
Indeno(1,2,3-cd)pyrene	4100		ug/Kg	D	YES															
Naphthalene	1200		ug/Kg	D	YES															
Phenanthrene	4700		ug/Kg	D	YES															
Pyrene	10000		ug/Kg	D	YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-HS1-B-01 **Lab Report Batch :** K0904454 **Lab ID :** CAS_K

Sample Date : 05/15/2009 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0904454-002

Reviewed By / Date : LG 8/20/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8270C SIM					**Dilution: 20**															
1-Methylnaphthalene	560		ug/Kg	D	YES															
2-Methylnaphthalene	780		ug/Kg	D	YES															
Acenaphthene	1200		ug/Kg	D	YES															
Acenaphthylene	670		ug/Kg	D	YES															
Anthracene	1800		ug/Kg	D	YES															
Benz(a)anthracene	3300		ug/Kg	D	YES															
Benzo(a)pyrene	3900		ug/Kg	D	YES															
Benzo(b)fluoranthene	4300		ug/Kg	D	YES															
Benzo(g,h,i)perylene	3000		ug/Kg	D	YES															
Benzo(k)fluoranthene	1400		ug/Kg	D	YES															
Chrysene	3800		ug/Kg	D	YES															
Dibenz(a,h)anthracene	470		ug/Kg	D	YES															
Dibenzofuran	190		ug/Kg	D	YES															
Fluoranthene	8600		ug/Kg	D	YES															
Fluorene	900		ug/Kg	D	YES															
Indeno(1,2,3-cd)pyrene	3000		ug/Kg	D	YES															
Naphthalene	520		ug/Kg	D	YES															
Phenanthrene	7100		ug/Kg	D	YES															
Pyrene	9200		ug/Kg	D	YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-HS1-B-01-DP **Lab Report Batch :** K0904454 **Lab ID :** CAS_K

Sample Date : 05/15/2009 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0904454-003

Reviewed By / Date : LG 8/20/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8270C SIM					**Dilution: 20**															
1-Methylnaphthalene	470		ug/Kg	D	YES															
2-Methylnaphthalene	440		ug/Kg	D	YES															
Acenaphthene	1000		ug/Kg	D	YES															
Acenaphthylene	440		ug/Kg	D	YES															
Anthracene	1300		ug/Kg	D	YES															
Benz(a)anthracene	2900		ug/Kg	D	YES															
Benzo(a)pyrene	3200		ug/Kg	D	YES															
Benzo(b)fluoranthene	3900		ug/Kg	D	YES															
Benzo(g,h,i)perylene	2700		ug/Kg	D	YES															
Benzo(k)fluoranthene	1200		ug/Kg	D	YES															
Chrysene	3500		ug/Kg	D	YES															
Dibenz(a,h)anthracene	420		ug/Kg	D	YES															
Dibenzofuran	280		ug/Kg	D	YES															
Fluoranthene	7900		ug/Kg	D	YES															
Fluorene	800		ug/Kg	D	YES															
Indeno(1,2,3-cd)pyrene	2900		ug/Kg	D	YES															
Naphthalene	560		ug/Kg	D	YES															
Phenanthrene	5500		ug/Kg	D	YES															
Pyrene	7400		ug/Kg	D	YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-HS1-B-02 **Lab Report Batch :** K0904454 **Lab ID :** CAS_K

Sample Date : 05/15/2009 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0904454-004

Reviewed By / Date : LG 8/20/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8270C SIM					**Dilution: 1**															
1-Methylnaphthalene	52		ug/Kg		YES															
2-Methylnaphthalene	56		ug/Kg		YES															
Acenaphthene	110		ug/Kg		YES															
Acenaphthylene	66		ug/Kg		YES															
Anthracene	190		ug/Kg		YES															
Benz(a)anthracene	340		ug/Kg		YES															
Benzo(a)pyrene	370		ug/Kg		YES															
Benzo(b)fluoranthene	410		ug/Kg		YES															
Benzo(g,h,i)perylene	290		ug/Kg		YES															
Benzo(k)fluoranthene	110		ug/Kg		YES															
Chrysene	350		ug/Kg		YES															
Dibenz(a,h)anthracene	47		ug/Kg		YES															
Dibenzofuran	27		ug/Kg		YES															
Fluoranthene	820		ug/Kg		YES															
Fluorene	99		ug/Kg		YES															
Indeno(1,2,3-cd)pyrene	290		ug/Kg		YES															
Naphthalene	65		ug/Kg		YES															
Phenanthrene	660		ug/Kg		YES															
Pyrene	840		ug/Kg		YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-HS1-B-02-DP **Lab Report Batch :** K0904454 **Lab ID :** CAS_K

Sample Date : 05/15/2009 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0904454-005

Reviewed By / Date : LG 8/20/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8270C SIM					**Dilution: 1**															
1-Methylnaphthalene	51		ug/Kg		YES															
2-Methylnaphthalene	48		ug/Kg		YES															
Acenaphthene	120		ug/Kg		YES															
Acenaphthylene	91		ug/Kg		YES															
Anthracene	180		ug/Kg		YES															
Benz(a)anthracene	400		ug/Kg		YES															
Benzo(a)pyrene	500		ug/Kg		YES															
Benzo(b)fluoranthene	570		ug/Kg		YES															
Benzo(g,h,i)perylene	400		ug/Kg		YES															
Benzo(k)fluoranthene	160		ug/Kg		YES															
Chrysene	480		ug/Kg		YES															
Dibenz(a,h)anthracene	81		ug/Kg		YES															
Dibenzofuran	33		ug/Kg		YES															
Fluoranthene	930		ug/Kg		YES															
Fluorene	110		ug/Kg		YES															
Indeno(1,2,3-cd)pyrene	440		ug/Kg		YES															
Naphthalene	60		ug/Kg		YES															
Phenanthrene	640		ug/Kg		YES															
Pyrene	910		ug/Kg		YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-HS1-B-03 **Lab Report Batch :** K0904454 **Lab ID :** CAS_K

Sample Date : 05/15/2009 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0904454-006

Reviewed By / Date : LG 8/20/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8270C SIM					**Dilution: 1**															
1-Methylnaphthalene	13		ug/Kg		YES															
2-Methylnaphthalene	15		ug/Kg		YES															
Acenaphthene	9.1		ug/Kg		YES															
Acenaphthylene	6.5		ug/Kg		YES															
Anthracene	17		ug/Kg		YES															
Benz(a)anthracene	28		ug/Kg		YES															
Benzo(a)pyrene	29		ug/Kg		YES															
Benzo(b)fluoranthene	34		ug/Kg		YES															
Benzo(g,h,i)perylene	30		ug/Kg		YES															
Benzo(k)fluoranthene	9.4		ug/Kg		YES															
Chrysene	46		ug/Kg		YES															
Dibenz(a,h)anthracene	3.8		ug/Kg		YES															
Dibenzofuran	5.9		ug/Kg		YES															
Fluoranthene	71		ug/Kg		YES															
Fluorene	9.9		ug/Kg		YES															
Indeno(1,2,3-cd)pyrene	23		ug/Kg		YES															
Naphthalene	8.0		ug/Kg		YES															
Phenanthrene	79		ug/Kg		YES															
Pyrene	84		ug/Kg		YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-HS1-B-04 **Lab Report Batch :** K0904454 **Lab ID :** CAS_K

Sample Date : 05/15/2009 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0904454-007

Reviewed By / Date : LG 8/20/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8270C SIM					**Dilution: 1**															
1-Methylnaphthalene	11		ug/Kg		YES															
2-Methylnaphthalene	11		ug/Kg		YES															
Acenaphthene	13		ug/Kg		YES															
Acenaphthylene	9.3		ug/Kg		YES															
Anthracene	24		ug/Kg		YES															
Benz(a)anthracene	42		ug/Kg		YES															
Benzo(a)pyrene	44		ug/Kg		YES															
Benzo(b)fluoranthene	47		ug/Kg		YES															
Benzo(g,h,i)perylene	46		ug/Kg		YES															
Benzo(k)fluoranthene	12		ug/Kg		YES															
Chrysene	61		ug/Kg		YES															
Dibenz(a,h)anthracene	5.0		ug/Kg		YES															
Dibenzofuran	7.7		ug/Kg		YES															
Fluoranthene	95		ug/Kg		YES															
Fluorene	13		ug/Kg		YES															
Indeno(1,2,3-cd)pyrene	30		ug/Kg		YES															
Naphthalene	10		ug/Kg		YES															
Phenanthrene	100		ug/Kg		YES															
Pyrene	120		ug/Kg		YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-HS1-B-05 **Lab Report Batch :** K0904454 **Lab ID :** CAS_K

Sample Date : 05/15/2009 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0904454-008

Reviewed By / Date : LG 8/20/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8270C SIM					**Dilution: 1**															
1-Methylnaphthalene	15		ug/Kg		YES															
2-Methylnaphthalene	13		ug/Kg		YES															
Acenaphthene	5.5		ug/Kg		YES															
Acenaphthylene	2.2		ug/Kg	J	YES	**J**								J						
Anthracene	4.9		ug/Kg		YES															
Benz(a)anthracene	13		ug/Kg		YES															
Benzo(a)pyrene	11		ug/Kg		YES															
Benzo(b)fluoranthene	16		ug/Kg		YES															
Benzo(g,h,i)perylene	29		ug/Kg		YES															
Benzo(k)fluoranthene	3.0		ug/Kg	J	YES	**J**								J						
Chrysene	34		ug/Kg		YES															
Dibenz(a,h)anthracene	2.2		ug/Kg	J	YES	**J**								J						
Dibenzofuran	13		ug/Kg		YES															
Fluoranthene	28		ug/Kg		YES															
Fluorene	8.1		ug/Kg		YES															
Indeno(1,2,3-cd)pyrene	9.7		ug/Kg		YES															
Naphthalene	8.7		ug/Kg		YES															
Phenanthrene	69		ug/Kg		YES															
Pyrene	34		ug/Kg		YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-HS1-C-01 **Lab Report Batch :** K0904454 **Lab ID :** CAS_K

Sample Date : 05/15/2009 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0904454-010

Reviewed By / Date : LG 8/20/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8270C SIM					**Dilution: 20**															
1-Methylnaphthalene	300		ug/Kg	D	YES															
2-Methylnaphthalene	480		ug/Kg	D	YES															
Acenaphthene	430		ug/Kg	D	YES															
Acenaphthylene	690		ug/Kg	D	YES															
Anthracene	1200		ug/Kg	D	YES															
Benz(a)anthracene	4200		ug/Kg	D	YES															
Benzo(a)pyrene	5300		ug/Kg	D	YES															
Benzo(b)fluoranthene	6400		ug/Kg	D	YES															
Benzo(g,h,i)perylene	4600		ug/Kg	D	YES															
Benzo(k)fluoranthene	1900		ug/Kg	D	YES															
Chrysene	5200		ug/Kg	D	YES															
Dibenz(a,h)anthracene	700		ug/Kg	D	YES															
Dibenzofuran	140		ug/Kg	D	YES															
Fluoranthene	11000		ug/Kg	D	YES															
Fluorene	510		ug/Kg	D	YES															
Indeno(1,2,3-cd)pyrene	5000		ug/Kg	D	YES															
Naphthalene	740		ug/Kg	D	YES															
Phenanthrene	5200		ug/Kg	D	YES															
Pyrene	10000		ug/Kg	D	YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-HS1-C-02 **Lab Report Batch :** K0904454 **Lab ID :** CAS_K

Sample Date : 05/15/2009 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0904454-011

Reviewed By / Date : LG 8/20/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8270C SIM					**Dilution: 20**															
1-Methylnaphthalene	2900		ug/Kg	D	YES															
2-Methylnaphthalene	4300		ug/Kg	D	YES															
Acenaphthene	4400		ug/Kg	D	YES															
Acenaphthylene	1000		ug/Kg	D	YES															
Anthracene	4800		ug/Kg	D	YES															
Benz(a)anthracene	6800		ug/Kg	D	YES															
Benzo(a)pyrene	6700		ug/Kg	D	YES															
Benzo(b)fluoranthene	7100		ug/Kg	D	YES															
Benzo(g,h,i)perylene	4500		ug/Kg	D	YES															
Benzo(k)fluoranthene	2200		ug/Kg	D	YES															
Chrysene	6600		ug/Kg	D	YES															
Dibenz(a,h)anthracene	810		ug/Kg	D	YES															
Dibenzofuran	1200		ug/Kg	D	YES															
Fluoranthene	18000		ug/Kg	D	YES															
Fluorene	3300		ug/Kg	D	YES															
Indeno(1,2,3-cd)pyrene	5200		ug/Kg	D	YES															
Naphthalene	1300		ug/Kg	D	YES															
Phenanthrene	18000		ug/Kg	D	YES															
Pyrene	17000		ug/Kg	D	YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-HS1-D-01 **Lab Report Batch :** K0904454 **Lab ID :** CAS_K

Sample Date : 05/15/2009 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0904454-012

Reviewed By / Date : LG 8/20/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8270C SIM					**Dilution: 20**															
1-Methylnaphthalene	1100		ug/Kg	D	YES															
2-Methylnaphthalene	1700		ug/Kg	D	YES															
Acenaphthene	930		ug/Kg	D	YES															
Acenaphthylene	1500		ug/Kg	D	YES															
Anthracene	2100		ug/Kg	D	YES															
Benz(a)anthracene	4200		ug/Kg	D	YES															
Benzo(a)pyrene	5300		ug/Kg	D	YES															
Benzo(b)fluoranthene	5900		ug/Kg	D	YES															
Benzo(g,h,i)perylene	4100		ug/Kg	D	YES															
Benzo(k)fluoranthene	1700		ug/Kg	D	YES															
Chrysene	4900		ug/Kg	D	YES															
Dibenz(a,h)anthracene	600		ug/Kg	D	YES															
Dibenzofuran	170		ug/Kg	D	YES															
Fluoranthene	11000		ug/Kg	D	YES															
Fluorene	1100		ug/Kg	D	YES															
Indeno(1,2,3-cd)pyrene	4400		ug/Kg	D	YES															
Naphthalene	4700		ug/Kg	D	YES															
Phenanthrene	8500		ug/Kg	D	YES															
Pyrene	11000		ug/Kg	D	YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-HS1-D-02 **Lab Report Batch :** K0904454 **Lab ID :** CAS_K

Sample Date : 05/15/2009 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0904454-013

Reviewed By / Date : LG 8/20/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8270C SIM					**Dilution: 20**															
1-Methylnaphthalene	450		ug/Kg	D	YES															
2-Methylnaphthalene	720		ug/Kg	D	YES															
Acenaphthene	610		ug/Kg	D	YES															
Acenaphthylene	810		ug/Kg	D	YES															
Anthracene	1200		ug/Kg	D	YES															
Benz(a)anthracene	3300		ug/Kg	D	YES															
Benzo(a)pyrene	4300		ug/Kg	D	YES															
Benzo(b)fluoranthene	5000		ug/Kg	D	YES															
Benzo(g,h,i)perylene	3600		ug/Kg	D	YES															
Benzo(k)fluoranthene	1500		ug/Kg	D	YES															
Chrysene	4100		ug/Kg	D	YES															
Dibenz(a,h)anthracene	550		ug/Kg	D	YES															
Dibenzofuran	130		ug/Kg	D	YES															
Fluoranthene	8300		ug/Kg	D	YES															
Fluorene	570		ug/Kg	D	YES															
Indeno(1,2,3-cd)pyrene	3900		ug/Kg	D	YES															
Naphthalene	770		ug/Kg	D	YES															
Phenanthrene	4700		ug/Kg	D	YES															
Pyrene	8200		ug/Kg	D	YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-HS1-D-02-FS **Lab Report Batch :** K0904454 **Lab ID :** CAS_K

Sample Date : 05/15/2009 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0904454-014

Reviewed By / Date : LG 8/20/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8270C SIM					**Dilution: 20**															
1-Methylnaphthalene	520		ug/Kg	D	YES															
2-Methylnaphthalene	810		ug/Kg	D	YES															
Acenaphthene	660		ug/Kg	D	YES															
Acenaphthylene	1100		ug/Kg	D	YES															
Anthracene	1300		ug/Kg	D	YES															
Benz(a)anthracene	3700		ug/Kg	D	YES															
Benzo(a)pyrene	5000		ug/Kg	D	YES															
Benzo(b)fluoranthene	5600		ug/Kg	D	YES															
Benzo(g,h,i)perylene	4100		ug/Kg	D	YES															
Benzo(k)fluoranthene	1700		ug/Kg	D	YES															
Chrysene	4600		ug/Kg	D	YES															
Dibenz(a,h)anthracene	670		ug/Kg	D	YES															
Dibenzofuran	140		ug/Kg	D	YES															
Fluoranthene	9300		ug/Kg	D	YES															
Fluorene	600		ug/Kg	D	YES															
Indeno(1,2,3-cd)pyrene	4500		ug/Kg	D	YES															
Naphthalene	790		ug/Kg	D	YES															
Phenanthrene	5300		ug/Kg	D	YES															
Pyrene	9300		ug/Kg	D	YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-HS1-E-01 **Lab Report Batch :** K0904454 **Lab ID :** CAS_K

Sample Date : 05/15/2009 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0904454-015

Reviewed By / Date : LG 8/20/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8270C SIM					**Dilution: 20**															
1-Methylnaphthalene	960		ug/Kg	D	YES															
2-Methylnaphthalene	1500		ug/Kg	D	YES															
Acenaphthene	650		ug/Kg	D	YES															
Acenaphthylene	1400		ug/Kg	D	YES															
Anthracene	1700		ug/Kg	D	YES															
Benz(a)anthracene	3400		ug/Kg	D	YES															
Benzo(a)pyrene	4400		ug/Kg	D	YES															
Benzo(b)fluoranthene	4900		ug/Kg	D	YES															
Benzo(g,h,i)perylene	3600		ug/Kg	D	YES															
Benzo(k)fluoranthene	1500		ug/Kg	D	YES															
Chrysene	4400		ug/Kg	D	YES															
Dibenz(a,h)anthracene	590		ug/Kg	D	YES															
Dibenzofuran	130		ug/Kg	D	YES															
Fluoranthene	8900		ug/Kg	D	YES															
Fluorene	910		ug/Kg	D	YES															
Indeno(1,2,3-cd)pyrene	3700		ug/Kg	D	YES															
Naphthalene	3400		ug/Kg	D	YES															
Phenanthrene	6700		ug/Kg	D	YES															
Pyrene	9400		ug/Kg	D	YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-HS1-E-02 **Lab Report Batch :** K0904454 **Lab ID :** CAS_K

Sample Date : 05/15/2009 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0904454-016

Reviewed By / Date : LG 8/20/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8270C SIM					**Dilution: 20**															
1-Methylnaphthalene	540		ug/Kg	D	YES															
2-Methylnaphthalene	870		ug/Kg	D	YES															
Acenaphthene	770		ug/Kg	D	YES															
Acenaphthylene	770		ug/Kg	D	YES															
Anthracene	1600		ug/Kg	D	YES															
Benz(a)anthracene	3100		ug/Kg	D	YES															
Benzo(a)pyrene	3900		ug/Kg	D	YES															
Benzo(b)fluoranthene	4600		ug/Kg	D	YES															
Benzo(g,h,i)perylene	3300		ug/Kg	D	YES															
Benzo(k)fluoranthene	1400		ug/Kg	D	YES															
Chrysene	3900		ug/Kg	D	YES															
Dibenz(a,h)anthracene	540		ug/Kg	D	YES															
Dibenzofuran	160		ug/Kg	D	YES															
Fluoranthene	8500		ug/Kg	D	YES															
Fluorene	730		ug/Kg	D	YES															
Indeno(1,2,3-cd)pyrene	3400		ug/Kg	D	YES															
Naphthalene	1100		ug/Kg	D	YES															
Phenanthrene	6000		ug/Kg	D	YES															
Pyrene	8300		ug/Kg	D	YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-HS1-F-01 **Lab Report Batch :** K0904454 **Lab ID :** CAS_K

Sample Date : 05/15/2009 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0904454-017

Reviewed By / Date : LG 8/20/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8270C SIM					**Dilution: 20**															
1-Methylnaphthalene	260		ug/Kg	D	YES															
2-Methylnaphthalene	430		ug/Kg	D	YES															
Acenaphthene	440		ug/Kg	D	YES															
Acenaphthylene	1100		ug/Kg	D	YES															
Anthracene	1400		ug/Kg	D	YES															
Benz(a)anthracene	3700		ug/Kg	D	YES															
Benzo(a)pyrene	4800		ug/Kg	D	YES															
Benzo(b)fluoranthene	5300		ug/Kg	D	YES															
Benzo(g,h,i)perylene	3900		ug/Kg	D	YES															
Benzo(k)fluoranthene	1700		ug/Kg	D	YES															
Chrysene	4400		ug/Kg	D	YES															
Dibenz(a,h)anthracene	590		ug/Kg	D	YES															
Dibenzofuran	100		ug/Kg	D	YES															
Fluoranthene	8100		ug/Kg	D	YES															
Fluorene	430		ug/Kg	D	YES															
Indeno(1,2,3-cd)pyrene	4100		ug/Kg	D	YES															
Naphthalene	560		ug/Kg	D	YES															
Phenanthrene	4200		ug/Kg	D	YES															
Pyrene	8800		ug/Kg	D	YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-HS1-F-02 **Lab Report Batch :** K0904454 **Lab ID :** CAS_K

Sample Date : 05/15/2009 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0904454-018

Reviewed By / Date : LG 8/20/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8270C SIM					**Dilution: 20**															
1-Methylnaphthalene	340		ug/Kg	D	YES															
2-Methylnaphthalene	580		ug/Kg	D	YES															
Acenaphthene	680		ug/Kg	D	YES															
Acenaphthylene	800		ug/Kg	D	YES															
Anthracene	1400		ug/Kg	D	YES															
Benz(a)anthracene	3800		ug/Kg	D	YES															
Benzo(a)pyrene	4300		ug/Kg	D	YES															
Benzo(b)fluoranthene	4900		ug/Kg	D	YES															
Benzo(g,h,i)perylene	3300		ug/Kg	D	YES															
Benzo(k)fluoranthene	1700		ug/Kg	D	YES															
Chrysene	4100		ug/Kg	D	YES															
Dibenz(a,h)anthracene	600		ug/Kg	D	YES															
Dibenzofuran	320		ug/Kg	D	YES															
Fluoranthene	8600		ug/Kg	D	YES															
Fluorene	700		ug/Kg	D	YES															
Indeno(1,2,3-cd)pyrene	3700		ug/Kg	D	YES															
Naphthalene	1100		ug/Kg	D	YES															
Phenanthrene	5200		ug/Kg	D	YES															
Pyrene	7800		ug/Kg	D	YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-HS1-F-03 **Lab Report Batch :** K0904454 **Lab ID :** CAS_K

Sample Date : 05/15/2009 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0904454-019

Reviewed By / Date : LG 8/20/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8270C SIM					**Dilution: 20**															
1-Methylnaphthalene	550		ug/Kg	D	YES															
2-Methylnaphthalene	760		ug/Kg	D	YES															
Acenaphthene	640		ug/Kg	D	YES															
Acenaphthylene	570		ug/Kg	D	YES															
Anthracene	1300		ug/Kg	D	YES															
Benz(a)anthracene	2700		ug/Kg	D	YES															
Benzo(a)pyrene	3000		ug/Kg	D	YES															
Benzo(b)fluoranthene	3300		ug/Kg	D	YES															
Benzo(g,h,i)perylene	2200		ug/Kg	D	YES															
Benzo(k)fluoranthene	1100		ug/Kg	D	YES															
Chrysene	2900		ug/Kg	D	YES															
Dibenz(a,h)anthracene	380		ug/Kg	D	YES															
Dibenzofuran	200		ug/Kg	D	YES															
Fluoranthene	6500		ug/Kg	D	YES															
Fluorene	780		ug/Kg	D	YES															
Indeno(1,2,3-cd)pyrene	2300		ug/Kg	D	YES															
Naphthalene	620		ug/Kg	D	YES															
Phenanthrene	4500		ug/Kg	D	YES															
Pyrene	7500		ug/Kg	D	YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-HS1-F-04 **Lab Report Batch :** K0904454 **Lab ID :** CAS_K

Sample Date : 05/15/2009 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0904454-020

Reviewed By / Date : LG 8/20/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8270C SIM					**Dilution: 20**															
1-Methylnaphthalene	620		ug/Kg	D	YES															
2-Methylnaphthalene	990		ug/Kg	D	YES															
Acenaphthene	790		ug/Kg	D	YES															
Acenaphthylene	490		ug/Kg	D	YES															
Anthracene	1400		ug/Kg	D	YES															
Benz(a)anthracene	2900		ug/Kg	D	YES															
Benzo(a)pyrene	3000		ug/Kg	D	YES															
Benzo(b)fluoranthene	3600		ug/Kg	D	YES															
Benzo(g,h,i)perylene	2300		ug/Kg	D	YES															
Benzo(k)fluoranthene	1100		ug/Kg	D	YES															
Chrysene	2800		ug/Kg	D	YES															
Dibenz(a,h)anthracene	420		ug/Kg	D	YES															
Dibenzofuran	360		ug/Kg	D	YES															
Fluoranthene	7200		ug/Kg	D	YES															
Fluorene	850		ug/Kg	D	YES															
Indeno(1,2,3-cd)pyrene	2500		ug/Kg	D	YES															
Naphthalene	1200		ug/Kg	D	YES															
Phenanthrene	4700		ug/Kg	D	YES															
Pyrene	8000		ug/Kg	D	YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-ZIC-C-01-TOX **Lab Report Batch :** K0904454 **Lab ID :** CAS_K

Sample Date : 05/16/2009 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0904454-009

Reviewed By / Date : LG 8/20/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8270C SIM					**Dilution: 1**															
1-Methylnaphthalene	10		ug/Kg		YES															
2-Methylnaphthalene	14		ug/Kg		YES															
Acenaphthene	25		ug/Kg		YES															
Acenaphthylene	9.5		ug/Kg		YES															
Anthracene	44		ug/Kg		YES															
Benz(a)anthracene	120		ug/Kg		YES															
Benzo(a)pyrene	130		ug/Kg		YES															
Benzo(b)fluoranthene	170		ug/Kg		YES															
Benzo(g,h,i)perylene	110		ug/Kg		YES															
Benzo(k)fluoranthene	51		ug/Kg		YES															
C1-Chrysenes	78		ug/Kg		YES															
C1-Fluoranthenes/Pyrenes	150		ug/Kg		YES															
C1-Fluorenes	14		ug/Kg		YES															
C1-Phenanthrenes/Anthracenes	75		ug/Kg		YES															
C2-Chrysenes	49		ug/Kg		YES															
C2-Fluorenes	20		ug/Kg		YES															
C2-Naphthalenes	39		ug/Kg		YES															
C2-Phenanthrenes/Anthracenes	80		ug/Kg		YES															
C3-Chrysenes	33		ug/Kg		YES															
C3-Fluorenes	30		ug/Kg		YES															
C3-Naphthalenes	58		ug/Kg		YES															
C3-Phenanthrenes/Anthracenes	74		ug/Kg		YES															
C4-Chrysenes	12		ug/Kg		YES															
C4-Naphthalenes	52		ug/Kg		YES															
C4-Phenanthrenes/Anthracenes	42		ug/Kg		YES															
Chrysene	130		ug/Kg		YES															
Dibenz(a,h)anthracene	19		ug/Kg		YES															
Dibenzofuran	20		ug/Kg		YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-ZIC-C-01-TOX **Lab Report Batch :** K0904454 **Lab ID :** CAS_K

Sample Date : 05/16/2009 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0904454-009

Reviewed By / Date : LG 8/20/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 8270C SIM					**Dilution: 1**															
Fluoranthene	280		ug/Kg		YES															
Fluorene	27		ug/Kg		YES															
Indeno(1,2,3-cd)pyrene	120		ug/Kg		YES															
Naphthalene	27		ug/Kg		YES															
Phenanthrene	130		ug/Kg		YES															
Pyrene	230		ug/Kg		YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Weston Solutions, Inc.
20 North Wacker Drive, Suite 1210
Chicago, IL 60606
(312) 424-3300 ● Fax: (312) 424-3330
www.westonsolutions.com

The Trusted Integrator for Sustainable Solutions

December 4, 2009

Ms. Diana Mally
Great Lakes National Program Office
United States Environmental Protection Agency, Region V
77 West Jackson Boulevard, Mail Code: G-17J
Chicago, Illinois 60604-3507

Re: **Data Review of pH Analyses**
For Sediment Samples Collected in October 2008 and May 2009
Lower Rouge River Sediment Investigation
Detroit, Wayne County, Michigan
Technical Direction Document Number: S05-0008-0805-012
Document Control Number: 451-2A-AEQA
Work Order Number: 20405.012.008.0451.00

Dear Ms. Mally:

The United States Environmental Protection Agency (U.S. EPA) tasked Weston Solutions, Inc., (WESTON®) to perform data validation for sediment samples collected from October 21, 2008, to May 16, 2009 for the Great Lakes National Program Office Lower Rouge River Sediment Investigation (LRR) Site. This data review is for pH analysis of 12 sediment samples that include one field replicate sample that were collected by the WESTON Superfund Technical Assessment and Response Team (START). The samples were validated in accordance with the "Quality Assurance Project Plan (QAPP), Lower Rouge River Sediment Investigation" dated October 17, 2008, which included using the U.S. EPA Contract Laboratory Program National Functional Guidance for Organic Data Review. Table 1 provides a summary of the samples included in this review. All tables are presented at the end of this report.

The samples listed in Table 1 were analyzed by Columbia Analytical Services (CAS) located in Kelso, Washington under the following nine work orders:

- K0810413
- K0810422
- K0810423
- K0810463
- K0810465
- K0904301
- K0904356
- K0904451
- K0904454

This document was prepared by Weston Solutions, Inc., expressly for U.S. EPA. It shall not be released or disclosed in whole or in part without the express, written permission of U.S. EPA.

The samples were analyzed for pH by SW-846 Method 9045C. CAS provided WESTON with a Staged Electronic Data Deliverable that was used in conjunction with the Automated Data Review software to assist in reviewing the data.

Attachment A to this report contains the individual Quality Assurance/Quality Control (QA/QC) Analysis Checklist for Sediment Chemistry Analysis for each work order. Attachment B to this report contains a summary of results. The QC limits utilized were those stated in the QAPP. If there was not a QC limit specified in the QAPP, then the method or laboratory-determined QC limits were used. Below is a data review summary.

SUMMARY OF GENERAL CHEMISTRY DATA REVIEW

The field replicate sample, laboratory control samples/check standards (LCS), and laboratory duplicate samples were all within the QC limits.

There were problems with the holding times for the pH analyses for the 2008 collected sediment samples. Although there is no specific holding time limit for pH analysis of sediment samples, the method states that pH should be analyzed "as soon as possible" on samples. For the sediment samples collected in 2008, the pH analyses were conducted 12 to 26 days from sample collection. This is somewhat excessive; therefore, all 2008-collected sediment sample results for pH were flagged "J" as estimated. The 2009-collected sediment samples were analyzed 3 to 6 days from sample collection for pH. No data qualifications were applied for the 2009-collected samples.

Below is a review of the data quality indicators.

DATA QUALITY INDICATORS REVIEW

Many the data quality indicators (sensitivity, precision, accuracy, and completeness) were evaluated through the data validation procedures which are summarized above and discussed in detail in the attachment.

Sensitivity. Laboratory reporting limits are not applicable to the pH analyses.

Precision. Field precision was determined by evaluating the RPDs for the field replicate result. Because there was no QC limit stated in the QAPP for field replicates, a standard QC limit of 50 RPD between the parent and replicate result was used for the evaluation. The field replicate RPD for pH was 0. Field precision was acceptable.

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For the pH analyses, laboratory precision was determined by evaluating the mean RPD value for the laboratory duplicates which was 1. Laboratory precision was acceptable for pH. Table 2 summarizes the laboratory precision results.

Accuracy/Bias. Accuracy is a measure of the agreement between an observed value and an accepted reference value. Laboratory accuracy was evaluated by reviewing the QC criteria for mean percent recovery for LCS results for pH. The mean recovery for the LCS results for pH was 100. Laboratory precision was acceptable for pH. Table 2 summarizes the laboratory accuracy results.

There is no bias (high or low) associated with the pH analyses.

Completeness. Completeness is a measure of the amount of valid data obtained compared to the amount of data that was planned to be collected under normal conditions. All samples results were received.

In summary, the pH data are usable. Table 3 summarizes the qualifiers applied during data validation.

If there are any questions or comments regarding this report, please do not hesitate to contact WESTON START at 312-424-3300.

Very truly yours,
Weston Solutions, Inc.

Lisa Graczyk
WESTON START Team

Tonya Balla
WESTON START Project Manager

Attachments:
Tables
A - Checklists for pH Analytical Data
B - Analytical Data Summary Sheets with Qualifiers

cc: project file

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TABLE 1 SAMPLES INCLUDED IN DATA REVIEW			
Sample ID	**Lab ID**	**Date Collected**	**Comment**
LRR-017-A-01	K0810413-001	10/21/2008	
LRR-OF2-A-01	K0810413-008	10/21/2008	
LRR-HS1-A-01	K0810422-001	10/21/2008	
LRR-OF2-B-01	K0810423-001	10/22/2008	
LRR-HS5-A-01	K0810423-011	10/23/2008	
LRR-HS4-B-01	K0810463-007	10/23/2008	
LRR-OBC-B-01	K0810465-004	10/23/2008	
LRR-HS6-F-01	K0904301-005	5/12/2009	
LRR-HS6-DOWN2-01	K0904356-014	5/13/2009	
LRR-HS3-A-01	K0904451-002	5/16/2009	
LRR-HS3-A-01-FS	K0904451-004	5/16/2009	Field replicate of LRR-HS3-A-01
LRR-ZIC-C-01-TOX	K0904454-009	5/15/2009	

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TABLE 2 QUANTITATIVE DATA ASSESSMENT FOR pH			
	Field Precision	**Analytical Precision**	**Analytical Accuracy/Bias**
Parameter	**Mean Field Replicate RPD (%) (n=1)**	**Mean Laboratory Duplicate RPD (%) (n=2)**	**Mean LCS Recovery (%) (n=4)**
Total Organic Carbon	0	1	100

Notes:

LCS - Laboratory Control Sample
RPD - Relative Percent Difference

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TABLE 3 SUMMARY OF DATA QUALIFICATION				
Sample ID	**Sampling Date**	**Analyte**	**Qualification**	**Reason**
LRR-017-A-01	10/21/2008	pH	Sample result should be considered estimated.	The pH analysis was not carried out in a reasonable time-frame.
LRR-WJB-A-01	10/21/2008			
LRR-HS1-A-01	10/21/2008			
LRR-HS5-A-01	10/22/2008			
LRR-OF2-B-01	10/22/2008			
LRR-HS4-B-01	10/23/2008			
LRR-OBC-B-01	10/23/2008			

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ATTACHMENT A
CHECKLISTS FOR PH ANALYTICAL DATA

pH by SW-846 Method 9045C

CAS Work Order #: K0810413

QA/QC Analysis Checklist for Sediment Chemistry Analysis

GRANT/IAG NUMBER: Not Applicable
PROJECT NAME: Lower Rouge River
REVIEWER: Lisa Graczyk, WESTON START
DATE: January 15, 2009

1. What sediment chemistry data has been collected (CHECK ALL THAT APPLY)?

Total Metals _____	PCBs _____	pH __X___	TOC _____
Dioxins/Furans _____	PAHs _____	Pesticides _____	DO _____
AVS _____	SEM Metals ___	Particle Size ___	Other ___

2. Were the target detection limits met for each parameter?

Yes Not Applicable

No _____ (EXPLAIN)

3. Were the method blanks less than the established MDL for each parameter?

Yes Not Applicable

No _____ (EXPLAIN)

4. Did the results of Field Replicate Analysis vary by less than the % RPD specified in the QAPP?

Yes Not Applicable

No _____ (EXPLAIN)

pH Checklist
Lower Rouge River
Columbia Analytical Services
Laboratory Work Order #: K0810413

5. Did the results of the Field Duplicates Analysis vary by less than the % RPD specified in the QAPP?

Yes	Not Applicable	
No		(EXPLAIN)

6. Did the surrogate spike/internal standards recoveries meet the limits set forth in the QAPP?

Yes	Not Applicable	
No		(EXPLAIN)

7. Did the MS/MSD recoveries meet the limits set forth in the QAPP?

Yes	Not Applicable	
No		(EXPLAIN)

8. Did the RPD (%) of the MS/MSD sample set meet the limits set forth in the QAPP?

Yes	Not Applicable	
No		(EXPLAIN)

9. Did the LCS recoveries meet the limits set forth in the QAPP?

Yes	X	
No		(EXPLAIN)

pH Checklist
Lower Rouge River
Columbia Analytical Services
Laboratory Work Order #: K0810413

10. Did the calibration verification standards (ICVs and CCVs) meet the requirements set forth in the QAPP?

Yes
Not Applicable
No (EXPLAIN)

11. Did the calibration blanks (ICBs and CCBs) meet the limits set forth in the QAPP?

Yes
Not Applicable
No (EXPLAIN)

12. Did the interference check samples meet the limits set forth in the QAPP?

Yes
Not Applicable
No (EXPLAIN)

13. Did the serial dilution samples meet the limits set forth in the QAPP?

Yes
Not Applicable
No (EXPLAIN)

14. Were any level of contaminants detected above the MDL for the trip blanks and storage blanks?

Yes
Not Applicable
No (EXPLAIN)

Trip blanks and storage blanks are not applicable to this work order.

pH Checklist
Lower Rouge River
Columbia Analytical Services
Laboratory Work Order #: K0810413

15. Did all required analyses take place within the required holding time protocols set forth in the QAPP?

Yes		
No	X	(EXPLAIN)

Although pH does not have a set holding time criteria, the method states that samples should be analyzed as soon as possible. The pH analyses were performed 14 days after sample collection which appears to be a little excessive. The results for pH in this work order were flagged "J" as estimated.

16. Did the laboratory duplicates vary by less than the % RPD specified in the QAPP?

Yes	X	
No		(EXPLAIN)

17. Are measured dry-weight contaminant concentrations reported?

Yes	Not Applicable	
No		(EXPLAIN)

18. Please provide details for all of the "EXPLAIN" marked above. Include details on the specific analytes affected by any QA/QC discrepancies, and recommendations regarding usability of data.

Any items with "EXPLAIN" marked above are described immediately following the "EXPLAIN" marking in the corresponding item above.

The data are acceptable for use as qualified.

pH Checklist
Lower Rouge River
Columbia Analytical Services
Laboratory Work Order #: K0810413

pH by SW-846 Method 9045C

CAS Work Order #: K0810422

QA/QC Analysis Checklist for Sediment Chemistry Analysis

GRANT/IAG NUMBER: Not Applicable
PROJECT NAME: Lower Rouge River
REVIEWER: Lisa Graczyk, WESTON START
DATE: January 19, 2009

1. What sediment chemistry data has been collected (CHECK ALL THAT APPLY)?

Total Metals _____	PCBs _____	pH __X___	TOC _____
Dioxins/Furans _____	PAHs _____	Pesticides _____	DO _____
AVS _____	SEM Metals ___	Particle Size ___	Other ___

2. Were the target detection limits met for each parameter?

Yes Not Applicable

No _____ (EXPLAIN)

3. Were the method blanks less than the established MDL for each parameter?

Yes Not Applicable

No _____ (EXPLAIN)

4. Did the results of Field Replicate Analysis vary by less than the % RPD specified in the QAPP?

Yes Not Applicable

No _____ (EXPLAIN)

pH Checklist
Lower Rouge River
Columbia Analytical Services
Laboratory Work Order #: K0810422

5. Did the results of the Field Duplicates Analysis vary by less than the % RPD specified in the QAPP?

Yes	Not Applicable	
No		(EXPLAIN)

6. Did the surrogate spike/internal standards recoveries meet the limits set forth in the QAPP?

Yes	Not Applicable	
No		(EXPLAIN)

7. Did the MS/MSD recoveries meet the limits set forth in the QAPP?

Yes	Not Applicable	
No		(EXPLAIN)

8. Did the RPD (%) of the MS/MSD sample set meet the limits set forth in the QAPP?

Yes	Not Applicable	
No		(EXPLAIN)

9. Did the LCS recoveries meet the limits set forth in the QAPP?

Yes	X	
No		(EXPLAIN)

pH Checklist
Lower Rouge River
Columbia Analytical Services
Laboratory Work Order #: K0810422

10. Did the calibration verification standards (ICVs and CCVs) meet the requirements set forth in the QAPP?

Yes
Not Applicable
No (EXPLAIN)

11. Did the calibration blanks (ICBs and CCBs) meet the limits set forth in the QAPP?

Yes
Not Applicable
No (EXPLAIN)

12. Did the interference check samples meet the limits set forth in the QAPP?

Yes
Not Applicable
No (EXPLAIN)

13. Did the serial dilution samples meet the limits set forth in the QAPP?

Yes
Not Applicable
No (EXPLAIN)

14. Were any level of contaminants detected above the MDL for the trip blanks and storage blanks?

Yes
Not Applicable
No (EXPLAIN)

Trip blanks and storage blanks are not applicable to this work order.

pH Checklist
Lower Rouge River
Columbia Analytical Services
Laboratory Work Order #: K0810422

15. Did all required analyses take place within the required holding time protocols set forth in the QAPP?

Yes		
No	X	(EXPLAIN)

Although pH does not have a set holding time criteria, the method states that samples should be analyzed as soon as possible. The pH analyses were performed 14 days after sample collection which appears to be a little excessive. The results for pH in this work order were flagged "J" as estimated.

16. Did the laboratory duplicates vary by less than the % RPD specified in the QAPP?

Yes	X	
No		(EXPLAIN)

17. Are measured dry-weight contaminant concentrations reported?

Yes	Not Applicable	
No		(EXPLAIN)

18. Please provide details for all of the "EXPLAIN" marked above. Include details on the specific analytes affected by any QA/QC discrepancies, and recommendations regarding usability of data.

Any items with "EXPLAIN" marked above are described immediately following the "EXPLAIN" marking in the corresponding item above.

The data are acceptable for use as qualified.

pH Checklist
Lower Rouge River
Columbia Analytical Services
Laboratory Work Order #: K0810422

pH by SW-846 Method 9045C

CAS Work Order #: K0810423

QA/QC Analysis Checklist for Sediment Chemistry Analysis

GRANT/IAG NUMBER: Not Applicable
PROJECT NAME: Lower Rouge River
REVIEWER: Lisa Graczyk, WESTON START
DATE: January 20, 2009

1. What sediment chemistry data has been collected (CHECK ALL THAT APPLY)?

Total Metals _____	PCBs _____	pH __X___	TOC _____
Dioxins/Furans _____	PAHs _____	Pesticides _____	DO _____
AVS _____	SEM Metals ___	Particle Size ___	Other ___

2. Were the target detection limits met for each parameter?

Yes Not Applicable
No _____ (EXPLAIN)

3. Were the method blanks less than the established MDL for each parameter?

Yes Not Applicable
No _____ (EXPLAIN)

4. Did the results of Field Replicate Analysis vary by less than the % RPD specified in the QAPP?

Yes Not Applicable
No _____ (EXPLAIN)

5. Did the results of the Field Duplicates Analysis vary by less than the % RPD specified in the QAPP?

Yes Not Applicable
No _____ (EXPLAIN)

pH Checklist
Lower Rouge River
Columbia Analytical Services
Laboratory Work Order #: K0810423

6. Did the surrogate spike/internal standards recoveries meet the limits set forth in the QAPP?

Yes	Not Applicable	
No		(EXPLAIN)

7. Did the MS/MSD recoveries meet the limits set forth in the QAPP?

Yes	Not Applicable	
No		(EXPLAIN)

8. Did the RPD (%) of the MS/MSD sample set meet the limits set forth in the QAPP?

Yes	Not Applicable	
No		(EXPLAIN)

9. Did the LCS recoveries meet the limits set forth in the QAPP?

Yes	X	
No		(EXPLAIN)

10. Did the calibration verification standards (ICVs and CCVs) meet the requirements set forth in the QAPP?

Yes	Not Applicable	
No		(EXPLAIN)

pH Checklist
Lower Rouge River
Columbia Analytical Services
Laboratory Work Order #: K0810423

11. Did the calibration blanks (ICBs and CCBs) meet the limits set forth in the QAPP?

Yes	Not Applicable	
No		(EXPLAIN)

12. Did the interference check samples meet the limits set forth in the QAPP?

Yes	Not Applicable	
No		(EXPLAIN)

13. Did the serial dilution samples meet the limits set forth in the QAPP?

Yes	Not Applicable	
No		(EXPLAIN)

14. Were any level of contaminants detected above the MDL for the trip blanks and storage blanks?

Yes	Not Applicable	
No		(EXPLAIN)

Trip blanks and storage blanks are not applicable to this work order.

15. Did all required analyses take place within the required holding time protocols set forth in the QAPP?

Yes		
No	X	(EXPLAIN)

Although pH does not have a set holding time criteria, the method states that samples should be analyzed as soon as possible. The pH analyses were performed 13 days after sample collection which appears to be a little excessive. The results for pH in this work order were flagged "J" as estimated.

pH Checklist
Lower Rouge River
Columbia Analytical Services
Laboratory Work Order #: K0810423

16. Did the laboratory duplicates vary by less than the % RPD specified in the QAPP?

Yes	X	
No		(EXPLAIN)

17. Are measured dry-weight contaminant concentrations reported?

Yes	Not Applicable	
No		(EXPLAIN)

18. Please provide details for all of the "EXPLAIN" marked above. Include details on the specific analytes affected by any QA/QC discrepancies, and recommendations regarding usability of data.

Any items with “EXPLAIN” marked above are described immediately following the “EXPLAIN” marking in the corresponding item above.

The data are acceptable for use as qualified.

pH Checklist
Lower Rouge River
Columbia Analytical Services
Laboratory Work Order #: K0810423

pH by SW-846 Method 9045C

CAS Work Order #: K0810463

QA/QC Analysis Checklist for Sediment Chemistry Analysis

GRANT/IAG NUMBER: Not Applicable
PROJECT NAME: Lower Rouge River
REVIEWER: Lisa Graczyk, WESTON START
DATE: January 28, 2009

1. What sediment chemistry data has been collected (CHECK ALL THAT APPLY)?

Total Metals _____	PCBs _____	pH __X___	TOC _____
Dioxins/Furans _____	PAHs _____	Pesticides _____	DO _____
AVS _____	SEM Metals ___	Particle Size ___	Other ___

2. Were the target detection limits met for each parameter?

Yes
Not Applicable
No _____ (EXPLAIN)

3. Were the method blanks less than the established MDL for each parameter?

Yes
Not Applicable
No _____ (EXPLAIN)

4. Did the results of Field Replicate Analysis vary by less than the % RPD specified in the QAPP?

Yes
Not Applicable
No _____ (EXPLAIN)

5. Did the results of the Field Duplicates Analysis vary by less than the % RPD specified in the QAPP?

Yes
Not Applicable
No _____ (EXPLAIN)

pH Checklist
Lower Rouge River
Columbia Analytical Services
Laboratory Work Order #: K0810463

6. Did the surrogate spike/internal standards recoveries meet the limits set forth in the QAPP?

Yes	Not Applicable	
No		(EXPLAIN)

7. Did the MS/MSD recoveries meet the limits set forth in the QAPP?

Yes	Not Applicable	
No		(EXPLAIN)

8. Did the RPD (%) of the MS/MSD sample set meet the limits set forth in the QAPP?

Yes	Not Applicable	
No		(EXPLAIN)

9. Did the LCS recoveries meet the limits set forth in the QAPP?

Yes	X	
No		(EXPLAIN)

10. Did the calibration verification standards (ICVs and CCVs) meet the requirements set forth in the QAPP?

Yes	Not Applicable	
No		(EXPLAIN)

pH Checklist
Lower Rouge River
Columbia Analytical Services
Laboratory Work Order #: K0810463

11. Did the calibration blanks (ICBs and CCBs) meet the limits set forth in the QAPP?

Yes	Not Applicable	
No		(EXPLAIN)

12. Did the interference check samples meet the limits set forth in the QAPP?

Yes	Not Applicable	
No		(EXPLAIN)

13. Did the serial dilution samples meet the limits set forth in the QAPP?

Yes	Not Applicable	
No		(EXPLAIN)

14. Were any level of contaminants detected above the MDL for the trip blanks and storage blanks?

Yes	Not Applicable	
No		(EXPLAIN)

Trip blanks and storage blanks are not applicable to this work order.

15. Did all required analyses take place within the required holding time protocols set forth in the QAPP?

Yes		
No	X	(EXPLAIN)

Although pH does not have a set holding time criteria, the method states that samples should be analyzed as soon as possible. The pH analyses were performed 25 days after sample collection which is excessive. The results for pH in this work order were flagged "J" as estimated.

pH Checklist
Lower Rouge River
Columbia Analytical Services
Laboratory Work Order #: K0810463

16. Did the laboratory duplicates vary by less than the % RPD specified in the QAPP?

Yes	X	
No		(EXPLAIN)

17. Are measured dry-weight contaminant concentrations reported?

Yes	Not Applicable	
No		(EXPLAIN)

18. Please provide details for all of the "EXPLAIN" marked above. Include details on the specific analytes affected by any QA/QC discrepancies, and recommendations regarding usability of data.

Any items with “EXPLAIN” marked above are described immediately following the “EXPLAIN” marking in the corresponding item above.

The data are acceptable for use as qualified.

pH Checklist
Lower Rouge River
Columbia Analytical Services
Laboratory Work Order #: K0810463

pH by SW-846 Method 9045C

CAS Work Order #: K0810465

QA/QC Analysis Checklist for Sediment Chemistry Analysis

GRANT/IAG NUMBER: Not Applicable
PROJECT NAME: Lower Rouge River
REVIEWER: Lisa Graczyk, WESTON START
DATE: January 29, 2009

1. What sediment chemistry data has been collected (CHECK ALL THAT APPLY)?

Total Metals _____	PCBs _____	pH __X___	TOC _____
Dioxins/Furans _____	PAHs _____	Pesticides _____	DO _____
AVS _____	SEM Metals ___	Particle Size ___	Other ___

2. Were the target detection limits met for each parameter?

Yes
Not Applicable
No _____ (EXPLAIN)

3. Were the method blanks less than the established MDL for each parameter?

Yes
Not Applicable
No _____ (EXPLAIN)

4. Did the results of Field Replicate Analysis vary by less than the % RPD specified in the QAPP?

Yes
Not Applicable
No _____ (EXPLAIN)

5. Did the results of the Field Duplicates Analysis vary by less than the % RPD specified in the QAPP?

Yes
Not Applicable
No _____ (EXPLAIN)

pH Checklist
Lower Rouge River
Columbia Analytical Services
Laboratory Work Order #: K0810465

6. Did the surrogate spike/internal standards recoveries meet the limits set forth in the QAPP?

Yes	Not Applicable	
No		(EXPLAIN)

7. Did the MS/MSD recoveries meet the limits set forth in the QAPP?

Yes	Not Applicable	
No		(EXPLAIN)

8. Did the RPD (%) of the MS/MSD sample set meet the limits set forth in the QAPP?

Yes	Not Applicable	
No		(EXPLAIN)

9. Did the LCS recoveries meet the limits set forth in the QAPP?

Yes	X	
No		(EXPLAIN)

10. Did the calibration verification standards (ICVs and CCVs) meet the requirements set forth in the QAPP?

Yes	Not Applicable	
No		(EXPLAIN)

pH Checklist
Lower Rouge River
Columbia Analytical Services
Laboratory Work Order #: K0810465

11. Did the calibration blanks (ICBs and CCBs) meet the limits set forth in the QAPP?

Yes	Not Applicable	
No		(EXPLAIN)

12. Did the interference check samples meet the limits set forth in the QAPP?

Yes	Not Applicable	
No		(EXPLAIN)

13. Did the serial dilution samples meet the limits set forth in the QAPP?

Yes	Not Applicable	
No		(EXPLAIN)

14. Were any level of contaminants detected above the MDL for the trip blanks and storage blanks?

Yes	Not Applicable	
No		(EXPLAIN)

Trip blanks and storage blanks are not applicable to this work order.

15. Did all required analyses take place within the required holding time protocols set forth in the QAPP?

Yes		
No	X	(EXPLAIN)

Although pH does not have a set holding time criteria, the method states that samples should be analyzed as soon as possible. The pH analyses were performed 12 days after sample collection which is somewhat excessive. The results for pH in this work order were flagged "J" as estimated.

pH Checklist
Lower Rouge River
Columbia Analytical Services
Laboratory Work Order #: K0810465

16. Did the laboratory duplicates vary by less than the % RPD specified in the QAPP?

Yes	X	
No		(EXPLAIN)

17. Are measured dry-weight contaminant concentrations reported?

Yes	Not Applicable	
No		(EXPLAIN)

18. Please provide details for all of the "EXPLAIN" marked above. Include details on the specific analytes affected by any QA/QC discrepancies, and recommendations regarding usability of data.

Any items with “EXPLAIN” marked above are described immediately following the “EXPLAIN” marking in the corresponding item above.

The data are acceptable for use as qualified.

pH Checklist
Lower Rouge River
Columbia Analytical Services
Laboratory Work Order #: K0810465

pH by SW-846 Method 9045C

CAS Work Order #: K0904301

QA/QC Analysis Checklist for Sediment Chemistry Analysis

GRANT/IAG NUMBER: Not Applicable
PROJECT NAME: Lower Rouge River
REVIEWER: Lisa Graczyk, WESTON START
DATE: August 20, 2009

1. What sediment chemistry data has been collected (CHECK ALL THAT APPLY)?

Total Metals _____	PCBs _____	pH __X___	TOC _____
Dioxins/Furans _____	PAHs _____	Pesticides _____	DO _____
AVS _____	SEM Metals ___	Particle Size ___	Other ___

2. Were the target detection limits met for each parameter?

Yes Not Applicable
No _____ (EXPLAIN)

3. Were the method blanks less than the established MDL for each parameter?

Yes Not Applicable
No _____ (EXPLAIN)

4. Did the results of Field Replicate Analysis vary by less than the % RPD specified in the QAPP?

Yes Not Applicable
No _____ (EXPLAIN)

5. Did the results of the Field Duplicates Analysis vary by less than the % RPD specified in the QAPP?

Yes Not Applicable
No _____ (EXPLAIN)

pH Checklist
Lower Rouge River
Columbia Analytical Services
Laboratory Work Order #: K0904301

6. Did the surrogate spike/internal standards recoveries meet the limits set forth in the QAPP?

Yes	Not Applicable	
No		(EXPLAIN)

7. Did the MS/MSD recoveries meet the limits set forth in the QAPP?

Yes	Not Applicable	
No		(EXPLAIN)

8. Did the RPD (%) of the MS/MSD sample set meet the limits set forth in the QAPP?

Yes	Not Applicable	
No		(EXPLAIN)

9. Did the LCS recoveries meet the limits set forth in the QAPP?

Yes	X	
No		(EXPLAIN)

10. Did the calibration verification standards (ICVs and CCVs) meet the requirements set forth in the QAPP?

Yes	Not Applicable	
No		(EXPLAIN)

pH Checklist
Lower Rouge River
Columbia Analytical Services
Laboratory Work Order #: K0904301

11. Did the calibration blanks (ICBs and CCBs) meet the limits set forth in the QAPP?

Yes	Not Applicable	
No		(EXPLAIN)

12. Did the interference check samples meet the limits set forth in the QAPP?

Yes	Not Applicable	
No		(EXPLAIN)

13. Did the serial dilution samples meet the limits set forth in the QAPP?

Yes	Not Applicable	
No		(EXPLAIN)

14. Were any level of contaminants detected above the MDL for the trip blanks and storage blanks?

Yes	Not Applicable	
No		(EXPLAIN)

Trip blanks and storage blanks are not applicable to this work order.

15. Did all required analyses take place within the required holding time protocols set forth in the QAPP?

Yes	X	
No		(EXPLAIN)

16. Did the laboratory duplicates vary by less than the % RPD specified in the QAPP?

Yes	X	
No		(EXPLAIN)

pH Checklist
Lower Rouge River
Columbia Analytical Services
Laboratory Work Order #: K0904301

17. Are measured dry-weight contaminant concentrations reported?

Yes	Not Applicable	
No		(EXPLAIN)

18. Please provide details for all of the "EXPLAIN" marked above. Include details on the specific analytes affected by any QA/QC discrepancies, and recommendations regarding usability of data.

Any items with “EXPLAIN” marked above are described immediately following the “EXPLAIN” marking in the corresponding item above.

The data are acceptable for use as qualified.

pH Checklist
Lower Rouge River
Columbia Analytical Services
Laboratory Work Order #: K0904301

pH by SW-846 Method 9045C

CAS Work Order #: K0904356

QA/QC Analysis Checklist for Sediment Chemistry Analysis

GRANT/IAG NUMBER: Not Applicable
PROJECT NAME: Lower Rouge River
REVIEWER: Lisa Graczyk, WESTON START
DATE: August 20, 2009

1. What sediment chemistry data has been collected (CHECK ALL THAT APPLY)?

Total Metals _____	PCBs _____	pH __X___	TOC _____
Dioxins/Furans _____	PAHs _____	Pesticides _____	DO _____
AVS _____	SEM Metals _ __	Particle Size ___	Other __ _

2. Were the target detection limits met for each parameter?

Yes Not Applicable

No _____ (EXPLAIN)

3. Were the method blanks less than the established MDL for each parameter?

Yes Not Applicable

No _____ (EXPLAIN)

4. Did the results of Field Replicate Analysis vary by less than the % RPD specified in the QAPP?

Yes Not Applicable

No _____ (EXPLAIN)

5. Did the results of the Field Duplicates Analysis vary by less than the % RPD specified in the QAPP?

pH Checklist
Lower Rouge River
Columbia Analytical Services
Laboratory Work Order #: K0904356

Yes	Not Applicable	
No		(EXPLAIN)

6. Did the surrogate spike/internal standards recoveries meet the limits set forth in the QAPP?

Yes	Not Applicable	
No		(EXPLAIN)

7. Did the MS/MSD recoveries meet the limits set forth in the QAPP?

Yes	Not Applicable	
No		(EXPLAIN)

8. Did the RPD (%) of the MS/MSD sample set meet the limits set forth in the QAPP?

Yes	Not Applicable	
No		(EXPLAIN)

9. Did the LCS recoveries meet the limits set forth in the QAPP?

Yes	X	
No		(EXPLAIN)

10. Did the calibration verification standards (ICVs and CCVs) meet the requirements set forth in the QAPP?

Yes	Not Applicable	
No		(EXPLAIN)

pH Checklist
Lower Rouge River
Columbia Analytical Services
Laboratory Work Order #: K0904356

11. Did the calibration blanks (ICBs and CCBs) meet the limits set forth in the QAPP?

Yes	Not Applicable	
No		(EXPLAIN)

12. Did the interference check samples meet the limits set forth in the QAPP?

Yes	Not Applicable	
No		(EXPLAIN)

13. Did the serial dilution samples meet the limits set forth in the QAPP?

Yes	Not Applicable	
No		(EXPLAIN)

14. Were any level of contaminants detected above the MDL for the trip blanks and storage blanks?

Yes	Not Applicable	
No		(EXPLAIN)

Trip blanks and storage blanks are not applicable to this work order.

15. Did all required analyses take place within the required holding time protocols set forth in the QAPP?

Yes	X	
No		(EXPLAIN)

pH Checklist
Lower Rouge River
Columbia Analytical Services
Laboratory Work Order #: K0904356

16. Did the laboratory duplicates vary by less than the % RPD specified in the QAPP?

Yes	X	
No		(EXPLAIN)

17. Are measured dry-weight contaminant concentrations reported?

Yes	Not Applicable	
No		(EXPLAIN)

18. Please provide details for all of the "EXPLAIN" marked above. Include details on the specific analytes affected by any QA/QC discrepancies, and recommendations regarding usability of data.

Any items with “EXPLAIN” marked above are described immediately following the “EXPLAIN” marking in the corresponding item above.

The data are acceptable for use as qualified.

pH Checklist
Lower Rouge River
Columbia Analytical Services
Laboratory Work Order #: K0904356

pH by SW-846 Method 9045C

CAS Work Order #: K0904451

QA/QC Analysis Checklist for Sediment Chemistry Analysis

GRANT/IAG NUMBER: Not Applicable
PROJECT NAME: Lower Rouge River
REVIEWER: Lisa Graczyk, WESTON START
DATE: August 21, 2009

1. What sediment chemistry data has been collected (CHECK ALL THAT APPLY)?

Total Metals _____	PCBs _____	pH __X___	TOC _____
Dioxins/Furans _____	PAHs _____	Pesticides _____	DO _____
AVS _____	SEM Metals ___	Particle Size ___	Other ___

2. Were the target detection limits met for each parameter?

Yes	Not Applicable	
No	_____	(EXPLAIN)

3. Were the method blanks less than the established MDL for each parameter?

Yes	Not Applicable	
No	_____	(EXPLAIN)

4. Did the results of Field Replicate Analysis vary by less than the % RPD specified in the QAPP?

Yes	X	
No	_____	(EXPLAIN)

5. Did the results of the Field Duplicates Analysis vary by less than the % RPD specified in the QAPP?

Yes	Not Applicable	
No	_____	(EXPLAIN)

6. Did the surrogate spike/internal standards recoveries meet the limits set forth in the QAPP?

Yes	Not Applicable	
No		(EXPLAIN)

7. Did the MS/MSD recoveries meet the limits set forth in the QAPP?

Yes	Not Applicable	
No		(EXPLAIN)

8. Did the RPD (%) of the MS/MSD sample set meet the limits set forth in the QAPP?

Yes	Not Applicable	
No		(EXPLAIN)

9. Did the LCS recoveries meet the limits set forth in the QAPP?

Yes	X	
No		(EXPLAIN)

10. Did the calibration verification standards (ICVs and CCVs) meet the requirements set forth in the QAPP?

Yes	Not Applicable	
No		(EXPLAIN)

11. Did the calibration blanks (ICBs and CCBs) meet the limits set forth in the QAPP?

Yes	Not Applicable	
No		(EXPLAIN)

12. Did the interference check samples meet the limits set forth in the QAPP?

Yes	Not Applicable	
No		(EXPLAIN)

13. Did the serial dilution samples meet the limits set forth in the QAPP?

Yes	Not Applicable	
No		(EXPLAIN)

14. Were any level of contaminants detected above the MDL for the trip blanks and storage blanks?

Yes	Not Applicable	
No		(EXPLAIN)

Trip blanks and storage blanks are not applicable to this work order.

15. Did all required analyses take place within the required holding time protocols set forth in the QAPP?

Yes	X	
No		(EXPLAIN)

16. Did the laboratory duplicates vary by less than the % RPD specified in the QAPP?

Yes	X	
No		(EXPLAIN)

17. Are measured dry-weight contaminant concentrations reported?

Yes	Not Applicable	
No		(EXPLAIN)

18. Please provide details for all of the "EXPLAIN" marked above. Include details on the specific analytes affected by any QA/QC discrepancies, and recommendations regarding usability of data.

Any items with “EXPLAIN” marked above are described immediately following the “EXPLAIN” marking in the corresponding item above.

The data are acceptable for use as qualified.

Data Validation Report
Lower Rouge River
Columbia Analytical Services
Laboratory Work Order #: K0904451

pH by SW-846 Method 9045C

CAS Work Order #: K0904454

QA/QC Analysis Checklist for Sediment Chemistry Analysis

GRANT/IAG NUMBER: Not Applicable
PROJECT NAME: Lower Rouge River
REVIEWER: Lisa Graczyk, WESTON START
DATE: August 20, 2009

1. What sediment chemistry data has been collected (CHECK ALL THAT APPLY)?

Total Metals _____	PCBs _____	pH __X___	TOC _____
Dioxins/Furans _____	PAHs _____	Pesticides _____	DO _____
AVS _____	SEM Metals ___	Particle Size ___	Other ___

2. Were the target detection limits met for each parameter?

Yes / Not Applicable / No _____ (EXPLAIN)

3. Were the method blanks less than the established MDL for each parameter?

Yes / Not Applicable / No _____ (EXPLAIN)

4. Did the results of Field Replicate Analysis vary by less than the % RPD specified in the QAPP?

Yes / Not Applicable / No _____ (EXPLAIN)

5. Did the results of the Field Duplicates Analysis vary by less than the % RPD specified in the QAPP?

Yes / Not Applicable / No _____ (EXPLAIN)

pH Checklist
Lower Rouge River
Columbia Analytical Services
Laboratory Work Order #: K0904454

6. Did the surrogate spike/internal standards recoveries meet the limits set forth in the QAPP?

Yes	Not Applicable	
No		(EXPLAIN)

7. Did the MS/MSD recoveries meet the limits set forth in the QAPP?

Yes	Not Applicable	
No		(EXPLAIN)

8. Did the RPD (%) of the MS/MSD sample set meet the limits set forth in the QAPP?

Yes	Not Applicable	
No		(EXPLAIN)

9. Did the LCS recoveries meet the limits set forth in the QAPP?

Yes	X	
No		(EXPLAIN)

10. Did the calibration verification standards (ICVs and CCVs) meet the requirements set forth in the QAPP?

Yes	Not Applicable	
No		(EXPLAIN)

pH Checklist
Lower Rouge River
Columbia Analytical Services
Laboratory Work Order #: K0904454

11. Did the calibration blanks (ICBs and CCBs) meet the limits set forth in the QAPP?

Yes	Not Applicable	
No		(EXPLAIN)

12. Did the interference check samples meet the limits set forth in the QAPP?

Yes	Not Applicable	
No		(EXPLAIN)

13. Did the serial dilution samples meet the limits set forth in the QAPP?

Yes	Not Applicable	
No		(EXPLAIN)

14. Were any level of contaminants detected above the MDL for the trip blanks and storage blanks?

Yes	Not Applicable	
No		(EXPLAIN)

Trip blanks and storage blanks are not applicable to this work order.

15. Did all required analyses take place within the required holding time protocols set forth in the QAPP?

Yes	X	
No		(EXPLAIN)

16. Did the laboratory duplicates vary by less than the % RPD specified in the QAPP?

Yes	X	
No		(EXPLAIN)

pH Checklist
Lower Rouge River
Columbia Analytical Services
Laboratory Work Order #: K0904454

17. Are measured dry-weight contaminant concentrations reported?

Yes	Not Applicable	
No		(EXPLAIN)

18. Please provide details for all of the "EXPLAIN" marked above. Include details on the specific analytes affected by any QA/QC discrepancies, and recommendations regarding usability of data.

Any items with “EXPLAIN” marked above are described immediately following the “EXPLAIN” marking in the corresponding item above.

The data are acceptable for use as qualified.

pH Checklist
Lower Rouge River
Columbia Analytical Services
Laboratory Work Order #: K0904454

ATTACHMENT B
ANALYTICAL DATA SUMMARY SHEETS

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-017-A-01 **Lab Report Batch :** K0810413 **Lab ID :** CAS_K

Sample Date : 10/21/2008 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0810413-001

Reviewed By / Date : LG 1/19/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 9045C					**Dilution: 1**															
pH	7.15		pH UNITS		YES	**J**		J												

Project Number and Name: **20405.016.008.0451.0 - Lower Rogue River** **Library Used:** **LRR**

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-WJB-A-01 **Lab Report Batch :** K0810413 **Lab ID :** CAS_K

Sample Date : 10/21/2008 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0810413-009

Reviewed By / Date : LG 1/19/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 9045C					**Dilution: 1**															
pH	7.32		pH UNITS		YES	**J**		J												

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-HS1-A-01 **Lab Report Batch :** K0810422 **Lab ID :** CAS_K

Sample Date : 10/21/2008 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0810422-001

Reviewed By / Date : LG 1/20/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 9045C					**Dilution: 1**															
pH	7.09		pH UNITS		YES	**J**		J												

Project Number and Name: **20405.016.008.0451.0 - Lower Rogue River** **Library Used:** **LRR**

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-HS5-A-01 **Lab Report Batch :** K0810423 **Lab ID :** CAS_K

Sample Date : 10/22/2008 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0810423-011

Reviewed By / Date : LG 1/20/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 9045C					**Dilution: 1**															
pH	7.10		pH UNITS		YES	**J**		J												

Project Number and Name: **20405.016.008.0451.0 - Lower Rogue River** **Library Used:** **LRR**

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-OF2-B-01 **Lab Report Batch :** K0810423 **Lab ID :** CAS_K

Sample Date : 10/22/2008 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0810423-001

Reviewed By / Date : LG 1/20/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 9045C					**Dilution: 1**															
pH	7.26		pH UNITS		YES	**J**		J												

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-HS4-B-01 **Lab Report Batch :** K0810463 **Lab ID :** CAS_K

Sample Date : 10/23/2008 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0810463-007

Reviewed By / Date : LG 1/28/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 9045C					**Dilution: 1**															
pH	7.61		pH UNITS		YES	**J**		J												

Project Number and Name: **20405.016.008.0451.0 - Lower Rogue River -** **Library Used:** **LRR**

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-OBC-B-01 **Lab Report Batch :** K0810465 **Lab ID :** CAS_K

Sample Date : 10/23/2008 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0810465-004

Reviewed By / Date : LG 1/29/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 9045C					**Dilution: 1**															
pH	7.83		pH UNITS		YES	**J**		J												

Project Number and Name: **20405.016.008.0451.0 - Lower Rogue River** **Library Used:** **LRR**

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-HS6-F-01 **Lab Report Batch :** K0904301 **Lab ID :** CAS_K

Sample Date : 05/12/2009 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0904301-005

Reviewed By / Date : LG 8/20/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 9045C					**Dilution: 1**															
pH	7.35		pH UNITS		YES															

Project Number and Name: **20405.016.008.0451.0 - Lower Rogue River** **Library Used:** **LRR**

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-HS6-DOWN2-01 **Lab Report Batch :** K0904356 **Lab ID :** CAS_K

Sample Date : 05/13/2009 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0904356-014

Reviewed By / Date : LG 8/20/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 9045C					**Dilution: 1**															
pH	7.30		pH UNITS		YES															

Project Number and Name: **20405.016.008.0451.0 - Lower Rogue River** **Library Used:** **LRR**

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-HS3-A-01 **Lab Report Batch :** K0904451 **Lab ID :** CAS_K

Sample Date : 05/16/2009 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0904451-002

Reviewed By / Date : LG 8/21/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 9045C					**Dilution: 1**															
pH	7.10		pH UNITS		YES															

Project Number and Name: **20405.016.008.0451.0 - Lower Rogue River** **Library Used:** **LRR**

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-HS3-A-01-FS
Lab Report Batch : K0904451
Lab ID : CAS_K
Sample Date : 05/16/2009
Analysis Type: 1RES
Sample Matrix : SED
Lab Sample ID: K0904451-004

Reviewed By / Date : LG 8/21/2009
Approved By / Date :

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 9045C					**Dilution: 1**															
pH	7.11		pH UNITS		YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-ZIC-C-01-TOX
Lab Report Batch : K0904454
Lab ID : CAS_K
Sample Date : 05/16/2009
Analysis Type: 1RES
Sample Matrix : SED
Lab Sample ID: K0904454-009

Reviewed By / Date : LG 8/20/2009
Approved By / Date :

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 9045C					**Dilution: 1**															
pH	7.17		pH UNITS		YES															

Project Number and Name: **20405.016.008.0451.0 - Lower Rogue River** **Library Used:** **LRR**

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Weston Solutions, Inc.
20 North Wacker Drive, Suite 1210
Chicago, IL 60606
(312) 424-3300 ● Fax: (312) 424-3330
www.westonsolutions.com

The Trusted Integrator for Sustainable Solutions

December 4, 2009

Ms. Diana Mally
Great Lakes National Program Office
United States Environmental Protection Agency, Region V
77 West Jackson Boulevard, Mail Code: G-17J
Chicago, Illinois 60604-3507

Re: Data Review of Total Organic Carbon (TOC) Analysis
For Sediment Samples Collected in October 2008 and May 2009
Lower Rouge River Sediment Investigation
Detroit, Wayne County, Michigan
Technical Direction Document Number: S05-0008-0805-012
Document Control Number: 451-2A-AEQA
Work Order Number: 20405.012.008.0451.00

Dear Ms. Mally:

The United States Environmental Protection Agency (U.S. EPA) tasked Weston Solutions, Inc., (WESTON®) to perform data validation for sediment samples collected from October 21, 2008, to May 16, 2009 for the Great Lakes National Program Office Lower Rouge River Sediment Investigation (LRR) Site. This data review is for TOC analysis of 39 sediment samples that include 2 field duplicate samples and 2 field replicate samples that were collected by the WESTON Superfund Technical Assessment and Response Team (START). The samples were validated in accordance with the "Quality Assurance Project Plan (QAPP), Lower Rouge River Sediment Investigation" dated October 17, 2008, which included using the U.S. EPA Contract Laboratory Program National Functional Guidance for Organic Data Review. Table 1 provides a summary of the samples included in this review. All tables are presented at the end of this report.

The samples listed in Table 1 were analyzed by Columbia Analytical Services (CAS) located in Kelso, Washington under the following 10 work orders:

- K0810413
- K0810422
- K0810423
- K0810463
- K0810465
- K0904268
- K0904301
- K0904356
- K0904451
- K0904454

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The samples were analyzed for TOC using U.S. EPA Method 9060M. Data validation was performed for each work order. CAS provided WESTON with a Staged Electronic Data Deliverable that was used in conjunction with the Automated Data Review (ADR) software to assist in reviewing the data.

Attachment A to this report contains the individual Quality Assurance/Quality Control (QA/QC) Analysis Checklist for Sediment Chemistry Analysis for each work order. Attachment B to this report contains a printed report from ADR that provides a summary of results with applied data qualifiers. The QC limits utilized were those stated in the QAPP. If there was not a QC limit specified in the QAPP, then the method or laboratory-determined QC limits were used. Below is a data review summary.

SUMMARY OF TOC DATA REVIEW

The holding times, method blanks, calibration standards, calibration blanks, laboratory duplicates, field replicates, field duplicates, matrix spike (MS) samples, and laboratory control samples (LCS) were all within the QC limits. All sample results were based on a dry weight for the TOC analyses.

Below is a review of the data quality indicators. All tables are included at the end of this report.

DATA QUALITY INDICATORS REVIEW

Many the data quality indicators (sensitivity, precision, accuracy, and completeness) were evaluated through the data validation procedures which are summarized above and discussed in detail in the attachment.

Sensitivity. The laboratory reporting limit of 0.05 percent TOC as stated in the QAPP was met for all samples.

Precision. Field precision was evaluated by evaluating the relative percent differences (RPD) between field replicate and field duplicate with the investigative sample result. There were two field replicates and two field duplicates associated with the 35 investigative samples collected for TOC analyses. The QAPP stated that field replicate and duplicate samples would be collected at a rate of 5 percent for TOC analysis. This frequency for field replicate and duplicate collection was met.

Tables 2 and 3 summarize the field replicate and duplicate results and calculated RPDs. The mean RPD for field replicates is 9 percent and the mean RPD for field duplicates is 30 percent. Field precision was evaluated and found to be acceptable.

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Laboratory precision was determined by evaluating the RPD values for laboratory duplicates. Table 4 summarizes the mean RPD for laboratory duplicates which is 2. The laboratory precision was acceptable for the TOC analyses.

Accuracy/Bias. Accuracy is a measure of the agreement between an observed value and an accepted reference value. Laboratory accuracy was evaluated by reviewing the QC criteria for percent recovery for MS and LCS results. Table 4 summarizes the accuracy estimates for the TOC analyses. The mean percent recovery for the MS samples was 94 percent and for the LCSs was 100 percent. All mean percent recoveries are within the QAPP specified QC limits. Laboratory accuracy was acceptable. The mean MS and LCS recoveries do not indicate either a low or high bias for the TOC analyses.

Completeness. Completeness is a measure of the amount of valid data obtained compared to the amount of data that was planned to be collected under normal conditions. All samples results were received.

In summary, all QC indicator samples that were analyzed were within control limits and no data qualifications were required.

If there are any questions or comments regarding this report, please do not hesitate to contact WESTON START at 312-424-3300.

Very truly yours,
Weston Solutions, Inc.

Lisa Graczyk
WESTON START Team

Tonya Balla
WESTON START Project Manager

Attachments:
Tables
A - Checklists for TOC Analytical Data
B - Analytical Data Summary Sheets with Qualifiers

cc: project file

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TABLES

TABLE 1 SAMPLES INCLUDED IN DATA REVIEW			
Sample ID	**Lab ID**	**Date Collected**	**Comment**
LRR-017-A-01	K0810413-001	10/21/2008	
LRR-017-A-02	K0810413-002	10/21/2008	
LRR-017-A-03	K0810413-003	10/21/2008	
LRR-017-A-04	K0810413-004	10/21/2008	
LRR-017-A-05	K0810413-005	10/21/2008	
LRR-OF2-A-01	K0810413-008	10/21/2008	
LRR-WJB-A-01	K0810413-009	10/21/2008	
LRR-WJB-A-02	K0810413-010	10/21/2008	
LRR-HS1-A-01	K0810422-001	10/21/2008	
LRR-HS1-A-02	K0810422-002	10/21/2008	
LRR-HSI-A-03	K0810422-003	10/21/2008	
LRR-HS1-A-04	K0810422-004	10/21/2008	
LRR-OF2-B-01	K0810423-001	10/22/2008	
LRR-OF2-B-02	K0810423-002	10/22/2008	
LRR-OF2-B-03	K0810423-003	10/22/2008	
LRR-OF2-B-04	K0810423-004	10/22/2008	
LRR-OF2-B-05	K0810423-005	10/22/2008	
LRR-HS5-A-01	K0810423-011	10/23/2008	
LRR-HS5-A-02	K0810423-012	10/23/2008	
LRR-HS5-A-02-FS	K0810423-013	10/23/2008	Field replicate of LRR-HS5-A-02
LRR-HS5-A-03	K0810423-014	10/23/2008	
LRR-HS4-B-01	K0810463-007	10/23/2008	
LRR-HS4-B-02	K0810463-008	10/23/2008	
LRR-HS4-B-03	K0810463-009	10/23/2008	
LRR-OBC-B-01	K0810465-004	10/23/2008	
LRR-OBC-B-02	K0810465-005	10/23/2008	
LRR-OBC-B-03	K0810465-006	10/23/2008	
LRR-HS6-B-01	K0904268-004	5/11/2009	
LRR-HS6-B-02	K0904268-005	5/11/2009	
LRR-HS6-B-03	K0904268-006	5/11/2009	
LRR-HS6-F-01	K0904301-005	5/12/2009	
LRR-HS6-F-01-DP	K0904301-006	5/12/2009	Field duplicate of LRR-HS6-F-01
LRR-HS6-DOWN2-01	K0904356-014	5/13/2009	
LRR-HS3-A-01	K0904451-002	5/16/2009	
LRR-HS3-A-01-FS	K0904451-004	5/16/2009	Field replicate of LRR-HS3-A-01
LRR-HS3-A-02	K0904451-005	5/16/2009	
LRR-HS3-A-02-DP	K0904451-006	5/16/2009	Field duplicate of LRR-HS3-A-02
LRR-HS3-A-03	K0904451-007	5/16/2009	
LRR-ZIC-C-01-TOX	K0904454-009	5/15/2009	

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TABLE 2 FIELD REPLICATE RESULTS						
	Sample: LRR-HS5-A-02-FS			Sample: LRR-HS3-A-01-FS		
Analyte	Sample Result (%)	Replicate Result (%)	RPD	Sample Result (%)	Replicate Result (%)	RPD
TOC	6.9	6.85	1	4.89	5.76	16

Notes:

RPD – Relative Percent Difference
TOC – Total Organic Carbon

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TABLE 3 FIELD DUPLICATE RESULTS						
	Sample: LRR-HS6-F-01-DP			Sample: LRR-HS3-A-03-DP		
Analyte	Sample Result (%)	Replicate Result (%)	RPD	Sample Result (%)	Replicate Result (%)	RPD
TOC	2.82	4.82	52	6.15	6.68	8

Notes:

RPD – Relative Percent Difference
TOC – Total Organic Carbon

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TABLE 4 QUANTITATIVE DATA ASSESSMENT FOR TOTAL ORGANIC CARBON			
	Analytical Precision	**Analytical Accuracy/Bias**	
Parameter	**Mean Laboratory Duplicate RPD (%) (n=3)**	**Mean MS Recovery (%) (n=3)**	**Mean LCS Recovery (%) (n=4)**
Total Organic Carbon	2	94	100

Notes:

LCS – Laboratory Control Sample
MS – Matrix Spike
RPD – Relative Percent Difference

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ATTACHMENT A
CHECKLISTS FOR TOC ANALYTICAL DATA

Total Organic Carbon (TOC) by 9060M

CAS Work Order #: K0810413

QA/QC Analysis Checklist for Sediment Chemistry Analysis

GRANT/IAG NUMBER: Not Applicable
PROJECT NAME: Lower Rouge River
REVIEWER: Lisa Graczyk, WESTON START
DATE: January 15, 2009

1. What sediment chemistry data has been collected (CHECK ALL THAT APPLY)?

Total Metals _____	PCBs _____	pH _____	TOC ___X__
Dioxins/Furans _____	PAHs _____	Pesticides _____	DO _____
AVS _____	SEM Metals ___	Particle Size ___	Other ___

2. Were the target detection limits met for each parameter?

Yes	X	
No	_____	(EXPLAIN)

3. Were the method blanks less than the established MDL for each parameter?

Yes	X	
No	_____	(EXPLAIN)

4. Did the results of Field Replicate Analysis vary by less than the % RPD specified in the QAPP?

Yes	Not Applicable	
No	_____	(EXPLAIN)

5. Did the results of the Field Duplicates Analysis vary by less than the % RPD specified in the QAPP?

Yes	Not Applicable	
No		(EXPLAIN)

6. Did the surrogate spike/internal standards recoveries meet the limits set forth in the QAPP?

Yes	Not Applicable	
No		(EXPLAIN)

7. Did the MS/MSD recoveries meet the limits set forth in the QAPP?

Yes	X	
No		(EXPLAIN)

8. Did the RPD (%) of the MS/MSD sample set meet the limits set forth in the QAPP?

Yes	Not Applicable	
No		(EXPLAIN)

9. Did the LCS recoveries meet the limits set forth in the QAPP?

Yes	X	
No		(EXPLAIN)

TOC Checklist
Lower Rouge River
Columbia Analytical Services
Laboratory Work Order #: K0810413

10. Did the calibration verification standards (ICVs and CCVs) meet the requirements set forth in the QAPP?

Yes	X	
No		(EXPLAIN)

11. Did the calibration blanks (ICBs and CCBs) meet the limits set forth in the QAPP?

Yes	X	
No		(EXPLAIN)

12. Did the interference check samples meet the limits set forth in the QAPP?

Yes	Not Applicable	
No		(EXPLAIN)

13. Did the serial dilution samples meet the limits set forth in the QAPP?

Yes	Not Applicable	
No		(EXPLAIN)

14. Were any level of contaminants detected above the MDL for the trip blanks and storage blanks?

Yes	Not Applicable	
No		(EXPLAIN)

Trip blanks and storage blanks are not applicable to this work order.

TOC Checklist
Lower Rouge River
Columbia Analytical Services
Laboratory Work Order #: K0810413

15. Did all required analyses take place within the required holding time protocols set forth in the QAPP?

Yes	X	
No		(EXPLAIN)

16. Did the laboratory duplicates vary by less than the % RPD specified in the QAPP?

Yes	X	
No		(EXPLAIN)

17. Are measured dry-weight contaminant concentrations reported?

Yes	X	
No		(EXPLAIN)

18. Please provide details for all of the "EXPLAIN" marked above. Include details on the specific analytes affected by any QA/QC discrepancies, and recommendations regarding usability of data.

Any items with “EXPLAIN” marked above are described immediately following the “EXPLAIN” marking in the corresponding item above.

The data are acceptable for use as qualified.

Total Organic Carbon (TOC) by 9060M

CAS Work Order #: K0810422

QA/QC Analysis Checklist for Sediment Chemistry Analysis

GRANT/IAG NUMBER: Not Applicable
PROJECT NAME: Lower Rouge River
REVIEWER: Lisa Graczyk, WESTON START
DATE: January 19, 2009

1. What sediment chemistry data has been collected (CHECK ALL THAT APPLY)?

Total Metals _____	PCBs _____	pH _____	TOC ___X__
Dioxins/Furans _____	PAHs _____	Pesticides _____	DO _____
AVS _____	SEM Metals ___	Particle Size ___	Other ___

2. Were the target detection limits met for each parameter?

Yes X
No _____ (EXPLAIN)

3. Were the method blanks less than the established MDL for each parameter?

Yes X
No _____ (EXPLAIN)

4. Did the results of Field Replicate Analysis vary by less than the % RPD specified in the QAPP?

Yes Not Applicable
No _____ (EXPLAIN)

5. Did the results of the Field Duplicates Analysis vary by less than the % RPD specified in the QAPP?

Yes Not Applicable
No _____ (EXPLAIN)

6. Did the surrogate spike/internal standards recoveries meet the limits set forth in the QAPP?

Yes	Not Applicable	
No		(EXPLAIN)

7. Did the MS/MSD recoveries meet the limits set forth in the QAPP?

Yes	X	
No		(EXPLAIN)

8. Did the RPD (%) of the MS/MSD sample set meet the limits set forth in the QAPP?

Yes	Not Applicable	
No		(EXPLAIN)

9. Did the LCS recoveries meet the limits set forth in the QAPP?

Yes	X	
No		(EXPLAIN)

10. Did the calibration verification standards (ICVs and CCVs) meet the requirements set forth in the QAPP?

Yes	X	
No		(EXPLAIN)

11. Did the calibration blanks (ICBs and CCBs) meet the limits set forth in the QAPP?

Yes	X	
No		(EXPLAIN)

12. Did the interference check samples meet the limits set forth in the QAPP?

Yes	Not Applicable	
No		(EXPLAIN)

13. Did the serial dilution samples meet the limits set forth in the QAPP?

Yes	Not Applicable	
No		(EXPLAIN)

14. Were any level of contaminants detected above the MDL for the trip blanks and storage blanks?

Yes	Not Applicable	
No		(EXPLAIN)

Trip blanks and storage blanks are not applicable to this work order.

15. Did all required analyses take place within the required holding time protocols set forth in the QAPP?

Yes	X	
No		(EXPLAIN)

16. Did the laboratory duplicates vary by less than the % RPD specified in the QAPP?

Yes	X	
No		(EXPLAIN)

17. Are measured dry-weight contaminant concentrations reported?

Yes	X	
No		(EXPLAIN)

TOC Checklist
Lower Rouge River
Columbia Analytical Services
Laboratory Work Order #: K0810422

18. Please provide details for all of the "EXPLAIN" marked above. Include details on the specific analytes affected by any QA/QC discrepancies, and recommendations regarding usability of data.

Any items with “EXPLAIN” marked above are described immediately following the “EXPLAIN” marking in the corresponding item above.

The data are acceptable for use as qualified.

TOC Checklist
Lower Rouge River
Columbia Analytical Services
Laboratory Work Order #: K0810422

Total Organic Carbon (TOC) by 9060M

CAS Work Order #: K0810423

QA/QC Analysis Checklist for Sediment Chemistry Analysis

GRANT/IAG NUMBER: Not Applicable
PROJECT NAME: Lower Rouge River
REVIEWER: Lisa Graczyk, WESTON START
DATE: January 20, 2009

1. What sediment chemistry data has been collected (CHECK ALL THAT APPLY)?

Total Metals _____	PCBs _____	pH _____	TOC ___X__
Dioxins/Furans _____	PAHs _____	Pesticides _____	DO _____
AVS _____	SEM Metals ___	Particle Size ___	Other ___

2. Were the target detection limits met for each parameter?

Yes X
No _____ (EXPLAIN)

3. Were the method blanks less than the established MDL for each parameter?

Yes X
No _____ (EXPLAIN)

4. Did the results of Field Replicate Analysis vary by less than the % RPD specified in the QAPP?

Yes X
No _____ (EXPLAIN)

There is one field replicate associated with this work order (identified with a "FS" suffix) for the general chemistry parameters. The field replicate results and investigative sample results were within a standard quality control (QC) limit of 50 RPD or less.

5. Did the results of the Field Duplicates Analysis vary by less than the % RPD specified in the QAPP?

Yes	Not Applicable	
No		(EXPLAIN)

6. Did the surrogate spike/internal standards recoveries meet the limits set forth in the QAPP?

Yes	Not Applicable	
No		(EXPLAIN)

7. Did the MS/MSD recoveries meet the limits set forth in the QAPP?

Yes	X	
No		(EXPLAIN)

8. Did the RPD (%) of the MS/MSD sample set meet the limits set forth in the QAPP?

Yes	Not Applicable	
No		(EXPLAIN)

9. Did the LCS recoveries meet the limits set forth in the QAPP?

Yes	X	
No		(EXPLAIN)

10. Did the calibration verification standards (ICVs and CCVs) meet the requirements set forth in the QAPP?

Yes	X	
No		(EXPLAIN)

TOC Checklist
Lower Rouge River
Columbia Analytical Services
Laboratory Work Order #: K0810423

11. Did the calibration blanks (ICBs and CCBs) meet the limits set forth in the QAPP?

Yes	X	
No		(EXPLAIN)

12. Did the interference check samples meet the limits set forth in the QAPP?

Yes	Not Applicable	
No		(EXPLAIN)

13. Did the serial dilution samples meet the limits set forth in the QAPP?

Yes	Not Applicable	
No		(EXPLAIN)

14. Were any level of contaminants detected above the MDL for the trip blanks and storage blanks?

Yes	Not Applicable	
No		(EXPLAIN)

Trip blanks and storage blanks are not applicable to this work order.

15. Did all required analyses take place within the required holding time protocols set forth in the QAPP?

Yes	X	
No		(EXPLAIN)

16. Did the laboratory duplicates vary by less than the % RPD specified in the QAPP?

Yes	X	
No		(EXPLAIN)

TOC Checklist
Lower Rouge River
Columbia Analytical Services
Laboratory Work Order #: K0810423

17. Are measured dry-weight contaminant concentrations reported?

Yes	X	
No		(EXPLAIN)

18. Please provide details for all of the "EXPLAIN" marked above. Include details on the specific analytes affected by any QA/QC discrepancies, and recommendations regarding usability of data.

Any items with “EXPLAIN” marked above are described immediately following the “EXPLAIN” marking in the corresponding item above.

The data are acceptable for use as qualified.

TOC Checklist
Lower Rouge River
Columbia Analytical Services
Laboratory Work Order #: K0810423

Total Organic Carbon (TOC) by 9060M

CAS Work Order #: K0810463

QA/QC Analysis Checklist for Sediment Chemistry Analysis

GRANT/IAG NUMBER: Not Applicable
PROJECT NAME: Lower Rouge River
REVIEWER: Lisa Graczyk, WESTON START
DATE: January 28, 2009

1. What sediment chemistry data has been collected (CHECK ALL THAT APPLY)?

Total Metals _____	PCBs _____	pH _____	TOC ___X__
Dioxins/Furans _____	PAHs _____	Pesticides _____	DO _____
AVS _____	SEM Metals ___	Particle Size ___	Other ___

2. Were the target detection limits met for each parameter?

Yes X
No _____ (EXPLAIN)

3. Were the method blanks less than the established MDL for each parameter?

Yes X
No _____ (EXPLAIN)

4. Did the results of Field Replicate Analysis vary by less than the % RPD specified in the QAPP?

Yes Not Applicable
No _____ (EXPLAIN)

5. Did the results of the Field Duplicates Analysis vary by less than the % RPD specified in the QAPP?

Yes Not Applicable
No _____ (EXPLAIN)

6. Did the surrogate spike/internal standards recoveries meet the limits set forth in the QAPP?

Yes	Not Applicable	
No		(EXPLAIN)

7. Did the MS/MSD recoveries meet the limits set forth in the QAPP?

Yes	X	
No		(EXPLAIN)

8. Did the RPD (%) of the MS/MSD sample set meet the limits set forth in the QAPP?

Yes	Not Applicable	
No		(EXPLAIN)

9. Did the LCS recoveries meet the limits set forth in the QAPP?

Yes	X	
No		(EXPLAIN)

10. Did the calibration verification standards (ICVs and CCVs) meet the requirements set forth in the QAPP?

Yes	X	
No		(EXPLAIN)

11. Did the calibration blanks (ICBs and CCBs) meet the limits set forth in the QAPP?

Yes	X	
No		(EXPLAIN)

12. Did the interference check samples meet the limits set forth in the QAPP?

Yes	Not Applicable	
No		(EXPLAIN)

13. Did the serial dilution samples meet the limits set forth in the QAPP?

Yes	Not Applicable	
No		(EXPLAIN)

14. Were any level of contaminants detected above the MDL for the trip blanks and storage blanks?

Yes	Not Applicable	
No		(EXPLAIN)

Trip blanks and storage blanks are not applicable to this work order.

15. Did all required analyses take place within the required holding time protocols set forth in the QAPP?

Yes	X	
No		(EXPLAIN)

16. Did the laboratory duplicates vary by less than the % RPD specified in the QAPP?

Yes	X	
No		(EXPLAIN)

17. Are measured dry-weight contaminant concentrations reported?

Yes	X	
No		(EXPLAIN)

18. Please provide details for all of the "EXPLAIN" marked above. Include details on the specific analytes affected by any QA/QC discrepancies, and recommendations regarding usability of data.

Any items with “EXPLAIN” marked above are described immediately following the “EXPLAIN” marking in the corresponding item above.

The data are acceptable for use as qualified.

TOC Checklist
Lower Rouge River
Columbia Analytical Services
Laboratory Work Order #: K0810463

Total Organic Carbon (TOC) by 9060M

CAS Work Order #: K0810465

QA/QC Analysis Checklist for Sediment Chemistry Analysis

GRANT/IAG NUMBER: Not Applicable
PROJECT NAME: Lower Rouge River
REVIEWER: Lisa Graczyk, WESTON START
DATE: January 29, 2009

1. What sediment chemistry data has been collected (CHECK ALL THAT APPLY)?

Total Metals _____	PCBs _____	pH _____	TOC ___X__
Dioxins/Furans _____	PAHs _____	Pesticides _____	DO _____
AVS _____	SEM Metals ___	Particle Size ___	Other ___

2. Were the target detection limits met for each parameter?

Yes	X	
No	_____	(EXPLAIN)

3. Were the method blanks less than the established MDL for each parameter?

Yes	X	
No	_____	(EXPLAIN)

4. Did the results of Field Replicate Analysis vary by less than the % RPD specified in the QAPP?

Yes	Not Applicable	
No	_____	(EXPLAIN)

5. Did the results of the Field Duplicates Analysis vary by less than the % RPD specified in the QAPP?

Yes	Not Applicable	
No	_____	(EXPLAIN)

6. Did the surrogate spike/internal standards recoveries meet the limits set forth in the QAPP?

Yes	Not Applicable	
No		(EXPLAIN)

7. Did the MS/MSD recoveries meet the limits set forth in the QAPP?

Yes	X	
No		(EXPLAIN)

8. Did the RPD (%) of the MS/MSD sample set meet the limits set forth in the QAPP?

Yes	Not Applicable	
No		(EXPLAIN)

9. Did the LCS recoveries meet the limits set forth in the QAPP?

Yes	X	
No		(EXPLAIN)

10. Did the calibration verification standards (ICVs and CCVs) meet the requirements set forth in the QAPP?

Yes	X	
No		(EXPLAIN)

11. Did the calibration blanks (ICBs and CCBs) meet the limits set forth in the QAPP?

Yes	X	
No		(EXPLAIN)

12. Did the interference check samples meet the limits set forth in the QAPP?

Yes	Not Applicable	
No		(EXPLAIN)

13. Did the serial dilution samples meet the limits set forth in the QAPP?

Yes	Not Applicable	
No		(EXPLAIN)

14. Were any level of contaminants detected above the MDL for the trip blanks and storage blanks?

Yes	Not Applicable	
No		(EXPLAIN)

Trip blanks and storage blanks are not applicable to this work order.

15. Did all required analyses take place within the required holding time protocols set forth in the QAPP?

Yes	X	
No		(EXPLAIN)

16. Did the laboratory duplicates vary by less than the % RPD specified in the QAPP?

Yes	X	
No		(EXPLAIN)

17. Are measured dry-weight contaminant concentrations reported?

Yes	X	
No		(EXPLAIN)

TOC Checklist
Lower Rouge River
Columbia Analytical Services
Laboratory Work Order #: K0810465

18. Please provide details for all of the "EXPLAIN" marked above. Include details on the specific analytes affected by any QA/QC discrepancies, and recommendations regarding usability of data.

Any items with “EXPLAIN” marked above are described immediately following the “EXPLAIN” marking in the corresponding item above.

The data are acceptable for use as qualified.

TOC Checklist
Lower Rouge River
Columbia Analytical Services
Laboratory Work Order #: K0810465

Total Organic Carbon (TOC) by 9060M

CAS Work Order #: K0904268

QA/QC Analysis Checklist for Sediment Chemistry Analysis

GRANT/IAG NUMBER: Not Applicable
PROJECT NAME: Lower Rouge River
REVIEWER: Lisa Graczyk, WESTON START
DATE: August 18, 2009

1. What sediment chemistry data has been collected (CHECK ALL THAT APPLY)?

Total Metals _____	PCBs _____	pH _____	TOC ___X__
Dioxins/Furans _____	PAHs _____	Pesticides _____	DO _____
AVS _____	SEM Metals ___	Particle Size ___	Other __

2. Were the target detection limits met for each parameter?

Yes	X	
No	_____	(EXPLAIN)

3. Were the method blanks less than the established MDL for each parameter?

Yes	X	
No	_____	(EXPLAIN)

4. Did the results of Field Replicate Analysis vary by less than the % RPD specified in the QAPP?

Yes	Not Applicable	
No	_____	(EXPLAIN)

5. Did the results of the Field Duplicates Analysis vary by less than the % RPD specified in the QAPP?

Yes	Not Applicable	
No	_____	(EXPLAIN)

6. Did the surrogate spike/internal standards recoveries meet the limits set forth in the QAPP?

Yes	Not Applicable	
No		(EXPLAIN)

7. Did the MS/MSD recoveries meet the limits set forth in the QAPP?

Yes	X	
No		(EXPLAIN)

8. Did the RPD (%) of the MS/MSD sample set meet the limits set forth in the QAPP?

Yes	Not Applicable	
No		(EXPLAIN)

9. Did the LCS recoveries meet the limits set forth in the QAPP?

Yes	X	
No		(EXPLAIN)

10. Did the calibration verification standards (ICVs and CCVs) meet the requirements set forth in the QAPP?

Yes	X	
No		(EXPLAIN)

11. Did the calibration blanks (ICBs and CCBs) meet the limits set forth in the QAPP?

Yes	X	
No		(EXPLAIN)

12. Did the interference check samples meet the limits set forth in the QAPP?

Yes	Not Applicable	
No		(EXPLAIN)

13. Did the serial dilution samples meet the limits set forth in the QAPP?

Yes	Not Applicable	
No		(EXPLAIN)

14. Were any level of contaminants detected above the MDL for the trip blanks and storage blanks?

Yes	Not Applicable	
No		(EXPLAIN)

Trip blanks and storage blanks are not applicable to this work order.

15. Did all required analyses take place within the required holding time protocols set forth in the QAPP?

Yes	X	
No		(EXPLAIN)

16. Did the laboratory duplicates vary by less than the % RPD specified in the QAPP?

Yes	X	
No		(EXPLAIN)

17. Are measured dry-weight contaminant concentrations reported?

Yes	X	
No		(EXPLAIN)

18. Please provide details for all of the "EXPLAIN" marked above. Include details on the specific analytes affected by any QA/QC discrepancies, and recommendations regarding usability of data.

Any items with “EXPLAIN” marked above are described immediately following the “EXPLAIN” marking in the corresponding item above.

The data are acceptable for use as qualified.

TOC Checklist
Lower Rouge River
Columbia Analytical Services
Laboratory Work Order #: K0904268

Total Organic Carbon (TOC) by 9060M

CAS Work Order #: K0904301

QA/QC Analysis Checklist for Sediment Chemistry Analysis

GRANT/IAG NUMBER: Not Applicable
PROJECT NAME: Lower Rouge River
REVIEWER: Lisa Graczyk, WESTON START
DATE: August 20, 2009

1. What sediment chemistry data has been collected (CHECK ALL THAT APPLY)?

Total Metals _____	PCBs _____	pH _____	TOC ___X__
Dioxins/Furans _____	PAHs _____	Pesticides _____	DO _____
AVS _____	SEM Metals ___	Particle Size ___	Other ___

2. Were the target detection limits met for each parameter?

Yes X
No _____ (EXPLAIN)

3. Were the method blanks less than the established MDL for each parameter?

Yes X
No _____ (EXPLAIN)

4. Did the results of Field Replicate Analysis vary by less than the % RPD specified in the QAPP?

Yes Not Applicable
No _____ (EXPLAIN)

5. Did the results of the Field Duplicates Analysis vary by less than the % RPD specified in the QAPP?

Yes X
No _____ (EXPLAIN)

6. Did the surrogate spike/internal standards recoveries meet the limits set forth in the QAPP?

Yes	Not Applicable	
No		(EXPLAIN)

7. Did the MS/MSD recoveries meet the limits set forth in the QAPP?

Yes	Not Applicable	
No		(EXPLAIN)

8. Did the RPD (%) of the MS/MSD sample set meet the limits set forth in the QAPP?

Yes	Not Applicable	
No		(EXPLAIN)

9. Did the LCS recoveries meet the limits set forth in the QAPP?

Yes	X	
No		(EXPLAIN)

10. Did the calibration verification standards (ICVs and CCVs) meet the requirements set forth in the QAPP?

Yes	X	
No		(EXPLAIN)

11. Did the calibration blanks (ICBs and CCBs) meet the limits set forth in the QAPP?

Yes	X	
No		(EXPLAIN)

12. Did the interference check samples meet the limits set forth in the QAPP?

Yes	Not Applicable	
No		(EXPLAIN)

13. Did the serial dilution samples meet the limits set forth in the QAPP?

Yes	Not Applicable	
No		(EXPLAIN)

14. Were any level of contaminants detected above the MDL for the trip blanks and storage blanks?

Yes	Not Applicable	
No		(EXPLAIN)

Trip blanks and storage blanks are not applicable to this work order.

15. Did all required analyses take place within the required holding time protocols set forth in the QAPP?

Yes	X	
No		(EXPLAIN)

16. Did the laboratory duplicates vary by less than the % RPD specified in the QAPP?

Yes	X	
No		(EXPLAIN)

17. Are measured dry-weight contaminant concentrations reported?

Yes	X	
No		(EXPLAIN)

TOC Checklist
Lower Rouge River
Columbia Analytical Services
Laboratory Work Order #: K0904301

18. Please provide details for all of the "EXPLAIN" marked above. Include details on the specific analytes affected by any QA/QC discrepancies, and recommendations regarding usability of data.

Any items with “EXPLAIN” marked above are described immediately following the “EXPLAIN” marking in the corresponding item above.

The data are acceptable for use as qualified.

TOC Checklist
Lower Rouge River
Columbia Analytical Services
Laboratory Work Order #: K0904301

Total Organic Carbon (TOC) by 9060M

CAS Work Order #: K0904356

QA/QC Analysis Checklist for Sediment Chemistry Analysis

GRANT/IAG NUMBER: Not Applicable
PROJECT NAME: Lower Rouge River
REVIEWER: Lisa Graczyk, WESTON START
DATE: August 20, 2009

1. What sediment chemistry data has been collected (CHECK ALL THAT APPLY)?

Total Metals _____	PCBs _____	pH _____	TOC ___X__
Dioxins/Furans _____	PAHs _____	Pesticides _____	DO _____
AVS _____	SEM Metals ___	Particle Size ___	Other ___

2. Were the target detection limits met for each parameter?

Yes	X	
No		(EXPLAIN)

3. Were the method blanks less than the established MDL for each parameter?

Yes	X	
No		(EXPLAIN)

4. Did the results of Field Replicate Analysis vary by less than the % RPD specified in the QAPP?

Yes	Not Applicable	
No		(EXPLAIN)

5. Did the results of the Field Duplicates Analysis vary by less than the % RPD specified in the QAPP?

Yes	Not Applicable	
No		(EXPLAIN)

6. Did the surrogate spike/internal standards recoveries meet the limits set forth in the QAPP?

Yes	Not Applicable	
No		(EXPLAIN)

7. Did the MS/MSD recoveries meet the limits set forth in the QAPP?

Yes	Not Applicable	
No		(EXPLAIN)

8. Did the RPD (%) of the MS/MSD sample set meet the limits set forth in the QAPP?

Yes	Not Applicable	
No		(EXPLAIN)

9. Did the LCS recoveries meet the limits set forth in the QAPP?

Yes	X	
No		(EXPLAIN)

10. Did the calibration verification standards (ICVs and CCVs) meet the requirements set forth in the QAPP?

Yes	X	
No		(EXPLAIN)

11. Did the calibration blanks (ICBs and CCBs) meet the limits set forth in the QAPP?

Yes	X	
No		(EXPLAIN)

12. Did the interference check samples meet the limits set forth in the QAPP?

Yes	Not Applicable	
No		(EXPLAIN)

13. Did the serial dilution samples meet the limits set forth in the QAPP?

Yes	Not Applicable	
No		(EXPLAIN)

14. Were any level of contaminants detected above the MDL for the trip blanks and storage blanks?

Yes	Not Applicable	
No		(EXPLAIN)

Trip blanks and storage blanks are not applicable to this work order.

15. Did all required analyses take place within the required holding time protocols set forth in the QAPP?

Yes	X	
No		(EXPLAIN)

16. Did the laboratory duplicates vary by less than the % RPD specified in the QAPP?

Yes	X	
No		(EXPLAIN)

17. Are measured dry-weight contaminant concentrations reported?

Yes	X	
No		(EXPLAIN)

TOC Checklist
Lower Rouge River
Columbia Analytical Services
Laboratory Work Order #: K0904356

18. Please provide details for all of the "EXPLAIN" marked above. Include details on the specific analytes affected by any QA/QC discrepancies, and recommendations regarding usability of data.

Any items with “EXPLAIN” marked above are described immediately following the “EXPLAIN” marking in the corresponding item above.

The data are acceptable for use as qualified.

TOC Checklist
Lower Rouge River
Columbia Analytical Services
Laboratory Work Order #: K0904356

Total Organic Carbon (TOC) by 9060M

CAS Work Order #: K0904451

QA/QC Analysis Checklist for Sediment Chemistry Analysis

GRANT/IAG NUMBER: Not Applicable
PROJECT NAME: Lower Rouge River
REVIEWER: Lisa Graczyk, WESTON START
DATE: August 21, 2009

1. What sediment chemistry data has been collected (CHECK ALL THAT APPLY)?

Total Metals _____	PCBs _____	pH _____	TOC ___X__
Dioxins/Furans _____	PAHs _____	Pesticides _____	DO _____
AVS _____	SEM Metals ___	Particle Size ___	Other ___

2. Were the target detection limits met for each parameter?

Yes X
No _____ (EXPLAIN)

3. Were the method blanks less than the established MDL for each parameter?

Yes X
No _____ (EXPLAIN)

4. Did the results of Field Replicate Analysis vary by less than the % RPD specified in the QAPP?

Yes X
No _____ (EXPLAIN)

5. Did the results of the Field Duplicates Analysis vary by less than the % RPD specified in the QAPP?

Yes X
No _____ (EXPLAIN)

6. Did the surrogate spike/internal standards recoveries meet the limits set forth in the QAPP?

Yes	Not Applicable	
No		(EXPLAIN)

7. Did the MS/MSD recoveries meet the limits set forth in the QAPP?

Yes	X	
No		(EXPLAIN)

8. Did the RPD (%) of the MS/MSD sample set meet the limits set forth in the QAPP?

Yes	Not Applicable	
No		(EXPLAIN)

9. Did the LCS recoveries meet the limits set forth in the QAPP?

Yes	X	
No		(EXPLAIN)

10. Did the calibration verification standards (ICVs and CCVs) meet the requirements set forth in the QAPP?

Yes	X	
No		(EXPLAIN)

11. Did the calibration blanks (ICBs and CCBs) meet the limits set forth in the QAPP?

Yes	X	
No		(EXPLAIN)

12. Did the interference check samples meet the limits set forth in the QAPP?

Yes	Not Applicable	
No		(EXPLAIN)

13. Did the serial dilution samples meet the limits set forth in the QAPP?

Yes	Not Applicable	
No		(EXPLAIN)

14. Were any level of contaminants detected above the MDL for the trip blanks and storage blanks?

Yes	Not Applicable	
No		(EXPLAIN)

Trip blanks and storage blanks are not applicable to this work order.

15. Did all required analyses take place within the required holding time protocols set forth in the QAPP?

Yes	X	
No		(EXPLAIN)

16. Did the laboratory duplicates vary by less than the % RPD specified in the QAPP?

Yes	X	
No		(EXPLAIN)

17. Are measured dry-weight contaminant concentrations reported?

Yes	X	
No		(EXPLAIN)

TOC Checklist
Lower Rouge River
Columbia Analytical Services
Laboratory Work Order #: K0904451

18. Please provide details for all of the "EXPLAIN" marked above. Include details on the specific analytes affected by any QA/QC discrepancies, and recommendations regarding usability of data.

Any items with “EXPLAIN” marked above are described immediately following the “EXPLAIN” marking in the corresponding item above.

The data are acceptable for use as qualified.

TOC Checklist
Lower Rouge River
Columbia Analytical Services
Laboratory Work Order #: K0904451

Total Organic Carbon (TOC) by 9060M

CAS Work Order #: K0904454

QA/QC Analysis Checklist for Sediment Chemistry Analysis

GRANT/IAG NUMBER: Not Applicable
PROJECT NAME: Lower Rouge River
REVIEWER: Lisa Graczyk, WESTON START
DATE: August 20, 2009

1. What sediment chemistry data has been collected (CHECK ALL THAT APPLY)?

Total Metals _____	PCBs _____	pH _____	TOC ___X__
Dioxins/Furans _____	PAHs _____	Pesticides _____	DO _____
AVS _____	SEM Metals ___	Particle Size ___	Other ___

2. Were the target detection limits met for each parameter?

Yes X
No _____ (EXPLAIN)

3. Were the method blanks less than the established MDL for each parameter?

Yes X
No _____ (EXPLAIN)

4. Did the results of Field Replicate Analysis vary by less than the % RPD specified in the QAPP?

Yes Not Applicable
No _____ (EXPLAIN)

5. Did the results of the Field Duplicates Analysis vary by less than the % RPD specified in the QAPP?

Yes Not Applicable
No _____ (EXPLAIN)

6. Did the surrogate spike/internal standards recoveries meet the limits set forth in the QAPP?

Yes	Not Applicable	
No		(EXPLAIN)

7. Did the MS/MSD recoveries meet the limits set forth in the QAPP?

Yes	X	
No		(EXPLAIN)

8. Did the RPD (%) of the MS/MSD sample set meet the limits set forth in the QAPP?

Yes	Not Applicable	
No		(EXPLAIN)

9. Did the LCS recoveries meet the limits set forth in the QAPP?

Yes	X	
No		(EXPLAIN)

10. Did the calibration verification standards (ICVs and CCVs) meet the requirements set forth in the QAPP?

Yes	X	
No		(EXPLAIN)

11. Did the calibration blanks (ICBs and CCBs) meet the limits set forth in the QAPP?

Yes	X	
No		(EXPLAIN)

12. Did the interference check samples meet the limits set forth in the QAPP?

Yes	Not Applicable	
No		(EXPLAIN)

13. Did the serial dilution samples meet the limits set forth in the QAPP?

Yes	Not Applicable	
No		(EXPLAIN)

14. Were any level of contaminants detected above the MDL for the trip blanks and storage blanks?

Yes	Not Applicable	
No		(EXPLAIN)

Trip blanks and storage blanks are not applicable to this work order.

15. Did all required analyses take place within the required holding time protocols set forth in the QAPP?

Yes	X	
No		(EXPLAIN)

16. Did the laboratory duplicates vary by less than the % RPD specified in the QAPP?

Yes	X	
No		(EXPLAIN)

17. Are measured dry-weight contaminant concentrations reported?

Yes	X	
No		(EXPLAIN)

18. Please provide details for all of the "EXPLAIN" marked above. Include details on the specific analytes affected by any QA/QC discrepancies, and recommendations regarding usability of data.

Any items with “EXPLAIN” marked above are described immediately following the “EXPLAIN” marking in the corresponding item above.

The data are acceptable for use as qualified.

TOC Checklist
Lower Rouge River
Columbia Analytical Services
Laboratory Work Order #: K0904454

ATTACHMENT B
ANALYTICAL DATA SUMMARY SHEETS WITH QUALIFIERS

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-017-A-01 **Lab Report Batch :** K0810413 **Lab ID :** CAS_K

Sample Date : 10/21/2008 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0810413-001

Reviewed By / Date : LG 1/19/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 9060M					**Dilution: 1**															
Carbon, Total Organic	24.9		%		YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-017-A-02 **Lab Report Batch :** K0810413 **Lab ID :** CAS_K

Sample Date : 10/21/2008 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0810413-002

Reviewed By / Date : LG 1/19/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 9060M					**Dilution: 1**															
Carbon, Total Organic	21.2		%		YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-017-A-03 **Lab Report Batch :** K0810413 **Lab ID :** CAS_K

Sample Date : 10/21/2008 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0810413-003

Reviewed By / Date : LG 1/19/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 9060M					**Dilution: 1**															
Carbon, Total Organic	23.5		%		YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-017-A-04 **Lab Report Batch :** K0810413 **Lab ID :** CAS_K

Sample Date : 10/21/2008 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0810413-004

Reviewed By / Date : LG 1/19/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 9060M					**Dilution: 1**															
Carbon, Total Organic	21.4		%		YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-017-A-05 **Lab Report Batch :** K0810413 **Lab ID :** CAS_K

Sample Date : 10/21/2008 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0810413-005

Reviewed By / Date : LG 1/19/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 9060M					**Dilution: 1**															
Carbon, Total Organic	19.9		%		YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-OF2-A-01 **Lab Report Batch :** K0810413 **Lab ID :** CAS_K

Sample Date : 10/21/2008 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0810413-008

Reviewed By / Date : LG 1/19/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 9060M					**Dilution: 1**															
Carbon, Total Organic	8.02		%		YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-WJB-A-01 **Lab Report Batch :** K0810413 **Lab ID :** CAS_K

Sample Date : 10/21/2008 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0810413-009

Reviewed By / Date : LG 1/19/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 9060M					**Dilution: 1**															
Carbon, Total Organic	3.95		%		YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-WJB-A-02 **Lab Report Batch :** K0810413 **Lab ID :** CAS_K

Sample Date : 10/21/2008 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0810413-010

Reviewed By / Date : LG 1/19/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 9060M					**Dilution: 1**															
Carbon, Total Organic	6.73		%		YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-HS1-A-01 **Lab Report Batch :** K0810422 **Lab ID :** CAS_K

Sample Date : 10/21/2008 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0810422-001

Reviewed By / Date : LG 1/20/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 9060M					**Dilution: 1**															
Carbon, Total Organic	5.79		%		YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-HS1-A-02 **Lab Report Batch :** K0810422 **Lab ID :** CAS_K

Sample Date : 10/21/2008 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0810422-002

Reviewed By / Date : LG 1/20/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 9060M					**Dilution: 1**															
Carbon, Total Organic	5.56		%		YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-HS1-A-03 **Lab Report Batch :** K0810422 **Lab ID :** CAS_K

Sample Date : 10/21/2008 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0810422-003

Reviewed By / Date : LG 1/20/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 9060M					**Dilution: 1**															
Carbon, Total Organic	6.93		%		YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-HS1-A-04 **Lab Report Batch :** K0810422 **Lab ID :** CAS_K

Sample Date : 10/21/2008 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0810422-004

Reviewed By / Date : LG 1/20/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 9060M					**Dilution: 1**															
Carbon, Total Organic	9.66		%		YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-HS5-A-01 **Lab Report Batch :** K0810423 **Lab ID :** CAS_K

Sample Date : 10/22/2008 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0810423-011

Reviewed By / Date : LG 1/20/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 9060M					**Dilution: 1**															
Carbon, Total Organic	6.78		%		YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-HS5-A-02 **Lab Report Batch :** K0810423 **Lab ID :** CAS_K

Sample Date : 10/23/2008 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0810423-012

Reviewed By / Date : LG 1/20/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 9060M					**Dilution: 1**															
Carbon, Total Organic	6.90		%		YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-HS5-A-02-FS
Lab Report Batch : K0810423
Lab ID : CAS_K
Sample Date : 10/23/2008
Analysis Type: 1RES
Sample Matrix : SED
Lab Sample ID: K0810423-013

Reviewed By / Date : LG 1/20/2009
Approved By / Date :

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 9060M					**Dilution: 1**															
Carbon, Total Organic	6.86		%		YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-HS5-A-03 **Lab Report Batch :** K0810423 **Lab ID :** CAS_K

Sample Date : 10/23/2008 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0810423-014

Reviewed By / Date : LG 1/20/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 9060M					**Dilution: 1**															
Carbon, Total Organic	7.03		%		YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-OF2-B-01 **Lab Report Batch :** K0810423 **Lab ID :** CAS_K

Sample Date : 10/22/2008 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0810423-001

Reviewed By / Date : LG 1/20/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 9060M					**Dilution: 1**															
Carbon, Total Organic	8.68		%		YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-OF2-B-02 **Lab Report Batch :** K0810423 **Lab ID :** CAS_K

Sample Date : 10/22/2008 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0810423-002

Reviewed By / Date : LG 1/20/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 9060M					**Dilution: 1**															
Carbon, Total Organic	6.41		%		YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-OF2-B-03 **Lab Report Batch :** K0810423 **Lab ID :** CAS_K

Sample Date : 10/22/2008 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0810423-003

Reviewed By / Date : LG 1/20/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 9060M					**Dilution: 1**															
Carbon, Total Organic	6.92		%		YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-OF2-B-04 **Lab Report Batch :** K0810423 **Lab ID :** CAS_K

Sample Date : 10/22/2008 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0810423-004

Reviewed By / Date : LG 1/20/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 9060M					**Dilution: 1**															
Carbon, Total Organic	6.88		%		YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-OF2-B-05 **Lab Report Batch :** K0810423 **Lab ID :** CAS_K

Sample Date : 10/22/2008 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0810423-005

Reviewed By / Date : LG 1/20/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 9060M					**Dilution: 1**															
Carbon, Total Organic	7.67		%		YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-HS4-B-01 **Lab Report Batch :** K0810463 **Lab ID :** CAS_K

Sample Date : 10/23/2008 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0810463-007

Reviewed By / Date : LG 1/28/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 9060M					**Dilution: 1**															
Carbon, Total Organic	5.75		%		YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-HS4-B-02 **Lab Report Batch :** K0810463 **Lab ID :** CAS_K

Sample Date : 10/23/2008 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0810463-008

Reviewed By / Date : LG 1/28/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 9060M					**Dilution: 1**															
Carbon, Total Organic	5.89		%		YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-HS4-B-03 **Lab Report Batch :** K0810463 **Lab ID :** CAS_K

Sample Date : 10/23/2008 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0810463-009

Reviewed By / Date : LG 1/28/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 9060M					**Dilution: 1**															
Carbon, Total Organic	2.67		%		YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-OBC-B-01 **Lab Report Batch :** K0810465 **Lab ID :** CAS_K

Sample Date : 10/23/2008 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0810465-004

Reviewed By / Date : LG 1/29/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 9060M					**Dilution: 1**															
Carbon, Total Organic	7.15		%		YES															

Project Number and Name: **20405.016.008.0451.0 - Lower Rogue River** **Library Used:** **LRR**

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-OBC-B-02 **Lab Report Batch :** K0810465 **Lab ID :** CAS_K

Sample Date : 10/23/2008 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0810465-005

Reviewed By / Date : LG 1/29/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 9060M					**Dilution: 1**															
Carbon, Total Organic	7.80		%		YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-OBC-B-03 **Lab Report Batch :** K0810465 **Lab ID :** CAS_K

Sample Date : 10/23/2008 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0810465-006

Reviewed By / Date : LG 1/29/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 9060M					**Dilution: 1**															
Carbon, Total Organic	7.28		%		YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-HS6-B-01 **Lab Report Batch :** K0904268 **Lab ID :** CAS_K

Sample Date : 05/11/2009 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0904268-004

Reviewed By / Date : LG 8/18/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 9060M					**Dilution: 1**															
Carbon, Total Organic	5.97		%		YES															

Project Number and Name: **20405.016.008.0451.0 - Lower Rogue River -** **Library Used:** **LRR**

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-HS6-B-02 **Lab Report Batch :** K0904268 **Lab ID :** CAS_K

Sample Date : 05/11/2009 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0904268-005

Reviewed By / Date : LG 8/18/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 9060M					**Dilution: 1**															
Carbon, Total Organic	4.88		%		YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-HS6-B-03 **Lab Report Batch :** K0904268 **Lab ID :** CAS_K

Sample Date : 05/11/2009 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0904268-006

Reviewed By / Date : LG 8/18/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 9060M					**Dilution: 1**															
Carbon, Total Organic	0.66		%		YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-HS6-F-01 **Lab Report Batch :** K0904301 **Lab ID :** CAS_K

Sample Date : 05/12/2009 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0904301-005

Reviewed By / Date : LG 8/20/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 9060M					**Dilution: 1**															
Carbon, Total Organic	2.82		%		YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-HS6-F-01-DP
Lab Report Batch : K0904301
Lab ID : CAS_K
Sample Date : 05/12/2009
Analysis Type: 1RES
Sample Matrix : SED
Lab Sample ID: K0904301-006

Reviewed By / Date : LG 8/20/2009
Approved By / Date :

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 9060M					**Dilution: 1**															
Carbon, Total Organic	4.82		%		YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-HS6-DOWN2-01 **Lab Report Batch :** K0904356 **Lab ID :** CAS_K

Sample Date : 05/13/2009 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0904356-014

Reviewed By / Date : LG 8/20/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 9060M					**Dilution: 1**															
Carbon, Total Organic	4.22		%		YES															

Project Number and Name: **20405.016.008.0451.0 - Lower Rogue River** **Library Used:** **LRR**

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-HS3-A-01 **Lab Report Batch :** K0904451 **Lab ID :** CAS_K

Sample Date : 05/16/2009 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0904451-002

Reviewed By / Date : LG 8/21/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 9060M					**Dilution: 1**															
Carbon, Total Organic	4.89		%		YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-HS3-A-01-FS **Lab Report Batch :** K0904451 **Lab ID :** CAS_K

Sample Date : 05/16/2009 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0904451-004

Reviewed By / Date : LG 8/21/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 9060M					**Dilution: 1**															
Carbon, Total Organic	5.76		%		YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-HS3-A-02 **Lab Report Batch :** K0904451 **Lab ID :** CAS_K

Sample Date : 05/16/2009 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0904451-005

Reviewed By / Date : LG 8/21/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 9060M					**Dilution: 1**															
Carbon, Total Organic	6.15		%		YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-HS3-A-02-DP
Lab Report Batch : K0904451
Lab ID : CAS_K
Sample Date : 05/16/2009
Analysis Type: 1RES
Sample Matrix : SED
Lab Sample ID: K0904451-006

Reviewed By / Date : LG 8/21/2009
Approved By / Date :

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 9060M					**Dilution: 1**															
Carbon, Total Organic	6.68		%		YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-HS3-A-03 **Lab Report Batch :** K0904451 **Lab ID :** CAS_K

Sample Date : 05/16/2009 **Analysis Type: 1RES** **Sample Matrix :** SED

Lab Sample ID: K0904451-007

Reviewed By / Date : LG 8/21/2009 **Approved By / Date :**

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 9060M					**Dilution: 1**															
Carbon, Total Organic	7.54		%		YES															

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review

Sample Qualification Report (All Analytes)

Client Sample ID : LRR-ZIC-C-01-TOX
Lab Report Batch : K0904454
Lab ID : CAS_K
Sample Date : 05/16/2009
Analysis Type: 1RES
Sample Matrix : SED
Lab Sample ID: K0904454-009

Reviewed By / Date : LG 8/20/2009
Approved By / Date :

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tot/Dis	Field QC	Tune	IC	ICV	CV / CCV
Analysis Method : 9060M					**Dilution: 1**															
Carbon, Total Organic	1.35		%		YES															

Project Number and Name: **20405.016.008.0451.0 - Lower Rogue River** **Library Used:** **LRR**

* Overall result qualifier reflects summation of qualifiers added during automated data review and any qualifiers added manually for categories not assessed by automated data review