Dilution Analysis for NGPL Hydrotest Discharges to the Saline River

1. Introduction

Natural Gas Pipeline Company of America LLC (NGPL) is planning a hydrotest for its Natural Gas Pipeline (NGPL) Gulf Coast No. 3 Segment 34, which crosses the Saline River Segment 2C near Benton, Arkansas. The tests will use water from the Saline River, south of Benton. For each test, the water will be drawn from the river, used for the Hydrotest, and then discharged back into the river at the same location. There is concern that post-test discharges may contain trace polychlorinated biphenyl (PCB) concentrations that could significantly impact ambient water quality. Therefore, the Arkansas Department of Environmental Quality (ADEQ) Water Division has requested that a dilution analysis be conducted to determine if there are any potential issues associated with the discharges.

2. Approach

The dilution analysis is divided into a near field and a far field assessment. The near field assessment is based on semi-empirical approaches summarized by Fischer et al. (1979). This analysis is intended to represent discharge conditions for the 'jet' phase of the dilution, during which the momentum associated with the discharge controls the dilution. For the near field analysis, the discharge conditions are developed, including the flow rates, discharge duration, PCB concentrations, and details of the discharge geometry, including the flow speed. These data are then used in the semi-empirical analysis to estimate the dilution of the discharge as the discharge enters the river.

The far field analysis was based on the solution to the depth averaged contaminant transport equation as described in Fischer et al. (1979). The equation provides the downstream concentration field for a bank discharge into a steady river flow. For the far field analysis, data including river cross-section and historical flow records are analyzed to determine appropriate design scenarios and mixing coefficients. These data are used in the transport equation to estimate the far field PCB-plume characteristics.

3. Hydrotest Discharge Characteristics

The approximate location for the Saline River discharge is shown in Figure 1. The Saline River discharge point is located south of Benton, Arkansas. The conditions for the Saline River discharge are summarized in Table 1.

Table 1. Hydrotest Discharge Conditions

Location	Volume (m3)	Discharge Rate (m^3/s)	Duration (days)	PCB Concentration (ppb)
Saline	12870	0.19	0.79	3.0

ppb = part per billion or ug/l

The flow rate of 0.19 m^3/s is based on the limitation of 3,000 gallons per minute (gpm) pumping capacity. The duration is estimated from the hydrotest water volume. The PCB concentration is based on measurements of the lubricant residue in the pipeline and is considered to be the maximum that might occur in the discharged water. It is expected that the actual hydrotest water PCB concentration will be between 0.5 ppb (the value assigned to non-detects) and 3.0 ppb.

The discharge configuration consists of open flow from the pipeline to a hay bale dewatering structure located near the river bank. The flow exiting the hay bale dewatering structure is a sheet flow; this is designed to minimize erosion by spreading the flow laterally creating a thinner and wider discharge area.

There is no detailed information about the bank conditions, such as the bank slope, the near-bank water depths, and the bank surface conditions. However, some regional channel information was provided in a river geomorphology report (USGS, 2008). A review of some cross-section profiles available in the report indicate two types of bank conditions, steep nearly vertical banks where the river has cut into the adjacent bank, or mildly sloping banks, with angles in the range of 3 to 8 degrees. In order to complete the dilution analysis, a range of reasonable conditions were assumed to provide the necessary input to the analysis. Bank slopes of 3 and 8 degrees were used and Manning's *n* values of 0.03 and 0.3 were used. The smaller Manning's *n* value represents smooth sandy banks, and the larger value represents a grassy or weed-covered bank.

4. Ambient River Conditions

The Saline River discharge point is located on the west bank south of Benton, AR. Ten years of daily flow data have been acquired from a USGS stream gage 07363000 located upstream of the site. The gage location is shown in Figure 1. A summary of the data is shown in Figures 2a, b and c. Figure 2a shows a time series of the flow data, Figure 2b shows a frequency plot of the daily discharge, and Figure 2c shows the monthly mean flow data for each of the 10 months in the data set, as well as the overall (10-year period) monthly average flow. The median flow is approximately 11 m^3/s, with a peak flow of approximately 980 m^3/s. There is also a clear seasonal trend evident in the plot of the monthly average flows. However, the lowest flows occur during the months of July through October.

Cross-section data for the Saline River in the vicinity of the discharge point was not available. However, some regional channel information was provided in a river geomorphology report (USGS, 2008). The report documents bank cross-sections for river sections in Saline County. There are no cross-sections at the discharge site, but the reported data indicates that at low flow conditions, the streams typically have water depths in the range of 0.3 to 1.1 m. The river width was estimated from aerial photographs, and is about 26 m wide at the discharge location.

The flows associated with the 1st percentile (1% of flows lower than this value), the 5th percentile, and the $_7Q_{10}$ are listed in Table 2 for the Saline River. The $_7Q_{10}$ value is defined as a seven-day, consecutive low flow with a ten year return frequency or the

lowest 7-day average stream flow that would be expected to occur once in ten years.

Table 2. Flow Characteristics

Location	one-percentile flow (m^3/s)	5th percentile flow (m^3/s)	$_7Q_{10}$ flow (m^3/s)
Saline River	0.25	0.48	0.17

The $_7Q_{10}$ for the Saline River occurred on September 9, 2006. The $_7Q_{10}$ average flow speed associated with the $_7Q_{10}$ flow is 0.02 m/s.

5. Regulatory Considerations

The rules governing allowable concentrations and mixing zones are provided in the Arkansas Pollution Control and Ecology Commission's Regulation No. 2, "Regulation Establishing Water Quality Standards for Surface Waters of the State of Arkansas".

As indicated in Regulation No. 2 (Section 2.301), substantially all surface water bodies in Arkansas have been designated for specific uses as found in Appendix A of Regulation No. 2. In those instances where waters are classified for multiple uses and different criteria are specified for each use, the criteria to protect the most sensitive use shall be applicable. Based on the designated uses, some specific water quality standards have been established for certain parameters. In Appendix A of Regulation No. 2, the section of the Saline River where the discharge is to occur is located in the Gulf Coastal Ecoregion, plate GC-4, and is designated for Primary and Secondary Contact Recreation and as a Domestic, Industrial and Agricultural Water Supply. In addition the Saline River portion in Ecoregion GC-4 is designated as Extraordinary Resource Waters by the regulation. There are some specific water quality standards for certain parameters, such as temperature, pH, etc; however, for all other parameters, including PCBs, for Ecoregion GC-4, the statewide standards found in the Regulation No. 2, Section 2.508 would apply.

The rules governing concentrations of toxic substances including PCBs are found in Regulation No. 2, Section 2.508 Toxic Substances which states:

> *Toxic substances shall not be present in receiving waters, after mixing, in such quantities as to be toxic to human, animal, plant or aquatic life or to interfere with the normal propagation, growth and survival of the indigenous aquatic biota. Acute toxicity standards may not be exceeded outside the zone of initial dilution. Within the ZID acute toxicity standards may be exceeded but acute toxicity may not occur. Chronic toxicity and chronic numeric toxicity standards shall not be exceeded at, or beyond, the edge of the mixing zone. Permitting of all toxic substances shall be in accordance with the toxic implementation strategy found in the Continuing Planning Process. For non permit issues and as a guideline for evaluating toxic substances not listed in the following tables, the Department may consider No Observed Effect Concentrations (NOECs) or other literature values as appropriate.*

For the PCBs for all water bodies, the aquatic life criteria does not specify an acute toxicity standard and the chronic value of 0.014 ug/l applies to all water bodies including the Saline River. For all water bodies, the human health criteria for PCBs is 0.4 ng/l and applies to all water bodies designated for primary/ secondary contact recreation and domestic water supply. So for this modeling study for the Saline River, the more stringent human health criteria for PCBs of 0.4 ng/l shall not be exceeded at, or beyond the edge of the mixing zone as previously described. However, previous dilution analysis models show that the 0.4 ng/l for PCBs is exceeded for the Saline River and we have modeled our study for the higher discharge standard of 0.014 ug/l for this application. In addition, there are many portions of the Saline River which are not suitable for domestic water supply. No domestic water withdrawals are located within 5 miles downstream of the proposed discharge. NGPL requests that this permit be issued based on its limited duration and limited variance for one time short term authorized hydrotest discharge. There are no known threatened or endangered species or critical habitats within 1 mile of the proposed discharge point. So for this dilution analysis study, 0.014 ug/l is used as the target concentration.

Since 3 ppb discharge is higher than the regulatory limit of 0.014 ppb, a mixing zone will be needed. The rules governing mixing zones are provided in the Arkansas Pollution Control and Ecology Commission's Regulation No. 2, "Regulation Establishing Water Quality Standards for Surface Waters of the State of Arkansas". Reg. 2.404 states:

> *Mixing zones are allowed for all parameters not specifically excluded in Reg. 2.404 and the effects of wastes on the receiving stream shall be determined after the wastes have been thoroughly mixed with the mixing zone volume. Outfall structures should be designed to minimize the extent of mixing zones to ensure rapid and complete mixing.*
>
> *In the smaller streams, (Q7-10 flows less than 100 cfs), because of varying local physical and chemical conditions and biological phenomena, a site specific determination shall be made on the percentage of river width necessary to allow passage of critical free-swimming and drifting organisms so that negligible or no effects are produced on their populations. As a guideline, no more than 2/3 of the cross-sectional area and/or critical flow volume of smaller streams should be devoted to mixing zones thus leaving at least 1/3 of the cross-sectional area free as a zone of passage.*

For the Saline River in the vicinity of the proposed discharge location, the river is well below 100 cubic feet per second (cfs), and the river width is approximately 26 meters. Therefore, discharge concentrations above the 0.014 ug/l (part per billion (ppb)) criteria must be contained within 17.3 meters of the river bank. (2/3 of 26 meters).

6. Near Field Analysis

The near field analysis is divided into two parts. The first part consists of estimating the over-bank discharge characteristics of flow width, depth and speed. The second part consists of estimating the fate of the discharge as it enters the river. This analysis is valid until the discharge flow momentum is dissipated (i.e. the 'jet' portion of the plume). Since the flow across the river bank will resemble sheet flow, the planer jet equations are used for the analysis (Fischer et. al., 1979)

The over-bank sheet flow analysis is based on the steady-flow Manning's equation (Brater et. al., 1996). Manning's formula relates the flow speed and height to the bottom slope and friction. The basic equation is:

$$q = \frac{a\, r^{2/3} s^{1/2}}{n}$$

Where q is the flow rate in m^3/s, a is the cross-sectional area (width w times depth d), r is the hydraulic radius, s is the slope and n is Manning's n, which characterizes the bottom friction. The width of the sheet flow over the bank is assumed to be 3 to 6m, which spans the likely impact of using three to six hay bales to impede and spread the flow. When the flow is expected to be wide and shallow, the hydraulic radius r can be approximated with the flow depth. With these inputs, Manning's equation can be re-written as:

$$q = \frac{w\, d\, d^{2/3} s^{1/2}}{n},$$

and solved for the depth d, when the flow rate q, width w, slope s and Manning's n values are known. For estimates of the bank slope, the range of 3 to 8 degrees was used, based on the estimates from the Saline River cross-section. The flow speed V, in m/s can then be determined from the equation:

$$V = \frac{q}{w\, d}.$$

The flow speed and depth are shown in Table 3 for a range of bank slopes, flow widths and bottom friction values.

Table 3. Over-bank flow characteristics

Scenario	Discharge Flow Rate (m^3/s)	Manning's n	width (m)	Slope	depth (m)	vel (m/s)
1	0.19	0.03	3	0.14	0.04	1.51
2	0.19	0.03	3	0.05	0.06	1.11
3	0.19	0.03	6	0.14	0.03	1.14
4	0.19	0.03	6	0.05	0.04	0.84
5	0.19	0.3	3	0.14	0.17	0.38

6	0.19	0.3	3	0.05	0.23	0.28
7	0.19	0.3	6	0.14	0.11	0.29
8	0.19	0.3	6	0.05	0.15	0.21

The effect of the bottom friction has a significant impact on the flow depth and the velocity. For the lower friction value, the flow is shallower with a higher speed. The width of the over-bank sheet flow has a smaller effect, with higher speeds and depths for the smaller width. The bottom slope also has an effect on the speed and depth. For a steeper bank, the flow is shallower and faster.

The above discharge parameters were used in the Fischer's (1979) semi-empirical 'jet' equations for a planer jet. These equations represent the condition of a rectangular jet perpendicular to a river flow, which is a good approximation of the hydrotest discharge conditions. The equation for the flow speed along a line perpendicular to the bank is:

$$w_m = \frac{M}{Q} 2.41 \left(\frac{\ell_Q}{z} \right)^{1/2},$$

where w_m is the discharge speed (m/s), M is the momentum flux per unit width (m^3/s^2), Q is the flow per unit width, (m^2/s), ℓ_Q is a length scale, and z is the distance from the bank (along a line perpendicular to the bank). The length scale is defined as:

$$\ell_Q = \frac{Q^2}{M}$$

and the momentum flux is:

$$M = V * Q .$$

The equation for the concentration along the centerline is:

$$C_m = C_o 2.38 \left(\frac{\ell_Q}{z} \right)^{1/2},$$

where C_o is the discharge concentration (i.e., 3 ppb).

The distance that the jet penetrates into the river, perpendicular to the river bank, can be estimated by assuming the jet ends when the jet speed decreases to 5 cm/s, and then solving the jet speed equation for the values of z. When the end of the jet is calculated, the concentration at the end of the jet can be estimated using the jet concentration equation. The jet extents and concentrations are shown in Table 4 for the over-bank discharge scenarios established in Table 3.

Table 4. Jet Characteristics

Scenario	Discharge Flow Rate (m^3/s)	V (m/s)	Q (m^2/s)	M (m^3/s^2)	l_q (m)	Jet Length*	Conc (ppb)
1	0.19	1.51	0.063	0.095	0.042	7.3	0.54
2	0.19	1.11	0.063	0.070	0.057	7.3	0.63
3	0.19	1.14	0.032	0.036	0.028	3.7	0.62
4	0.19	0.84	0.032	0.026	0.038	3.7	0.72
5	0.19	0.38	0.063	0.024	0.167	7.3	1.08
6	0.19	0.28	0.063	0.018	0.227	7.3	1.26
7	0.19	0.29	0.032	0.009	0.110	3.7	1.24
8	0.19	0.21	0.032	0.007	0.150	3.7	1.44

*defined as the point when the jet centerline speed decreases to 0.05 m/s

The jet length is only dependent on the sheet flow width and is estimated to be 3.7 to 7.3 m. The concentration at the end of the jet ranges from 0.47 ppb to 1.32 ppb. The concentrations tend to be higher for the wider sheet flow scenarios, due to the slower associated discharge velocities, and subsequently, lower mixing.

These results for the near field jet indicate that the jet momentum will be dissipated within the regulatory mixing zone (17.3 m) and therefore the impact of the discharge concentration on the mixing zone boundaries will be controlled by the far field processes. The length of the near field can be controlled during the hydrotest setup by adjusting the width of the discharge such that it is minimized.

7. Far Field Analysis

The far field analysis was based on the solution to the depth-averaged contaminant transport equation as described in Fischer et al. (1979). The equation provides the downstream concentration field for a bank discharge into steady river flow. The governing equation is:

$$C = Co\left(\frac{\sum_{n=-\infty}^{\infty} e^{-\frac{(y'-2n-yo')^2}{4x'}} + e^{-\frac{(y'-2n+yo')^2}{4x'}}}{\sqrt{4\pi x'}}\right)$$

where

$$Co = \frac{M}{\bar{u}dW}, \quad x' = \frac{xD}{\bar{u}W^2}, \quad y' = \frac{y}{W}$$

And M is the contaminant mass flux, $\bar{u}$ is the average river flow speed, W is the river width, d is the average river depth and D is the lateral mixing. An estimate of the lateral mixing has been made using the river mixing equations of Fischer et al. (1979). The equation is:

$$D = 0.15 d u_* ,$$

where D is the diffusion coefficient (m^2/s) and u_* is the friction velocity. For this analysis, the friction velocity is assumed to be 10% of the depth-averaged flow speed.

The hydrotest is expected to occur during March and possibly April of 2010. The historic flow records for this period have been reviewed in order to determine the range of flow conditions that can be expected. A plot of the distribution of historical flows for that period is shown in Figure 3. The 50th percentile flow is 479 cfs, but high flows are on the order of 20,000 cfs. The flow conditions for various percentiles are shown in Table 5.

Table 5. Flow Characteristics for the Saline River for March and April

Percentile	Flow (cfs)
90	2514
75	1105
50	479
25	291
10	191

The solution to the transport equations was obtained for the median flow (479 cfs) to determine the plume characteristics. Input to the equations included a 26 meter river width, 1.1 meter average depth, a flow of 13.6 m^3/s (479 cfs), a hydrotest discharge of 3,000 gallons per minute (gpm) (0.19 cfs) and a discharge concentration of 3 ppb. The PCB concentration in the ambient river flow was assumed to be zero, based on the results of stream sampling (Environmental Science Corp., 2009). The results of the analysis are shown in Figure 4a. The upper panel is a schematic that shows the basic characteristics of the plume. The lower plot shows the results of the dilution calculations along the discharge bank, the opposite bank, and along a line representing the allowable mixing zone, which is 2/3 of the river width (2/3 of 26 meters ~ 17.3 meters). As can be seen, the plume concentration exceeds the criteria of 0.014 ppb at the mixing zone and therefore the 3,000 gpm discharge is not feasible. Results for the same river and hydrotest discharge flows, but with the hydrotest discharge concentration of 0.5 ppb, are shown in Figure 4b. For this lower discharge concentration, the river concentration at the edge of the mixing zone is well below the criteria of 0.014 ppb, and therefore pumping at 3000 gpm is feasible.

NGPL has the ability to reduce the discharge pump rate to reduce the plume concentration along the mixing zone boundary. Thus if the hydrotest discharge concentrations are at the higher end of the expected range (i.e., 3 ppb), NGPL can reduce the pumping rate to keep the river concentrations in compliance with the PCB mixing zone requirements. The general plan is to access the daily flow each day of the discharge and adjust the hydrotest discharge appropriately, such that the PCB concentration in the plume complies with the water quality criteria. As an example of this approach, the transport equations were applied with incrementally reduced hydrotest discharge rates

until the discharge plume had concentrations at or below the 0.014 ppb criteria at the mixing zone boundary. For the 50th percentile flow (i.e., 13.6 m^3/s) this allowable hydrotest discharge rate assuming a 3.0 ppb PCB concentration was found to be 1008 gpm. A plot of the plume concentration along the mixing zone boundary for the 1008 gpm results is shown in Figure 5. There was no need to reduce the hydrotest discharge rate below 3000 gpm for the case when the hydrotest water concentration is assumed to be 0.5 ppb, since it was shown in Figure 4b that the resulting downstream PCB concentrations meet the mixing zone requirements.

The results in Figure 5 suggest that the limits placed on the allowable discharge rate are the same as those imposed by the maximum dilution. The concentration at the mixing zone boundary increase monotonically to the 0.014 ppb level. To determine if this results hold for all flow rates, the same plume calculations were made for the 10th percentile river flow rate (191 cfs). For a discharge concentration of 3.0 ppb, a hydrotest discharge rate of 402 gpm was required to keep the concentration at the mixing zone boundary at or below 0.014 ppb. For a discharge concentration of 0.5 ppb, a hydrotest discharge rate of 2469 gpm was required to keep the concentration at the mixing zone boundary at or below 0.014 ppb. The results are shown in Figure 6a and 6b and confirm that the limits on the flow rate for complying with the mixing zone are essentially the same as those imposed by the maximum dilution. Therefore the maximum dilution equation, shown below can be used for determine the limits on the hydrotest discharge for different flow rates. The maximum dilution equation is:

$$C_R = \frac{Q_H * C_H}{Q_H + Q_R}$$

Where C_R is the fully diluted concentration in the river, Q_H and Q_R are the hydrotest discharge rate and the river flow rate, and C_H is the PCB concentration in the hydrotest discharge water. Implicit in this equation is the assumption that the river background PCB concentration is zero. This equation can be solved to determine the maximum discharge allowed to comply with the 0.014 ppb criteria:

$$Q_H = \frac{Q_R C_R}{C_H - C_R}$$

In this formula, C_R is the criteria 0.014 ppb. This formula was applied to the flows in Table 6 as an example and the results are shown in Table 6. Two concentrations were considered in the analysis, 3 ppb and 0.5 ppb. The 3 pbb value represents the highest value that NGPL has experienced in previous hydrotests. The 0.5 ppb value represents the detection limit.

Table 6. Allowable Hydrotest Discharge for River Discharges

River Flow (cfs)	Allowable Discharge (gpm) @ 3 ppb	Allowable Discharge (gpm) @ 0.5 ppb
2514	3000	3000
1105	2325	3000
479	1008	3000
291	612	3000
191	402	2469

8. Implementation

The far field dilution results have been analyzed and it was found that the maximum dilution equation can be used to take advantage of the flexible hydrotest discharge rate and the PCB concentration measured during the test. The maximum dilution equation provides a means to limit the hydrotest discharge based on the river discharge and hydrotest PCB concentration. The plan consists of using the USGS real time flow data (1 to 4 hour delay) from the stream gauge for the Saline River near Benton available at:

http://waterdata.usgs.gov/nwis/rt

and the PCB concentration measured in the hydrotest discharge then limiting the flow according to the maximum dilution equation. The actual implementation would be:

For all river discharges the daily allowable hydrotest discharge Q in gpm would be calculated as:

$$Q = \text{minimum of } 448.8\left(\frac{R \times 0.014}{C - 0.014}\right) \textit{ and } 3000$$

where R is the river discharge in cfs, C is the hydrotest PCB concentration in ppb and 448.8 is the conversion from cfs to gpm. Figure 7a displays the allowable discharge rates from Table 6 based on Saline River flow (cfs) and PCB concentration (0.5 ppb or 3 ppb) in the hydrotest discharge. Figure 7b displays the estimated number of days to complete the discharge of the 3,600,000 gallons of hydrotest water to the Saline River based on the estimated flow rates for each of the concentrations shown in Table 6.

In order to estimate the time that may be required to completely discharge the hydrotest water, a duration analysis was conducted. The analysis consisted of a Monte-Carlo type approach in which a starting date in March or April was selected from the 10-year historical flow record. The allowable hydrotest discharge rate was determined using the algorithm described above for the particular days river discharge. The initial hydrotest volume was then reduced by a volume equivalent to a 24-hour discharge at the allowable discharge rate. Calculations were then continued for each successive day in the historic

flow record until the initial hydrotest volume was discharged. This analysis provided duration for the discharge for each day in March or April over the 10-year record. The duration data was then analyzed to estimate the distribution of the discharge durations. The results are plotted in Figure 8 assuming both a 3 pbb and 0.5 ppb PCB concentration in the hydrotest water. The median duration assuming a 3 ppb PCB concentration is 18.75 days. There is a 10% chance, based on this analysis, that the duration required to discharge the entire hydrotest volume will be greater than 39 days. If the hydrotest discharge concentration is 0.5 ppb, then the median discharge duration is 5 days.

9. Conclusions

A dilution analysis was conducted for the proposed hydrotest discharge into the Saline River. The analysis indicated that compliance with the appropriate water quality standards was controlled by the far field process, and not the near field dilution. The far field analysis indicated that the water quality standard for PCBs of 0.014 ppb could not be obtained at the edge of the mixing zone for the desired pumping rate of 3,000 gpm and the typical river flow rates occurring during the March and April periods.

An alternate plan was developed in which the hydrotest discharge rate was reduced below the 3,000 gpm and the actual rate was dependent on the instantaneous Saline River discharge rate and PCB concentration in the hydrotest water. The far field dilution analysis was used to determine the allowable hydrotest discharge such that the appropriate PCB water quality criteria of 0.014 ppb was met at the edge of the mixing zone. The discharge plan consists of using the USGS estimated daily flow for the upcoming day and selecting the allowable hydrotest discharge rate based on the dilution analysis. A simple equation has been provided to calculate the allowable hydrotest discharge rate when the river flow rate is provided.

Finally, an analysis was conducted to determine the typical hydrotest discharge duration for the March and April periods. The analysis indicated that the likely duration would be 18.75 days, if the measured hydrotest water PCB concentration was 3 ppb, and 5 days if the measured concentration was at or below 0.5 pbb (the detection limit).

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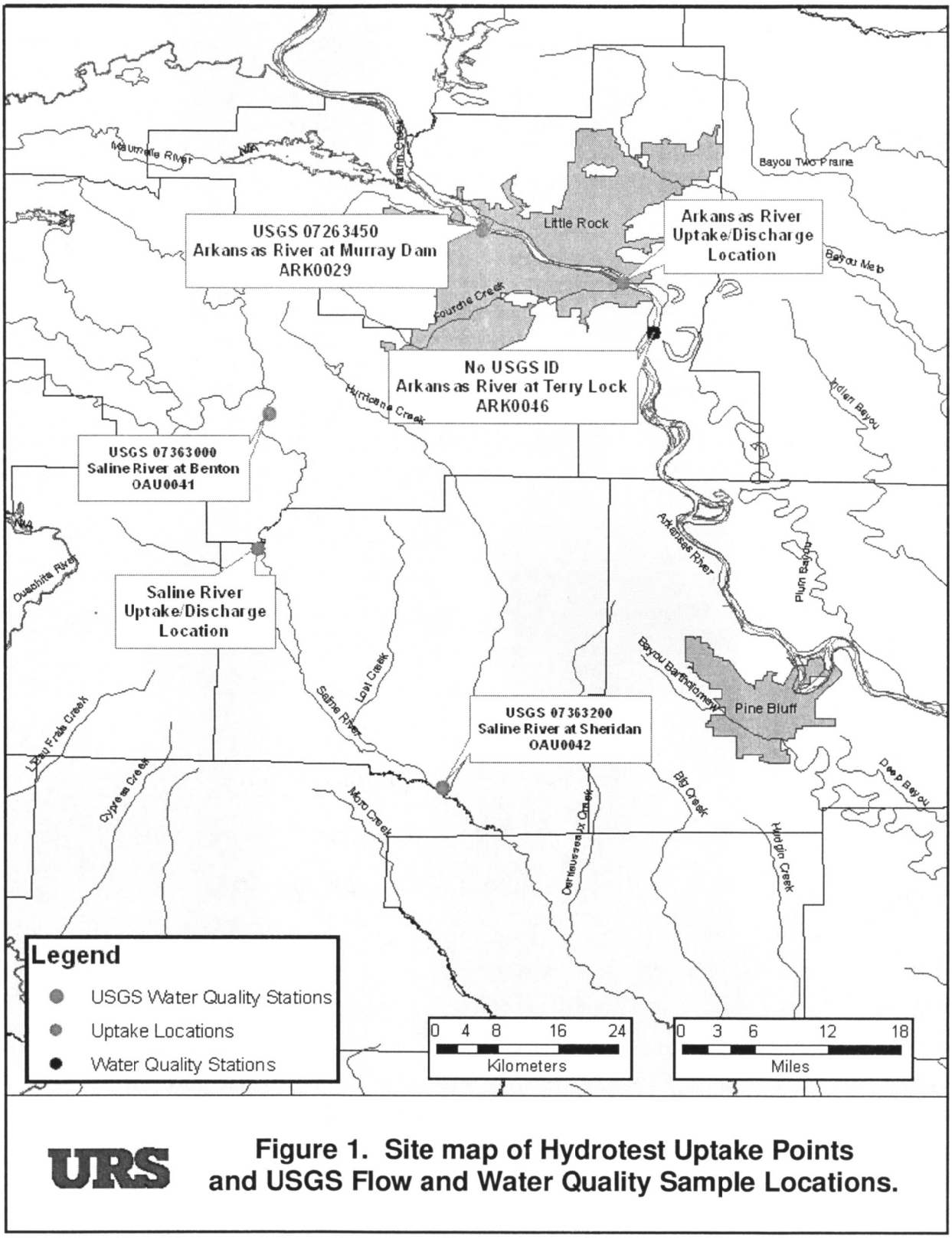

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Figure 1. Site map of Hydrotest Uptake Points and USGS Flow and Water Quality Sample Locations.

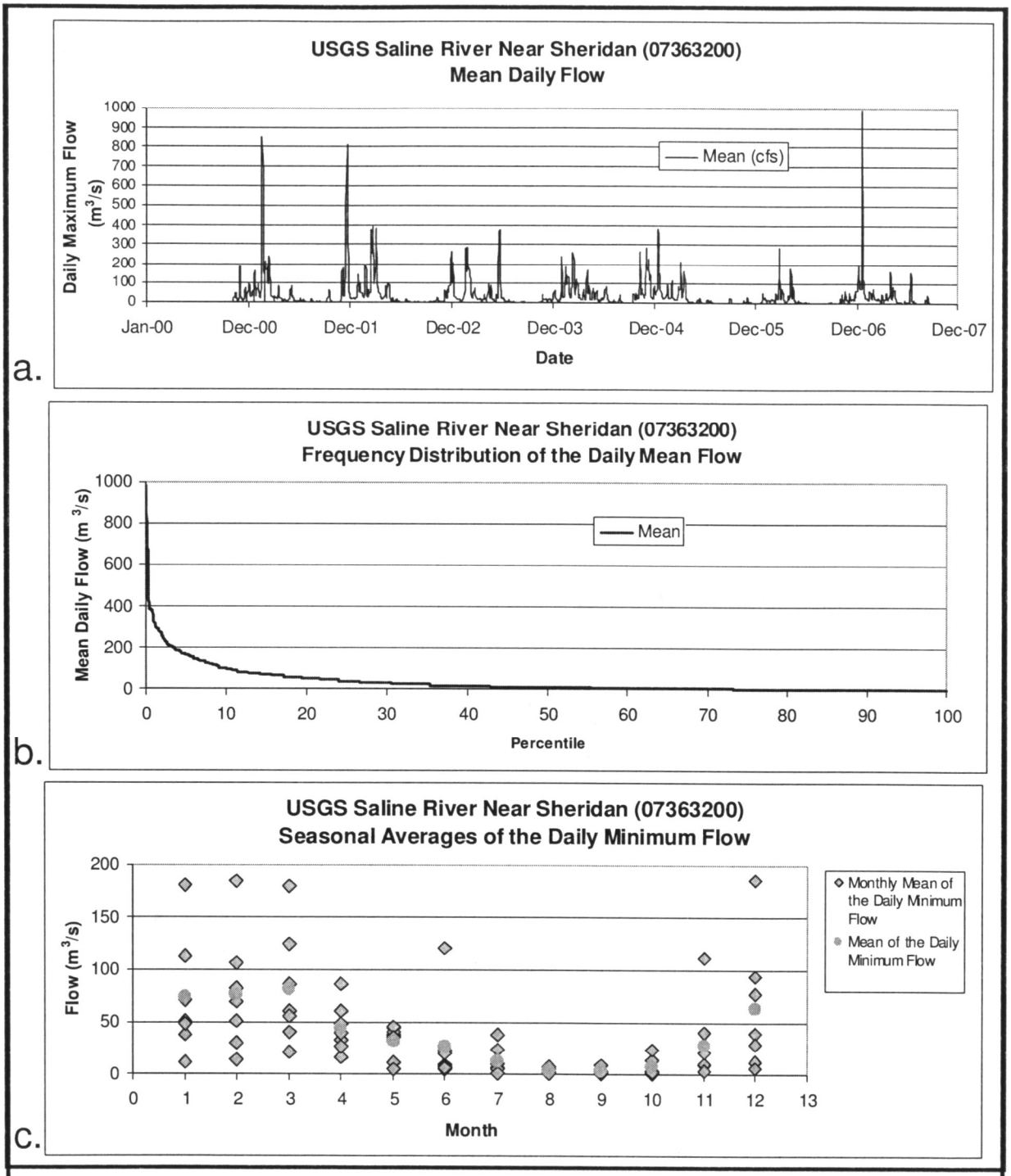

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Figure 2. Daily Mean Flow Plots for the Saline River Station near Benton (07363000)- a) Time Series, b) Frequency Distribution, and c) Seasonal Averages

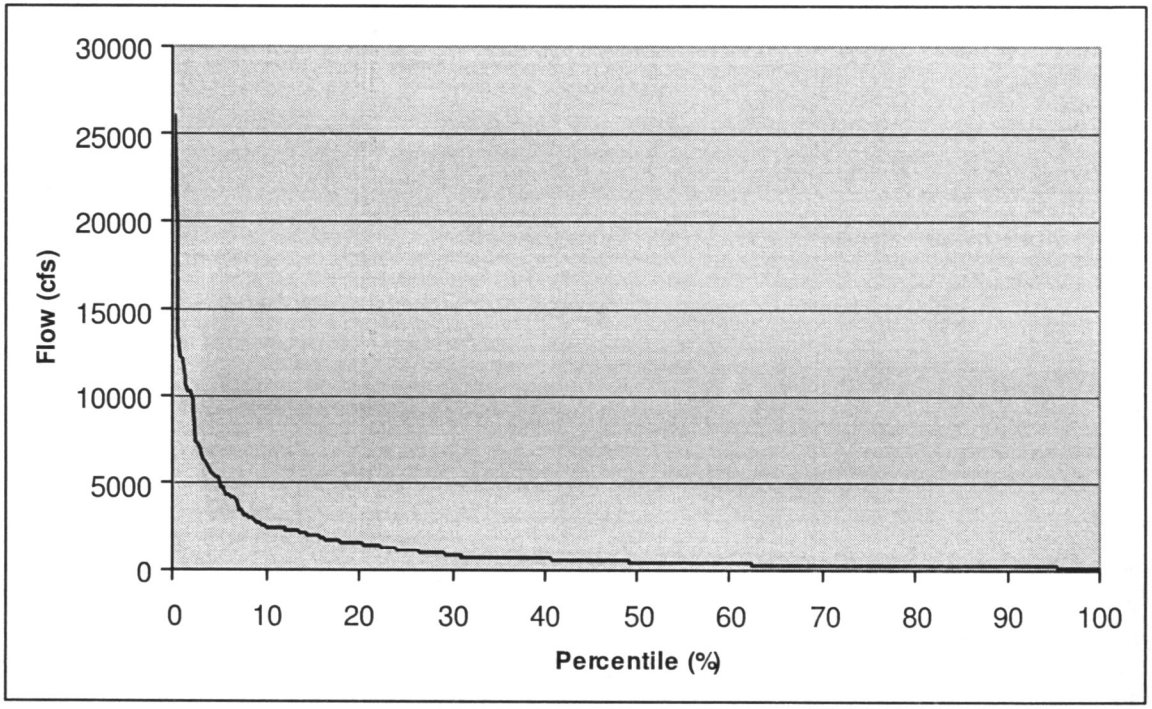

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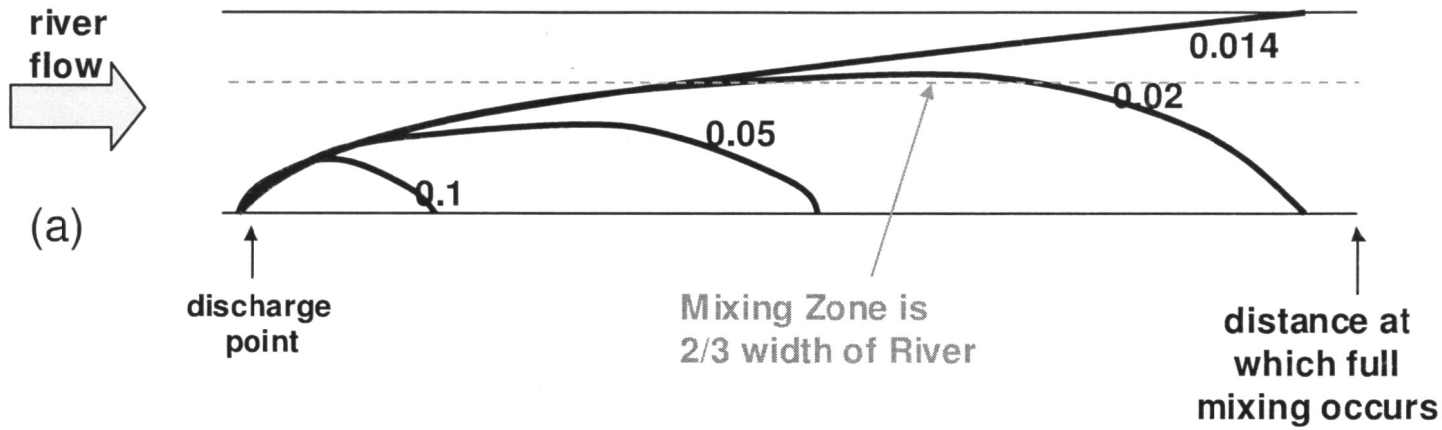
Figure 3 Saline River Flow Distribution for March and April over 10-year Period



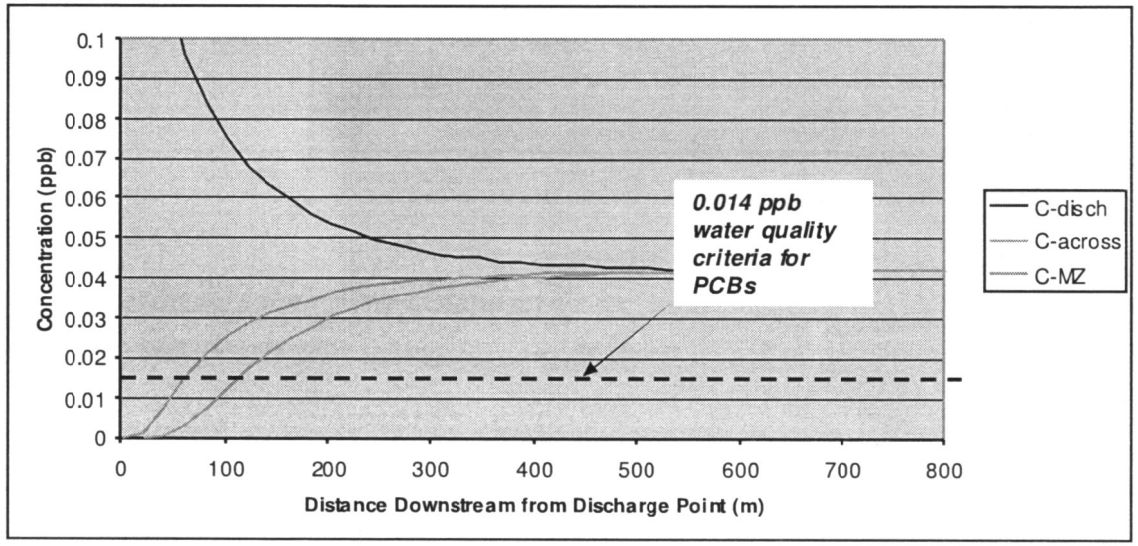


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Figure 4a (a) Plume conceptual characterization and (b) plume concentrations for 3000 gpm, 3.0 ppb hydrotest discharge and 479 cfs river discharge

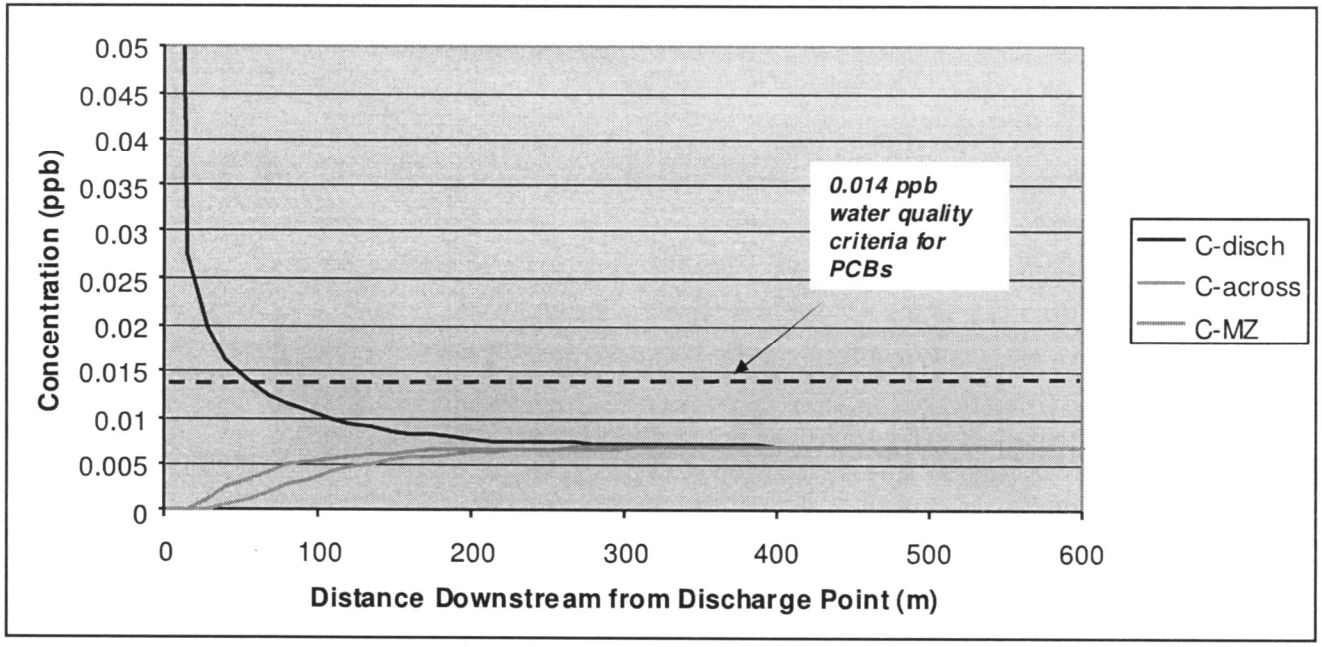

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Figure 4b Plume concentrations for 3000 gpm, 0.5 ppb hydrotest discharge and 479 cfs river discharge

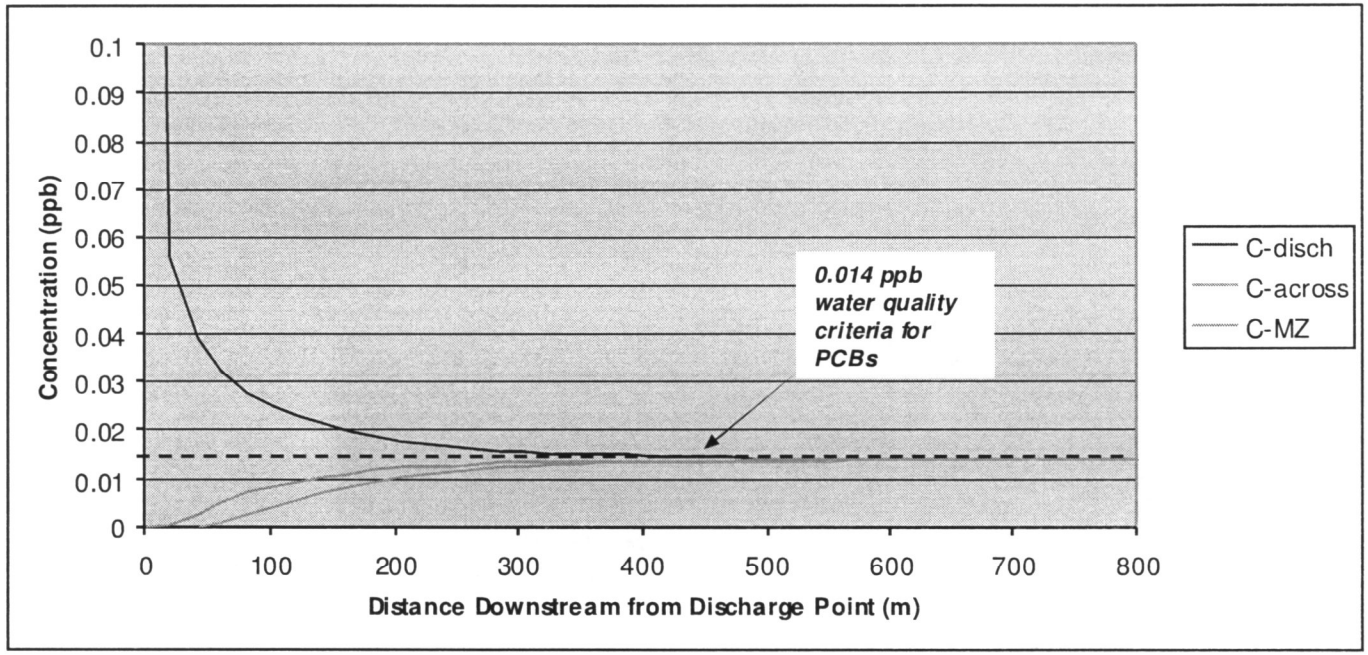

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Figure 5 Plume concentrations for 1008 gpm, 3.0 ppb hydrotest discharge and 479 cfs river discharge

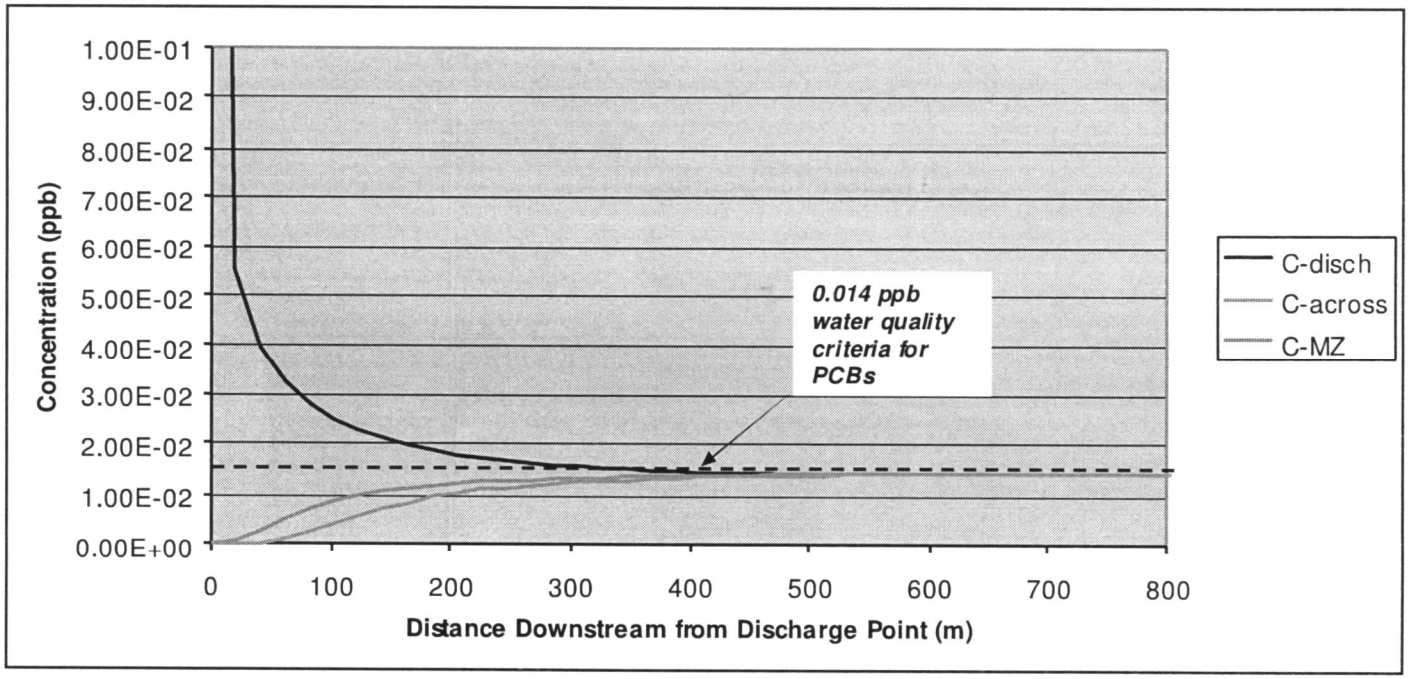

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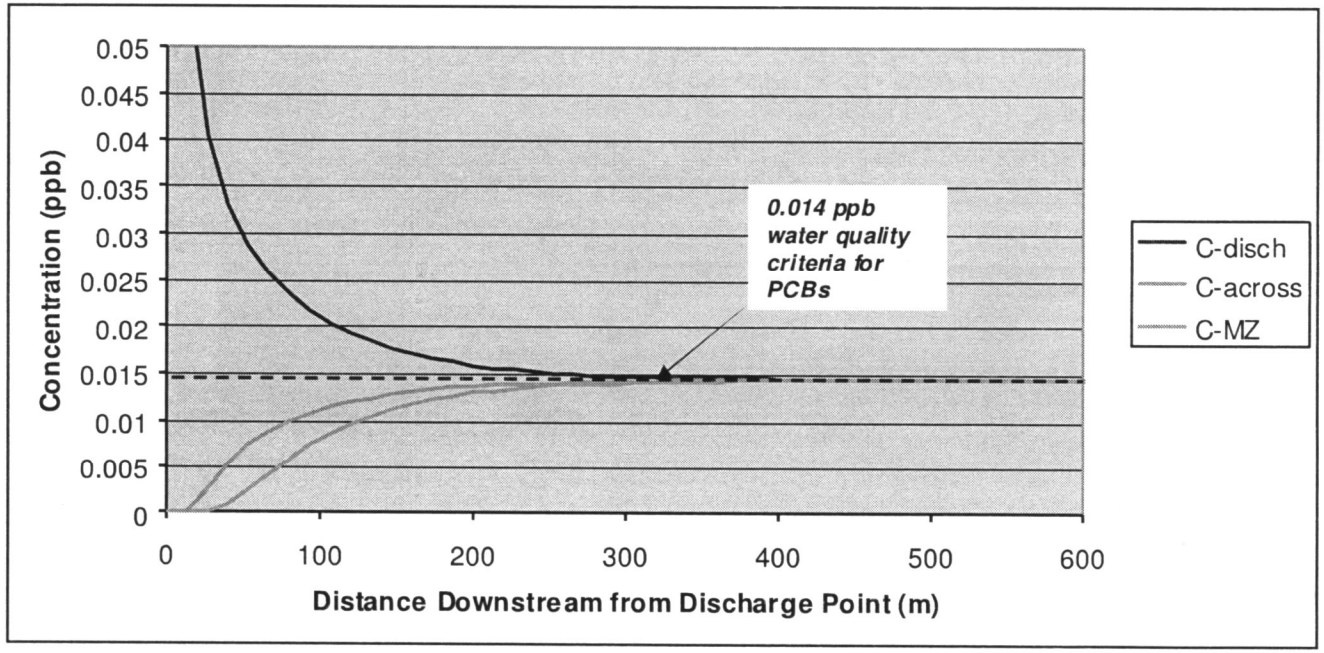
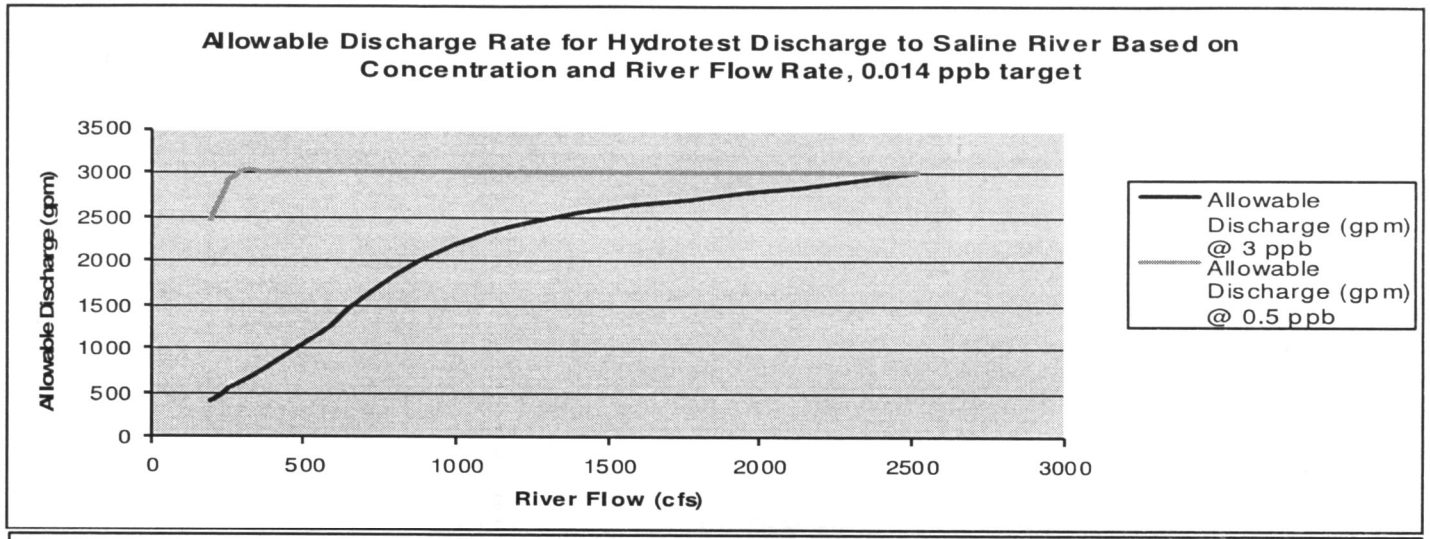
Figure 6a Plume concentrations for 402 gpm, 3.0 ppb hydrotest discharge and 191 cfs river discharge



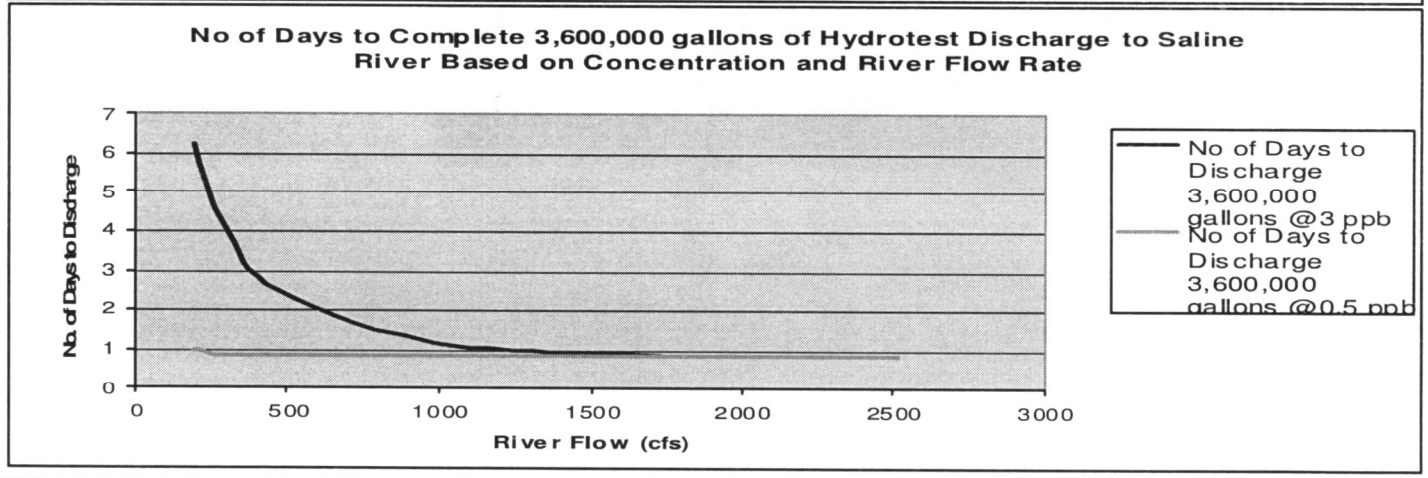
URS

Figure 6b Plume concentrations for 2469 gpm, 0.5 ppb hydrotest discharge and 191 cfs river discharge

7a

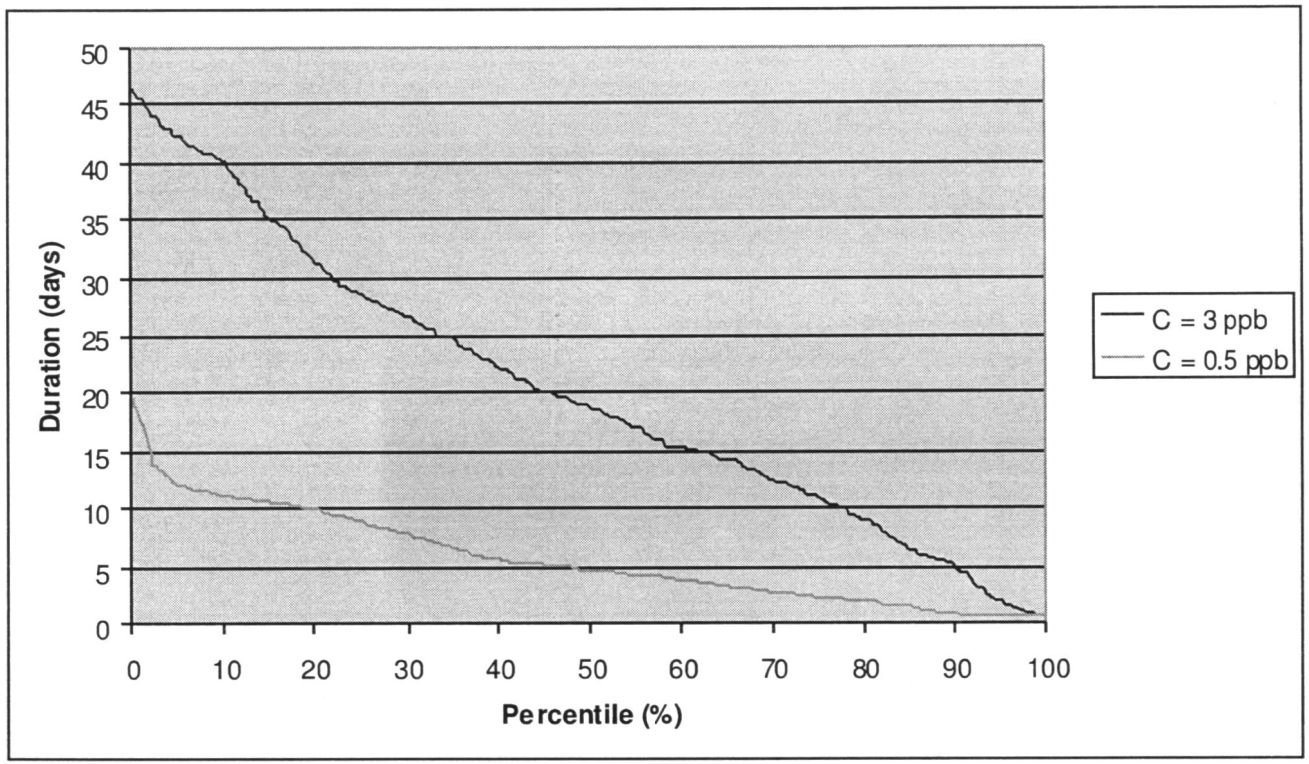


7b



URS

Figures 7a and 7b Hydrotest Discharge Rate (gpm) and Duration Based on Concentration (ppb) and River Flow Rate (cfs)



URS

Figure 8 Distribution of Hydrotest Discharge Durations for March and April

Sampling and Analysis Report

Arkansas River and Saline River

Surface Water Sampling Events for PCBs

May 13-14, 2009

Executive Summary

In accordance with the Sampling and Analysis Plan (SAP) dated April 3, 2009 and Addendum No. 1 - Quality Assurance Plan dated April 20, 2009, surface water samples were collected by URS Corporation (URS) for Polychlorinated Biphenyl (PCBs) testing in order to determine background concentrations (if any) in each surface water body. The SAP and Addendum No.1 were previously submitted by URS on behalf of Natural Gas Pipeline Company of America (NGPL) for review and approval by the Arkansas Department of Environmental Quality (ADEQ). The ADEQ approval for the SAP and Addendum No. 1 was provided in a letter dated April 23, 2009. The surface water samples were collected upstream of proposed NGPL hydrostatic test discharge points from the Arkansas and Saline Rivers on 5/13/09 and 5/14/09, respectively and subsequently submitted to the Environmental Science Corporation (ESC) laboratory on 05/15/09 for testing of PCBs according to Environmental Protection Agency (EPA) Method 608. All of the surface water sample results from both rivers were below the respective minimum detection limits (MDL) and reported detection limits (RDL) for target PCB Aroclors by EPA Method 608.

Field Sampling Procedures

The closest boat ramp on the Arkansas River to the sampling transect location was closed so the next downstream boat access point was used for entry onto the Arkansas River. The proposed sampling transect location from the SAP was located in line with the pipeline crossing which clearly stated not to anchor in this area; therefore, the transect was relocated upstream of the pipeline crossing to avoid any possibility snagging the pipelines with the boat anchor. Figure 1 displays the transect and sampling locations on the Arkansas River. Global Positioning System (GPS) coordinates were recorded as landmarks on each shoreline along the sampling transect which provided the width of the channel. The width was then used to calculate the sampling location intervals. The width of the Arkansas River at the transect location was 600 meters. Positioning of the boat required anchoring upstream of the transect and letting the boat drift back to the approximate sampling location. Once stabilized, GPS coordinates were recorded at each sampling location (Table 1). The rope used to lower the

anchor with the Teflon tubing attached was marked in 1 ft intervals. At each sampling location, the depth was recorded using a depth sounder which provided the sample depth (mid-depth) Table 2. The tubing was lowered to that depth and using a peristaltic pump, water was flushed through the tubing prior to collecting the 2-1L amber bottles for each sample. Additional volumes were collected in the same manner when Quality Assurance/Quality Control (QA/QC) samples were collected. The sample bottles were labeled, placed in Ziplocs bags and stored on ice. The sampling procedure did not deviate from the SAP and samples were collected for all proposed locations.

The elevation of the Arkansas River was higher than normal pool; however, according to United States Geological Service (USGS) data, the river was well below action or flood levels and was continuing to fall (Attachment 1). The water was turbid but high turbidity is probably a normal condition for this size of river.

The mid-depth water sampling for the Saline River was repeated as described above. GPS coordinates were collected for each sampling location (Table 3). Water depths for sample collection from the Saline River are provided in Table 4. Surface samples were collected by simply lowering the amber bottle approximately one foot below the water surface. The bottles were then dried with paper towel, labeled, placed in Ziploc bags and placed on ice. The total width of the Saline River at the transect location was approximately 33 m. Figure 2 displays transect sampling locations for the Saline River.

As with the Arkansas River, the Saline River was higher than normal likely more turbid but was well below the action or flood level according to USGS Data (Attachment 2). During the sampling activities, it was clearly observed that the water level was continuing to drop. Photographs of both river sampling locations are included in Attachment 3. Field notebook page copies are also included in Attachment 3 following the photolog.

Samples were packaged, placed on fresh ice and hand-delivered to the ESC laboratory in Mt. Juliet, TN on 5/15/09 under strict chain of custody procedures.

Results of Sampling and Analysis

The results of the analytical testing are summarized in Table 5. All of the surface water sample results from both rivers were below the respective method detection and reporting limits for target PCB Aroclors by EPA Method 608. A copy of the laboratory report, chain of custody form, and quality assurance summary are found in Attachment 4.

QA/QC results were summarized by the laboratory and were reviewed in accordance with the criteria specified in the Quality Assurance Plan.

All quality assurance equipment blanks (EB) and laboratory method blanks (MB) were not detected for any target PCBs.

Percent recoveries (%R) and relative percent differences (RPDs) for all laboratory control samples/laboratory control sample duplicates (LCS/LCSD) were within the specified control limits.

The Matrix Spike (MS)/Matrix Spike Duplicate (MSD) recoveries for laboratory analytical batch WG422147 were outside control limits. The Relative Percent Difference (RPD) for the MS/MSD pair for analytical batch WG422147 was within the acceptance limit for precision. The associated LCS/LCSD sample results demonstrated acceptable accuracy for the analytical batch; therefore, no qualifications were made to the associated sample results based on MS/MSD recovery results.

The MS/MSD %R and RPD results for analytical batch WG422108 demonstrated acceptable precision and accuracy.

A field duplicate sample (DUP) (Sample ID ARSW-07M-DUP) was collected for sample ARSW-07M for the Arkansas River surface water sampling site. A field duplicate (Sample ID SALSW-04S-DUP) was collected for sample SALSW-04S for the Saline River surface water sampling site. The sample/ duplicate pair results for each river were not detected for all target PCBs and therefore showed good agreement.

Surrogate spike recovery results were within acceptance limits for all samples with three exceptions. In sample ARDW-5M, the tetracholoro-m-xylene surrogate recovery was below the lower control limit. The second surrogate standard for this sample was within acceptance limits. In samples SALSW-02M and SALSW-08S, the surrogate spike recovery for tetrachloro-m-xylene was slightly above the upper control limit. The second surrogate compound was within control limits for both samples. No qualifications were made to the associated sample data based on the surrogate spike recovery failures.

No other problems were encountered regarding data quality assurance results for this data set. The quality assurance results met the data quality objectives goals established in the Quality Assurance Plan; therefore, the data gathered from this sampling event is judged to be of acceptable quality.

Table 1. Arkansas River Sampling Location GPS Coordinates		
Sample Identification	**Latitude**	**Longitude**
ARSW-10M	34.7367175915028	-92.1891307093388
ARSW-09M	34.736521231427	-92.1894926800144
ARSW-08M	34.7361742923172	-92.1898753783963
ARSW-07M	34.7357503426873	-92.1904954542691
ARSW-06M	34.7354117609849	-92.1911291518668
ARSW-05M	34.7350847099418	-92.1916918982432
ARSW-04M	34.7348411589687	-92.1922018635105
ARSW-03M	34.7344797245689	-92.192850533933
ARSW-02M	34.7342920047685	-92.1933153167718
ARSW-01M	34.7340709334726	-92.1937374980838

M = mid depth sample

Table 2. Water Depths (ft) along the Arkansas River Sampling Transect.

	Sample Location (East to West)									
Sample ID	**ARSW-01M**	**ARSW-02M**	**ARSW-03M**	**ARSW-04M**	**ARSW-05M**	**ARSW-06M**	**ARSW-07M**	**ARSW-08M**	**ARSW-09M**	**ARSW-10M**
Total Depth (ft)	28	24	24	26	28	28	24	18	30	12
Sampling Depth (ft)	14	12	12	13	14	14	12	9	15	6

M = mid depth sample

Table 3. Saline River Sampling Location GPS Coordinates		
Sample Identification	**Latitude**	**Longitude**
SRSW-10S, -10M	34.4068057216483	-92.6254887551301
SRSW-09S, -09M	34.4067724138683	-92.6255305890846
SRSW-08S, -08M	34.406740479424	-92.6255702397786
SRSW-07S, -07M	34.4067171977363	-92.6256073942873
SRSW-06S, -06M	34.4066913515571	-92.6256452489547
SRSW-05S, -05M	34.4066698431993	-92.6256753760636
SRSW-04S, -04M	34.4066494280535	-92.6257158717451
SRSW-03S, -03M	34.406617208175	-92.625749056143
SRSW-02S, -02M	34.4065878143822	-92.6257865182627
SRSW-01S, -01M	34.4065601773547	-92.6258257014421

M = mid depth sample ; S = surface sample

Table 4. Water Depths (ft) along the Saline River Sampling Transect.

	Sample Location (East to West)									
Sample ID	**SALSW-01M**	**SALSW-02M**	**SALSW-03M**	**SALSW-04M**	**SALSW-05M**	**SALSW-06M**	**SALSW-07M**	**SALSW-08M**	**SALSW-09M**	**SALSW-10M**
Total Depth (ft)	16	16	17	17	17	18	17	16	16	16
Sampling Depth (ft)	8	8	8.5	8.5	8.5	9	8.5	8	8	8
Sample ID	**SALSW-01S**	**SALSW-02S**	**SALSW-03S**	**SALSW-04S**	**SALSW-05S**	**SALSW-06S**	**SALSW-07S**	**SALSW-08S**	**SALSW-09S**	**SALSW-10S**
Sampling Depth (ft)	1	1	1	1	1	1	1	1	1	1

M = mid depth sample; S = surface sample

Table 5. PCB Results for Surface Water Samples
Arkansas and Saline Rivers
Sampling Dates: May 13-14, 2009, respectively

	MDL	RDL	Units	ARSW-01M	ARSW-02M	ARSW-03M	ARSW-04M	ARSW-05M	ARSW-06M	ARSW-07M	ARSW-08M	ARSW-09M	ARSW-10M
PCB 1016	0.077	0.5	µg/l	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
PCB 1221	0.16	0.5	µg/l	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
PCB 1232	0.18	0.5	µg/l	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
PCB 1242	0.099	0.5	µg/l	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
PCB 1248	0.039	0.5	µg/l	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
PCB 1254	0.12	0.5	µg/l	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
PCB 1260	0.16	0.5	µg/l	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	MDL	**RDL**		**SALSW-01M**	**SALSW-02M**	**SALSW-03M**	**SALSW-04M**	**SALSW-05M**	**SALSW-06M**	**SALSW-07M**	**SALSW-08M**	**SALSW-09M**	**SALSW-10M**
PCB 1016	0.077	0.5	µg/l	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
PCB 1221	0.16	0.5	µg/l	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
PCB 1232	0.18	0.5	µg/l	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
PCB 1242	0.099	0.5	µg/l	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
PCB 1248	0.039	0.5	µg/l	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
PCB 1254	0.12	0.5	µg/l	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
PCB 1260	0.16	0.5	µg/l	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	MDL	**RDL**		**SALSW-01S**	**SALSW-02S**	**SALSW-03S**	**SALSW-04S**	**SALSW-05S**	**SALSW-06S**	**SALSW-07S**	**SALSW-08S**	**SALSW-09S**	**SALSW-10S**
PCB 1016	0.077	0.5	µg/l	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
PCB 1221	0.16	0.5	µg/l	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
PCB 1232	0.18	0.5	µg/l	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
PCB 1242	0.099	0.5	µg/l	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
PCB 1248	0.039	0.5	µg/l	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
PCB 1254	0.12	0.5	µg/l	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
PCB 1260	0.16	0.5	µg/l	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

MDL = Minimum Detection Limit or Method Detection Limit; RDL = Reported Detection Limit or Practical Quantitation Limit
ND = Not Detected in sample; M = mid depth sample; S = surface sample

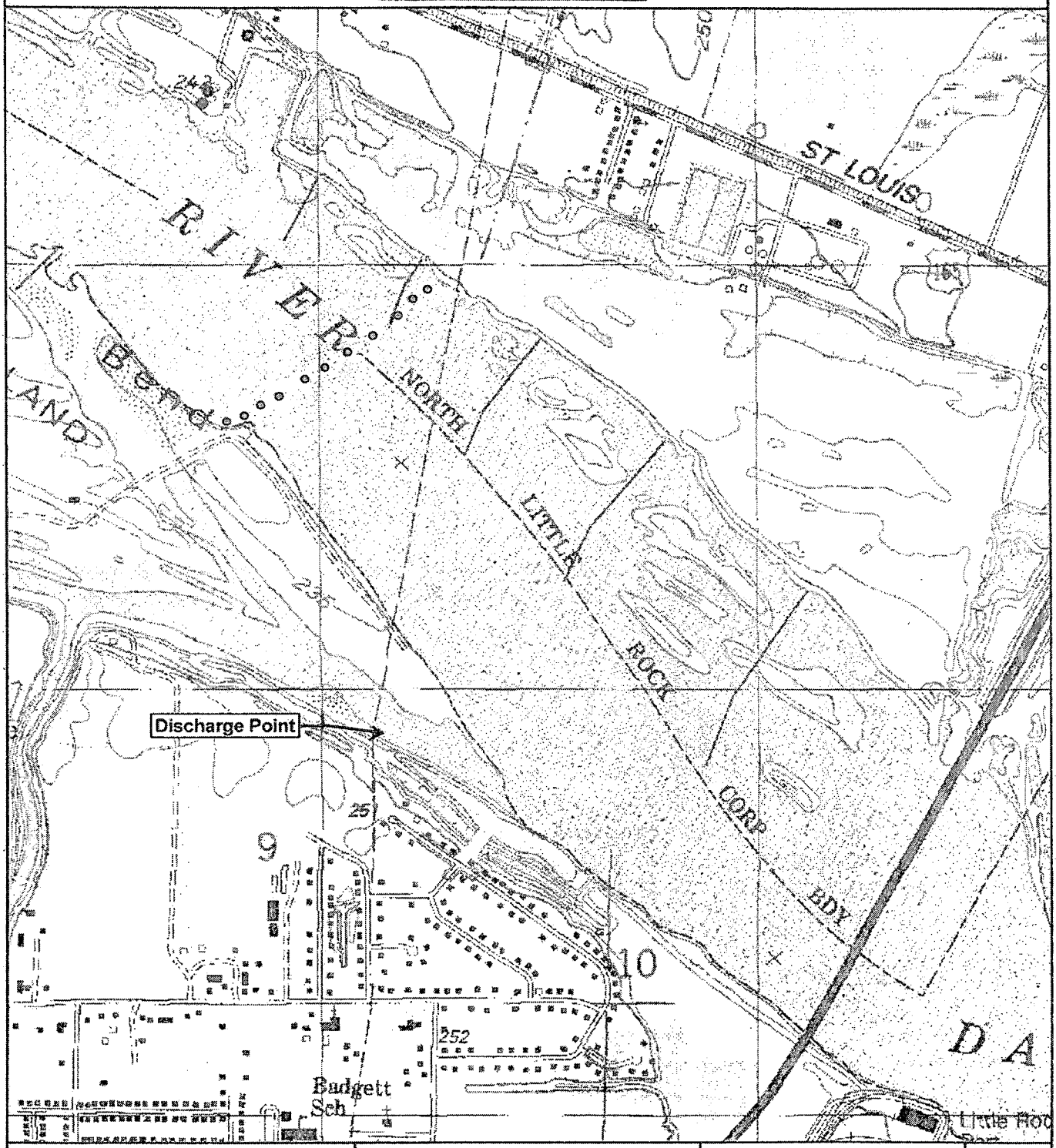
Figures

UNITED STATES DEPARTMENT
OF THE INTERIOR
GEOLOGICAL SURVEY

N

0 500 1,000 2,000 Feet

SWEET HOME
7.5 MINUTE QUADRANGLE



HYDROSTATIC TESTING
NGPL
ARKANSAS RIVER DISCHARGE POINT
PULASKI COUNTY, AR

URS
Franklin, Tennessee

SCALE:	DRAWN BY: RL	DATE: 06/11/09
1:12,000	CHECKED BY: TH	DATE: 06/11/09

G:/Saline_River-Arkansas/deliverables/figure1_samplelocations.mxd

SURFACE WATER
SAMPLE LOCATIONS

PROJECT NO:
19556722
.00001

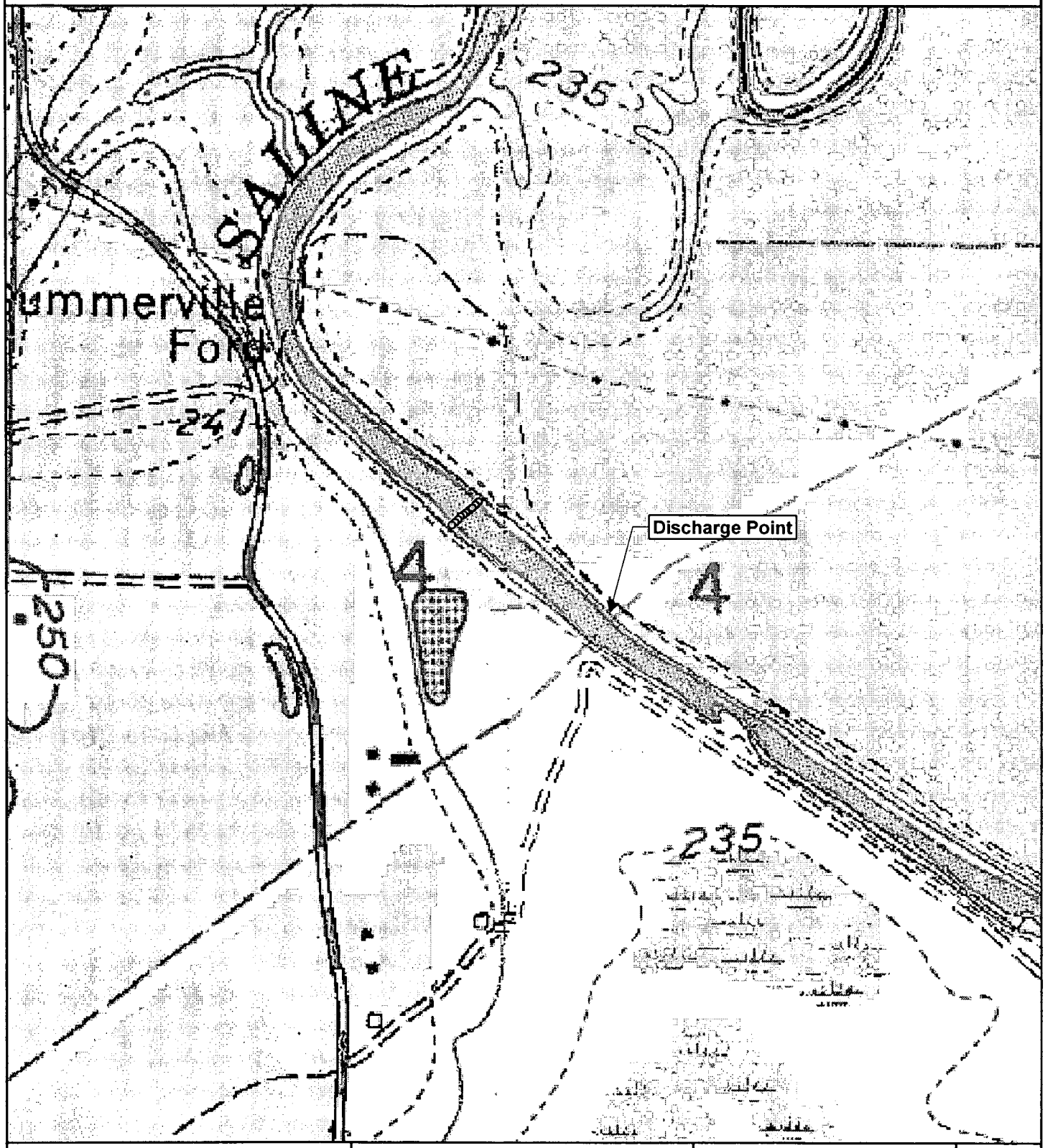
FIGURE NO:
1

UNITED STATES DEPARTMENT
OF THE INTERIOR
GEOLOGICAL SURVEY

N

0 250 500 1,000 Feet

TULL AND TRASKWOOD
7.5 MINUTE QUADRANGLES



HYDROSTATIC TESTING
NGPL
SALINE RIVER DISCHARGE POINT
GRANT COUNTY, AR

URS
Franklin, Tennessee

SCALE:	DRAWN BY: RL	DATE: 06/11/09
1:6,000	CHECKED BY: TH	DATE: 06/11/09

G:/Saline_River-Arkansas/deliverables/figure2_samplelocations.mxd

SURFACE WATER
SAMPLE LOCATIONS

PROJECT NO:
19556722
.00001

FIGURE NO:
2

Attachment 1

Arkansas River Hydrograph

weather.gov

National Weather Service
Advanced Hydrologic Prediction Service

Local weather forecast by "City, ST"
City, ST Go

National Conditions
Rivers
Satellite
Climate
Observed Precip

Local Conditions
Warnings
Weather Forecast
Radar

AHPS Documentation
User Guide

What is AHPS?
Facts
Our Partners

Feedback/Questions
Provide Feedback
Ask Questions

FLOODSMART.GOV
USA.gov

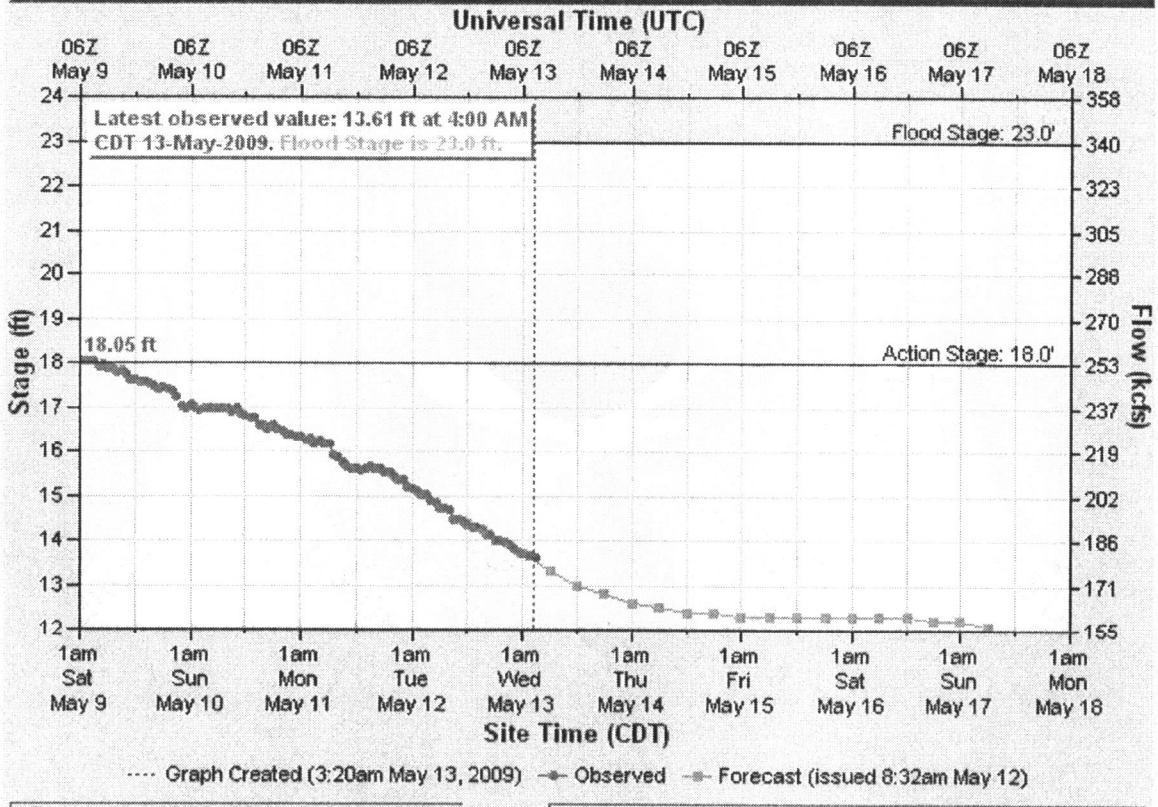
Weather Forecast Office Little Rock, AR — Arkansas Red-Basin River Forecast Center

Flash Flood Watch **Flood Advisory**

View all valid statements/warnings

Hydrograph | River at a Glance | Download | Weekly Chance of Exceeding Levels | Chance of Exceeding Levels During Entire Period

ARKANSAS RIVER AT LITTLE ROCK



LITA4 (plotting HGIRG) "Gage 0" Datum: 223.61' | Observations courtesy of the US Army Corps of Engineers LRD

Printable Image
About this graph
Tabular Data
XML
RSS
Datum: N/A
Metadata

Reliability of the Forecast: Based on current and forecast river, weather and reservoir conditions

NOTE: Forecasts for the Arkansas River at Little Rock are issued routinely year-round.

Default Hydrograph

Return to Area Map

Attachment 2

Saline River Hydrograph

weather.gov

National Weather Service
Advanced Hydrologic Prediction Service

Local weather forecast by "City, ST"
City, ST Go

National Conditions
Rivers
Satellite
Climate
Observed Precip

Local Conditions
Warnings
Weather Forecast
Radar

AHPS Documentation
User Guide

What is AHPS?
Facts
Our Partners

Feedback/Questions
Provide Feedback
Ask Questions

Observations courtesy of
USGS science for a changing world

FLOODSMART.GOV
USA.gov Government Made Easy

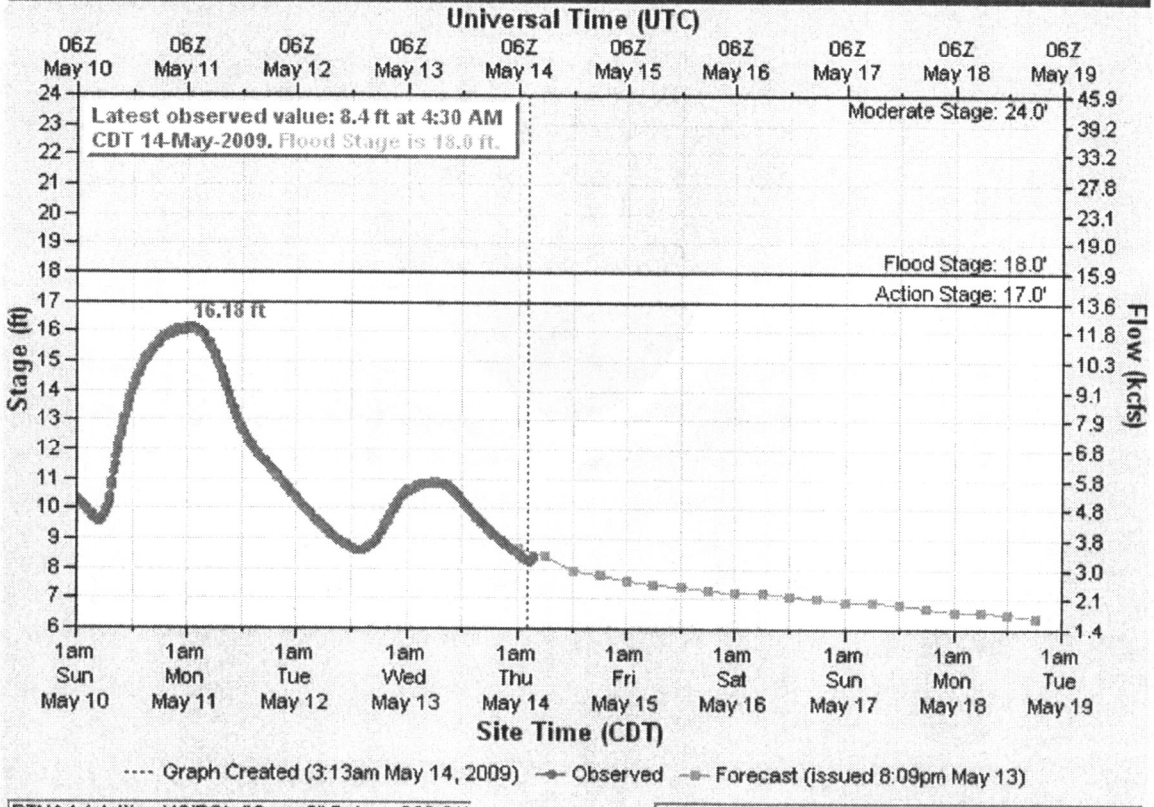
Weather Forecast Office Little Rock, AR — Lower Mississippi River Forecast Center

Flash Flood Watch | **Flood Watch**

View all valid statements/warnings

Hydrograph | River at a Glance | Download

SALINE RIVER AT BENTON



BTNA4 (plotting HGIRG) "Gage 0" Datum: 260.91'

Observations courtesy of the US Geological Survey

Printable Image
About this graph
Tabular Data
XML
RSS
Datum: N/A
Metadata

NOTE: Forecasts for the Saline River at Benton are issued routinely year-round.

Default Hydrograph

Return to Area Map

Attachment 3

Photographs of the Arkansas and Saline Rivers

& Field Notebook Copies

URS

PHOTOGRAPHIC LOG

Client Name:	Site Location:	Project No.
Natural Gas Pipeline Company of America (NGPL)	Arkansas River	19556722.00001

Photo No.	Date:
1	5/13/09

Direction Photo Taken:

North East

Description:

Gage on Interstate Bridge showing relative water levels compared to high water events.

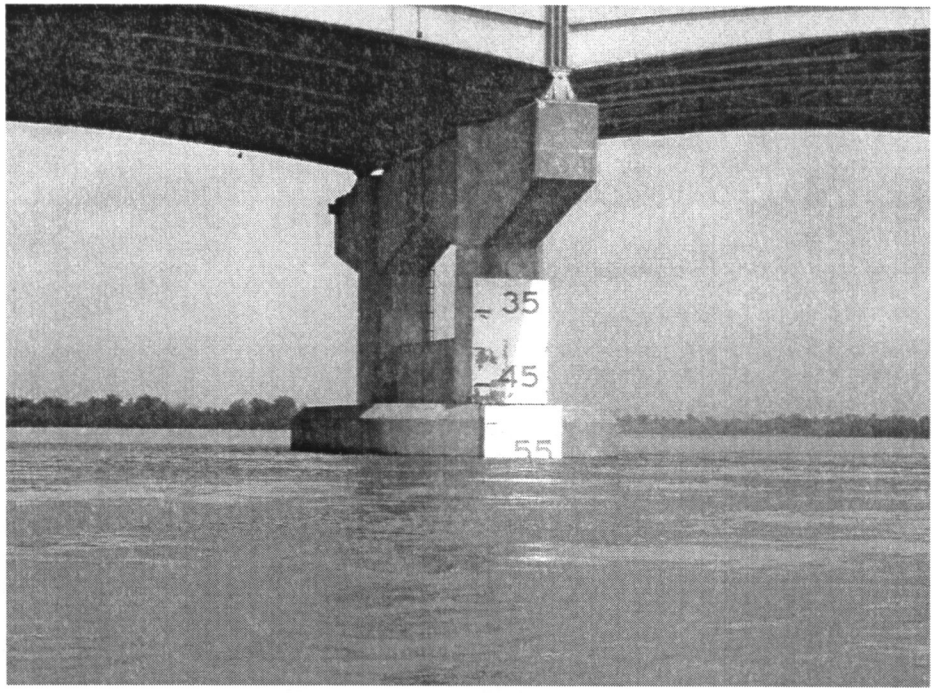


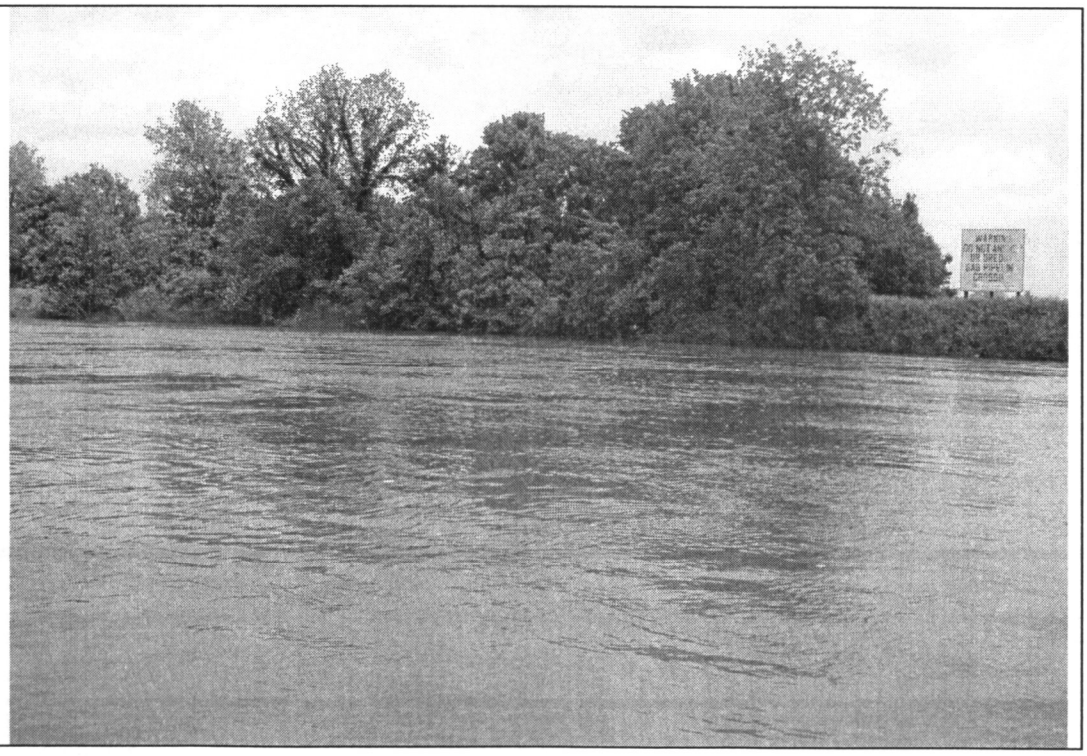
Photo No.	Date:
2	5/13/09

Direction Photo Taken:

North

Description:

Downstream of the Pipe Crossing, Looking upstream toward the sampling transect.



URS

PHOTOGRAPHIC LOG

Client Name:	Site Location:	Project No.
Natural Gas Pipeline Company of America (NGPL)	Saline River	19556722.00001

Photo No.	Date:
3	5/14/09

Direction Photo Taken:

North

Description:

Photograph of the conditions along the transect

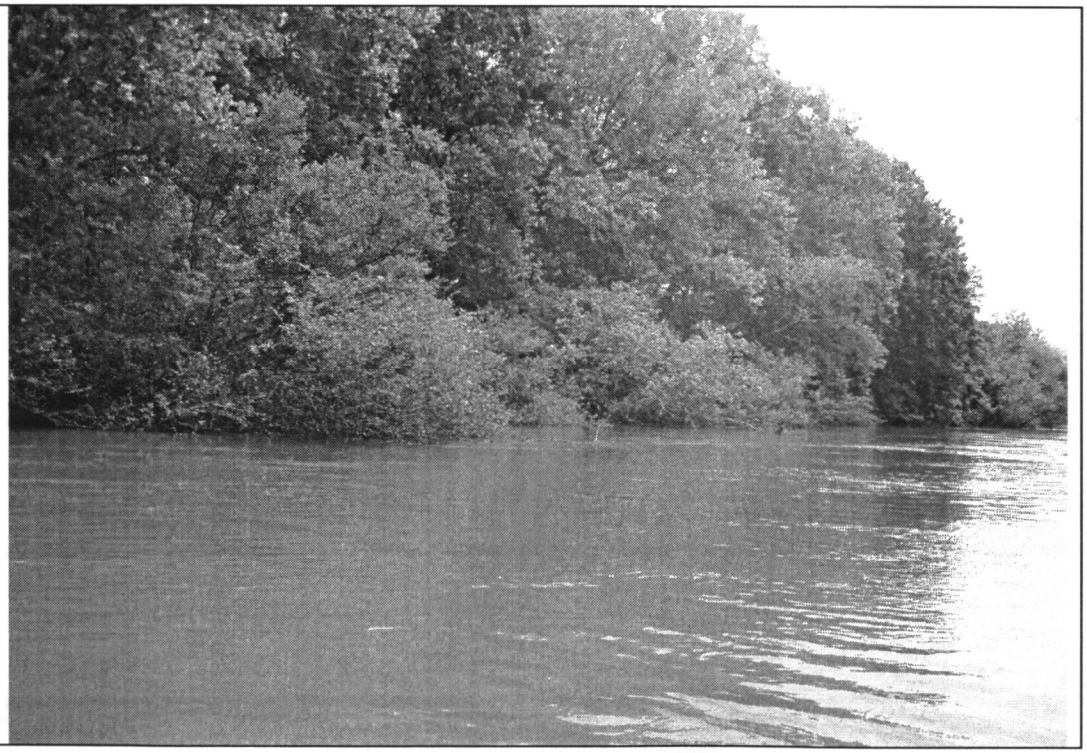
Photo No.	Date:
4	5/14/09

Direction Photo Taken:

North East

Description:

General view of the water elevation.



CURVE FORMULAS

$T = R \tan \frac{1}{2} I$

$T = \frac{50 \tan \frac{1}{2} I}{\text{Sin. } \frac{1}{2} D}$

$\text{Sin. } \frac{1}{2} D = \frac{50}{R}$

$\text{Sin. } \frac{1}{2} D = \frac{50 \tan \frac{1}{2} I}{T}$

$R = T \text{ cot. } \frac{1}{2} I$

$R = \frac{50}{\text{Sin. } \frac{1}{2} D}$

$E = R \text{ ex. sec } \frac{1}{2} I$

$E = T \tan \frac{1}{4} I$

$\text{Chord def.} = \frac{\text{chord}^2}{R}$

$\text{No. chords} = \frac{I}{D}$

$\text{Tan. def.} = \frac{1}{2} \text{ chord def.}$

The square of any distance, divided by twice the radius, will equal the distance from tangent to curve. very nearly.

To find angle for a given distance and deflection.

Rule 1. Multiply the given distance by .01745 (def. for 1° for 1 ft.) and divide given deflection by the product.

Rule 2. Multiply given deflection by 57.3, and divide the product by the given distance.

To find deflection for a given angle and distance. Multiply the angle by .01745, and the product by the distance.

GENERAL DATA

RIGHT ANGLE TRIANGLES. Square the altitude, divide by twice the base. Add quotient to base for hypotenuse.

Given Base 100, Alt. $10.10^2 \div 200 = .5$. $100 + .5 = 100.5$ hyp.

Given Hyp. 100, Alt. $25.25^2 \div 200 = 3.125$. $100 - 3.125 = 96.875 =$ Base.

Error in first example, .002; in last, .045.

To find Tons of Rail in one mile of track: multiply weight per yard by 11, and divide by 7.

LEVELING. The correction for curvature and refraction, in feet and decimals of feet is equal to $0.574 d^2$, where d is the distance in miles. The correction for curvature alone is closely, $\frac{2}{3} d^2$. The combined correction is negative.

PROBABLE ERROR. If d_1, d_2, d_3, etc. are the discrepancies of various results from the mean, and if Σd^2 = the sum of the squares of these differences and n = the number of observations, then the probable error of the mean = $\pm 0.6745 \sqrt{\frac{\Sigma d^2}{n(n-1)}}$

MINUTES IN DECIMALS OF A DEGREE

1'	.0167	11'	.1833	21'	.3500	31'	.5167	41'	.6833	51'	.8500
2	.0333	12	.2000	22	.3667	32	.5333	42	.7000	52	.8667
3	.0500	13	.2167	23	.3833	33	.5500	43	.7167	53	.8833
4	.0667	14	.2333	24	.4000	34	.5667	44	.7333	54	.9000
5	.0833	15	.2500	25	.4167	35	.5833	45	.7500	55	.9167
6	.1000	16	.2667	26	.4333	36	.6000	46	.7667	56	.9333
7	.1167	17	.2833	27	.4500	37	.6167	47	.7833	57	.9500
8	.1333	18	.3000	28	.4667	38	.6333	48	.8000	58	.9667
9	.1500	19	.3167	29	.4833	39	.6500	49	.8167	59	.9833
10	.1667	20	.3333	30	.5000	40	.6667	50	.8333	60	1.0000

INCHES IN DECIMALS OF A FOOT

1-16	3-32	1/8	3-16	1/4	5-16	3/8	1/2	5/8	3/4	7/8
.0052	.0078	.0104	.0156	.0208	.0260	.0313	.0417	.0521	.0625	.0729

1	2	3	4	5	6	7	8	9	10	11
.0833	.1667	.2500	.3333	.4167	.5000	.5833	.6667	.7500	.8333	.9167

05/[illegible]/09

0930: Arrive at Southern Boat Ramp, Prepare Sampling Kits, Ice Coolers H&S Meeting) Regarding the conditions and concerns

1030: Arrive at Proposed Transect: Position on Pipeline ROW / Buoy Anchor & Lops, Transect Relocated Upstream

1115 At Location ARSW-10M

Sample 11:16 12' TD / Collected 6'

1135 At Location ARSW-9M

MS

Sample 1135 MSD

Depth 38' / Sampled at 15'

1207 Boat Shifted closer to ARSW-07

Sample 1210 24' TD / 12' Collection

Sample ID

ARSW-07M

ARSW-07M-Dup

5/13/09

1235 At ARSW-08M

18' TD / 9' Sample

Sample ARSW-08M

1245 At ARSW-06

28' TD / 14' Sample Depth

Sample ID ARSW-06M

1300: Equipment Rinsate Collected ARSW-0[illegible]

1329 At ARSW-05M

1335 ARSW-05M

28 TD / 14 Depth

1340 At ARSW-04M

1345 Sample ARSW-04M

26 TD / 13' Depth

1410 At ARSW-03M

1415 Sample ARSW-03M

24' TD / 12' Sample

Abbt,

5/13/09

1415 Position at ARSW-02M
Sample ID ARSW-02M
1420 24 TD / Sampled at 10'

1430 Position to ARSW-01M

1435 Sample ID ARSW-01M
28 T. Depth / Sample at 14'

20702805

5/14/09

1100 at SALSW-01S & SALSW-01M

Time: 1100 TD 16'/SD 8'

1116 at SALSW-02S & SALSW-02M

TD 16'/SD 8'

1128 at SALSW-03S & SALSW-03M

SALSW-03-MS

TD 17'/SD 8.5' SALSW-03-MSD

1140 at SALSW-04S & SALSW-04M

SALSW-04M-DUP

17' TD Sample at 8.5

1155 at SALSW-05S & SALSW-05M

17' TD Sample at 8.5

5/14/09

1208 at SALSW-06S & SALSW-06M
18' TD, Sample at 9'

1225 at SALSW-07S & SALSW-07M
TD 17'/SD 8.5'

1245 at SALSW-08S & SALSW-08M
TD 16'/SD 8'

1304 at SALSW-09S & SALSW-09M
TD 16'/SD 8'

1315 at SALSW-10S & SALSW-10M
TD 16'/SD 8'

Attachment 4

ESC Laboratory Report, Chain of Custody Form,

& Quality Assurance Summary

ENVIRONMENTAL
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Mr. Todd Hunt
URS INC. - ID 1139312
1000 Corp Ctr Dr Ste 250 1 Corp. Center

Franklin, TN 37067

Report Summary

Wednesday June 03, 2009

Report Number: L402845
Samples Received: 05/15/09
Client Project:

Description: Natural Gas Pipeline Company of America

The analytical results in this report are based upon information supplied by you, the client, and are for your exclusive use. If you have any questions regarding this data package, please do not hesitate to call.

Entire Report Reviewed By: Terrie Fudge

Terrie Fudge, ESC Representative

Laboratory Certification Numbers

A2LA - 1461-01, AIHA - 100789, AL - 40660, CA - I-2327, CT - PH-0197, FL - E87487
GA - 923, IN - C-TN-01, KY - 90010, KYUST - 0016, NC - ENV375,DW21704, ND - R-140
NJ - TN002, NJ NELAP - TN002, SC - 84004, TN - 2006, VA - 00109, WV - 233
AZ - 0612, MN - 047-999-395, NY - 11742, WI - 998093910

Accreditation is only applicable to the test methods specified on each scope of accreditation held by ESC Lab Sciences.

Where applicable, sampling conducted by ESC is performed per guidance provided in laboratory standard operating procedures: 060302, 060303, and 060304.

34 Samples Reported: 05/29/09 14:31 Revised: 06/03/09 15:27

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REPORT OF ANALYSIS

Mr. Todd Hunt
URS INC. - ID 1139312
1000 Corp Ctr Dr Ste 250 1 Corp. Ce
Franklin, TN 37067

June 03, 2009

ESC Sample # : L402845-01

Date Received : May 15, 2009
Description : Natural Gas Pipeline Company of America

Site ID :

Sample ID : ARSW-10M 6FT

Project # :

Collected By : Todd D. Hunt
Collection Date : 05/13/09 11:16

Parameter	Result	MDL	RDL	Units	Q	Method	Date	Dil.
Pesticide/PCBs								
PCB 1016	U	0.077	0.50	ug/l		608	05/28/09	1
PCB 1221	U	0.16	0.50	ug/l		608	05/28/09	1
PCB 1232	U	0.18	0.50	ug/l		608	05/28/09	1
PCB 1242	U	0.099	0.50	ug/l		608	05/28/09	1
PCB 1248	U	0.039	0.50	ug/l		608	05/28/09	1
PCB 1254	U	0.12	0.50	ug/l		608	05/28/09	1
PCB 1260	U	0.16	0.50	ug/l		608	05/28/09	1
Pest/PCBs Surrogates								
Decachlorobiphenyl	61.8			% Rec.		608	05/28/09	1
Tetrachloro-m-xylene	58.5			% Rec.		608	05/28/09	1

U = ND (Not Detected)
RDL = Reported Detection Limit = LOQ = PQL = EQL
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Note:
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REPORT OF ANALYSIS

Mr. Todd Hunt
URS INC. - ID 1139312
1000 Corp Ctr Dr Ste 250 1 Corp. Ce
Franklin, TN 37067

June 03, 2009

ESC Sample # : L402845-02

Date Received : May 15, 2009
Description : Natural Gas Pipeline Company of America

Site ID :

Sample ID : ARSW-09M 15FT

Project # :

Collected By : Todd D. Hunt
Collection Date : 05/13/09 11:35

Parameter	Result	MDL	RDL	Units	Q	Method	Date	Dil.
Pesticide/PCBs								
PCB 1016	U	0.085	0.55	ug/l		608	05/28/09	1.1
PCB 1221	U	0.18	0.55	ug/l		608	05/28/09	1.1
PCB 1232	U	0.19	0.55	ug/l		608	05/28/09	1.1
PCB 1242	U	0.11	0.55	ug/l		608	05/28/09	1.1
PCB 1248	U	0.043	0.55	ug/l		608	05/28/09	1.1
PCB 1254	U	0.13	0.55	ug/l		608	05/28/09	1.1
PCB 1260	U	0.17	0.55	ug/l		608	05/28/09	1.1
Pest/PCBs Surrogates								
Decachlorobiphenyl	87.4			% Rec.		608	05/28/09	1.1
Tetrachloro-m-xylene	93.2			% Rec.		608	05/28/09	1.1

U = ND (Not Detected)
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REPORT OF ANALYSIS

Mr. Todd Hunt
URS INC. - ID 1139312
1000 Corp Ctr Dr Ste 250 1 Corp. Ce
Franklin, TN 37067

June 03, 2009

ESC Sample # : L402845-03

Date Received : May 15, 2009
Description : Natural Gas Pipeline Company of America

Site ID :

Sample ID : ARSW-07M 12FT

Project # :

Collected By : Todd D. Hunt
Collection Date : 05/13/09 12:10

Parameter	Result	MDL	RDL	Units	Q	Method	Date	Dil.
Pesticide/PCBs								
PCB 1016	U	0.077	0.50	ug/l		608	05/28/09	1
PCB 1221	U	0.16	0.50	ug/l		608	05/28/09	1
PCB 1232	U	0.18	0.50	ug/l		608	05/28/09	1
PCB 1242	U	0.099	0.50	ug/l		608	05/28/09	1
PCB 1248	U	0.039	0.50	ug/l		608	05/28/09	1
PCB 1254	U	0.12	0.50	ug/l		608	05/28/09	1
PCB 1260	U	0.16	0.50	ug/l		608	05/28/09	1
Pest/PCBs Surrogates								
Decachlorobiphenyl	70.0			% Rec.		608	05/28/09	1
Tetrachloro-m-xylene	58.9			% Rec.		608	05/28/09	1

U = ND (Not Detected)
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REPORT OF ANALYSIS

Mr. Todd Hunt
URS INC. - ID 1139312
1000 Corp Ctr Dr Ste 250 1 Corp. Ce
Franklin, TN 37067

June 03, 2009

ESC Sample # : L402845-04

Date Received : May 15, 2009
Description : Natural Gas Pipeline Company of America

Site ID :

Sample ID : ARSW-07M 12FT

Project # :

Collected By : Todd D. Hunt
Collection Date : 05/13/09 12:10

Parameter	Result	MDL	RDL	Units	Q	Method	Date	Dil.
Pesticide/PCBs								
PCB 1016	U	0.077	0.50	ug/l		608	05/28/09	1
PCB 1221	U	0.16	0.50	ug/l		608	05/28/09	1
PCB 1232	U	0.18	0.50	ug/l		608	05/28/09	1
PCB 1242	U	0.099	0.50	ug/l		608	05/28/09	1
PCB 1248	U	0.039	0.50	ug/l		608	05/28/09	1
PCB 1254	U	0.12	0.50	ug/l		608	05/28/09	1
PCB 1260	U	0.16	0.50	ug/l		608	05/28/09	1
Pest/PCBs Surrogates								
Decachlorobiphenyl	60.8			% Rec.		608	05/28/09	1
Tetrachloro-m-xylene	63.1			% Rec.		608	05/28/09	1

U = ND (Not Detected)
RDL = Reported Detection Limit = LOQ = PQL = EQL
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REPORT OF ANALYSIS

Mr. Todd Hunt
URS INC. - ID 1139312
1000 Corp Ctr Dr Ste 250 1 Corp. Ce
Franklin, TN 37067

June 03, 2009

ESC Sample # : L402845-05

Date Received : May 15, 2009
Description : Natural Gas Pipeline Company of America

Site ID :

Sample ID : ARSW-08M 9FT

Project # :

Collected By : Todd D. Hunt
Collection Date : 05/13/09 12:35

Parameter	Result	MDL	RDL	Units	Q	Method	Date	Dil.
Pesticide/PCBs								
PCB 1016	U	0.077	0.50	ug/l		608	05/28/09	1
PCB 1221	U	0.16	0.50	ug/l		608	05/28/09	1
PCB 1232	U	0.18	0.50	ug/l		608	05/28/09	1
PCB 1242	U	0.099	0.50	ug/l		608	05/28/09	1
PCB 1248	U	0.039	0.50	ug/l		608	05/28/09	1
PCB 1254	U	0.12	0.50	ug/l		608	05/28/09	1
PCB 1260	U	0.16	0.50	ug/l		608	05/28/09	1
Pest/PCBs Surrogates								
Decachlorobiphenyl	59.8			% Rec.		608	05/28/09	1
Tetrachloro-m-xylene	66.5			% Rec.		608	05/28/09	1

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REPORT OF ANALYSIS

Mr. Todd Hunt
URS INC. - ID 1139312
1000 Corp Ctr Dr Ste 250 1 Corp. Ce
Franklin, TN 37067

June 03, 2009

ESC Sample # : L402845-06

Site ID :

Project # :

Date Received : May 15, 2009
Description : Natural Gas Pipeline Company of America

Sample ID : ARSW-06M 14FT

Collected By : Todd D. Hunt
Collection Date : 05/13/09 12:45

Parameter	Result	MDL	RDL	Units	Q	Method	Date	Dil.
Pesticide/PCBs								
PCB 1016	U	0.077	0.50	ug/l		608	05/28/09	1
PCB 1221	U	0.16	0.50	ug/l		608	05/28/09	1
PCB 1232	U	0.18	0.50	ug/l		608	05/28/09	1
PCB 1242	U	0.099	0.50	ug/l		608	05/28/09	1
PCB 1248	U	0.039	0.50	ug/l		608	05/28/09	1
PCB 1254	U	0.12	0.50	ug/l		608	05/28/09	1
PCB 1260	U	0.16	0.50	ug/l		608	05/28/09	1
Pest/PCBs Surrogates								
Decachlorobiphenyl	73.5			% Rec.		608	05/28/09	1
Tetrachloro-m-xylene	71.6			% Rec.		608	05/28/09	1

U = ND (Not Detected)
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REPORT OF ANALYSIS

Mr. Todd Hunt
URS INC. - ID 1139312
1000 Corp Ctr Dr Ste 250 1 Corp. Ce
Franklin, TN 37067

June 03, 2009

ESC Sample # : L402845-07

Site ID :

Project # :

Date Received : May 15, 2009
Description : Natural Gas Pipeline Company of America

Sample ID : ARSW-05M 14FT

Collected By : Todd D. Hunt
Collection Date : 05/13/09 13:35

Parameter	Result	MDL	RDL	Units	Q	Method	Date	Dil.
Pesticide/PCBs								
PCB 1016	U	0.077	0.50	ug/l		608	05/28/09	1
PCB 1221	U	0.16	0.50	ug/l		608	05/28/09	1
PCB 1232	U	0.18	0.50	ug/l		608	05/28/09	1
PCB 1242	U	0.099	0.50	ug/l		608	05/28/09	1
PCB 1248	U	0.039	0.50	ug/l		608	05/28/09	1
PCB 1254	U	0.12	0.50	ug/l		608	05/28/09	1
PCB 1260	U	0.16	0.50	ug/l		608	05/28/09	1
Pest/PCBs Surrogates								
Decachlorobiphenyl	20.3			% Rec.		608	05/28/09	1
Tetrachloro-m-xylene	12.7			% Rec.	J2	608	05/28/09	1

U = ND (Not Detected)
RDL = Reported Detection Limit = LOQ = PQL = EQL
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REPORT OF ANALYSIS

Mr. Todd Hunt
URS INC. - ID 1139312
1000 Corp Ctr Dr Ste 250 1 Corp. Ce
Franklin, TN 37067

June 03, 2009

ESC Sample # : L402845-08

Site ID :

Project # :

Date Received : May 15, 2009
Description : Natural Gas Pipeline Company of America

Sample ID : ARSW-05MEB

Collected By : Todd D. Hunt
Collection Date : 05/13/09 13:00

Parameter	Result	MDL	RDL	Units	Q	Method	Date	Dil.
Pesticide/PCBs								
PCB 1016	U	0.077	0.50	ug/l		608	05/28/09	1
PCB 1221	U	0.16	0.50	ug/l		608	05/28/09	1
PCB 1232	U	0.18	0.50	ug/l		608	05/28/09	1
PCB 1242	U	0.099	0.50	ug/l		608	05/28/09	1
PCB 1248	U	0.039	0.50	ug/l		608	05/28/09	1
PCB 1254	U	0.12	0.50	ug/l		608	05/28/09	1
PCB 1260	U	0.16	0.50	ug/l		608	05/28/09	1
Pest/PCBs Surrogates								
Decachlorobiphenyl	73.1			% Rec.		608	05/28/09	1
Tetrachloro-m-xylene	82.9			% Rec.		608	05/28/09	1

U = ND (Not Detected)
RDL = Reported Detection Limit = LOQ = PQL = EQL
MDL = Minimum Detection Limit = LOD = SQL(TRRP)
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Reported: 05/29/09 14:31 Revised: 06/03/09 15:27

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REPORT OF ANALYSIS

Mr. Todd Hunt
URS INC. - ID 1139312
1000 Corp Ctr Dr Ste 250 1 Corp. Ce
Franklin, TN 37067

June 03, 2009

ESC Sample # : L402845-09

Date Received : May 15, 2009
Description : Natural Gas Pipeline Company of America

Site ID :

Sample ID : ARSW-04M 13FT

Project # :

Collected By : Todd D. Hunt
Collection Date : 05/13/09 13:45

Parameter	Result	MDL	RDL	Units	Q	Method	Date	Dil.
Pesticide/PCBs								
PCB 1016	U	0.077	0.50	ug/l		608	05/28/09	1
PCB 1221	U	0.16	0.50	ug/l		608	05/28/09	1
PCB 1232	U	0.18	0.50	ug/l		608	05/28/09	1
PCB 1242	U	0.099	0.50	ug/l		608	05/28/09	1
PCB 1248	U	0.039	0.50	ug/l		608	05/28/09	1
PCB 1254	U	0.12	0.50	ug/l		608	05/28/09	1
PCB 1260	U	0.16	0.50	ug/l		608	05/28/09	1
Pest/PCBs Surrogates								
Decachlorobiphenyl	75.7			% Rec.		608	05/28/09	1
Tetrachloro-m-xylene	91.0			% Rec.		608	05/28/09	1

U = ND (Not Detected)
RDL = Reported Detection Limit = LOQ = PQL = EQL
MDL = Minimum Detection Limit = LOD = SQL(TRRP)
Note:
The reported analytical results relate only to the sample submitted.

Reported: 05/29/09 14:31 Revised: 06/03/09 15:27

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REPORT OF ANALYSIS

Mr. Todd Hunt
URS INC. - ID 1139312
1000 Corp Ctr Dr Ste 250 1 Corp. Ce
Franklin, TN 37067

June 03, 2009

ESC Sample # : L402845-10

Site ID :

Project # :

Date Received : May 15, 2009
Description : Natural Gas Pipeline Company of America

Sample ID : ARSW-03M 12FT

Collected By : Todd D. Hunt
Collection Date : 05/13/09 14:10

Parameter	Result	MDL	RDL	Units	Q	Method	Date	Dil.
Pesticide/PCBs								
PCB 1016	U	0.077	0.50	ug/l		608	05/28/09	1
PCB 1221	U	0.16	0.50	ug/l		608	05/28/09	1
PCB 1232	U	0.18	0.50	ug/l		608	05/28/09	1
PCB 1242	U	0.099	0.50	ug/l		608	05/28/09	1
PCB 1248	U	0.039	0.50	ug/l		608	05/28/09	1
PCB 1254	U	0.12	0.50	ug/l		608	05/28/09	1
PCB 1260	U	0.16	0.50	ug/l		608	05/28/09	1
Pest/PCBs Surrogates								
Decachlorobiphenyl	82.6			% Rec.		608	05/28/09	1
Tetrachloro-m-xylene	77.4			% Rec.		608	05/28/09	1

U = ND (Not Detected)
RDL = Reported Detection Limit = LOQ = PQL = EQL
MDL = Minimum Detection Limit = LOD = SQL(TRRP)
Note:
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Reported: 05/29/09 14:31 Revised: 06/03/09 15:27

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REPORT OF ANALYSIS

Mr. Todd Hunt
URS INC. - ID 1139312
1000 Corp Ctr Dr Ste 250 1 Corp. Ce
Franklin, TN 37067

June 03, 2009

ESC Sample # : L402845-11

Date Received : May 15, 2009
Description : Natural Gas Pipeline Company of America

Site ID :

Sample ID : ARSW-02M 12FT

Project # :

Collected By : Todd D. Hunt
Collection Date : 05/13/09 14:20

Parameter	Result	MDL	RDL	Units	Q	Method	Date	Dil.
Pesticide/PCBs								
PCB 1016	U	0.077	0.50	ug/l		608	05/28/09	1
PCB 1221	U	0.16	0.50	ug/l		608	05/28/09	1
PCB 1232	U	0.18	0.50	ug/l		608	05/28/09	1
PCB 1242	U	0.099	0.50	ug/l		608	05/28/09	1
PCB 1248	U	0.039	0.50	ug/l		608	05/28/09	1
PCB 1254	U	0.12	0.50	ug/l		608	05/28/09	1
PCB 1260	U	0.16	0.50	ug/l		608	05/28/09	1
Pest/PCBs Surrogates								
Decachlorobiphenyl	115.			% Rec.		608	05/28/09	1
Tetrachloro-m-xylene	62.9			% Rec.		608	05/28/09	1

U = ND (Not Detected)
RDL = Reported Detection Limit = LOQ = PQL = EQL
MDL = Minimum Detection Limit = LOD = SQL(TRRP)
Note:
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Reported: 05/29/09 14:31 Revised: 06/03/09 15:27

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REPORT OF ANALYSIS

Mr. Todd Hunt
URS INC. - ID 1139312
1000 Corp Ctr Dr Ste 250 1 Corp. Ce
Franklin, TN 37067

June 03, 2009

ESC Sample # : L402845-12

Site ID :

Project # :

Date Received : May 15, 2009
Description : Natural Gas Pipeline Company of America

Sample ID : ARSW-01M 14FT

Collected By : Todd D. Hunt
Collection Date : 05/13/09 14:35

Parameter	Result	MDL	RDL	Units	Q	Method	Date	Dil.
Pesticide/PCBs								
PCB 1016	U	0.077	0.50	ug/l		608	05/28/09	1
PCB 1221	U	0.16	0.50	ug/l		608	05/28/09	1
PCB 1232	U	0.18	0.50	ug/l		608	05/28/09	1
PCB 1242	U	0.099	0.50	ug/l		608	05/28/09	1
PCB 1248	U	0.039	0.50	ug/l		608	05/28/09	1
PCB 1254	U	0.12	0.50	ug/l		608	05/28/09	1
PCB 1260	U	0.16	0.50	ug/l		608	05/28/09	1
Pest/PCBs Surrogates								
Decachlorobiphenyl	113.			% Rec.		608	05/28/09	1
Tetrachloro-m-xylene	85.7			% Rec.		608	05/28/09	1

U = ND (Not Detected)
RDL = Reported Detection Limit = LOQ = PQL = EQL
MDL = Minimum Detection Limit = LOD = SQL(TRRP)
Note:
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Est. 1970

REPORT OF ANALYSIS

Mr. Todd Hunt
URS INC. - ID 1139312
1000 Corp Ctr Dr Ste 250 1 Corp. Ce
Franklin, TN 37067

June 03, 2009

ESC Sample # : L402845-13

Site ID :

Project # :

Date Received : May 15, 2009
Description : Natural Gas Pipeline Company of America

Sample ID : SALSW-01S 1FT

Collected By : Todd D. Hunt
Collection Date : 05/14/09 11:00

Parameter	Result	MDL	RDL	Units	Q	Method	Date	Dil.
Pesticide/PCBs								
PCB 1016	U	0.077	0.50	ug/l		608	05/29/09	1
PCB 1221	U	0.16	0.50	ug/l		608	05/29/09	1
PCB 1232	U	0.18	0.50	ug/l		608	05/29/09	1
PCB 1242	U	0.099	0.50	ug/l		608	05/29/09	1
PCB 1248	U	0.039	0.50	ug/l		608	05/29/09	1
PCB 1254	U	0.12	0.50	ug/l		608	05/29/09	1
PCB 1260	U	0.16	0.50	ug/l		608	05/29/09	1
Pest/PCBs Surrogates								
Decachlorobiphenyl	113.			% Rec.		608	05/29/09	1
Tetrachloro-m-xylene	103.			% Rec.		608	05/29/09	1

U = ND (Not Detected)
RDL = Reported Detection Limit = LOQ = PQL = EQL
MDL = Minimum Detection Limit = LOD = SQL(TRRP)
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REPORT OF ANALYSIS

Mr. Todd Hunt
URS INC. - ID 1139312
1000 Corp Ctr Dr Ste 250 1 Corp. Ce
Franklin, TN 37067

June 03, 2009

ESC Sample # : L402845-14

Date Received : May 15, 2009
Description : Natural Gas Pipeline Company of America

Site ID :

Sample ID : SALSW-01M 8FT

Project # :

Collected By : Todd D. Hunt
Collection Date : 05/14/09 11:00

Parameter	Result	MDL	RDL	Units	Q	Method	Date	Dil.
Pesticide/PCBs								
PCB 1016	U	0.077	0.50	ug/l		608	05/29/09	1
PCB 1221	U	0.16	0.50	ug/l		608	05/29/09	1
PCB 1232	U	0.18	0.50	ug/l		608	05/29/09	1
PCB 1242	U	0.099	0.50	ug/l		608	05/29/09	1
PCB 1248	U	0.039	0.50	ug/l		608	05/29/09	1
PCB 1254	U	0.12	0.50	ug/l		608	05/29/09	1
PCB 1260	U	0.16	0.50	ug/l		608	05/29/09	1
Pest/PCBs Surrogates								
Decachlorobiphenyl	81.2			% Rec.		608	05/29/09	1
Tetrachloro-m-xylene	90.7			% Rec.		608	05/29/09	1

U = ND (Not Detected)
RDL = Reported Detection Limit = LOQ = PQL = EQL
MDL = Minimum Detection Limit = LOD = SQL(TRRP)
Note:
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REPORT OF ANALYSIS

Mr. Todd Hunt
URS INC. - ID 1139312
1000 Corp Ctr Dr Ste 250 1 Corp. Ce
Franklin, TN 37067

June 03, 2009

ESC Sample # : L402845-15

Date Received : May 15, 2009
Description : Natural Gas Pipeline Company of America

Site ID :

Sample ID : SALSW-02S 1FT

Project # :

Collected By : Todd D. Hunt
Collection Date : 05/14/09 11:16

Parameter	Result	MDL	RDL	Units	Q	Method	Date	Dil.
Pesticide/PCBs								
PCB 1016	U	0.077	0.50	ug/l		608	05/29/09	1
PCB 1221	U	0.16	0.50	ug/l		608	05/29/09	1
PCB 1232	U	0.18	0.50	ug/l		608	05/29/09	1
PCB 1242	U	0.099	0.50	ug/l		608	05/29/09	1
PCB 1248	U	0.039	0.50	ug/l		608	05/29/09	1
PCB 1254	U	0.12	0.50	ug/l		608	05/29/09	1
PCB 1260	U	0.16	0.50	ug/l		608	05/29/09	1
Pest/PCBs Surrogates								
Decachlorobiphenyl	99.8			% Rec.		608	05/29/09	1
Tetrachloro-m-xylene	91.5			% Rec.		608	05/29/09	1

U = ND (Not Detected)
RDL = Reported Detection Limit = LOQ = PQL = EQL
MDL = Minimum Detection Limit = LOD = SQL(TRRP)
Note:
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REPORT OF ANALYSIS

Mr. Todd Hunt
URS INC. - ID 1139312
1000 Corp Ctr Dr Ste 250 1 Corp. Ce
Franklin, TN 37067

June 03, 2009

ESC Sample # : L402845-16

Site ID :

Project # :

Date Received : May 15, 2009
Description : Natural Gas Pipeline Company of America

Sample ID : SALSW-02M 8FT

Collected By : Todd D. Hunt
Collection Date : 05/14/09 11:16

Parameter	Result	MDL	RDL	Units	Q	Method	Date	Dil.
Pesticide/PCBs								
PCB 1016	U	0.077	0.50	ug/l		608	05/29/09	1
PCB 1221	U	0.16	0.50	ug/l		608	05/29/09	1
PCB 1232	U	0.18	0.50	ug/l		608	05/29/09	1
PCB 1242	U	0.099	0.50	ug/l		608	05/29/09	1
PCB 1248	U	0.039	0.50	ug/l		608	05/29/09	1
PCB 1254	U	0.12	0.50	ug/l		608	05/29/09	1
PCB 1260	U	0.16	0.50	ug/l		608	05/29/09	1
Pest/PCBs Surrogates								
Decachlorobiphenyl	102.			% Rec.		608	05/29/09	1
Tetrachloro-m-xylene	124.			% Rec.	J1	608	05/29/09	1

U = ND (Not Detected)
RDL = Reported Detection Limit = LOQ = PQL = EQL
MDL = Minimum Detection Limit = LOD = SQL(TRRP)
Note:
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REPORT OF ANALYSIS

Mr. Todd Hunt
URS INC. - ID 1139312
1000 Corp Ctr Dr Ste 250 1 Corp. Ce
Franklin, TN 37067

June 03, 2009

ESC Sample # : L402845-17

Date Received : May 15, 2009
Description : Natural Gas Pipeline Company of America

Site ID :

Sample ID : SALSW-04S-DUP 1FT

Project # :

Collected By : Todd D. Hunt
Collection Date : 05/14/09 11:40

Parameter	Result	MDL	RDL	Units	Q	Method	Date	Dil.
Pesticide/PCBs								
PCB 1016	U	0.077	0.50	ug/l		608	05/29/09	1
PCB 1221	U	0.16	0.50	ug/l		608	05/29/09	1
PCB 1232	U	0.18	0.50	ug/l		608	05/29/09	1
PCB 1242	U	0.099	0.50	ug/l		608	05/29/09	1
PCB 1248	U	0.039	0.50	ug/l		608	05/29/09	1
PCB 1254	U	0.12	0.50	ug/l		608	05/29/09	1
PCB 1260	U	0.16	0.50	ug/l		608	05/29/09	1
Pest/PCBs Surrogates								
Decachlorobiphenyl	83.0			% Rec.		608	05/29/09	1
Tetrachloro-m-xylene	82.9			% Rec.		608	05/29/09	1

U = ND (Not Detected)
RDL = Reported Detection Limit = LOQ = PQL = EQL
MDL = Minimum Detection Limit = LOD = SQL(TRRP)
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REPORT OF ANALYSIS

Mr. Todd Hunt
URS INC. - ID 1139312
1000 Corp Ctr Dr Ste 250 1 Corp. Ce
Franklin, TN 37067

June 03, 2009

ESC Sample # : L402845-18

Site ID :

Project # :

Date Received : May 15, 2009
Description : Natural Gas Pipeline Company of America

Sample ID : SALSW-06M 9FT

Collected By : Todd D. Hunt
Collection Date : 05/14/09 12:08

Parameter	Result	MDL	RDL	Units	Q	Method	Date	Dil.
Pesticide/PCBs								
PCB 1016	U	0.077	0.50	ug/l		608	06/02/09	1
PCB 1221	U	0.16	0.50	ug/l		608	06/02/09	1
PCB 1232	U	0.18	0.50	ug/l		608	06/02/09	1
PCB 1242	U	0.099	0.50	ug/l		608	06/02/09	1
PCB 1248	U	0.039	0.50	ug/l		608	06/02/09	1
PCB 1254	U	0.12	0.50	ug/l		608	06/02/09	1
PCB 1260	U	0.16	0.50	ug/l		608	06/02/09	1
Pest/PCBs Surrogates								
Decachlorobiphenyl	76.2			% Rec.		608	06/02/09	1
Tetrachloro-m-xylene	63.3			% Rec.		608	06/02/09	1

U = ND (Not Detected)
RDL = Reported Detection Limit = LOQ = PQL = EQL
MDL = Minimum Detection Limit = LOD = SQL(TRRP)
Note:
The reported analytical results relate only to the sample submitted.

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REPORT OF ANALYSIS

Mr. Todd Hunt
URS INC. - ID 1139312
1000 Corp Ctr Dr Ste 250 1 Corp. Ce
Franklin, TN 37067

June 03, 2009

ESC Sample # : L402845-19

Site ID :

Project # :

Date Received : May 15, 2009
Description : Natural Gas Pipeline Company of America

Sample ID : SALSW-07S 1FT

Collected By : Todd D. Hunt
Collection Date : 05/14/09 12:25

Parameter	Result	MDL	RDL	Units	Q	Method	Date	Dil.
Pesticide/PCBs								
PCB 1016	U	0.077	0.50	ug/l		608	06/02/09	1
PCB 1221	U	0.16	0.50	ug/l		608	06/02/09	1
PCB 1232	U	0.18	0.50	ug/l		608	06/02/09	1
PCB 1242	U	0.099	0.50	ug/l		608	06/02/09	1
PCB 1248	U	0.039	0.50	ug/l		608	06/02/09	1
PCB 1254	U	0.12	0.50	ug/l		608	06/02/09	1
PCB 1260	U	0.16	0.50	ug/l		608	06/02/09	1
Pest/PCBs Surrogates								
Decachlorobiphenyl	69.5			% Rec.		608	06/02/09	1
Tetrachloro-m-xylene	75.2			% Rec.		608	06/02/09	1

U = ND (Not Detected)
RDL = Reported Detection Limit = LOQ = PQL = EQL
MDL = Minimum Detection Limit = LOD = SQL(TRRP)
Note:
The reported analytical results relate only to the sample submitted.

Reported: 05/29/09 14:31 Revised: 06/03/09 15:28

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REPORT OF ANALYSIS

Mr. Todd Hunt
URS INC. - ID 1139312
1000 Corp Ctr Dr Ste 250 1 Corp. Ce
Franklin, TN 37067

June 03, 2009

ESC Sample # : L402845-20

Site ID :

Project # :

Date Received : May 15, 2009
Description : Natural Gas Pipeline Company of America

Sample ID : SALSW-07M 8.5FT

Collected By : Todd D. Hunt
Collection Date : 05/14/09 12:25

Parameter	Result	MDL	RDL	Units	Q	Method	Date	Dil.
Pesticide/PCBs								
PCB 1016	U	0.077	0.50	ug/l		608	06/02/09	1
PCB 1221	U	0.16	0.50	ug/l		608	06/02/09	1
PCB 1232	U	0.18	0.50	ug/l		608	06/02/09	1
PCB 1242	U	0.099	0.50	ug/l		608	06/02/09	1
PCB 1248	U	0.039	0.50	ug/l		608	06/02/09	1
PCB 1254	U	0.12	0.50	ug/l		608	06/02/09	1
PCB 1260	U	0.16	0.50	ug/l		608	06/02/09	1
Pest/PCBs Surrogates								
Decachlorobiphenyl	93.5			% Rec.		608	06/02/09	1
Tetrachloro-m-xylene	95.5			% Rec.		608	06/02/09	1

U = ND (Not Detected)
RDL = Reported Detection Limit = LOQ = PQL = EQL
MDL = Minimum Detection Limit = LOD = SQL(TRRP)
Note:
The reported analytical results relate only to the sample submitted.

Reported: 05/29/09 14:31 Revised: 06/03/09 15:28

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REPORT OF ANALYSIS

Mr. Todd Hunt
URS INC. - ID 1139312
1000 Corp Ctr Dr Ste 250 1 Corp. Ce
Franklin, TN 37067

June 03, 2009

ESC Sample # : L402845-21

Site ID :

Project # :

Date Received : May 15, 2009
Description : Natural Gas Pipeline Company of America

Sample ID : SALSW-08S 1FT

Collected By : Todd D. Hunt
Collection Date : 05/14/09 12:45

Parameter	Result	MDL	RDL	Units	Q	Method	Date	Dil.
Pesticide/PCBs								
PCB 1016	U	0.077	0.50	ug/l		608	06/02/09	1
PCB 1221	U	0.16	0.50	ug/l		608	06/02/09	1
PCB 1232	U	0.18	0.50	ug/l		608	06/02/09	1
PCB 1242	U	0.099	0.50	ug/l		608	06/02/09	1
PCB 1248	U	0.039	0.50	ug/l		608	06/02/09	1
PCB 1254	U	0.12	0.50	ug/l		608	06/02/09	1
PCB 1260	U	0.16	0.50	ug/l		608	06/02/09	1
Pest/PCBs Surrogates								
Decachlorobiphenyl	87.4			% Rec.		608	06/02/09	1
Tetrachloro-m-xylene	117.			% Rec.	J1	608	06/02/09	1

U = ND (Not Detected)
RDL = Reported Detection Limit = LOQ = PQL = EQL
MDL = Minimum Detection Limit = LOD = SQL(TRRP)
Note:
The reported analytical results relate only to the sample submitted.

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REPORT OF ANALYSIS

Mr. Todd Hunt
URS INC. - ID 1139312
1000 Corp Ctr Dr Ste 250 1 Corp. Ce
Franklin, TN 37067

June 03, 2009

ESC Sample # : L402845-22

Site ID :

Project # :

Date Received : May 15, 2009
Description : Natural Gas Pipeline Company of America

Sample ID : SALSW-08M 8FT

Collected By : Todd D. Hunt
Collection Date : 05/14/09 12:45

Parameter	Result	MDL	RDL	Units	Q	Method	Date	Dil.
Pesticide/PCBs								
PCB 1016	U	0.077	0.50	ug/l		608	06/01/09	1
PCB 1221	U	0.16	0.50	ug/l		608	06/01/09	1
PCB 1232	U	0.18	0.50	ug/l		608	06/01/09	1
PCB 1242	U	0.099	0.50	ug/l		608	06/01/09	1
PCB 1248	U	0.039	0.50	ug/l		608	06/01/09	1
PCB 1254	U	0.12	0.50	ug/l		608	06/01/09	1
PCB 1260	U	0.16	0.50	ug/l		608	06/01/09	1
Pest/PCBs Surrogates								
Decachlorobiphenyl	99.3			% Rec.		608	06/01/09	1
Tetrachloro-m-xylene	95.1			% Rec.		608	06/01/09	1

U = ND (Not Detected)
RDL = Reported Detection Limit = LOQ = PQL = EQL
MDL = Minimum Detection Limit = LOD = SQL(TRRP)
Note:
The reported analytical results relate only to the sample submitted.

Reported: 05/29/09 14:31 Revised: 06/03/09 15:28

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REPORT OF ANALYSIS

Mr. Todd Hunt
URS INC. - ID 1139312
1000 Corp Ctr Dr Ste 250 1 Corp. Ce
Franklin, TN 37067

June 03, 2009

ESC Sample # : L402845-23

Site ID :

Project # :

Date Received : May 15, 2009
Description : Natural Gas Pipeline Company of America

Sample ID : SALSW-09S 1FT

Collected By : Todd D. Hunt
Collection Date : 05/14/09 13:04

Parameter	Result	MDL	RDL	Units	Q	Method	Date	Dil.
Pesticide/PCBs								
PCB 1016	U	0.077	0.50	ug/l		608	06/01/09	1
PCB 1221	U	0.16	0.50	ug/l		608	06/01/09	1
PCB 1232	U	0.18	0.50	ug/l		608	06/01/09	1
PCB 1242	U	0.099	0.50	ug/l		608	06/01/09	1
PCB 1248	U	0.039	0.50	ug/l		608	06/01/09	1
PCB 1254	U	0.12	0.50	ug/l		608	06/01/09	1
PCB 1260	U	0.16	0.50	ug/l		608	06/01/09	1
Pest/PCBs Surrogates								
Decachlorobiphenyl	76.7			% Rec.		608	06/01/09	1
Tetrachloro-m-xylene	102.			% Rec.		608	06/01/09	1

U = ND (Not Detected)
RDL = Reported Detection Limit = LOQ = PQL = EQL
MDL = Minimum Detection Limit = LOD = SQL(TRRP)
Note:
The reported analytical results relate only to the sample submitted.

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REPORT OF ANALYSIS

Mr. Todd Hunt
URS INC. - ID 1139312
1000 Corp Ctr Dr Ste 250 1 Corp. Ce
Franklin, TN 37067

June 03, 2009

ESC Sample # : L402845-24

Site ID :

Project # :

Date Received : May 15, 2009
Description : Natural Gas Pipeline Company of America

Sample ID : SALSW-09M 8FT

Collected By : Todd D. Hunt
Collection Date : 05/14/09 13:04

Parameter	Result	MDL	RDL	Units	Q	Method	Date	Dil.
Pesticide/PCBs								
PCB 1016	U	0.077	0.50	ug/l		608	06/01/09	1
PCB 1221	U	0.16	0.50	ug/l		608	06/01/09	1
PCB 1232	U	0.18	0.50	ug/l		608	06/01/09	1
PCB 1242	U	0.099	0.50	ug/l		608	06/01/09	1
PCB 1248	U	0.039	0.50	ug/l		608	06/01/09	1
PCB 1254	U	0.12	0.50	ug/l		608	06/01/09	1
PCB 1260	U	0.16	0.50	ug/l		608	06/01/09	1
Pest/PCBs Surrogates								
Decachlorobiphenyl	83.1			% Rec.		608	06/01/09	1
Tetrachloro-m-xylene	69.2			% Rec.		608	06/01/09	1

U = ND (Not Detected)
RDL = Reported Detection Limit = LOQ = PQL = EQL
MDL = Minimum Detection Limit = LOD = SQL(TRRP)
Note:
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REPORT OF ANALYSIS

Mr. Todd Hunt
URS INC. - ID 1139312
1000 Corp Ctr Dr Ste 250 1 Corp. Ce
Franklin, TN 37067

June 03, 2009

ESC Sample # : L402845-25

Date Received : May 15, 2009
Description : Natural Gas Pipeline Company of America

Site ID :

Sample ID : SALSW-10S 1TF

Project # :

Collected By : Todd D. Hunt
Collection Date : 05/14/09 13:15

Parameter	Result	MDL	RDL	Units	Q	Method	Date	Dil.
Pesticide/PCBs								
PCB 1016	U	0.077	0.50	ug/l		608	06/01/09	1
PCB 1221	U	0.16	0.50	ug/l		608	06/01/09	1
PCB 1232	U	0.18	0.50	ug/l		608	06/01/09	1
PCB 1242	U	0.099	0.50	ug/l		608	06/01/09	1
PCB 1248	U	0.039	0.50	ug/l		608	06/01/09	1
PCB 1254	U	0.12	0.50	ug/l		608	06/01/09	1
PCB 1260	U	0.16	0.50	ug/l		608	06/01/09	1
Pest/PCBs Surrogates								
Decachlorobiphenyl	92.9			% Rec.		608	06/01/09	1
Tetrachloro-m-xylene	85.8			% Rec.		608	06/01/09	1

U = ND (Not Detected)
RDL = Reported Detection Limit = LOQ = PQL = EQL
MDL = Minimum Detection Limit = LOD = SQL(TRRP)
Note:
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Reported: 05/29/09 14:31 Revised: 06/03/09 15:28

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Tax I.D. 62-0814289

Est. 1970

REPORT OF ANALYSIS

Mr. Todd Hunt
URS INC. - ID 1139312
1000 Corp Ctr Dr Ste 250 1 Corp. Ce
Franklin, TN 37067

June 03, 2009

ESC Sample # : L402845-26

Site ID :

Project # :

Date Received : May 15, 2009
Description : Natural Gas Pipeline Company of America

Sample ID : SALSW-10M 8FT

Collected By : Todd D. Hunt
Collection Date : 05/14/09 13:15

Parameter	Result	MDL	RDL	Units	Q	Method	Date	Dil.
Pesticide/PCBs								
PCB 1016	U	0.077	0.50	ug/l		608	06/01/09	1
PCB 1221	U	0.16	0.50	ug/l		608	06/01/09	1
PCB 1232	U	0.18	0.50	ug/l		608	06/01/09	1
PCB 1242	U	0.099	0.50	ug/l		608	06/01/09	1
PCB 1248	U	0.039	0.50	ug/l		608	06/01/09	1
PCB 1254	U	0.12	0.50	ug/l		608	06/01/09	1
PCB 1260	U	0.16	0.50	ug/l		608	06/01/09	1
Pest/PCBs Surrogates								
Decachlorobiphenyl	105.			% Rec.		608	06/01/09	1
Tetrachloro-m-xylene	84.5			% Rec.		608	06/01/09	1

U = ND (Not Detected)
RDL = Reported Detection Limit = LOQ = PQL = EQL
MDL = Minimum Detection Limit = LOD = SQL(TRRP)
Note:
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REPORT OF ANALYSIS

Mr. Todd Hunt
URS INC. - ID 1139312
1000 Corp Ctr Dr Ste 250 1 Corp. Ce
Franklin, TN 37067

June 03, 2009

ESC Sample # : L402845-27

Site ID :

Project # :

Date Received : May 15, 2009
Description : Natural Gas Pipeline Company of America

Sample ID : SALSW-03S 1FT

Collected By : Todd D. Hunt
Collection Date : 05/14/09 11:28

Parameter	Result	MDL	RDL	Units	Q	Method	Date	Dil.
Pesticide/PCBs								
PCB 1016	U	0.077	0.50	ug/l		608	06/01/09	1
PCB 1221	U	0.16	0.50	ug/l		608	06/01/09	1
PCB 1232	U	0.18	0.50	ug/l		608	06/01/09	1
PCB 1242	U	0.099	0.50	ug/l		608	06/01/09	1
PCB 1248	U	0.039	0.50	ug/l		608	06/01/09	1
PCB 1254	U	0.12	0.50	ug/l		608	06/01/09	1
PCB 1260	U	0.16	0.50	ug/l		608	06/01/09	1
Pest/PCBs Surrogates								
Decachlorobiphenyl	101.			% Rec.		608	06/01/09	1
Tetrachloro-m-xylene	104.			% Rec.		608	06/01/09	1

U = ND (Not Detected)
RDL = Reported Detection Limit = LOQ = PQL = EQL
MDL = Minimum Detection Limit = LOD = SQL(TRRP)
Note:
The reported analytical results relate only to the sample submitted.

Reported: 05/29/09 14:31 Revised: 06/03/09 15:28

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REPORT OF ANALYSIS

Mr. Todd Hunt
URS INC. - ID 1139312
1000 Corp Ctr Dr Ste 250 1 Corp. Ce
Franklin, TN 37067

June 03, 2009

ESC Sample # : L402845-28

Site ID :

Project # :

Date Received : May 15, 2009
Description : Natural Gas Pipeline Company of America

Sample ID : SALSW-03M 8.5FT

Collected By : Todd D. Hunt
Collection Date : 05/14/09 11:28

Parameter	Result	MDL	RDL	Units	Q	Method	Date	Dil.
Pesticide/PCBs								
PCB 1016	U	0.077	0.50	ug/l		608	05/30/09	1
PCB 1221	U	0.16	0.50	ug/l		608	05/30/09	1
PCB 1232	U	0.18	0.50	ug/l		608	05/30/09	1
PCB 1242	U	0.099	0.50	ug/l		608	05/30/09	1
PCB 1248	U	0.039	0.50	ug/l		608	05/30/09	1
PCB 1254	U	0.12	0.50	ug/l		608	05/30/09	1
PCB 1260	U	0.16	0.50	ug/l		608	05/30/09	1
Pest/PCBs Surrogates								
Decachlorobiphenyl	58.9			% Rec.		608	05/30/09	1
Tetrachloro-m-xylene	85.9			% Rec.		608	05/30/09	1

U = ND (Not Detected)
RDL = Reported Detection Limit = LOQ = PQL = EQL
MDL = Minimum Detection Limit = LOD = SQL(TRRP)
Note:
The reported analytical results relate only to the sample submitted.

Reported: 05/29/09 14:31 Revised: 06/03/09 15:28

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REPORT OF ANALYSIS

Mr. Todd Hunt
URS INC. - ID 1139312
1000 Corp Ctr Dr Ste 250 1 Corp. Ce
Franklin, TN 37067

June 03, 2009

ESC Sample # : L402845-29

Site ID :

Project # :

Date Received : May 15, 2009
Description : Natural Gas Pipeline Company of America

Sample ID : SALSW-04M 8.5FT

Collected By : Todd D. Hunt
Collection Date : 05/14/09 11:40

Parameter	Result	MDL	RDL	Units	Q	Method	Date	Dil.
Pesticide/PCBs								
PCB 1016	U	0.077	0.50	ug/l		608	05/30/09	1
PCB 1221	U	0.16	0.50	ug/l		608	05/30/09	1
PCB 1232	U	0.18	0.50	ug/l		608	05/30/09	1
PCB 1242	U	0.099	0.50	ug/l		608	05/30/09	1
PCB 1248	U	0.039	0.50	ug/l		608	05/30/09	1
PCB 1254	U	0.12	0.50	ug/l		608	05/30/09	1
PCB 1260	U	0.16	0.50	ug/l		608	05/30/09	1
Pest/PCBs Surrogates								
Decachlorobiphenyl	48.5			% Rec.		608	05/30/09	1
Tetrachloro-m-xylene	65.7			% Rec.		608	05/30/09	1

U = ND (Not Detected)
RDL = Reported Detection Limit = LOQ = PQL = EQL
MDL = Minimum Detection Limit = LOD = SQL(TRRP)
Note:
The reported analytical results relate only to the sample submitted.

Reported: 05/29/09 14:31 Revised: 06/03/09 15:28

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REPORT OF ANALYSIS

Mr. Todd Hunt
URS INC. - ID 1139312
1000 Corp Ctr Dr Ste 250 1 Corp. Ce
Franklin, TN 37067

June 03, 2009

ESC Sample # : L402845-30

Site ID :

Project # :

Date Received : May 15, 2009
Description : Natural Gas Pipeline Company of America

Sample ID : SALSW-04S 1FT

Collected By : Todd D. Hunt
Collection Date : 05/14/09 11:40

Parameter	Result	MDL	RDL	Units	Q	Method	Date	Dil.
Pesticide/PCBs								
PCB 1016	U	0.077	0.50	ug/l		608	05/30/09	1
PCB 1221	U	0.16	0.50	ug/l		608	05/30/09	1
PCB 1232	U	0.18	0.50	ug/l		608	05/30/09	1
PCB 1242	U	0.099	0.50	ug/l		608	05/30/09	1
PCB 1248	U	0.039	0.50	ug/l		608	05/30/09	1
PCB 1254	U	0.12	0.50	ug/l		608	05/30/09	1
PCB 1260	U	0.16	0.50	ug/l		608	05/30/09	1
Pest/PCBs Surrogates								
Decachlorobiphenyl	54.6			% Rec.		608	05/30/09	1
Tetrachloro-m-xylene	77.8			% Rec.		608	05/30/09	1

U = ND (Not Detected)
RDL = Reported Detection Limit = LOQ = PQL = EQL
MDL = Minimum Detection Limit = LOD = SQL(TRRP)
Note:
The reported analytical results relate only to the sample submitted.

Reported: 05/29/09 14:31 Revised: 06/03/09 15:28

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REPORT OF ANALYSIS

Mr. Todd Hunt
URS INC. - ID 1139312
1000 Corp Ctr Dr Ste 250 1 Corp. Ce
Franklin, TN 37067

June 03, 2009

ESC Sample # : L402845-31

Date Received : May 15, 2009
Description : Natural Gas Pipeline Company of America

Site ID :

Sample ID : SALSW-05S 1FT

Project # :

Collected By : Todd D. Hunt
Collection Date : 05/14/09 11:55

Parameter	Result	MDL	RDL	Units	Q	Method	Date	Dil.
Pesticide/PCBs								
PCB 1016	U	0.077	0.50	ug/l		608	05/30/09	1
PCB 1221	U	0.16	0.50	ug/l		608	05/30/09	1
PCB 1232	U	0.18	0.50	ug/l		608	05/30/09	1
PCB 1242	U	0.099	0.50	ug/l		608	05/30/09	1
PCB 1248	U	0.039	0.50	ug/l		608	05/30/09	1
PCB 1254	U	0.12	0.50	ug/l		608	05/30/09	1
PCB 1260	U	0.16	0.50	ug/l		608	05/30/09	1
Pest/PCBs Surrogates								
Decachlorobiphenyl	54.7			% Rec.		608	05/30/09	1
Tetrachloro-m-xylene	79.0			% Rec.		608	05/30/09	1

U = ND (Not Detected)
RDL = Reported Detection Limit = LOQ = PQL = EQL
MDL = Minimum Detection Limit = LOD = SQL(TRRP)
Note:
The reported analytical results relate only to the sample submitted.

Reported: 05/29/09 14:31 Revised: 06/03/09 15:28

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REPORT OF ANALYSIS

Mr. Todd Hunt
URS INC. - ID 1139312
1000 Corp Ctr Dr Ste 250 1 Corp. Ce
Franklin, TN 37067

June 03, 2009

ESC Sample # : L402845-32

Site ID :

Project # :

Date Received : May 15, 2009
Description : Natural Gas Pipeline Company of America

Sample ID : SALSW-05M 8.5FT

Collected By : Todd D. Hunt
Collection Date : 05/14/09 11:55

Parameter	Result	MDL	RDL	Units	Q	Method	Date	Dil.
Pesticide/PCBs								
PCB 1016	U	0.077	0.50	ug/l		608	05/30/09	1
PCB 1221	U	0.16	0.50	ug/l		608	05/30/09	1
PCB 1232	U	0.18	0.50	ug/l		608	05/30/09	1
PCB 1242	U	0.099	0.50	ug/l		608	05/30/09	1
PCB 1248	U	0.039	0.50	ug/l		608	05/30/09	1
PCB 1254	U	0.12	0.50	ug/l		608	05/30/09	1
PCB 1260	U	0.16	0.50	ug/l		608	05/30/09	1
Pest/PCBs Surrogates								
Decachlorobiphenyl	58.5			% Rec.		608	05/30/09	1
Tetrachloro-m-xylene	81.5			% Rec.		608	05/30/09	1

U = ND (Not Detected)
RDL = Reported Detection Limit = LOQ = PQL = EQL
MDL = Minimum Detection Limit = LOD = SQL(TRRP)
Note:
The reported analytical results relate only to the sample submitted.

Reported: 05/29/09 14:31 Revised: 06/03/09 15:28

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REPORT OF ANALYSIS

Mr. Todd Hunt
URS INC. - ID 1139312
1000 Corp Ctr Dr Ste 250 1 Corp. Ce
Franklin, TN 37067

June 03, 2009

ESC Sample # : L402845-33

Site ID :

Project # :

Date Received : May 15, 2009
Description : Natural Gas Pipeline Company of America

Sample ID : SALSW-06S 1FT

Collected By : Todd D. Hunt
Collection Date : 05/14/09 12:08

Parameter	Result	MDL	RDL	Units	Q	Method	Date	Dil.
Pesticide/PCBs								
PCB 1016	U	0.077	0.50	ug/l		608	05/30/09	1
PCB 1221	U	0.16	0.50	ug/l		608	05/30/09	1
PCB 1232	U	0.18	0.50	ug/l		608	05/30/09	1
PCB 1242	U	0.099	0.50	ug/l		608	05/30/09	1
PCB 1248	U	0.039	0.50	ug/l		608	05/30/09	1
PCB 1254	U	0.12	0.50	ug/l		608	05/30/09	1
PCB 1260	U	0.16	0.50	ug/l		608	05/30/09	1
Pest/PCBs Surrogates								
Decachlorobiphenyl	60.9			% Rec.		608	05/30/09	1
Tetrachloro-m-xylene	75.3			% Rec.		608	05/30/09	1

U = ND (Not Detected)
RDL = Reported Detection Limit = LOQ = PQL = EQL
MDL = Minimum Detection Limit = LOD = SQL(TRRP)
Note:
The reported analytical results relate only to the sample submitted.

Reported: 05/29/09 14:31 Revised: 06/03/09 15:28

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REPORT OF ANALYSIS

Mr. Todd Hunt
URS INC. - ID 1139312
1000 Corp Ctr Dr Ste 250 1 Corp. Ce
Franklin, TN 37067

June 03, 2009

ESC Sample # : L402845-34

Site ID :

Project # :

Date Received : May 15, 2009
Description : Natural Gas Pipeline Company of America

Sample ID : SALSW-04M-DUP

Collected By : Todd D. Hunt
Collection Date : 05/14/09 00:00

Parameter	Result	MDL	RDL	Units	Q	Method	Date	Dil.
Pesticide/PCBs								
PCB 1016	U	0.077	0.50	ug/l		608	05/30/09	1
PCB 1221	U	0.16	0.50	ug/l		608	05/30/09	1
PCB 1232	U	0.18	0.50	ug/l		608	05/30/09	1
PCB 1242	U	0.099	0.50	ug/l		608	05/30/09	1
PCB 1248	U	0.039	0.50	ug/l		608	05/30/09	1
PCB 1254	U	0.12	0.50	ug/l		608	05/30/09	1
PCB 1260	U	0.16	0.50	ug/l		608	05/30/09	1
Pest/PCBs Surrogates								
Decachlorobiphenyl	58.7			% Rec.		608	05/30/09	1
Tetrachloro-m-xylene	64.9			% Rec.		608	05/30/09	1

U = ND (Not Detected)
RDL = Reported Detection Limit = LOQ = PQL = EQL
MDL = Minimum Detection Limit = LOD = SQL(TRRP)
Note:
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Reported: 05/29/09 14:31 Revised: 06/03/09 15:28

Attachment A
List of Analytes with QC Qualifiers

Sample Number	Work Group	Sample Type	Analyte	Run ID	Qualifier
L402845-07	WG422045	SAMP	Tetrachloro-m-xylene	R745289	J2
L402845-16	WG422108	SAMP	Tetrachloro-m-xylene	R746147	J1
L402845-21	WG422108	SAMP	Tetrachloro-m-xylene	R746147	J1

Attachment B
Explanation of QC Qualifier Codes

Qualifier	Meaning
J1	Surrogate recovery limits have been exceeded; values are outside upper control limits
J2	Surrogate recovery limits have been exceeded; values are outside lower control limits

Qualifier Report Information

ESC utilizes sample and result qualifiers as set forth by the EPA Contract Laboratory Program and as required by most certifying bodies including NELAC. In addition to the EPA qualifiers adopted by ESC, we have implemented ESC qualifiers to provide more information pertaining to our analytical results. Each qualifier is designated in the qualifier explanation as either EPA or ESC. Data qualifiers are intended to provide the ESC client with more detailed information concerning the potential bias of reported data. Because of the wide range of constituents and variety of matrices incorporated by most EPA methods,it is common for some compounds to fall outside of established ranges. These exceptions are evaluated and all reported data is valid and useable unless qualified as 'R' (Rejected).

Definitions

Accuracy - The relationship of the observed value of a known sample to the true value of a known sample. Represented by percent recovery and relevant to samples such as: control samples, matrix spike recoveries, surrogate recoveries, etc.

Precision - The agreement between a set of samples or between duplicate samples. Relates to how close together the results are and is represented by Relative Percent Differrence.

Surrogate - Organic compounds that are similar in chemical composition, extraction, and chromotography to analytes of interest. The surrogates are used to determine the probable response of the group of analytes that are chemically related to the surrogate compound. Surrogates are added to the sample and carried through all stages of preparation and analyses.

TIC - Tentatively Identified Compound: Compounds detected in samples that are not target compounds, internal standards, system monitoring compounds, or surrogates.

Summary of Remarks For Samples Printed
06/03/09 at 15:28:09

TSR Signing Reports: 064
R5 - Desired TAT

as of 1/5/09 a PO# is required on invoices...tf; need MDL/RDL & D1 dil.

Sample: L402845-01 Account: RESCON06 Received: 05/15/09 17:35 Due Date: 06/08/09 00:00 RPT Date: 05/29/09 14:31
report MDL/RDL; uninvoiced 477480 per tfudge 6/1/09
Sample: L402845-02 Account: RESCON06 Received: 05/15/09 17:35 Due Date: 06/08/09 00:00 RPT Date: 05/29/09 14:31
MS/MSD Sample. report MDL/RDL
Sample: L402845-03 Account: RESCON06 Received: 05/15/09 17:35 Due Date: 06/08/09 00:00 RPT Date: 05/29/09 14:31
report MDL/RDL
Sample: L402845-04 Account: RESCON06 Received: 05/15/09 17:35 Due Date: 06/08/09 00:00 RPT Date: 05/29/09 14:31
report MDL/RDL
Sample: L402845-05 Account: RESCON06 Received: 05/15/09 17:35 Due Date: 06/08/09 00:00 RPT Date: 05/29/09 14:31
report MDL/RDL
Sample: L402845-06 Account: RESCON06 Received: 05/15/09 17:35 Due Date: 06/08/09 00:00 RPT Date: 05/29/09 14:31
report MDL/RDL
Sample: L402845-07 Account: RESCON06 Received: 05/15/09 17:35 Due Date: 06/08/09 00:00 RPT Date: 05/29/09 14:31
report MDL/RDL
Sample: L402845-08 Account: RESCON06 Received: 05/15/09 17:35 Due Date: 06/08/09 00:00 RPT Date: 05/29/09 14:31
report MDL/RDL
Sample: L402845-09 Account: RESCON06 Received: 05/15/09 17:35 Due Date: 06/08/09 00:00 RPT Date: 05/29/09 14:31
report MDL/RDL
Sample: L402845-10 Account: RESCON06 Received: 05/15/09 17:35 Due Date: 06/08/09 00:00 RPT Date: 05/29/09 14:31
report MDL/RDL
Sample: L402845-11 Account: RESCON06 Received: 05/15/09 17:35 Due Date: 06/08/09 00:00 RPT Date: 05/29/09 14:31
report MDL/RDL
Sample: L402845-12 Account: RESCON06 Received: 05/15/09 17:35 Due Date: 06/08/09 00:00 RPT Date: 05/29/09 14:31
report MDL/RDL
Sample: L402845-13 Account: RESCON06 Received: 05/15/09 17:35 Due Date: 06/08/09 00:00 RPT Date: 05/29/09 14:31
report MDL/RDL
Sample: L402845-14 Account: RESCON06 Received: 05/15/09 17:35 Due Date: 06/08/09 00:00 RPT Date: 05/29/09 14:31
report MDL/RDL
Sample: L402845-15 Account: RESCON06 Received: 05/15/09 17:35 Due Date: 06/08/09 00:00 RPT Date: 05/29/09 14:31
report MDL/RDL
Sample: L402845-16 Account: RESCON06 Received: 05/15/09 17:35 Due Date: 06/08/09 00:00 RPT Date: 05/29/09 14:31
report MDL/RDL
Sample: L402845-17 Account: RESCON06 Received: 05/15/09 17:35 Due Date: 06/08/09 00:00 RPT Date: 05/29/09 14:31
report MDL/RDL
Sample: L402845-18 Account: RESCON06 Received: 05/15/09 17:35 Due Date: 06/08/09 00:00 RPT Date: 05/29/09 14:31
report MDL/RDL
Sample: L402845-19 Account: RESCON06 Received: 05/15/09 17:35 Due Date: 06/08/09 00:00 RPT Date: 05/29/09 14:31
report MDL/RDL
Sample: L402845-20 Account: RESCON06 Received: 05/15/09 17:35 Due Date: 06/08/09 00:00 RPT Date: 05/29/09 14:31
report MDL/RDL
Sample: L402845-21 Account: RESCON06 Received: 05/15/09 17:35 Due Date: 06/08/09 00:00 RPT Date: 05/29/09 14:31
report MDL/RDL
Sample: L402845-22 Account: RESCON06 Received: 05/15/09 17:35 Due Date: 06/08/09 00:00 RPT Date: 05/29/09 14:31
report MDL/RDL
Sample: L402845-23 Account: RESCON06 Received: 05/15/09 17:35 Due Date: 06/08/09 00:00 RPT Date: 05/29/09 14:31
report MDL/RDL
Sample: L402845-24 Account: RESCON06 Received: 05/15/09 17:35 Due Date: 06/08/09 00:00 RPT Date: 05/29/09 14:31
report MDL/RDL
Sample: L402845-25 Account: RESCON06 Received: 05/15/09 17:35 Due Date: 06/08/09 00:00 RPT Date: 05/29/09 14:31
report MDL/RDL
Sample: L402845-26 Account: RESCON06 Received: 05/15/09 17:35 Due Date: 06/08/09 00:00 RPT Date: 05/29/09 14:31
report MDL/RDL
Sample: L402845-27 Account: RESCON06 Received: 05/15/09 17:35 Due Date: 06/08/09 00:00 RPT Date: 05/29/09 14:31
report MDL/RDL
Sample: L402845-28 Account: RESCON06 Received: 05/15/09 17:35 Due Date: 06/08/09 00:00 RPT Date: 05/29/09 14:31
report MDL/RDL
Sample: L402845-29 Account: RESCON06 Received: 05/15/09 17:35 Due Date: 06/08/09 00:00 RPT Date: 05/29/09 14:31
report MDL/RDL
Sample: L402845-30 Account: RESCON06 Received: 05/15/09 17:35 Due Date: 06/08/09 00:00 RPT Date: 05/29/09 14:31
report MDL/RDL
Sample: L402845-31 Account: RESCON06 Received: 05/15/09 17:35 Due Date: 06/08/09 00:00 RPT Date: 05/29/09 14:31
report MDL/RDL
Sample: L402845-32 Account: RESCON06 Received: 05/15/09 17:35 Due Date: 06/08/09 00:00 RPT Date: 05/29/09 14:31
report MDL/RDL
Sample: L402845-33 Account: RESCON06 Received: 05/15/09 17:35 Due Date: 06/08/09 00:00 RPT Date: 05/29/09 14:31
report MDL/RDL
Sample: L402845-34 Account: RESCON06 Received: 05/15/09 17:35 Due Date: 06/08/09 00:00 RPT Date: 05/29/09 14:31
report MDL/RDL

URS INC. - ID 1139312

1000 Corp Ctr Dr Ste 250 1 Corp. Cente
Franklin,TN 37067

Alternate billing information:

Analysis/Container/Preservative

Chain of Custody
Page 1 of 4

Prepared by:
ENVIRONMENTAL SCIENCE CORP.
12065 Lebanon Road
Mt. Juliet, TN 37122
Phone (800) 767-5859
FAX (615) 758-5859

Report to: Todd D. Hunt — Email: Todd_Hunt@URSCorp.com

Project Description: K. Morgan Site — City/State Collected: Little Rock, AR

Phone: (615) 771-2480
FAX: (615) 771-2459

Client Project #:

Lab Project #: RESCON06-KMORGAN

Collected by (print): Todd D. Hunt

Site/Facility ID#:

P.O.#: 207028US

Collected by (signature):

Immediately Packed on Ice N ___ Y X

Rush? (Lab MUST Be Notified)
___ Same Day 200%
___ Next Day 100%
___ Two Day 50%
___ Three Day 25%
NORMAL

Date Results Needed

Email? ___No X Yes
FAX? ___No ___Yes

Acctnum: RESCON06 (lab use only)
Template/Prelogin: T57838/P280834
Cooler #: 4-30 KW
Shipped Via: Courier

Sample ID	Comp/Grab	Matrix*	Depth	Date	Time	No. of Cntrs	SV8082-1L-Amb NoPres SV008	Remarks/Contaminant	Sample # (lab only)
ARSW-10M	G	WW	6'	051309	1116	2	X		L402845-01
ARSW-09M	G	WW	15'	051309	1135	2	X		02
ARSW-09M-MS	G	WW	15'	051309	1135	2	X		02 MS
ARSW-09M-MSD	G	WW	15'	051309	1135	2	X		02 MSD
ARSW-07M	G	WW	12'	051309	1210	2	X		03
ARSW-07M-Dup	G	WW	12'	051309	1210	2	X		04 06
ARSW-08M	G	WW	9'	051309	1236	2	X		05 07
ARSW-06M	G	WW	14'	051309	1245	2	X		06 08
ARSW-05M	G	WW	14'	051309	1335	2	X		07 09

*Matrix: SS - Soil GW - Groundwater WW - WasteWater DW - Drinking Water OT - Other_____

Remarks: DATES ON SAMPLE LABELS ARE 051409 which is INCORRECT.

pH _____ Temp _____

Flow _____ Other _____

	Date:	Time:		
Relinquished by: (Signature)	051509	1735	Received by: (Signature)	
Relinquished by: (Signature)			Received by: (Signature)	
Relinquished by: (Signature)			Received for lab by: (Signature)	Date: 5.15.09 Time: 1735

Samples returned via: ☐ UPS ☐ FedEx ☐ Courier ☒ URS
Temp: 4.1c Bottles Received: 76

Condition: Rec in Ice. (lab use only)
COC Seal Intact: ___Y ___N ___NA
pH Checked: NCF: NA

URS INC. - ID 1139312

1000 Corp Ctr Dr Ste 250 1 Corp. Cente
Franklin,TN 37067

Alternate billing information:

Analysis/Container/Preservative

Chain of Custody
Page 2 of 4

Prepared by:
ENVIRONMENTAL SCIENCE CORP.
12065 Lebanon Road
Mt. Juliet, TN 37122
Phone (800) 767-5859
FAX (615) 758-5859

Report to: Todd D. Hunt — Email: Todd_Hunt@URSCorp.com

Project Description: K. Morgan Site — City/State Collected: Little Rock, AR

Phone: (615) 771-2480
FAX: (615) 771-2459

Client Project #:

Lab Project #: RESCON06-KMORGAN

Collected by (print): Todd D. Hunt

Site/Facility ID#:

P.O.#: 20702805

Collected by (signature):

Immediately Packed on Ice N ___ Y X

Rush? (Lab MUST Be Notified)
___ Same Day 200%
___ Next Day 100%
___ Two Day NORMAL 50%
___ Three Day TA 25%

Date Results Needed

Email? __No X_Yes
FAX? __No __Yes

Acctnum: RESCON06 (lab use only)
Template/Prelogin: T57838/ P280834
Cooler #: 4-30 KW
Shipped Via: Courier

Sample ID	Comp/Grab	Matrix*	Depth	Date	Time	No. of Cntrs	~~SV0002~~ 1L-Amb NoPres - 608	Remarks/Contaminant	Sample # (lab only)
ARSW-05 EB	G	WW	—	051309	1300	2	X		L407845-10 08
ARSW-04m	G	WW	13'	051309	1345	2	X		09
~~MS~~ ARSW-03m	G	WW	12'	051309	1410	2	X		10
~~MS~~ ARSW-02m	G	WW	12'	051309	1420	2	X		11
~~MS~~ ARSW-01M	G	WW	14'	051309	1435	2	X		12
~~MSD~~ SALSW-01S	G	WW	1'	051409	1100	2	X		13
~~MSD~~ SALSW-01m	G	WW	8'	051409	1106	2	X		14
~~MSD~~ SALSW-02S	G	WW	1	051409	1116	2	X		15
~~FIELD BLANK~~ SALSW-02m	G	WW	8'	051409	1116	2	X		16

*Matrix: SS - Soil GW - Groundwater WW - WasteWater DW - Drinking Water OT - Other_____

Remarks: ARSW Sample Labels with wrong DATE; COC Correct

pH _____ Temp _____

Flow _____ Other _____

	Date:	Time:	
Relinquished by: (Signature)	051509	0936	Received by: (Signature)
Relinquished by: (Signature)	Date:	Time:	Received by: (Signature)
Relinquished by: (Signature)	Date:	Time:	Received for lab by: (Signature)

Samples returned via: ☐ UPS ☐ FedEx ☐ Courier ☑ C/T
Temp: 4.1c Bottles Received: 76
Date: 5.15.09 Time: 1735

Condition: Rec. on ice (lab use only)
COC Seal Intact: ___ Y ___ N ✓ NA
pH Checked: NCF:

Chain of Custody Record

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

TAL-4142 (0907)

Client: URS Corporation	Project Manager: Todd_Hunt@URSCorp.com	Date: 051509	Chain of Custody Number: 373270
Address: 1000 Corporate Center Dr Suite 250	Telephone Number (Area Code)/Fax Number: 615-771-2480	Lab Number: RECONOG-KMORGAN	Page 03 of 4
City: Franklin / State: TN / Zip Code: 37067	Site Contact: Todd Hunt	Lab Contact: Terry Fungs	
Project Name and Location (State): Little Rock, AR	Carrier/Waybill Number: —		
Contract/Purchase Order/Quote No.: PO 2070285			

Sample I.D. No. and Description (Containers for each sample may be combined on one line)	Date	Time	Matrix: Air	Aqueous	Sed	Soil	Containers & Preservatives: Unpres	H_2SO_4	HNO_3	HCl	NaOH	ZnAc/NaOH	Analysis (Attach list if more space is needed): KB 608	Special Instructions/ Conditions of Receipt: L402845 Depth
SALSW-04S-Dup	051409	1140		X			2						✓	1 17 ~~18~~
SALSW-06M		1208		X			2						✓	9 18 ~~20~~
SALSW-07S		1225 ~~1208~~		X			2						✓	~~8.5~~ / 19 ~~21~~
SALSW-07M		1225 ~~1208~~		X			2						✓	8.5 20 ~~22~~
SALSW-08S		1245		X			2						✓	1 21 ~~23~~
SALSW-08M		1245		X			2						✓	8 22 ~~24~~
SALSW-09S		1304		X			2						✓	1 23 ~~25~~
SALSW-09M		1304		X			2						✓	8 24 ~~26~~
SALSW-10S		1315		X			2						✓	1 25 ~~27~~
SALSW-10M	↓	1315		X			2						✓	8 26 ~~28~~

Possible Hazard Identification: ☒ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal: ☒ ~~Return To Client~~ ☒ Disposal By Lab ☐ Archive For _____ Months (A fee may be assessed if samples are retained longer than 1 month)

Turn Around Time Required: ☐ 24 Hours ☐ 48 Hours ☐ 7 Days ☐ 14 Days ☐ 21 Days ☒ Other Normal

QC Requirements (Specify): Recon ICP.

1. Relinquished By	Date: 051509	Time: 1736	1. Received By	Date: 5/15/09	Time: 1735
2. Relinquished By	Date:	Time:	2. Received By: 4.1°C 76	Date:	Time:
3. Relinquished By	Date:	Time:	3. Received By	Date:	Time:

Comments:

DISTRIBUTION: WHITE - Returned to Client with Report; CANARY - Stays with the Sample; PINK - Field Copy

URS INC. - ID 1139312

1000 Corp Ctr Dr Ste 250 1 Corp. Cente
Franklin,TN 37067

Alternate billing information:

Analysis/Container/Preservative

Chain of Custody
Page 4 of 4

Prepared by:
ENVIRONMENTAL SCIENCE CORP.
12065 Lebanon Road
Mt. Juliet, TN 37122
Phone (800) 767-5859
FAX (615) 758-5859

Report to: Todd D. Hunt Email: Todd_Hunt @URSCorp.com

Project Description: K. Morgan Site City/State Collected: Little Rock, AR

Phone: (615) 771-2480
FAX: (615) 771-2459

Client Project #:

Lab Project #: RESCON06-KMORGAN

Collected by (print): Todd D. Hunt

Site/Facility ID#:

P.O.#: 207028US

Collected by (signature):

Immediately Packed on Ice N ___ Y X

Rush? (Lab MUST Be Notified)
___ Same Day 200%
___ Next Day 100%
___ Two Day 50%
___ Three Day 25%
Normal
TA

Date Results Needed

Email? ___No X Yes
FAX? ___No ___Yes

Acctnum: RESCON06 (lab use only)
Template/Prelogin: T57838/P280834
Cooler #: 4-30 (W)
Shipped Via: Courier

Sample ID	Comp/Grab	Matrix*	Depth	Date	Time	No. of Cntrs	8260 SV 8270 1L-Amb-NoPres	Remarks/Contaminant	Sample # (lab only)
~~FIELD BLANK~~ SALSW-035	G	WW	1	051409	1128	2	X		27 29
~~FIELD BLANK~~ SALSW-03M	G	WW	8.5'	051409	1128	2	X		28 30
~~EQUIPMENT BLANK~~ SALSW-04M	G	WW	8.5'	051409	1140	2	X		29 31
~~EQUIPMENT BLANK~~ SALSW-045	G	WW	1	051409	1140	2	X		30 32
~~EQUIPMENT BLANK~~ SALSW-035-MS		WW	1	051409	1128	2	X		27 29
SALSW-035-MSD	C	WW	1	051409	1128	2	X		27 29
SALSW-055	G	WW	1	051409	1155	2	X		31 ~~33~~ 35
SALSW-05M	G	WW	8.5	051409	1155	2	X		32 27 35
SALSW-065	G	WW	1	051409	1208	2	X		33 30 35

*Matrix: SS - Soil GW - Groundwater WW - WasteWater DW - Drinking Water OT - Other_____

Remarks:

pH _____ Temp _____

Flow _____ Other _____

	Date:	Time:	
Relinquished by: (Signature)	051509	1736	Received by: (Signature)
Relinquished by: (Signature)			Received by: (Signature)
Relinquished by: (Signature)			Received for lab by: (Signature)

Samples returned via: ☐ UPS ☐ FedEx ☐ Courier ☒ CLT
Temp: 4.1°c Bottles Received: 76
Date: 3.15.09 Time: 1735

Condition: Rec. on ice (lab use only)
COC Seal Intact: ___Y ___N ✓NA
pH Checked: ___ NCF: ___

Terri6

ENVIRONMENTAL SCIENCE CORP.

SAMPLE NON-CONFORMANCE FORM

Sample No. : L402845

Date: 5/15/09

Evaluated by: AJL

Client: RESCON06

Non-Conformance (check applicable items)

_____	Chain of Custody is missing	_____	Login Clarification Needed
_____	Improper container type	_____	Improper preservation
_____	Chain of custody is incomplete	_____	Container lid not intact
_____	Parameter(s) past holding time	_____	Improper temperature
_____	Broken container(s) **see below**	_____	Broken container: sufficient sample volume remains for analysis requested

_____ Insufficient packing material around container

_____ Insufficient packing material inside cooler

_____ Improper handling by carrier (FedEx / UPS / Courier)

_____ Sample was frozen

Comments: Received SALSU-04M-DUP not listed on the coc.

Login Instructions:

TSR Initials: tf

Client informed by (call) / email / fax / voice mail date: 5-18-09 time: 920

Client contact: Todd Hunt

add to c/c

ENVIRONMENTAL SCIENCE CORP.

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Tax I.D. 62-0814289

Est. 1970

URS INC. - ID 1139312
Mr. Todd Hunt
1000 Corp Ctr Dr Ste 250 1 Corp. Center

Franklin, TN 37067

Quality Assurance Report
Level II

L402845

June 08, 2009

Laboratory Blank

Analyte	Result	Units	% Rec	Limit	Batch	Date Analyzed
PCB 1016	< .0005	mg/l			WG422045	05/18/09 18:12
PCB 1221	< .0005	mg/l			WG422045	05/18/09 18:12
PCB 1232	< .0005	mg/l			WG422045	05/18/09 18:12
PCB 1242	< .0005	mg/l			WG422045	05/18/09 18:12
PCB 1248	< .0005	mg/l			WG422045	05/18/09 18:12
PCB 1254	< .0005	mg/l			WG422045	05/18/09 18:12
PCB 1260	< .0005	mg/l			WG422045	05/18/09 18:12
Decachlorobiphenyl		% Rec.	75.94	10-122.6	WG422045	05/18/09 18:12
Tetrachloro-m-xylene		% Rec.	82.39	15.3-114.2	WG422045	05/18/09 18:12
PCB 1016	< .0005	mg/l			WG422147	05/19/09 19:46
PCB 1221	< .0005	mg/l			WG422147	05/19/09 19:46
PCB 1232	< .0005	mg/l			WG422147	05/19/09 19:46
PCB 1242	< .0005	mg/l			WG422147	05/19/09 19:46
PCB 1248	< .0005	mg/l			WG422147	05/19/09 19:46
PCB 1254	< .0005	mg/l			WG422147	05/19/09 19:46
PCB 1260	< .0005	mg/l			WG422147	05/19/09 19:46
Decachlorobiphenyl		% Rec.	60.29	10-122.6	WG422147	05/19/09 19:46
Tetrachloro-m-xylene		% Rec.	60.56	15.3-114.2	WG422147	05/19/09 19:46
PCB 1016	< .0005	mg/l			WG422108	05/19/09 11:19
PCB 1221	< .0005	mg/l			WG422108	05/19/09 11:19
PCB 1232	< .0005	mg/l			WG422108	05/19/09 11:19
PCB 1242	< .0005	mg/l			WG422108	05/19/09 11:19
PCB 1248	< .0005	mg/l			WG422108	05/19/09 11:19
PCB 1254	< .0005	mg/l			WG422108	05/19/09 11:19
PCB 1260	< .0005	mg/l			WG422108	05/19/09 11:19
Decachlorobiphenyl		% Rec.	69.03	10-122.6	WG422108	05/19/09 11:19
Tetrachloro-m-xylene		% Rec.	60.63	15.3-114.2	WG422108	05/19/09 11:19
PCB 1016	< .0005	mg/l			WG422466	05/20/09 15:40
PCB 1221	< .0005	mg/l			WG422466	05/20/09 15:40
PCB 1232	< .0005	mg/l			WG422466	05/20/09 15:40
PCB 1242	< .0005	mg/l			WG422466	05/20/09 15:40
PCB 1248	< .0005	mg/l			WG422466	05/20/09 15:40
PCB 1254	< .0005	mg/l			WG422466	05/20/09 15:40
PCB 1260	< .0005	mg/l			WG422466	05/20/09 15:40
Decachlorobiphenyl		% Rec.	76.82	10-122.6	WG422466	05/20/09 15:40
Tetrachloro-m-xylene		% Rec.	85.79	15.3-114.2	WG422466	05/20/09 15:40

Laboratory Control Sample

Analyte	Units	Known Val	Result	% Rec	Limit	Batch
PCB 1260	mg/l	.0005	0.000384	76.9	46-126	WG422045
Decachlorobiphenyl				85.29	10-122.6	WG422045
Tetrachloro-m-xylene				85.87	15.3-114.2	WG422045
PCB 1260	mg/l	.0005	0.000360	71.9	46-126	WG422147
Decachlorobiphenyl				65.13	10-122.6	WG422147
Tetrachloro-m-xylene				43.66	15.3-114.2	WG422147
PCB 1260	mg/l	.0005	0.000272	54.3	46-126	WG422108
Decachlorobiphenyl				61.02	10-122.6	WG422108
Tetrachloro-m-xylene				62.75	15.3-114.2	WG422108

* Performance of this Analyte is outside of established criteria.
For additional information, please see Attachment A 'List of Analytes with QC Qualifiers.'

ENVIRONMENTAL SCIENCE CORP.

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Est. 1970

URS INC. - ID 1139312
Mr. Todd Hunt
1000 Corp Ctr Dr Ste 250 1 Corp. Center
Franklin, TN 37067

Quality Assurance Report
Level II

L402845

June 08, 2009

Laboratory Control Sample

Analyte	Units	Known Val	Result	% Rec	Limit	Batch
PCB 1260	mg/l	.0005	0.000491	98.2	46-126	WG422466
Decachlorobiphenyl				60.46	10-122.6	WG422466
Tetrachloro-m-xylene				64.87	15.3-114.2	WG422466

Laboratory Control Sample Duplicate

Analyte	Units	Result	Ref	%Rec	Limit	RPD	Limit	Batch
PCB 1260	mg/l	0.000339	0.000384	68.0	46-126	12.4	34	WG422045
Decachlorobiphenyl				71.29	10-122.6			WG422045
Tetrachloro-m-xylene				83.07	15.3-114.2			WG422045
PCB 1260	mg/l	0.000345	0.000360	69.0	46-126	4.23	34	WG422147
Decachlorobiphenyl				56.61	10-122.6			WG422147
Tetrachloro-m-xylene				48.06	15.3-114.2			WG422147
PCB 1260	mg/l	0.000346	0.000272	69.0	46-126	24.2	34	WG422108
Decachlorobiphenyl				81.87	10-122.6			WG422108
Tetrachloro-m-xylene				67.64	15.3-114.2			WG422108
PCB 1260	mg/l	0.000436	0.000491	87.0	46-126	11.9	34	WG422466
Decachlorobiphenyl				75.58	10-122.6			WG422466
Tetrachloro-m-xylene				83.74	15.3-114.2			WG422466

Matrix Spike

Analyte	Units	MS Res	Ref Res	TV	% Rec	Limit	Ref Samp	Batch
PCB 1260	mg/l	0.00014	0.00	.0005	28.3*	46-126	L403079-08	WG422147
Decachlorobiphenyl					27.90	10-122.6		WG422147
Tetrachloro-m-xylene					41.86	15.3-114.2		WG422147
PCB 1260	mg/l	0.00061	0.00	.0005	123.	46-126	L402845-27	WG422108
Decachlorobiphenyl					138.6*	10-122.6		WG422108
Tetrachloro-m-xylene					123.4*	15.3-114.2		WG422108

Matrix Spike Duplicate

Analyte	Units	MSD	Ref	%Rec	Limit	RPD	Limit	Ref Samp	Batch
PCB 1260	mg/l	0.0001	0.0001	34.243*	46-126	19.1	34	L403079-08	WG422147
Decachlorobiphenyl				31.18	10-122.6				WG422147
Tetrachloro-m-xylene				45.83	15.3-114.2				WG422147
PCB 1260	mg/l	0.0005	0.0006	119.	46-126	3.13	34	L402845-27	WG422108
Decachlorobiphenyl				128.7*	10-122.6				WG422108
Tetrachloro-m-xylene				108.4	15.3-114.2				WG422108

Batch number /Run number / Sample number cross reference

WG422045: R745289: L402845-01 03 04 05 06 07 08 10 11 12
WG422108: R746147: L402845-02 13 14 15 16 17 18 19 20 21 22 23 27 28 29 30 31 32 33
WG422147: R746207: L402845-24 25 26 34
WG422466: R748726: L402845-09

* * Calculations are performed prior to rounding of reported values .
* Performance of this Analyte is outside of established criteria.
For additional information, please see Attachment A 'List of Analytes with QC Qualifiers.'

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Mr. Todd Hunt
1000 Corp Ctr Dr Ste 250 1 Corp. Center

Franklin, TN 37067

Quality Assurance Report
Level II

L402845

June 08, 2009

The data package includes a summary of the analytic results of the quality control samples required by the SW-846 or CWA methods. The quality control samples include a method blank, a laboratory control sample, and the matrix spike/matrix spike duplicate analysis. If a target parameter is outside the method limits, every sample that is effected is flagged with the appropriate qualifier in Appendix B of the analytic report.

Method Blank - an aliquot of reagent water carried through the entire analytic process. The method blank results indicate if any possible contamination exposure during the sample handling, digestion or extraction process, and analysis. Concentrations of target analytes above the reporting limit in the method blank are qualified with the "B" qualifier.

Laboratory Control Sample - is a sample of known concentration that is carried through the digestion/extraction and analysis process. The percent recovery, expressed as a percentage of the theoretical concentration, has statistical control limits indicating that the analytic process is "in control". If a target analyte is outside the control limits for the laboratory control sample or any other control sample, the parameter is flagged with a "J4" qualifier for all effected samples.

Matrix Spike and Matrix Spike Duplicate - is two aliquots of an environmental sample that is spiked with known concentrations of target analytes. The percent recovery of the target analytes also has statistical control limits. If any recoveries that are outside the method control limits, the sample that was selected for matrix spike/matrix spike duplicate analysis is flagged with either a "J5" or a "J6". The relative percent difference (%RPD) between the matrix spike and the matrix spike duplicate recoveries is all calculated. If the RPD is above the method limit, the effected samples are flagged with a "J3" qualifier.