Callaway2COLPEm Resource

From: Klang, Susan L [SKlang@ameren.com]
Sent: Tuesday, June 16, 2009 1:03 PM
To: Olson, Bruce
Subject: Missing Wet Report
Attachments: 2005 Wet Test Report.pdf

We submitted the missing Whole Effluent Toxicity (WET) report for 2005 on ALNRC 00031 mailed out May 29, 2009. I've attached it to this e-mail. Thanks!

Susan Klang
Nuclear Generation Development
573-676-4277
SKlang@Ameren.com

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Hearing Identifier: CallawayPlant_Unit2_COL_Public
Email Number: 246

Mail Envelope Properties (4524C8117330EA429AA592E99946A50606138FBE)

Subject: Missing Wet Report
Sent Date: 6/16/2009 1:03:16 PM
Received Date: 6/16/2009 1:03:52 PM
From: Klang, Susan L

Created By: SKlang@ameren.com

Recipients:
"Olson, Bruce" <Bruce.Olson@nrc.gov>
Tracking Status: None

Post Office: exchcal.corp.dir.ameren.com

Files	**Size**	**Date & Time**
MESSAGE	1252	6/16/2009 1:03:52 PM
2005 Wet Test Report.pdf	1414930	

Options
Priority: Standard
Return Notification: No
Reply Requested: No
Sensitivity: Normal
Expiration Date:
Recipients Received:

AmerenUE
Callaway Plant

PO Box 620
Fulton, MO 65251

10 CFR 52.75

May 29, 2009

U.S. Nuclear Regulatory Commission
Attn: Document Control Desk
11555 Rockville Pike
Rockville, MD. 20852

ALNRC 00031

Subject: AmerenUE, Callaway Plant Unit 2 (NRC Docket No. 52-037) Whole Effluent Toxicity (WET) Report for 2005

Reference: Letter from R. T. Lamb (AmerenUE) to U.S. Nuclear Regulatory Commission, "AmerenUE-Callaway Plant Unit 2 (NRC Docket No. 52-037) Environmental & Alternate Site Audit Information Needs Item Updates and Environmental Report Supplements", dated May 15, 2009 (ALNRC 00025)

The purpose of this letter is to provide the 2005 Whole Effluent Toxicity (WET) Report. This report was requested by the NRC staff to supplement the 2004, 2006, 2007 and 2008 WET reports previously submitted in Reference 1.

This letter contains no proprietary information. This letter contains no new regulatory commitments. There are no COLA impacts associated with this information.

If there are any questions regarding this transmittal, please contact me at (573) 676-8519, SBond2@ameren.com or Dave Shafer at (573) 676-4722, DShafer@ameren.com.

I declare under penalty of perjury that the foregoing is true and correct.

Executed on May 29, 2009

Scott Bond

Scott Bond
Manager
Nuclear Generation Development

SMB/RCW/slk

Enclosure: Whole Effluent Toxicity Report for 2005

cc:

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Project Team/Others Distribution List

RACC Members Distribution List

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ALNRC 00031
Enclosure

Enclosure

Whole Effluent Toxicity Report for 2005

SEVERN TRENT STL

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Arvada, CO 80002

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ANALYTICAL REPORT

Callaway Nuclear Plant

Lot #: D5F170186

Charlie Riggs

Ameren UE
Callaway Plant
PO Box 620
Fulton, MO 65251

STL DENVER

Betsy Farnaus
Project Manager

June 27, 2005

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- **Chain-of-Custody**

Lot #: D5F170186

Case Narrative

Enclosed is the report for two samples received at STL Denver on June 17, 2005. The results included in this report have been reviewed for compliance with STL's Laboratory Quality Manual. The test results shown in this report meet all requirements of NELAC and any exceptions are noted below.

This report may include reporting limits (RLs) less than STL Denver's standard reporting limit. The reported sample results and associated reporting limits are being used specifically to meet the needs of this project. Note that data are not normally reported to these levels without qualification because they are inherently less reliable and potentially less defensible than required by the latest industry standards.

Dilution factors and footnotes have been provided to assist in the interpretation of the results. Each sample was analyzed to achieve the lowest possible reporting limit within the constraints of the method. In some cases, due to interference or analytes present at concentrations above the linear calibration curve, samples were diluted. For diluted samples, the reporting limits are adjusted relative to the dilution required.

STL utilizes USEPA approved methods in all analytical work. The samples presented in this report were analyzed for the parameters listed on the analytical methods summary page in accordance with the methods indicated. A summary of quality control parameters is provided below.

This report shall not be reproduced except in full, without the written approval of the laboratory.

Quality Control Summary for Lot D5F170186

Sample Receiving

- The cooler temperatures upon receipt at the Denver laboratory were 2.8°C and 3.7°C.
- Each cubitainer was received with approximately two inches of headspace. Both samples were at super saturation dissolved oxygen (DO) levels of greater than 9 mg/L upon arrival.
- The sample RAW WATER contained an extreme amount of particulate organic matter (POM). The POM could not be filtered using a 50 micron mesh sieve.
- All other sample containers were received in acceptable condition.

Holding Times

- All holding times were met.

Method Blanks

- All Method Blank samples were within established control limits.

Laboratory Control Samples (LCS)

- All Laboratory Control Samples were within established control limits.

Lot #: D5F170186

Matrix Spike (MS) and Matrix Spike Duplicate (MSD)

- All MS and MSD samples were within established control limits.

EXECUTIVE SUMMARY - Detection Highlights

D5F170186

PARAMETER	RESULT	REPORTING LIMIT	UNITS	ANALYTICAL METHOD
RAW WATER 06/16/05 05:00 001				
Ammonia as N	0.041 B	0.10	mg/L	MCAWW 350.1
Specific Conductance	420	2.0	umhos/cm	MCAWW 120.1
Hardness, as CaCO3	170	5.0	mg/L	MCAWW 130.2
pH	7.9	0.10	No Units	MCAWW 150.1
Ceriodaphnia dubia	>100		%	EPA-23 LC-50 C. D
Total Alkalinity	120	5.0	mg/L	MCAWW 310.1
Fathead Minnow (P.promelas)	>100		%	EPA-23 LC-50 Fath
OUTFALL COMPOSITE 06/16/05 05:00 002				
Ammonia as N	1.7	0.10	mg/L	MCAWW 350.1
Specific Conductance	1800	2.0	umhos/cm	MCAWW 120.1
Hardness, as CaCO3	940 Q	25	mg/L	MCAWW 130.2
pH	8.7	0.10	No Units	MCAWW 150.1
Ceriodaphnia dubia	>100		%	EPA-23 LC-50 C. D
Total Alkalinity	190	5.0	mg/L	MCAWW 310.1
Fathead Minnow (P.promelas)	>100		%	EPA-23 LC-50 Fath

METHODS SUMMARY

D5F170186

PARAMETER	ANALYTICAL METHOD	PREPARATION METHOD
pH (Electrometric)	MCAWW 150.1	MCAWW 150.1
Alkalinity	MCAWW 310.1	MCAWW 310.1
LC-50	EPA-23 LC-50 Fa	
LC-50	EPA-23 LC-50 C.	NONE
Nitrogen, Ammonia	MCAWW 350.1	MCAWW 350.1
Specific Conductance	MCAWW 120.1	MCAWW 120.1
Total Hardness (Titrimetric, EDTA)	MCAWW 130.2	MCAWW 130.2

References:

EPA-23 "METHODS FOR MEASURING THE ACUTE TOXICITY OF EFFLUENTS AND RECEIVING WATERS TO FRESHWATER AND MARINE ORGANISMS" "EPA/600/4-90/027F"

MCAWW "Methods for Chemical Analysis of Water and Wastes", EPA-600/4-79-020, March 1983 and subsequent revisions.

METHOD / ANALYST SUMMARY

D5F170186

ANALYTICAL METHOD	ANALYST	ANALYST ID
EPA-23 LC-50 C. Daphnia	Jeff Hoffman	009151
EPA-23 LC-50 Fathead	Jeff Hoffman	009151
MCAWW 120.1	Fougere M. Danielle	006481
MCAWW 130.2	Fougere M. Danielle	006481
MCAWW 150.1	Fougere M. Danielle	006481
MCAWW 310.1	Ewa Kudla	001167
MCAWW 350.1	Claire Likar	004382

References:

EPA-23 "METHODS FOR MEASURING THE ACUTE TOXICITY OF EFFLUENTS AND RECEIVING WATERS TO FRESHWATER AND MARINE ORGANISMS" "EPA/600/4-90/027F"

MCAWW "Methods for Chemical Analysis of Water and Wastes", EPA-600/4-79-020, March 1983 and subsequent revisions.

SAMPLE SUMMARY

D5F170186

WO #	SAMPLE#	CLIENT SAMPLE ID	SAMPLED DATE	SAMP TIME
HDTWV	001	RAW WATER	06/16/05	05:00
HDTW7	002	OUTFALL COMPOSITE	06/16/05	05:00

NOTE(S):

- The analytical results of the samples listed above are presented on the following pages.
- All calculations are performed before rounding to avoid round-off errors in calculated results.
- Results noted as "ND" were not detected at or above the stated limit.
- This report must not be reproduced, except in full, without the written approval of the laboratory.
- Results for the following parameters are never reported on a dry weight basis: color, corrosivity, density, flashpoint, ignitability, layers, odor, paint filter test, pH, porosity pressure, reactivity, redox potential, specific gravity, spot tests, solids, solubility, temperature, viscosity, and weight.

AMEREN SERVICES

Client Sample ID: RAW WATER

General Chemistry

Lot-Sample #...: D5F170186-001 **Work Order #...:** HDTWV **Matrix.....:** WATER
Date Sampled...: 06/16/05 05:00 **Date Received..:** 06/17/05

PARAMETER	RESULT	RL	UNITS	METHOD	PREPARATION-ANALYSIS DATE	PREP BATCH #
pH	7.9	0.10	No Units	MCAWW 150.1	06/22/05	5173471
		Dilution Factor: 1		Analysis Time..: 10:18		
Ammonia as N	0.041 B	0.10	mg/L	MCAWW 350.1	06/23/05	5175478
		Dilution Factor: 1		Analysis Time..: 16:00		
Ceriodaphnia dubia	>100		%	EPA-23 LC-50 C. D	06/17-06/20/05	5171269
		Dilution Factor: 1		Analysis Time..: 10:43		
Fathead Minnow (P.promelas)	>100		%	EPA-23 LC-50 Fath	06/17-06/20/05	5171262
		Dilution Factor: 1		Analysis Time..: 10:38		
Hardness, as CaCO3	170	5.0	mg/L	MCAWW 130.2	06/20/05	5171570
		Dilution Factor: 1		Analysis Time..: 12:00		
Specific Conductance	420	2.0	umhos/cm	MCAWW 120.1	06/20/05	5171572
		Dilution Factor: 1		Analysis Time..: 15:00		
Total Alkalinity	120	5.0	mg/L	MCAWW 310.1	06/20/05	5172136
		Dilution Factor: 1		Analysis Time..: 11:00		

NOTE(S):

RL Reporting Limit

B Estimated result. Result is less than RL.

AMEREN SERVICES

Client Sample ID: OUTFALL COMPOSITE

General Chemistry

Lot-Sample #...: D5F170186-002 **Work Order #...:** HDTW7 **Matrix.....:** WATER
Date Sampled...: 06/16/05 05:00 **Date Received..:** 06/17/05

PARAMETER	RESULT	RL	UNITS	METHOD	PREPARATION-ANALYSIS DATE	PREP BATCH #
pH	8.7	0.10	No Units	MCAWW 150.1	06/22/05	5173471
		Dilution Factor: 1		Analysis Time..: 10:34		
Ammonia as N	1.7	0.10	mg/L	MCAWW 350.1	06/23/05	5175478
		Dilution Factor: 1		Analysis Time..: 16:00		
Ceriodaphnia dubia	>100		%	EPA-23 LC-50 C. D	06/17-06/20/05	5171267
		Dilution Factor: 1		Analysis Time..: 10:43		
Fathead Minnow (P.pr omelas)	>100		%	EPA-23 LC-50 Fath	06/17-06/20/05	5171263
		Dilution Factor: 1		Analysis Time..: 10:38		
Hardness, as CaCO3	940 Q	25	mg/L	MCAWW 130.2	06/20/05	5171570
		Dilution Factor: 5		Analysis Time..: 12:00		
Specific Conductance	1800	2.0	umhos/cm	MCAWW 120.1	06/20/05	5171572
		Dilution Factor: 1		Analysis Time..: 15:00		
Total Alkalinity	190	5.0	mg/L	MCAWW 310.1	06/20/05	5172136
		Dilution Factor: 1		Analysis Time..: 11:00		

NOTE(S):

RL Reporting Limit

Q Elevated reporting limit. The reporting limit is elevated due to high analyte levels.

QC DATA ASSOCIATION SUMMARY

D5F170186

Sample Preparation and Analysis Control Numbers

SAMPLE#	MATRIX	ANALYTICAL METHOD	LEACH BATCH #	PREP BATCH #	MS RUN#
001	WATER	MCAWW 120.1		5171572	5172267
	WATER	MCAWW 130.2		5171570	5172152
	WATER	MCAWW 150.1		5173471	5173302
	WATER	EPA-23 LC-50 C. D		5171269	
	WATER	MCAWW 310.1		5172136	5172304
	WATER	MCAWW 350.1		5175478	5175306
	WATER	EPA-23 LC-50 Fath		5171262	
002	WATER	MCAWW 120.1		5171572	5172267
	WATER	MCAWW 130.2		5171570	5172152
	WATER	MCAWW 150.1		5173471	5173302
	WATER	EPA-23 LC-50 C. D		5171267	
	WATER	MCAWW 310.1		5172136	5172304
	WATER	MCAWW 350.1		5175478	5175306
	WATER	EPA-23 LC-50 Fath		5171263	

METHOD BLANK REPORT

General Chemistry

Client Lot #...: D5F170186 **Matrix.....:** WATER

PARAMETER	RESULT	REPORTING LIMIT	UNITS	METHOD	PREPARATION-ANALYSIS DATE	PREP BATCH #
Hardness, as CaCO3		Work Order #: HD2LK1AA		MB Lot-Sample #:	D5F200000-570	
	ND	5.0	mg/L	MCAWW 130.2	06/20/05	5171570
		Dilution Factor: 1				
		Analysis Time..: 12:00				
Specific Conductance		Work Order #: HD3WN1AA		MB Lot-Sample #:	D5F200000-572	
	ND	2.0	umhos/cm	MCAWW 120.1	06/20/05	5171572
		Dilution Factor: 1				
		Analysis Time..: 15:00				
Total Alkalinity		Work Order #: HD3521AA		MB Lot-Sample #:	D5F210000-136	
	ND	5.0	mg/L	MCAWW 310.1	06/20/05	5172136
		Dilution Factor: 1				
		Analysis Time..: 11:00				

NOTE(S):

Calculations are performed before rounding to avoid round-off errors in calculated results.

METHOD BLANK REPORT

General Chemistry

Client Lot #...: D5F170186 **Matrix.....:** WATER

PARAMETER	RESULT	REPORTING LIMIT	UNITS	METHOD	PREPARATION-ANALYSIS DATE	PREP BATCH #
Ammonia as N		Work Order #:	HEDJQ1AA	MB Lot-Sample #:	D5F240000-478	
	ND	0.10	mg/L	MCAWW 350.1	06/23/05	5175478
		Dilution Factor: 1				
		Analysis Time..: 16:00				

NOTE(S):

Calculations are performed before rounding to avoid round-off errors in calculated results.

LABORATORY CONTROL SAMPLE EVALUATION REPORT

General Chemistry

Lot-Sample #...: D5F170186 **Matrix.....:** WATER

PARAMETER	PERCENT RECOVERY	RECOVERY LIMITS	RPD	RPD LIMITS	METHOD	PREPARATION-ANALYSIS DATE	PREP BATCH #
pH		WO#:HD6Q81AA-LCS/HD6Q81AC-LCSD				LCS Lot-Sample#: D5F220000-471	
	100	(97 - 102)			MCAWW 150.1	06/22/05	5173471
	100	(97 - 102)	0.14	(0-5.0)	MCAWW 150.1	06/22/05	5173471
		Dilution Factor: 1			Analysis Time..: 09:52		
Hardness, as CaCO3		WO#:HD2LK1AC-LCS/HD2LK1AD-LCSD				LCS Lot-Sample#: D5F200000-570	
	100	(96 - 108)			MCAWW 130.2	06/20/05	5171570
	100	(96 - 108)	0.65	(0-5.0)	MCAWW 130.2	06/20/05	5171570
		Dilution Factor: 1			Analysis Time..: 12:00		
Specific Conductance		WO#:HD3WN1AC-LCS/HD3WN1AD-LCSD				LCS Lot-Sample#: D5F200000-572	
	100	(89 - 109)			MCAWW 120.1	06/20/05	5171572
	101	(89 - 109)	0.28	(0-7.0)	MCAWW 120.1	06/20/05	5171572
		Dilution Factor: 1			Analysis Time..: 15:00		
Total Alkalinity		WO#:HD3521AC-LCS/HD3521AD-LCSD				LCS Lot-Sample#: D5F210000-136	
	102	(95 - 110)			MCAWW 310.1	06/20/05	5172136
	100	(95 - 110)	1.5	(0-10)	MCAWW 310.1	06/20/05	5172136
		Dilution Factor: 1			Analysis Time..: 11:00		

NOTE(S):

Calculations are performed before rounding to avoid round-off errors in calculated results.

LABORATORY CONTROL SAMPLE DATA REPORT

General Chemistry

Lot-Sample #...: D5F170186 **Matrix.....:** WATER

PARAMETER	SPIKE AMOUNT	MEASURED AMOUNT	UNITS	PERCNT RECVRY	RPD	METHOD	PREPARATION-ANALYSIS DATE	PREP BATCH #
pH		WO#:HD6Q81AA-LCS/HD6Q81AC-LCSD				LCS Lot-Sample#: D5F220000-471		
	7.00	7.02	No Units	100		MCAWW 150.1	06/22/05	5173471
	7.00	7.01	No Units	100	0.14	MCAWW 150.1	06/22/05	5173471
		Dilution Factor: 1				Analysis Time..: 09:52		
Hardness, as CaCO3		WO#:HD2LK1AC-LCS/HD2LK1AD-LCSD				LCS Lot-Sample#: D5F200000-570		
	400	402	mg/L	100		MCAWW 130.2	06/20/05	5171570
	400	399	mg/L	100	0.65	MCAWW 130.2	06/20/05	5171570
		Dilution Factor: 1				Analysis Time..: 12:00		
Specific Conductance		WO#:HD3WN1AC-LCS/HD3WN1AD-LCSD				LCS Lot-Sample#: D5F200000-572		
	1410	1420	umhos/cm	100		MCAWW 120.1	06/20/05	5171572
	1410	1420	umhos/cm	101	0.28	MCAWW 120.1	06/20/05	5171572
		Dilution Factor: 1				Analysis Time..: 15:00		
Total Alkalinity		WO#:HD3521AC-LCS/HD3521AD-LCSD				LCS Lot-Sample#: D5F210000-136		
	200	204	mg/L	102		MCAWW 310.1	06/20/05	5172136
	200	201	mg/L	100	1.5	MCAWW 310.1	06/20/05	5172136
		Dilution Factor: 1				Analysis Time..: 11:00		

NOTE(S):

Calculations are performed before rounding to avoid round-off errors in calculated results.

LABORATORY CONTROL SAMPLE EVALUATION REPORT

General Chemistry

Lot-Sample #...: D5F170186 **Matrix.....:** WATER

PARAMETER	PERCENT RECOVERY	RECOVERY LIMITS	RPD	RPD LIMITS	METHOD	PREPARATION-ANALYSIS DATE	PREP BATCH #
Ammonia as N		WO#:HEDJQ1AC-LCS/HEDJQ1AD-LCSD				LCS Lot-Sample#: D5F240000-478	
	102	(90 - 110)			MCAWW 350.1	06/23/05	5175478
	102	(90 - 110)	0.36	(0-10)	MCAWW 350.1	06/23/05	5175478

Dilution Factor: 1 Analysis Time..: 16:00

NOTE(S):

Calculations are performed before rounding to avoid round-off errors in calculated results.

LABORATORY CONTROL SAMPLE DATA REPORT

General Chemistry

Lot-Sample #...: D5F170186 **Matrix.....:** WATER

PARAMETER	SPIKE AMOUNT	MEASURED AMOUNT	UNITS	PERCNT RECVRY	RPD	METHOD	PREPARATION-ANALYSIS DATE	PREP BATCH #
Ammonia as N		WO#:HEDJQ1AC-LCS/HEDJQ1AD-LCSD				LCS Lot-Sample#: D5F240000-478		
	4.00	4.08	mg/L	102		MCAWW 350.1	06/23/05	5175478
	4.00	4.06	mg/L	102	0.36	MCAWW 350.1	06/23/05	5175478

Dilution Factor: 1 Analysis Time..: 16:00

NOTE(S):

Calculations are performed before rounding to avoid round-off errors in calculated results.

MATRIX SPIKE SAMPLE EVALUATION REPORT

General Chemistry

Client Lot #...: D5F170186 **Matrix.....:** WATER
Date Sampled...: 06/16/05 15:20 **Date Received..:** 06/17/05

PARAMETER	PERCENT RECOVERY	RECOVERY LIMITS	RPD	RPD LIMITS	METHOD	PREPARATION-ANALYSIS DATE	PREP BATCH #
Hardness, as CaCO3			WO#: HDTN11AJ-MS/HDTN11AK-MSD			MS Lot-Sample #: D5F170166-001	
	99	(96 - 108)			MCAWW 130.2	06/20/05	5171570
	98	(96 - 108)	0.46	(0-5.0)	MCAWW 130.2	06/20/05	5171570
		Dilution Factor: 1					
		Analysis Time..: 12:00					
Hardness, as CaCO3			WO#: HDTWV1AK-MS/HDTWV1AL-MSD			MS Lot-Sample #: D5F170186-001	
	97	(96 - 108)			MCAWW 130.2	06/20/05	5171570
	97	(96 - 108)	0.13	(0-5.0)	MCAWW 130.2	06/20/05	5171570
		Dilution Factor: 1					
		Analysis Time..: 12:00					

NOTE(S):

Calculations are performed before rounding to avoid round-off errors in calculated results.

MATRIX SPIKE SAMPLE DATA REPORT

General Chemistry

Client Lot #...: D5F170186 **Matrix.....:** WATER
Date Sampled...: 06/16/05 15:20 **Date Received..:** 06/17/05

PARAMETER	SAMPLE AMOUNT	SPIKE AMT	MEASRD AMOUNT	UNITS	PERCNT RECVRY	RPD	METHOD	PREPARATION-ANALYSIS DATE	PREP BATCH #
Hardness, as CaCO3			WO#: HDTN11AJ-MS/HDTN11AK-MSD				MS Lot-Sample #: D5F170166-001		
	10	400	406	mg/L	99		MCAWW 130.2	06/20/05	5171570
	10	400	404	mg/L	98	0.46	MCAWW 130.2	06/20/05	5171570
			Dilution Factor: 1						
			Analysis Time..: 12:00						
Hardness, as CaCO3			WO#: HDTWV1AK-MS/HDTWV1AL-MSD				MS Lot-Sample #: D5F170186-001		
	170	400	559	mg/L	97		MCAWW 130.2	06/20/05	5171570
	170	400	558	mg/L	97	0.13	MCAWW 130.2	06/20/05	5171570
			Dilution Factor: 1						
			Analysis Time..: 12:00						

NOTE(S):

Calculations are performed before rounding to avoid round-off errors in calculated results.

MATRIX SPIKE SAMPLE EVALUATION REPORT

General Chemistry

Client Lot #...: D5F170186 **Matrix.....:** WATER
Date Sampled...: 06/16/05 05:00 **Date Received..:** 06/17/05

PARAMETER	PERCENT RECOVERY	RECOVERY LIMITS	RPD	RPD LIMITS	METHOD	PREPARATION-ANALYSIS DATE	PREP BATCH #
Ammonia as N		WO#:	HDTWV1AM-MS/HDTWV1AN-MSD			MS Lot-Sample #: D5F170186-001	
	102	(44 - 130)			MCAWW 350.1	06/23/05	5175478
	101	(44 - 130)	1.3	(0-30)	MCAWW 350.1	06/23/05	5175478

Dilution Factor: 1
Analysis Time..: 16:00

NOTE(S):

Calculations are performed before rounding to avoid round-off errors in calculated results.

MATRIX SPIKE SAMPLE DATA REPORT

General Chemistry

Client Lot #...: D5F170186 **Matrix.....:** WATER
Date Sampled...: 06/16/05 05:00 **Date Received..:** 06/17/05

PARAMETER	SAMPLE AMOUNT	SPIKE AMT	MEASRD AMOUNT	UNITS	PERCNT RECVRY	RPD	METHOD	PREPARATION-ANALYSIS DATE	PREP BATCH #
Ammonia as N			WO#: HDTWV1AM-MS/HDTWV1AN-MSD				MS Lot-Sample #: D5F170186-001		
	0.041	4.00	4.13	mg/L	102		MCAWW 350.1	06/23/05	5175478
	0.041	4.00	4.08	mg/L	101	1.3	MCAWW 350.1	06/23/05	5175478
			Dilution Factor: 1						
			Analysis Time..: 16:00						

NOTE(S):

Calculations are performed before rounding to avoid round-off errors in calculated results.

SAMPLE DUPLICATE EVALUATION REPORT

General Chemistry

Client Lot #...: D5F170186 **Work Order #...:** HDTP7-SMP HDTP7-DUP **Matrix.....:** WATER

Date Sampled...: 06/16/05 07:45 **Date Received..:** 06/17/05

PARAM	RESULT	DUPLICATE RESULT	UNITS	RPD	RPD LIMIT	METHOD	PREPARATION-ANALYSIS DATE	PREP BATCH #
Specific Conductance						SD Lot-Sample #:	D5F170171-001	
	9700	9500	umhos/cm	2.3	(0-7.0)	MCAWW 120.1	06/20/05	5171572

Dilution Factor: 1 Analysis Time..: 15:00

SAMPLE DUPLICATE EVALUATION REPORT

General Chemistry

Client Lot #...: D5F170186 **Work Order #...:** HDT38-SMP HDT38-DUP **Matrix.....:** WATER

Date Sampled...: 06/16/05 10:10 **Date Received..:** 06/17/05

PARAM	RESULT	DUPLICATE RESULT	UNITS	RPD	RPD LIMIT	METHOD	PREPARATION-ANALYSIS DATE	PREP BATCH #
Specific Conductance						SD Lot-Sample #:	D5F170206-001	
	79	81	umhos/cm	2.1	(0-7.0)	MCAWW 120.1	06/20/05	5171572

Dilution Factor: 1 Analysis Time..: 15:00

SAMPLE DUPLICATE EVALUATION REPORT

General Chemistry

Client Lot #...: D5F170186 **Work Order #...:** HDMML-SMP HDMML-DUP **Matrix.....:** WATER

Date Sampled...: 06/14/05 10:40 **Date Received..:** 06/15/05

PARAM	RESULT	DUPLICATE RESULT	UNITS	RPD	RPD LIMIT	METHOD	PREPARATION-ANALYSIS DATE	PREP BATCH #
Total Alkalinity						SD Lot-Sample #:	D5F150234-001	
	200	200	mg/L	0.51	(0-10)	MCAWW 310.1	06/20/05	5172136

Dilution Factor: 1 Analysis Time..: 11:00

SAMPLE DUPLICATE EVALUATION REPORT

General Chemistry

Client Lot #...: D5F170186 **Work Order #...:** HD38E-SMP HD38E-DUP **Matrix.....:** WATER

Date Sampled...: 06/21/05 07:00 **Date Received..:** 06/21/05

PARAM	RESULT	DUPLICATE RESULT	UNITS	RPD	RPD LIMIT	METHOD	PREPARATION-ANALYSIS DATE	PREP BATCH #
pH						SD Lot-Sample #:	D5F210320-001	
	7.6	7.6	No Units	0.13	(0-5.0)	MCAWW 150.1	06/22/05	5173471

Dilution Factor: 1 Analysis Time..: 10:38

SAMPLE DUPLICATE EVALUATION REPORT

General Chemistry

Client Lot #...: D5F170186 **Work Order #...:** HD483-SMP HD483-DUP **Matrix.....:** WATER

Date Sampled...: 06/20/05 07:45 **Date Received..:** 06/22/05

PARAM	RESULT	DUPLICATE RESULT	UNITS	RPD	RPD LIMIT	METHOD	PREPARATION-ANALYSIS DATE	PREP BATCH #
pH						SD Lot-Sample #:	D5F220164-002	
	7.0	7.0	No Units	0.14	(0-5.0)	MCAWW 150.1	06/22/05	5173471

Dilution Factor: 1 Analysis Time..: 12:55

Reported Data

SEVERN TRENT STL

Severn Trent Laboratories - Denver
4955 Yarrow Street
Arvada, CO 80002

ACUTE TOXICITY REPORT

Fathead minnows - *Pimephales promelas*

Aquatic Toxicology - Biology

CLIENT NAME: Ameren Callaway Power Plant
SAMPLE I.D.: D5F170186-001
50 % MORTALITY TEST: Passed
TEST RESULT LC50: >100%
% SURVIVAL IN 100% DILUTION: 75%
SAMPLE DATE: 6-16-05 TIME: 05:00A
CLIENT ID: Raw H_2O
ORGANISM: Fathead Minnow AGE: DOH 6-9-05
TEST START: 6-17-05 12:47P
TEST FINISH: 6-19-05 12:47P
TYPE OF TEST: LC50, 48 hours, static non-renewal, moderately hard fresh synthetic dilution water.

MODERATELY HARD FRESH SYNTHETIC DILUTION WATER CONSTITUENT

AMMONIA: .051 mg/L
D.O.: 7.01 mg/L
HARDNESS: 91 mg/L
CHLORINE: ND
ALKALINITY: 59.3 mg/L
TEMPERATURE: 20.3 deg C
pH: 8.23

SURVIVAL DATA

DATE	(HOURS)	CONTROL	6.25	12.5	25	50	75	100
		DILUTIONS (%)						
6/17/2005	INITIAL	20	20	20	20	20	20	20
6/18/2005	24	20	20	20	20	20	20	20
6/19/2005	48	20	20	20	20	20	20	15
MORTALITY:		0	0	0	0	0	0	5
% SURVIVAL:		100%	100%	100%	100%	100%	100%	75%

DAILY CHEMISTRY - (MIN/MAX)

	CONTROL	6.25	12.5	25	50	75	100
	DILUTIONS (%)						
CONDUCTIVITY	406/441	420/428	430/436	446/449	479/483	515/521	551/559
D.O.	6.8/7.0	6.6/7.0	6.5/7.2	6.6/7.4	6.5/7.7	6.6/8.0	6.5/8.3
pH	8.2/8.2	8.1/8.1	8.0/8.1	8.0/8.1	7.9/8.1	7.8/8.2	7.8/8.2
TEMPERATURE	20.3/20.3	20.3/20.3	20.3/20.3	20.3/20.3	20.3/20.3	20.3/20.3	20.3/20.3

GENERAL CHEMISTRY - SAMPLE

AMMONIA: .041 mg/L
D.O.: 8.26 mg/L
HARDNESS: 170 mg/L
CHLORINE: ND
ALKALINITY: 120 mg/L
TEMPERATURE: 20.3 deg C
pH: 7.78
D.O AFTER AERATION: NA

ANOEC	CALCULATION METHOD	METHOD REFERENCE
75%	SPEARMAN-KARBER	EPA -821-R-02-012 October 2002 pg.78

ADDITIONAL COMMENTS:

Analysis Conducted by: [signature]
Date: 6/27/05

Reviewed by: [signature]
Date: 6/27/05

PPRAW

CT-TOX: BINOMIAL, MOVING AVERAGE, PROBIT, AND SPEARMAN METHODS

MINIMUM REQUIRED TRIM IS TOO LARGE: 75.0,SO SK IS NOT CALCULABLE.

SPEARMAN-KARBER

TRIM: .00%
LC50: .000
95% CONFIDENCE LIMITS
ARE UNRELIABLE.

CONC. %	NUMBER EXPOSED	NUMBER DEAD	PERCENT DEAD	BINOMIAL PROB.(%)
6.25	20.	0.	.00	.9537D-04
12.50	20.	0.	.00	.9537D-04
25.00	20.	0.	.00	.9537D-04
50.00	20.	0.	.00	.9537D-04
75.00	20.	0.	.00	.9537D-04
100.00	20.	5.	25.00	.2069D+01

THE BINOMIAL TEST SHOWS THAT 100.00 AND +INFINITY CAN BE USED AS STATISTICALLY SOUND CONSERVATIVE 95 PERCENT CONFIDENCE LIMITS SINCE THE ACTUAL CONFIDENCE LEVEL ASSOCIATED WITH THESE LIMITS IS 97.9305 PERCENT.
THE LC50 FOR THIS DATA SET IS GREATER THAN 100.00

WHEN THERE ARE LESS THAN TWO CONCENTRATIONS AT WHICH THE PERCENT DEAD IS BETWEEN 0 AND 100, NEITHER THE MOVING AVERAGE NOR THE PROBIT METHOD CAN GIVE ANY STATISCALLY SOUND RESULTS.

DATE: 6-17-05 TEST NUMBER: 170186-1 DURATION: 48 hours
SAMPLE: Raw H20 SPECIES: Pimephales promelas

METHOD	LC50	CONFIDENCE LIMITS LOWER	UPPER	SPAN
BINOMIAL	*******	100.000	*******	*******
MAA	*******	*******	*******	*******
PROBIT	*******	*******	*******	*******
SPEARMAN	.000	*******	*******	*******

**** = LIMIT DOES NOT EXIST

SEVERN TRENT STL

Severn Trent Laboratories - Denver
4955 Yarrow Street
Arvada, CO 80002

ACUTE TOXICITY REPORT

Ceriodaphnia dubia

Aquatic Toxicology - Biology

CLIENT NAME: Ameren Callaway Power Plant
SAMPLE I.D.: D5F170186-001
50 % MORTALITY TEST: Passed
TEST RESULT LC50: >100%
% SURVIVAL IN 100% DILUTION: 95%
SAMPLE DATE: 6-16-05 TIME: 05:00A
CLIENT ID: Raw H_2O
ORGANISM: Ceriodaphnia dubia AGE: < 24 hours old
TEST START: 6-17-05 13:00P
TEST FINISH: 6-19-05 13:00P
TYPE OF TEST: LC50, 48 hours, static non-renewal, moderately hard fresh synthetic dilution water.

MODERATELY HARD FRESH SYNTHETIC DILUTION WATER CONSTITUENT

AMMONIA: .051 mg/L
D.O.: 7.01 mg/L
HARDNESS: 91 mg/L
CHLORINE: ND
ALKALINITY: 59.3 mg/L
TEMPERATURE: 20.3 deg C
pH: 8.23

SURVIVAL DATA

DATE	(HOURS)	DILUTIONS (%) CONTROL	6.25	12.5	25	50	75	100
6/17/2005	INITIAL	20	20	20	20	20	20	20
6/18/2005	24	20	20	20	20	20	20	20
6/19/2005	48	20	20	20	18	17	19	19
	MORTALITY:	0	0	0	2	3	1	1
	% SURVIVAL:	100%	100%	100%	90%	85%	95%	95%

DAILY CHEMISTRY - (MIN/MAX)

	DILUTIONS (%) 0	6.25	12.5	25	50	75	100
CONDUCTIVITY	406/410	420/454	430/457	446/470	479/506	515/540	551/586
D.O.	6.9/7.0	6.9/7.0	6.9/7.2	6.9/7.4	6.9/7.7	6.9/8.0	6.9/8.3
pH	8.2/8.3	8.1/8.2	8.1/8.2	8.0/8.2	7.9/8.2	7.8/8.3	7.8/8.4
TEMPERATURE	20.3/20.3	20.3/20.3	20.3/20.3	20.3/20.3	20.3/20.3	20.3/20.3	20.3/20.3

GENERAL CHEMISTRY - SAMPLE

AMMONIA: .041 mg/L
D.O.: 8.26 mg/L
HARDNESS: 170 mg/L
CHLORINE: ND
ALKALINITY: 120 mg/L
TEMPERATURE: 20.3 deg C
pH: 7.78
D.O AFTER AERATION: NA

ANOEC	CALCULATION METHOD	METHOD REFERENCE
12.5%	SPEARMAN-KARBER	EPA -821-R-02-012 October 2002 pg.78

ADDITIONAL COMMENTS:

Analysis Conducted by: [signature]
Date: 6/27/05

Reviewed by: [signature]
Date: 6/27/05

CDRAW

CT-TOX: BINOMIAL, MOVING AVERAGE, PROBIT, AND SPEARMAN METHODS

MINIMUM REQUIRED TRIM IS TOO LARGE: 91.3,SO SK IS NOT CALCULABLE.

SPEARMAN-KARBER

TRIM: .00%
LC50: .000
95% CONFIDENCE LIMITS
ARE UNRELIABLE.

CONC. %	NUMBER EXPOSED	NUMBER DEAD	PERCENT DEAD	BINOMIAL PROB.(%)
6.25	20.	0.	.00	.9537D-04
12.50	20.	0.	.00	.9537D-04
25.00	20.	2.	10.00	.2012D-01
50.00	20.	3.	15.00	.1288D+00
75.00	20.	1.	5.00	.2003D-02
100.00	20.	1.	5.00	.2003D-02

THE BINOMIAL TEST SHOWS THAT 100.00 AND +INFINITY CAN BE USED AS STATISTICALLY SOUND CONSERVATIVE 95 PERCENT CONFIDENCE LIMITS SINCE THE ACTUAL CONFIDENCE LEVEL ASSOCIATED WITH THESE LIMITS IS 99.9980 PERCENT.
THE LC50 FOR THIS DATA SET IS GREATER THAN 100.00

THE MOVING AVERAGE METHOD CANNOT BE USED WITH
THIS DATA SET BECAUSE NO SPAN WHICH PRODUCES
AVERAGE ANGLES BRACKETING 45 DEGREES ALSO USES
TWO PERCENT DEAD BETWEEN 0 AND 100 PERCENT.

NO CONVERGENCE IN 25 ITERATIONS. PROBIT METHOD
PROBABLY CAN NOT BE USE WITH THIS SET OF DATA.

DATE: 6-17-05 TEST NUMBER: 170186-1 DURATION: 48 hours
SAMPLE: Raw H20 SPECIES: Ceriodaphnia dubia

METHOD	LC50	CONFIDENCE LIMITS LOWER	UPPER	SPAN
BINOMIAL	*******	100.000	*******	*******
MAA	*******	*******	*******	*******
PROBIT	*******	*******	*******	*******
SPEARMAN	.000	*******	*******	*******

NOTE: MORTALITY PROPORTIONS WERE NOT MONOTONICALLY INCREASING.
ADJUSTMENTS WERE MADE PRIOR TO SPEARMAN-KARBER ESTIMATION.

**** = LIMIT DOES NOT EXIST

Mortality Benchsheet for 48-Hour Test

SEVERN TRENT STL

STL-Denver

Test Type: 48 hour static non-renewal
Facility Name: Ameren Callaway Power Plant
Source: Raw H2O
Lot No.: D5F170186-001
Organism/Age: Ceriodaphnia dubia <24 hours old
Dilution Water: MHFSW 6/14/05
Analyst(s): Jeffrey Hoffman / Celeste Maes
Test Initiation: 6/17/05 1300
Test Termination: 6/19/05 1300
Test Duration: 48 hours
Temperature: 25°C ±1°C

	0 Hours (Survival)				24 Hours (Survival)				48 Hours (Survival)				Total Mortality	Percent Survival
Concentration %	A	B	C	D	A	B	C	D	A	B	C	D		
Lab control (0%)	5	5	5	5	5	5	5	5	5	5	5	5	Ø	100%
6.25	5	5	5	5	5	5	5	5	5	5	5	5	Ø	100%
12.5	5	5	5	5	5	5	5	5	5	5	5	5	Ø	100%
25	5	5	5	5	5	5	5	5	5	4	5	4	2	90%
50	5	5	5	5	5	5	5	5	5	4	4	4	3	85%
75	5	5	5	5	5	5	5	5	5	5	4	5	1	95%
100	5	5	5	5	5	5	5	5	5	4	5	5	1	95%

Comments Non-renewal Cd 25°C

Test Type: 48 hour static non-renewal
Facility Name: ~~Ameren Callaway~~ Power Plant
Source: ~~Outfall Composite~~
Lot No.: D5F170186-002
Organism/Age: Ceriodaphnia dubia <24 hours old
Dilution Water: MHFSW 6/14/05
Analyst(s): Jeffrey Hoffman / Celeste Maes
Test Initiation: 6/17/05 ~~1300~~ 1305
Test Termination: 6/19/05 ~~1300~~ 1305
Test Duration: 48 hours
Temperature: 25°C ±1°C

	0 Hours (Survival)				24 Hours (Survival)				48 Hours (Survival)				Total Mortality	Percent Survival
Concentration %	A	B	C	D	A	B	C	D	A	B	C	D		
Lab control (0%)	5	5	5	5	5	5	5	5	5	5	5	5	Ø	100%
6.25	5	5	5	5	5	5	5	5	5	5	5	5	Ø	100%
12.5	5	5	5	5	5	5	5	5	5	5	5	5	Ø	100%
25	5	5	5	5	5	5	5	5	5	5	5	5	Ø	100%
50	5	5	5	5	5	5	5	5	5	5	5	5	Ø	100%
75	5	5	5	5	5	5	5	5	5	5	5	5	Ø	100%
100	5	5	5	5	5	5	5	5	5	5	5	5	Ø	100%

Comments Non-renewal Cd 25°C

SEVERN TRENT STI

STL Denve

Daily Chemistry Benchsheet

Facility Name: Ameren Callaway River Plant
Lot No.: D5F170180-001
Source: Raw H2O
Organism: Ceriodaphnia dubia
Dilution Water: MHFSW 6/14/05

Chemistry for Test Water as Received:					
Resid.Chlorine	Alkalinity	Ammonia	D.O.	pH	Hardness
ND	ND	.041 mg/L	8.30 mg/L	7.78	170 mg/L

Test Start, Date/Time: 6/17/05 1300 Test Finish, Date/Time: 6/19/05 1300

EFFLUENT CONCENTRATIONS %		CHEMICAL TEST	COMMENT	DAY OF TEST INT.	24	48	72	96
LAB CONTROL 0% Sample	A	COND.	6/17 410	406	NA	~~[illegible]~~		
	B	DO		7.01		6.92		
	C	pH		8.23		8.29		
	D	TEMP.		20.3		20.3		
6.25% Sample	A	COND.		420		454		
	B	DO		7.03		6.89		
	C	pH		8.06		8.21		
	D	TEMP.		20.3		20.3		
12.5% Sample	A	COND.		430		457		
	B	DO		7.19		6.87		
	C	pH		8.05		8.17		
	D	TEMP.		20.3		20.3		
25% Sample	A	COND.		446		470		
	B	DO		7.39		6.92		
	C	pH		7.98		8.15		
	D	TEMP.		20.3		20.3		
50% Sample	A	COND.		479		506		
	B	DO		7.72		6.93		
	C	pH		7.89		8.21		
	D	TEMP.		20.3		20.3		
75% Sample	A	COND.		515		540		
	B	DO		7.98		6.94		
	C	pH		7.84		8.34		
	D	TEMP.		20.3		20.3		
100% Sample	A	COND.		551		586		
	B	DO		8.26		6.89		
	C	pH		7.78		8.36		
	D	TEMP.		20.3		20.3		
ANALYST				[illegible]	[illegible]	[illegible]		

Control Limits: D.O. 4.0-Saturated, pH 6.4-8.4, Temperature = 19.0-21.0 deg. C

Final Results	NOEC	Statistical Method Used
>100%	12.5%	Spearman-Karber

5/22/03 Version

Mortality Benchsheet for 96-Hour Test

SEVERN TRENT STL

STL-Denver

Test Type: 48 hour static non-renewal
Facility Name: Ameren Callaway Power Plant **Source:** Raw #20
Lot No.: DSF170186-001 **Organism/Age:** Pimephales promelas DOH 6/9/05
Dilution Water: MHFSW 6/14/05 **Analyst(s):** Jeffrey Hoffman / Celeste Maes
Test Initiation: 6/17/05 1247 **Test Termination:** 6/19/05 1247
Test Duration: 48 hours **Temperature:** 25°C ± 1°C

	0 Hours (Survival)		24 Hours (Survival)		48 Hours (Survival)		72 Hours (Survival)		96 Hours (Survival)		Total Mortality	Percent Survival
Concentration %	A	B	A	B	A	B	A	B	A	B		
Lab control (0%)	10	10	10	10	10	10					Ø	100%
6.25	10	10	10	10	10	10					Ø	100%
12.5	10	10	10	10	10	10					Ø	100%
25	10	10	10	10	10	10					Ø	100%
50	10	10	10	10	10	10					Ø	100%
75	10	10	10	10	10	10					Ø	100%
100	10	10	10	10	8	7					5	75%

6/17/05

Test Type: 48 hour static non-renewal
Facility Name: Ameren Callaway Power Plant **Source:** Outfall Composite
Lot No.: DSF170186-002 **Organism/Age:** Pimephales promelas DOH 6/9/05
Dilution Water: MHFSW 6/14/05 **Analyst(s):** Jeffrey Hoffman / Celeste Maes
Test Initiation: 6/17/05 1252 **Test Termination:** 6/19/05 1252
Test Duration: 48 hours **Temperature:** 25°C ± 1°C

	0 Hours (Survival)		24 Hours (Survival)		48 Hours (Survival)		72 Hours (Survival)		96 Hours (Survival)		Total Mortality	Percent Survival
Concentration %	A	B	A	B	A	B	A	B	A	B		
Lab control (0%)	10	10	10	10	10	10					Ø	100%
6.25	10	10	10	10	10	10					Ø	100%
12.5	10	10	10	10	10	10					Ø	100%
25	10	10	10	10	10	10					Ø	100%
50	10	10	10	10	10	10					Ø	100%
75	10	10	10	10	10	10					Ø	100%
100	10	10	10	10	10	10					Ø	100%

6/17/05

Comments:

Non-renewal Pp 25°C

SEVERN TRENT STL

STL Denver

Daily Chemistry Benchsheet

Facility Name: Ameren Callaway Power Plant
Lot No.: D5F170186-001
Source: Raw H2O

Organism: Pimephales promelas
Dilution Water: MHFSW 6/17/05

Chemistry for Test Water as Received:					
Resid.Chlorine	Alkalinity	Ammonia	D.O.	pH	Hardness
ND	ND	.04 mg/L	8.20 mg/L	7.78	170 mg/L

Test Start, Date/Time: 6/17/05 1247 Test Finish, Date/Time: 6/19/05 1247

EFFLUENT CONCENTRATIONS %		CHEMICAL TEST	COMMENT	DAY OF TEST INT.	24	48	72	96
LAB CONTROL 0% Sample	A	COND.		406		441		
	B	DO		7.01		6.75		
	C	PH		8.23		8.18		
	D	TEMP		20.3	20.3	20.3		
6.25% Sample	A	COND.		420		428		
	B	DO		7.03		6.63		
	C	PH		8.06		8.07		
	D	TEMP		20.3	20.3	20.3		
12.5% Sample	A	COND.		430		436		
	B	DO		7.19		6.50		
	C	PH		8.05		7.99		
	D	TEMP		20.3	20.3	20.3		
25% Sample	A	COND.		446		449		
	B	DO		7.39		6.55		
	C	PH		7.98		8.07		
	D	TEMP		20.3	20.3	20.3		
50% Sample	A	COND.		479		483		
	B	DO		7.72		6.53		
	C	PH		7.87		8.06		
	D	TEMP		20.3	20.3	20.3		
75% Sample	A	COND.		515		521		
	B	DO		7.98		6.59		
	C	PH		7.84		8.15		
	D	TEMP		20.3	20.3	20.3		
100% Sample	A	COND.		551		559		
	B	DO		8.26		6.54		
	C	PH		7.78		8.22		
	D	TEMP		20.3	20.3	20.3		
ANALYST				CM		CM		

Control Limits: D.O. 4.0-Saturated, pH 6.4-8.4, Temperature = 19.0-21.0 deg. C

Final LC50	NOEC	Statistical Method Used
>100%	75%	Spearman - Karber

5/22/03 Version

SEVERN TRENT STL

Severn Trent Laboratories - Denver
4955 Yarrow Street
Arvada, CO 80002

ACUTE TOXICITY REPORT

Fathead minnows - *Pimephales promelas*

Aquatic Toxicology - Biology

CLIENT NAME: Ameren Callaway Power Plant
SAMPLE I.D.: D5F170186-002
50 % MORTALITY TEST: Passed
TEST RESULT LC50: >100%
% SURVIVAL IN 100% DILUTION: 100%
SAMPLE DATE: 6-16-05 TIME: 05:00A
CLIENT ID: Outfall Composite
ORGANISM: Fathead Minnow AGE: DOH 6-9-05
TEST START: 6-17-05 12:52P
TEST FINISH: 6-19-05 12:52P
TYPE OF TEST: LC50, 48 hours, static non-renewal, moderately hard fresh synthetic dilution water.

MODERATELY HARD FRESH SYNTHETIC DILUTION WATER CONSTITUENT

AMMONIA: .051 mg/L
D.O.: 7.01 mg/L
HARDNESS: 91 mg/L
CHLORINE: ND
ALKALINITY: 59.3 mg/L
TEMPERATURE: 20.3 deg C
pH: 8.23

SURVIVAL DATA

DATE	(HOURS)	CONTROL	6.25	12.5	25	50	75	100
		DILUTIONS (%)						
6/17/2005	INITIAL	20	20	20	20	20	20	20
6/18/2005	24	20	20	20	20	20	20	20
6/19/2005	48	20	20	20	20	20	20	20
MORTALITY:		0	0	0	0	0	0	0
% SURVIVAL:		100%	100%	100%	100%	100%	100%	100%

DAILY CHEMISTRY - (MIN/MAX)

	CONTROL	6.25	12.5	25	50	75	100
	DILUTIONS (%)						
CONDUCTIVITY	406/452	551/559	700/717	960/964	1410/1445	1888/1910	2050/2110
D.O.	6.8/7.0	6.7/7.3	6.7/7.4	6.7/7.6	6.7/8.1	6.7/8.4	6.7/8.8
pH	8.1/8.2	8.0/8.3	8.1/8.4	8.1/8.4	8.2/8.5	8.3/8.5	8.4/8.5
TEMPERATURE	20.3/20.3	20.3/20.3	20.3/20.3	20.3/20.3	20.3/20.3	20.3/20.3	20.3/20.3

GENERAL CHEMISTRY - SAMPLE

AMMONIA: 1.7 mg/L
D.O.: 8.80 mg/L
HARDNESS: 940 mg/L
CHLORINE: ND
ALKALINITY: 190 mg/L
TEMPERATURE: 20.3 deg C
pH: 8.47
D.O AFTER AERATION: NA

ANOEC	CALCULATION METHOD	METHOD REFERENCE
100%	SPEARMAN-KARBER	EPA -821-R-02-012 October 2002 pg.78

ADDITIONAL COMMENTS:

Analysis Conducted by: [signature]
Date: 6/27/05

Reviewed by: [signature]
Date: 6/27/05

PPOUT

CT-TOX: BINOMIAL, MOVING AVERAGE, PROBIT, AND SPEARMAN METHODS

MINIMUM REQUIRED TRIM IS TOO LARGE: 100.0,SO SK IS NOT CALCULABLE.

SPEARMAN-KARBER

TRIM: .00%
LC50: .000
95% CONFIDENCE LIMITS
ARE UNRELIABLE.

CONC. %	NUMBER EXPOSED	NUMBER DEAD	PERCENT DEAD	BINOMIAL PROB.(%)
6.25	20.	0.	.00	.9537D-04
12.50	20.	0.	.00	.9537D-04
25.00	20.	0.	.00	.9537D-04
50.00	20.	0.	.00	.9537D-04
75.00	20.	0.	.00	.9537D-04
100.00	20.	0.	.00	.9537D-04

THE BINOMIAL TEST SHOWS THAT 100.00 AND +INFINITY CAN BE USED AS STATISTICALLY SOUND CONSERVATIVE 95 PERCENT CONFIDENCE LIMITS SINCE THE ACTUAL CONFIDENCE LEVEL ASSOCIATED WITH THESE LIMITS IS 99.9999 PERCENT.
THE LC50 FOR THIS DATA SET IS GREATER THAN 100.00

WHEN THERE ARE LESS THAN TWO CONCENTRATIONS AT WHICH THE PERCENT DEAD IS BETWEEN 0 AND 100, NEITHER THE MOVING AVERAGE NOR THE PROBIT METHOD CAN GIVE ANY STATISCALLY SOUND RESULTS.

DATE: 6-17-05 TEST NUMBER: 170186-2 DURATION: 48 hours
SAMPLE: Outfall Composite SPECIES: Pimephales promelas

METHOD	LC50	CONFIDENCE LIMITS LOWER	UPPER	SPAN
BINOMIAL	*******	100.000	*******	*******
MAA	*******	*******	*******	*******
PROBIT	*******	*******	*******	*******
SPEARMAN	.000	*******	*******	*******

**** = LIMIT DOES NOT EXIST

SEVERN TRENT STL

Severn Trent Laboratories - Denver
4955 Yarrow Street
Arvada, CO 80002

ACUTE TOXICITY REPORT

Ceriodaphnia dubia

Aquatic Toxicology - Biology

CLIENT NAME: Ameren Callaway Power Plant
SAMPLE I.D.: D5F170186-002
50 % MORTALITY TEST: Passed
TEST RESULT LC50: >100%
% SURVIVAL IN 100% DILUTION: 100%
SAMPLE DATE: 6-16-05 TIME: 05:00A
CLIENT ID: Outfall Composite
ORGANISM: Ceriodaphnia dubia AGE: < 24 hours old
TEST START: 6-17-05 13:05P
TEST FINISH: 6-19-05 13:05P
TYPE OF TEST: LC50, 48 hours, static non-renewal, moderately hard fresh synthetic dilution water.

MODERATELY HARD FRESH SYNTHETIC DILUTION WATER CONSTITUENT

AMMONIA: .051 mg/L
D.O.: 7.01 mg/L
HARDNESS: 91 mg/L
CHLORINE: ND
ALKALINITY: 59.3 mg/L
TEMPERATURE: 20.3 deg C
pH: 8.23

SURVIVAL DATA

DATE	(HOURS)	CONTROL	6.25	12.5	25	50	75	100
		DILUTIONS (%)						
6/17/2005	INITIAL	20	20	20	20	20	20	20
6/18/2005	24	20	20	20	20	20	20	20
6/19/2005	48	20	20	20	20	20	20	20
MORTALITY:		0	0	0	0	0	0	0
% SURVIVAL:		100%	100%	100%	100%	100%	100%	100%

DAILY CHEMISTRY - (MIN/MAX)

	0	6.25	12.5	25	50	75	100
	DILUTIONS (%)						
CONDUCTIVITY	406/466	551/572	700/737	960/990	1445/1473	1910/1939	2050/2110
D.O.	6.9/7.0	6.9/7.3	6.9/7.4	6.9/7.6	6.9/8.1	6.9/8.4	6.9/8.8
pH	8.2/8.4	8.2/8.3	8.2/8.4	8.2/8.4	8.3/8.5	8.4/8.5	8.5/8.5
TEMPERATURE	20.3/20.3	20.3/20.3	20.3/20.3	20.3/20.3	20.3/20.3	20.3/20.3	20.3/20.3

GENERAL CHEMISTRY - SAMPLE

AMMONIA: 1.7 mg/L
D.O.: 8.80 mg/L
HARDNESS: 940 mg/L
CHLORINE: ND
ALKALINITY: 190 mg/L
TEMPERATURE: 20.3 deg C
pH: 8.47
D.O AFTER AERATION: NA

ANOEC	CALCULATION METHOD	METHOD REFERENCE
100%	SPEARMAN-KARBER	EPA -821-R-02-012 October 2002 pg.78

ADDITIONAL COMMENTS:

Analysis Conducted by: [signature]
Date: 6/27/05

Reviewed by: [signature]
Date: 6/27/05

CDOUT

CT-TOX: BINOMIAL, MOVING AVERAGE, PROBIT, AND SPEARMAN METHODS

MINIMUM REQUIRED TRIM IS TOO LARGE: 100.0,SO SK IS NOT CALCULABLE.

SPEARMAN-KARBER

TRIM: .00%
LC50: .000
95% CONFIDENCE LIMITS
ARE UNRELIABLE.

CONC. %	NUMBER EXPOSED	NUMBER DEAD	PERCENT DEAD	BINOMIAL PROB.(%)
6.25	20.	0.	.00	.9537D-04
12.50	20.	0.	.00	.9537D-04
25.00	20.	0.	.00	.9537D-04
50.00	20.	0.	.00	.9537D-04
75.00	20.	0.	.00	.9537D-04
100.00	20.	0.	.00	.9537D-04

THE BINOMIAL TEST SHOWS THAT 100.00 AND +INFINITY CAN BE USED AS STATISTICALLY SOUND CONSERVATIVE 95 PERCENT CONFIDENCE LIMITS SINCE THE ACTUAL CONFIDENCE LEVEL ASSOCIATED WITH THESE LIMITS IS 99.9999 PERCENT.
THE LC50 FOR THIS DATA SET IS GREATER THAN 100.00

WHEN THERE ARE LESS THAN TWO CONCENTRATIONS AT WHICH THE PERCENT DEAD IS BETWEEN 0 AND 100, NEITHER THE MOVING AVERAGE NOR THE PROBIT METHOD CAN GIVE ANY STATISCALLY SOUND RESULTS.

DATE: 6-17-05 TEST NUMBER: 170186-2 DURATION: 48 hours
SAMPLE: Outfall Composite SPECIES: Ceriodaphnia dubia

METHOD	LC50	CONFIDENCE LIMITS LOWER	UPPER	SPAN
BINOMIAL	*******	100.000	*******	*******
MAA	*******	*******	*******	*******
PROBIT	*******	*******	*******	*******
SPEARMAN	.000	*******	*******	*******

**** = LIMIT DOES NOT EXIST

SEVERN TRENT STL

STL Denver

Daily Chemistry Benchsheet

Facility Name: Ameren Callaway Power Plant

Lot No.: D5F170186-002

Source: Outfall Composite

Organism: Ceriodaphnia dubia

Dilution Water: MHFSW 4/14/05

Chemistry for Test Water as Received:					
Resid.Chlorine	Alkalinity	Ammonia	D.O.	pH	Hardness
ND	~~ND~~ 140 mg/L	7mg/L	8.80 mg/L	8.47	940mg/L

Test Start, Date/Time: 4/14/05 1305 Test Finish, Date/Time: 4/19/05 1305

EFFLUENT CONCENTRATIONS %		CHEMICAL TEST	COMMENT	DAY OF TEST INT.	24	48	72	96
LAB CONTROL 0% Sample	A	COND.		406	NA	466		
	B	DO		7.01		6.94		
	C	pH	8.23	~~8.37~~		8.37		
	D	TEMP		20.3		20.3		
6.25% Sample	A	COND.		551		572		
	B	DO		7.25		6.91		
	C	pH		8.27		8.22		
	D	TEMP		20.3		20.3		
12.5% Sample	A	COND.		700		737		
	B	DO		7.35		6.93		
	C	pH		8.35		8.18		
	D	TEMP		20.3		20.3		
25% Sample	A	COND.		960		990		
	B	DO		7.60		6.90		
	C	pH		8.42		8.21		
	D	TEMP		20.3		20.3		
50% Sample	A	COND.		1445		1473		
	B	DO		8.05		6.92		
	C	pH		8.47		8.32		
	D	TEMP		20.3		20.3		
75% Sample	A	COND.		1910		1939		
	B	DO		8.44		6.91		
	C	pH		8.47		8.40		
	D	TEMP		20.3		20.3		
100% Sample	A	COND.		2050		2110		
	B	DO		8.80		6.92		
	C	pH		8.47		8.45		
	D	TEMP		20.3		20.3		
ANALYST				CM	CM	CM		

Control Limits: D.O. 4.0-Saturated, pH 6.4-8.4, Temperature = 19.0-21.0 deg. C

Final Cc 50%	NOEC	Statistical Method Used
>100%	100%	Spearman - Karber

5/22/03 Version

Mortality Benchsheet for 48-Hour Test

SEVERN TRENT STL

STL-Denver

Test Type: 48 hour static non-renewal
Facility Name: Ameren Calloway Power Plant
Source: Raw H_2O
Lot No.: D5F170186-001
Organism/Age: Ceriodaphnia dubia <24 hours old
Dilution Water: MHFSW 6/14/05
Analyst(s): Jeffrey Hoffman / Celeste Mates
Test Initiation: 6/17/05 1200
Test Termination: 6/19/05 1300
Test Duration: 48 hours
Temperature: 25°C ± 1°C

	0 Hours (Survival)				24 Hours (Survival)				48 Hours (Survival)				Total Mortality	Percent Survival
Concentration %	A	B	C	D	A	B	C	D	A	B	C	D		
Lab control (0%)	5	5	5	5	5	5	5	5	5	5	5	5	Ø	100%
6.25	5	5	5	5	5	5	5	5	5	5	5	5	Ø	100%
12.5	5	5	5	5	5	5	5	5	5	5	5	5	Ø	100%
25	5	5	5	5	5	5	5	5	5	4	5	4	2	90%
50	5	5	5	5	5	5	5	5	5	4	4	4	3	85%
75	5	5	5	5	5	5	5	5	5	5	4	5	1	95%
100	5	5	5	5	5	5	5	5	5	4	5	5	1	95%

Comments Non-renewal Cd 25°C

Test Type: 48 hour static non-renewal
Facility Name: Ameren Calloway Power Plant
Source: Outfall Composite
Lot No.: D5F170186-002
Organism/Age: Ceriodaphnia dubia <24 hours old
Dilution Water: MHFSW 6/14/05
Analyst(s): Jeffrey Hoffman / Celeste Mates
Test Initiation: 6/17/05 ~~1300~~ 1305
Test Termination: 6/19/05 ~~1300~~ 1305
Test Duration: 48 hours
Temperature: 25°C ± 1°C

	0 Hours (Survival)				24 Hours (Survival)				48 Hours (Survival)				Total Mortality	Percent Survival
Concentration %	A	B	C	D	A	B	C	D	A	B	C	D		
Lab control (0%)	5	5	5	5	5	5	5	5	5	5	5	5	Ø	100%
6.25	5	5	5	5	5	5	5	5	5	5	5	5	Ø	100%
12.5	5	5	5	5	5	5	5	5	5	5	5	5	Ø	100%
25	5	5	5	5	5	5	5	5	5	5	5	5	Ø	100%
50	5	5	5	5	5	5	5	5	5	5	5	5	Ø	100%
75	5	5	5	5	5	5	5	5	5	5	5	5	Ø	100%
100	5	5	5	5	5	5	5	5	5	5	5	5	Ø	100%

Comments Non-renewal Cd 25°C

Mortality Benchsheet for 96-Hour Test

SEVERN TRENT STL

STL-Denver

Test Type: 48 hour static non-renewal
Facility Name: Ameren Callaway Power Plant
Lot No.: DSF170186-001
Dilution Water: MHFSW 6/14/05
Test Initiation: 6/17/05 1247
Test Duration: 48 hours

Source: Raw H2O
Organism/Age: Pimephales promelas DOH 6/9/05
Analyst(s): Jeffrey Hoffman / Celeste Maes
Test Termination: 6/19/05 1247
Temperature: 25°C ± 1°C

	0 Hours (Survival)		24 Hours (Survival)		48 Hours (Survival)		72 Hours (Survival)		96 Hours (Survival)		Total Mortality	Percent Survival
Concentration %	A	B	A	B	A	B	A	B	A	B		
Lab control (0%)	10	10	10	10	10	10					Ø	100%
6.25	10	10	10	10	10	10					Ø	100%
12.5	10	10	10	10	10	10					Ø	100%
25	10	10	10	10	10	10					Ø	100%
50	10	10	10	10	10	10					Ø	100%
75	10	10	10	10	10	10					Ø	100%
100	10	10	10	10	8	7					5	75%

6/17/05

Test Type: 48 hour static non-renewal
Facility Name: Ameren Callaway Power Plant
Lot No.: DSF170186-002
Dilution Water: MHFSW 6/14/05
Test Initiation: 6/17/05 1252
Test Duration: 48 hours

Source: Outfall Composite
Organism/Age: Pimephales promelas DOH 6/9/05
Analyst(s): Jeffrey Hoffman / Celeste Maes
Test Termination: 6/19/05 1252
Temperature: 25°C ± 1°C

	0 Hours (Survival)		24 Hours (Survival)		48 Hours (Survival)		72 Hours (Survival)		96 Hours (Survival)		Total Mortality	Percent Survival
Concentration %	A	B	A	B	A	B	A	B	A	B		
Lab control (0%)	10	10	10	10	10	10					Ø	100%
6.25	10	10	10	10	10	10					Ø	100%
12.5	10	10	10	10	10	10					Ø	100%
25	10	10	10	10	10	10					Ø	100%
50	10	10	10	10	10	10					Ø	100%
75	10	10	10	10	10	10					Ø	100%
100	10	10	10	10	10	10					Ø	100%

6/17/05

Comments:

Non-renewal Pp 25°C

SEVERN TRENT STL

STL Denver

Daily Chemistry Benchsheet

Facility Name: Ameren Callaway Power Plant

Lot No.: D5F170.80-002

Source: Outfall Composite

Organism: Pimephales promelas

Dilution Water: MHFSW 6/14/05

Chemistry for Test Water as Received:					
Resid.Chlorine	Alkalinity	Ammonia	D.O.	pH	Hardness
ND	~~ND~~ 190mg/L	~~[illegible]~~ 1.7mg/L	8.80mg/L	8.47	940mg/L

Test Start, Date/Time: 6/19/05 1252 Test Finish, Date/Time: 6/19/05 1252

EFFLUENT CONCENTRATIONS %		CHEMICAL TEST	COMMENT	DAY OF TEST INT.	24	48	72	96
LAB CONTROL 0% Sample	A	COND.		406	NA	452		
	B	DO		7.01		6.79		
	C	pH		8.23		8.11		
	D	TEMP		20.3		20.3		
6.25% Sample	A	COND.		551		559		
	B	DO		7.25		6.66		
	C	pH		8.27		8.04		
	D	TEMP		20.3		20.3		
12.5% Sample	A	COND.		700		717		
	B	DO		7.35		6.73		
	C	pH		8.35		8.10		
	D	TEMP		20.3		20.3		
25% Sample	A	COND.		960		964		
	B	DO		7.60		6.73		
	C	pH		8.42		8.14		
	D	TEMP		20.3		20.3		
50% Sample	A	COND.		1445		1410		
	B	DO		8.05		6.66		
	C	pH		8.47		8.24		
	D	TEMP		20.3		20.3		
75% Sample	A	COND.		1910		1888		
	B	DO		8.44		6.70		
	C	pH		8.47		8.34		
	D	TEMP		20.3		20.3		
100% Sample	A	COND.		2050		2110		
	B	DO		8.80		6.72		
	C	pH		8.47		8.38		
	D	TEMP		20.3		20.3		
ANALYST				[illegible]	[illegible]	[illegible]		

Control Limits: D.O. 4.0-Saturated, pH 6.4-8.4, Temperature = 19.0-21.0 deg. C

Final EC50	NOEC	Statistical Method Used
>100%	100%	Spearman - Karber

5/22/0 ...ion

[redacted]

Chain of Custody Record

2X37 6/17/05

SEVERN TRENT **STL**

Severn Trent Laboratories, Inc.

STL Denver
4955 Yarrow Street
Arvada, CO 80002

43

STL-4124 (0901)

Client: AMERENUE CALLAWAY NUCLEAR PLANT	Project Manager: RON Boutelle	Date: 6-16-5	Chain of Custody Number: 326749
Address: (P.O. BOX 620) JCT HWY CC AND RTO	Telephone Number (Area Code)/Fax Number: 573 676 8004	Lab Number:	Page ____ of ____
City: FULTON; State: MO; Zip Code: 65251	Site Contact: Same; Lab Contact: Betsy Farnan		
Project Name and Location (State): Callaway	Carrier/Waybill Number:		
Contract/Purchase Order/Quote No.: 58302			

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	H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Analysis (Attach list if more space is needed): Res. Cl	Sp. Cond.	Ti Hardness	pH	Alk	NH3	Total Mn	C. Daphnia	Special Instructions/ Conditions of Receipt
RAW WATER	6-16-5	0500		X			3	1					X	X	X	X	X	X	X	X	
OUTFALL COMPOSITE	6-16-5	0500		X			3	1					X	X	X	X	X	X	X	X	

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 STD

QC Requirements (Specify)

	Date	Time		Date	Time
1. Relinquished By: Ronald S Boutelle			1. Received By: Aaron Bindl	6/17/05	0930
2. Relinquished By			2. Received By		
3. Relinquished By			3. Received By		

Comments: SHIPPED VIA UPS RED

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