



Tennessee Valley Authority, Post Office Box 2000, Soddy-Daisy, Tennessee 37384-2000

October 24, 2005

Mr. Mark McAdoo
State of Tennessee
Department of Environment and Conservation
Division of Water Pollution Control
Enforcement & Compliance Section
6th Floor, L&C Annex
401 Church Street
Nashville, Tennessee 37243-1534

Mr. McAdoo:

**2005 DISCHARGE MONITORING REPORT – QUALITY ASSURANCE (DMR-QA) STUDY 25
PROVIDER-GRADED TEST RESULTS**

Please find enclosed the provider-graded test results of the 2005 DMR-QA Study 25 Laboratory Performance Evaluation obtained by TVA Sequoyah Nuclear Plant (SQN) and supporting Laboratories as required by NPDES Permit TN0026450. SQN will send a signed corrective action report on "not-acceptable" Total Residual Chlorine by December 8, 2005.

Please contact me at (423) 843-6700 if you have any questions or comments.

Sincerely,

Stephanie A. Howard
Principal Environmental Engineer
Signatory Authority for
J. Randy Douet
Site Vice President
Sequoyah Nuclear Plant

Enclosure
cc (Enclosure)

Mr. Wayne Turnbull
EPA Region IV
ESD/ASB/LE&QAS
980 College Station Road
Athens, Georgia 30605-2720

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Chattanooga, Tennessee 37402-2013

U.S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, D.C. 20555

IE25



ENVIRONMENTAL
RESOURCE ASSOCIATES®

ERA Study: **DMR-QA 25**

Permittee Name:

TVA - Sequoyah Nuclear Plant

NPDES Permit Number: **TN0026450**

Customer Code: **T2033-02**

Report Prepared by:
Environmental Resource Associates
Arvada, Colorado

October 17, 2005

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Proficiency Testing Studies / Quality Control Standards





NPDES Permit Number: TN0026450

Report Issued: 10/17/05

Study Dates: 06/02/05 - 09/02/05

DMR-QA Study Definitions:

The Reported Value is the value that the laboratory reported to ERA.

The ERA Assigned Values were established per the USEPA/NELAC FoPT Tables, June 2005.

The Acceptance Limits and Warning Limits are established per the criteria contained in the USEPA/NELAC FoPT Tables, June 2005.

The Performance Evaluation:

Acceptable = Reported Value falls within the Acceptance Limits.

Not Acceptable = Reported Value falls outside the Acceptance Limits.

Check for Error = Reported Value falls within the Acceptance Limits and outside of the Warning Limits.

No Evaluation = Reported Value cannot be evaluated.

The Method Description is the method the laboratory reported to ERA.

Any Performance Evaluation left blank indicates results were evaluated as 'Not Reported'.

DMR-QA Study Discussion:

ERA's DMR-QA 25 Study has been reviewed by ERA Senior Management and certified compliant with the requirements of the USEPA's National Standards for Water Proficiency Testing Studies Criteria Document (December 1998), and the criteria contained in the NELAC FoPT Tables, June 2005. ERA is a NIST NVLAP accredited PT Provider (Lab Code 200386-0).

ERA's DMR-QA 25 Study standards were examined for any study anomalies. A full review of all homogeneity, stability, and accuracy verification data was completed. All analytical verification data for all analytes in ERA's DMR-QA 25 standards met the acceptance criteria contained in the USEPA's National Criteria Document for Water Proficiency Testing Studies, December 1998, and the criteria contained in the NELAC FoPT Tables, June 2005.

The data submitted by participating laboratories was also examined for study anomalies. There were no study anomalies found during the review of the study data.

The DMR-QA 25 Study report shall not be reproduced except in its entirety and not without the permission of the participating laboratory. The report must not be used by the participating laboratory to claim product endorsement by NVLAP or any agency of the U. S. government.

If you have any questions regarding ERA's DMR-QA 25 Study, please contact Shawn Kassner, Proficiency Testing Manager, or Curtis Wood, Quality Assurance Director, at 1-800-372-0122.

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Permit Holder: Stephanie A Howard
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Soddy Daisy, TN 37384-2000
423-843-6700

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Analyte	Performance Evaluation	Reported Value	Assigned Value	Acceptance Limits	Warning Limits	Units	Method Description	USEPA Lab Code	Study
Trace Metals									
Aluminum †			818	653 - 978	707 - 924	µg/L			DMRQA025
Arsenic †			407	340 - 478	363 - 455	µg/L			DMRQA025
Cadmium †			341	291 - 388	307 - 372	µg/L			DMRQA025
Chromium †			675	588 - 763	617 - 734	µg/L			DMRQA025
Cobalt †				730	642 - 818	671 - 789	µg/L		DMRQA025
Copper †	Acceptable	431	445	403 - 490	417 - 475	µg/L	EPA 220.2	TN00016	DMRQA025
Iron †	Acceptable	317	310	271 - 355	285 - 341	µg/L	EPA 200.7	TN00016	DMRQA025
Lead †			468	407 - 528	427 - 507	µg/L			DMRQA025
Manganese †			552	495 - 613	515 - 594	µg/L			DMRQA025
Mercury †			2.96	1.84 - 4.15	2.22 - 3.76	µg/L			DMRQA025
Nickel †			321	285 - 362	298 - 349	µg/L			DMRQA025
Selenium †			716	568 - 829	611 - 786	µg/L			DMRQA025
Vanadium †			597	523 - 668	547 - 644	µg/L			DMRQA025

† Indicates analytes included in ERA's NIST/NVLAP accreditation. Lab Code 200386-0



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Analyte	Performance Evaluation	Reported Value	Assigned Value	Acceptance Limits	Warning Limits	Units	Method Description	USEPA Lab Code	Study
Trace Metals (Continued)									
Zinc †		871		748 - 1000	790 - 958	µg/L			DMRQA025
Demand									
BOD †		110		55.6 - 164	73.8 - 146	mg/L			DMRQA025
CBOD †		94.6		42.5 - 147	59.9 - 129	mg/L			DMRQA025
COD †		178		137 - 202	148 - 192	mg/L			DMRQA025
TOC †		70.4		58.8 - 81.0	62.5 - 77.3	mg/L			DMRQA025
Nutrients									
Ammonia as N †		9.58		7.08 - 12.0	7.90 - 11.2	mg/L			DMRQA025
Nitrate as N †		7.72		6.01 - 9.32	6.57 - 8.77	mg/L			DMRQA025
Ortho-phosphate as P †		3.78		3.11 - 4.48	3.34 - 4.25	mg/L			DMRQA025
Total Kjeldahl Nitrogen †		24.5		16.1 - 31.5	18.7 - 28.9	mg/L			DMRQA025
Total phosphorus as P †	Acceptable	2.72	2.98	2.42 - 3.60	2.61 - 3.40	mg/L	EPA 365.4	TN00016	DMRQA025

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Analyte	Performance Evaluation	Reported Value	Assigned Value	Acceptance Limits	Warning Limits	Units	Method Description	USEPA Lab Code	Study
Miscellaneous Analytes									
Total Residual Chlorine †	Not Acceptable	1.17	0.880	0.635 - 1.10	0.713 - 1.02	mg/L	EPA 330.4	TN00999	DMRQA025
Cyanide, total †			0.703	0.439 - 0.968	0.527 - 0.880	mg/L			DMRQA025
pH †	Acceptable	6.43	6.48	6.28 - 6.68		S.U.	EPA 150.1	TN00999	DMRQA025
Phenolics, total †			0.648	0.353 - 0.943	0.451 - 0.845	mg/L			DMRQA025
Total Suspended Solids (TSS) †	Acceptable	55	57.6	45.5 - 65.3	48.8 - 62.0	mg/L	EPA 160.2	TN00016	DMRQA025
Grease & Oil (Gravimetric) †	Acceptable	38	42.0	26.0 - 52.2	30.3 - 47.8	mg/L	EPA 1664A	TN00016	DMRQA025
Grease & Oil (Infrared)			51.7	33.5 - 62.9		mg/L			DMRQA025

† Indicates analytes included in ERA's NIST/NVLAP accreditation. Lab Code 200386-0



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Analyte	Performance Evaluation	Reported Value	Assigned Value	Acceptance Limits	Warning Limits	Units	Method Description	USEPA Lab Code	Study
Additional Analytes									
Antimony †			491	343 - 592	384 - 550	µg/L			DMRQA025
Barium			244	211 - 275		µg/L			DMRQA025
Beryllium †			164	138 - 185	146 - 178	µg/L			DMRQA025
Boron	Acceptable	1430	1390	1140 - 1620		µg/L	EPA 200.7	TN00016	DMRQA025
Molybdenum †			177	146 - 206	156 - 196	µg/L			DMRQA025
Silver †			159	136 - 182	144 - 175	µg/L			DMRQA025
Strontium †			219	190 - 248	200 - 239	µg/L			DMRQA025
Thallium †			351	273 - 429	299 - 403	µg/L			DMRQA025
Calcium †			59.3	53.0 - 67.2	55.4 - 64.8	mg/L			DMRQA025
Magnesium †			31.7	27.2 - 36.4	28.7 - 34.9	mg/L			DMRQA025
Calcium Hardness (CaCO ₃)			148	132 - 168		mg/L			DMRQA025
Total Hardness (CaCO ₃) †			279	244 - 318	257 - 306	mg/L			DMRQA025
Nitrate + Nitrite as N			7.72	6.29 - 8.98		mg/L			DMRQA025

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Anal. Test Conditions No.	Test Endpoint	Performance Evaluation	Reported Value	Assigned Value	Acceptance Limits	Units	Method Description	USEPA Lab Code
Fathead minnow (Test Code 15)								
0756 7-day Short term Chronic, Daily Renewal, MHSF	NOEC Survival			25.0	12.5 - 50.0	%		
0808 7-day Short term Chronic, Daily Renewal, MHSF	IC25 (ON) Growth	Acceptable	32.0	39.7	14.3 - 65.1	%	EPA1000	NC01230
0809 7-day Short term Chronic, Daily Renewal, MHSF	IC25 (SN) Growth			56.3	29.5 - 83.1	%		
0810 7-day Short term Chronic, Daily Renewal, MHSF	NOEC (ON) Growth			25.0	12.5 - 50.0	%		
0811 7-day Short term Chronic, Daily Renewal, MHSF	NOEC (SN) Growth			25.0	12.5 - 50.0	%		
Ceriodaphnia dubia (Test Code 21)								
0766 7-day Short term Chronic, Daily Renewal, MHSF	NOEC Survival			50.0	25.0 - 100	%		
0767 7-day Short term Chronic, Daily Renewal, MHSF	IC25 Reproduction	Acceptable	57.2	42.2	11.6 - 72.8	%	EPA1002	NC01230
0768 7-day Short term Chronic, Daily Renewal, MHSF	NOEC Reproduction			25.0	12.5 - 50.0	%		

All analytes are included in ERA's NIST/NVLAP (200386-0) and A2LA (1539-01) accreditations.

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Anal. Test Conditions No.	Test Endpoint	Reference Toxicant Code	Reference Toxicant Name	Total # Reported	Total # Acceptable	Total # Not Acceptable	Total # No. Eval.	Study Failure Rate
Fathead minnow (Test Code 11)								
0752 48Hr., Acute, Non-Renewal, 20° C, MHSF	LC50	004	(NH4)2HPO4	50	46	4	0	8.00 %
Fathead minnow (Test Code 13)								
0754 48Hr., Acute, Non-Renewal, 25° C, MHSF	LC50	004	(NH4)2HPO4	57	47	10	0	17.5 %
Fathead minnow (Test Code 14)								
0755 48Hr., Acute, Non-Renewal, 25° C, 20% DMW	LC50	004	(NH4)2HPO4	16	15	1	0	6.25 %
Fathead minnow (Test Code 15)								
0756 7-day Short term Chronic, Daily Renewal, MHSF	NOEC Survival	001	KCl	61	59	2	0	3.28 %
0808 7-day Short term Chronic, Daily Renewal, MHSF	IC25 (ON) Growth	001	KCl	57	54	3	0	5.26 %
0809 7-day Short term Chronic, Daily Renewal, MHSF	IC25 (SN) Growth	001	KCl	28	24	2	0	7.69 %
0810 7-day Short term Chronic, Daily Renewal, MHSF	NOEC (ON) Growth	001	KCl	58	55	3	0	5.17 %
0811 7-day Short term Chronic, Daily Renewal, MHSF	NOEC (SN) Growth	001	KCl	27	26	1	0	3.70 %

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Fathead minnow (Test Code 16)								
0759 7-day Short term Chronic, Daily Renewal, 20% DMW	NOEC Survival	001	KCl	17	17	0	0	0.00 %
0812 7-day Short term Chronic, Daily Renewal, 20% DMW	IC25 (ON) Growth	001	KCl	17	17	0	0	0.00 %
0813 7-day Short term Chronic, Daily Renewal, 20% DMW	IC25 (SN) Growth	001	KCl	10	10	0	0	0.00 %
0814 7-day Short term Chronic, Daily Renewal, 20% DMW	NOEC (ON) Growth	001	KCl	16	15	1	0	6.25 %
0815 7-day Short term Chronic, Daily Renewal, 20% DMW	NOEC (SN) Growth	001	KCl	9	7	2	0	22.2 %
Ceriodaphnia dubia (Test Code 17)								
0762 48Hr., Acute Renewal, 20° C, MHSF	LC50	004	(NH4)2HPO4	13	13	0	0	0.00 %
Ceriodaphnia dubia (Test Code 18)								
0763 48Hr., Acute Renewal, 20° C, 20% DMW	LC50	004	(NH4)2HPO4	7	7	0	0	0.00 %
Ceriodaphnia dubia (Test Code 19)								
0764 48Hr., Acute Renewal, 25° C, MHSF	LC50	004	(NH4)2HPO4	48	40	8	0	16.7 %

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Ceriodaphnia dubia (Test Code 20)								
0765 48Hr., Acute Renewal, 25° C, 20% DMW	LC50	001	KCI	18	16	2	0	11.1 %
Ceriodaphnia dubia (Test Code 21)								
0766 7-day Short term Chronic, Daily Renewal, MHSF	NOEC Survival	001	KCI	58	55	3	0	5.17 %
0767 7-day Short term Chronic, Daily Renewal, MHSF	IC25 Reproduction	001	KCI	58	56	2	0	3.45 %
0768 7-day Short term Chronic, Daily Renewal, MHSF	NOEC Reproduction	001	KCI	58	52	6	0	10.3 %
Ceriodaphnia dubia (Test Code 22)								
0769 7-day Short term Chronic, Daily Renewal, 20% DMW	NOEC Survival	001	KCI	24	24	0	0	0.00 %
0770 7-day Short term Chronic, Daily Renewal, 20% DMW	IC25 Reproduction	001	KCI	26	25	1	0	3.85 %
0771 7-day Short term Chronic, Daily Renewal, 20% DMW	NOEC Reproduction	001	KCI	25	25	0	0	0.00 %
Daphnia magna (Test Code 32)								
0788 48Hr., Acute, Non-Renewal, 20° C, MHSF	LC50	001	KCI	15	14	1	0	6.67 %



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Daphnia pulex (Test Code 36)								
0792 48Hr., Acute, Non-Renewal, 20° C, MHSF	LC50	001	KCI	13	12	1	0	7.69 %
Daphnia pulex (Test Code 38)								
0794 48Hr., Acute, Non-Renewal, 25° C, MHSF	LC50	001	KCI	22	21	1	0	4.55 %
Mysid (Test Code 42)								
0798 48Hr., Acute, Non-Renewal, 20° C, 40 FSW	LC50	001	KCI	36	30	6	0	16.7 %
Mysid (Test Code 43)								
0799 7-day Short term Chronic, Daily Renewal, 40 FSW	NOEC Survival	001	KCI	22	22	0	0	0.00 %
0816 7-day Short term Chronic, Daily Renewal, 40 FSW	IC25 (ON) Growth	001	KCI	20	19	1	0	5.00 %
0817 7-day Short term Chronic, Daily Renewal, 40 FSW	IC25 (SN) Growth	001	KCI	12	10	2	0	16.7 %
0818 7-day Short term Chronic, Daily Renewal, 40 FSW	NOEC (ON) Growth	001	KCI	20	19	1	0	5.00 %
0819 7-day Short term Chronic, Daily Renewal, 40 FSW	NOEC (SN) Growth	001	KCI	12	11	1	0	8.33 %

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Inland silverside (Test Code 44)								
0803 48Hr., Acute, Non-Renewal, 20° C, 40 FSW	LC50	003	Phenol	28	28	0	0	0.00 %
Sheepshead minnow (Test Code 46)								
0804 48Hr., Acute, Non-Renewal, 20° C, 40 FSW	LC50	001	KCl	10	10	0	0	0.00 %
Sheepshead minnow (Test Code 47)								
0805 7-day Short term Chronic, Daily Renewal, 40 FSW	NOEC Survival	001	KCl	6	6	0	0	0.00 %
0820 7-day Short term Chronic, Daily Renewal, 40 FSW	IC25 (ON) Growth	001	KCl	6	6	0	0	0.00 %
0821 7-day Short term Chronic, Daily Renewal, 40 FSW	IC25 (SN) Growth	001	KCl	5	5	0	0	0.00 %
0822 7-day Short term Chronic, Daily Renewal, 40 FSW	NOEC (ON) Growth	001	KCl	6	6	0	0	0.00 %
0823 7-day Short term Chronic, Daily Renewal, 40 FSW	NOEC (SN) Growth	001	KCl	5	5	0	0	0.00 %