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Env. Document Type: Solid Waste Correspondence

April 19, 2005

Mr. David Fugate, P.G.
Geologist
Knoxville Environmental Field Office
Division of Solid Waste Management
Tennessee Department of Environment
and Conservation
2700 Middlebrook Pike, Suite 220
Knoxville, Tennessee 37921-5602

TENNESSEE VALLEY AUTHORITY – KINGSTON FOSSIL PLANT – ASH DISPOSAL AREA – IDL 73-0094 – MARCH 2005 BASELINE GROUNDWATER MONITORING REPORT

Dear Mr. Fugate:

Please find enclosed the quarterly baseline groundwater monitoring report for samples collected March 15-17, 2005 at designated compliance wells surrounding the subject facility. Analytical results derived from this most recent event indicate that there were no primary MCL limit exceedences evident. As you will note, this is the final baseline monitoring event and statistical testing will begin with the next compliance sampling event currently scheduled for June 2005.

If you have questions regarding the report, please contact Amos Smith at (423) 751-3522 or Linda Campbell at (865) 717-2157.

I certify this information was prepared by a system designed to ensure qualified personnel properly gathered and evaluated the information submitted. The information submitted is to the best of my knowledge and belief true, accurate, and complete.

Gordon G. Park
Manager of Permitted Programs
Environmental Affairs
5D Lookout Place

ALS ALS:SMF
Enclosures
cc (Enclosures):
J. M. Boggs, LAB 2C-N
L. F. Campbell, KFP 1A-KST
E. L. Deskins, KFP 1A-KST (w/o Enclosure)
B. B. Walton, ET 11A-K (w/o Enclosure)
EDM, WT CA-K
Prepared by J. Mark Boggs, reviewed by Amos L. Smith

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Tennessee Valley Authority, 1101 Market Street, Chattanooga, Tennessee 37402-2801

April 19, 2005

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Gordon G. Park
Manager of Permitted Programs
Environmental Affairs
5D Lookout Place

Enclosures

Tennessee Valley Authority
Kingston Fossil Plant
Ash Disposal Area (IDL 73-0094)

GROUNDWATER MONITORING REPORT
MARCH 2005 SAMPLING EVENT

Prepared by

J. Mark Boggs, P.G.

Tennessee Valley Authority
Knoxville, Tennessee

April 18, 2005

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INTRODUCTION

This report contains quarterly baseline monitoring results for groundwater samples collected in March 2005 from the four designated compliance monitoring wells surrounding the Kingston Fossil Plant (KIF) ash disposal area. These data represent the eighth and final set of quarterly baseline monitoring data for the facility which began in June 2003. Groundwater samples were analyzed by the TVA Environmental Chemistry Laboratory, an EPA-certified laboratory. Sample collection and laboratory analyses were performed in accordance with Tennessee Department of Conservation and Environment (TDEC) Rule 1200-1-7-.04 and the facility groundwater monitoring plan approved by TDEC (August 1996). Since baseline data are collected for the purpose of establishing statistical testing limits, no statistical evaluation the current monitoring data was performed. Statistical testing will begin with the June 2005 sampling event.

GROUNDWATER SAMPLING

Groundwater sampling was performed March 15-17 by J.E. Stockburger and W.J. Burke at upgradient well 16A and downgradient wells 4B, 6A and 13B. A Grundfos Rediflow submersible pump was used to purge and sample wells 13B and 16A, whereas wells 4B and 6A were purged until dry with the submersible pump and sampled with disposable bailers following recovery. Duplicate samples were collected from well 16A, and an equipment blank was collected between wells 4B and 13B. Field parameters (i.e., temperature, specific conductance, pH, dissolved oxygen, and oxidation-reduction potential) were monitored during well purging using a flow-through cell and calibrated instruments. Each well was considered properly evacuated when field parameters remained stable during purging a minimum of two well volumes or the well was purged to dryness. Field data sheets are included in Appendix A.

Please note that no samples of leachate were collected from the disposal facility. As described in the Facility Operations Manual, engineering measures incorporated in the facility design should result in minimal ash leachate production. Therefore, leachate sampling is not included in the approved groundwater monitoring plan.

Immediately following collection, samples were transferred to new sample bottles provided by the laboratory with appropriate preservatives, where applicable. The samples were then sealed, labeled, recorded on a custody form, and placed in an iced

cooler for transport. Samples were delivered to the TVA Environmental Chemistry Laboratory on March 18. A copy of the sample custody record is given in Appendix B.

ANALYTICAL RESULTS

Groundwater samples were analyzed for the 17 required inorganic constituents specified in Appendix I of TDEC Rule 1200-1-7. Laboratory results completed on April 12 are summarized in Table 1. The laboratory report presented in Appendix C includes analytical methods and detection limits for each constituent. Constituent concentrations reported for all samples were below drinking water maximum contaminant limits (MCL).

All analytical testing was performed within recommended sample holding times. There were no detections of the required 17 inorganic constituents in the equipment blank.

HYDROGEOLOGIC CONDITIONS

The Kingston plant site is located in the Valley and Ridge physiographic province of the Appalachian Highlands region. This region is characterized by a sequence of long narrow ridges and valleys trending northeast-southwest. In general, ridges are formed by relatively resistant sandstone, limestone, and dolomite units while the valleys are underlain by soluble limestone and easily weathered shale. The controlling structural feature of the site is a series of northeast-striking thrust faults which has forced older Cambrian and Ordovician rocks over younger units. Bedrock dips southeast at angles ranging from a few degrees to about 90
degrees.

The ash pond area is immediately underlain by Quaternary alluvium ranging in thickness from about 1.5 m along a portion of the northern perimeter of the site to maximum of 20 m on the western boundary. The alluvial deposits are unconsolidated and lenticular, and consist of clay, silt, and sand with occasional gravel. A thin layer of residuum is occasionally present directly above bedrock. The residuum is typically composed of clay and silt with weathered fissile shale fragments.

Bedrock beneath the alluvial deposits at the disposal site is primarily represented by the Conasauga Group (middle to upper Cambrian age). The only exception is a small area along the northern margin of the site underlain by the Rome formation (lower Cambrian

Table 1. March 15-17, 2005 Baseline Groundwater Monitoring Data

Analytical Results for Appendix I Inorganic Constituents						MCL	Comparison to MCL[b]			
Constituent	Units	Well No.					Well No.			
		4B downgradient	6A downgradient	13B[a] downgradient	16A upgradient		4B	6A	13B	16A
Antimony	µg/L	<3	4	<3	<3	6	L	L	L	L
Arsenic	µg/L	3	6	<1	<1	50	L	L	L	L
Barium	µg/L	90	80	360	50	2,000	L	L	L	L
Beryllium	µg/L	<1	<1	<1	<1	4	L	L	L	L
Cadmium	µg/L	0.2	0.2	<0.1	<0.15	5	L	L	L	L
Chromium	µg/L	6	3	<1	<1	100	L	L	L	L
Cobalt	µg/L	16	12	<1	<1	--	--	--	--	--
Copper	µg/L	<10	<10	<10	<10	1,000	L	L	L	L
Fluoride	µg/L	<100	<100	130	355	4,000	L	L	L	L
Lead	µg/L	<1	<1	<1	<1	50	L	L	L	L
Mercury	µg/L	0.1	<0.1	<0.1	<0.1	2	L	L	L	L
Nickel	µg/L	16	3	<1	<1	100	L	L	L	L
Selenium	µg/L	<1	<1	<1	<1	50	L	L	L	L
Silver	µg/L	<10	<10	<10	<10	100	L	L	L	L
Thallium	µg/L	<2	<2	<2	<2	2	L	L	L	L
Vanadium	µg/L	<10	50	<10	<10	--	--	--	--	--
Zinc	µg/L	10	<10	<10	<10	5,000	L	L	L	L

[a] *reported concentrations are averages of duplicate samples.*

[b] *"L" = less than or equal to MCL, "G" = greater than MCL.*

age). Specific geologic units within the Conasauga Group represented at the site include the Nolichucky, Maryville, Rogersville, Rutledge, and Pumpkin Valley formations. These formations are locally of low water-producing capacity, and predominantly consist of shale with interbedded siltstone, limestone, and conglomerate. Total thickness of the Conasauga Group beneath the site is unknown but is estimated to be approximately 450 meters. The Rome formation is generally composed of interbedded shale, sandstone, and siltstone. The elevation of the top of rock in the ash pond area is relatively uniform, varying from approximately 213 to 218 m-MSL. Outside this area the bedrock surface rises steeply to the west and southwest. The lower bedrock terrace corresponding to the disposal area represents an erosion surface associated with the ancestral Emory River.

Groundwater movement at the site generally follows topography with groundwater flowing eastward and southeastward from Pine Ridge toward the reservoir. Groundwater originating on, or flowing beneath, the ash pond area ultimately discharges to the reservoir without traversing private property.

Groundwater levels measured in site monitoring wells on March 14 prior to sample collection are presented in Table 2. The groundwater potentiometric surface derived from these measurements is shown on Figure 1. Groundwater generally flows eastward across the ash disposal area toward the reservoir. An average hydraulic gradient of approximately 0.013 is estimated between the western and eastern boundaries of the disposal area. The shallow alluvial aquifer underlying the ash disposal area exhibits a mean horizontal hydraulic conductivity of 0.006 m/d. The local Darcy flux is therefore estimated to be approximately 7.8×10^{-5} m/d.

Table 2. Groundwater Levels Measured on March 14, 2005

Well No.	Top of Casing Elevation (m)	Depth to Water (m)	Water Elevation (m-MSL)	Well Bottom Depth (m)
4B	230.72	4.82	225.90	12.72
6A	230.13	4.37	225.76	8.88
13B	234.85	2.95	231.90	25.68
16A	234.26	0.97	233.29	20.16

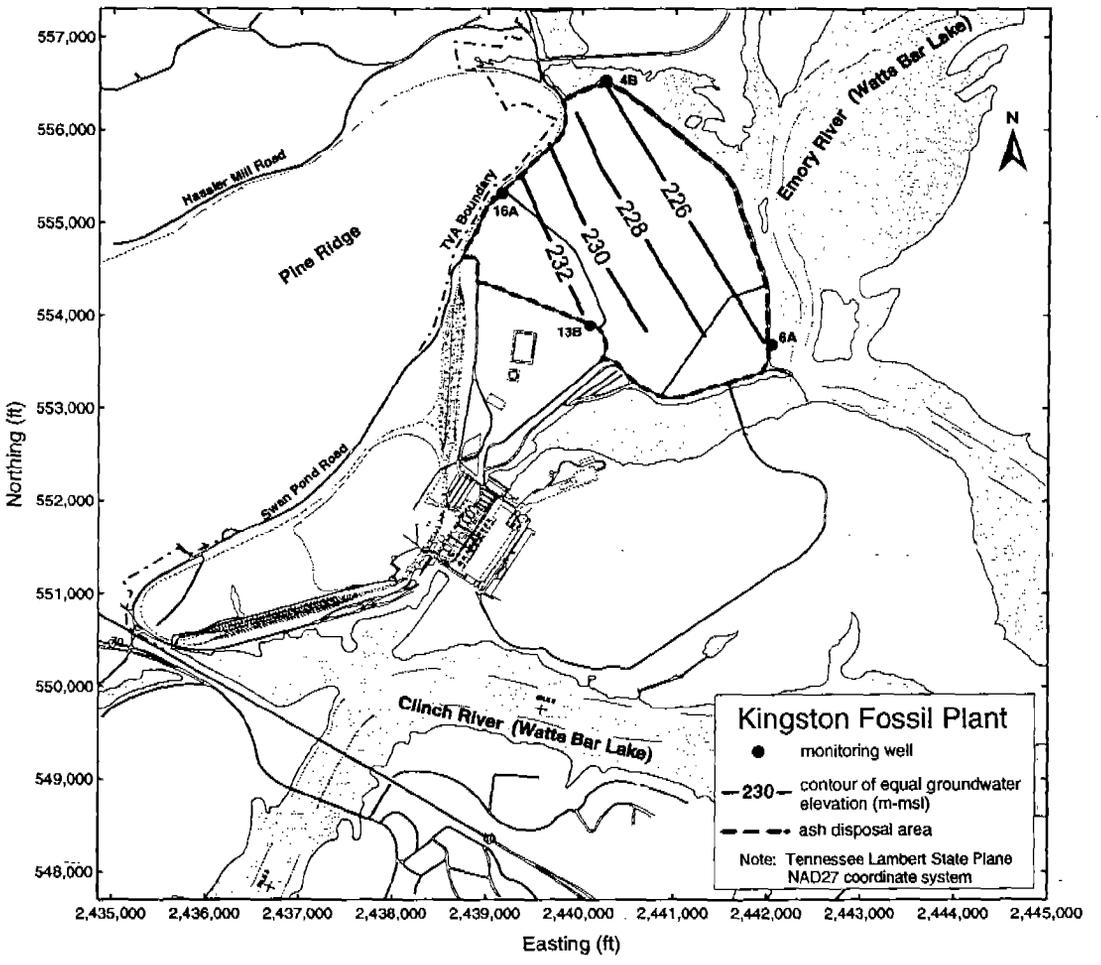


Figure 1. Groundwater Potentiometric Surface on March 14, 2005

CONCLUSIONS

Groundwater analytical data for the March 15, 2005 baseline sampling event show no evidence of groundwater contamination from the ash disposal area. Concentrations of the 17 Appendix I inorganic constituents are below MCLs in all samples.

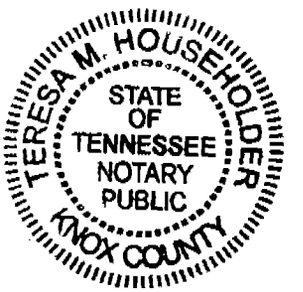
SIGNATURE PAGE

I certify under penalty of law that the information contained in this report is true, accurate and complete to the best of my knowledge, information, and belief.

J. Mark Boggs, P.G. — *Print Name*
J. Mark Boggs — *Signature*
14 April 2005 — *Date*

Sworn to and subscribed before me by J. Mark Boggs on this date 14 April 2005. My commission expires June 7, 2008.

Teresa M. Householder — *Notary Public (Print Name)*
Teresa M. Householder — *Signature / Seal*
4-14-05 — *Date*



APPENDIX A

FIELD DATA SHEETS

Preliminary Groundwater Data Field Worksheet

Sheet 1 of 1

Project/Site	Well Number	Purge Date Year	Month	Day
KINGSTON	4B 84068	05	03	15

Depth to Water (m)	Bottom of Well (m)	Well Diameter (mm)	Survey Leader	Field Crew
4.82 4195	12.72 4194	102 4188	[initials]	WJB

☑ Depth of Screen ☐ Open Bore Hole

(m)	To	(m)	Sample Label	
12.37 4191	To	12.82 4190	KIF-4B-031505	☑ Unfiltered ☐ Filtered ☐ Both; Filter Type and Size:

[Bottom of Well − Depth to Water] x Volume Factor = Well Volume; Target Purge Volume; Actual Purge Volume

[(12.72)m − (4.82)m] x (8.107)L/m = 64 (L) | 128 (L) | 79 (L) 4186

Purge Pump: ☐ Bladder ☐ Centrifugal ☐ Peristaltic ☐ Dedicated Other (list):

Sample Pump: ☐ Bladder ☐ Centrifugal ☐ Peristaltic ☐ Dedicated Other (list):

Notes and WQ Observations	Time (ET) CT	Pump Rate (L/min)	Depth to Water (m)	Pump Depth (m)	Temp °C	pH (s.u.)	DO (mg/L)	COND (umhos/cm)	(+/-) ORP (mV)	Turbidity (NTU)
Begin Purge →	1129	8.0		12.5						
16	1131	8.0	6.8	"	15.3	6.2	8.5	1026	512	
'	1133	7.0	8.62	"	15.0	6.2	8.5	1022	530	
46	1135	7.0	10.32	"	14.7	6.2	8.5	1018	537	
60	1137	7.0	12.26		14.5	6.2	8.3	1016	540	
67	1138	– out of water –								
RESTART	1224	3.0	8.84	11.0	RESUMED		PUMPING			
	1226	3.0		11.0	15.3	6.3	4.7	1034	545	
	1228	3.0	9.8	11.0	15.5	6.3	4.7	1039	532	

Remarks:

Reviewed By: [signature] 03-16-05 [signature] 03-16-05
Survey Leader Date Project Leader Date

Sample Collector: WJB

Sample Date: Year 05 Month 03 Day 15; Time (ET) CT

Pump Duration: 13 min 72004 ("999" = 2 days)

Sample Readings

Analysis Time (ET) CT	Pump Rate (L/min) 4193	Depth to Water (m)	Pump Depth (m) 4192	Temp °C 10 EPA 170.1	pH (s.u.) 400 EPA 150.1	DO (mg/L) 300 EPA 360.1	COND (umhos/cm) 94 EPA 120.1	(+/-) ORP (mV) 90 SM 2580B	Turbidity (NTU) EPA 180.1
1228	3.0	9.8	11	15.5	6.3	4.7	1039	532	—

Additional Sample Data

Analyst: [initials]

Date Analyzed: Year 05 Month 03 Day 16

415 Phenol Alkalinity mg/L (EPA 310.1)	431 Total Alk. mg/L (EPA 310.1)	436 Mineral Acidity mg/L (EPA 305.1)	437 CO_2 Acidity mg/L (EPA 305.1)
[struck out]	250	[struck out]	72
Time:	Time: 10:26	Time:	Time: 10:31
Initial:	Initial: [initials]	Initial:	Initial: [initials]

Well Diameter (mm)		Vol. Factor (L/m)
12.7	(0.5 in)	0.127
51	(2 in)	2.027
76	(3 in)	4.560
102	(4 in)	8.107
127	(5 in)	12.668
153	(6 in)	18.228

Turbidity 1350: ☐ Clear ☐ Turbid ☑ Slightly Turbid ☐ Highly Turbid

Color: grey

Odor: —

Bottles Required: ☐ Ferrous ☑ Mineral ☐ Phenol Others (list): F
☐ BOD ☐ TOC ☑ Metals ☐ Dis. Mineral ☐ Filt TIC
☐ COD ☑ TIC ☐ Dis. Metals ☐ Nutrient ☐ TSS/TDS

Preliminary Groundwater Data Field Worksheet

Sheet 1 of 1

Project/Site	Well Number	Purge Date (Year / Month / Day)
KINGSTON	6A 84088	~~05~~ / ~~03~~ / ~~15~~

Depth to Water (m)	Bottom of Well (m)	Well Diameter (mm)	Survey Leader	Field Crew
4.37 4195	8.89 4194	102 4188	JES	05 03 15 JW JB

☐ Depth of Screen ☐ Open Bore Hole

(m)	To	(m)	Sample Label	Filter Type and Size:
8.47 4191	To	8.92 4190	KIF-6A-031505	☑ Unfiltered ☐ Filtered ☐ Both

[Bottom of Well - Depth to Water] x Volume Factor =	Well Volume	Target Purge Volume	Actual Purge Volume
[(8.89)m - (4.37)m] x (8.107)L/m=	36.56 (L)	73.1 (L)	34 (L) 4186

Purge Pump: ☐ Bladder ☐ Centrifugal ☐ Peristaltic ☐ Dedicated Other (list): ~~Redi-Flo~~

Sample Pump: ☐ Bladder ☐ Centrifugal ☐ Peristaltic ☐ Dedicated Other (list): BAILER

Notes and WQ Observations	Time ET CT	Pump Rate (L/min)	Depth to Water (m)	Pump Depth (m)	Temp °C	pH (s.u.)	DO (mg/L)	COND (umhos/cm)	(+/-) ORP (mV)	Turbidity (NTU)
Begin Purge →	1055	7.0	~~5.54~~ 8.6							
~~Flow~~ 21	1058	6.5	6.88		16.9	5.7	0.3	4215	198	
~~Flow~~ 13 34	1100	6.0	3.10		17.0	5.6	0.3	3360	229	
	— OUT OF WATER —									
	1515		5.66		16.7	5.7	2.6	2144	273	

Remarks:

Reviewed By: [signature] Survey Leader 03-16-05 Date [signature] Project Leader 03-18-05 Date

Sample Collector: JW JB JES

Sample Date			Time
Year	Month	Day	
05	03	15	1515 ET CT

Pump Duration 5 min 72004

"999" = 2 days

Sample Readings

Analysis Time ET CT		Pump Rate (L/min) 4193	Depth to Water (m)	Pump Depth (m) 4192	Temp °C 10 EPA 170.1	pH (s.u.) 400 EPA 150.1	DO (mg/L) 300 EPA 360.1	COND (umhos/cm) 94 EPA 120.1	(+/-) ORP (mV) 90 SM 2580B	Turbidity (NTU) EPA 180.1
1515	—	—	5.66	—	16.7	5.7	2.6	2144	273	—

Additional Sample Data

Analyst: JES

Date Analyzed: Year 05 Month 03 Day 16

Turbidity 1350: ☐ Clear ☐ Turbid ☑ Slightly Turbid ☐ Highly Turbid

Color: brown

Odor: —

415 Phenol Alkalinity mg/L (EPA 310.1)	431 Total Alk. mg/L (EPA 310.1)	436 Mineral Acidity mg/L (EPA 305.1)	437 CO_2 Acidity mg/L (EPA 305.1)
	113		1395
Time:	Time: 1043	Time:	Time: 1111
Initial:	Initial: JES	Initial:	Initial: JES

Bottles Required: ☐ BOD ☐ COD ☐ TOC ☑ TIC ☑ Metals ☐ Dis. Metals ☐ Ferrous ☑ Mineral ☐ Dis. Mineral ☑ Nutrient ☐ Phenol ☐ Filt TIC ☐ TSS/TDS

Others (list): F

Well Diameter (mm)		Vol. Factor (L/m)
12.7	(0.5 in)	0.127
51	(2 in)	2.027
76	(3 in)	4.560
102	(4 in)	8.107
127	(5 in)	12.668
153	(6 in)	18.228

TVA 30068A (9-1999)

Distribution: (1) Original - Data Mgmt. (2) Pink - Survey Leader (3) Blue - Project Manager (4) Green - Customer (5) Yellow - ERS Files

Preliminary Groundwater Data Field Worksheet

Sheet 1 of 1

Project/Site	Well Number	Purge Date: Year	Month	Day
KINGSTON	13B 84068	05	03	15

Depth to Water (m)	Bottom of Well (m)	Well Diameter (mm)	Survey Leader	Field Crew
3.95 4195	25.7 4194	51 4188	JES	WJB

☑ Depth of Screen ☐ Open Bore Hole

(m)	To	(m)	Sample Label	Filter Type and Size:
22.29 4191		25.34 4190	KIF-13B-031505	☑ Unfiltered ☐ Filtered ☐ Both

[Bottom of Well	-	Depth to Water]	x	Volume Factor	=	Well Volume	Target Purge Volume	Actual Purge Volume
[(25.7)m	-	(2.95)m]	x	(2.027)L/m=		46.1 (L)	92.2 (L)	98 (L) 4186

Purge Pump: ☐ Bladder ☐ Centrifugal ☐ Peristaltic ☐ Dedicated Other (list): Redi-flo

Sample Pump: ☐ Bladder ☐ Centrifugal ☐ Peristaltic ☐ Dedicated Other (list): Redi-flo

Notes and WQ Observations	Time ET / CT	Pump Rate (L/min)	Depth to Water (m)	Pump Depth (m)	Temp °C	pH (s.u.)	DO (mg/L)	COND (umhos/cm)	(+/-) ORP (mV)	Turbidity (NTU)
Begin Purge 1435 →	1432	6.5	2.95	10						
13	1434	5.0	7.24	10	16.2	7.3	1.0	345	469	—
33	1438	4.5	8.09	10	16.4	7.3	0.4	347	449	—
42	1440	4.5	8.35	10	16.6	7.3	0.3	360	427	—
51	1442	4.5	8.61	10	16.6	7.4	0.2	360	360	—
60	1444	5.0		10	16.6	7.4	0.2	358	328	—
80	1446	4.5	8.67	10	16.6	7.4	0.1	357	291	—
89	1448	4.5		10	16.6	7.4	0.1	355	255	—
98	1450		8.74	10	16.6	7.4	0.1	354	235	—

Remarks:

Reviewed By: [signature] Survey Leader 03-16-05 Date [signature] Project Leader 03-16-05 Date

Sample Collector: WJB

Sample Date			Time
Year	Month	Day	
05	03	15	ET / CT

Pump Duration 18 min 72004

"999" = 2 days

Sample Readings

Analysis Time ET / CT	Pump Rate (L/min) 4193	Depth to Water (m)	Pump Depth (m) 4192	Temp °C 10 EPA 170.1	pH (s.u.) 400 EPA 150.1	DO (mg/L) 360 EPA 360.1	COND (umhos/cm) 94 EPA 120.1	(+/-) ORP (mV) 90 SM 2580B	Turbidity (NTU) EPA 180.1
1450	4.5	8.74	10	16.6	7.4	0.1	354	235	—

Additional Sample Data

Analyst: JES

Date Analyzed: Year 05 Month 03 Day 16

Turbidity 1350: ☑ Clear ☐ Turbid ☐ Slightly Turbid ☐ Highly Turbid

Color:

Odor: ~

415 Phenol Alkalinity mg/L (EPA 310.1)	431 Total Alk. mg/L (EPA 310.1)	436 Mineral Acidity mg/L (EPA 305.1)	437 CO_2 Acidity mg/L (EPA 305.1)
	18.8		8
Time:	Time: 11:20	Time:	Time: 1116
Initial:	Initial: JES	Initial:	Initial: JES

Well Diameter (mm)		Vol. Factor (L/m)
12.7	(0.5 in)	0.127
51	(2 in)	2.027
78	(3 in)	4.560
102	(4 in)	8.107
127	(5 in)	12.668
153	(6 in)	18.228

Bottles Required: ☐ BOD ☐ COD ☐ TOC ☑ TIC ☐ Ferrous ☑ Metals ☐ Dis. Metals ☑ Mineral ☐ Dis. Mineral ☑ Nutrient ☐ Phenol ☐ Filt TIC ☐ TSS/TDS

Others (list): F

Preliminary Groundwater Data Field Worksheet

Sheet 1 of 1

Project/Site	Well Number	Purge Date	Year	Month	Day
KINGSTON	16A 84068		05	03	17

Depth to Water (m)	Bottom of Well (m)	Well Diameter (mm)	Survey Leader	Field Crew
0.96 4195	20.16 4194	51 4188	JES	JDL

☑ Depth of Screen ☐ Open Bore Hole

(m)	To	(m)	Sample Label	
16.98 4191	To	20.03 4190	KIF-16A-031705	☑ Unfiltered ☐ Filtered ☐ Both; Filter Type and Size:

[Bottom of Well - Depth to Water] x Volume Factor =	Well Volume (L)	Target Purge Volume (L)	Actual Purge Volume (L)
[(20.16)m - (0.96)m] x (2.027)L/m=	38.9	77.8	86 4186

Purge Pump: ☐ Bladder ☐ Centrifugal ☐ Peristaltic ☐ Dedicated Other (list): Redi Flo
Sample Pump: ☐ Bladder ☐ Centrifugal ☐ Peristaltic ☐ Dedicated Other (list): Redi Flo

Notes and WQ Observations	Time ET CT	Pump Rate (L/min)	Depth to Water (m)	Pump Depth (m)	Temp °C	pH (s.u.)	DO (mg/L)	COND (umhos/cm)	(+/-) ORP (mV)	Turbidity (NTU)
Begin Purge →	931	8.0	0.96	6						
	933		3.41	6	14.4	6.8	0.4	310	449	
32	935	7.0	3.78	6	15.0	6.9	0.3	312	238	
	937		4.46	6	15.3	6.9	0.2	316	197	
60	939	6.5	4.76	6	15.5	6.9	0.2	320	181	
73	941		5.18	6	15.5	6.9	0.2	321	172	
86	943	6.5	5.47	6	15.6	6.9	0.2	321	166	

Remarks:

Reviewed By: James Stockburger (Survey Leader) 03-18-05 (Date) [signature] (Project Leader) 03-18-05 (Date)

Sample Collector: JES-JDL

Sample Date Year	Month	Day	Time
05	03	17	943 ET CT

Pump Duration 12 min 72004
"999" = 2 days

Sample Readings

Analysis Time ET CT	Pump Rate (L/min) 4193	Depth to Water (m)	Pump Depth (m) 4192	Temp °C 10 EPA 170.1	pH (s.u.) 400 EPA 150.1	DO (mg/L) 300 EPA 360.1	COND (umhos/cm) 94 EPA 120.1	(+/-) ORP (mV) 90 SM 2580B	Turbidity (NTU) EPA 180.1
943	6.5	5.47	6	15.6	6.9	0.2	321	166	—

Additional Sample Data

Analyst: JES

Date Analyzed Year	Month	Day
05	03	17

Turbidity 1350 ☑ Clear ☐ Turbid ☐ Slightly Turbid ☐ Highly Turbid

Color: —
Odor: —

	415 Phenol Alkalinity mg/L (EPA 310.1)	431 Total Alk. mg/L (EPA 310.1) 142 / 143	436 Mineral Acidity mg/L (EPA 305.1)	437 CO2 Acidity mg/L (EPA 305.1) 16 / 17
Time:		1510 / 1513		1519 / 1522
Initial:		JES / JES		JES / JES

Well Diameter (mm)	Vol. Factor (L/m)
12.7 (0.5 in)	0.127
51 (2 in)	2.027
76 (3 in)	4.560
102 (4 in)	8.107
127 (5 in)	12.668
153 (6 in)	18.228

Bottles Required: ☐ Ferrous ☑ Mineral ☐ Phenol Others (list): ☐ BOD ☐ TOC ☑ Metals ☐ Dis. Mineral ☐ Filt TIC ☐ COD ☑ TIC ☐ Dis. Metals ☑ Nutrient ☐ TSS/TDS

Distribution: (1) Original - Data Mgmt (2) Pink - Survey Leader

APPENDIX B

SAMPLE CUSTODY RECORD

KIF4B
KIF6A
KIF13B
KIF16A

TENNESSEE VALLEY AUTHORITY WATER MANAGEMENT
ENVIRONMENTAL CHEMISTRY ANALYSIS REQUEST AND CUSTODY RECORD ~~WQUAL~~ RCRA

FORM CONTROL # 18208

PROJECT ID KINGSTON GROUNDWATER

REFERENCE: ☑ WORKPLAN ☐ OTHER

ACCT NO.

DATE REQUIRED 4-8-05

RESULTS TO MARK BOGGS
WT 9C-K
865/632-6941

LAB USE ONLY
TEST IDC'S [illegible]
100%
4/11/05 per conversation with Mark Boggs
DATE RECEIVED 3-18-05
DAYS DUE ~~4-6-05~~
PROJECT LEADER BLH
NO. LABELS 1
LIF-05030374

LAB ID	FIELD ID	SAMPLE DESCRIPTION	SAMPLE MATRIX	DATE/TIME COLLECTED	NO. OF BOTTLES	ADDITIONAL IDC'S
14042	KIF-4B-031505	GROUNDWATER MIN,M,N,TIC	H_2O	3/15 1228	4	
14043	KIF-6A-031505	" " " " "	"	" 1515	4	
14044	KIF-13B-031505	" " " " "	"	3/17 943	4	
14045	KIF-16A-031805	" " " " "	"	" 943	4	
14046	KIF-16A-031805-DUP	" " " " "	"	3/15 1230	4	
14047	EQUIPMENT BLANK	SUPER Q thru SAMPLING EQUIPMENT				

FIELD COMMENTS

ANALYSIS REQUESTED per WORKPLAN

SUBMITTED BY [signature] DATE/TIME 3/18/05

RECEIVED BY [signature] DATE/TIME

LABORATORY COMMENTS

MAR 18 '05 12:32

APPENDIX C

LABORATORY DATA SHEETS

Data Report Number: 050412-142341
Report of Results: Environmental

TENNESSEE VALLEY AUTHORITY
CENTRAL LABORATORIES SERVICES
1101 Market Street, PSC 1B-C
Chattanooga, Tennessee 37402-2801
Phone: (423) 876 - 4318 • Fax: (423) 876 - 4137

Shipping Address:
Chickamauga Power Service Center
North Side Chickamauga Reservation
Chattanooga, Tennessee 37415

Customer Address: Mark Boggs, WT 9C-K
Jack Milligan, CST17B-C
Phone: Debbie Nunn, HB 2A-C
Fax : Not Available
E-Mail: GroundwaterWells; EDM

Location Code: KIF-4B
Field ID: KIF-4B-031505
Sample Description: GROUNDWATER

Sample ID: AF14042 **LRF ID:** 05030374
Matrix: Water **Reg:** RCRA
Date Collected: 03/15/2005
Time Collected: 12:28 EST
Date Received: 03/18/2005
Time Received: 12:32
Project Manager: Randall L. Howell

Analyte	CAS Number[1]	Result	Units	MDL[2]	Analysis Date	Analysis Time	Analyst	Method Reference
Aluminum, Total	7429-90-5	1.9	mg/L	0.05	03/24/2005	21:35	LMJ	EPA 6010B
Ammonia as N	7664-41-7	0.15	mg/L	0.01	03/22/2005	7:42	ADP	EPA 350.1
Antimony,Total	7440-36-0	< MDL	mg/L	0.003	03/28/2005	12:44	BRJ	EPA 7041A
Arsenic, Total	7440-38-2	0.003	mg/L	0.001	03/25/2005	2:42	BRJ	EPA 7060A
Barium, Total	7440-39-3	0.09	mg/L	0.01	03/24/2005	21:35	LMJ	EPA 6010B
Beryllium, Total	7440-41-7	< MDL	mg/L	0.001	03/24/2005	21:35	LMJ	EPA 6010B
Boron, Total	7440-42-8	< MDL	mg/L	0.2	03/24/2005	21:35	LMJ	EPA 6010B
Cadmium, Total	7440-43-9	0.0002	mg/L	0.0001	03/28/2005	17:44	BRJ	EPA 7131A
Calcium, Total	7440-70-2	250	mg/L	0.1	03/24/2005	21:35	LMJ	EPA 6010B
Chloride, Total	16887-00-6	2.9	mg/L	1.	04/05/2005	13:37	GMP	EPA 325.2
Chromium, Total	7440-47-3	0.006	mg/L	0.001	03/24/2005	18:46	BRJ	EPA 7191
Cobalt, Total	7440-48-4	0.016	mg/L	0.001	03/24/2005	22:32	BRJ	EPA 7201
Copper, Total	7440-50-8	< MDL	mg/L	0.01	03/24/2005	21:35	LMJ	EPA 6010B
Filterable Residue		870.	mg/L	10.	03/21/2005	16:28	WMG	EPA 160.1
Fluoride, Total	16984-48-8	< MDL	mg/L	0.1	04/08/2005	9:00	GMP	EPA 340.2
Inorganic Carbon, Total		94	mg/L	1.	03/21/2005	19:07	ADP	ASTM477988
Iron, Total	7439-89-6	4.7	mg/L	0.01	03/24/2005	21:35	LMJ	EPA 6010B
Lead , Total	7439-92-1	< MDL	mg/L	0.001	04/01/2005	18:49	BRJ	EPA 7421
Magnesium, Total	7439-95-4	20	mg/L	0.01	03/24/2005	21:35	LMJ	EPA 6010B
Manganese, Total	7439-96-5	2.7	mg/L	0.005	03/24/2005	21:35	LMJ	EPA 6010B
Mercury, Total	7439-97-6	0.0001	mg/L	0.0001	04/01/2005	13:59	CLS	EPA 7470A
Molybdenum, Total	7439-98-7	< MDL	mg/L	0.02	03/24/2005	21:35	LMJ	EPA 6010B
Nickel, Total	7440-02-0	0.016	mg/L	0.001	03/25/2005	0:24	BRJ	EPA 7521
Nitrate-Nitrite as N		0.03	mg/L	0.01	03/30/2005	10:07	ADP	EPA 353.2
Non-Filterable Residue		34.	mg/L	1.	03/21/2005	11:00	WMG	EPA 160.2
Potassium, Total	7440-09-7	6.5	mg/L	0.1	04/05/2005	12:04	BRJ	EPA 7610
Selenium, Total	7782-49-2	< MDL	mg/L	0.001	03/24/2005	20:40	BRJ	EPA 7740
Silver, Total	7440-22-4	< MDL	mg/L	0.01	03/24/2005	21:35	LMJ	EPA 6010B
Sodium, Total	7440-23-5	4.8	mg/L	0.1	04/05/2005	11:34	BRJ	EPA 7770
Strontium, Total	7440-24-6	0.46	mg/L	0.05	03/24/2005	21:35	LMJ	EPA 6010B
Sulfate, Total	14808-79-8	371	mg/L	1.	04/06/2005	12:18	CLS	EPA 375.4
Thallium, Total	7440-28-0	< MDL	mg/L	0.002	03/28/2005	15:49	BRJ	EPA 7841
Tin, Total	7440-31-5	< MDL	mg/L	0.05	03/24/2005	21:35	LMJ	EPA 6010B
Titanium, Total	7440-32-6	0.012	mg/L	0.005	03/24/2005	21:35	LMJ	EPA 6010B
Total Kjeldahl Nitrogen		0.46	mg/L	0.02	03/31/2005	14:23	GMP	EPA 351.2

[1] Chemical Abstracts Service Registry Number [2] Method Detection Limit

Data Report Number: 050412-142341
Report of Results: Environmental

TENNESSEE VALLEY AUTHORITY
CENTRAL LABORATORIES SERVICES
1101 Market Street, PSC 1B-C
Chattanooga, Tennessee 37402-2801
Phone: (423) 876 - 4318 • Fax: (423) 876 - 4137

Shipping Address:
Chickamauga Power Service Center
North Side Chickamauga Reservation
Chattanooga, Tennessee 37415

Customer Address: Mark Boggs, WT 9C-K
Jack Milligan, CST17B-C
Phone: Debbie Nunn, HB 2A-C
Fax : Not Available
E-Mail: GroundwaterWells; EDM
Location Code: KIF-4B
Field ID: KIF-4B-031505
Sample Description: GROUNDWATER

Sample ID: AF14042 **LRF ID:** 05030374
Matrix: Water **Reg:** RCRA
Date Collected: 03/15/2005
Time Collected: 12:28 EST
Date Received: 03/18/2005
Time Received: 12:32
Project Manager: Randall L. Howell

Analyte	CAS Number[1]	Result	Units	MDL[2]	Analysis Date	Analysis Time	Analyst	Method Reference
Vanadium, Total	7440-62-2	< MDL	mg/L	0.01	03/24/2005	21:35	LMJ	EPA 6010B
Zinc, Total	7440-66-6	0.01	mg/L	0.01	03/24/2005	21:35	LMJ	EPA 6010B

Sample Comments: Mercury confirmed by redigestion and reanalysis.
Sulfate analyzed by EPA Method 300.1 (Ion Chromatography).

[1] Chemical Abstracts Service Registry Number [2] Method Detection Limit

Data Report Number: 050412-142341
Report of Results: Environmental

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Chickamauga Power Service Center
North Side Chickamauga Reservation
Chattanooga, Tennessee 37415

Customer Address: Mark Boggs, WT 9C-K
Jack Milligan, CST17B-C
Phone: Debbie Nunn, HB 2A-C
Fax : Not Available
E-Mail: GroundwaterWells; EDM
Location Code: KIF-6A
Field ID: KIF-6A-031505
Sample Description: GROUNDWATER

Sample ID: AF14043 **LRF ID:** 05030374
Matrix: Water **Reg:** RCRA
Date Collected: 03/15/2005
Time Collected: 15:15 EST
Date Received: 03/18/2005
Time Received: 12:32
Project Manager: Randall L. Howell

Analyte	CAS Number[1]	Result	Units	MDL[2]	Analysis Date	Analysis Time	Analyst	Method Reference
Aluminum, Total	7429-90-5	< MDL	mg/L	0.05	03/24/2005	21:39	LMJ	EPA 6010B
Ammonia as N	7664-41-7	12	mg/L	0.01	03/23/2005	8:59	ADP	EPA 350.1
Antimony,Total	7440-36-0	0.004	mg/L	0.003	03/28/2005	12:50	BRJ	EPA 7041A
Arsenic, Total	7440-38-2	0.006	mg/L	0.001	03/25/2005	2:47	BRJ	EPA 7060A
Barium, Total	7440-39-3	0.08	mg/L	0.01	03/24/2005	21:39	LMJ	EPA 6010B
Beryllium, Total	7440-41-7	< MDL	mg/L	0.001	03/24/2005	21:39	LMJ	EPA 6010B
Boron, Total	7440-42-8	0.3	mg/L	0.2	03/24/2005	21:39	LMJ	EPA 6010B
Cadmium, Total	7440-43-9	0.0002	mg/L	0.0001	03/28/2005	17:49	BRJ	EPA 7131A
Calcium, Total	7440-70-2	180	mg/L	0.1	03/24/2005	21:39	LMJ	EPA 6010B
Chloride, Total	16887-00-6	5.3	mg/L	1.	04/05/2005	13:37	GMP	EPA 325.2
Chromium, Total	7440-47-3	0.003	mg/L	0.001	03/24/2005	18:53	BRJ	EPA 7191
Cobalt, Total	7440-48-4	0.012	mg/L	0.001	03/24/2005	22:38	BRJ	EPA 7201
Copper, Total	7440-50-8	< MDL	mg/L	0.01	03/24/2005	21:39	LMJ	EPA 6010B
Filterable Residue		3100.	mg/L	10.	03/21/2005	16:28	WMG	EPA 160.1
Fluoride, Total	16984-48-8	< MDL	mg/L	0.1	04/08/2005	9:00	GMP	EPA 340.2
Inorganic Carbon, Total		56	mg/L	1.	03/21/2005	19:14	ADP	ASTM477988
Iron, Total	7439-89-6	650	mg/L	0.01	03/24/2005	21:39	LMJ	EPA 6010B
Lead , Total	7439-92-1	< MDL	mg/L	0.001	04/01/2005	18:55	BRJ	EPA 7421
Magnesium, Total	7439-95-4	57	mg/L	0.01	03/24/2005	21:39	LMJ	EPA 6010B
Manganese, Total	7439-96-5	100	mg/L	0.005	03/24/2005	21:39	LMJ	EPA 6010B
Mercury, Total	7439-97-6	<MDL	mg/L	0.0001	04/01/2005	16:46	CLS	EPA 7470A
Molybdenum, Total	7439-98-7	< MDL	mg/L	0.02	03/24/2005	21:39	LMJ	EPA 6010B
Nickel, Total	7440-02-0	0.003	mg/L	0.001	03/25/2005	0:30	BRJ	EPA 7521
Nitrate-Nitrite as N		< MDL	mg/L	0.01	03/30/2005	10:07	ADP	EPA 353.2
Non-Filterable Residue		91.	mg/L	1.	03/21/2005	11:00	WMG	EPA 160.2
Potassium, Total	7440-09-7	11	mg/L	0.1	04/05/2005	12:05	BRJ	EPA 7610
Selenium, Total	7782-49-2	< MDL	mg/L	0.001	03/24/2005	20:46	BRJ	EPA 7740
Silver, Total	7440-22-4	< MDL	mg/L	0.01	03/24/2005	21:39	LMJ	EPA 6010B
Sodium, Total	7440-23-5	5.7	mg/L	0.1	04/05/2005	11:36	BRJ	EPA 7770
Strontium, Total	7440-24-6	0.67	mg/L	0.05	03/24/2005	21:39	LMJ	EPA 6010B
Sulfate, Total	14808-79-8	1883	mg/L	1.	04/06/2005	13:18	CLS	EPA 375.4
Thallium, Total	7440-28-0	< MDL	mg/L	0.002	03/28/2005	15:55	BRJ	EPA 7841
Tin, Total	7440-31-5	< MDL	mg/L	0.05	03/24/2005	21:39	LMJ	EPA 6010B
Titanium, Total	7440-32-6	< MDL	mg/L	0.005	03/24/2005	21:39	LMJ	EPA 6010B
Total Kjeldahl Nitrogen		12	mg/L	0.02	04/06/2005	12:00	GMP	EPA 351.2

[1] Chemical Abstracts Service Registry Number [2] Method Detection Limit

Data Report Number: 050412-142341
Report of Results: Environmental

TENNESSEE VALLEY AUTHORITY
CENTRAL LABORATORIES SERVICES
1101 Market Street, PSC 1B-C
Chattanooga, Tennessee 37402-2801
Phone: (423) 876 - 4318 • Fax: (423) 876 - 4137

Shipping Address:
Chickamauga Power Service Center
North Side Chickamauga Reservation
Chattanooga, Tennessee 37415

Customer Address: Mark Boggs, WT 9C-K
Jack Milligan, CST17B-C
Phone: Debbie Nunn, HB 2A-C
Fax : Not Available
E-Mail: GroundwaterWells; EDM
Location Code: KIF-6A
Field ID: KIF-6A-031505
Sample Description: GROUNDWATER

Sample ID: AF14043 **LRF ID:** 05030374
Matrix: Water **Reg:** RCRA
Date Collected: 03/15/2005
Time Collected: 15:15 EST
Date Received: 03/18/2005
Time Received: 12:32
Project Manager: Randall L. Howell

Analyte	CAS Number[1]	Result	Units	MDL[2]	Analysis Date	Analysis Time	Analyst	Method Reference
Vanadium, Total	7440-62-2	0.05	mg/L	0.01	03/24/2005	21:39	LMJ	EPA 6010B
Zinc, Total	7440-66-6	< MDL	mg/L	0.01	03/24/2005	21:39	LMJ	EPA 6010B

Sample Comments: Sulfate analyzed by EPA Method 300.1 (Ion Chromatography).

[1] Chemical Abstracts Service Registry Number [2] Method Detection Limit

Data Report Number: 050412-142341
Report of Results: Environmental

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North Side Chickamauga Reservation
Chattanooga, Tennessee 37415

Customer Address: Mark Boggs, WT 9C-K
Jack Milligan, CST17B-C
Phone: Debbie Nunn, HB 2A-C
Fax : Not Available
E-Mail: GroundwaterWells; EDM

Location Code: KIF-13B
Field ID: KIF-13B-031505
Sample Description: GROUNDWATER

Sample ID: AF14044 **LRF ID:** 05030374
Matrix: Water **Reg:** RCRA
Date Collected: 03/15/2005
Time Collected: 14:50 EST
Date Received: 03/18/2005
Time Received: 12:32
Project Manager: Randall L. Howell

Analyte	CAS Number[1]	Result	Units	MDL[2]	Analysis Date	Analysis Time	Analyst	Method Reference
Aluminum, Total	7429-90-5	< MDL	mg/L	0.05	03/24/2005	21:43	LMJ	EPA 6010B
Ammonia as N	7664-41-7	0.14	mg/L	0.01	03/22/2005	7:42	ADP	EPA 350.1
Antimony,Total	7440-36-0	< MDL	mg/L	0.003	03/28/2005	12:55	BRJ	EPA 7041A
Arsenic, Total	7440-38-2	< MDL	mg/L	0.001	03/25/2005	2:52	BRJ	EPA 7060A
Barium, Total	7440-39-3	0.36	mg/L	0.01	03/24/2005	21:43	LMJ	EPA 6010B
Beryllium, Total	7440-41-7	< MDL	mg/L	0.001	03/24/2005	21:43	LMJ	EPA 6010B
Boron, Total	7440-42-8	< MDL	mg/L	0.2	03/24/2005	21:43	LMJ	EPA 6010B
Cadmium, Total	7440-43-9	< MDL	mg/L	0.0001	03/28/2005	17:54	BRJ	EPA 7131A
Calcium, Total	7440-70-2	15	mg/L	0.1	03/24/2005	21:43	LMJ	EPA 6010B
Chloride, Total	16887-00-6	2.8	mg/L	1.	04/05/2005	13:37	GMP	EPA 325.2
Chromium, Total	7440-47-3	< MDL	mg/L	0.001	03/24/2005	18:59	BRJ	EPA 7191
Cobalt, Total	7440-48-4	< MDL	mg/L	0.001	03/24/2005	22:43	BRJ	EPA 7201
Copper, Total	7440-50-8	< MDL	mg/L	0.01	03/24/2005	21:43	LMJ	EPA 6010B
Filterable Residue		240.	mg/L	10.	03/21/2005	16:29	WMG	EPA 160.1
Fluoride, Total	16984-48-8	0.13	mg/L	0.1	04/08/2005	9:00	GMP	EPA 340.2
Inorganic Carbon, Total		50	mg/L	1.	03/21/2005	19:20	ADP	ASTM477988
Iron, Total	7439-89-6	0.07	mg/L	0.01	03/24/2005	21:43	LMJ	EPA 6010B
Lead , Total	7439-92-1	< MDL	mg/L	0.001	04/01/2005	19:00	BRJ	EPA 7421
Magnesium, Total	7439-95-4	2.1	mg/L	0.01	03/24/2005	21:43	LMJ	EPA 6010B
Manganese, Total	7439-96-5	0.073	mg/L	0.005	03/24/2005	21:43	LMJ	EPA 6010B
Mercury, Total	7439-97-6	<MDL	mg/L	0.0001	04/01/2005	16:48	CLS	EPA 7470A
Molybdenum, Total	7439-98-7	< MDL	mg/L	0.02	03/24/2005	21:43	LMJ	EPA 6010B
Nickel, Total	7440-02-0	< MDL	mg/L	0.001	03/25/2005	0:35	BRJ	EPA 7521
Nitrate-Nitrite as N		< MDL	mg/L	0.01	03/30/2005	10:07	ADP	EPA 353.2
Non-Filterable Residue		< MDL	mg/L	1.	03/21/2005	11:00	WMG	EPA 160.2
Potassium, Total	7440-09-7	3.7	mg/L	0.1	04/05/2005	12:07	BRJ	EPA 7610
Selenium, Total	7782-49-2	< MDL	mg/L	0.001	03/24/2005	20:51	BRJ	EPA 7740
Silver, Total	7440-22-4	< MDL	mg/L	0.01	03/24/2005	21:43	LMJ	EPA 6010B
Sodium, Total	7440-23-5	73	mg/L	0.1	04/05/2005	11:37	BRJ	EPA 7770
Strontium, Total	7440-24-6	0.29	mg/L	0.05	03/24/2005	21:43	LMJ	EPA 6010B
Sulfate, Total	14808-79-8	2.0	mg/L	1.	04/06/2005	10:36	CLS	EPA 375.4
Thallium, Total	7440-28-0	< MDL	mg/L	0.002	03/28/2005	16:00	BRJ	EPA 7841
Tin, Total	7440-31-5	< MDL	mg/L	0.05	03/24/2005	21:43	LMJ	EPA 6010B
Titanium, Total	7440-32-6	< MDL	mg/L	0.005	03/24/2005	21:43	LMJ	EPA 6010B
Total Kjeldahl Nitrogen		0.18	mg/L	0.02	03/31/2005	14:23	GMP	EPA 351.2

[1] Chemical Abstracts Service Registry Number [2] Method Detection Limit

Data Report Number: 050412-142341
Report of Results: Environmental

TENNESSEE VALLEY AUTHORITY
CENTRAL LABORATORIES SERVICES
1101 Market Street, PSC 1B-C
Chattanooga, Tennessee 37402-2801
Phone: (423) 876 - 4318 • Fax: (423) 876 - 4137

Shipping Address:
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North Side Chickamauga Reservation
Chattanooga, Tennessee 37415

Customer Address: Mark Boggs, WT 9C-K
Jack Milligan, CST17B-C
Phone: Debbie Nunn, HB 2A-C
Fax : Not Available
E-Mail: GroundwaterWells; EDM
Location Code: KIF-13B
Field ID: KIF-13B-031505
Sample Description: GROUNDWATER

Sample ID: AF14044 **LRF ID:** 05030374
Matrix: Water **Reg:** RCRA
Date Collected: 03/15/2005
Time Collected: 14:50 EST
Date Received: 03/18/2005
Time Received: 12:32
Project Manager: Randall L. Howell

Analyte	CAS Number[1]	Result	Units	MDL[2]	Analysis Date	Analysis Time	Analyst	Method Reference
Vanadium, Total	7440-62-2	< MDL	mg/L	0.01	03/24/2005	21:43	LMJ	EPA 6010B
Zinc, Total	7440-66-6	< MDL	mg/L	0.01	03/24/2005	21:43	LMJ	EPA 6010B

Sample Comments: Barium, Calcium and Strontium confirmed by reanalysis.
Sulfate analyzed by EPA Method 300.1 (Ion Chromatography).
Potassium confirmed by reanalysis.
Chloride data is confirmed by reanalysis.

[1] Chemical Abstracts Service Registry Number [2] Method Detection Limit

Data Report Number: 050412-142341
Report of Results: Environmental

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Shipping Address:
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North Side Chickamauga Reservation
Chattanooga, Tennessee 37415

Customer Address: Mark Boggs, WT 9C-K
Jack Milligan, CST17B-C
Phone: Debbie Nunn, HB 2A-C
Fax : Not Available
E-Mail: GroundwaterWells; EDM

Location Code: KIF-16A
Field ID: KIF-16A-031705
Sample Description: GROUNDWATER

Sample ID: AF14045 **LRF ID:** 05030374
Matrix: Water **Reg:** RCRA
Date Collected: 03/17/2005
Time Collected: 9:43 EST
Date Received: 03/18/2005
Time Received: 12:32
Project Manager: Randall L. Howell

Analyte	CAS Number[1]	Result	Units	MDL[2]	Analysis Date	Analysis Time	Analyst	Method Reference
Aluminum, Total	7429-90-5	0.09	mg/L	0.05	03/24/2005	21:47	LMJ	EPA 6010B
Ammonia as N	7664-41-7	0.47	mg/L	0.01	03/22/2005	7:42	ADP	EPA 350.1
Antimony,Total	7440-36-0	< MDL	mg/L	0.003	03/28/2005	13:01	BRJ	EPA 7041A
Arsenic, Total	7440-38-2	< MDL	mg/L	0.001	03/25/2005	2:58	BRJ	EPA 7060A
Barium, Total	7440-39-3	0.05	mg/L	0.01	03/24/2005	21:47	LMJ	EPA 6010B
Beryllium, Total	7440-41-7	< MDL	mg/L	0.001	03/24/2005	21:47	LMJ	EPA 6010B
Boron, Total	7440-42-8	< MDL	mg/L	0.2	03/24/2005	21:47	LMJ	EPA 6010B
Cadmium, Total	7440-43-9	< MDL	mg/L	0.0001	03/28/2005	18:00	BRJ	EPA 7131A
Calcium, Total	7440-70-2	45	mg/L	0.1	03/24/2005	21:47	LMJ	EPA 6010B
Chloride, Total	16887-00-6	< MDL	mg/L	1.	04/05/2005	13:37	GMP	EPA 325.2
Chromium, Total	7440-47-3	< MDL	mg/L	0.001	03/24/2005	19:05	BRJ	EPA 7191
Cobalt, Total	7440-48-4	< MDL	mg/L	0.001	03/24/2005	22:49	BRJ	EPA 7201
Copper, Total	7440-50-8	< MDL	mg/L	0.01	03/24/2005	21:47	LMJ	EPA 6010B
Filterable Residue		170.	mg/L	10.	03/21/2005	16:29	WMG	EPA 160.1
Fluoride, Total	16984-48-8	0.36	mg/L	0.1	04/08/2005	9:00	GMP	EPA 340.2
Inorganic Carbon, Total		39	mg/L	1.	03/21/2005	19:26	ADP	ASTM477988
Iron, Total	7439-89-6	0.95	mg/L	0.01	03/24/2005	21:47	LMJ	EPA 6010B
Lead , Total	7439-92-1	< MDL	mg/L	0.001	04/01/2005	19:06	BRJ	EPA 7421
Magnesium, Total	7439-95-4	9.6	mg/L	0.01	03/24/2005	21:47	LMJ	EPA 6010B
Manganese, Total	7439-96-5	1.3	mg/L	0.005	03/24/2005	21:47	LMJ	EPA 6010B
Mercury, Total	7439-97-6	<MDL	mg/L	0.0001	04/01/2005	16:50	CLS	EPA 7470A
Molybdenum, Total	7439-98-7	< MDL	mg/L	0.02	03/24/2005	21:47	LMJ	EPA 6010B
Nickel, Total	7440-02-0	< MDL	mg/L	0.001	03/25/2005	0:41	BRJ	EPA 7521
Nitrate-Nitrite as N		< MDL	mg/L	0.01	03/30/2005	10:07	ADP	EPA 353.2
Non-Filterable Residue		4.	mg/L	1.	03/21/2005	11:00	WMG	EPA 160.2
Potassium, Total	7440-09-7	3.2	mg/L	0.1	04/05/2005	12:08	BRJ	EPA 7610
Selenium, Total	7782-49-2	< MDL	mg/L	0.001	03/24/2005	20:56	BRJ	EPA 7740
Silver, Total	7440-22-4	< MDL	mg/L	0.01	03/24/2005	21:47	LMJ	EPA 6010B
Sodium, Total	7440-23-5	13	mg/L	0.1	04/05/2005	11:39	BRJ	EPA 7770
Strontium, Total	7440-24-6	0.27	mg/L	0.05	03/24/2005	21:47	LMJ	EPA 6010B
Sulfate, Total	14808-79-8	33.0	mg/L	1.	04/06/2005	11:06	CLS	EPA 375.4
Thallium, Total	7440-28-0	< MDL	mg/L	0.002	03/28/2005	16:06	BRJ	EPA 7841
Tin, Total	7440-31-5	< MDL	mg/L	0.05	03/24/2005	21:47	LMJ	EPA 6010B
Titanium, Total	7440-32-6	< MDL	mg/L	0.005	03/24/2005	21:47	LMJ	EPA 6010B
Total Kjeldahl Nitrogen		0.56	mg/L	0.02	03/31/2005	14:23	GMP	EPA 351.2

[1] Chemical Abstracts Service Registry Number [2] Method Detection Limit

Data Report Number: 050412-142341
Report of Results: Environmental

TENNESSEE VALLEY AUTHORITY
CENTRAL LABORATORIES SERVICES
1101 Market Street, PSC 1B-C
Chattanooga, Tennessee 37402-2801
Phone: (423) 876 - 4318 • Fax: (423) 876 - 4137

Shipping Address:
Chickamauga Power Service Center
North Side Chickamauga Reservation
Chattanooga, Tennessee 37415

Customer Address: Mark Boggs, WT 9C-K
Jack Milligan, CST17B-C
Phone: Debbie Nunn, HB 2A-C
Fax : Not Available
E-Mail: GroundwaterWells; EDM
Location Code: KIF-16A
Field ID: KIF-16A-031705
Sample Description: GROUNDWATER

Sample ID: AF14045 **LRF ID:** 05030374
Matrix: Water **Reg:** RCRA
Date Collected: 03/17/2005
Time Collected: 9:43 EST
Date Received: 03/18/2005
Time Received: 12:32
Project Manager: Randall L. Howell

Analyte	CAS Number[1]	Result	Units	MDL[2]	Analysis Date	Analysis Time	Analyst	Method Reference
Vanadium, Total	7440-62-2	< MDL	mg/L	0.01	03/24/2005	21:47	LMJ	EPA 6010B
Zinc, Total	7440-66-6	< MDL	mg/L	0.01	03/24/2005	21:47	LMJ	EPA 6010B

Sample Comments: Sulfate analyzed by EPA Method 300.1 (Ion Chromatography).

[1] Chemical Abstracts Service Registry Number [2] Method Detection Limit

Data Report Number: 050412-142341
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North Side Chickamauga Reservation
Chattanooga, Tennessee 37415

Customer Address: Mark Boggs, WT 9C-K
Jack Milligan, CST17B-C
Phone: Debbie Nunn, HB 2A-C
Fax : Not Available
E-Mail: GroundwaterWells; EDM
Location Code: KIF-16A
Field ID: KIF-16A-031705-DUP
Sample Description: GROUNDWATER

Sample ID: AF14046 **LRF ID:** 05030374
Matrix: Water **Reg:** RCRA
Date Collected: 03/17/2005
Time Collected: 9:43 EST
Date Received: 03/18/2005
Time Received: 12:32
Project Manager: Randall L. Howell

Analyte	CAS Number[1]	Result	Units	MDL[2]	Analysis Date	Analysis Time	Analyst	Method Reference
Aluminum, Total	7429-90-5	0.14	mg/L	0.05	03/24/2005	21:51	LMJ	EPA 6010B
Ammonia as N	7664-41-7	0.47	mg/L	0.01	03/22/2005	7:42	ADP	EPA 350.1
Antimony,Total	7440-36-0	< MDL	mg/L	0.003	03/28/2005	13:06	BRJ	EPA 7041A
Arsenic, Total	7440-38-2	0.001	mg/L	0.001	03/25/2005	3:03	BRJ	EPA 7060A
Barium, Total	7440-39-3	0.05	mg/L	0.01	03/24/2005	21:51	LMJ	EPA 6010B
Beryllium, Total	7440-41-7	< MDL	mg/L	0.001	03/24/2005	21:51	LMJ	EPA 6010B
Boron, Total	7440-42-8	< MDL	mg/L	0.2	03/24/2005	21:51	LMJ	EPA 6010B
Cadmium, Total	7440-43-9	0.0002	mg/L	0.0001	03/28/2005	18:06	BRJ	EPA 7131A
Calcium, Total	7440-70-2	46	mg/L	0.1	03/24/2005	21:51	LMJ	EPA 6010B
Chloride, Total	16887-00-6	1.1	mg/L	1.	04/05/2005	13:37	GMP	EPA 325.2
Chromium, Total	7440-47-3	< MDL	mg/L	0.001	03/24/2005	19:11	BRJ	EPA 7191
Cobalt, Total	7440-48-4	< MDL	mg/L	0.001	03/24/2005	22:54	BRJ	EPA 7201
Copper, Total	7440-50-8	< MDL	mg/L	0.01	03/24/2005	21:51	LMJ	EPA 6010B
Filterable Residue		190.	mg/L	10.	03/21/2005	16:30	WMG	EPA 160.1
Fluoride, Total	16984-48-8	0.35	mg/L	0.1	04/08/2005	9:00	GMP	EPA 340.2
Inorganic Carbon, Total		41	mg/L	1.	03/21/2005	19:36	ADP	ASTM477988
Iron, Total	7439-89-6	0.97	mg/L	0.01	03/24/2005	21:51	LMJ	EPA 6010B
Lead , Total	7439-92-1	< MDL	mg/L	0.001	04/01/2005	19:11	BRJ	EPA 7421
Magnesium, Total	7439-95-4	9.7	mg/L	0.01	03/24/2005	21:51	LMJ	EPA 6010B
Manganese, Total	7439-96-5	1.4	mg/L	0.005	03/24/2005	21:51	LMJ	EPA 6010B
Mercury, Total	7439-97-6	<MDL	mg/L	0.0001	04/01/2005	14:07	CLS	EPA 7470A
Molybdenum, Total	7439-98-7	< MDL	mg/L	0.02	03/24/2005	21:51	LMJ	EPA 6010B
Nickel, Total	7440-02-0	< MDL	mg/L	0.001	03/25/2005	0:46	BRJ	EPA 7521
Nitrate-Nitrite as N		< MDL	mg/L	0.01	03/30/2005	10:07	ADP	EPA 353.2
Non-Filterable Residue		5.	mg/L	1.	03/21/2005	11:00	WMG	EPA 160.2
Potassium, Total	7440-09-7	2.9	mg/L	0.1	04/05/2005	12:10	BRJ	EPA 7610
Selenium, Total	7782-49-2	< MDL	mg/L	0.001	03/24/2005	21:02	BRJ	EPA 7740
Silver, Total	7440-22-4	< MDL	mg/L	0.01	03/24/2005	21:51	LMJ	EPA 6010B
Sodium, Total	7440-23-5	13	mg/L	0.1	04/05/2005	11:40	BRJ	EPA 7770
Strontium, Total	7440-24-6	0.28	mg/L	0.05	03/24/2005	21:51	LMJ	EPA 6010B
Sulfate, Total	14808-79-8	33.0	mg/L	1.	04/06/2005	12:54	CLS	EPA 375.4
Thallium, Total	7440-28-0	< MDL	mg/L	0.002	03/28/2005	16:12	BRJ	EPA 7841
Tin, Total	7440-31-5	< MDL	mg/L	0.05	03/24/2005	21:51	LMJ	EPA 6010B
Titanium, Total	7440-32-6	< MDL	mg/L	0.005	03/24/2005	21:51	LMJ	EPA 6010B
Total Kjeldahl Nitrogen		0.57	mg/L	0.02	03/31/2005	14:23	GMP	EPA 351.2

[1] Chemical Abstracts Service Registry Number [2] Method Detection Limit

Data Report Number: 050412-142341
Report of Results: Environmental

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Shipping Address:
Chickamauga Power Service Center
North Side Chickamauga Reservation
Chattanooga, Tennessee 37415

Customer Address: Mark Boggs, WT 9C-K
Jack Milligan, CST17B-C
Phone: Debbie Nunn, HB 2A-C
Fax : Not Available
E-Mail: GroundwaterWells; EDM

Location Code: KIF-16A
Field ID: KIF-16A-031705-DUP
Sample Description: GROUNDWATER

Sample ID: AF14046 **LRF ID:** 05030374
Matrix: Water **Reg:** RCRA
Date Collected: 03/17/2005
Time Collected: 9:43 EST
Date Received: 03/18/2005
Time Received: 12:32
Project Manager: Randall L. Howell

Analyte	CAS Number[1]	Result	Units	MDL[2]	Analysis Date	Analysis Time	Analyst	Method Reference
Vanadium, Total	7440-62-2	< MDL	mg/L	0.01	03/24/2005	21:51	LMJ	EPA 6010B
Zinc, Total	7440-66-6	< MDL	mg/L	0.01	03/24/2005	21:51	LMJ	EPA 6010B

Sample Comments: Sulfate analyzed by EPA Method 300.1 (Ion Chromatography).

[1] Chemical Abstracts Service Registry Number [2] Method Detection Limit

Data Report Number: 050412-142341
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Chattanooga, Tennessee 37415

Customer Address: Mark Boggs, WT 9C-K
Jack Milligan, CST17B-C
Phone: Debbie Nunn, HB 2A-C
Fax : Not Available
E-Mail: GroundwaterWells; EDM

Location Code: KIF

Field ID: EQUIPMENT BLANK

Sample Description: SUPER Q THROUGH SAMPLING EQUIPMENT

Sample ID: AF14047 **LRF ID:** 05030374
Matrix: Water **Reg:** RCRA
Date Collected: 03/15/2005
Time Collected: 12:30 EST
Date Received: 03/18/2005
Time Received: 12:32
Project Manager: Randall L. Howell

Analyte	CAS Number[1]	Result	Units	MDL[2]	Analysis Date	Analysis Time	Analyst	Method Reference
Aluminum, Total	7429-90-5	< MDL	mg/L	0.05	03/24/2005	21:55	LMJ	EPA 6010B
Ammonia as N	7664-41-7	< MDL	mg/L	0.01	03/22/2005	7:42	ADP	EPA 350.1
Antimony,Total	7440-36-0	< MDL	mg/L	0.003	03/28/2005	13:12	BRJ	EPA 7041A
Arsenic, Total	7440-38-2	< MDL	mg/L	0.001	03/25/2005	3:09	BRJ	EPA 7060A
Barium, Total	7440-39-3	< MDL	mg/L	0.01	03/24/2005	21:55	LMJ	EPA 6010B
Beryllium, Total	7440-41-7	< MDL	mg/L	0.001	03/24/2005	21:55	LMJ	EPA 6010B
Boron, Total	7440-42-8	< MDL	mg/L	0.2	03/24/2005	21:55	LMJ	EPA 6010B
Cadmium, Total	7440-43-9	< MDL	mg/L	0.0001	03/28/2005	18:11	BRJ	EPA 7131A
Calcium, Total	7440-70-2	< MDL	mg/L	0.1	03/24/2005	21:55	LMJ	EPA 6010B
Chloride, Total	16887-00-6	< MDL	mg/L	1.	04/05/2005	13:37	GMP	EPA 325.2
Chromium, Total	7440-47-3	< MDL	mg/L	0.001	03/24/2005	19:17	BRJ	EPA 7191
Cobalt, Total	7440-48-4	< MDL	mg/L	0.001	03/24/2005	23:00	BRJ	EPA 7201
Copper, Total	7440-50-8	< MDL	mg/L	0.01	03/24/2005	21:55	LMJ	EPA 6010B
Filterable Residue		< MDL	mg/L	10.	03/21/2005	16:31	WMG	EPA 160.1
Fluoride, Total	16984-48-8	< MDL	mg/L	0.1	04/08/2005	9:00	GMP	EPA 340.2
Inorganic Carbon, Total		< MDL	mg/L	1.	03/21/2005	19:39	ADP	ASTM477988
Iron, Total	7439-89-6	< MDL	mg/L	0.01	03/24/2005	21:55	LMJ	EPA 6010B
Lead , Total	7439-92-1	< MDL	mg/L	0.001	04/01/2005	19:16	BRJ	EPA 7421
Magnesium, Total	7439-95-4	< MDL	mg/L	0.01	03/24/2005	21:55	LMJ	EPA 6010B
Manganese, Total	7439-96-5	< MDL	mg/L	0.005	03/24/2005	21:55	LMJ	EPA 6010B
Mercury, Total	7439-97-6	<MDL	mg/L	0.0001	04/01/2005	14:09	CLS	EPA 7470A
Molybdenum, Total	7439-98-7	< MDL	mg/L	0.02	03/24/2005	21:55	LMJ	EPA 6010B
Nickel, Total	7440-02-0	< MDL	mg/L	0.001	03/25/2005	0:52	BRJ	EPA 7521
Nitrate-Nitrite as N		< MDL	mg/L	0.01	03/30/2005	10:07	ADP	EPA 353.2
Non-Filterable Residue		< MDL	mg/L	1.	03/21/2005	11:00	WMG	EPA 160.2
Potassium, Total	7440-09-7	< MDL	mg/L	0.1	04/05/2005	12:14	BRJ	EPA 7610
Selenium, Total	7782-49-2	< MDL	mg/L	0.001	03/24/2005	21:07	BRJ	EPA 7740
Silver, Total	7440-22-4	< MDL	mg/L	0.01	03/24/2005	21:55	LMJ	EPA 6010B
Sodium, Total	7440-23-5	< MDL	mg/L	0.1	04/05/2005	11:44	BRJ	EPA 7770
Strontium, Total	7440-24-6	< MDL	mg/L	0.05	03/24/2005	21:55	LMJ	EPA 6010B
Sulfate, Total	14808-79-8	<1.0	mg/L	1.	04/06/2005	11:46	CLS	EPA 375.4
Thallium, Total	7440-28-0	< MDL	mg/L	0.002	03/28/2005	16:17	BRJ	EPA 7841
Tin, Total	7440-31-5	< MDL	mg/L	0.05	03/24/2005	21:55	LMJ	EPA 6010B
Titanium, Total	7440-32-6	< MDL	mg/L	0.005	03/24/2005	21:55	LMJ	EPA 6010B
Total Kjeldahl Nitrogen		0.04	mg/L	0.02	04/12/2005	10:59	GMP	EPA 351.2

[1] Chemical Abstracts Service Registry Number [2] Method Detection Limit

Data Report Number: 050412-142341
Report of Results: Environmental

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Chattanooga, Tennessee 37415

Customer Address: Mark Boggs, WT 9C-K
Jack Milligan, CST17B-C
Phone: Debbie Nunn, HB 2A-C
Fax : Not Available
E-Mail: GroundwaterWells; EDM
Location Code: KIF
Field ID: EQUIPMENT BLANK
Sample Description: SUPER Q THROUGH SAMPLING EQUIPMENT

Sample ID: AF14047 **LRF ID:** 05030374
Matrix: Water **Reg:** RCRA
Date Collected: 03/15/2005
Time Collected: 12:30 EST
Date Received: 03/18/2005
Time Received: 12:32
Project Manager: Randall L. Howell

Analyte	CAS Number[1]	Result	Units	MDL[2]	Analysis Date	Analysis Time	Analyst	Method Reference
Vanadium, Total	7440-62-2	< MDL	mg/L	0.01	03/24/2005	21:55	LMJ	EPA 6010B
Zinc, Total	7440-66-6	< MDL	mg/L	0.01	03/24/2005	21:55	LMJ	EPA 6010B

Sample Comments: TKN result confirmed by reanalysis.
Sulfate analyzed by EPA Method 300.1 (Ion Chromatography).

[1] Chemical Abstracts Service Registry Number [2] Method Detection Limit

Central Laboratories Services data report number 050412-142340 was electronically approved using Labworks Enterprise Version 5.7, Build 255 on **04/12/2005 at 12:55:00 PM by Randall L. Howell**

Vanessa L. Ramey, Lab Director
Lisa D. Ortiz, Department Manager
Randall L. Howell, Product Manager
Ricardo I. Gilbert, Product Manager, Interim

This report contains sample results for the following samples, Login Reference File number: 05030374

AF14042
AF14043
AF14044
AF14045
AF14046
AF14047

[1] Chemical Abstracts Service Registry Number [2] Method Detection Limit