Groundwater Permit Correspondence (EDMS)

April 9, 2008

Mark Boggs, WT 9D-K

KINGSTON GROUNDWATER MONITORING – MARCH 2008

On March 25 and 26, Bill Nichols and I conducted field-monitoring activities specified for Kingston groundwater monitoring. Groundwater samples were collected from Wells G3A, G3B, G4B, G5A, G5B, and G6B. Routine samples (mineral, metal, nutrient, and TIC) were collected from all wells. Equipment blanks were collected after Well G3A was sampled. Duplicate samples were collected from Well G4B. Sample readings of Hydrolab parameters (temperature, pH, dissolved oxygen, conductivity, and oxidation-reduction potential) were determined utilizing a flow-through cell to eliminate groundwater-to-air contact.

On April 7, Bill Nichols and Sam Grindstaff conducted field-monitoring activities specified for Kingston groundwater monitoring for Well G1B. This well was sampled and monitored as the wells above. This well was pumped at a later date due to a delay in the delivery of special equipment needed to complete the sampling. The well recharged with minimal drawdown and was slightly turbid with no odor.

Acidity and alkalinity values were determined by potentiometric titration using an Orion pH meter. Depth to water was measured with a depth sounder. Final standardization of instruments showed minimal drift on most parameters.

Samples were iced upon collection and kept cold. They have already been shipped to and received at the Environmental Science Corporation laboratory.

Attached are eight Groundwater Data Field Worksheets (TVA 30066A (9-1999)), five Instrument Standardization forms (TVA 30035 (2-2006) [2-2006]), three Acidity and Alkalinity Field Worksheets (TVA 30533 (RD-BUS 4-92)), one spreadsheet of water surface elevation measurements, and two Environmental Science Corporation chain of custody forms.

If you have any questions or comments, please call me at (865) 673-2317 in Knoxville.

James E. (Jim) Stockburger
Environmental Engineering Services East
GRN 2E-K

JES:ELD
Attachments
cc (Attachments):
Daryl R. Armentrout, GRN 2E-K
Linda F. Campbell, KFP 1A-KST
Matthew D. Williams, WT 9A-K (orig.)
EDMS, CEB 1B-M

Project/Site	Well Number	Purge Date	Year	Month	Day
KINGSTON GROUNDWATER	1B (4088)		08	04	07

Depth to Water (m)	Bottom of Well (m)	Well Diameter (mm)	Survey Leader	Field Crew
31.31 (4195)	39.19 (4194)	153 (4188)	SAG	WFN

☐ Depth of Screen ☑ Open Bore Hole

(m) (4191) To	(m) (4190) Sample Label	Filter Type and Size:
	KIF-G1B	☑ Unfiltered ☐ Filtered ☐ Both

[Bottom of Well - Depth to Water] x Volume Factor =	Well Volume	Target Purge Volume	Actual Purge Volume
[(39.19)m - (31.31)m] x (18.228)L/m =	143.63 (L)	287.26 (L)	298 (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)
295 Begin Purge →	0937	4.0	31.31	38.0						
	0942		34.50		15.3	7.25	8.9	411	345	—
28L	0944	6.0	34.60		15.5	7.3	9.0	411	351	—
60L	0954	6.0	34.70		15.5	7.3	8.8	417	352	—
148L 60L	1004	6.0	34.74		15.5	7.4	8.7	421	353	—
30L	1009	6.0	34.76		15.5	7.3	8.7	435	350	—
208L 30L	1014	6.0	34.77		15.5	7.3	8.8	449	350	—
30L	1019	6.0	34.77		15.6	7.3	8.8	460	350	—
30L	1024	6.0	34.78		15.6	7.3	8.8	467	354	—
30L	1029	6.0	34.78		15.6	7.2	8.8	468	355	—

Remarks: _____

Reviewed By: _____ Survey Leader 04-07-08 Date _____ Project Leader 04-09-08 Date

Sample Collector: WFN

Sample Date			Time
Year	Month	Day	
08	04	07	1029 (ET) CT

Pump Duration 52 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 ±0 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
1029	6.0	34.78	38.0	15.6	7.2	8.8	468	355	—

Additional Sample Data

Analyst: WFN

Date Analyzed: Year 08 Month 04 Day 07

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

Color: CLOUDY/TAN

Odor: NONE

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)
—	211	—	14
Time: —	Time: 1430	Time: —	Time: 1438
Initial: —	Initial: WFN	Initial: —	Initial: WFN

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

Others (list): FQ

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

TVA 30066A (9-1999)

12.43 12.53

Preliminary Groundwater Data Field Worksheet

Sheet 1 of 1

Project/Site	Well Number	Purge Date	Year	Month	Day
KIF	GSA 84068		08	03	25

Depth to Water (m)	Bottom of Well (m)	Well Diameter (mm)	Survey Leader	Field Crew
3.7 4195	9.74 4194	51 4188	JES	WFN

☑ Depth of Screen ☐ Open Bore Hole

	(m)	To	(m)	Sample Label	Filter Type and Size:
	6.6 4191		9.6 4190	KIF-GSA-0308	☑ Unfiltered ☐ Filtered ☐ Both

[Bottom of Well - Depth to Water]	x Volume Factor =	Well Volume	Target Purge Volume	Actual Purge Volume
[(9.74)m - (3.7)m]	x (2.027)L/m =	12.2 (L)	24.4 (L)	27 (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 →	1353	3.25		9						
6.5	1355	↓	5.47	9	15.1	6.2	2.2	197	528	—
9	1357	2.0	5.62	9	15.4	6.1	2.3	235	526	—
	1359	↓		9	15.7	6.2	2.2	217	535	—
17	1401	↓ 1.6	5.75	9	15.8	6.1	2.1	213	530	—
20	1403	↓	6.11	9	15.8	6.1	1.9	195	522	—
23.5	1405	1.75 ↓		9	15.9	6.0	1.7	205	531	—
27	1407		6.15	9	16.0	6.0	1.8	207	527	—

130
112

Remarks: Collected in settling container - decanted later

Reviewed By: [signature] Survey Leader 3/27/08 Date [signature] Project Leader 03/28/08 Date

Sample Collector: WFN/JES			
Sample Date			Time
Year 08	Month 03	Day 25	1407 ET CT
Pump Duration: 14 min			72004

"999" = 2 days

Sample Readings

Analysis Time ET/CT	Pump Rate (L/min)	Pump Depth (m)	Temp °C EPA 170.1	pH (s.u.) EPA 150.1	DO (mg/L) EPA 360.1	COND (umhos/cm) EPA 120.1	(+/-) ORP (mv) SM 2580B	Turbidity (NTU) EPA 180.1
1407	1.75	9	16	6	1.8	207	527	—
	4193	4192	10	400	300	94	90	

Additional Sample Data

Analyst: JES		90		53	Well Diameter (mm)	Vol. Factor (L/m)
Date Analyzed	415	431	436	437	12.7 (0.5 in)	0.127
Year 08 Month 03 Day 25	Phenol Alkalinity mg/L (EPA 310.1)	Total Alk. mg/L (EPA 310.1)	Mineral Acidity mg/L (EPA 305.1)	CO_2 Acidity mg/L (EPA 305.1)	51 (2 in)	2.027
	Time:	Time: 1625	Time:	Time: 1731	76 (3 in)	4.560
Turbidity 1350 ☐ Clear ☐ Slightly Turbid ☑ Turbid ☐ Highly Turbid	Initial:	Initial: JES	Initial:	Initial: JES	102 (4 in)	8.107
					127 (5 in)	12.668
Color: Brown	Bottles Required ☐ BOD ☐ TOC ☐ COD ☑ TIC	☐ Ferrous ☑ Metals ☐ Dis. Metals	☑ Mineral ☐ Dis. Mineral ☑ Nutrient	☐ Phenol ☐ Filt TIC ☐ TSS/TDS	153 (6 in)	18.228
Odor: —					Others (list): F	

TVA 30066A [2-2008]

Preliminary Groundwater Data Field Worksheet

Sheet 1 of 2

Project/Site	Well Number	Purge Date: Year	Month	Day
KIF	GSB 84068	08	03	25 26

Depth to Water (m)	Bottom of Well (m)	Well Diameter (mm)	Survey Leader	Field Crew
3.92 4195	19.19 4194	51 4188	JES	WFN

☑ Depth of Screen ☐ Open Bore Hole

(m)	To	(m)	Sample Label	Filter Type and Size:
12.8 4191	To	18.9 4190	KIF-GSB-0308	☑ Unfiltered ☐ Filtered ☐ Both

[Bottom of Well − Depth to Water]	x Volume Factor =	Well Volume	Target Purge Volume	Actual Purge Volume
[(19.19)m − (3.92)m]	x (2.027) L/m =	31 (L)	62 (L)	See page 2 (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)
1245 HZ Begin Purge →	1245	2.0	3.92	17						
	1247	↓	5.91	17	15.0	7.1	4.4	290	555	—
10	1250	1.2 ↓	8.47	17	15.3	7.1	5.3	262	544	—
16	1255	↓ 0.36	10.10	17	15.8	7.2	5.4	120	535	—
1350 HZ 17.8	1300	0.73 ↓	10.63	17	16.0	7.2	5.3	432	521	
20	1303	↓ 0.43	11.47	17	17.7	7.2	4.8	440	518	—
	1305	↓		17	17.5	7.2	4.6	438	515	—
23	1310	↓ 0.4	12.01	17	17.2	7.1	4.3	438	513	—
25	1315	1.25 ↓	12.20	17	17.4	7.1	4.2	444	508	—
1515 HZ 30	1319	↓ 1.5		17	17.7	7.1	4.1	435	505	—
	1320	↓	13.09	17						
39	1325	↓	13.46	17	17.2	7.0	3.4	423	509	—
400 (1326) 45	1330	1.0	14.09	17	17.3	7.0	3.1	460	508	—
1655 HZ 50	1335	1.4	14.93	17	17.5	7.0	2.9	479	499	—
57	1340	↓	15.91	17	17.4	7.1	2.2	502	491	—
1717 HZ										

Remarks:

1.4
4
5.0

Reviewed By: James Stockburger 03/27/08 Survey Leader Date

Matt Hall 03/28/08 Project Leader Date

Sample Collector: WFN/JES

Sample Date			Time
Year	Month	Day	(ET) CT
08	03	26	

Pump Duration: See page 2 min 72004

"999" = 2 days

Sample Readings

Analysis Time (ET) CT	4193 Pump Rate (L/min)	4192 Pump Depth (m)	10 Temp °C EPA 170.1	400 pH (s.u.) EPA 150.1	300 DO (mg/L) EPA 360.1	94 COND (umhos/cm) EPA 120.1	90 (+/-) ORP (mv) SM 2580B	Turbidity (NTU) EPA 180.1

Additional Sample Data

Analyst:

Date Analyzed: Year	Month	Day	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)
			Time:	Time:	Time:	Time:
			Initial:	Initial:	Initial:	Initial:

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

Color:

Odor:

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

Others (list):

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 30066A [2-2008]

Preliminary Groundwater Data Field Worksheet

Sheet 2 of 2

Project/Site	Well Number	Purge Date	Year	Month	Day
KIF	GSB 84068		08	03	25

Depth to Water (m)	Bottom of Well (m)	Well Diameter (mm)	Survey Leader	Field Crew
3.92 4195	19.19 4194	51 4188	JES	WFN

☑ Depth of Screen ☐ Open Bore Hole

(m)	To	(m)	Sample Label	
12.8 4191	To	18.9 4190	KIF-GSB-0308	☑ Unfiltered ☐ Filtered ☐ Both Filter Type and Size:

[Bottom of Well - Depth to Water]	x Volume Factor =	Well Volume	Target Purge Volume	Actual Purge Volume
[(19.19)m - (3.92)m]	x (2.027)L/m =	31 (L)	62 (L)	62 (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 →	~~1344~~ 1344	5	16.4	17	16.8	7.2	1.4	520	477	—
125Hz 3/26/08 →	1229	3.0	4.05	12	Resume Pumping					
120Hz 3	1230	2.0	5.68	12	15.9	7.4	9.6	412	513	—
7	1232	1.5	7.07	12	16.0	7.3	9.3	413	519	—
8.5	1233	-	7.70	12	16.2	7.3	9.2	414	521	—

Remarks: ONLY recovered to 15.6m by 12:14, LEFT OVERNIGHT TO RECHARGE —
★ NOTE: PUMPING RESUMED ON 3/26/08 AFTER A 3/25/08 PURGE. ★

Reviewed By: [signature] Survey Leader 03/27/08 Date [signature] Project Leader 03/28/08 Date

Sample Collector: WFN/JES

Sample Date			Time
Year	Month	Day	1233 ET / CT
08	03	26	

Pump Duration: 999 min 72004

"999" = 2 days

Sample Readings

Analysis Time ET / CT	Pump Rate (L/min)	Pump Depth (m)	Temp °C EPA 170.1	pH (s.u.) EPA 150.1	DO (mg/L) EPA 360.1	COND (umhos/cm) EPA 120.1	(+/-) ORP (mv) SM 2580B	Turbidity (NTU) EPA 180.1
1233	1.5	12	16.2	7.3	9.2	414	521	—
	4193	4192	10	400	300	94	90	

Additional Sample Data

Analyst: JES

Date Analyzed: Year 08, Month 03, Day 26

Turbidity 1350: ☑ Clear ☐ Slightly Turbid ☐ 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)
	71		12
Time:	Time:	Time:	Time: 1508
Initial:	Initial:	Initial:	Initial: JES

Bottles Required: ☐ BOD ☐ TOC ☐ Ferrous ☑ Mineral ☐ Phenol ☐ COD ☐ TIC ☐ Metals ☐ Dis. Mineral ☐ Filt TIC ☑ Nutrient ☐ Dis. Metals ☐ 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 30066A [2-2008]

TVA-00025116

Preliminary Groundwater Data Field Worksheet

Sheet 1 of 1

Project/Site	Well Number	Purge Date	Year	Month	Day
KIF	GWB 84068		08	03	26

Depth to Water (m)	Bottom of Well (m)	Well Diameter (mm)	Survey Leader	Field Crew
8.87 4195	25.02 4194	51 4188	JES	WFN

☑ Depth of Screen ☐ Open Bore Hole

(m)	To	(in)	Sample Label	Filtering
18.8 4191		24.9 4190	KIF-GWB-030826 KIF-GWB-030826-DUP	☑ Unfiltered ☐ Filtered ☐ Both; Filter Type and Size:

[Bottom of Well - Depth to Water]	x	Volume Factor	=	Well Volume	Target Purge Volume	Actual Purge Volume
[(25.02)m - (8.87)m]	x	(7.627)L/m	=	32.7 (L)	65.4 (L)	66 (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 →	1010	1.4	8.87	24						
140 HZ water hits bucket	1011	1.4		24	14.9	6.9	4.9	777	477	—
	1015	1.4	10.07	24	16.0	7.0	1.0	776	279	—
10	1018	0.9	11.07	24	16.3	7.0	0.8	766	263	—
14.5	1023	0.8	11.97	24	16.7	7.0	0.7	797	231	—
19.3	1030	0.8	12.82	24	17.3	7.0	0.7	825	212	—
145 HZ 24 20 @ 10:32	1036	0.7	13.42	24	17.7	7.0	0.6	836	188	—
155 HZ 27.5	1041	1.0	13.22	24	17.8	7.0	0.6	835	188	—
30@10:44 32.5	1046	0.8	14.1	24	17.8	6.9	0.5	835	179	—
160 HZ 36.5	1051	0.9	14.52	24	18.0	6.9	0.5	836	181	—
41	1056	1.0	15.3	24	18.0	6.9	0.5	848	184	—
170 HZ 46	1101	1.3	16.1	24	18.3	6.9	0.5	850	180	—
51@1104 52.5	1106	0.9	16.62	24	18.0	6.9	0.4	862	181	—
180 HZ 57	1111	1.2	17.42	24	18.2	6.9	0.5	864	196	—
63	1116	1.5	18.01	24	18.1	6.9	0.4	888	184	—
Remarks: 66	1118	1.5	18.87	24	18.1	6.9	0.4	881	190	—

Duplicate Sample

Reviewed By: Survey Leader — Date: 03/27/08 — Project Leader — Date: 03/28/08

Sample Collector: WFN

Sample Date			Time
Year	Month	Day	(ET) CT
08	03	26	

Pump Duration: 68 min 72004

"999" = 2 days

Analysis Time (ET) CT	Pump Rate (L/min)
1118	1.5
	4193

Sample Readings

Pump Depth (m)	Temp °C EPA 170.1	pH (s.u.) EPA 150.1	DO (mg/L) EPA 360.1	COND (umhos/cm) EPA 120.1	(+/-) ORP (mv) SM 2580B	Turbidity (NTU) EPA 180.1
24	18.1	6.9	0.4	881	190	—
4192	10	400	300	94	90	

Additional Sample Data

Analyst:

Date Analyzed		
Year	Month	Day
08	03	26

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

Color: —

Odor: —

415 Phenol Alkalinity mg/L (EPA 310.1)	431 Total Alk. mg/L	436 Mineral Acidity mg/L (EPA 305.1)	437 CO_2 Acidity mg/L (EPA 305.1)
1	422 / 417		68 / 73
Time:	Time:	Time:	Time: 1524 / 1535
Initial:	Initial:	Initial:	Initial: 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: ☐ BOD ☐ TOC ☐ COD ☑ TIC ☐ Total Metals ☑ Mineral ☐ Dis. Mineral ☑ Nutrient ☐ Phenol ☐ Filt TIC ☐ TSS/TDS

Others (list): F

TVA 30066A [2-2008]

Preliminary Groundwater Data Field Worksheet

Sheet 1 of 1

Project/Site	Well Number	Purge Date	Year	Month	Day
KIF	GSA 84068		08	03	25

Depth to Water (m)	Bottom of Well (m)	Well Diameter (mm)	Survey Leader	Field Crew
6.65 4195	8.57 4194	51 38	JES	WFN

☑ Depth of Screen ☐ Open Bore Hole

(m)		(m)	Sample Label	Filter Type and Size:
5.7 4191	To	8.7 4190	KIF-GSA-0308	☑ Unfiltered ☐ Filtered ☐ Both

[Bottom of Well - Depth to Water]	x	Volume Factor	=	Well Volume	Target Purge Volume	Actual Purge Volume
[(8.57)m - (6.65)m]	x	(7.027)L/m	=	3.9 (L)	7.8 (L)	10.6 (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 →	1324		6.65							
water hits cyl.	1328	2.1			14.4	6.6	5.0	155	584	
	1330		6.65	7.5	15.0	6.4	4.4	163	576	—
8.5	1332	2.1		7.5	15.8	6.5	4.7	159	573	-
10.6	1333			7.5	15.9	6.5	5.0	175	571	—

125HZ

Remarks:- very slight turbidity

Reviewed By: [signature] Survey Leader 3/28/08 Date [signature] Project Leader 03/28/08 Date

Sample Collector: WFN			
Sample Date			Time
Year 08	Month 03	Day 25	1333 (ET) CT
Pump Duration: 7 min			72004

"999" = 2 days

1333	2.1
	4193
Analysis Time (ET) CT	Pump Rate (L/min)

Sample Readings

7.5	15.9	6.5	5.0	175	571	—
4192	10	400	300	94	90	
Pump Depth (m)	Temp °C EPA 170.1	pH (s.u.) EPA 150.1	DO (mg/L) EPA 360.1	COND (umhos/cm) EPA 120.1	(+/-) ORP (mv) SM 2580B	Turbidity (NTU) EPA 180.1

Additional Sample Data

Analyst: JS		149		38	Well Diameter (mm)	Vol. Factor (L/m)
Date Analyzed	415	437	436	437	12.7 (0.5 in)	0.127
Year 08 Month 03 Day 25	Phenol Alkalinity mg/L (EPA 310.1)	Total Alkalinity mg/L (EPA 310.1)	Mineral Acidity mg/L (EPA 305.1)	CO_2 Acidity mg/L (EPA 305.1)	51 (2 in)	2.027
Turbidity 1350 ☐ Clear ☑ Slightly Turbid ☐ Turbid ☐ Highly Turbid	Time:	Time:	Time:	Time: 1724	76 (3 in)	4.560
	Initial:	Initial:	Initial:	Initial: JS	102 (4 in)	8.107
Color: TAN	Bottles Required		☑ Mineral ☐ Dis. Mineral ☑ Nutrient	☐ Phenol ☐ Filt TIC ☐ TSS/TDS	127 (5 in)	12.668
Odor: —	☐ BOD ☐ COD ☐ TOC ☑ TIC	Dissolved Metals			153 (6 in)	18.228
					Others (list): F	

TVA 30066A [2-2008]

TVA-00025118

Preliminary Groundwater Data Field Worksheet

Sheet 1 of 1

Project/Site	Well Number	Purge Date	Year	Month	Day
KIF	GSB 84068		08	03	25

Depth to Water (m)	Bottom of Well (m)	Well Diameter (mm)	Survey Leader	Field Crew
6.51 4195	18.36 4194	51		WFN

☑ Depth of Screen ☐ Open Bore Hole

(m)	To	Sample Label	Filter Type and Size:
12 4191	18.1	KF-GSB-0305	☐ Unfiltered ☐ Filtered ☐ Both

[Bottom of Well - Depth to Water]	x	Volume Factor	=	Well Volume	Target Purge Volume	Actual Purge Volume
[(18.36)m - (6.51)m]	x	(2 [illegible]/m)	=	24 (L)	48 (L)	54.5 (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)
140 HZ Begin Purge →	1053	3.0	6.6							
	1055		7.[illegible]		15.3	7.2	2.0	494	469	—
10@1057	1100	2.5	7.[illegible]		16.3	7.2	0.3	528	440	—
18.5	1105		7.[illegible]		16.4	7.1	4.3	399	493	—
20@1103:30	1110	2.9	7.[illegible]		16.4	7.0	6.2	361	531	—
30@1107 40@1108	1113	2.9	7.[illegible]		16.4	7.0	6.6	354	541	—
54.5 total										

Remarks:

Reviewed By: [signature] Survey Leader [illegible] Date [signature] Project Leader 03/28/08 Date

Sample Collector: WFN		
Sample Date		Time
Year 08	Month 03 Day 25	ET CT 1113
Pump Duration: 20 min		72004

"999" = 2 days

Analysis Time ET CT	Pump Rate (L/min)
1113	2.9
	4193

Sample Readings

Pump Depth (m)	Temp °C EPA 170.1	pH (s.u.) EPA 150.1	DO (mg/L) EPA 360.1	COND (umhos/cm) EPA 120.1	(+/-) ORP (mv) SM 2580B	Turbidity (NTU) EPA 180.1
17	16.4	7.0	6.6	354	541	—
4192	10	400	300	94	90	

Additional Sample Data

Analyst: JES					Well Diameter (mm)	Vol. Factor (L/m)
Date Analyzed	415	431	436	437	12.7 (0.5 in)	0.127
Year 08 Month 03 Day 25	Phenol Alkalinity mg/L (EPA 310.1)	Total [illegible]	Mineral Acidity mg/L (EPA 305.1)	CO_2 Acidity mg/L (EPA 305.1)	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 ☑ Slightly Turbid ☐ Turbid ☐ Highly Turbid	Time:	T[illegible]	Time:	Time: 1716		
	Initial:	In[illegible]	Initial:	Initial: [illegible]		
Color: TAN	Bottles Required		☑ Mineral ☐ Dis. Mineral ☑ Nutrient	☐ Phenol ☐ Filt TIC ☐ TSS/TDS	Others (list): F	
Odor: —	☐ BOD ☐ TOC ☐ COD ☑ TIC					

TVA 30066A [2-2008]

TVA-00025119

Preliminary Groundwater Data Field Worksheet

Sheet 1 of 1

Project/Site	Well Number	Purge Date	Year	Month	Day
KIF	GW65 84068		08	03	25

Depth to Water (m)	Bottom of Well (m)	Well Diameter (mm)	Survey Leader	Field Crew
11.01 4195	18.19 4194	51	JES	JWN

☑ Depth of Screen ☐ Open Bore Hole

(m)	To	(m)	Sample Label	Filter Type and Size:
11.9 4191	To	18 4190	KIF-GW-0308	☑ Unfiltered ☐ Filtered ☐ Both

[Bottom of Well - Depth to Water]	x Volume Factor =	Well Volume	Target Purge Volume	Actual Purge Volume
[(18.19)m - (11.01)m]	x (2.027)L/m =	14.55 (L)	29.1 (L)	30.4 (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)
150 140 Begin Purge →	940	2.1	11.01							
Stop-	942									
Resume	953			17						
	954			17	15.2	6.8	6.1	614	438	—
6.2 L	956	1.2	11.07	17	15.2	6.8	6.3	611	465	—
10	1000	1.3	11.07	17	15.9	6.8	6.6	617	478	—
16	1005	1.2	11.07	17	16.2	6.8	6.7	610	501	—
22	1010	1.2	11.07	17	16.4	6.9	6.6	609	510	—
28	1015	1.2	11.07	17	16.4	6.9	6.3	603	515	—
30.4	1017	1.2	11.07	17	16.5	6.9	6.3	601	514	—

Remarks:

Reviewed By: [signature] Survey Leader Date 03/28/08 [signature] Project Leader Date 03/28/08

Sample Collector: WFN	Sample Date			Time	
	Year	Month	Day	ET	CT
	08	03	25		
Pump Duration: 37 min 72004					

"999" = 2 days

Analysis Time ET CT	Pump Rate (L/min)
1017	1.2
	4193

Sample Readings

Pump Depth (m)	Temp C EPA 170.1	pH (s.u.) EPA 150.1	DO (mg/L) EPA 360.1	COND (umhos/cm) EPA 120.1	(+/-) ORP (mv) SM 2580B	Turbidity (NTU) EPA 180.1
17	16.5	6.9	6.3	601	514	—
4192	10	400	300	94	90	

Additional Sample Data

Analyst: JES					Well Diameter (mm)	Vol. Factor (L/m)
Date Analyzed	415	431	436	437	12.7 (0.5 in)	0.127
Year 08 Month 03 Day 25	Phenol Alkalinity mg/L (EPA 310.1)		Mineral Acidity mg/L (EPA 305.1)	CO_2 Acidity mg/L (EPA 305.1)	51 (2 in)	2.027
Turbidity 1350 ☐ Clear ☑ Slightly Turbid ☐ Turbid ☐ Highly Turbid	Time:	T	Time:	Time: 1706	76 (3 in)	4.560
	Initial:	In	Initial:	Initial: JES	102 (4 in)	8.107
Color: TAN	Bottles Required		☑ Mineral	☐ Phenol	127 (5 in)	12.668
Odor: —	☐ BOD ☐ TOC		☐ Dis. Mineral	☐ Filt TIC	153 (6 in)	18.228
	☐ COD ☑ TIC	☐ Metals	☑ Nutrient	☐ TSS/TDS	Others (list): 2	

TVA 30066A [2-2008]

ACIDITY AND ALKALINITY FIELD [illegible] SHEET

PRELIMINARY DATA

PROJECT/SITE	COLLECTION DATE
KIF Gw	03/26/08
SURVEY LEADER	
tdg	
FIELD CREW	
WFN	

NORMALITY	
ACID	0.02
BASE	0.02

SAMPLE TAG NO.	INITIAL pH	SAMPLE VOL TITRATED (ml)	FACTOR	ALKALINITY TITRATION(S) ml ACID TO pH 3.3	PHENOL (mg/L CO_3)	TOTAL ml ACID TO pH 4.5	TOTAL ALK. (mg/L ($Ca\ CO_3$))	ACIDITY TITRATION(S) ml BASE TO pH 3.7	MINERAL ACIDITY (mg/L ($Ca\ CO_3$))	TOTAL ml BASE TO pH 8.3	CO_2 ACIDITY (mg/L ($Ca\ CO_3$))
1619/1508 KIF-3B-0308	7.4	100	10	—		17.1	171	—	—	1.2	12
1611/1526 KIF-4B-0308	7.1	100	10	—		42.2	422	—	—	6.8	68
1606/1535 KIF-4B-0308-DUP	7.1	100	10	—		41.7	417	—	—	7.3	73

ALKALINITY OR ACIDITY (mg/L $CaCO_3$) = [illegible] X 50,000 / V

A = ml TITRANT
N = TITRANT NORMALITY
V = SAMPLE VOLUME

NORMALITY	SAMPLE VOL TITRATED	FACTOR
0.02N	100 ml	10
0.02N	50 ml	20

REVIEWED BY:

Survey Leader — 03/27/08 (Date)

FE Proj. Eng. — 03/28/08 (Date)

DISTRIBUTION: Data Management (2) Pink - Lab with samples (3) Blue - Unit Leader (Office Notebook) Survey Leader (Field Notebook) (4) Yellow - F.E. Project Engineer (AJDMDS)

TVA 30533 (RD-BUS 4-92)

TVA-00025121

ACIDITY AND ALKALINITY FIELD WORKSHEET

PRELIMINARY DATA

PROJECT/SITE	COLLECTION DATE
KIF GW	03/25/08
SURVEY LEADER	
JES	
FIELD CREW	
WFN	

NORMALITY	
ACID	0.02
BASE	0.02

	SAMPLE TAG NO.	INITIAL pH	SAMPLE VOL TITRATED (ml)	FACTOR	ALKALINITY TITRATION(S) ml ACID TO pH 8.3	ALKALINITY TITRATION(S) PHENOL ALK (mg/L) (Ca CO_3)	ALKALINITY TITRATION(S) TOTAL ml ACID TO pH 4.5	ALKALINITY TITRATION(S) TOTAL ALK. (mg/L) (Ca CO_3)	ACIDITY TITRATION(S) ml BASE TO pH 3.7	ACIDITY TITRATION(S) MINERAL ACIDITY (mg/L) (Ca CO_3)	ACIDITY TITRATION(S) TOTAL ml BASE TO pH 8.3	ACIDITY TITRATION(S) CO_2 ACIDITY (mg/L) (Ca CO_3)
1628/1736	KIF-3A-0308	6.3	100	10			9.0	90			5.3	53
1636/1724	KIF-5A-0308	6.8	100	10			14.9	149			3.8	38
1645/1716	KIF-5B-0308	7.3	100	10			17.1	171			1.5 / 6.6	15 / 66
1655/1706	KIF-6B-0308	7.2	100	10			31.1	311			3.3	33

ALKALINITY OR ACIDITY (mg/L $CaCO_3$) = $\frac{A \times N \times 50{,}000}{V}$

A = ml TITRANT
N = TITRANT NORMALITY
V = SAMPLE VOLUME

NORMALITY	SAMPLE VOL TITRATED	FACTOR
0.02N	100 ml	10
0.02N	50 ml	20

REVIEWED BY:

Survey Leader — Date: 03/27/08

FE Proj. Eng. — Date: 03/28/08

DISTRIBUTION: (1) Original - Data Management (2) Pink - Lab with samples (3) Blue - Unit Leader (Office Notebook) (4) White - Survey Leader (Field Notebook) (5) Yellow - F.E. Project Engineer (AJDMDS)

TVA 30533 (RD-BUS 4-92)

TVA-00025122

ACIDITY AND ALKALINITY FIELD WORKSHEET

PRELIMINARY DATA

PROJECT/SITE	COLLECTION DATE
KINGSTON S.P. GROUNDWATER	04-07-08
SURVEY LEADER	
S. GRINDSTAFF	
FIELD CREW	
B. NICHOLS	

NORMALITY	
ACID	0.02
BASE	0.02

SAMPLE TAG NO.	INITIAL pH	SAMPLE VOL TITRATED (ml)	FACTOR	ALKALINITY TITRATION(S) ml ACID TO pH 8.3	PHENOL ALK (mg/L) ($CaCO_3$)	TOTAL ml ACID TO pH 4.5	TOTAL ALK. (mg/L) ($CaCO_3$)	ACIDITY TITRATION(S) ml BASE TO pH 3.7	MINERAL ACIDITY (mg/L) ($CaCO_3$)	TOTAL ml BASE TO pH 8.3	CO_2 ACIDITY (mg/L) ($CaCO_3$)
KIF-GIB-0308	7.5	100	10	—	—	21.4	214	—	—	1.4	14

ALKALINITY OR ACIDITY (mg/L $CaCO_3$) = $\frac{A \times N \times 50,000}{V}$

A = ml TITRANT
N = TITRANT NORMALITY
V = SAMPLE VOLUME

NORMALITY	SAMPLE VOL TITRATED	FACTOR
0.02N	100 ml	10
0.02N	50 ml	20

REVIEWED BY:

Survey Leader — 04-07-08 (Date)

FE Proj. Eng. — 04-09-08 (Date)

DISTRIBUTION: (1) Original - Data Management (2) Pink - Lab with samples (3) Blue - Unit Leader (Office Notebook) (4) Green - Survey Leader (Field Notebook) (5) Yellow - F.E. Project Engineer (AJDMDS)

TVA 30533 (RD-BUS 4-92)

Instrument Standardization

Field Standardization of Instruments

Survey KIF GW

	As Found	Check Final
Standardized By	~~JS~~	
Date/Time-Begin & End	03/26/08 @ 1445	03/26/08 @ 1620
Elevation (m)		
Air Temp (°C)		
Barometric Pressure (BP'mmHg)		

Instrument(s)		TVA Tag Number(s) or SN	
Type	PH		Calibration Date
Model	ORION 250A+	= 36639	Calibration Due Date 02-11-09

Field Measurements		Instrument Readings: As Found	Adjusted To	Check Final	Remarks & Additional Information
Temp. (°C)	Instrument				
	* Hand Thermometer				* Annual Ice Pt Ck Date
	ID #				
Dissolved Oxygen (mg/l)	Water Temp/Oxy Sol.	/		/	% Sat = %
	Instrument				
Conductivity (umhos/cm) (uS/cm)	Instrument				Date Expires
	Low Range	Conc of STD =			Lot #
	Instrument				Date Expires
	High Range	Conc of STD =			Lot #
pH (std units) % slope of probe 98.3	Buffers Temp	21		19.4	Date Expires / Lot #
	Instrument @ 7.0	7		7	10/09 0928 HW
	Instrument @ 10.0 or	9.9		10	02/09 0206 HWW
	Instrument @ 4.0	4		3.9	02/08 0725 GTT
pH Probe Response to Tap Water	After 30 sec				
	After 30 min				
	Temp				
☐ ORP ☐ Sulfide	Instrument				Date Std Prepared
	STD Temp/Conc.	/		/	
	Instrument				Date Std Prepared
	STD Temp/Conc.	/		/	
Turbidity	Instrument				Date Expires
	Low Range	Conc of STD =			Lot #
	Instrument				Date Expires
	High Range	Conc of STD =			Lot #
Depth (m)	Instrument (0.0)				

Comments

Reviewed By: MW

NOTE: Return Instrument to calibration facility if out of tol- (see QA manual).

TVA 30035 (2-2006) [2-2006]

Instrument Standardization

Field Standardization of Instruments

Survey KIFGW

	As Found	Check Final
Standardized By	JS	
Date/Time-Begin & End	03/25/08 @ 1545	03/25/08 @ 1732
Elevation (m)		
Air Temp (°C)		
Barometric Pressure (BP'mmHg)		

Instrument(s)		TVA Tag Number(s) or SN	
Type	pH		Calibration Date
Model	ORION 250A+	E36635	Calibration Due Date 02-11-09

Field Measurements		Instrument Readings: As Found	Adjusted To	Check Final	Remarks & Additional Information
Temp. (°C)	Instrument				
	* Hand Thermometer				* Annual Ice Pt Ck Date
	ID #				
Dissolved Oxygen (mg/l)	Water Temp/Oxy Sol.	/		/	% Sat = %
	Instrument				
Conductivity (umhos/cm) (uS/cm)	Instrument				Date Expires
	Low Range		Conc of STD =		Lot #
	Instrument				Date Expires
	High Range		Conc of STD =		Lot #
pH (std units) % slope of probe 99.2	Buffers Temp	20.3		19.5	Date Expires / Lot #
	Instrument @ 7.0	7.0		7.0	10/09 / 0925MAA
	Instrument @ 10.0 or	9.9		10.0	02/09 / 0206HWW
	Instrument @ 4.0	4		4.0	08/08 / 0725GTT
pH Probe Response to Tap Water	After 30 sec				
	After 30 min				
	Temp				
☐ ORP ☐ Sulfide	Instrument				Date Std Prepared
	STD Temp/Conc.	/		/	
	Instrument				Date Std Prepared
	STD Temp/Conc.	/		/	
Turbidity	Instrument				Date Expires
	Low Range		Conc of STD =		Lot #
	Instrument				Date Expires
	High Range		Conc of STD =		Lot #
Depth (m)	Instrument (0.0)				

Comments _____

Reviewed By: [signature]

NOTE: Return Instrument to calibration facility if out of tol[illegible] manual).

TVA 30035 (2-2006) [2-2006]

785
~~44~~
~~940~~
747
741

Instrument Standardization

Field Standardization of Instruments

Survey KIF GW

	As Found	Check Final
Standardized By	JES	WRC
Date/Time-Begin & End	03/26/08 @ 0645	03/26/08 @ 1500
Elevation (m)		
Air Temp (°C)		
Barometric Pressure (BP'mmHg)		741

Instrument(s)		TVA Tag Number(s) or SN		
Type	Sys 4	2557	Calibration Date	05/08/08
Model	DS5X	46106	Calibration Due Date	01/24/09

Field Measurements		Instrument Readings: As Found	Adjusted To	Check Final	Remarks & Additional Information
Temp. (°C)	Instrument	18.2		18.5	
	* Hand Thermometer				* Annual Ice Pt Ck Date
	ID # 95M100599	18.3		18.5	
Dissolved Oxygen (mg/l)	Water Temp/Oxy Sol.	100.5%		99.5%	% Sat = %
	Instrument	9.8	9.2	9.1	
Conductivity (umhos/cm) (uS/cm)	Instrument	300		300	Date Expires 05/08
	Low Range	Cond STD = 300			Lot # 1704114
	Instrument	1502		1513	Date Expires 04/08
	High Range	Cond STD = 1500			Lot # 1704394
pH (std units) % slope of probe ____	Buffers Temp	21.6		21.1	Date Expires / Lot #
	Instrument @ 7.0	7.1		7.0	10/09 0928 HAA
	Instrument @ 10.0 or				
	Instrument @ 4.0	3.8		4.0	05/09 0418 HZZ
pH Probe Response to Tap Water	After 30 sec				
	After 30 min				
	Temp				
☒ ORP ☐ Sulfide	Instrument	285		291	Date Std Prepared
	STD Temp/Conc.	22 / 291		22 / 291	03/25 and 03/26/08
	Instrument	461		467	Date Std Prepared
	STD Temp/Conc.	22 / 467		22 / 467	03/25 and 03/26/08
Turbidity	Instrument				Date Expires
	Low Range				Lot #
	Instrument				Date Expires
	High Range				Lot #
Depth (m)	Instrument (0.0)				

Comments _____

Reviewed By: [signature]

NOTE: Return Instrument to calibration facility if out of tolerance (see manual).

TVA 30035 (2-2006) [2-2006]

Instrument Standardization

Field Standardization of Instruments

Survey KIF Groundwater

	As Found	Check Final
Standardized By		with
Date/Time-Begin & End	04/[illegible] @ 0650	04/07/08 @ 1223
Elevation (m)		
Air Temp (°C)		
Barometric Pressure (BP'mmHg)		737

Instrument(s)		TVA Tag Number(s) or SN	
Type	SR94	52[illegible]	Calibration Date 1/24/08
Model	DS5X	46[illegible]	Calibration Due Date 1/24/09

Field Measurements		Instrument Readings: As Found	As Found (Adjusted To)	Check Final	Remarks & Additional Information
Temp. (°C)	Instrument	19.8		19.7	
	* Hand Thermometer	19.8		19.7	* Annual Ice Pt Ck Date
	ID # 95M/20599				
Dissolved Oxygen (mg/l)	Water Temp/Oxy Sol.	19.8 8.7		100.1	% Sat = 100.1 % @ 8.82
	Instrument	[illegible]		8.9	
Conductivity (umhos/cm) (uS/cm)	Instrument	300		300	Date Expires 03/08
	Low Range		STD =	300	Lot # 1709114
	Instrument	1512		1513	Date Expires 04/08
	High Range		STD =	500	Lot # 1704394
pH (std units) % slope of probe ____	Buffers Temp	21.9		22.1/22.2	Date Expires / Lot #
	Instrument @ 7.0	7.0		7.0	10/09 092 8HAA
	Instrument @ 10.0 or	—			
	Instrument @ 4.0	4.0		3.9	08/08 0725GTT
pH Probe Response to Tap Water	After 30 sec				
	After 30 min				
	Temp				
[X] ORP	Instrument	467		474	Date Std Prepared 04/07
[ ] Sulfide	STD Temp/Conc.	22 467		22 467	
	Instrument	291		291	Date Std Prepared 04/07
	STD Temp/Conc.	22 291		22 291	
Turbidity	Instrument				Date Expires
	Low Range				Lot #
	Instrument				Date Expires
	High Range				Lot #
Depth (m)	Instrument (0.0)				

Comments _____ Reviewed By: [signature]

NOTE: Return Instrument to calibration facility if out of to[illegible] A manual).

TVA 30035 (2-2006) [2-2006]

Instrument Standardization

Field Standardization of Instruments

Survey KINGSTON S.P. GROUNDWATER

	As Found	Check Final
Standardized By		SAG
Date/Time-Begin & End	04/07/08 @ 1416	04/07/08 @ 1440
Elevation (m)		
Air Temp (°C)		
Barometric Pressure (BP'mmHg)		

Instrument(s)		TVA Tag (Equipment) or SN	
Type	ORION pH	FE3	Calibration Date 02/11/08
Model	250 A+		Calibration Due Date 02/11/09

Field Measurements		Instrument Readings: As Found	Instrument Readings: Check Final	Remarks & Additional Information
Temp. (°C)	Instrument			
	* Hand Thermometer			* Annual Ice Pt Ck Date
	ID #			
Dissolved Oxygen (mg/l)	Water Temp/Oxy Sol.		/	% Sat = %
	Instrument			
Conductivity (umhos/cm) (uS/cm)	Instrument			Date Expires
	Low Range			Lot #
	Instrument			Date Expires
	High Range			Lot #
pH (std units) % slope of probe 97.5	Buffers Temp	21.2 / 21.3	21.2	Date Expires / Lot #
	Instrument @ 7.0	6.97	7.00	02/10 0122JAA
	Instrument @ ~~10.0~~ or 4.0	3.98	3.99	08/08 0725GTT
	Instrument @ ~~4.0~~ 10.0	10.02	10.04	02/09 0206 HNW
pH Probe Response to Tap Water	After 30 sec			
	After 30 min			
	Temp			
☐ ORP ☐ Sulfide	Instrument			Date Std Prepared
	STD Temp/Conc.		/	
	Instrument			Date Std Prepared
	STD Temp/Conc.		/	
Turbidity	Instrument			Date Expires
	Low Range			Lot #
	Instrument			Date Expires
	High Range			Lot #
Depth (m)	Instrument (0.0)			

Comments

Reviewed By: MWD

NOTE: Return Instrument to calibration facility if out of tc [illegible] manual).

TVA 30035 (2-2006) [2-2006]

GROUNDWATER LEVEL MEASUREMENTS - KINGSTON PENINSULA

Date:	Survey Leader:	Measured By:				
03/25/2008	jes	wln				
Location Identifier (P84068)	**Reference Point Description**	**Ref Point Elev (m)**	**Dist to Wtr Surface (m) (4195)**	**Calc Water Surf El (m) (4189)**	**Bottom Depth (m) (4194)**	**Remarks**
KIF-G1B	Top of 153mm casing	261.61	34.85	226.76		Open borehole
KIF-G3A	Top of 51mm casing	228.49	3.70	224.79	9.74	
KIF-G3B	Top of 51mm casing	228.71	3.92	224.79	19.19	
KIF-G4B	Top of 51mm casing	233.75	8.87	224.88	25.02	
KIF-G5A	Top of 51mm casing	231.37	6.65	224.72	8.57	
KIF-G5B	Top of 51mm casing	231.23	6.51	224.72	18.36	
KIF-G6A	Top of 51mm casing	235.82	11.01	224.81	18.19	

Chain of Custody
Page ___ of ___

Prepared by:

ENVIRONMENTAL SCIENCE CORP.
12065 Lebanon Road
Mt. Juliet, TN 37122
Phone (615) 758-5858
Phone (800) 767-5859
FAX (615) 758-5859

TVA - ENVAFF
(ENVIRONMENTAL AFFAIRS)

Alternate billing information:
Cynthia Anderson
cmanders@tva.gov

Report to: J. MARK BOGGS
Email to: jmboggs@tva.gov

Project Description: ~~BRF~~ KIF GROUNDWATER
Phone: (865) 632-6941
FAX: (865) 632-8212
Collected by: BILL NICHOLS AND JIM STECKBURGER
Collected by (signature): [signature]
Packed on Ice N ___ Y ___

Client Project #
Site/Facility ID#: C014DOM
City/State Collected: KINGSTON
ESC Key
P.O.#

Rush? (Lab MUST Be Notified)
___ Same Day 200%
Next Day 100%
Two Day [illegible]

Date Results Needed: STANDARD
Email? No ___ Yes
FAX? No ___ Yes

Analysis/Container/Preservative: Total Organic Carbon; Suspended Solids; Metals by ICP/MS, Aluminum *see ATTACHED; Nitrate-Nitrite, Kjeldahl; Ammonia Nitrogen; SG; Chloride by IC, Fluoride by IC

CoCode (lab use only)
Template/Prelogin
Shipped Via

Sample ID	Comp/Grab	Matrix*	Depth	Date	Time	No. of Cntrs	Organic Carbon	Suspended Solids	Metals ICP/MS	Nitrate-Nitrite, Kjeldahl	Ammonia Nitrogen	SG	Chloride/Fluoride by IC	Remarks/Contaminant	Sample # (lab only)
KIF-G3A-0308	[illegible]	GW		[illegible]	1007	8/7	1	1	1	1	1	1	1	EDD	
KIF-G3B-0308		GW		3/26/08	1233	7	1	1	1	1	1	1	1	EDD	
KIF-G4B-0308		GW		3/26/08	1118	7	1	1	1	1	1	1	1	EDD	
KIF-G4B-0308 DUP		GW		3/26/08	1118	7	1	1	1	1	1	1	1	EDD	
KIF-G5A-0308		GW		3/25/08	1333	7	1	1	1	1	1	1	1	EDD	
KIF-G5B-0308		GW		3/25/08	1113	7	1	1	1	1	1	1	1	EDD	
KIF-G6B-0308		GW		3/25/08	1017	7	1	1	1	1	1	1	1	EDD	
KIF-EQBLANK-0308		GW		3/26/08	0900	7	1	1	1	1	1	1	1	EDP	

*Matrix: SS - Soil/Solid GW - Groundwater WW - WasteWater DW - Drinking Water OT - Other

Remarks

pH ______ Temp ______
Flow ______ Other ______

Relinquished by: (Signature)	Date:	Time:	Received by: (Signature)
[signature]	3/27/08	12:00	
Relinquished by: (Signature)	Date	Time	Received by: (Signature)
Relinquished by: (Signature)	Date	Time	Received for lab by: (Signature)

Samples returned via: [ ] UPS [ ] FedEx [ ] Courier [ ]
Temp: ___ Bottles Received: ___
Date: ___ Time: ___
Condition (lab use only)
pH Checked ___ NCF: ___

TVA-ENVAFF (ENVIRONMENTAL AFFAIRS)

Alternate billing information:
Cynthia Anderson
cmanders@tva.gov

Report to: J. Mark Boggs

Email to: jmboggs@tva.gov

Project Description: KIF Groundwater

City/State Collected: Kingston, TN

Phone: 865-632-6941
FAX: 865-632-8212

Client Project #

ESC Key:

Collected by: Sam Grindstaff

Site/Facility ID#: 0014D0M

P.O.#:

Collected by (signature):

Packed on Ice (Y/N) Y

Rush? (Lab MUST Be Notified)
____ Same Day.....200%
____ Next Day.....100%
____ Two Day.....50%

Date Results Needed:

Email? __No✓ Yes

FAX? __No✓ Yes

Sample ID	Comp/Grab	Matrix*	Depth	Date	Time	No. of Cntrs	INORGANIC CARBON	SUSPENDED SOLIDS	SILVER by ICPMS, ALUMINUM + *SEE ATTACHED	NITRATE - NITRITE, KJELDAHL	AMMONIA NITROGEN	TDS	CHLORIDE by IC, FLUORIDE by IC	Remarks/Contaminant	Sample # (lab only)
KIF-G1A-0308	Grab	GW	X	04/07/08	1027	7	X	X	X	X	X	X	X		

Analysis/Container/Preservative

Chain of Custody
Page 1 of 1

Prepared by:

ENVIRONMENTAL SCIENCE CORP.
12065 Lebanon Road
Mt. Juliet, TN 37122
Phone (615) 758-5858
Phone (800) 767-5859
FAX (615) 758-5859

CoCode (lab use only)

Template/Prelogin

Shipped Via:

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

pH _____ Temp _____

Remarks:

Flow _____ Other _____

Relinquished by: (Signature)	Date:	Time:	Received by: (Signature)	Samples returned via: ☐ UPS ☐ FedEx ☐ Courier ☐ _____	Condition: (lab use only)
	04/07/08	1522			
Relinquished by: (Signature)	Date:	Time:	Received by: (Signature)	Temp: / Bottles Received:	
Relinquished by: (Signature)	Date:	Time:	Received for lab by: (Signature)	Date: / Time:	pH Checked: / NCF:

TVA-00025131

Laboratory Analyses

Aluminum, Total	Copper, Total	Non-Filterable Residue (TSS)
Ammonia as N*	Filterable Residue (TDS)	Potassium, Total
Antimony, Total	Fluoride, Total	Selenium, Total
Arsenic, Total	Inorganic Carbon, Total	Silver, Total
Barium, Total	Iron, Total	Sodium, Total
Beryllium, Total	Lead, Total	Strontium, Total
Boron, Total	Magnesium, Total	Sulfate, Total
Cadmium, Total	Manganese, Total	Sulfide, Total (if sulfur odor)
Calcium, Total	Mercury, Total	Thallium, Total
Chloride, Total	Molybdenum, Total	Total Kjeldahl Nitrogen*
Chromium, Total	Nickel, Total	Vanadium, Total
Cobalt, Total	Nitrate-Nitrite as N, Total*	Zinc, Total

NOTE: Ab Sulfide If Needed

**Well 22 water sample analyzed only for these nutrients*